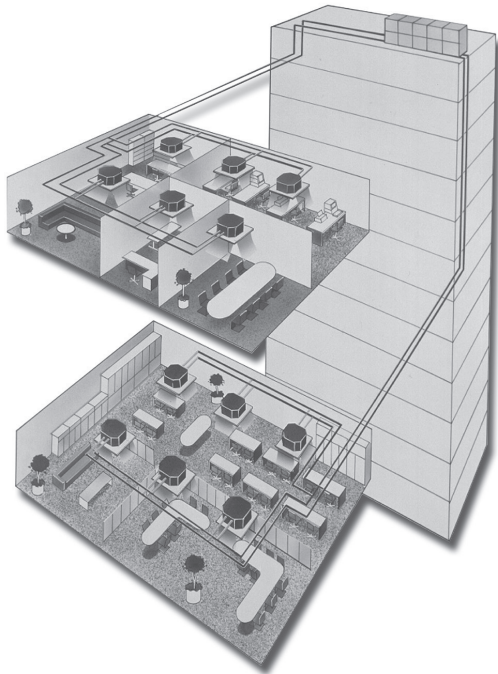


SERVICE MANUAL

INVERTER-DRIVEN MULTI-SPLIT SYSTEM HEAT PUMP AIR CONDITIONERS

Service Manual



< Outdoor Units >

(H,Y)VAHP072B(3,4)1S to (H,Y)VAHP360B(3,4)1S
(H,Y)VAHR072B(3,4)1S to (H,Y)VAHR360B(3,4)1S

< Indoor Units >

- Ducted High Static Type
(H,Y)IDH018B21S to (H,Y)IDH048B21S
- Ducted Medium Static Type
(H,Y)IDM006B21S to (H,Y)IDM048B21S
- Ducted Slim Type
(H,Y)IDS006B21S to (H,Y)IDS018B21S
- 4-Way Cassette Type
(H,Y)IC4012B21S to (H,Y)IC4036B21S
- 1-Way Cassette Type
(H,Y)IC1006B21S to (H,Y)IC1015B21S
- Wall Mounted Type
TIWM006B21S to TIWM024B21S

Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This heat pump air conditioning unit has been designed for a specific temperature range. For optimum performance and long life, operate this unit within the range limits according to the table below.

Temperature

		Maximum	Minimum
Cooling Operation	Indoor	89°F DB/73°F WB (32°C DB/23°C WB)	69°F DB/59°F WB (21°C DB/15°C WB)
	Outdoor	118°F DB (48°C DB) *1, *2)	14°F DB (-10°C DB) *3), *4)
Heating Operation	Indoor	80°F DB (27°C DB)	59°F DB (15°C DB)
	Outdoor	59°F WB (15°C WB) *5)	-4°F WB (-20°C WB) *6)

DB: Dry Bulb, WB: Wet Bulb

- *1) When the outdoor air temperature is 100°F DB (38°C DB) or more and the outdoor unit operation capacity ratio is 100% or more, the outdoor unit will be Thermo-OFF to protect the compressor from failure.
- *2) When the outdoor air temperature is 109°F (43°C) or more during the outdoor unit cooling operation, the maximum connectable indoor unit capacity ratio is 100%.
- *3) When the outdoor air temperature is 23°F (-5°C) or less during the outdoor unit cooling operation, the minimum connectable indoor unit capacity is 18,000 Btu/h. In this case, install the snow protection hood (optional).
- *4) When operating the outdoor unit under the low cooling load conditions and in the low outdoor air temperature, (approx. 50°F DB (10°C DB) or less), the indoor unit will be Thermo-OFF to prevent the heat exchanger of the indoor unit from being frosted.
- *5) When operating the outdoor unit under the low heating load conditions and the outdoor temperature is 59°F DB (15°C DB) or more, the outdoor unit will be Thermo-OFF to protect the compressor from failure.
- *6) Operation in the outdoor temperature of 5~-4°F WB (-15~20°C WB) is assumed to limited conditions such as start-up in early morning. Long time operation in this condition may shorten the life of the compressor.

- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.



1. Introduction

This manual concentrates on the Outdoor Heat Pump Unit. Read this installation and maintenance manual carefully before installation. Read over the installation manual for the Indoor Unit also.


This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

(Transportation/Installation Work) > (Refrigerant Piping Work) > (Electrical Wiring Work) > (Ref. Charge Work) > (Test Run) > (User)

2. Important Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
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- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (approximately 1 meter) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

⚠ WARNING


To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where fire, oil, steam, or powder can directly enter the unit, such as in close proximity or directly above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.

- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If condensate piping becomes clogged, moisture can back up and can drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.
- During transportation, do not allow the backrest of the forklift make contact with the unit, otherwise, it may cause damage to the heat exchanger and also may cause injury when stopped or started suddenly.
- Remove gas inside the closing pipe when the brazing work is performed. If the brazing filler metal is melted with remaining gas inside, the pipes will be blown off and it may cause injury.
- Be sure to use nitrogen gas for an airtight test. If other gases such as oxygen gas, acetylene gas or fluorocarbon gas are accidentally used, it may cause explosion or gas intoxication.

After installation work for the system has been completed, explain the “Safety Precautions,” the proper use and maintenance of the unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

 WARNING	<p>To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.</p>
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- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit’s intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit’s faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country’s requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Check the design pressure for this product is 601 psi (4.15MPa). The pressure of the refrigerant R410A is 1.4 times higher than that of the refrigerant R22. Therefore, the refrigerant piping for R410A shall be thicker than that for R22. Make sure to use the specified refrigerant piping. If not, the refrigerant piping may rupture due to an excessive refrigerant pressure. Besides, pay attention to the piping thickness when using copper refrigerant piping. The thickness of copper refrigerant piping differs depending on its material.
- The refrigerant R410A is adopted. The refrigerant oil tends to be affected by foreign matters such as moisture, oxide film, (or fat). Perform the installation work with care to prevent moisture, dust, or different refrigerant from entering the refrigerant cycle. Foreign matter can be introduced into the cycle from such parts as expansion valve and the operation may be unavailable.
- To avoid the possibility of different refrigerant or refrigerant oil being introduced into the cycle, the sizes of the charging connections have been changed from R407C type and R22 type. It is necessary to prepare the appropriate tools before performing installation work.
- Use refrigerant pipes and joints which are approved for use with R410A.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.

- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.
- When pipes are removed out from under the piping cover, after the insulation work is completed, cover the gap between the piping cover and pipes by a packing (field-supplied). If the gap is not covered, the unit may be damaged if snow, rain water or small animals enter the unit.
- Do not apply an excessive force to the spindle valve at the end of opening. Otherwise, the spindle valve flies out due to refrigerant pressure. At the test run, fully open the gas and liquid valves, otherwise, these devices will be damaged. (It is closed before shipment.)
- If the arrangement for outdoor units is incorrect, it may cause flowback of the refrigerant and result in failure of the outdoor unit.
- The refrigerant system may be damaged if the slope of the piping connection kit exceeds $\pm 15^\circ$.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Perform all electrical work in strict accordance with this installation and maintenance manual and all the relevant regulatory standards.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- The new air conditioner may not function normally in the following instances:
 - If electrical power for the new air conditioner is supplied from the same transformer as the device* referred to below.
 - If the power source cables for this device* and the new air conditioner unit are located in close proximity to each other.

Device*: (Example): A lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch.

Regarding the cases mentioned above, surge voltage may be inducted into the power supply cables for the packaged air conditioner due to a rapid change in power consumption of the device and an activation of a switch.

Check field regulations and standards before performing electrical work in order to protect the power supply for the new air conditioner unit.

- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.

- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After ceasing operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.
- Perform all electrical work in accordance with this manual and in compliance with all regulations and safety standards.
- Do not open a service access cover or panel of an indoor or outdoor unit without first turning OFF the power at the main power supply.
- Residual voltage can cause electric shock. At all times, check for residual voltage after disconnecting from the power source before starting work on the unit.
- Use a Ground Fault Circuit Interrupter (GFCI) to reduce the chance of an electric shock.

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1. Installation

1.1 Outdoor Unit

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1. Introduction

This manual concentrates on the Outdoor Heat Pump Unit. Read this installation and maintenance manual carefully before installation. Read over the installation manual for the Indoor Unit also.


This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

(Transportation/Installation Work) > (Refrigerant Piping Work) > (Electrical Wiring Work) > (Ref. Charge Work) > (Test Run) > (User)

2. Important Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
---	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (approximately 1 meter) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

⚠ WARNING


To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where fire, oil, steam, or powder can directly enter the unit, such as in close proximity or directly above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.

- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If condensate piping becomes clogged, moisture can back up and can drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.
- During transportation, do not allow the backrest of the forklift make contact with the unit, otherwise, it may cause damage to the heat exchanger and also may cause injury when stopped or started suddenly.
- Remove gas inside the closing pipe when the brazing work is performed. If the brazing filler metal is melted with remaining gas inside, the pipes will be blown off and it may cause injury.
- Be sure to use nitrogen gas for an airtight test. If other gases such as oxygen gas, acetylene gas or fluorocarbon gas are accidentally used, it may cause explosion or gas intoxication.

After installation work for the system has been completed, explain the “Safety Precautions,” the proper use and maintenance of the unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

 <b style="font-size: 1.2em;">WARNING	<p>To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.</p>
---	---

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit’s intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit’s faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country’s requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Check the design pressure for this product is 601 psi (4.15MPa). The pressure of the refrigerant R410A is 1.4 times higher than that of the refrigerant R22. Therefore, the refrigerant piping for R410A shall be thicker than that for R22. Make sure to use the specified refrigerant piping. If not, the refrigerant piping may rupture due to an excessive refrigerant pressure. Besides, pay attention to the piping thickness when using copper refrigerant piping. The thickness of copper refrigerant piping differs depending on its material.
- The refrigerant R410A is adopted. The refrigerant oil tends to be affected by foreign matters such as moisture, oxide film, (or fat). Perform the installation work with care to prevent moisture, dust, or different refrigerant from entering the refrigerant cycle. Foreign matter can be introduced into the cycle from such parts as expansion valve and the operation may be unavailable.
- To avoid the possibility of different refrigerant or refrigerant oil being introduced into the cycle, the sizes of the charging connections have been changed from R407C type and R22 type. It is necessary to prepare the following tools listed in Section 3 before performing the installation work.
- Use refrigerant pipes and joints which are approved for use with R410A.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.

INSTALLATION

- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.
- When pipes are removed out from under the piping cover, after the insulation work is completed, cover the gap between the piping cover and pipes by a packing (field-supplied). If the gap is not covered, the unit may be damaged if snow, rain water or small animals enter the unit.
- Do not apply an excessive force to the spindle valve at the end of opening. Otherwise, the spindle valve flies out due to refrigerant pressure. At the test run, fully open the gas and liquid valves, otherwise, these devices will be damaged. (It is closed before shipment.)
- If the arrangement for outdoor units is incorrect, it may cause flowback of the refrigerant and result in failure of the outdoor unit.
- The refrigerant system may be damaged if the slope of the piping connection kit exceeds $\pm 15^\circ$.

Electrical Precautions



WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Perform all electrical work in strict accordance with this installation and maintenance manual and all the relevant regulatory standards.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- The new air conditioner may not function normally in the following instances:
 - If electrical power for the new air conditioner is supplied from the same transformer as the device* referred to below.
 - If the power source cables for this device* and the new air conditioner unit are located in close proximity to each other.

Device*: (Example): A lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor and large-sized switch.

Regarding the cases mentioned above, surge voltage may be inducted into the power supply cables for the packaged air conditioner due to a rapid change in power consumption of the device and an activation of a switch.

Check field regulations and standards before performing electrical work in order to protect the power supply for the new air conditioner unit.

- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.

- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After ceasing operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.
- Perform all electrical work in accordance with this manual and in compliance with all regulations and safety standards.
- Do not open a service access cover or panel of an indoor or outdoor unit without first turning OFF the power at the main power supply.
- Residual voltage can cause electric shock. At all times, check for residual voltage after disconnecting from the power source before starting work on the unit.
- Use a Ground Fault Circuit Interrupter (GFCI) to reduce the chance of an electric shock.

3. Before Installation

3.1 Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool	No.	Tool
1	Handsaw	8	Pliers	16	Wire Cutters
2	Phillips Screwdriver	9	Pipe Cutter	17	Gas Leak Detector
3	Vacuum Pump	10	Brazing Kit	18	Level
4	Refrigerant Gas Hose	11	Hexagon Wrench	19	Clamper for Solderless Terminals
5	Megohmmeter	12	Spanner	20	Hoist (for Indoor Unit)
6	Copper Pipe Bender	13	Scale	21	Ammeter
7	Manual Water Pump (for Indoor Unit)	14	Charging Cylinder	22	Voltage Meter
		15	Gauge Manifold	23	Wrench

Use specially designated tools for handling R410A refrigerant.

◇: Interchangeability is available with current R22
 X: Prohibited

●: Only for Refrigerant R410A (No Interchangeability with R22)
 ◆: Only for Refrigerant R407C (No Interchangeability with R22)

Measuring Instrument and Tool		Interchangeability with R22		Reason of Non-Interchangeability and Attention (★: Strictly Required)	Use
		R410A	R407C		
Refrigerant Pipe	Pipe Cutter, Chamfering Reamer	◇	◇	-	Cutting Pipe Removing Burrs
	Flaring Tool	◇●	◇	* The flaring tools for R407C are applicable to R22. * If using flaring tube, make dimension of tube larger for R410A. * In case of hard temper pipe, flaring is not available.	Flaring for Tubes
	Extrusion Adjustment Gauge	●	-		Dimensional Control for Extruded Portion of Tube after Flaring
	Pipe Bender	◇	◇	* In case of hard temper pipe, bending is not available. Use elbow for bend and braze.	Bending
	Expanding Tool	◇	◇	* In case of hard temper pipe, expanding of tube is not available. Use socket for connecting tube.	Expanding Tubes
	Torque Wrench	●	◇	* For 1/2 inch D. (12.7mm), 5/8 inch D. (15.88mm), spanner size is up 3/32 inch (2mm).	Connection of Flare Nut
		◇	◇	* For 1/4 inch D. (6.35mm), 3/8 inch D. (9.52mm), 3/4 inch D. (19.05mm), spanner size is the same.	
	Brazing Tool	◇	◇	* Perform correct brazing work.	Brazing for Tubes
	Nitrogen Gas	◇	◇	* Strict Control against Contamin (Blow nitrogen during brazing.)	Prevention from Oxidation during Brazing
	Lubrication Oil (for Flare Surface)	●	◆	* Use a synthetic oil which is equivalent to the oil used in the refrigeration cycle. * Synthetic oil absorbs moisture quickly.	Applying Oil to the Flared Surface
Vacuum Drying · Refrigerant Charge	Refrigerant Cylinder	●	◆	* Check refrigerant cylinder color. ★ Liquid refrigerant charging is required regarding zeotropic refrigerant.	Refrigerant Charging
	Vacuum Pump	◇	◇	★ The current ones are applicable. However, it is required to mount a vacuum pump adapter which can prevent from reverse flow when a vacuum pump stops, resulting in no reverse oil flow.	Vacuum Pumping
	Adapter for Vacuum Pump	*●	◆		
	Manifold Valve	●	◆	* No interchangeability is available due to higher pressures when compared with R22. ★ Do not use current ones to the different refrigerant. If used, mineral oil will flow into the cycle and cause sludges, resulting in clogging or compressor failure.	Vacuum Pumping, Vacuum Holding, Refrigerant Charging and Check of Pressures
	Charging Hose	●	◆	Connection diameter is different; R410A: UNF1/2, R407C: UNF7/16.	
	Charging Cylinder	X	X	* Use the weight scale.	-
	Weight Scale	◇	◇	-	Measuring Instrument for Refrigerant Charging
	Refrigerant Gas Leakage Detector	*●	◆	* The current gas leakage detector (R22) is not applicable due to different detecting method.	Gas Leakage Check

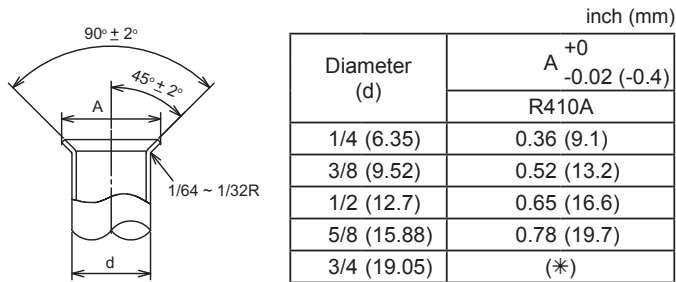
*: Interchangeability with R407C.

INSTALLATION

3.2 Flaring and Joint

• Flaring Dimension

Perform the flaring work as shown below.



(*) It is impossible to perform flaring work with hard temper pipe. Use an accessory pipe with a flare.

• Joint Selection

If hard temper pipe is used, the flaring work cannot be performed. In this case, use a joint selected from the table below.

< Minimum Thickness of Joint >

inch (mm)

Diameter	R410A
1/4 (6.35)	0.020 (0.5)
3/8 (9.52)	0.024 (0.6)
1/2 (12.7)	0.028 (0.7)
5/8 (15.88)	0.031 (0.8)
3/4 (19.05)	0.031 (0.8)
7/8 (22.2)	0.035 (0.9)
1-1/8 (28.58)	0.039 (1.0)
1-3/8 (34.93)	0.047 (1.2)
1-5/8 (41.28)	0.057 (1.45)

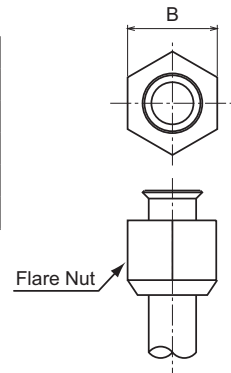
< Flare Nut Dimension B >

inch (mm)

Diameter	R410A
1/4 (6.35)	21/32 (17)
3/8 (9.52)	7/8 (22)
1/2 (12.7)	1-1/32 (26)
5/8 (15.88)	1-5/32 (29)
3/4 (19.05)	1-13/32 (36)

NOTE:

Do not use a thin joint other than the ones shown in the table at left.



• Piping Thickness and Material

Use the pipe as below.

The thickness of refrigerant pipe differs depending on design pressure.

For copper pipe, pay attention to pipe selection, because the piping thickness differs depending on its material.

inch (mm)

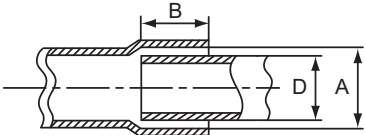
Outer Diameter	R410A	
	Thickness	Temper
1/4 (6.35)	0.03 (0.76)	Annealed
3/8 (9.52)	0.032 (0.81)	Annealed
1/2 (12.7)	0.032 (0.81)	Annealed
5/8 (15.88)	0.035 (0.89)	Annealed
3/4 (19.05)	0.035 (0.89)	Hard Temper (or Annealed)
7/8 (22.2)	0.045 (1.14)	Hard Temper
1-1/8 (28.58)	0.050 (1.27)	Hard Temper
1-3/8 (34.93)	0.065 (1.65)	Hard Temper
1-5/8 (41.28)	0.072 (1.83)	Hard Temper

NOTES:

- Do not use the pipe of its allowable pressure is 601 psi (4.15MPa).
- The reference value of the refrigerant piping thickness is indicated in the table at left. Do not use the pipe which is considerably different from the reference value.

- Processing at Brazing Connection

To prevent gas leakage at the brazing connection, refer to the table for the insertion depth and the gap for joint pipe.



inch (mm)

Diameter (D)	Min. Insertion Depth (B)	Gap (A - D)
$3/16 \leq D < 5/16$ ($5 \leq D < 8$)	1/4 (6)	0.002 - 0.014 (0.05 - 0.35)
$5/16 \leq D < 15/32$ ($8 \leq D < 12$)	9/32 (7)	
$15/32 \leq D < 5/8$ ($12 \leq D < 16$)	5/16 (8)	0.002 - 0.018 (0.05 - 0.45)
$5/8 \leq D < 31/32$ ($16 \leq D < 25$)	13/32 (10)	
$31/32 \leq D < 1-3/8$ ($25 \leq D < 35$)	15/32 (12)	0.002 - 0.022 (0.05 - 0.55)
$1-3/8 \leq D < 1-25/32$ ($35 \leq D < 45$)	9/16 (14)	

INSTALLATION

3.3 Line-Up of Outdoor Unit

- (1) This outdoor unit series can build the capacity of 72 to 360 MBH by combining the outdoor units of 72 to 120 MBH. The outdoor unit can be used as either heat pump system or heat recovery system.
- (2) The outdoor unit of 144 to 360 MBH consists of the combination of two to four base units. The combinations not indicated in the table below are unavailable.

3.3.1 Heat Pump System

< 208/230V >

• Base Unit

Capacity (MBH)	72	96	120
Model	(H,Y)VAHP072B31S	(H,Y)VAHP096B31S	(H,Y)VAHP120B31S

• Combination of Base Units

Capacity (MBH)	144	168	192	216	240
Model	(H,Y)VAHP144B31S	(H,Y)VAHP168B31S	(H,Y)VAHP192B31S	(H,Y)VAHP216B31S	(H,Y)VAHP240B31S
Combination	(H,Y)VAHP072B31S	(H,Y)VAHP096B31S	(H,Y)VAHP096B31S	(H,Y)VAHP072B31S	(H,Y)VAHP096B31S
	(H,Y)VAHP072B31S	(H,Y)VAHP072B31S	(H,Y)VAHP096B31S	(H,Y)VAHP072B31S	(H,Y)VAHP072B31S
	-	-	-	(H,Y)VAHP072B31S	(H,Y)VAHP072B31S

Capacity (MBH)	264	288	312	336	360
Model	(H,Y)VAHP264B31S	(H,Y)VAHP288B31S	(H,Y)VAHP312B31S	(H,Y)VAHP336B31S	(H,Y)VAHP360B31S
Combination	(H,Y)VAHP120B31S	(H,Y)VAHP120B31S	(H,Y)VAHP120B31S	(H,Y)VAHP096B31S	(H,Y)VAHP120B31S
	(H,Y)VAHP072B31S	(H,Y)VAHP096B31S	(H,Y)VAHP120B31S	(H,Y)VAHP096B31S	(H,Y)VAHP096B31S
	(H,Y)VAHP072B31S	(H,Y)VAHP072B31S	(H,Y)VAHP072B31S	(H,Y)VAHP072B31S	(H,Y)VAHP072B31S
	-	-	-	(H,Y)VAHP072B31S	(H,Y)VAHP072B31S

< 460V >

• Base Unit

Capacity (MBH)	72	96	120
Model	(H,Y)VAHP072B41S	(H,Y)VAHP096B41S	(H,Y)VAHP120B41S

• Combination of Base Units

Capacity (MBH)	144	168	192	216	240
Model	(H,Y)VAHP144B41S	(H,Y)VAHP168B41S	(H,Y)VAHP192B41S	(H,Y)VAHP216B41S	(H,Y)VAHP240B41S
Combination	(H,Y)VAHP072B41S	(H,Y)VAHP096B41S	(H,Y)VAHP096B41S	(H,Y)VAHP072B41S	(H,Y)VAHP096B41S
	(H,Y)VAHP072B41S	(H,Y)VAHP072B41S	(H,Y)VAHP096B41S	(H,Y)VAHP072B41S	(H,Y)VAHP072B41S
	-	-	-	(H,Y)VAHP072B41S	(H,Y)VAHP072B41S

Capacity (MBH)	264	288	312	336	360
Model	(H,Y)VAHP264B41S	(H,Y)VAHP288B41S	(H,Y)VAHP312B41S	(H,Y)VAHP336B41S	(H,Y)VAHP360B41S
Combination	(H,Y)VAHP120B41S	(H,Y)VAHP120B41S	(H,Y)VAHP120B41S	(H,Y)VAHP096B41S	(H,Y)VAHP120B41S
	(H,Y)VAHP072B41S	(H,Y)VAHP096B41S	(H,Y)VAHP120B41S	(H,Y)VAHP096B41S	(H,Y)VAHP096B41S
	(H,Y)VAHP072B41S	(H,Y)VAHP072B41S	(H,Y)VAHP072B41S	(H,Y)VAHP072B41S	(H,Y)VAHP072B41S
	-	-	-	(H,Y)VAHP072B41S	(H,Y)VAHP072B41S

3.3.2 Heat Recovery System

< 208/230V >

• Base Unit

Capacity (MBH)	72	96	120
Model	(H,Y)VAHR072B31S	(H,Y)VAHR096B31S	(H,Y)VAHR120B31S

• Combination of Base Units

Capacity (MBH)	144	168	192	216	240
Model	(H,Y)VAHR144B31S	(H,Y)VAHR168B31S	(H,Y)VAHR192B31S	(H,Y)VAHR216B31S	(H,Y)VAHR240B31S
Combination	(H,Y)VAHR072B31S	(H,Y)VAHR096B31S	(H,Y)VAHR096B31S	(H,Y)VAHR072B31S	(H,Y)VAHR096B31S
	(H,Y)VAHR072B31S	(H,Y)VAHR072B31S	(H,Y)VAHR096B31S	(H,Y)VAHR072B31S	(H,Y)VAHR072B31S
	-	-	-	(H,Y)VAHR072B31S	(H,Y)VAHR072B31S

Capacity (MBH)	264	288	312	336	360
Model	(H,Y)VAHR264B31S	(H,Y)VAHR288B31S	(H,Y)VAHR312B31S	(H,Y)VAHR336B31S	(H,Y)VAHR360B31S
Combination	(H,Y)VAHR120B31S	(H,Y)VAHR120B31S	(H,Y)VAHR120B31S	(H,Y)VAHR096B31S	(H,Y)VAHR120B31S
	(H,Y)VAHR072B31S	(H,Y)VAHR096B31S	(H,Y)VAHR120B31S	(H,Y)VAHR096B31S	(H,Y)VAHR096B31S
	(H,Y)VAHR072B31S	(H,Y)VAHR072B31S	(H,Y)VAHR072B31S	(H,Y)VAHR072B31S	(H,Y)VAHR072B31S
	-	-	-	(H,Y)VAHR072B31S	(H,Y)VAHR072B31S

< 460V >

• Base Unit

Capacity (MBH)	72	96	120
Model	(H,Y)VAHR072B41S	(H,Y)VAHR096B41S	(H,Y)VAHR120B41S

• Combination of Base Units

Capacity (MBH)	144	168	192	216	240
Model	(H,Y)VAHR144B41S	(H,Y)VAHR168B41S	(H,Y)VAHR192B41S	(H,Y)VAHR216B41S	(H,Y)VAHR240B41S
Combination	(H,Y)VAHR072B41S	(H,Y)VAHR096B41S	(H,Y)VAHR096B41S	(H,Y)VAHR072B41S	(H,Y)VAHR096B41S
	(H,Y)VAHR072B41S	(H,Y)VAHR072B41S	(H,Y)VAHR096B41S	(H,Y)VAHR072B41S	(H,Y)VAHR072B41S
	-	-	-	(H,Y)VAHR072B41S	(H,Y)VAHR072B41S

Capacity (MBH)	264	288	312	336	360
Model	(H,Y)VAHR264B41S	(H,Y)VAHR288B41S	(H,Y)VAHR312B41S	(H,Y)VAHR336B41S	(H,Y)VAHR360B41S
Combination	(H,Y)VAHR120B41S	(H,Y)VAHR120B41S	(H,Y)VAHR120B41S	(H,Y)VAHR096B41S	(H,Y)VAHR120B41S
	(H,Y)VAHR072B41S	(H,Y)VAHR096B41S	(H,Y)VAHR120B41S	(H,Y)VAHR096B41S	(H,Y)VAHR096B41S
	(H,Y)VAHR072B41S	(H,Y)VAHR072B41S	(H,Y)VAHR072B41S	(H,Y)VAHR072B41S	(H,Y)VAHR072B41S
	-	-	-	(H,Y)VAHR072B41S	(H,Y)VAHR072B41S

3.4 Combination of Indoor Unit and Outdoor Unit

Table 3.1 Indoor Unit Type List

Indoor Unit Type			Capacity (MBH)								
			6	8	12	15	18	24	30	36	48
Ducted	Ducted (High Static)	(H,Y)IDH_B21S					○	○	○	○	○
	Ducted (Medium Static)	(H,Y>IDM_B21S	○	○	○	○	○	○	○	○	○
	Ducted (Slim)	(H,Y)IDS_B21S	○	○	○	○	○				
Non-Ducted	Ceiling-Mounted 4-Way Cassette	(H,Y)IC4_B21S			○	○	○	○	○	○	
	Ceiling-Mounted 1-Way Cassette	(H,Y)IC1_B21S	○	○	○	○					
	Wall-Mounted	TIWM_B21S	○	○	○	○	○	○			

○ : Available

- The number of indoor units that can be connected to an outdoor unit is as defined in Table 3.2: Comply with the following conditions when installing the unit.
- A maximum and minimum total capacity against the nominal outdoor unit capacity can be obtained through combination of indoor units.

Table 3.2 System Combination

Outdoor Unit Capacity (MBH)	Minimum Capacity at Individual Operation (MBH)	Maximum Number of Connectable I.U.	Recommended Number of Connected I.U.	Connectable Indoor Unit Capacity Ratio	
				Maximum *2)	Minimum
72	6 *1)	18	10	150%	70%
96		21	16	135%	65%
120		25	16	130%	60%
144		36	26	150%	75%
168		39	32	140%	65%
192		43	32	135%	65%
216		54	32	150%	70%
240		60	38	150%	70%
264		61	38	140%	65%
288		64	38	135%	65%
312		64	38	130%	65%
336		64	38	140%	65%
360		64	38	135%	65%

*1) When the outdoor air temperature is 23°F (-5°C) or cooler during the outdoor unit cooling operation, the minimum connectable indoor unit capacity is 18,000 Btu/h. A snow protection hood (optional) should be installed.

*2) When the outdoor air temperature is 109°F (43°C) or warmer during the outdoor unit cooling operation, the maximum connectable indoor unit capacity ratio is 100%.

NOTES:

1. The connectable indoor unit capacity ratio can be calculated as follows:

$$\text{Connectable Indoor Unit Capacity Ratio} = \frac{\text{Total Indoor Unit Capacity}}{\text{Total Outdoor Unit Capacity}}$$
2. For the system under which all the indoor units operate simultaneously, the total indoor unit capacity should be less than the outdoor unit capacity. Otherwise, a decrease in operating performance and an increase in the operating limit can result in an overload.
3. For the system under which all the indoor units do not operate simultaneously, the total indoor unit capacity is available up to 150% against the outdoor unit capacity.
4. A maximum number of connectable indoor units differs depending on the model, capacity, environment and installation location of connected indoor units. Refer to “Engineering Manual” for the selection.
5. When operating the outdoor unit in cold areas with temperatures of 14°F (-10°C), or under the high heating load conditions, the total indoor unit capacity should be less than 100% against the outdoor unit capacity and the total piping length should be less than 984.3ft (300m).
6. The air flow volume for indoor units of 6 and 8 MBH is set higher than that for indoor units of 12 MBH or more. Make sure to select appropriate indoor units for installation where cold draft may occur during heating operation. If installing indoor units in such locations, refer to the recommended number of indoor units that can be connected.
7. When the connected indoor units are only the types indicated below, regardless of the value indicated in Table 3.2 “System Combination”, the maximum connectable indoor unit capacity ratio is 150%.
 - Ducted (Medium Static)
 - Ducted (Slim)

3.5 Caution about Outdoor Unit Installation

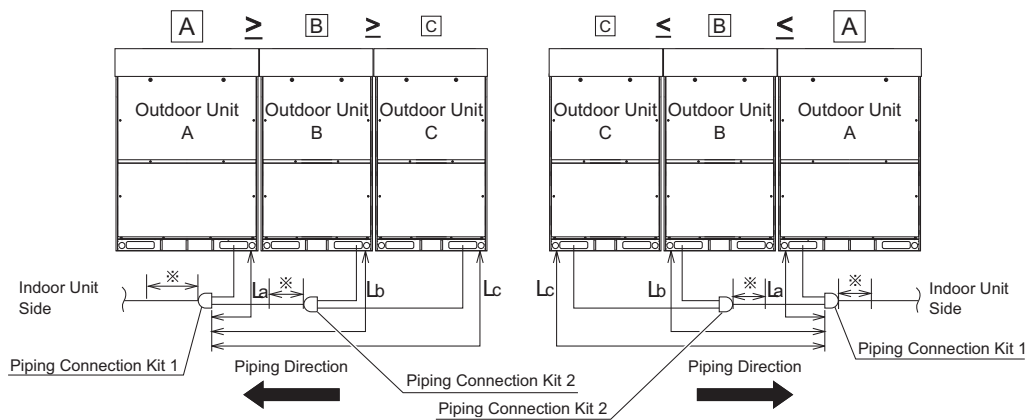
When the installation and piping work for the multiple outdoor units are performed, it is required that the arrangement for outdoor units and piping length be determined. Perform the installation work in strict accordance with the following restrictions.

NOTICE

If the arrangement for outdoor units is incorrect, it may cause flowback of the refrigerant and result in failure of outdoor unit.

< Restrictions for Two and Three Units Combination >

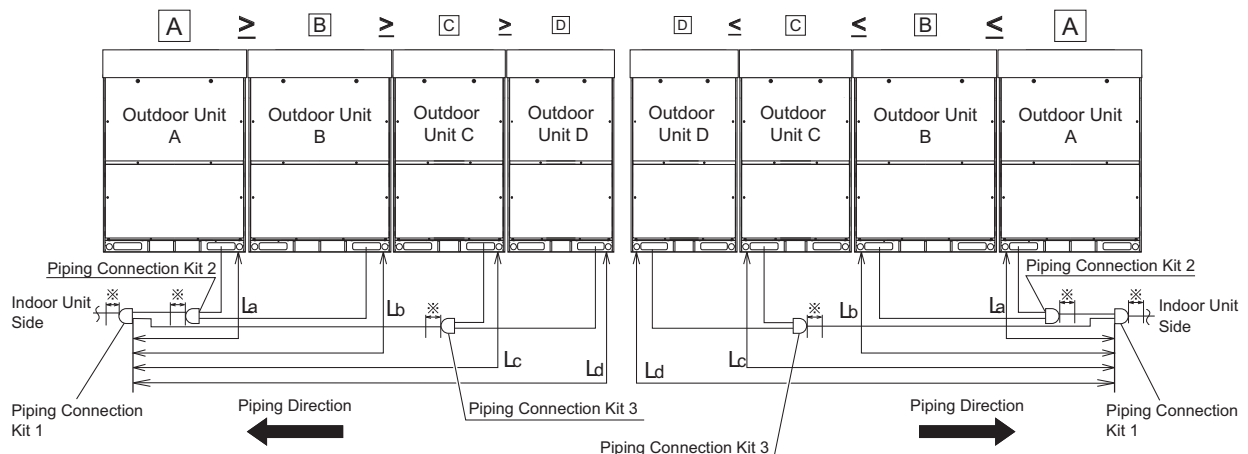
- (1) When using a combination of two and three outdoor units, align the outdoor units from largest capacity to smallest as $A \geq B \geq C$ and outdoor unit "A" connected to the piping connection kit 1.
- (2) The piping length between the piping connection kit 1 and the outdoor unit should be $L_a \leq L_b \leq L_c \leq 32.8 \text{ ft (10m)}$.



※: Maintain a straight-line distance of 19-11/16 inch (500mm) or more for piping after the piping connection kit.

< Restrictions for Four Units Combination >

- (1) When using a combination of four outdoor units, align the outdoor units from largest capacity to smallest as $A \geq B \geq C \geq D$. The outdoor units "A" and "B" should be connected to the piping connection kit 2 and the outdoor unit "C" and "D" should be connected to the piping connection kit 3.
- (2) The piping length between the piping connection kit 1 and each outdoor unit should be $L_a \leq L_b \leq L_c \leq L_d \leq 32.8 \text{ ft (10m)}$.
















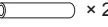
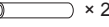
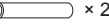





※: Maintain a straight-line distance of 19-11/16 inch (500mm) or more for piping after the piping connection kit.

3.6 Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the outdoor unit.

inch (mm)

Accessory		72 Type	96 Type	120 Type	Remarks
Accessory Pipe	(A) Connection for Refrigerant Gas (High/Low) Pipe	-	 1 (25.4)→7/8 (22.2)	 1 (25.4)→7/8 (22.2)	Only for Heat Recovery System
	(B) Connection for Refrigerant Gas (High/Low, Low) Pipe	 7/8 (22.2)→1-1/8 (28.58)	 1 (25.4)→1-1/8 (28.58)	 1 (25.4)→1-1/8 (28.58)	* Low for Heat Recovery System * High/Low for Heat Pump System
	(C) Connection for Refrigerant Liquid Pipe	 3/8 (9.52)→1/2 (12.7)	-	-	
Cable Clamp	For Fixing Power Supply Wiring and PVC Tube	 x 1	 x 1	 x 1	
Cable Band		 x 5	 x 5	 x 5	
Screw (One for Fixing Cord Clamp, Tow for Spare)		 x 3	 x 3	 x 3	
PVC Tube		 x 2	 x 2	 x 2	ID 15/32 (12)
Rubber Bush	For Power Supply Wiring (Bottom Base)	 x 1	 x 1	 x 1	OD 2-9/32 (58)

NOTE

If any of these accessories is not packed with the unit, please contact your distributor.

INSTALLATION

3.7 Piping Work between Outdoor Units

When installing a combination unit, a piping connection kit is needed for each additional unit but not for the base unit: (72, 96, 120 types).

Operation Type	Applicable Outdoor Unit		Model	Piping Set	Remarks
	Outdoor Unit Capacity (MBH)	Outdoor Unit Number			
for Heat Pump Type	144 - 192	2	MC-NP21A1	1	2 Pipes Type * for High/Low Pressure Gas * for Liquid
	216 - 312	3	MC-NP30A1	1	
	336 - 360	4	MC-NP40A1	1	
for Heat Recovery Type	144 - 192	2	MC-NP21X1	1	3 Pipes Type * for Low Pressure Gas * for High/Low Pressure Gas * for Liquid
	216 - 312	3	MC-NP30X1	1	
	336 - 360	4	MC-NP40X1	1	

NOTE:

The piping connection kit (MC-NP**A1) consists of branch pipes for high/low pressure gas and liquid.
 The piping connection kit (MC-NP**X1) consists of branch pipes for low pressure gas, high/low pressure gas and liquid. Interconnecting pipe is not included in these kits (Field-Supplied).

4. Outdoor Unit Installation

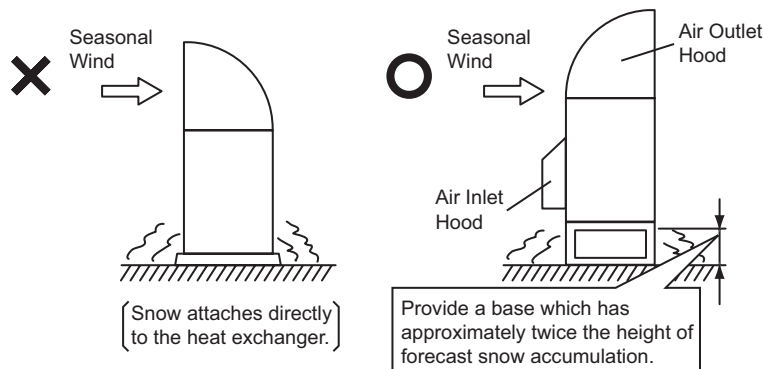
4.1 Installation Location and Precautions

! WARNING

To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left behind inside the unit being installed.

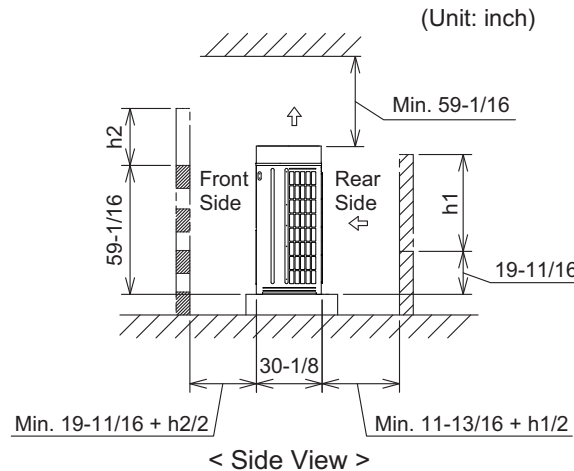
After installation work for the system has been completed, explain the "Safety Precautions," the proper use and maintenance of the unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.



4.2 Service Space

When an outdoor unit is installed, allow sufficient clearance as follows:

- If there is insufficient clearance for air inlets and outlets, it may result in a performance drop-off and mechanical issues due to insufficient air intake.
- Additionally, adequate clearance is required for service maintenance access.

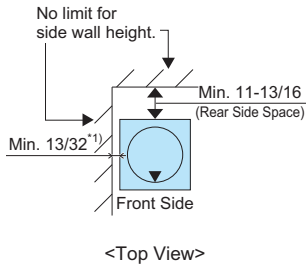


- If there are no walls on the front and rear sides, clearance for service access is required as follows:
 - * Front Side: Minimum 19-11/16 inch (500mm)
 - * Rear Side: Minimum 11-13/16 inch (300mm)
 - * Right and Left Sides: Minimum 13/32 inch (10mm)
(In an instance where the snow protection food (option) or the air outlet duct (field-supplied) is mounted to the unit, a minimum gap of 1-31/32 inch (50mm) is required.)
- If the wall on the front side is over 59-1/16 inch (1,500mm) high, a clearance of (19-11/16 inch (500mm) + h2/2) for the front side is required.
- If the wall on the rear side is over 19-11/16 inch (500mm) high, a clearance of (11-13/16 inch (300mm) + h1/2) for the rear side is required.
- When the units are surrounded by walls on more than two sides, observe the necessary clearance indicated in the diagram above.
- For walls on more than two sides, secure adequate clearance for service access space as shown in the following illustrations.
- If the space between the unit and an obstacle above the unit is less than 59-1/16 inch (1,500mm) or the space above the unit is closed, set up the duct at the air outlet side in order to prevent short circuit.
- When there are obstacles above the unit, the four (front, rear, right and left) sides of the unit shall be open in practical.

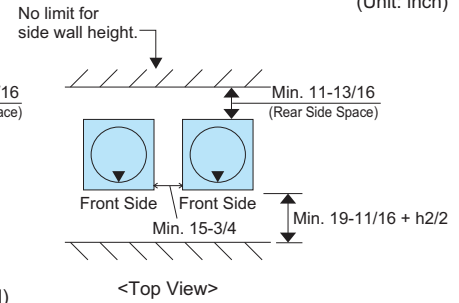
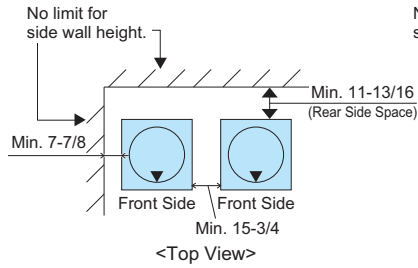
1) Walls on Two Sides

If units are installed adjacent to tall buildings where are two open sides, the minimum rear side clearance must be at least 11-13/16 inch (300mm).

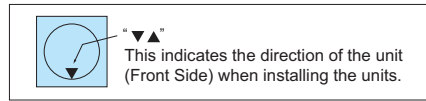
• Single Installation



• Multiple / Serial Installation

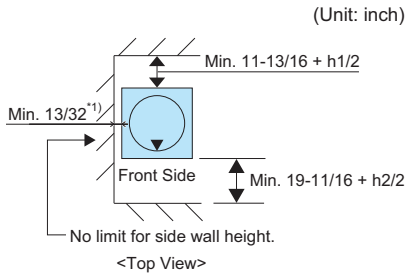


*1): In the case that the snow protection hood (option) or the air outlet duct (field-supplied) is adopted, a minimum spacial clearance of 1-31/32 inch is required.



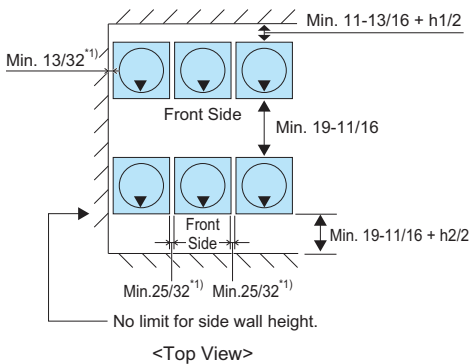
2) Walls on Three Sides

• Single Installation

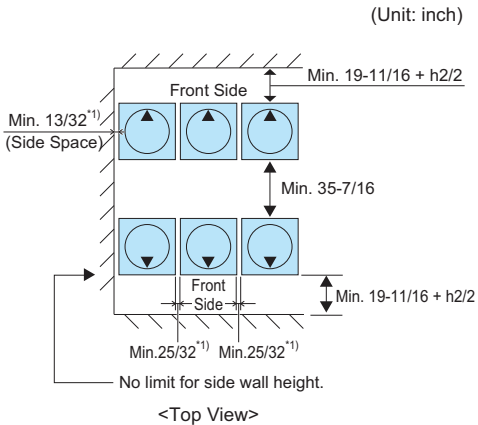


• Multiple / Serial Installation

< Installation in the Same Direction >



< Rear to Rear Installation >

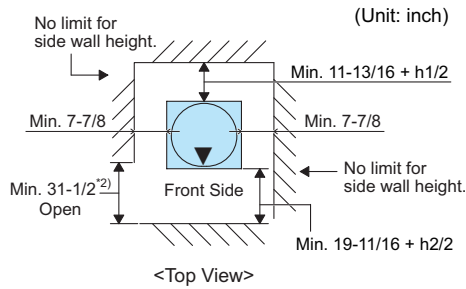


*1): In the case that the snow protection hood (option) or the air outlet duct (field-supplied) is adopted, a minimum spacial clearance of 1-31/32 inch is required.

INSTALLATION

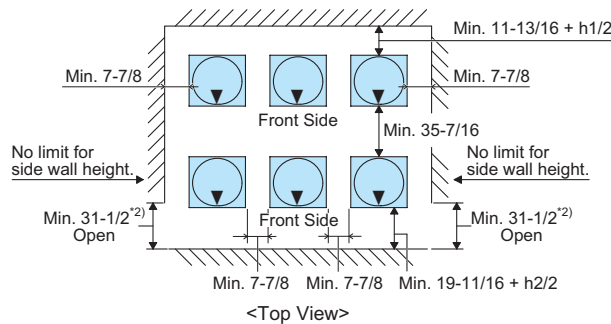
3) Walls on Four Sides

• Single Installation

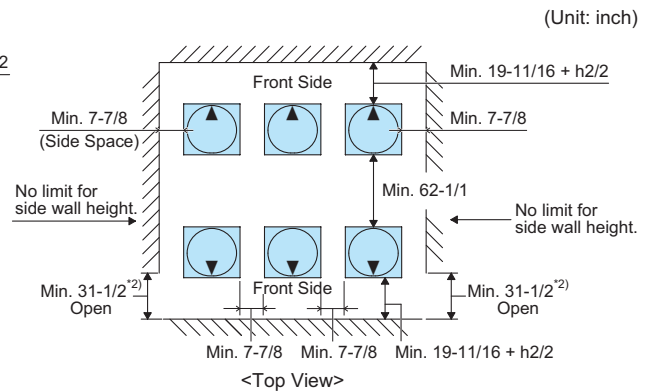


• Multiple / Serial Installation

< Installation in the Same Direction >



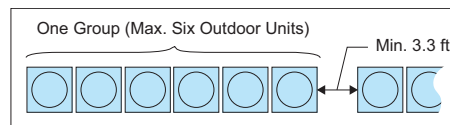
< Rear to Rear Installation >



*2): Partly open a wall if the unit is surrounded by walls on four sides.

NOTE

1. Keep the upper side open to prevent mutual interference of inlet and outlet air of each outdoor unit.
2. The figure dimensions indicate sufficient clearance dimensions around outdoor units for operation and maintenance at typical installation conditions as follows. [Operation Mode: Cooling Operation, Outside Temp.: 95°F (35°C)]
In case of the following situations when compared to the installation condition, it is required to find an appropriate clearance dimension by calculating air flow current.
 - * When the outdoor unit ambient temperature is higher.
 - * When there is a fear that the short circuit is likely to occur.
3. For the multiple installation, one group shall consist of six outdoor units (maximum).
Maintain a 3.3 ft (1m) spacial distance between each unit group.



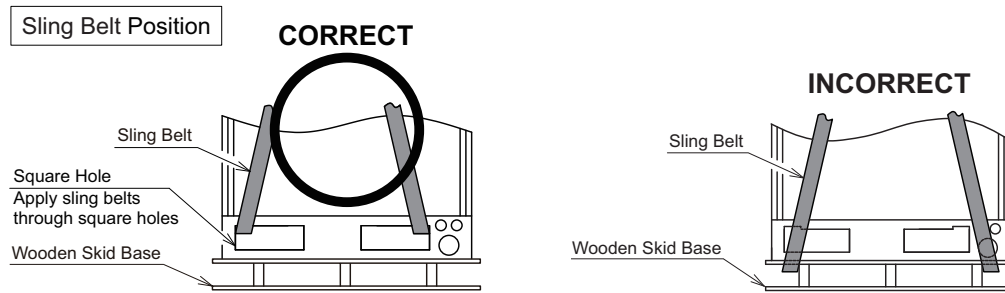
5. Transportation and Installation Work

5.1 Transportation

Transport the product as close to the installation location as practical before unpacking. When using a crane, hang the unit according to the description of the outdoor unit packing.

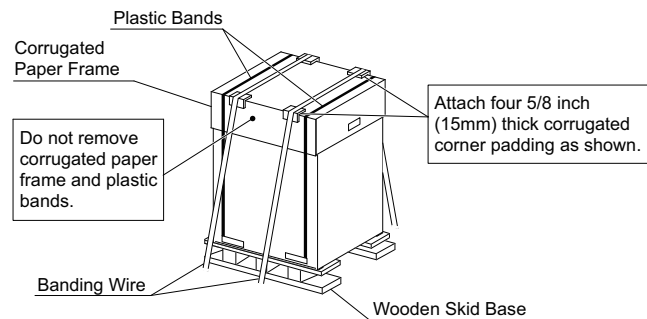
! WARNING

- Do not hang the unit with the sling belts at the wooden skid base.



! CAUTION

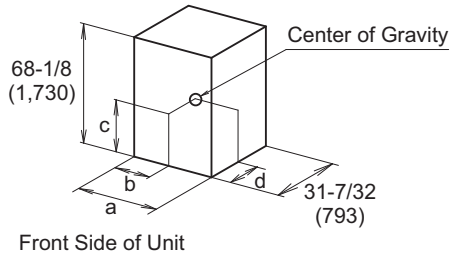
- Transportation and Storage:**
 - The protective corrugated cardboard is not strong enough to resist rough handling.
 - Secure with two sling belts when hoisting the outdoor unit it with a crane.
- Transportation and Banding Wire:**
 - To protect the unit, do not remove any packing.
 - Do not stack or place any material on top of the product.
 - Apply banding wire to both sides of the packaged unit as shown at right.



INSTALLATION

Take special care when hanging or moving the outdoor unit because its center of mass is off-center and unbalanced. See the diagram below.

- Center of Gravity



Voltage Type	Model Type	inch (mm)			
		a	b	c	d
208/230V	72	37-7/8 (962)	18-1/2 (470)	26-25/32 (680)	13-3/8 (340)
	96, 120	48-1/8 (1,222)	20-7/8 (530)	22-27/32 (580)	12 (305)
460V	72	37-7/8 (962)	17-1/8 (435)	24-19/32 (625)	13 (330)
	96, 120	48-1/8 (1,222)	19-11/16 (500)	21-21/32 (550)	11-13/16 (300)

- Hanging Method

- Suspend the unit (with wooden skid base) in its packing with two sling belts as shown in Figure 5.1.
- Do not use banding wire.
- Ensure that the unit is balanced.
- Ensure safety while hoisting the unit gently in order not to cause the unit to tip.

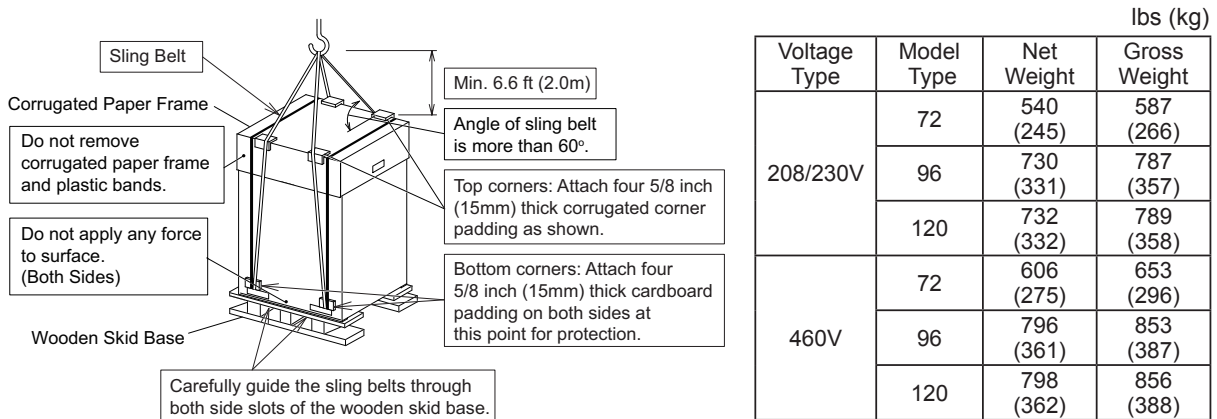


Figure 5.1 Hanging Unit on Wooden Skid Base for Transportation

- Hang the unit without a wooden skid base with two sling belts as shown in Figure 5.2.

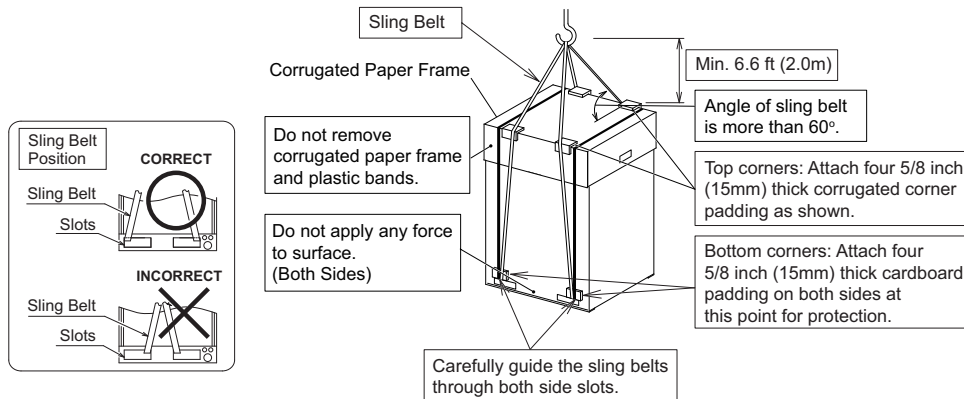
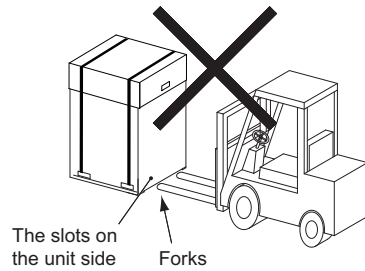


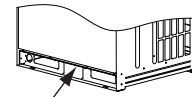
Figure 5.2 Hanging Unit without Wooden Skid Base

When using a forklift, do not insert forks into the slots at the unit side panels. The unit can sustain damage.



Do not apply excessive force to the squared slots with forks or other materials. The bottom of the unit can become deformed.

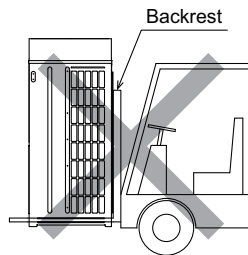
- * Do not push the bottom base with forks.
- * Do not use a roller.



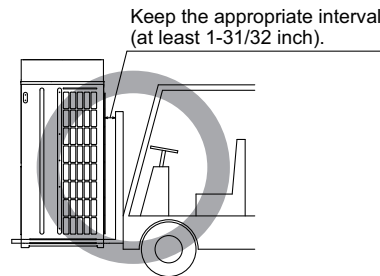
Do not apply an excessive force.
(Both Sides)

CAUTION

During transportation, do not allow the backrest of the forklift to come into contact with the unit. Sudden forward movement on the forklift can cause damage to the unit heat exchanger.



Touching to the Unit



Non-Touching to the Unit

NOTE

If transporting after unpacking, protect the unit with corrugated material, styrofoam, bubble pack, or a tarp.

5.2 Handling of Outdoor Unit

WARNING

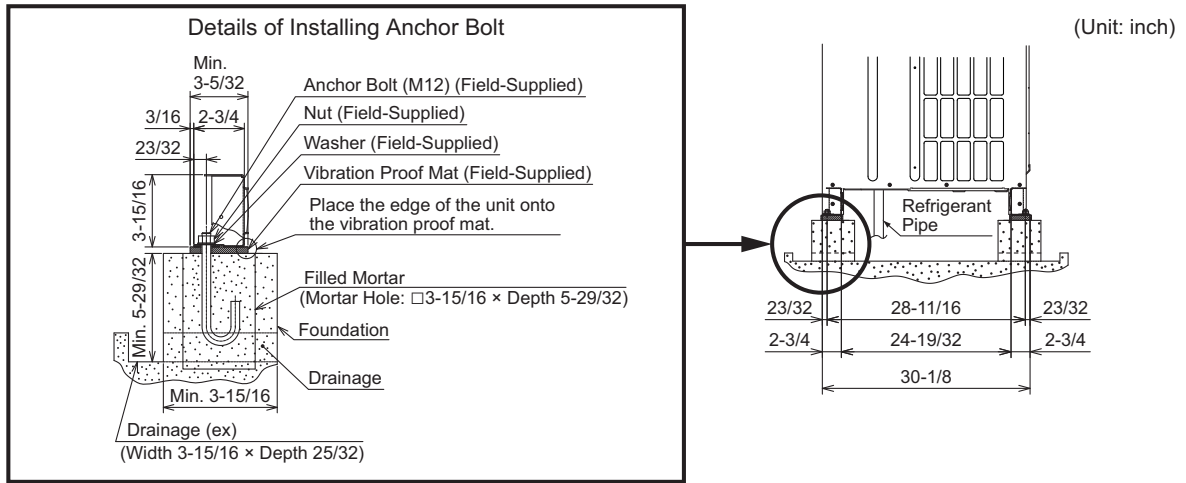
Do not place or leave any foreign objects: (cables, tools), inside the outdoor unit or control module and verify that nothing remains there prior to installation and test run. Damage and fire can result due to carelessness.

INSTALLATION

5.3 Installation Work

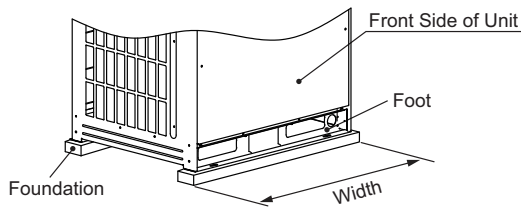
5.3.1 Concrete Foundations

- (1) The height of the foundation should be over 5-29/32 inch (150mm) above the ground.
- (2) Provide adequate drainage around the foundation.



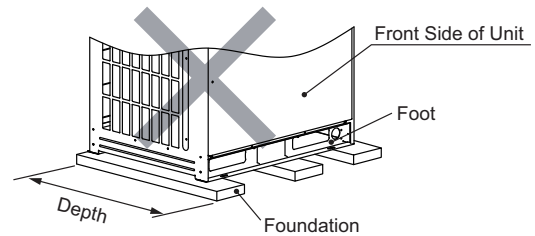
* Provide a concrete foundation as shown below.

CORRECT

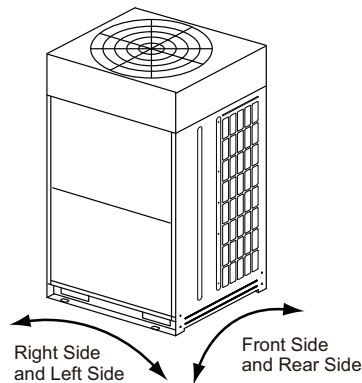


* Do not use a concrete foundation such as seen here. The footing for the outdoor unit can become deformed.

INCORRECT



- (3) Install the outdoor unit in the front-rear and right-left direction horizontally. (Use a level.) Verify that the gradient slope in all four directions (front, rear, right, and left) falls within 13/32 inch (10mm).

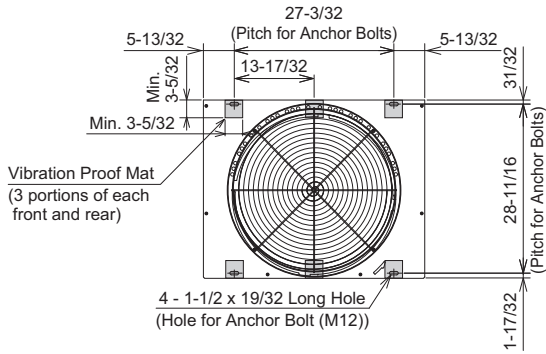


- (4) Provide a strong, level, and stable foundation so that:
 - a. The outdoor unit does not lean to one side.
 - b. Strange noises are not heard from within.
 - c. The outdoor unit remains stable and upright in the face of strong winds and seismic events.

- (5) When installing the outdoor unit, secure the unit with anchor bolts and field-supplied vibration-proof mats. Refer to Figure 5.3 for the location of holes for anchor bolts.

< 72 Type >

(Unit: inch)



< 96 and 120 Type >

(Unit: inch)

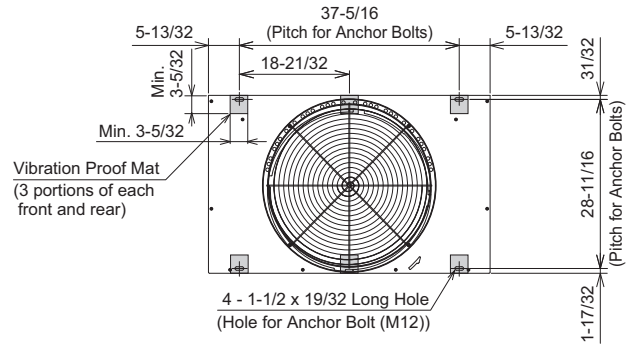


Figure 5.3 Position of Anchor Bolts

INSTALLATION

5.3.2 Condensate Treatment

Condensation is discharged during heating and defrosting operations. (Rain water is also discharged.) Comply with the following conditions.

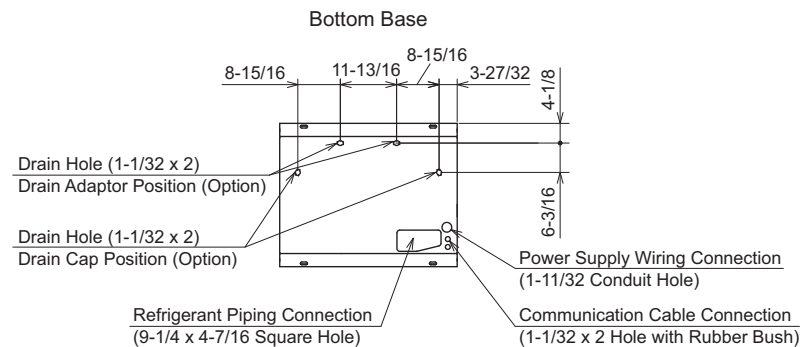
- (1) Choose a place where good drainage is available, or provide a drainage ditch.
- (2) Do not install the unit over the walkways. Condensation can spill onto people below. If installing the unit in such a place, utilize the additional condensation drainage pan.
- (3) When drain piping is necessary for the outdoor unit, use the optional drain adaptor: (DBS-TP10A). Do not use the drain adaptor in the cold area. Condensate in the drain piping can freeze, resulting in a fractured pipeline.

NOTICE:

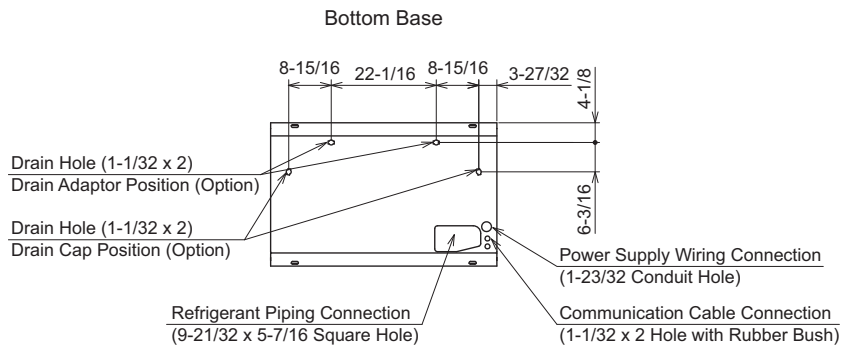
Even when the drain adaptor is used, moisture may drain slightly from screw holes. Provide a second condensation drainage drain pan under the outdoor unit as necessary.

< 72 Type >

(Unit: inch)



< 96 and 120 Type >



- Drain Adaptor (Optional Parts)

A drain adaptor is used for a condensation pipe connection in order to use an outdoor unit bottom base as a condensation drainage pan.

Name	Model
Drain Adaptor	DBS-TP10A

Component Formation of Drain Adaptor

Model	Parts Name	Material / Color	Qty.	Application
DBS-TP10A	Drain Adaptor	PP / Black	2	Connecting for Drain Piping
	Drain Cap	PP / Black	2	Cover for Drain Hole
	Rubber Cap	CR / Black	4	Sealing for Adaptor and Cap

6. Refrigerant Piping Work

WARNING

- The pressure for this product is 601 psi (4.15MPa). The pressure required for refrigerant R410A is 1.4 times higher than that of the refrigerant R22. That means that the refrigerant piping for R410A must be thicker than that for R22. Make sure to use specified refrigerant piping. Otherwise, the refrigerant piping may rupture due to an excessive refrigerant pressure. Pay close attention to the piping thickness when using copper refrigerant piping. The thickness of copper refrigerant piping differs depending on its material.
- Check to ensure that no pressure exists inside the stop valve before removing the flange.

CAUTION

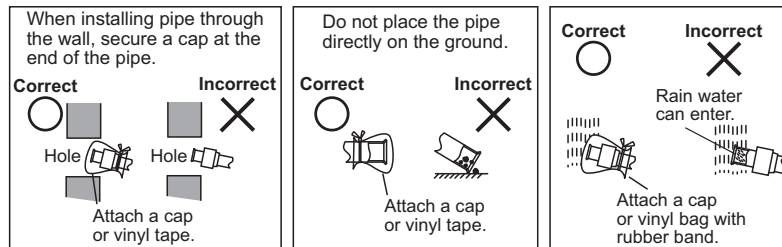
- Make sure to connect all piping among the units in the same refrigerant cycle.
- When handling the refrigerant, be sure to wear leather gloves to prevent injuries.

INSTALLATION

6.1 Piping Materials

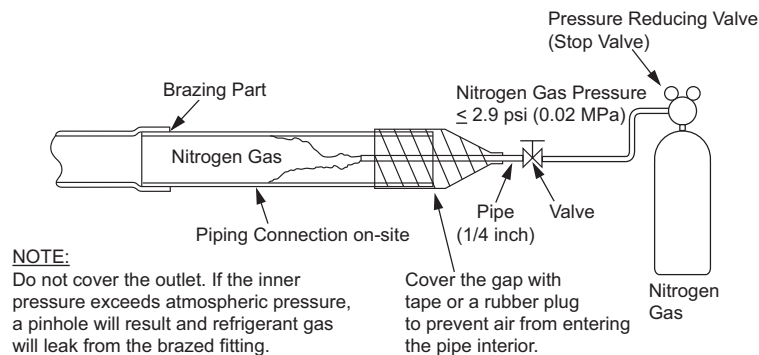
- (1) Obtain locally-supplied copper pipes.
- (2) Use the copper pipe for refrigerant piping.
- (3) Pay close attention to pipe thickness.
- (4) Use clean copper pipes. Make sure there is no dust or moisture inside the pipes. Blow nitrogen or dry, compressed air into the pipes to remove any dust or foreign materials before connecting them. Do not use any tools which produce a lot of swarf such as a saw or a grinder.
- (5) Take special care to prevent contamination or moisture settling on interior pipe surfaces during piping work.
- (6) Avoid performing the piping connection work for outdoor unit in the rain.

• Cautions for Refrigerant Pipe Ends



• Brazing Work

- (1) Brazing work must be performed by an authorized installer in order to prevent any problems.
- (2) For piping connections, complete non-oxidation brazing with a nitrogen charge. If brazing the pipes without the nitrogen substitution, a large amount of oxidized scaling will be generated in the piping. This oxidized scaling can cause clogging inside the expansion valve, solenoid valve, accumulator, and compressor, which can prevent the unit from operating properly. Do not use the field-supplied antioxidant which can corrode pipes and degrade the refrigerant oil.



NOTES:

1. Make sure to use nitrogen. Nitrogen gas pressure shall be 2.9 psi (0.02 MPa) or less. **DO NOT** use the following gases.

Oxygen:	This is flammable and causes oxidation degradation of refrigerant oil.
Carbon Dioxide:	This can cause decreased performance over drier periods.
Freon Gas:	This emits harmful gases if exposed to fire.

2. Make sure to use the pressure-reducing valve.
3. Do not use field-supplied antioxidant.

- (3) Use a type of flux with a low chlorine concentration.
- (4) Remove all flux completely after completing brazing work.

NOTICE:

To avoid oxidation and scaling, perform brazing at the appropriate temperature.

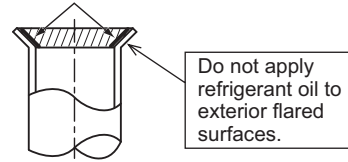
● Cautions for Piping Connection Work

- (1) Verify that there are no scratches, swarf, gaps, or deformations at the flared end before making connections to the system.
- (2) Apply a light film of refrigerant oil on the sheet surface of the pipe and flare nut before performing flaring work. Tighten the flare nut to specified torque settings using two wrenches. Perform flaring work to the liquid piping side before treating the gas piping side. Verify that no gas leakage has occurred after completing flaring work.

NOTE:

Refrigerant oil is field-supplied.
 [Ethereal Oil: FVC68D (Idemitsu Kousan Co. Ltd.)]

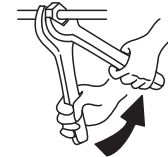
Apply Refrigerant Oil.



- (3) Be sure to use the accessory flare nuts for indoor unit connections.

< Required Tightening Torque >

Pipe Size	Tightening Torque
1/4 inch (6.35 mm)	10.3 - 13.3 ft·lbs (14 - 18 N·m)
3/8 inch (9.52 mm)	25.1 - 31.0 ft·lbs (34 - 42 N·m)
1/2 inch (12.7 mm)	36.1 - 45.0 ft·lbs (49 - 61 N·m)
5/8 inch (15.88 mm)	50.2 - 60.5 ft·lbs (68 - 82 N·m)
3/4 inch (19.05 mm)	73.8 - 88.5 ft·lbs (100 - 120 N·m)



Use two wrenches as shown.

NOTE:

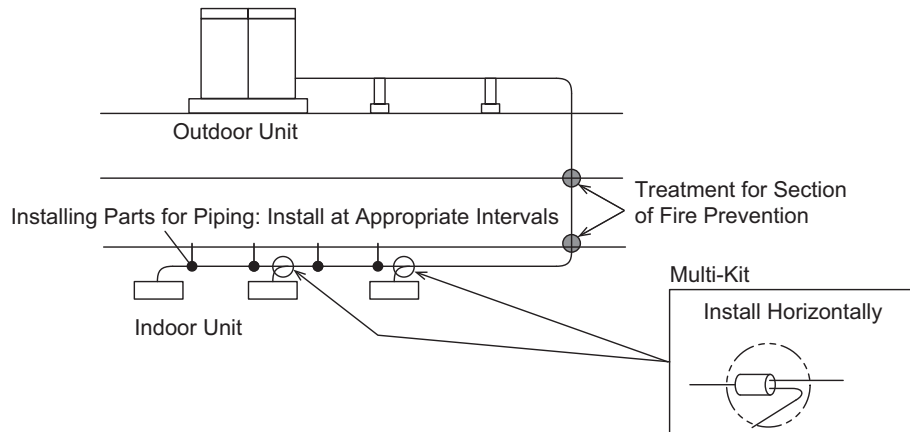
As for the tightening torque for liquid stop valve, according to Section 6.2.1 "Stop Valve" < Liquid Valve > of the tightening torque table.

- (4) When the temperature and humidity inside the ceiling exceed 80°F (27°C)/RH80%, apply additional insulation of approximately 13/32 inch (10mm) in thickness to the accessory insulation. It prevents the formation of condensation on the surface of the insulation (refrigerant pipe only).
- (5) Perform the airtight test at (601 psi (4.15MPa) for the test pressure).
- (6) Perform cold insulation work by wrapping tape around flared and reducer connections. Also, insulate all the refrigerant pipes.
- (7) Connect the indoor/outdoor units with refrigerant piping. Secure the piping to prevent it from coming into contact with weak structures such as a wall or ceiling. Otherwise, strange noises may be heard due to vibration in the piping.

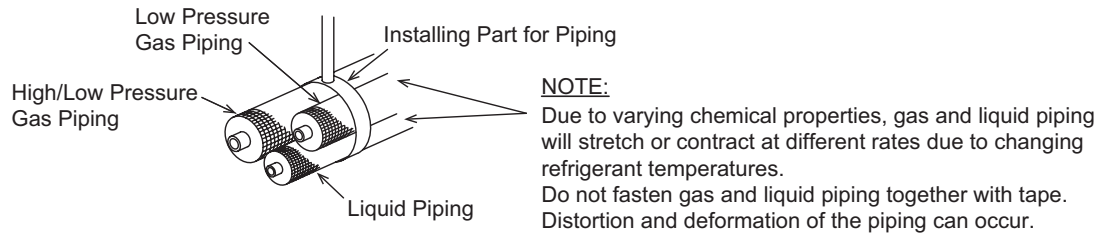
INSTALLATION

- Caution for Installing and Securing Piping

[Example for Supporting Direction]



[Secure for Liquid Piping, Low Pressure Gas Piping, and High/Low Pressure Gas Piping]



NOTICE:

When assembling piping on-site with hidden elbow or socket joints, provide a service access doorway to facilitate close-up examination of interconnecting components.

Table 6.1 Piping Size of Outdoor Unit

< For Heat Pump System (2 Pipes) >

inch (mm)

Outdoor Unit Capacity (MBH)	High/Low Pressure Gas	Liquid
72 - 120	1-1/8 (28.58)	1/2 (12.7)
144	1-1/8 (28.58)	5/8 (15.88)
168 - 216	1-3/8 (34.93)	3/4 (19.05)
240 - 360	1-5/8 (41.28)	3/4 (19.05)

< For Heat Recovery System (3 Pipes) >

inch (mm)

Outdoor Unit Capacity (MBH)	Gas		Liquid
	Low Pressure	High/Low Pressure	
72 - 120	1-1/8 (28.58)	7/8 (22.2)	1/2 (12.7)
144	1-1/8 (28.58)	7/8 (22.2)	5/8 (15.88)
168 - 216	1-3/8 (34.93)	1-1/8 (28.58)	3/4 (19.05)
240 - 360	1-5/8 (41.28)	1-3/8 (34.93)	3/4 (19.05)

Table 6.2 Piping Size of Indoor Unit

inch (mm)

Indoor Unit Capacity (MBH)	Gas	Liquid
6 - 15	1/2 (12.7)	1/4 (6.35)
18 - 48	5/8 (15.88)	3/8 (9.52)

6.2 Piping Connection Work

Comply with the restrictions for refrigerant piping (permissible length, height difference) in Sections 6.5.1 and 6.5.2 "Piping Work Conditions" and "Piping Branch Restriction". If not, the outdoor unit can become damaged or fail.

The stop valves will be closed completely (factory-setting) when refrigerant piping connections are performed. Do not open these stop valves until all the refrigerant piping connections, airtight testing, and vacuuming have been completed.

6.2.1 Stop Valve

< Gas Valve >

- (1) Make sure that all the spindles are closed completely.
- (2) Connect the charging hose to the service port and release the gas inside the piping.
- (3) Cut the end of the closing pipe and ensure that no residual gas exists inside the gas piping.

! WARNING

When there is a Heat Pump System, do not cut the end of the closing pipe of a low pressure gas pipe. If the end of the closing pipe for the low pressure gas pipe is cut by mistake, close it off completely to prevent refrigerant leakage.

- (4) Remove the closing pipe from the brazing portion with a torch. Be careful that the flame doesn't burn the stop valve.

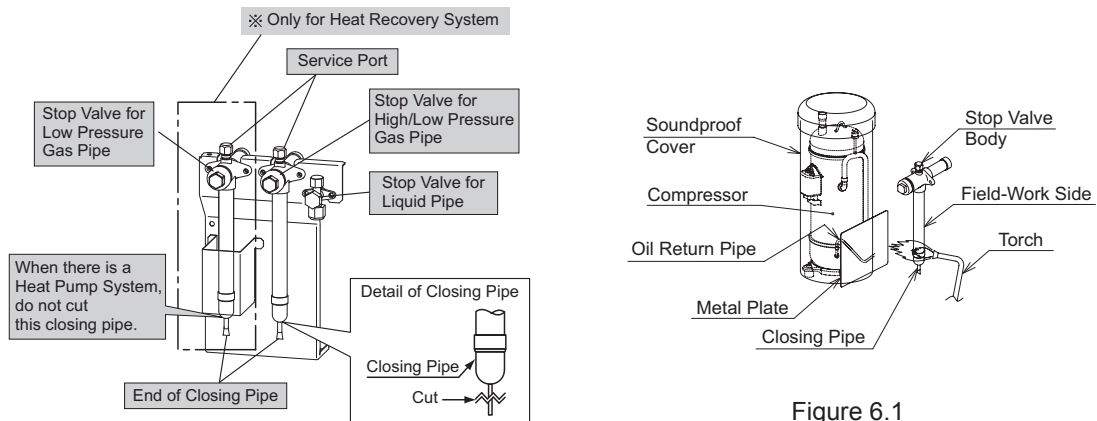


Figure 6.1

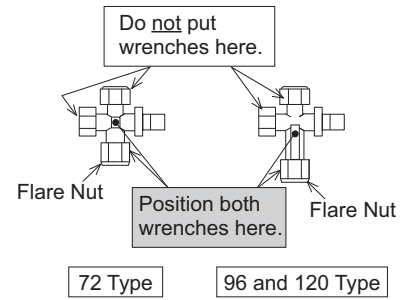
! WARNING

- Remove gas inside the closing pipe before the brazing work is performed. If the brazing filler metal melts with residual gas inside, the piping will explode and injuries can result.
- Do not expose surrounding parts and the oil return pipe of the compressor to flames when a torch is used. If the oil return piping is exposed to the fire, high temperature oil will spurt and cause a fire or injury.

< Liquid Valve >

Tighten the flare nut for the liquid stop valve according to the following torque. If excessive force is applied to the flare nut, refrigerant leakage may occur from the spindle part. (To prevent leakage, place two wrenches at the positions as shown at right when removing and connecting piping.)

Model Type	Tightening Torque
72	26 ft·lbs (35 N·m)
96 and 120	33 ft·lbs (45 N·m)



CAUTION

- Do not apply an excessive force to the spindle valve after fully opening the spindle.
- At the test run, fully open the spindle. If it is not fully opened, the devices will be damaged.

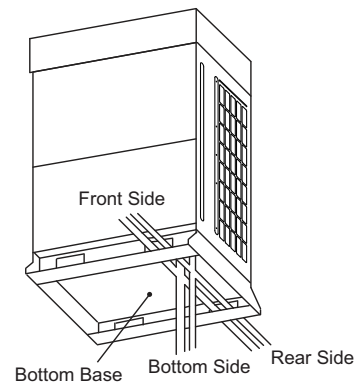
6.2.2 Piping Connection Method

Perform the piping connection work for each outdoor unit.

NOTE:

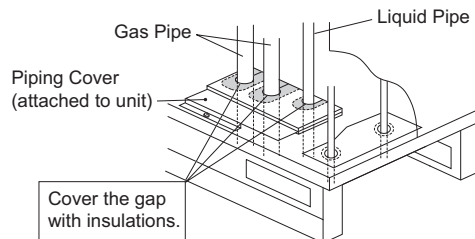
Ensure that the refrigerant pipe is connected to the same refrigerant cycle unit.

- Firmly secure the piping in order to avoid vibration and excessive force exerted on the valve.
- (1) Piping can be installed in three directions (front, rear, or bottom side) from the bottom base. For vibration protection, properly secure piping connections and check that no excessive force is applied to the stop valve.



- (2) Follow the installation procedures in Section 6.2.1.
- (3) Connect the piping in accordance with Figures 6.1 and 6.2 on the following page.
- (4) Completely seal the penetration part at the bottom of the pipes with insulation in order to prevent rain water from entering the conduit.

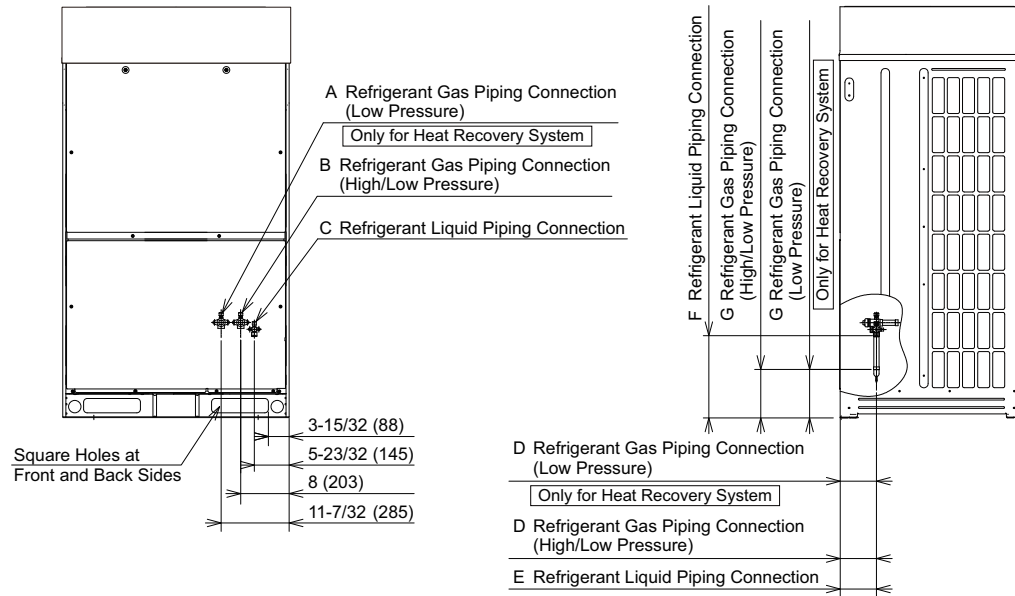
● For Piping from Bottom Base



INSTALLATION

- Prepare refrigerant piping for assembly.
Refer to Figure 6.2 for the position for piping connections.

Unit: inch (mm)



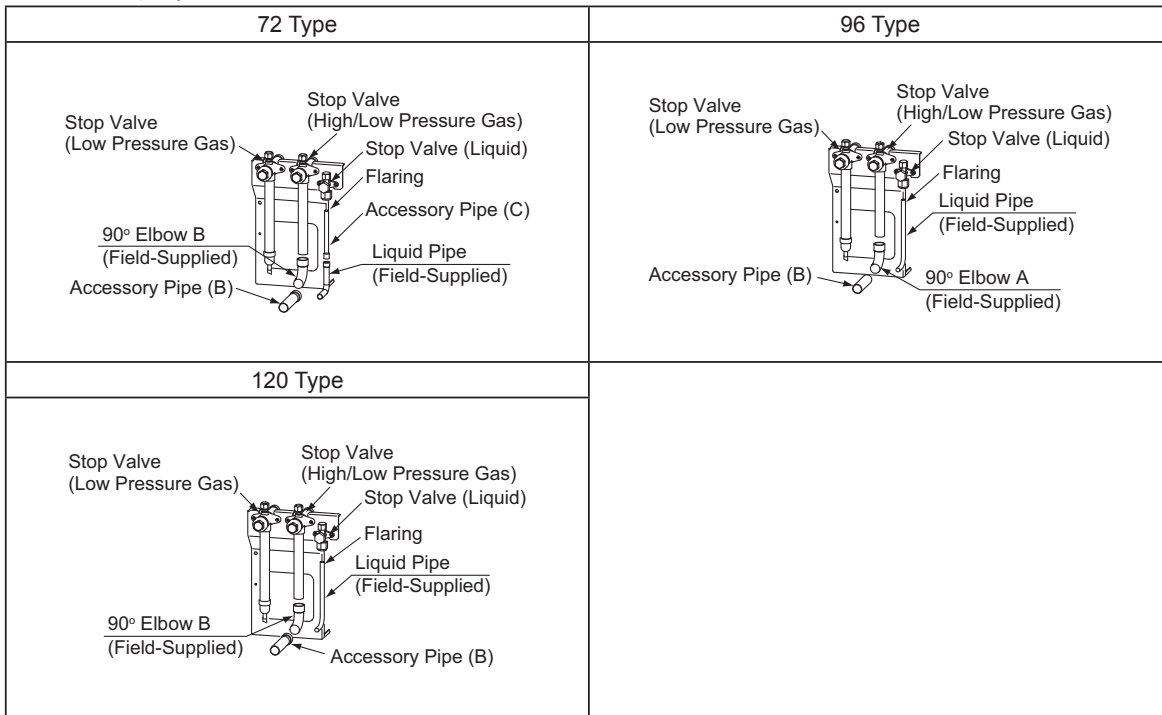
Model Type	Field Piping (*)					A	B	C	D	E	F	G
	Heat Pump System		Heat Recovery System		Liquid							
	Low Pressure Gas	High/Low Pressure Gas	Low Pressure Gas	High/Low Pressure Gas								
72	-	1-1/8 (28.58)	1-1/8 (28.58)	7/8 (22.2)	1/2 (12.7)	7/8 (22.2)	7/8 (22.2)	3/8 (9.52)	5-29/32 (150)	5-29/32 (150)	13-3/8 (340)	8-1/16 (205)
96	-	1-1/8 (28.58)	1-1/8 (28.58)	7/8 (22.2)	1/2 (12.7)	1 (25.4)	1 (25.4)	1/2 (12.7)	6-11/16 (170)	6-11/16 (170)	12-25/32 (325)	7-7/8 (200)
120	-	1-1/8 (28.58)	1-1/8 (28.58)	7/8 (22.2)	1/2 (12.7)	1 (25.4)	1 (25.4)	1/2 (12.7)	6-11/16 (170)	6-11/16 (170)	12-25/32 (325)	7-7/8 (200)

(*): Using the accessory pipe (refer to Section 3.6 "Factory-Supplied Accessories"), combine the piping size.

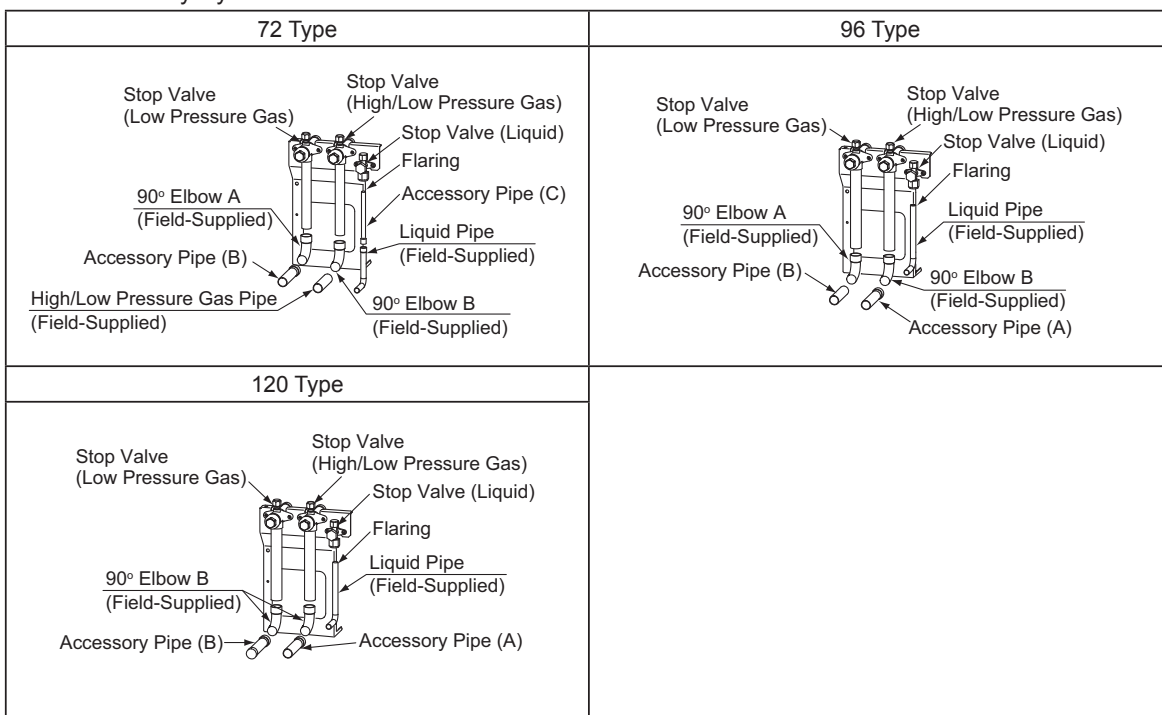
Figure 6.2 Refrigerant Piping Connection

• Details of Stop Valve Piping Connection

< Heat Pump System >



< Heat Recovery System >



NOTES:

1. Ensure that the closing pipes of the high/low and low pressure gas stop valves (two components) are removed firstly.
2. Refer to Figure 6.1 for the flaring work.
3. Refer to Section 3.6 "Factory-Supplied Accessories" for the details of the accessory pipes (A), (B) and (C).

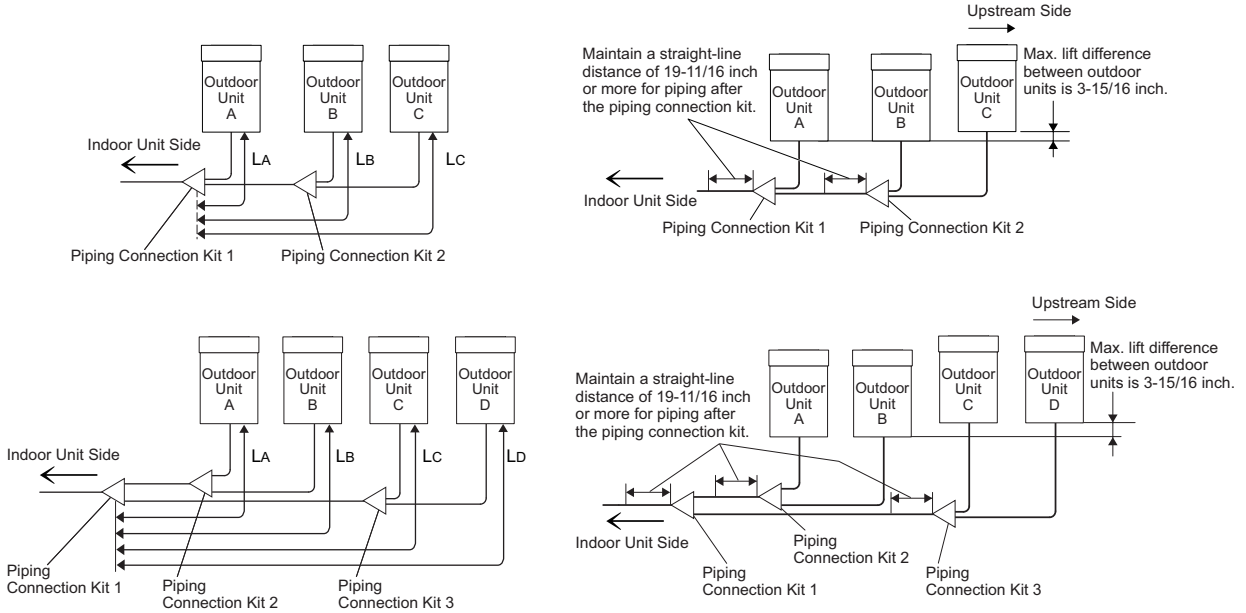
6.3 Piping Work between Outdoor Units

Select the pipe size according to Section 6.4 "Piping Size between Outdoor Units".

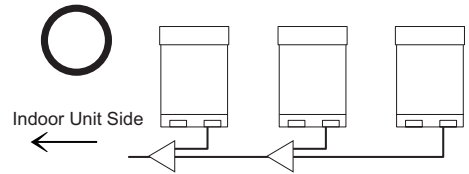
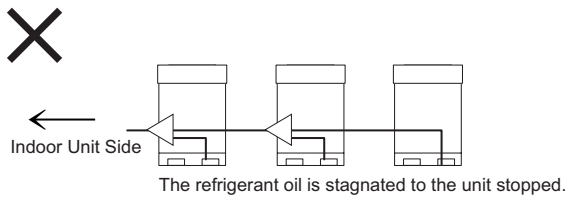
For refrigerant piping between multiple outdoor units, use the optional piping connection kit.

The arrangement for outdoor units should be determined depending on the piping direction when the refrigerant piping work and installation work are planned. When the outdoor unit is installed, perform the installation work according to the following restrictions.

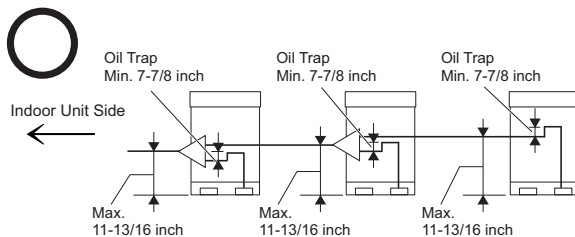
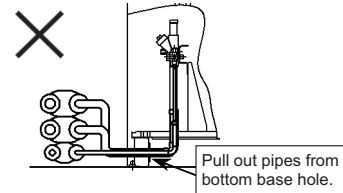
- Piping length between piping connection kit 1 and each outdoor unit should be $L_A \leq L_B \leq L_C \leq L_D \leq 32.8 \text{ ft (10m)}$.
Maintain a straight-line distance of 19-11/16 inch (500mm) or more for piping after the piping connection kit 1.



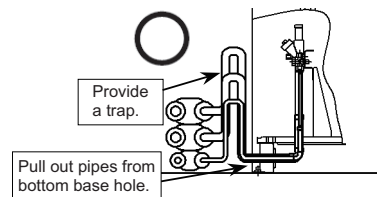
- Place the piping connection kit lower than the outdoor unit piping connection.
When the piping connection kit is installed higher than the outdoor unit piping connection, maintain a maximum clearance of 11-13/16 inch (300mm) between the piping connection kit and the bottom of the outdoor unit. Also, install an oil trap (minimum 7-7/8 inch (200mm)) between the piping connection kit and the outdoor unit.



< Side View of Outdoor Unit >

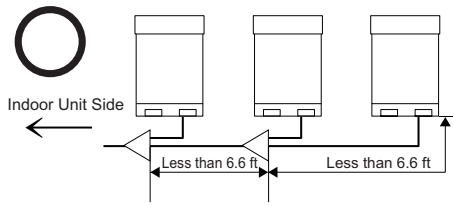


< Side View of Outdoor Unit >

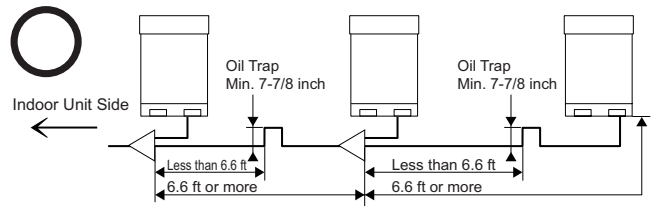


(3) When piping length between outdoor units is 6.6 ft (2m) or more, an oil trap for the gas piping should be installed so that any accumulation of refrigerant oil cannot occur.

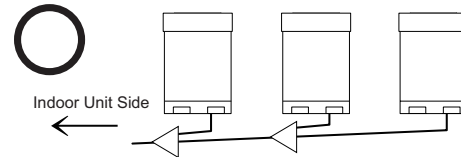
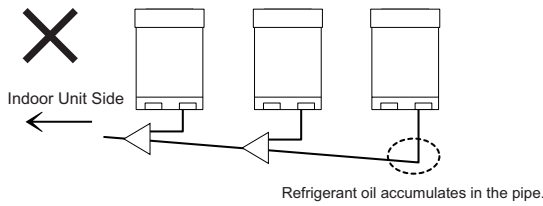
• Less than 6.6 ft (2m)



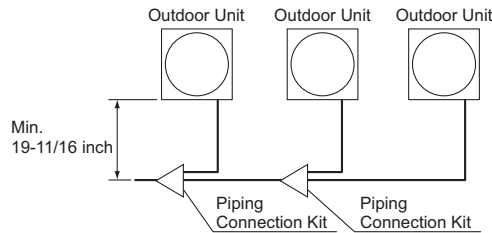
• 6.6 ft (2m) or More



(4) Place the outdoor unit pipe horizontally or with the pipe slanted downward towards the indoor unit side so that accumulation of refrigerant oil does not occur in the pipe.

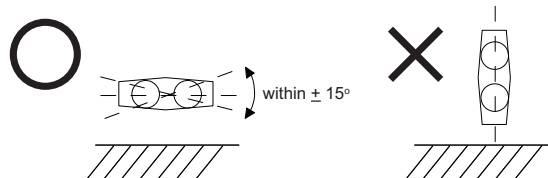


(5) For servicing, if the pipe is installed in front of the outdoor unit, make sure minimum clearance of 19-11/16 inch (500mm) between the outdoor unit and piping connection kits. (When the compressor is replaced, minimum clearance of 19-11/16 inch (500mm) is required.)



(6) Direction of Piping Connection Kit

Place the piping connection kit so it is vertical to the ground (the slope must be within $\pm 15^\circ$) as shown in the figure.



NOTICE

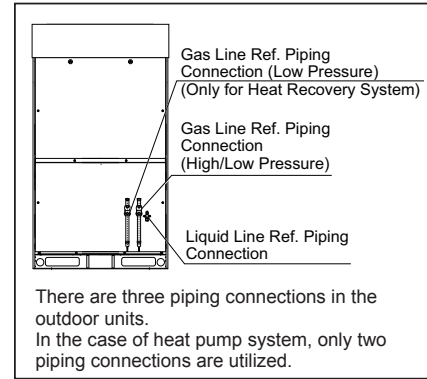
The refrigerant system may be damaged if the slope of the piping connection kit exceeds $\pm 15^\circ$.

INSTALLATION

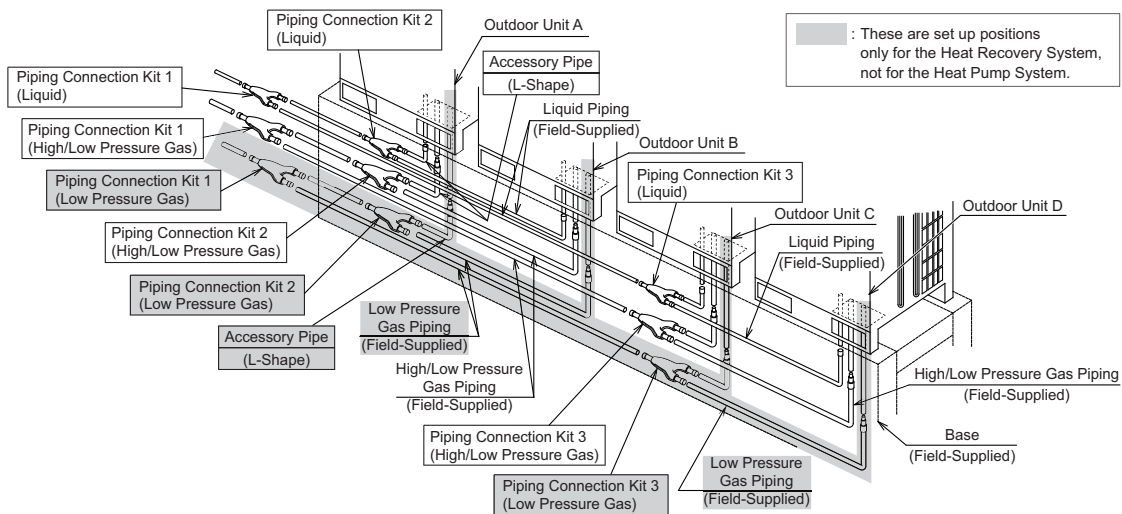
- Construction Example

The following figures show the examples of heat recovery system (four units combination).

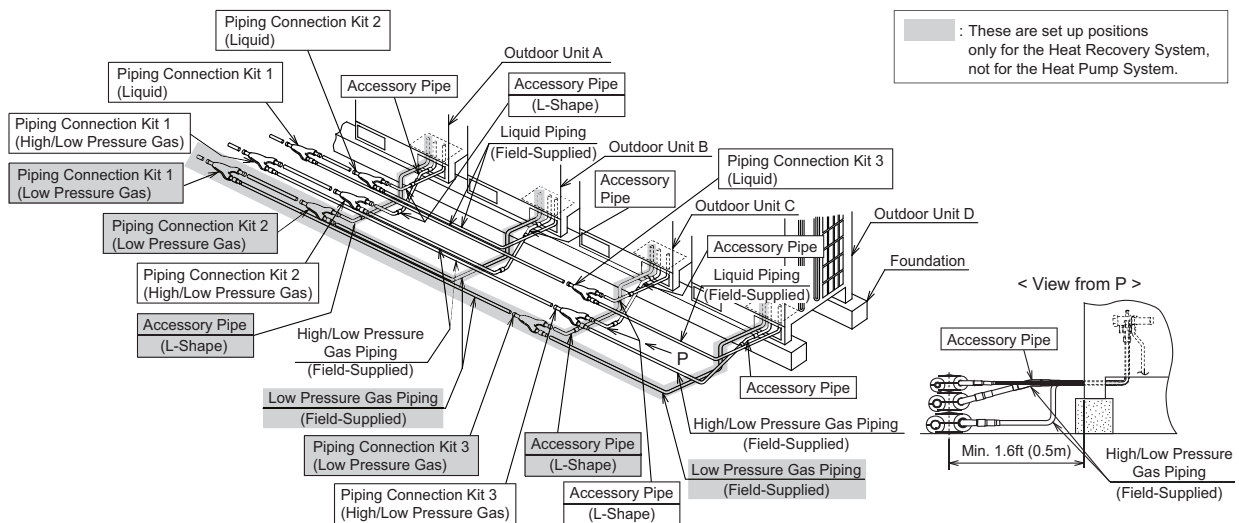
Regarding the piping work for Combination Unit, refer to "Installation & Maintenance Manual" attached to the piping connection kit.



< Downward Piping Connection >



< Front Side Piping Connection >



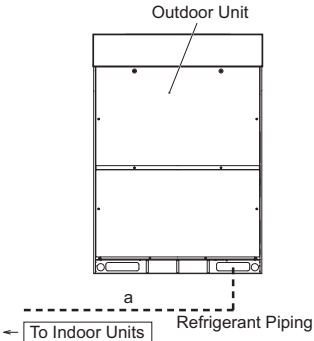
NOTE:

The figure shows the an instance where the refrigerant pipes are pulled out from the bottom base slots.

6.4 Piping Size between Outdoor Units

6.4.1 Heat Pump System

Base Unit

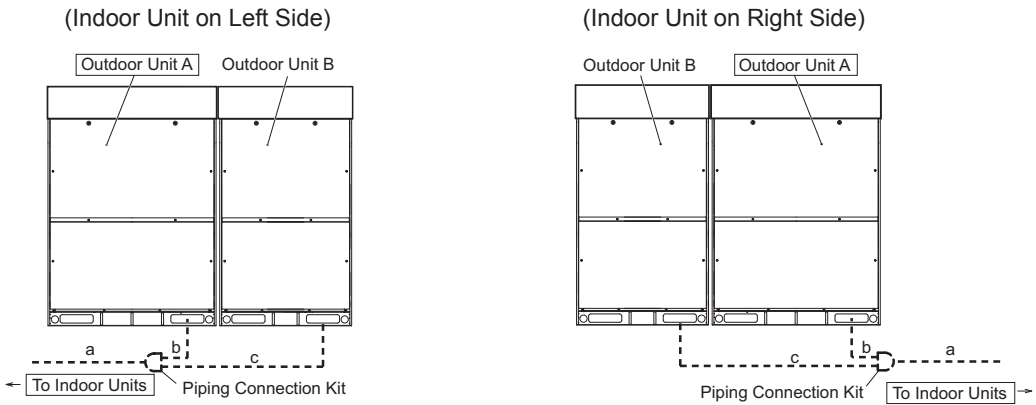


Model Type		72	96	120	
Piping Size	a	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)

inch (mm)

Two Units Combination

< Figure for 168 Type >



Model Type		144	168	192	
Combination Unit	Outdoor Unit A	72	96	96	
	Outdoor Unit B	72	72	96	
Piping Connection Kit		MC-NP21A1			
Piping Size	a	High/Low Pressure Gas	1-1/8 (28.58)	1-3/8 (34.93)	1-3/8 (34.93)
		Liquid	5/8 (15.88)	3/4 (19.05)	3/4 (19.05)
	b	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
	c	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)

inch (mm)

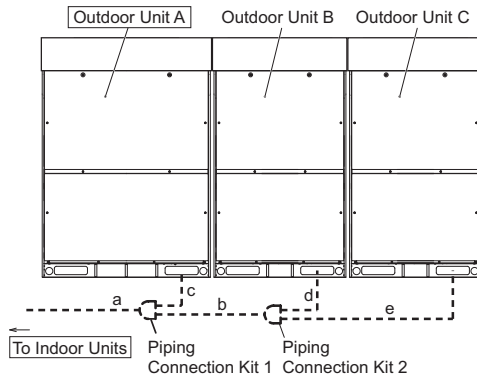
* Install the outdoor unit and piping connections in accordance to whatever is applicable to your situation. Refer to the table for the outdoor unit model, the piping connection kit model, and the piping diameter.

INSTALLATION

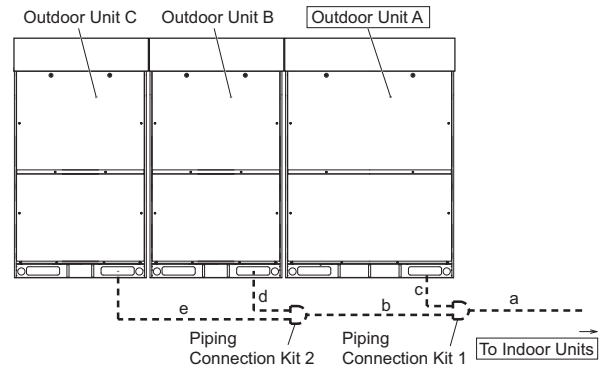
Three Units Combination

< Figure for 240, 264 Type >

(Indoor Unit on Left Side)



(Indoor Unit on Right Side)

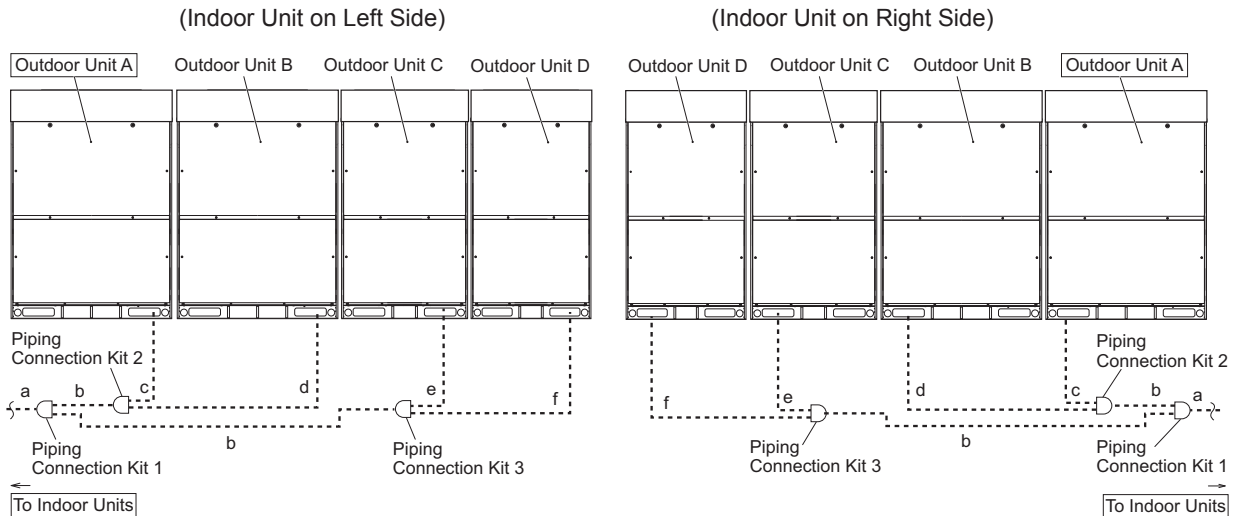


inch (mm)

Model Type		216	240	264	288	312	
Combination Unit	Outdoor Unit A	72	96	120	120	120	
	Outdoor Unit B	72	72	72	96	120	
	Outdoor Unit C	72	72	72	72	72	
Piping Connection Kit		MC-NP30A1					
Piping Size	a	High/Low Pressure Gas	1-3/8 (34.93)	1-5/8 (41.28)	1-5/8 (41.28)	1-5/8 (41.28)	1-5/8 (41.28)
		Liquid	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)
	b	High/Low Pressure Gas	1-3/8 (34.93)	1-3/8 (34.93)	1-3/8 (34.93)	1-3/8 (34.93)	1-3/8 (34.93)
		Liquid	5/8 (15.88)	5/8 (15.88)	5/8 (15.88)	5/8 (15.88)	5/8 (15.88)
	c	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
	d	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
	e	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)

* Install the outdoor unit and piping connections in accordance to whatever is applicable to your situation. Refer to the table for the outdoor unit model, the piping connection kit model, and the piping diameter.

Four Units Combination



inch (mm)

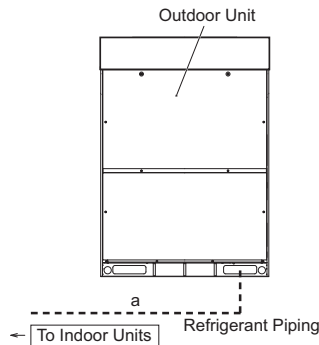
Model Type		336	360	
Combination Unit	Outdoor Unit A	96	120	
	Outdoor Unit B	96	96	
	Outdoor Unit C	72	72	
	Outdoor Unit D	72	72	
Piping Connection Kit		MC-NP41A1		
Piping Size	a	High/Low Pressure Gas	1-5/8 (41.28)	1-5/8 (41.28)
		Liquid	3/4 (19.05)	3/4 (19.05)
	b	High/Low Pressure Gas	1-3/8 (34.93)	1-3/8 (34.93)
		Liquid	3/4 (19.05)	3/4 (19.05)
	c	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)
	d	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)
	e	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)
	f	High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	1/2 (12.7)	1/2 (12.7)

* Install the outdoor unit and piping connections in accordance to whatever is applicable to your situation. Refer to the table for the outdoor unit model, the piping connection kit model, and the piping diameter.

INSTALLATION

6.4.2 Heat Recovery System

Base Unit

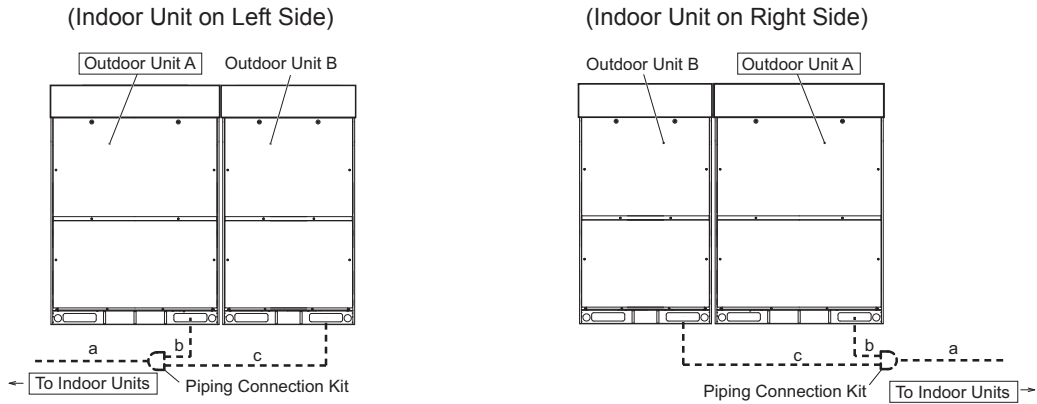


Model Type		72	96	120	
Piping Size	a	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)

inch (mm)

Two Units Combination

< Figure for 168 Type >



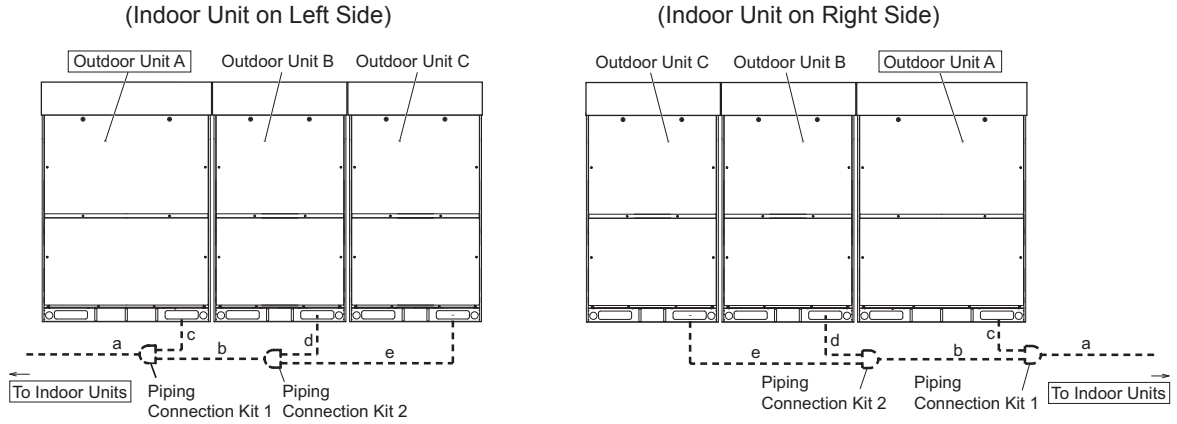
Model Type		144	168	192	
Combination Unit	Outdoor Unit A	72	96	96	
	Outdoor Unit B	72	72	96	
Piping Connection Kit		MC-NP21X1			
Piping Size	a	Low Pressure Gas	1-1/8 (28.58)	1-3/8 (34.93)	1-3/8 (34.93)
		High/Low Pressure Gas	7/8 (22.2)	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	5/8 (15.88)	3/4 (19.05)	3/4 (19.05)
	b	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
	c	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)

inch (mm)

* Install the outdoor unit and piping connections in accordance to whatever is applicable to your situation. Refer to the table for the outdoor unit model, the piping connection kit model, and the piping diameter.

Three Units Combination

< Figure for 240, 264 Type >

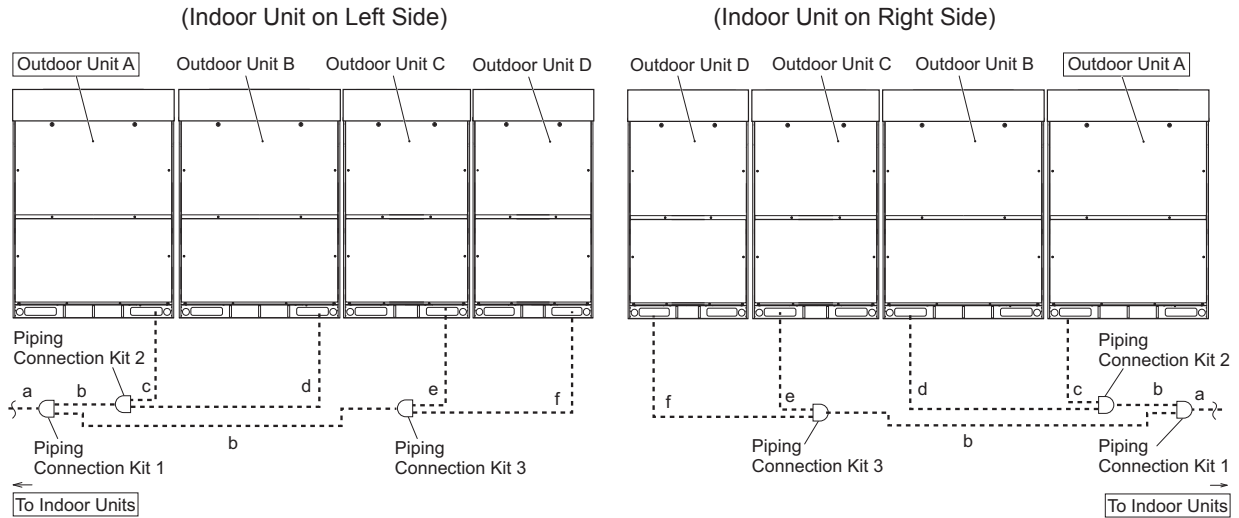


Model Type		216	240	264	288	312	
Combination Unit	Outdoor Unit A	72	96	120	120	120	
	Outdoor Unit B	72	72	72	96	120	
	Outdoor Unit C	72	72	72	72	72	
Piping Connection Kit		MC-NP30X1					
Piping Size	a	Low Pressure Gas	1-3/8 (34.93)	1-5/8 (41.28)	1-5/8 (41.28)	1-5/8 (41.28)	1-5/8 (41.28)
		High/Low Pressure Gas	1-1/8 (28.58)	1-3/8 (34.93)	1-3/8 (34.93)	1-3/8 (34.93)	1-3/8 (34.93)
		Liquid	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)	3/4 (19.05)
	b	Low Pressure Gas	1-3/8 (34.93)	1-3/8 (34.93)	1-3/8 (34.93)	1-3/8 (34.93)	1-3/8 (34.93)
		High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	5/8 (15.88)	5/8 (15.88)	5/8 (15.88)	3/4 (19.05)	3/4 (19.05)
	c	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
	d	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)
	e	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)	1-1/8 (28.58)
		High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)	7/8 (22.2)
		Liquid	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)	1/2 (12.7)

* Install the outdoor unit and piping connections in accordance to whatever is applicable to your situation. Refer to the table for the outdoor unit model, the piping connection kit model, and the piping diameter.

INSTALLATION

Four Units Combination



φinch (φmm)

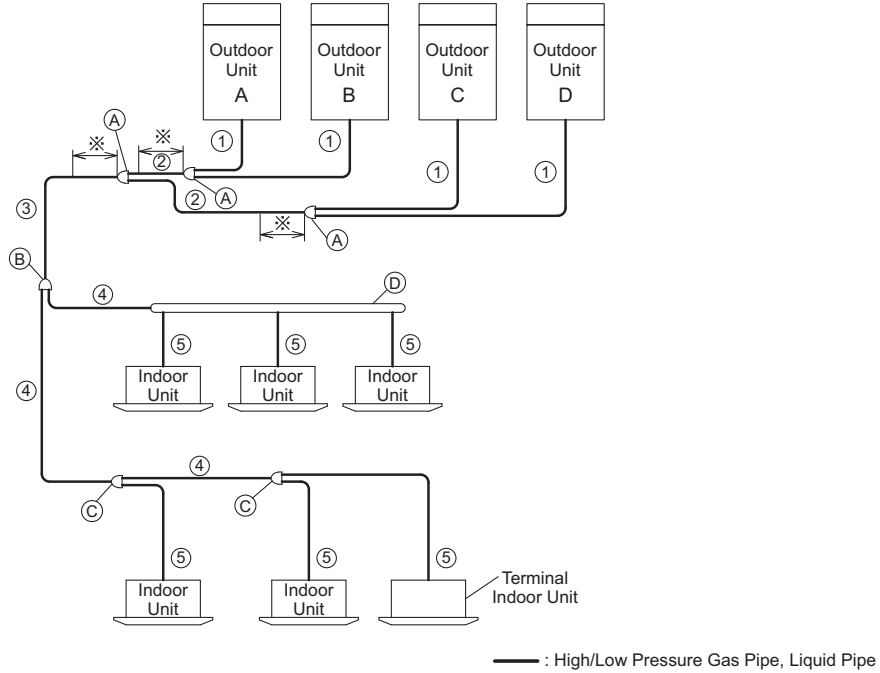
Model Type		336	360	
Combination Unit	Outdoor Unit A	96	120	
	Outdoor Unit B	96	96	
	Outdoor Unit C	72	72	
	Outdoor Unit D	72	72	
Piping Connection Kit		MC-NP40X1		
Piping Size	a	Low Pressure Gas	1-5/8 (41.28)	1-5/8 (41.28)
		High/Low Pressure Gas	1-3/8 (34.93)	1-3/8 (34.93)
		Liquid	3/4 (19.05)	3/4 (19.05)
	b	Low Pressure Gas	1-3/8 (34.93)	1-3/8 (34.93)
		High/Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)
		Liquid	3/4 (19.05)	3/4 (19.05)
	c	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)
		High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)
		Liquid	1/2 (12.7)	1/2 (12.7)
	d	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)
		High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)
		Liquid	1/2 (12.7)	1/2 (12.7)
e	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	
	High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)	
	Liquid	1/2 (12.7)	1/2 (12.7)	
f	Low Pressure Gas	1-1/8 (28.58)	1-1/8 (28.58)	
	High/Low Pressure Gas	7/8 (22.2)	7/8 (22.2)	
	Liquid	1/2 (12.7)	1/2 (12.7)	

* Install the outdoor unit and piping connections in accordance to whatever is applicable to your situation. Refer to the table for the outdoor unit model, the piping connection kit model, and the piping diameter.

6.5 Piping Size and Multi-Kit Selection

6.5.1 Heat Pump System

For selecting the pipe sizes ① between the outdoor unit and the piping connection kit, the piping size ② between the piping connection kits and piping connection kit (A), refer to Section 6.4.1 “Piping Size between Outdoor Units”.



※ Maintain a straight-line distance of 19-11/16 inch (500mm) or more for piping after the piping connection kit.

Multi-Kit (Optional Parts)

< Line Branch >

② First Branch

Outdoor Unit Capacity (MBH)	Model
72 - 120	MW-NP452A2
144	MW-NP692A2
168 - 360	MW-NP902A2

< Header Branch >

④ Header Branch

Total Indoor Unit Capacity (MBH)	No. of Header Branches	Model
36 - 60	4	MH-NP224A
36 - 72	8	MH-NP288A

③ Line Branch after First Branch

Total Indoor Unit Capacity (MBH)	Model
≤ 86	MW-NP282A2
87 - 125	MW-NP452A2
126 - 185	MW-NP692A2
≥ 186	MW-NP902A2

NOTE:

If ③ “Line Branch after First Branch” is larger than ② “First Branch”, use the same model as ② “First Branch”.

INSTALLATION

Refer to the figure on the previous page.

Piping Size < inch (mm) >

- ③ [Main Pipe Diameter]
(Base Unit or Piping Connection Kit 1 to First Branch)

Outdoor Unit Capacity (MBH)	Equivalent Piping Length			
	< 328.1 ft (100m)		≥ 328.1 ft (100m) *1)	
	High/Low Pressure Gas	Liquid	High/Low Pressure Gas	Liquid
72 - 96	1-1/8 (28.58)	1/2 (12.7)	1-1/8 (28.58)	5/8 (15.88)
120	1-1/8 (28.58)	1/2 (12.7)	1-3/8 (34.93)	5/8 (15.88)
144	1-1/8 (28.58)	5/8 (15.88)	1-3/8 (34.93)	3/4 (19.05)
168 - 216	1-3/8 (34.93)	3/4 (19.05)	1-5/8 (41.28)	7/8 (22.2)
240 - 360	1-5/8 (41.28)	3/4 (19.05)	1-5/8 (41.28)	7/8 (22.2)

*1): In some cases, it is required to prepare the reducer (field-supplied).

- ④ [Diameter of Pipe after First Branch]

Total Indoor Unit Capacity (MBH)	Piping Length between First Branch and Indoor Unit			
	≤ 131.2 ft (40m)		> 131.2 ft (40m) *1)	
	High/Low Pressure Gas	Liquid	High/Low Pressure Gas	Liquid
≤ 41	5/8 (15.88)	3/8 (9.52)	3/4 (19.05)	1/2 (12.7)
42 - 65	3/4 (19.05)	3/8 (9.52)	7/8 (22.2)	1/2 (12.7)
66 - 86	7/8 (22.2)	3/8 (9.52)	1-1/8 (28.58)	1/2 (12.7)
87 - 113	1-1/8 (28.58)	1/2 (12.7)	1-1/8 (28.58)	5/8 (15.88)
114 - 125	1-1/8 (28.58)	1/2 (12.7)	1-3/8 (34.93)	5/8 (15.88)
126 - 155	1-1/8 (28.58)	5/8 (15.88)	1-3/8 (34.93)	3/4 (19.05)
156 - 185	1-3/8 (34.93)	5/8 (15.88)	1-3/8 (34.93)	3/4 (19.05)
186 - 257	1-3/8 (34.93)	3/4 (19.05)	1-5/8 (41.28)	7/8 (22.2)
≥ 258	1-5/8 (41.28)	3/4 (19.05)	1-5/8 (41.28)	7/8 (22.2)

*1): In the case that piping length from the multi-kit at the first branch to the terminal indoor unit exceeds 131.2 ft (40m), according to "Piping Branch Restriction" in Section 6.5.1 when installing. In some cases, it is required to prepare the reducer (field-supplied).

NOTE:

If the size of ④ "Pipe after First Branch" is larger than the size of ③ "Main Pipe", adjust the size of ④ "Pipe after First Branch" to the same size as ③ "Main Pipe".

- ⑤ [Diameter of Pipe between Multi-Kit and Indoor Unit]

Indoor Unit Capacity (MBH)	High/Low Pressure Gas	Liquid
6 - 15	1/2 (12.7)	1/4 (6.35) *1)
18 - 48	5/8 (15.88)	3/8 (9.52)

*1): When liquid piping length is longer than 49.2 ft (15m), use 3/8 inch (9.52mm) diameter piping with the reducer (accessory pipe for Multi-Kit).

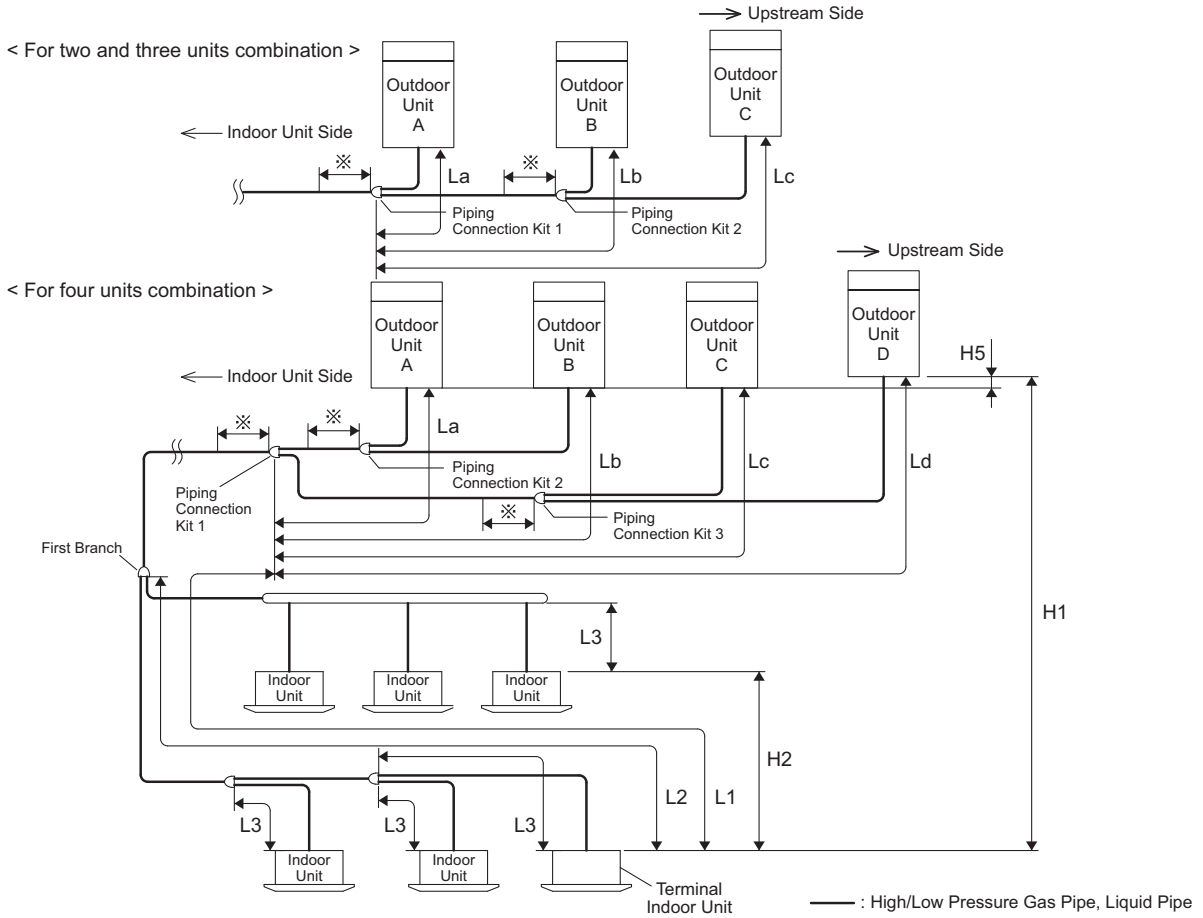
NOTE:

The pipe diameter should be the same as the indoor unit piping connection size.

● Piping Work Conditions

Comply with the following when installing the unit.

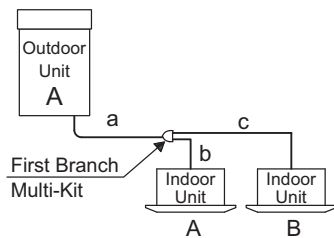
[Example]



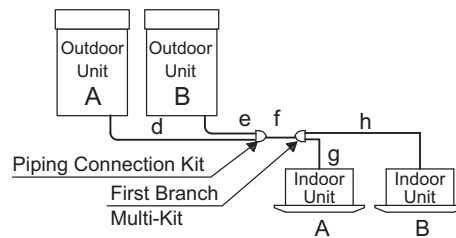
※ Maintain a straight-line distance of 19-11/16 inch (500mm) or more for piping after the piping connection kit.

Item	Mark	Details
Total Piping Length	Ex1 a+b+c	The total amount of all piping actual length.
	Ex2 d+e+f+g+h	
Maximum Piping Length	Ex1 a+c	The actual piping length between the stop valve of the outdoor unit or the piping connection kit1 and the terminal indoor unit.
	Ex2 f+h	
Piping Length	-	The actual length of pipe that takes no account for equivalent lengths for pressure drops of elbows.
Equivalent Piping Length	-	The combination of the straight pipe length plus the equivalent length of elbows and other pressure drop calculations.

Example 1) If a Line Branch Including Main Branch



Example 2) If Utilizing a Piping Connection Kit



INSTALLATION

Item		Mark	Allowable Piping Length	
			≤ the recommended number of connected indoor unit	> the recommended number of connected indoor unit
Total Piping Length		-	≤ 3,281 ft (1,000m)	≤ 984 ft (300m)
Maximum Piping Length	Actual Length	L1	≤ 541 ft (165m)	≤ 541 ft (165m)
	Equivalent Length		≤ 623 ft (190m)	≤ 623 ft (190m)
Maximum Piping Length between Multi-kit of 1st Branch and Each Indoor Unit		L2	≤ 295 ft (90m)	≤ 131 ft (40m)
Maximum Piping Length between Each Multi-kit and Each Indoor Unit		L3	≤ 131 ft (40m)	≤ 98 ft (30m)
Piping Length between Piping Connection Kit 1 and Each Outdoor Unit		La, Lb, Lc, Ld	≤ 32 ft (10m)	≤ 32 ft (10m)
Height Difference between Outdoor Units and Indoor Units	O.U. is Higher	H1	≤ 164 ft (50m)	≤ 164 ft (50m)
	O.U. is Lower		≤ 131 ft (40m)	≤ 131 ft (40m)
Height Difference between Indoor Units		H2	≤ 98.4 ft (30m)	≤ 98.4 ft (30m)
Height Difference between Outdoor Units		H5	≤ 0.3 ft (0.1m)	≤ 0.3 ft (0.1m)

NOTICE

Comply with the following conditions when installing the unit.

- For a combination of two or three outdoor units, the outdoor unit "A" should be connected to the piping connection of Kit 1. For a combination with four units, the outdoor units "A" and "B" should be connected to the piping connection of Kit 2 and the outdoor units "C" and "D" should be connected to the piping connection of Kit 3. (Refer to Section 6.4.1 for outdoor unit models.) Refer to the Piping Kit Installation Manual for piping details.
- The piping length between outdoor units should be $L_a \leq L_b \leq L_c \leq L_d \leq 32.8$ ft (10m).
(If the piping length is incorrect, there may be a failure of outdoor units caused by a refrigerant back-up.)
- Maintain a straight-line distance of 19-11/16 inch (500mm) or more for piping after the piping connection kit.
- The condition of refrigerant piping installation is different depending on the connected number of indoor units. Refer to Table 3.2 "System Combination" above for details.
- Allowable total piping length may not exceed 3,281 ft (1,000m) because of the limitation of maximum additional refrigerant amount as described in the following table. Make sure that the additional refrigerant volume does not exceed the maximum additional refrigerant amount as shown below.

Outdoor Unit Capacity (MBH)	72	96 - 120	144	168 - 360
Max. Additional Refrigerant Charge: lbs (kg)	79.4 (36)	88.2 (40)	112.4 (51)	138.9 (63)

- If the piping length (L3) between each multi-kit and indoor unit is considerably longer than other indoor unit, refrigerant may not flow well, lessening performance compared to other models.
(Recommended Piping Length: Within 49.2 ft (15m))
- When the piping length from the multi-kit to the first branch to the terminal indoor unit exceeds 131.2 ft (40m), refer to "Piping Branch Restrictions", Section 6.5.1.
- When installing Energy Recovery Ventilation in the system, the piping length between Energy Recovery Ventilation and the outdoor unit must be within 49.2 ft (15m).
- When completing on-site piping, install bent piping or horizontal loop piping to absorb any expansion or contraction due to changing temperatures.

● Piping Branch Restriction

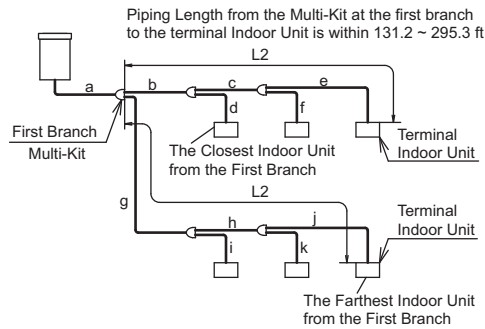
In the following instances, there is no limit to the number of main piping branches.

If that the piping length L2 from the Multi-Kit at the first branch to the farthest indoor unit is over 131.2 ft (40m), follow the instructions below when performing the field-supplied piping work.

(Example 1) : Installation with Main Piping Branch (*)

Piping length from the Multi-Kit at the first branch to the terminal indoor unit is within 131.2 - 295.3 ft (40 - 90m).

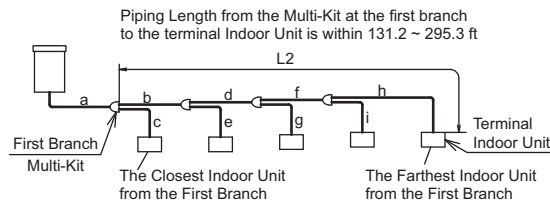
- (1) If the pipe length L2 is over 131.2 ft (40m), the size of gas and liquid pipes “b and c” or “g and h” should be selected according to Table ④ below, “Diameter of Pipe after First Branch”.
 - * If the size of (a) is smaller than the size of (b, g) after selecting the size according to Table ④ below, “Diameter of Pipe after First Branch”, adjust the size of (a) so it is the same size as (b, g).
 - If the size of (a) is larger than the size indicated in Table ③ below, “Main Pipe Diameter” of (Equivalent Piping Length ≥ 328.1 ft), adjust the size of (a) so it is the same size according to Table ③ below, “Main Pipe Diameter” of (Equivalent Piping Length ≥ 328.1 ft).
 - In this instance, if the size of (b, c, g, h) is larger than the size of each before the branch, adjust the size of (b, c, g, h) to the same size as each before the branch.
- (2) The difference between the piping length from the first branch to the farthest indoor unit and the piping length from the first branch to the closest indoor unit must be within 131.2 ft (40m).
 - * $(g+h+j)-(b+d) \leq 131.2$ ft (40m)



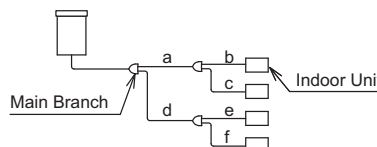
(Example 2): Installation without Main Piping Branch (*)

Piping length from the Multi-Kit at the first branch to the terminal indoor unit is within 131.2 - 295.3 ft (40 - 90m).

- (1) If the pipe length L2 is over 131.2 ft (40m), the size of gas and liquid pipes “b, d and f” should be selected according to Table ④ below, “Diameter of Pipe after First Branch”.
 - * If the size of (a) is smaller than the size of (b) after selecting the size according to Table ④ below, “Diameter of Pipe after First Branch”, adjust the size of (a) so it is the same size as (b).
 - If the size of (a) is larger than the size indicated in Table ③ below, “Main Pipe Diameter” of (Equivalent Piping Length ≥ 328.1 ft), adjust the size of (a) so it is the size according to Table ③ below, “Main Pipe Diameter” of (Equivalent Piping Length ≥ 328.1 ft).
 - In this case, if the size of (b, d, f) is larger than the size of each before the branch, adjust the size of (b, d, f) to the same size as each before the branch.

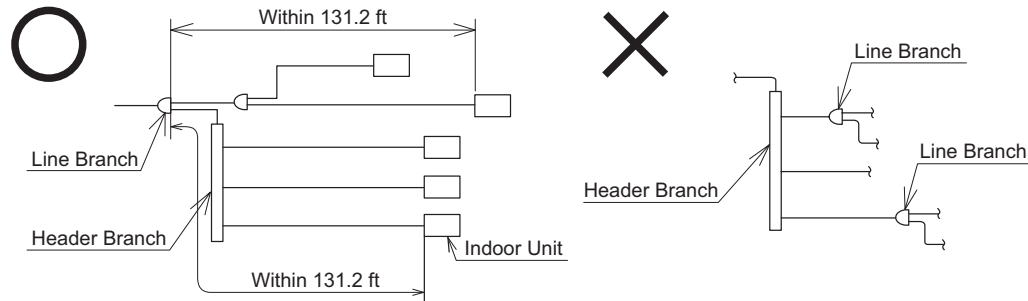


(*): Main Piping Branch:
Both branches of piping from a Multi-Kit are connected to the next Multi-Kits.



INSTALLATION

A header branch can be used with a line branch at the three pipes segment and two pipes segment. A header branch can also be used after the second branch. Do not connect a line branch to a header branch. When using a header branch, make sure that the piping length L2 from the Multi-Kit at the first branch to the farthest indoor unit is within 131.2 ft (40m).



- The number of indoor units connectable to outdoor unit is as follows:
Comply with the following conditions when installing the unit.
- A maximum total capacity and a minimum total capacity against the nominal outdoor unit capacity can be obtained by combination of the indoor units.

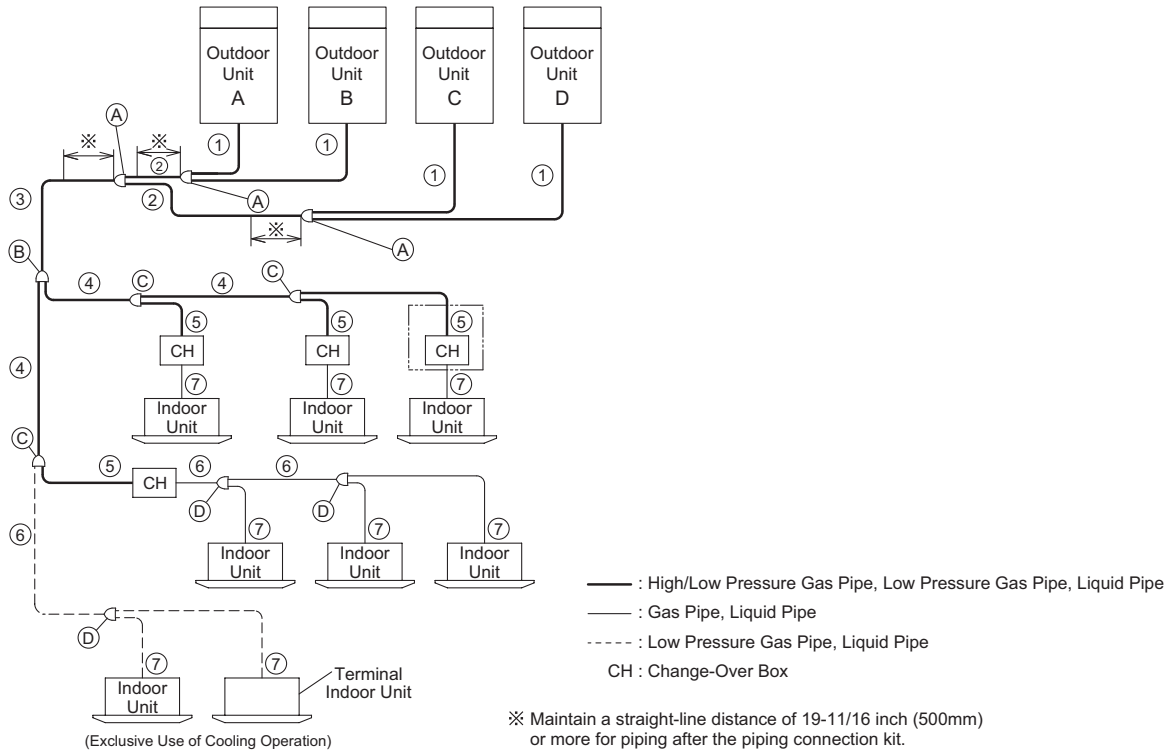
Outdoor Unit Capacity (MBH)	72	96	120	144	168	192	216	240	264	288	312	336	360
Maximum Number of Connectable I.U	18	21	25	36	39	43	54	60	61	64	64	64	64
Recommended Number of Connectable I.U	10	16	16	26	32	32	32	38	38	38	38	38	38

NOTES:

1. For a system under which all the indoor units are supposed to operate simultaneously, the total indoor unit capacity should be less than outdoor unit capacity. Otherwise, it may cause a decrease of operating performance and operating limit in overload operation.
2. For the system under which all the indoor units are not supposed to operate simultaneously, the total indoor unit capacity is available 100% or more against the outdoor unit capacity. Refer to Table 3.2 "System Combination" for detail.
3. When operating the outdoor unit in cold area with temperatures of 14°F (-10°C), or under the high heating load conditions, the total indoor unit capacity should be 100% or less against the outdoor unit capacity and the total piping length should be 984.3ft (300m) or less.
4. The airflow volume for indoor units of 6 and 8 MBH is set higher than that for indoor units of 12 MBH or more. Make sure to select appropriate indoor units when installing indoor units where cold draft may occur during heating operation. If installing indoor units in such places, refer to the recommended number of connectable indoor units.
5. When installing an Energy Recovery Ventilation unit, the additional load must be considered when calculating the maximum units that can be attached.

6.5.2 Heat Recovery System

When selecting the pipe sizes ① between the outdoor unit and the piping connection kit, the piping size ② between the piping connection kits and piping connection kit (A), refer to Section 6.4.2 “Piping Size between Outdoor Units”.



INSTALLATION

Refer to the figure on the previous page.

Multi-Kit (Optional Parts)

< Line Branch >

Ⓑ First Branch

Outdoor Unit Capacity (MBH)	Model
72 - 120	MW-NP452X2
144	MW-NP692X2
168 - 360	MW-NP902X2

Ⓒ Line Branch after First Branch (Three Pipes Portion)

Total Indoor Unit Capacity (MBH)	Model
≤ 41	MW-NP142X2
42 - 86	MW-NP282X2
87 - 113	MW-NP452X2
114 - 155	MW-NP562X2
156 - 185	MW-NP692X2
≥ 186	MW-NP902X2

NOTE:

If Ⓒ "Line Branch after First Branch" is larger than Ⓑ "First Branch", use the same model as Ⓑ "First Branch".

Ⓓ Multi-Kit after First Branch (Two Pipes Portion)

Total Indoor Unit Capacity (MBH)	Model
≤ 86	MW-NP282A2
87 - 125	MW-NP452A2
126 - 185	MW-NP692A2
≥ 186	MW-NP902A2

< Header Branch >

Ⓒ for Three Pipes Portion

Total Indoor Unit Capacity (MBH)	No. of Header Branches	Model
36 - 72	8	MH-NP288X

Ⓓ for Two Pipes Portion

Total Indoor Unit Capacity (MBH)	No. of Header Branches	Model
36 - 60	4	MH-NP224A
36 - 72	8	MH-NP288A

Piping Size < inch (mm) >

- ③ [Main Pipe Diameter]
(Base Unit or Piping Connection Kit 1 to First Branch)

Outdoor Unit Capacity (MBH)	Low Pressure Gas	High/Low Pressure Gas	Liquid	
			< 328.1ft (100m)	≥ 328.1ft (100m) *1)
72 - 120	1-1/8 (28.58)	7/8 (22.2)	1/2 (12.7)	5/8 (15.88)
144	1-1/8 (28.58)	7/8 (22.2)	5/8 (15.88)	3/4 (19.05)
168 - 216	1-3/8 (34.93)	1-1/8 (28.58)	3/4 (19.05)	7/8 (22.2)
240 - 360	1-5/8 (41.28)	1-3/8 (34.93)	3/4 (19.05)	7/8 (22.2)

*1): In some cases, preparing a field-supplied reducer is required.

- ④ [Diameter of Pipe after First Branch] (3 Pipes Portion)

Total Indoor Unit Capacity (MBH)	Low Pressure Gas	High/Low Pressure Gas	Liquid
≤ 41	5/8 (15.88)	1/2 (12.7)	3/8 (9.52)
42 - 65	3/4 (19.05)	5/8 (15.88)	3/8 (9.52)
66 - 86	7/8 (22.2)	3/4 (19.05)	3/8 (9.52)
87 - 125	1-1/8 (28.58)	7/8 (22.2)	1/2 (12.7)
126 - 155	1-1/8 (28.58)	7/8 (22.2)	5/8 (15.88)
156 - 185	1-3/8 (34.93)	1-1/8 (28.58)	5/8 (15.88)
186 - 257	1-3/8 (34.93)	1-1/8 (28.58)	3/4 (19.05)
≥ 258	1-5/8 (41.28)	1-3/8 (34.93)	3/4 (19.05)

NOTE:

If the size of ④ "Pipe after First Branch" is larger than the size of ③ "Main Pipe", adjust the size of ④ "Pipe after First Branch" to the same size as ③ "Main Pipe".

- ⑤ [Diameter of Pipe between Change-Over Box to Multi-Kit]

Number of Connected Indoor Unit = 1

Total Indoor Unit Capacity (MBH)	Change-Over Box Model	Low Pressure Gas	High/Low Pressure Gas
≤ 17	COBS048B21S	5/8 (15.88)	1/2 (12.7)
18 - 29		5/8 (15.88)	1/2 (12.7)
30 - 48		3/4 (19.05)	5/8 (15.88)
49 - 59	COBS096B21S	3/4 (19.05)	5/8 (15.88)
60 - 96		7/8 (22.2)	3/4 (19.05)

Number of Connected Indoor Unit > 1

Total Indoor Unit Capacity (MBH)	Change-Over Box Model	Max. Number of Connectable Indoor Unit	Number of Connected Indoor Unit ≤ 4		Number of Connected Indoor Unit > 4 *1)	
			Low Pressure Gas	High/Low Pressure Gas	Low Pressure Gas	High/Low Pressure Gas
≤ 17	COBS048B21S	7	5/8 (15.88)	1/2 (12.7)	-	-
18 - 29			5/8 (15.88)	1/2 (12.7)	-	-
30 - 41			3/4 (19.05)	5/8 (15.88)	7/8 (22.2)	3/4 (19.05)
42 - 59	COBS096B21S	8	3/4 (19.05)	5/8 (15.88)	7/8 (22.2)	3/4 (19.05)
60 - 71			7/8 (22.2)	3/4 (19.05)	1-1/8 (28.58)	7/8 (22.2)

*1): If the number of connected indoor unit exceeds four, the gas and liquid pipes of ⑥ "Pipe for Two Pipes Portion" and ⑦ "Pipe between Multi-Kit and Indoor Unit" need to increase one size respectively. In this case, prepare a field-supplied reducer.

NOTE:

The liquid pipe is not required to connect to the change-over box.

The liquid pipe of ⑤ "Pipe between Change-Over Box to Multi-Kit" is the same liquid pipes of ⑥ "Pipe for Two Pipes Portion" or ⑦ "Pipe between Multi-Kit and Indoor Unit".

INSTALLATION

⑥ [Diameter of Pipe] (Two Pipes Portion)

Total Indoor Unit Capacity (MBH)	Gas *1)	Liquid
≤ 41	5/8 (15.88)	3/8 (9.52)
42 - 65	3/4 (19.05)	3/8 (9.52)
66 - 86	7/8 (22.2)	3/8 (9.52)
114 - 155	1-1/8 (28.58)	1/2 (12.7)
156 - 185	1-3/8 (34.93)	5/8 (15.88)
186 - 257	1-3/8 (34.93)	3/4 (19.05)
≥ 258	1-5/8 (41.28)	3/4 (19.05)

*1): For the exclusive use of cooling operation, connect the low pressure gas pipe to the gas pipe of Line Branch or Header Branch for two pipes portion.

⑦ [Diameter of Pipe between Multi-Kit and Indoor Unit] (Two Pipes Portion)

Indoor Unit Capacity (MBH)	Gas *1)	Liquid
6 - 15	1/2 (12.7)	1/4 (6.35) *2)
18 - 48	5/8 (15.88)	3/8 (9.52)

*1): For the exclusive use of cooling operation connect the low pressure gas pipe to the gas pipe of the indoor unit.

*2): When the liquid piping length is longer than 49.2ft (15m), use 3/8 inch (9.52mm) pipe with reducer (accessory pipe for Multi-Kit).

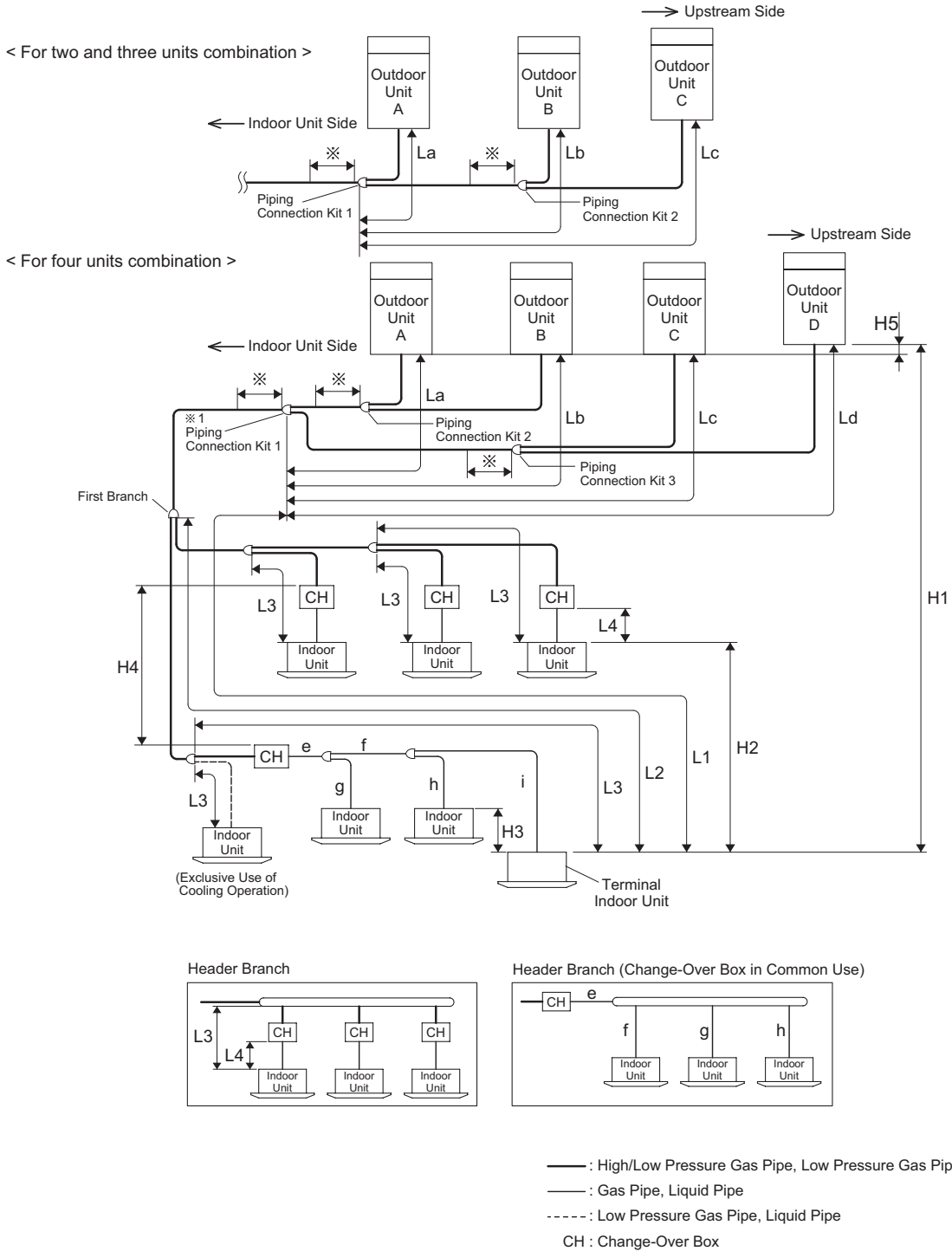
NOTE:

The pipe diameter should be the same as the indoor unit piping connection size.

● Piping Work Conditions

Comply with the following when installing the unit.

[Example]

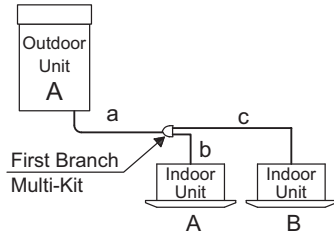


※ Maintain a straight-line distance of 19-11/16 inch (500mm) or more for piping after the piping connection kit.

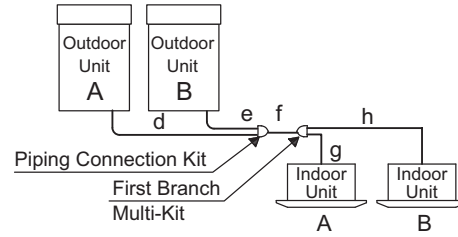
INSTALLATION

Item	Mark		Details
Total Piping Length	Ex1	a+b+c	The total amount of all piping actual length.
	Ex2	d+e+f+g+h	
Maximum Piping Length	Ex1	a+c	The actual piping length between the stop valve of the outdoor unit or the piping connection kit1 and the terminal indoor unit.
	Ex2	f+h	
Piping Length	-		The actual length of pipe that takes no account for equivalent lengths for pressure drops of elbows.
Equivalent Piping Length	-		The combination of the straight pipe length plus the equivalent length of elbows and other pressure drop calculations.

Example 1) If a Line Branch Including Main Branch



Example 2) If Utilizing a Piping Connection Kit



● Piping Work Conditions

Item	Mark	Allowable Piping Length	
		≤ the recommended number of connected indoor unit	> the recommended number of connected indoor unit
Total Piping Length	-	≤ 3,281 ft (1,000m)	≤ 984 ft (300m)
Maximum Piping Length	L1	Actual Length	≤ 541 ft (165m)
		Equivalent Length	≤ 623 ft (190m)
Maximum Piping Length between Multi-kit of 1st Branch and Each Indoor Unit	L2	≤ 295 ft (90m)	≤ 131 ft (40m)
Maximum Piping Length between Each Multi-kit and Each Indoor Unit	L3	≤ 131 ft (40m)	≤ 98 ft (30m)
Total Piping Length between Change-Over Box and Each Indoor Unit	* L4 * e+f+g+h+i	COBS048B21S: ≤ 98 ft (30m)	COBS048B21S: ≤ 98 ft (30m)
		COBS096B21S: ≤ 32 ft (10m)	COBS096B21S: ≤ 32 ft (10m)
Piping Length between Piping Connection Kit 1 and Each Outdoor Unit	La, Lb, Lc, Ld	≤ 32 ft (10m)	≤ 32 ft (10m)
Height Difference between Outdoor Units and Indoor Units	H1	O.U. is Higher	≤ 164 ft (50m)
		O.U. is Lower	≤ 131 ft (40m)
Height Difference between Indoor Units	H2	≤ 49 ft (15m)	≤ 49 ft (15m)
Height Difference between Indoor Units using the Same Change-Over Box	H3	≤ 13 ft (4m)	≤ 13 ft (4m)
Height Difference between Change-Over Box	H4	≤ 49 ft (15m)	≤ 49 ft (15m)
Height Difference between Outdoor Units	H5	≤ 0.3 ft (0.1m)	≤ 0.3 ft (0.1m)

NOTICE

Comply with the following condition of restriction when installing the unit. If not, it may cause failure of the instrument.

- For a combination of two or three outdoor units, the outdoor unit "A" should be connected to the piping connection of Kit 1. For a combination with four units, the outdoor units "A" and "B" should be connected to the piping connection of Kit 2 and the outdoor units "C" and "D" should be connected to the piping connection of Kit 3. (Refer to Section 6.4.2 for outdoor unit models.) Refer to the Piping Kit Installation Manual for piping details.
- The piping length between outdoor units should be $L_a \leq L_b \leq L_c \leq L_d \leq 32.8$ ft (10m).
(If the piping length is incorrect, there may be a failure of outdoor units caused by a refrigerant back-up.)
- Maintain the straight-line distance of 19-11/16 inch (500mm) or more for piping after the piping connection kit.
- For an exclusive cooling operation, connect indoor units with a low pressure gas piping and liquid piping (without a Heat Pump System).
- The condition of refrigerant piping installation is different depending on the connected number of indoor units. Refer to Table 3.2 "System Combination" above for details.
- Allowable total piping length may not exceed 3,281 ft (1,000m) because of the limitation of maximum additional refrigerant amount as described in the following table. Make sure that the additional refrigerant volume does not exceed the maximum additional refrigerant amount as shown below.

Outdoor Unit Capacity (MBH)	72	96 - 120	144	168 - 360
Max. Additional Refrigerant Charge: lbs (kg)	79.4 (36)	88.2 (40)	112.4 (51)	138.9 (63)

- If the piping length (L3) between each multi-kit and indoor unit is considerably longer than other indoor unit, refrigerant may not flow well, lessening performance compared to other models.
(Recommended Piping Length: Within 49.2 ft (15m))
- When the piping length from the multi-kit to the first branch to the terminal indoor unit exceeds 131.2 ft (40m), refer to "Piping Branch Restrictions", Section 6.5.2.
- When completing on-site piping, install bent piping or horizontal loop piping to absorb any expansion or contraction due to changing temperatures.

INSTALLATION

- Piping Branch Restriction

In the following instances, there is no limit to the number of main piping branches.

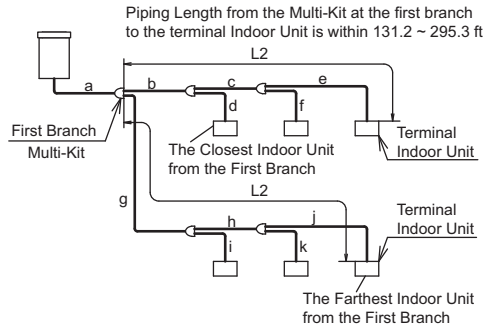
If the piping length L2 from the Multi-Kit at the first branch to the farthest indoor unit is over 131.2 ft (40m), follow the instructions below when performing the field-supplied piping work.

(Example): Installation with Main Piping Branch (*)

Piping length from the Multi-Kit at the first branch to the terminal indoor unit is within 131.2 - 295.3 ft (40 - 90m).

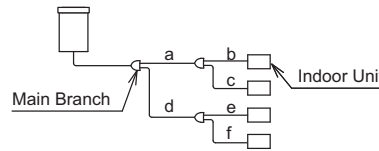
(1) The difference between the piping length from the first branch to the farthest indoor unit and the piping length from the first branch to the closest indoor unit must be within 131.2 ft (40m).

$$*(g+h+j)-(b+d) \leq 131.2 \text{ ft (40m)}$$

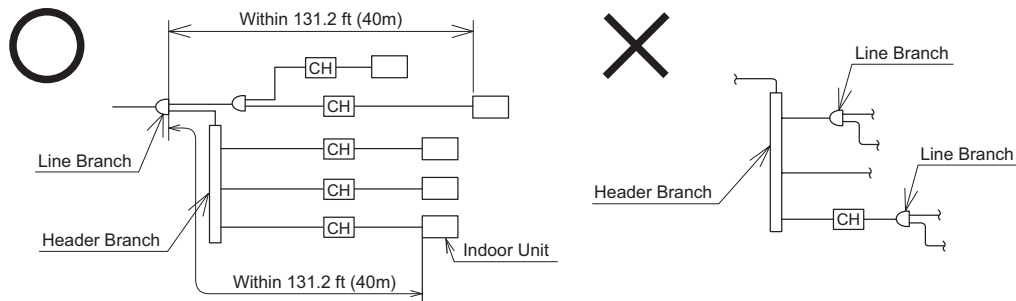


(*): Main Piping Branch:

Both branches of piping from a Multi-Kit are connected to the next Multi-Kits.



A header branch can be used with a line branch at the three pipes segment and two pipes segment. A header branch can also be used after the second branch. Do not connect a line branch to a header branch. When using a header branch, make sure that the piping length L2 from the Multi-Kit at the first branch to the farthest indoor unit is within 131.2 ft (40m).



- The number of indoor units connectable to outdoor unit is as follows:
Comply with the following conditions when installing the unit.
- A maximum total capacity and a minimum total capacity against the nominal outdoor unit capacity can be obtained by combination of the indoor units.

Outdoor Unit Capacity (MBH)	72	96	120	144	168	192	216	240	264	288	312	336	360
Maximum Number of Connectable I.U	18	21	25	36	39	43	54	60	61	64	64	64	64
Recommended Number of Connectable I.U	10	16	16	26	32	32	32	38	38	38	38	38	38

NOTES:

1. For a system under which all the indoor units are supposed to operate simultaneously, the total indoor unit capacity should be less than outdoor unit capacity. Otherwise, it may cause a decrease of operating performance and operating limit in overload operation.
2. For the system under which all the indoor units are not supposed to operate simultaneously, the total indoor unit capacity is available 100% or more against the outdoor unit capacity. Refer to Table 3.2 "System Combination" for detail.
3. When operating the outdoor unit in cold area with temperatures of 14°F (-10°C), or under the high heating load conditions, the total indoor unit capacity should be 100% or less against the outdoor unit capacity and the total piping length should be 984.3ft (300m) or less.
4. The airflow volume for indoor units of 6 and 8 MBH is set higher than that for indoor units of 12 MBH or more. Make sure to select appropriate indoor units when installing indoor units where cold draft may occur during heating operation. If installing indoor units in such places, refer to the recommended number of connectable indoor units.
5. When installing an Energy Recovery Ventilation unit, the additional load must be considered when calculating the maximum units that can be attached.

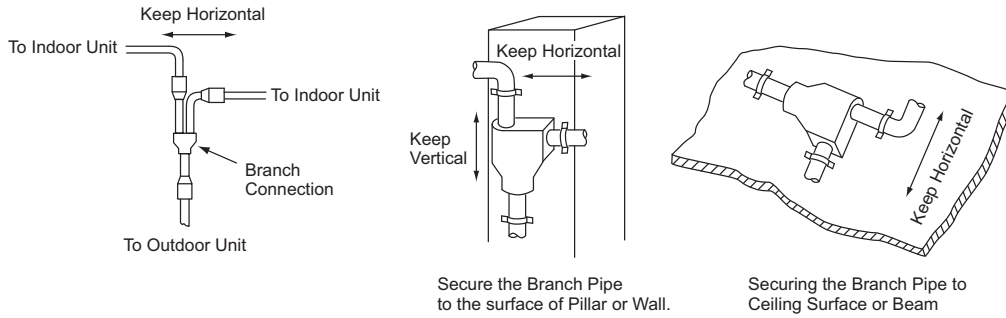
INSTALLATION

6.6 Multi-Kit Connection

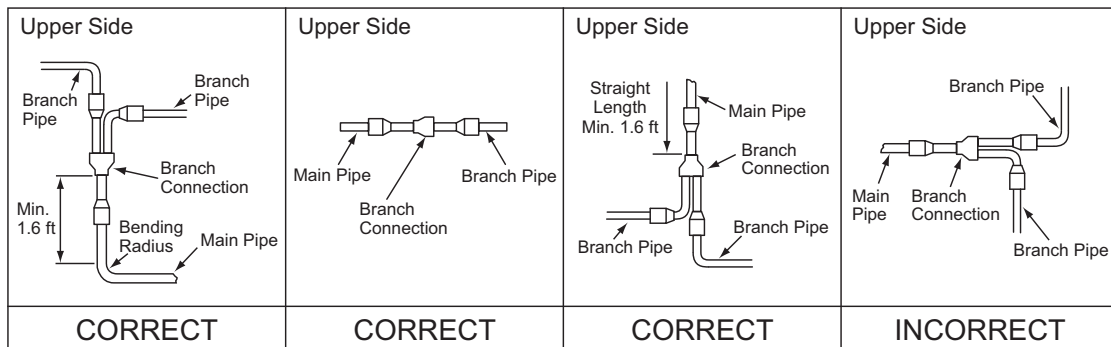
Use the branch piping kit to ensure proper piping.
Do not use a T-Joint. Secure the branch pipes horizontally to a pillar, a wall, or a ceiling.

NOTE:

When installing the piping by securing plates, wrap the branch pipe with an insulation or slip a cushioning between the pipe and the plate. Then secure it to the wall.



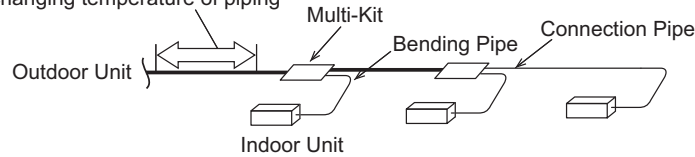
< Installation Posture of Branch Piping >



[Piping Form from Multi-Kit to Indoor Unit]

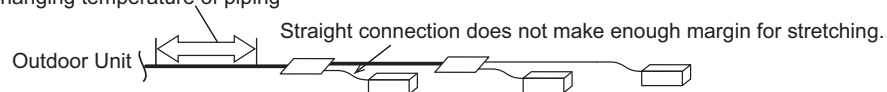
Ex. Recommended To prevent pipe damage, use bending pipes from each Indoor Unit to the Multi-Kit.

Piping stretches during operation because of changing temperature of piping



Ex. Not Recommended

Piping stretches during operation because of changing temperature of piping



NOTICE:

When on-site piping, install the bend pipes or the horizontal loop pipes to absorb stretched pipes that is due to the changing temperature of refrigerant pipes.

7. Electrical Wiring

! WARNING

- The indoor unit fan may continue to operate for up to five minutes following the heating cycle to dissipate residual heat from the indoor unit.
- Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a periodical check is performed.
- Insulate electrical wiring, drain piping, and electrical components from threats posed by burrowing animals and temperature extremes. Failure to do so can over time, deteriorate system performance.
- Electrical cables should not come into contact with refrigerant piping, plate edges, and electrical components inside the unit.
- Use a medium sensing speed Ground Fault Circuit Interrupter (GFCI) with an activation speed of 0.1 second or less). If not, electric shock or a fire can result.
- Secure the cables. External forces on the terminals can lead to fire.
- Tighten screws according to the following torque.
 - M4: 0.7 to 1.0 ft·lbs (1.0 to 1.3 N·m)
 - M5: 1.5 to 1.8 ft·lbs (2.0 to 2.5 N·m)
 - M6: 3.0 to 3.7 ft·lbs (4.0 to 5.0 N·m)
 - M8: 6.6 to 8.1 ft·lbs (9.0 to 11.0 N·m)
 - M10: 13.3 to 17.0 ft·lbs (18.0 to 23.0 N·m)
- Set DSW7 on the PCB1 according to each power supply shown in the figure below.

DSW7	Power Supply Setting and Service Setting
208V Unit:	Setting is required.
230V, 460V Unit:	No setting is required.
208V, 230V Unit: 230V Setting Before Shipment	
460V Unit: 460V Setting Before Shipment	
208V	230V
460V	

- Use the specified cables for wiring between the outdoor unit and indoor units. Selecting incorrect cables will cause an electric shock or a fire. Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Tightly secure the electrical wirings to the terminal block according to the specified torque. If tightening the terminals is not completed, heat generation, an electric shock or a fire will occur at the terminal connections.

7.1 General Check

- (1) Make sure that the field-supplied electrical components (main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical characteristics indicated in Table 7.2. Make sure that the components comply with National Electrical Code (NEC) standards.
 - Supply electrical power to each outdoor unit. This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches and wiring in accordance to local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements. Failure to use a GFCI could result in electric shock or fire.
 - The power sources for the indoor unit and outdoor unit should be supplied respectively. Connect the power supply wiring to each indoor unit group connected to the same outdoor unit. This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches and wiring in accordance to local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements. Failure to use a GFCI could result in electric shock or fire.
 - As for the heat recovery system, the power sources for the Change-Over Box and indoor unit in the same refrigerant cycle can be supplied with one main switch.
- (2) Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage. If the power supply voltage is too low, the system cannot start due to the voltage drop.
- (3) Check the size of the electrical wires.
- (4) Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
 - In an instance where the power source for the packaged air conditioner is supplied from the same power transformer as the device with high electricity consumption*
 - In an instance where the power supply wiring for the device* and for the packaged air conditioner are located close to each other.

* Example: Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor, and large-sized switch.

In the instances mentioned above, an induction surge of the power supply wiring for the packaged air conditioner could occur due to a rapid change in electricity consumption of the device and activation of the switch. Therefore, check the field regulations and standards before performing electrical work in order to protect the power supply wiring for the packaged air conditioner.
- (5) Check to ensure that the ground cable for the outdoor unit, indoor unit, and Change-Over Box are connected.

7.2 Electrical Wiring Connection

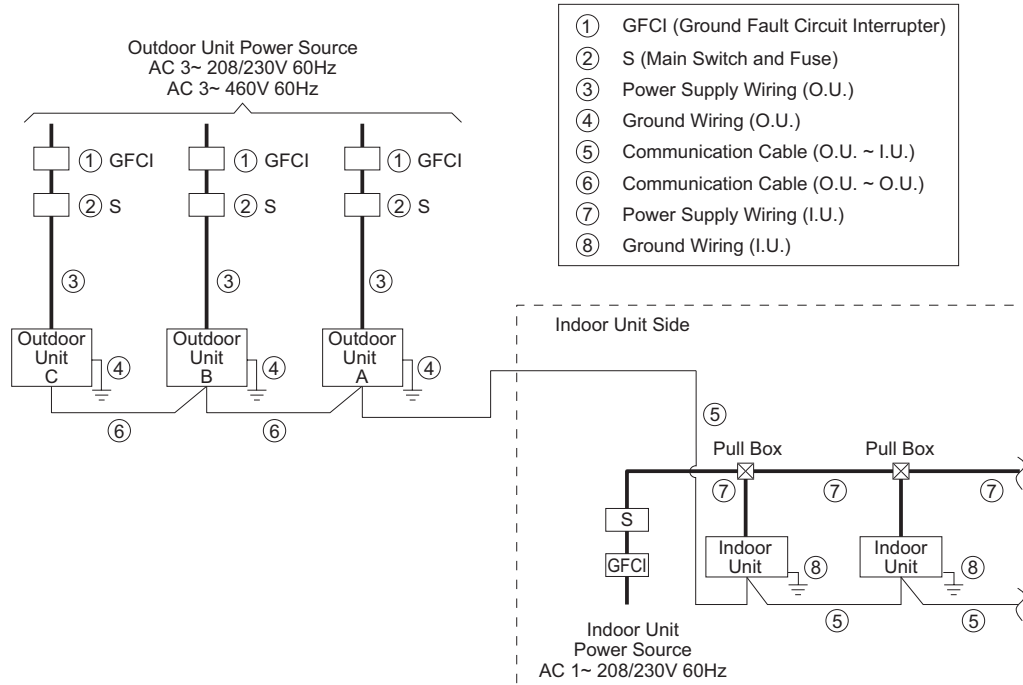
WARNING

- **This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches and wiring in accordance to local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements. Failure to use a GFCI could result in electric shock or fire.**
- **Perform the electrical work according to the regulations of each region and this installation and maintenance manual. A separate, dedicated electrical circuit must be used. If the electrical wiring work is performed incorrectly or there is a capacity shortage of the power circuit, it will cause an electric shock or a fire.**
- **Check that the ground wire is securely connected. If the unit is not correctly grounded, it may lead to an electrical shock. Do not connect the ground wiring to gas piping, water piping, lighting conductor, or telephone ground cables.**

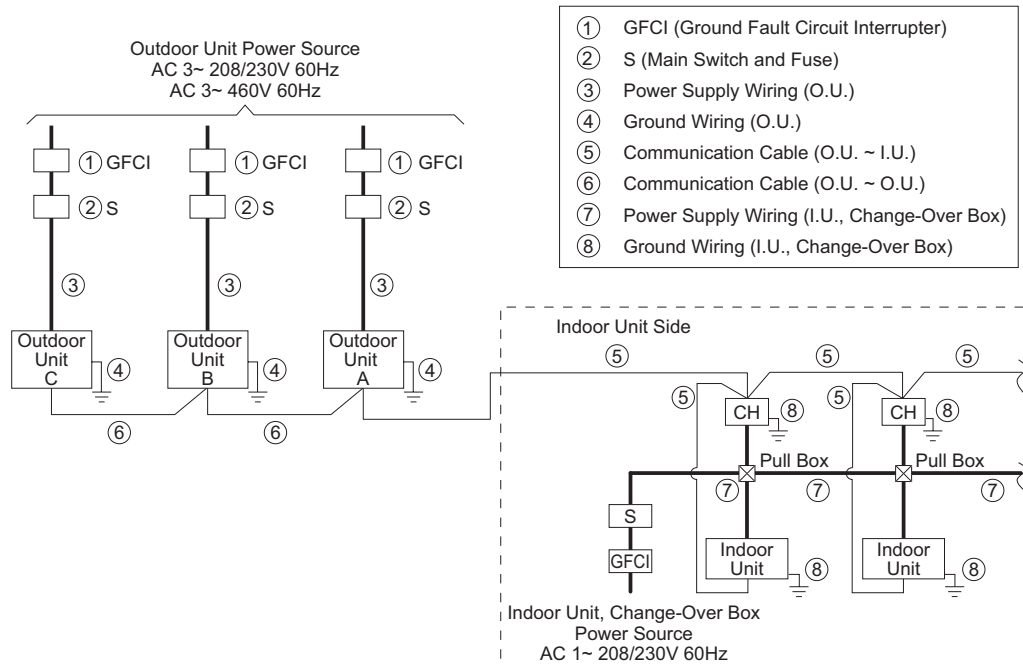
(1) Power Source Wiring

Supply the power sources to each outdoor unit and indoor unit group respectively.
Using this method is a basic principle of power supply wiring.

< Heat Pump System >



< Heat Recovery System >



INSTALLATION

(2) Electrical Characteristics

Table 7.1 Electrical Characteristics and Recommended Wiring Size

Model	Outdoor Unit							INV Comp.	
	Hz (Hz)	Voltage (V)	Max. (V)	Min. (V)	MCA (A)	MOP (A)	Max. Fuse (A)	RLA (A)	LRA (A)
(H,Y)VAH(P,R)072B31S	60	208/230	253	188	45/40	79/71	70/70	34.0/30.5	150
(H,Y)VAH(P,R)096B31S	60	208/230	253	188	55/50	84/76	80/70	15.7/14.5	150
(H,Y)VAH(P,R)120B31S	60	208/230	253	188	64/58	92/84	90/80	23.2/21.0	150
(H,Y)VAH(P,R)072B41S	60	460	506	414	24	41	40	17.5	75
(H,Y)VAH(P,R)096B41S	60	460	506	414	28	40	40	11	75
(H,Y)VAH(P,R)120B41S	60	460	506	414	34	49	40	15	75

Model	Fix Speed Comp.		Fan Motor		Wiring Size		
	RLA (A)	LRA (A)	Output (kW)	FLA (A)	Power Supply Wiring (AWG)	Ground Wiring (AWG)	Communication Cable (AWG)
(H,Y)VAH(P,R)072B31S	-	-	0.75	4.8/4.4	6/6	6/6	18
(H,Y)VAH(P,R)096B31S	28.8/26.0	153	1.2	5.6/5.1	4/6	4/6	18
(H,Y)VAH(P,R)120B31S	28.8/26.0	153	1.2	5.6/5.1	4/4	4/4	18
(H,Y)VAH(P,R)072B41S	-	-	0.75	8.7	10	10	18
(H,Y)VAH(P,R)096B41S	12	74.2	1.2	8.7	10	10	18
(H,Y)VAH(P,R)120B41S	12	74.2	1.2	8.7	8	8	18

MCA: Minimum Circuit Ampacity (A)
MOP: Maximum Overcurrent Protective Device (A)
RLA: Rated Load Ampacity (A)
LRA: Locked Rotor Ampacity (A)
FLA: Full Load Ampacity (A)

NOTES:

1. Select wire size based on the value of MCA.
2. MOP is used to select the fuse, circuit breaker, or a Ground Fault Circuit Interrupter (GFCI).
3. Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.

CAUTION

Install a multi-pole main switch with a space of 1/8 inch (3.5mm) or more between each phase.

NOTES:

1. When the power supply wiring is longer, select the minimum wiring size which the voltage drop is within 2%.
2. Power supply voltage should be satisfied with the followings.
Supply Voltage: Rated Voltage within $\pm 10\%$
Starting Voltage: Rated Voltage within -15%
Operating Voltage: Rated Voltage within $\pm 10\%$
Imbalance between Phases: within 3%
3. Do not connect the ground wiring to gas piping, water piping, or a lightning conductor.
Gas Piping: An explosion and ignition may occur if there is escaping gas.
Water Piping: There is no effective electrical ground provided when hard vinyl piping is used.
Lightning Conductor: The electrical potential of the earth increases when a lightning conductor is used.

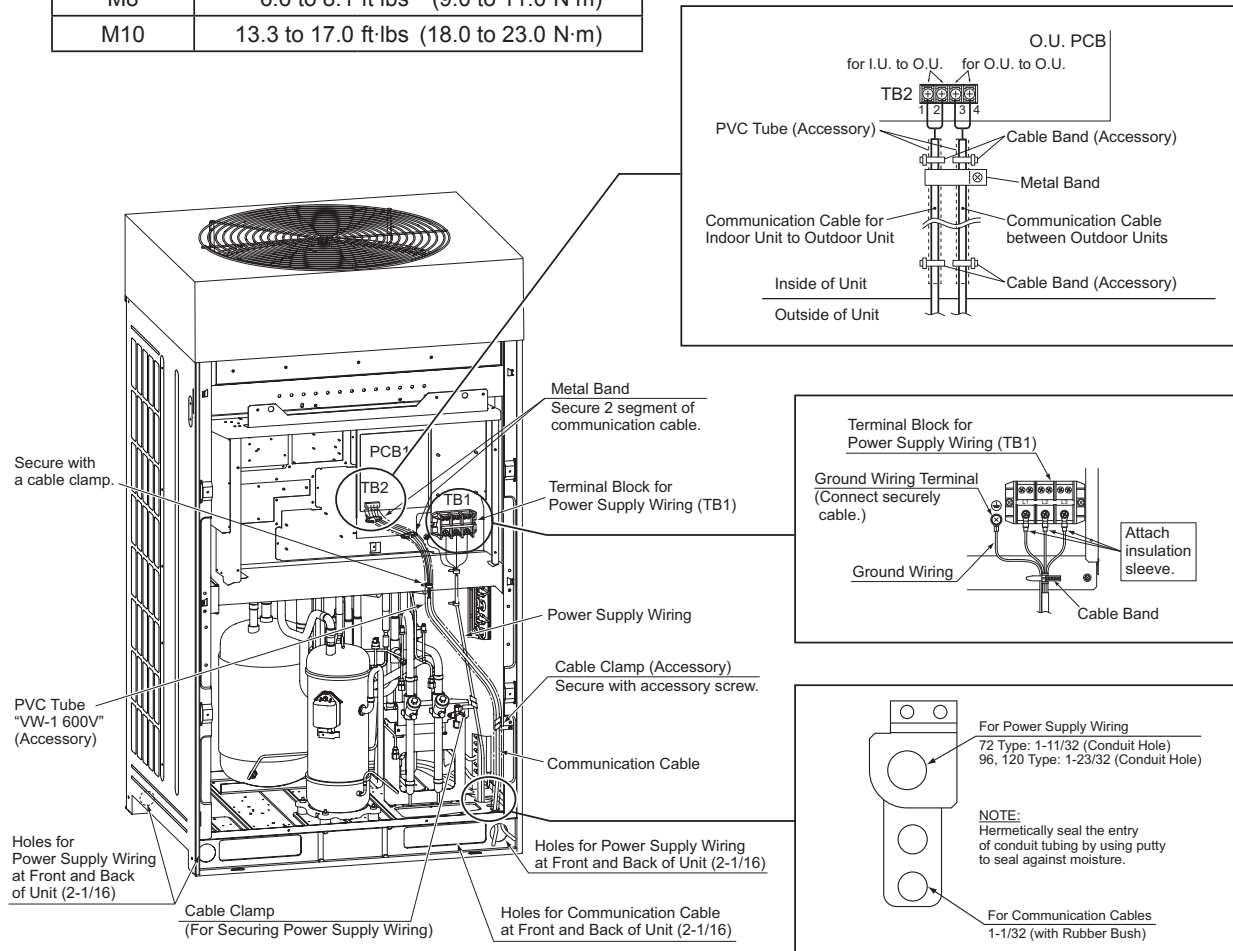
7.3 Electrical Wiring for Outdoor Unit

Connect the electrical wiring according to the following figure:

- (1) Connect the power supply wires to L1, L2 and L3 for the three-phase power source on the terminal block TB1 and ground wiring to the terminal in the electrical control box.
- (2) Connect the communication cables between the outdoor and indoor units to the TB2 terminals 1 and 2 on the PCB1. As for the communication cables between outdoor units in the same refrigerant cycle, connect them to the TB2 terminals 3 and 4 on the PCB1. When shielded cabling is applied (M4), proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements. Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper.
- (3) Insert the communication cables into the PVC tube "VW-1 600V" (Accessory) to separate from the power supply wirings and the communication cables in the outdoor unit. Then, tighten both ends of the PVC tubing with the cable bands (accessory) in order to secure the PVC tubing to the communication cables.
- (4) Tighten screws for the terminal block according to the following table.

< Required Tightening Torque >

Size	Tightening Torque
M4	0.7 to 1.0 ft·lbs (1.0 to 1.3 N·m)
M5	1.5 to 1.8 ft·lbs (2.0 to 2.4 N·m)
M6	3.0 to 3.7 ft·lbs (4.0 to 5.0 N·m)
M8	6.6 to 8.1 ft·lbs (9.0 to 11.0 N·m)
M10	13.3 to 17.0 ft·lbs (18.0 to 23.0 N·m)



CAUTION

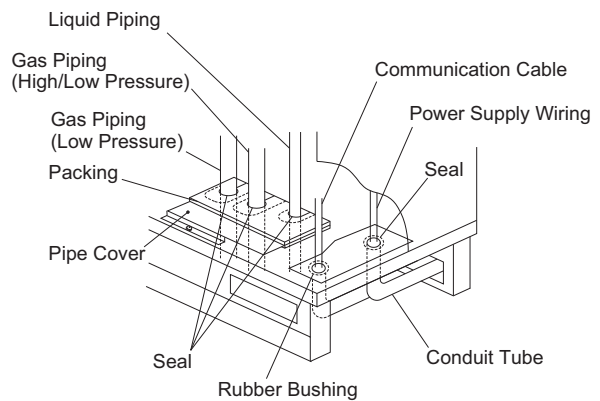
Be sure to note the following points when running cables under the unit using conduit tubing.
(The pipe cover needs to be removed before performing piping and wiring.)

NOTES:

1. When installing the power supply wiring, use the field-supplied conduit tube as shown below. Remove the rubber bushing from the unit for the conduit tubing installation.
2. When installing the communication cables, run them through the rubber grommet attached to the unit.
3. Draw each individual cable through its corresponding hole.
4. Maintain at least 5 inch (127mm) between the power supply wiring and communication cables.
5. Attach the pipe cover to prevent rats or other small animals from entering the unit.
6. Prevent cables from touching or rubbing up against refrigerant piping, plate edges, and electrical components inside the unit.
7. Completely seal the end of conduit tube with sealing materials to prevent the rain from entering the conduit tube.
8. Create a drainage hole at the lowest part of the conduit tube.

CAUTION

Tightly secure the power supply wiring using a cable clamp inside the unit.

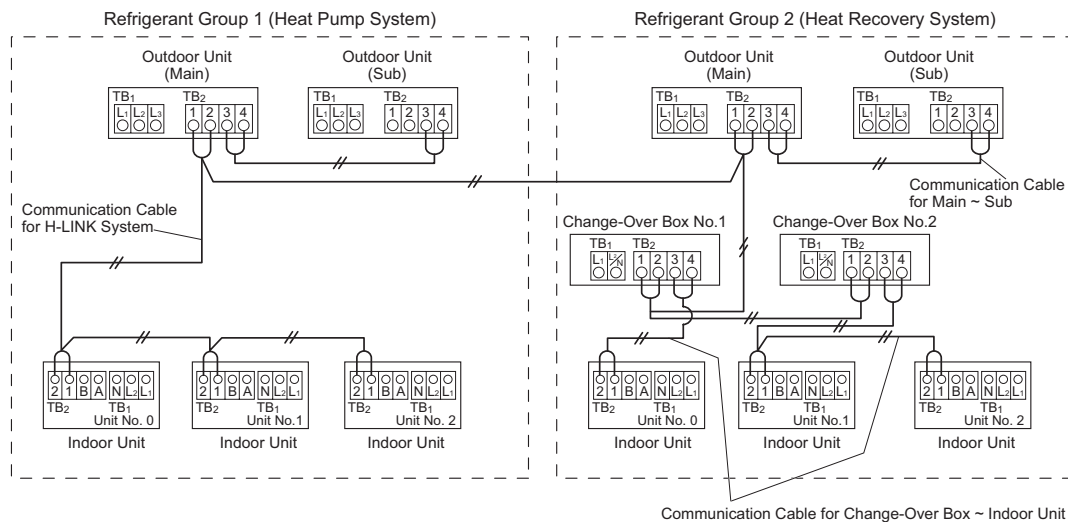


7.4 Electrical Wiring Connections of Indoor Unit, Outdoor Unit, and Change-Over Box

- (1) Connect a power supply wiring to each outdoor unit. Connect a Ground Fault Circuit Interrupter (GFCI), fuse, and main switch (S) to each outdoor unit.
- (2) Connect a power supply wiring to each indoor unit group and change-over box group connected to the same outdoor unit. (Total operating current be less than 12A.)
Connect a Ground Fault Circuit Interrupter (GFCI), fuse, and main switch (S) to each indoor unit group.
- (3) Connect the communication cable between indoor units, change-over boxes and outdoor units, as shown in Figure 7.1 and 7.2.
- (4) Connect the communication cables in the same refrigerant cycle unit. (If the refrigerant piping of indoor unit is connected to the outdoor unit, also connect the communication cables to the same indoor unit.)
Connecting the refrigerant piping and communication cables to the different refrigerant cycle systems may lead to malfunction.
- (5) Use communication cabling that is a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements. (Do not use Tri-Core or anything beyond.)

- (6) Use the same kind of cables in the same H-LINK system.
- (7) Maintain at least 5 inch (127mm) between the communication cables and the power supply wiring, and also min. 5 ft (1.5m) between the communication cables and power supply wiring for other electrical device. If these cables are not secured, sleeve the power supply wiring into the metallic conduit tubing to separate them from the other cables. Make sure power supply wiring are well-grounded.
- (8) Connect the following communication cables to the terminals 1 and 2 on terminal block (TB2) in the outdoor unit A (main unit).
 - between outdoor unit and indoor unit
 - between outdoor unit and change-over box
 - between outdoor unit and outdoor unit in other refrigerant cycles
- (9) Do not connect the power supply wiring to the terminal block for transmission wiring (TB2). All the printed circuit boards in the same refrigerant cycle will be damaged.
- (10) For a Heat Recovery System, connect the communication cables from indoor unit exclusively used for cooling to the terminals 1 and 2 on TB2 in the change-over box.
- (11) Connect the ground wiring to the outdoor/indoor units and change-over box. The ground wiring work under the condition of 100Ω (max.) ground resistance must be performed by a authorized personnel.
- (**) Connect the communication cables between outdoor units in the same refrigerant cycle to the terminals 3 and 4 on TB2.

• Communication Cabling



NOTES:

1. For the combination units, DSW settings of Main and Sub are required.
2. An alarm occurs if the communication cables between main outdoor unit and sub outdoor units are connected to the terminals 1 and 2 for H-LINK system.
3. In an alarm is triggered on the LCD of Main outdoor unit, follow the "7-segment" display at the Main outdoor unit for verification purposes.
4. Perform a function setting at the Main outdoor unit.
5. Maximum number of refrigerant groups with one central controller is 64 (for H-LINK II).
Maximum number of indoor units to be connected is 160 (for H-LINK II).

INSTALLATION

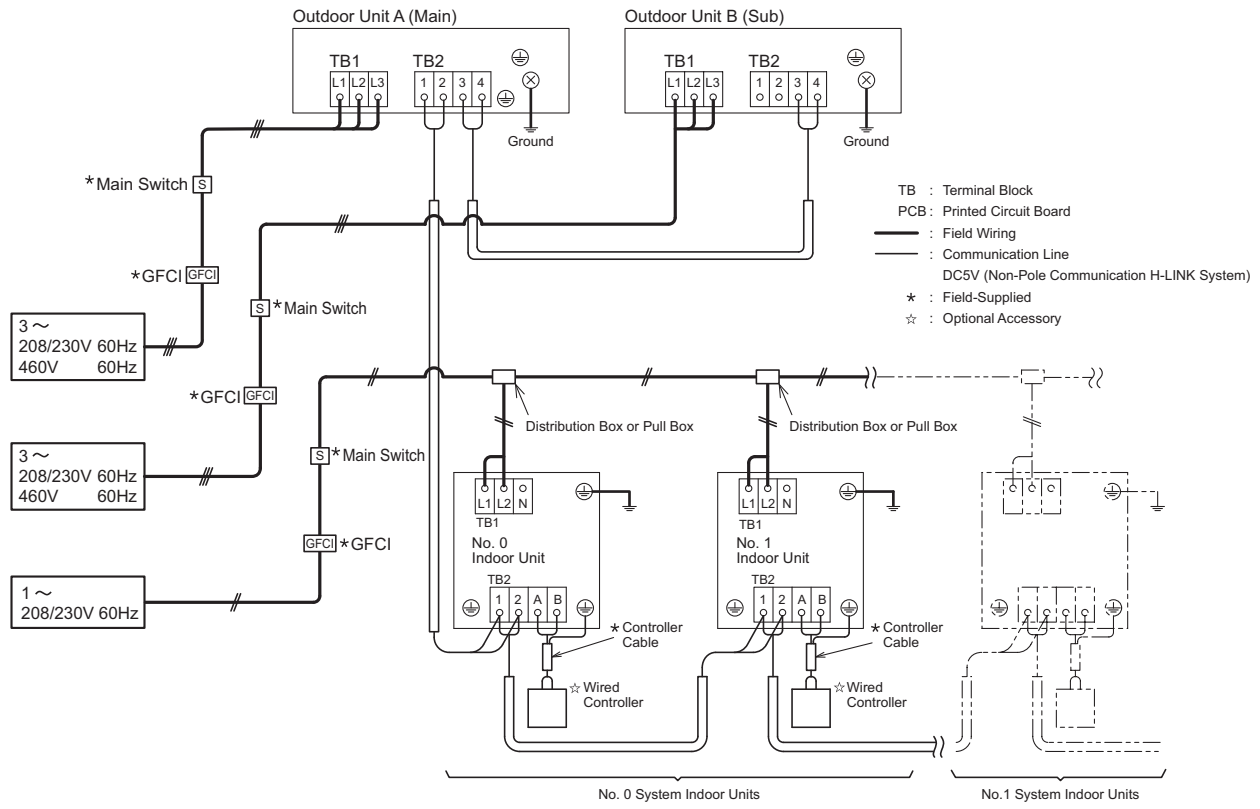


Figure 7.1 Instruction for Electrical Wiring Connection (Heat Pump System)

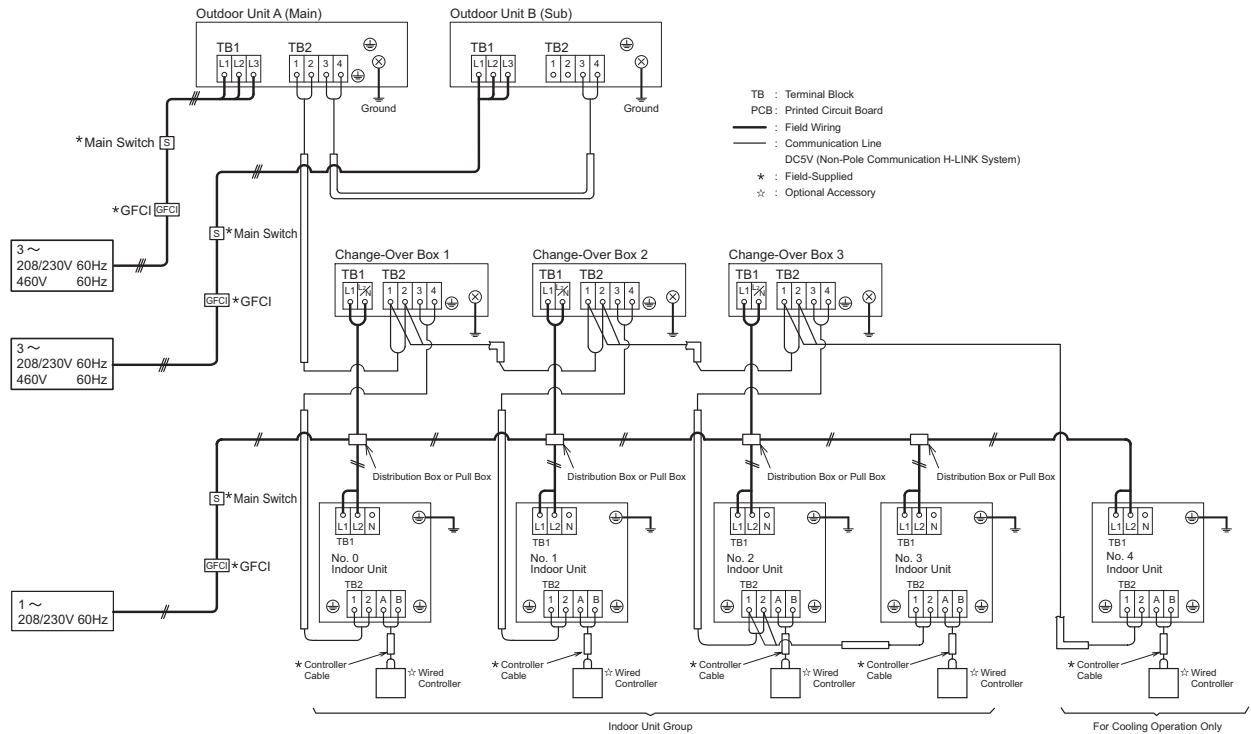


Figure 7.2 Instruction for Electrical Wiring Connection (Heat Recovery System)

7.5 DIP Switch Setting of Outdoor Unit

Turn OFF all power sources before performing settings.

DIP switch settings cannot be set without first disconnecting from the power source. (However, No.1, 2, 4, and 6 pins of DSW4, No.4 pin of DSW7 and push switches can be operated when power source is ON.)
The darkened square "■" indicates the position of DIP switches.

NOTE

- By using switch DSW4, the unit is started 10 to 20 seconds after the switch is adjustment is made.
- To simplify service and maintenance, number this outdoor unit to help distinguish it from the other outdoor units.
Record the unit number in the box right.

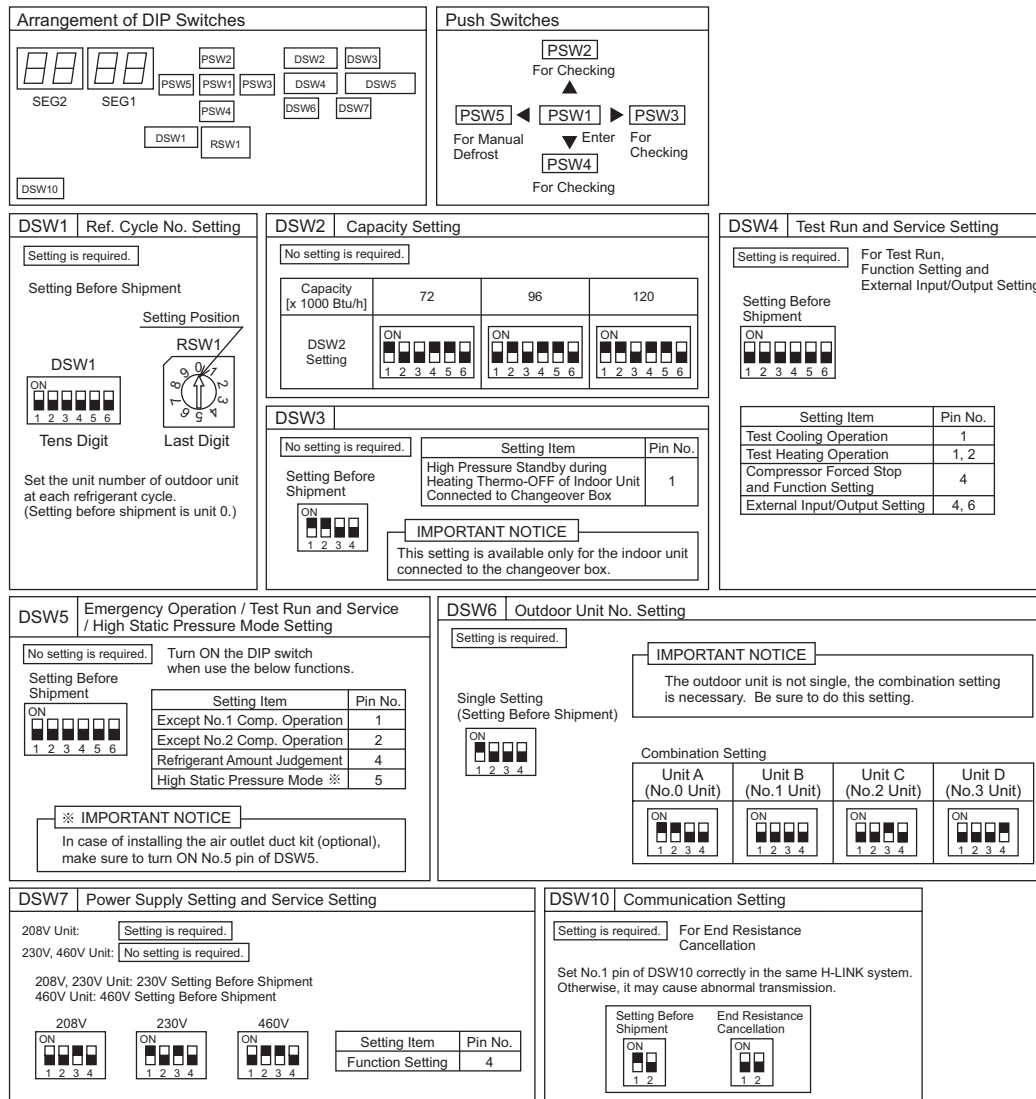


Figure 7.3 DSW Setting

- **High Static Pressure Setting (No.5 pin of DSW5: ON)**

Turn ON the No.5 pin of DSW5 for the high static pressure setting.

This setting enables the high static pressure operation up to maximum of 0.24 in.W.G. (60Pa).

NOTES:

1. In an instance where there are combined outdoor units, set this function for all the outdoor units.
2. While the unit operates in a high static pressure mode, the operation sound value increases by 3dB from the nominal value.

INSTALLATION

- **Setting for Transmitting**

Setting the outdoor unit Nos., refrigerant cycle Nos. and end terminal resistance for this H-LINK system.

- **Setting of Outdoor Unit No.**

If there are combined outdoor units, set DSW6 as shown below.

Base Unit (Before Shipment)	Combination of Base Unit			
	Unit A (No.0)	Unit B (No.1)	Unit C (No.2)	Unit D (No.3)

- **Setting of Refrigerant Cycle No.**

In the same refrigerant cycle, set the same refrigerant cycle No. for the outdoor unit and the indoor units as shown below.

Setting outdoor unit refrigerant cycle No. is required only for the main unit.

The sub unit settings are not required.

As for setting indoor unit refrigerant cycle No., set RSW2 and DSW5 on the indoor unit PCB.

	Setting Switch	
	10 digit	1 digit
		 Setting Position Set by inserting slotted screwdriver into the groove.
Outdoor Unit	DSW1	RSW1
Indoor Unit (H-LINK II)	DSW5	RSW2

Example: If Setting Refrigerant Cycle No. 25

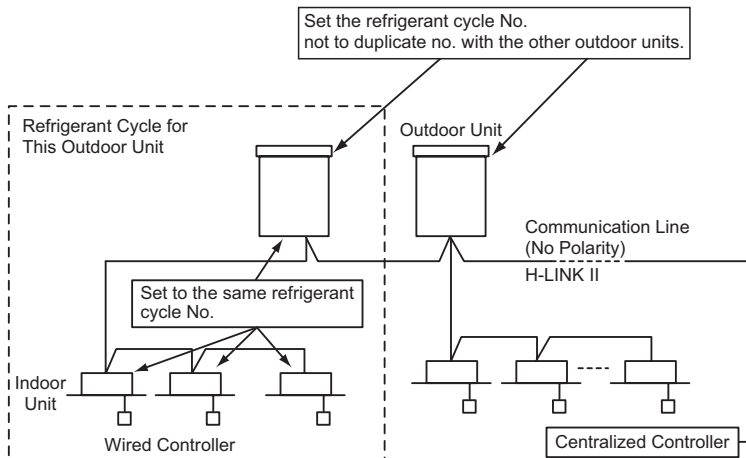
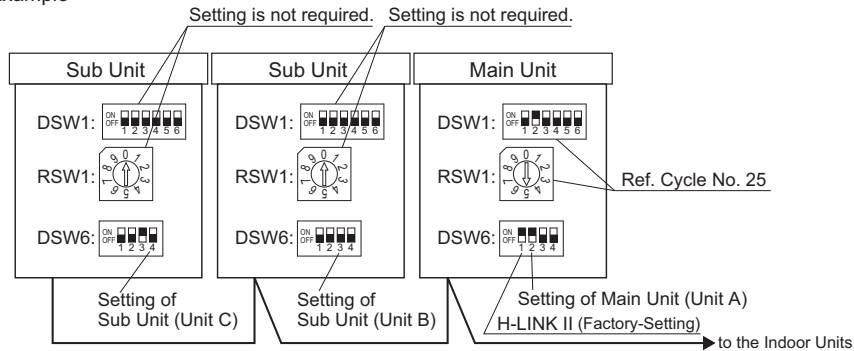


Turn ON No. 2 pin.

Set Dial No.5.

DSW and RSW setting before shipment is 0.
Maximum in setting refrigerant cycle No. is 63.

< Setting Example >



Maximum Number of Connectable Outdoor Units and Indoor Units (for H-LINK II)

Outdoor Unit	64
Indoor Unit	160

NOTE:

For installing the outdoor unit and the indoor unit on the same communication cable, which cannot be used for H-LINK II, maximum number of connectable indoor units is 128.

● **DSW7 Setting for Rated Voltage**

DSW7 is used for setting of rated voltage for the outdoor unit as shown at right.
When the site power source voltage is different from factory setting, a DSW7 setting is required.

NOTE:

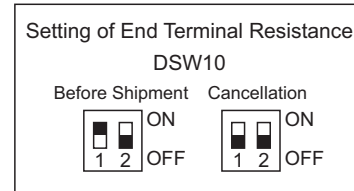
The same voltage setting is required to the main unit and sub unit(s).

Voltage	DSW7 Setting
208V	
230V	
460V	

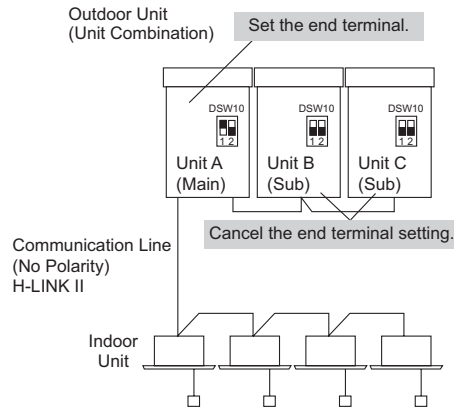
● **Setting of End Terminal Resistance**

Before shipment, No.1 pin of DSW10 (for the setting of end terminal resistance) is in the “ON” position.

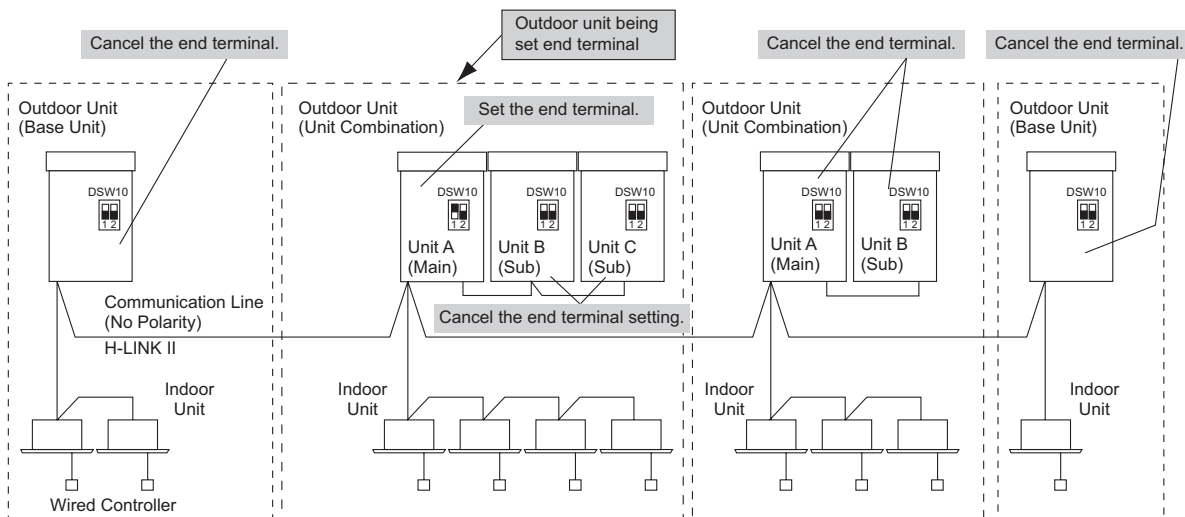
In the case of one refrigerant cycle in the same H-LINK II, set all No.1 pin of DSW10 in the “OFF” position except the main outdoor unit A.



In the case of one refrigerant cycle in the same H-LINK II, set all No.1 pin of DSW10 in the “OFF” position except the main outdoor unit A.



If more than one refrigerant cycles in the same H-LINK II, set all No.1 pin of DSW10 to the “OFF” position except the main outdoor unit A.



● **Automatic Simple Judgement System for Refrigerant Amount (No.4 pin of DSW5)**

This function is NOT available for this outdoor unit.

If No.4 pin of DSW5 is turned ON, 7-segment display flashes “”, which means forced termination of this function.

INSTALLATION

• Function Setting

External Input/Output and Function Setting

Make sure to perform external input/output and function setting while the outdoor unit is stopped. It cannot be set while the outdoor unit is operating or check mode.

[External Input/Output Setting]

■ Start of Setting

Turn ON No.4 pin of DSW4.
Turn ON No.6 pin of DSW4.

External Input/Output Setting Mode
"iO S f"

For the setting mode, refer to ① below.

■ Exit Setting Mode

Turn OFF No.6 pin of DSW4 during indicated External Input/Output Setting Mode.
Turn OFF No.4 pin of DSW4.

After setting, confirm DSW4 setting is same as setting before shipment, and DSW7 setting is correct.

[Function Setting]

■ Start of Setting

Turn ON No.4 pin of DSW4.
Turn ON No.4 pin of DSW7.

Function Setting Mode
"F u n c"

For the setting mode, refer to ② below.

■ Exit Setting Mode

Turn OFF No.4 pin of DSW7 during indicated Function Setting Mode.
Turn OFF No.4 pin of DSW4.

Details of Checking Mode should be according to the exhibit of "Checking Method by 7-Segment Display" attached to the back side of the service cover.

NOTE:
Release "Menu Mode" after the setting is completed. Otherwise, the air conditioner may not operate appropriately.

② [Function Setting]

By pressing the push-switches PSW3 (▶) and PSW5 (◀), the setting can be changed.
PSW4 (▼): forward, PSW2 (▲): backward
Refer to the Service Manual for more details.

Fill out the selected function setting No. in the space of the table as shown.

< Example >

1

① [External Input/Output Setting]

By pressing the push-switches PSW3 (▶) and PSW5 (◀), the function No. can be selected.
PSW4 (▼): forward, PSW2 (▲): backward

Fill out the selected function setting No. in the space of the table as shown.

< Example >

1

Item	SEG2	SEG1	SET
1 Input Setting 1 CN17 [1-2 pin]	11	1	
2 Input Setting 2 CN17 [2-3 pin]	12	2	
3 Input Setting 3 CN18 [1-2 pin]	13	3	
4 Output Setting 1 CN16 [1-2 pin]	01	1	
5 Output Setting 2 CN16 [1-3 pin]	02	2	

(Setting Before Shipment)

Before shipping, the input/output function settings are specified to each input/output terminal according to above table. The details of function No. and external input/output settings are as shown below.

Setting of External Input/Output Function

Function No.	Input	Output
1	Fixing Heating Operation Mode	Operation Signal
2	Fixing Cooling Operation Mode	Alarm Signal
3	Demand Stoppage	Compressor ON Signal
4	Outdoor Fan Motor Start/Stop	Defrost Signal
5	Forced Stoppage	-
6	Demand Current Control 40%	-
7	Demand Current Control 60%	-
8	Demand Current Control 70%	-
9	Demand Current Control 80%	-
10	Demand Current Control 100%	-
11	Low Noise Setting 1	-
12	Low Noise Setting 2	-
13	Low Noise Setting 3	-
0	No Setting	No Setting

The same input/output function setting cannot be set to different input/output terminals.

If set, a setting of larger function number becomes invalid.

Example: When setting of input 1 and input 2 are same, input 2 will be invalid.

Item	SEG2	SEG1	SET	Item	SEG2	SEG1	SET
1 Circulator Function at Heating Thermo-OFF	F A	0		18 Demand Function Setting	d E	0	
2 Night-Shift (Low Noise)	n i	0		19 Wave Function Setting	u E	0	
3 Cancellation of Outdoor Ambient Temperature Limit	o s	0		20 Protection of Decrease in Outlet Temperature for Cooling	F b	0	
4 Defrost for Cold Area (Change of Defrost Condition)	d o	0		21 Outlet Temperature Control (DOAS)	F r	0	
5 SLo (Fan Speed) Defrost Setting	b u	0		22 Adjustment of Fan Rotation (for multiple installation)	F o	0	
6 Cancellation of Hot Start	H r	0		23 Not Prepared	L r	0	
7 Priority Capacity Mode	r u	0		24 Thermo-OFF Setting for Outdoor Unit After Defrosting Operation	d s	0	
8 Compressor Frequency Control Target Value for Cooling	H c	0		25 Not Prepared	F i	0	
9 Compressor Frequency Control Target Value for Heating	H h	0		26 Crankcase Heater Control during Stoppage	F 2	0	
10 Indoor Expansion Valve Control Target Value for Cooling	S c	0		27 Not Prepared	F 3	0	
11 Indoor Expansion Valve Control Target Value for Heating	S h	0		28 Intermittent Operation of Outdoor Fan Motor	F 4	0	
12 Indoor Expansion Valve Opening during Heating Operation Stoppage	S i	0		29 Indoor Expansion Valve Control Target Value for Cooling (Only for 4-Way Cassette Type)	F 5	0	
13 Indoor Expansion Valve Opening during Heating Thermo-OFF	S o	0		30 Indoor Expansion Valve Opening Limit during Heating SW-OFF	F 6	0	
14 Indoor Expansion Valve Initial Opening during Heating Thermo-ON	c i	0		31 Invalid Capacity Control by Compressor for Cooling	F 7	0	
15 Indoor Expansion Valve Initial Opening for Cooling	c b	0		32 Forced Defrosting after Enforced Stoppage during Defrosting Cycle	F 8	0	
16 Outdoor Expansion Valve Initial Opening for Heating	c h	0		33 Not Prepared	F 9	0	
17 Sound Reduced Function	d b	0					

8. Additional Refrigerant Charge

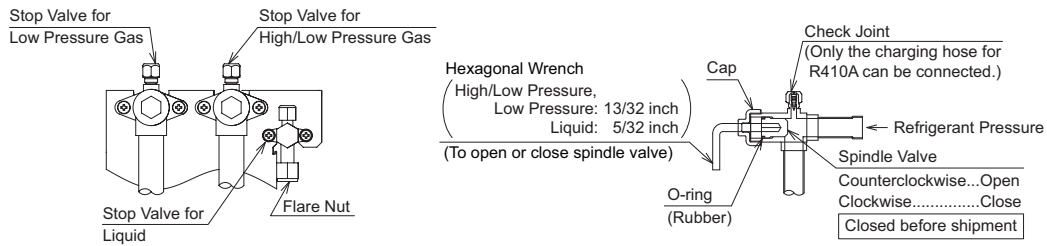
8.1 Airtight Test

- (1) Check to ensure that spindles of the stop valves for high/low pressure gas, low pressure gas (for heat recovery system only) and liquid pipes are closed completely before airtight test.
- (2) The refrigerant used for this outdoor unit is R410A. Use the manifold gauge and the charging hose for exclusive use of R410A.

< Tightening Check of Stop Valves >

After connecting the pipe, remove the caps of stop valves for high/low pressure gas, low pressure gas (for heat recovery system only) and liquid. Tighten the open-close spindle in the closing direction according to the following tightening torque.

- Caution for Operation of Stop Valves
 - (a) Remove the stop valve caps before performing the airtight test after connecting the refrigerant piping. Tighten the spindle (valve) in clockwise direction.
 - (b) Perform the work after warming the spindle with a hair dryer etc. when controlling the stop valve in a cold area. (The spindle O-ring will harden at low temperature, causing the O-ring material to contract by volume, and refrigerant leakage can occur.)
 - (c) Do not apply excessive force after fully opening the spindle (Tightening Torque: < 3.7 ft·lbs (5.0 N·m)). (A back seat (hard stop), is not provided, allowing complete removal of the valve stem.)
 - (d) Tighten caps securely according to the following torque specifications after each spindle valve is opened.



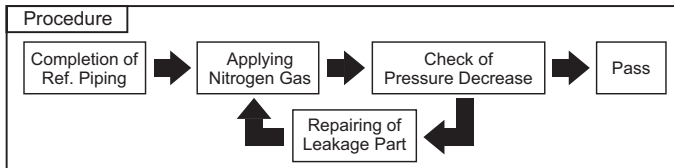
ft·lbs (N·m)

Model Type	Spindle (Valve)		Flare Nut	Cap		Check Joint	
	High/Low Pressure and Low Pressure Gas Valves	Liquid Valve	Liquid	High/Low Pressure and Low Pressure Gas Valves	Liquid Valve	High/Low Pressure and Low Pressure Gas Valves	Liquid Valve
72	18	5 (7)	26 (35)	31 - 35 (42 - 47)	19 (25)	6 - 7 (8 - 10)	8 (11)
96, 120	(25)	7 (10)	33 (45)		26 (35)		

INSTALLATION

< Airtight Test Method >

- (1) Connect the manifold gauge to the check joints of the liquid line and the gas line stop valves using charging hoses with a vacuum pump or a nitrogen cylinder.
Perform the airtight test.
Do not open the stop valves. Apply nitrogen gas pressure of 601 psi (4.15MPa).
For checking gas leakage, use the leak detector or forming agent. If there is any leakage, fix the leaking part.
- (2) For checking gas leakage, do not use a forming agent which generates ammonia.
Additionally, do NOT use any household detergent as forming agent with potentially unknown or harmful ingredients.
The recommended forming agent to detect leaking refrigerant gas is shown below.



Recommended Forming Agent	Manufacturer
Güproflex	Yokogawa & CO.,Ltd

NOTE:

Nitrogen Gas should be sufficiently charged for each check joints (high/low pressure gas line side, low pressure gas line side (for heat recovery system only), and for liquid line side). If not performed in this manner, the expansion valve for the outdoor unit, indoor unit, or change-over box (for heat recovery system only) can close up, making any airtight test impossible.

! WARNING

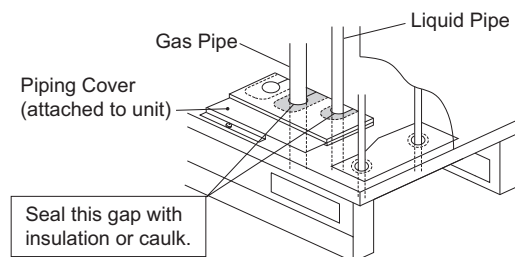
Be sure to use nitrogen gas for airtight test. If other gases such as oxygen gas, acetylene gas or fluorocarbon gas are accidentally used, it may cause an explosion or gas intoxication.

< Insulation Work >

- (1) Securely insulate the high/low pressure and low pressure (for heat recovery system only) gas piping side and liquid piping side individually.
Make sure to insulate the union flare nut for the piping connection as well.
- (2) Mount the piping cover equipped with the outdoor unit after connecting the pipe.
Completely seal the point of penetration at the bottom of the pipes with insulation in order to prevent rain water from entering the conduit.
- (3) Seal the gap between the piping cover and pipes with the field-supplied packing after insulation work is completed.

NOTICE:

If the gap is not sealed, damage can occur from rain, snow, animals, or insects that can gain entry.



8.2 Vacuuming

- (1) Connect a manifold gauge and vacuum pump to the check joints*.

* Heat Pump System	High/Low Pressure Gas Stop Valve Liquid Stop Valve
Heat Recovery System	High/Low Pressure Gas Stop Valve Low Pressure Gas Stop Valve Liquid Stop Valve

- (2) Continue vacuum pumping work until the pressure reaches -14.5 psi (-0.1MPa, -756mmHg) or lower for one to two hours.
Once the desired vacuum pressure has been reached, turn OFF the pump and leave the gauge for one hour. Verify that the pressure inside the manifold gauge has not increased.
- (3) Tighten the caps on the check joint according to torque specs (as indicated in Section 8.1-(2)-(d), after vacuum pumping work is complete.
- (4) If the pressure inside the gauge does not reach -14.5 psi (-0.1MPa, -756mmHg), a gas leak is suspected.
- (5) Inspect for any gas leakage once again. If no leakage exists, resume vacuum pumping for another one to two hours. If moisture remains inside the piping, the compressor may be damaged.

NOTICE

1. Use tools or measuring instruments exclusively devised for use with R410A.
2. DO NOT perform vacuum pumping work with the valves of the outdoor units open. Otherwise, refrigerant charged before shipment can leak out and the operation can result in failure.

8.3 Charging Work

- (1) An additional refrigerant charge is required according to total piping length. Refer to Table 8.1.
- (2) After vacuum pumping work, check that the high/low pressure gas valve, (low pressure gas valve is for heat recovery system only) and liquid stop valve are fully closed.
Charge the additional refrigerant from the check joint of liquid stop valve (acceptable error must be within 1.1 lbs (0.5 kg)).
- (3) After refrigerant has been charged, fully open the liquid stop valve and gas stop valves.

NOTE:

Gas remaining at the O-ring or screw component may emit a hissing sound when removing the spindle cap. However, this is not leaking gas.

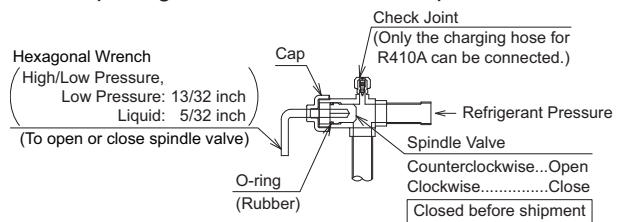
- (4) If it proves impossible to dispense the specified (charged) quantity of refrigerant, follow the procedure below.
 - (a) Fully open the stop valve at the gas line side (for a heat recovery system, both stop valves of high/low pressure and low pressure side)

NOTICE

Do not apply excessive force to the spindle valve after fully opening the spindle. Otherwise, the spindle valve will blow out due to refrigerant pressure. At the test run, fully open the spindle valve. Otherwise, these devices will be damaged. (It is closed before shipment.)

< Caution for Opening Stop Valve >

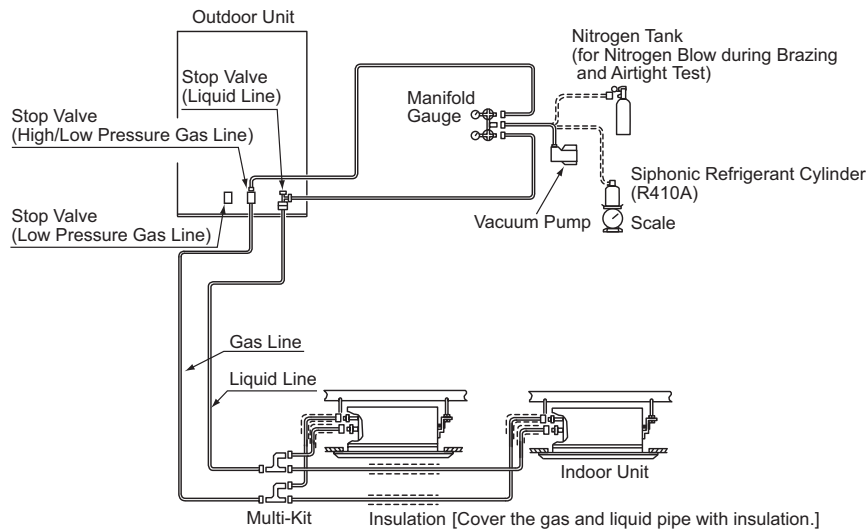
1. Do not apply an excessive force after fully opening the spindle (Tightening Torque: < 3.7 ft·lbs (5.0 N·m)). (This valve does not have a hard stop when opening, and allows for the complete removal of the valve stem.)
2. Securely tighten the caps according to the torque specs (Section 8.1-(2)-(d) after each spindle valve is opened.



INSTALLATION

- (b) Operate the compressor in the cooling mode and charge the additional refrigerant from the check joint of the liquid stop valve. An acceptable error must fall within 1.1 lbs (0.5 kg). At this time, keep the liquid stop valve slightly open.
- (c) After the refrigerant is charged, fully open the liquid stop valve and the gas stop valve.
- (d) Carefully calculate any additional refrigerant quantity for charging. If the quantity of additional refrigerant is not correct, it might cause a compressor failure. The additional refrigerant must be charged in a liquid condition.
- (e) Refrigerant charge from the check joint on the gas stop valve can lead to compressor failure. Be sure to charge refrigerant from the check joint on the liquid stop valve.

< Heat Pump System >

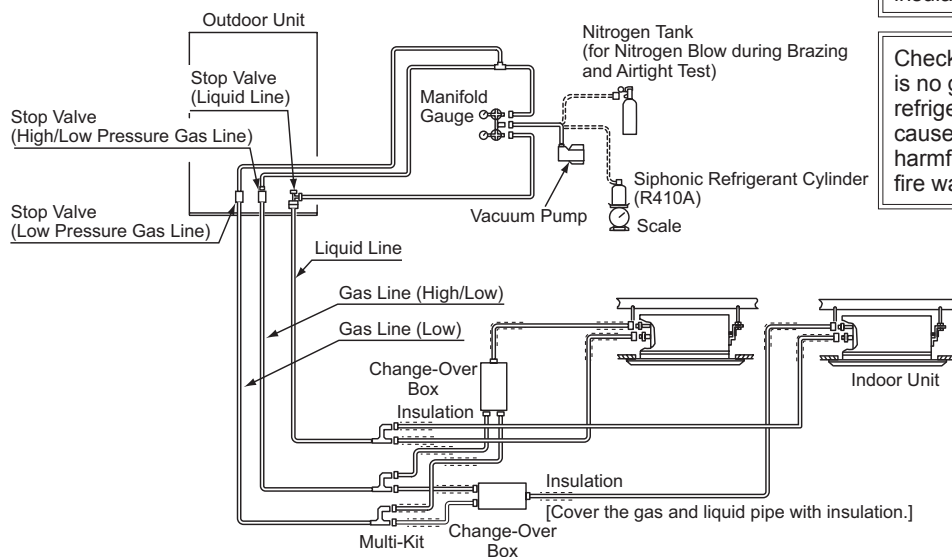


Charge the correct refrigerant quantity according to Table 8.1. If not, a compressor may be damaged due to an excess or insufficient refrigerant charge.

Refrigerant charge from check joint of gas stop valve may lead to compressor failure. Be sure to charge refrigerant from the check joint of liquid stop valve.

Insulate the liquid piping and gas piping completely to avoid decreasing of performance and dewing on the surface of the pipe.

< Heat Recovery System >



Insulate the flare nut and union of the piping connection with insulation.

Check to ensure that there is no gas leakage. If a large refrigerant leakage occurs, it will cause difficulty with breathing or harmful gases would occur if a fire was being used in the room.

8.4 Additional Refrigerant Charge Calculation

Table 8.1 Additional Refrigerant Charge Calculation

Although this unit has been charged with refrigerant, an additional refrigerant charge is required according to piping length.

Determine what additional quantity of refrigerant according to the following procedures, and charge it into the system. Record the additional refrigerant quantity to facilitate maintenance and servicing activities thereafter.

(1) Calculating Method of Additional Refrigerant Charge (WT lbs)

No.	Symbol	Contents	Additional Charge																																				
1	W1	<p>Additional Refrigerant Charge Calculation for Liquid Piping (W1 lbs)</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 25%;">Pipe Diameter inch (mm)</th> <th style="width: 25%;">Total Piping Length (ft)</th> <th style="width: 25%;">Refrigerant Amount for 1 ft Pipe</th> <th style="width: 25%;">Additional Charge (lbs)</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">7/8 (22.2)</td><td></td><td style="text-align: center;">× 0.24 =</td><td></td></tr> <tr><td style="text-align: center;">3/4 (19.05)</td><td></td><td style="text-align: center;">× 0.17 =</td><td></td></tr> <tr><td style="text-align: center;">5/8 (15.88)</td><td></td><td style="text-align: center;">× 0.11 =</td><td></td></tr> <tr><td style="text-align: center;">1/2 (12.7)</td><td></td><td style="text-align: center;">× 0.074 =</td><td></td></tr> <tr><td style="text-align: center;">3/8 (9.52)</td><td></td><td style="text-align: center;">× 0.038 =</td><td></td></tr> <tr><td style="text-align: center;">1/4 (6.35)</td><td></td><td style="text-align: center;">× 0.016 =</td><td></td></tr> <tr> <td colspan="4" style="text-align: center;">Total Additional Charge For Liquid Piping =</td> </tr> </tbody> </table> <p>NOTE: In case the calculated amount above is less than the amount shown in the table below then add W1 as the additional refrigerant amount shown below.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <tr> <td style="width: 50%; text-align: center;">Outdoor Unit (x 1,000 Btu/h)</td> <td style="text-align: center;">72, 96, 120</td> </tr> <tr> <td style="text-align: center;">Minimum Additional Ref. Charge Quantity</td> <td style="text-align: center;">6.6 lbs per Outdoor Unit</td> </tr> </table>	Pipe Diameter inch (mm)	Total Piping Length (ft)	Refrigerant Amount for 1 ft Pipe	Additional Charge (lbs)	7/8 (22.2)		× 0.24 =		3/4 (19.05)		× 0.17 =		5/8 (15.88)		× 0.11 =		1/2 (12.7)		× 0.074 =		3/8 (9.52)		× 0.038 =		1/4 (6.35)		× 0.016 =		Total Additional Charge For Liquid Piping =				Outdoor Unit (x 1,000 Btu/h)	72, 96, 120	Minimum Additional Ref. Charge Quantity	6.6 lbs per Outdoor Unit	lbs
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Outdoor Unit (x 1,000 Btu/h)	72, 96, 120																																						
Minimum Additional Ref. Charge Quantity	6.6 lbs per Outdoor Unit																																						
2	W2	<p>Depending on connection of indoor unit type, additional refrigerant charge is required. Select adequate refrigerant amount from the table below.</p> <p>Additional Refrigerant Charge for Each Indoor Unit Connected (W2 lbs)</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 15%;">Capacity (x 1,000 Btu/h)</th> <th style="width: 5%;">6</th> <th style="width: 5%;">8</th> <th style="width: 5%;">12</th> <th style="width: 5%;">15</th> <th style="width: 5%;">18</th> <th style="width: 5%;">24</th> <th style="width: 5%;">30</th> <th style="width: 5%;">36</th> <th style="width: 5%;">48</th> </tr> </thead> <tbody> <tr> <td>Indoor Unit Type</td> <td>(H,Y)IDM***B21S</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0</td> <td style="text-align: center;">0.26</td> <td style="text-align: center;">0.35</td> <td style="text-align: center;">0.55</td> <td style="text-align: center;">0.66</td> <td style="text-align: center;">1.1</td> <td style="text-align: center;">0</td> </tr> <tr> <td></td> <td>(H,Y)IC4***B21S</td> <td style="text-align: center;">-</td> <td style="text-align: center;">-</td> <td colspan="2" style="text-align: center;">0.55</td> <td colspan="2" style="text-align: center;">1.1</td> <td colspan="2" style="text-align: center;">-</td> </tr> </tbody> </table> <p>NOTE: Maximum additional refrigerant charge must not exceed 4.4 lbs.</p>	Capacity (x 1,000 Btu/h)	6	8	12	15	18	24	30	36	48	Indoor Unit Type	(H,Y)IDM***B21S	0	0	0.26	0.35	0.55	0.66	1.1	0		(H,Y)IC4***B21S	-	-	0.55		1.1		-		lbs						
Capacity (x 1,000 Btu/h)	6	8	12	15	18	24	30	36	48																														
Indoor Unit Type	(H,Y)IDM***B21S	0	0	0.26	0.35	0.55	0.66	1.1	0																														
	(H,Y)IC4***B21S	-	-	0.55		1.1		-																															
3	W3	<p>The Ratio of Indoor Unit Connection Capacity (Indoor Unit Total Capacity/Outdoor Unit Capacity) Additional Charge (W3 lbs) Determine the ratio of indoor unit connection capacity.</p> <table border="1" style="width: 100%; border-collapse: collapse; margin-bottom: 10px;"> <thead> <tr> <th style="width: 50%;">Condition</th> <th style="width: 50%;">Refrigerant Amount</th> </tr> </thead> <tbody> <tr> <td>I.U. Capacity Ratio is less than 100%</td> <td style="text-align: center;">0.0 lbs</td> </tr> <tr> <td>I.U. Capacity Ratio is 100% or more</td> <td style="text-align: center;">1.1 lbs</td> </tr> </tbody> </table>	Condition	Refrigerant Amount	I.U. Capacity Ratio is less than 100%	0.0 lbs	I.U. Capacity Ratio is 100% or more	1.1 lbs	lbs																														
Condition	Refrigerant Amount																																						
I.U. Capacity Ratio is less than 100%	0.0 lbs																																						
I.U. Capacity Ratio is 100% or more	1.1 lbs																																						
4	WT	<p>Calculation of Additional Charge (WT lbs) = W1 + W2 + W3 =</p>	lbs																																				

NOTE:
Ensure that the total additional charge WT does not exceed the maximum additional refrigerant charge quantity as shown in the table on the following page.

INSTALLATION

< Max. Additional Refrigerant Charge Quantity Allowed >

Outdoor Unit Capacity (x 1,000 Btu/h)	72	96, 120	144	168 - 360
Max. Additional Ref. Charge Quantity (lbs)	79.4	88.2	112.4	138.9

< Initial Ref. Charge Amount of O.U. (Before Shipment) (W0 lbs) >

Outdoor Unit Capacity (x 1,000 Btu/h)	72	96	120
W0 Outdoor Unit Ref. Charge (lbs)	16.1	18.7	20.9

NOTE:

W0 is the outdoor unit refrigerant charge prior to shipment.

If there is a combination of base units, calculate the total refrigerant charge prior to shipment of those combined outdoor units.

(2) Record of Additional Charge

Total refrigerant charge of this system is calculated in the following formula.

$$\text{Total Ref. Charge} = \text{WT lbs} + \text{W0 lbs} = \boxed{} \text{ lbs}$$

NOTE:

When refrigerant is recovered or charged due to repairs, operating, or adjusting the unit, record the refrigerant quantity again.

NOTICE

1. Emissions of the fluorocarbons without any reason are prohibited.
2. For disposal and maintenance of this product, recovery of fluorocarbons is required.

8.5 Automatic Simple Judgement System for Refrigerant Amount

NOTE

1. This function is applicable when outdoor air temperature is 32 to 109°F DB (0 to 43°C DB) and indoor air temperature is 50 to 90°F DB (10 to 32°C DB).
2. An operation check or condition check shall be performed by checking the PCB1 for the outdoor unit. During the checking, do not remove the front cover. Otherwise, the checking will not be conducted normally due to pressure increase. For combination outdoor unit, the inspection shall be conducted at Unit A. Service covers for Unit B, C, or D must be closed.

- (1) Perform the refrigerant quantity check operation according to the automatic judgement function after completing refrigerant charging.
 When the result is judged to be excessive refrigerant, insufficient refrigerant, or abnormal termination, find out the cause of the irregularity and perform another refrigerant quantity check operation.

< Procedure of Refrigerant Quantity Check Operation >

- (a) Reassemble all cover except for the electrical control box cover and service cover of Unit A.
- (b) Turn ON the power supply of indoor unit and outdoor unit in the refrigerant cycle to perform the refrigerant quantity check operation. (Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.)
- (c) Turn ON the No.4 pin of DSW5 (PCB1).
 The 7-segment display will be indicated as follows.

F 0 C H

- (d) Check the 7-segment display and press PSW1. The outdoor fan and compressor will be in standby mode and the 7-segment display will indicate as follows: (Maximum five minutes)

c h 0 1

The outdoor fan and compressor will activate and the 7-segment display will indicate as follows:

c h 0 2

- (2) Judgement takes 30 to 40 minutes. Refer to the table below for results.
 When the judgement result is excessive refrigerant, insufficient refrigerant, or abnormal termination, find out the cause of irregularity and perform the refrigerant quantity check again.

< Judgement Result Indication >

7-segment Indication	Result	Remarks
E n d	Sufficient Refrigerant	The refrigerant quantity is sufficient. * Turn No.4 pin of DSW5 OFF and perform Test Run.
c h H 1	Excessive Refrigerant	The refrigerant quantity is excessive. * Calculate the additional refrigerant quantity according to the piping length. Collect the excess refrigerant and charge with the correct amount of refrigerant.
c h L 0	Insufficient Refrigerant	The refrigerant quantity is insufficient. * Check if the additional refrigerant has been charged. * Calculate the additional refrigerant quantity according to the piping length and charge the refrigerant. NOTE: If the deficit reading still does not disappear, charge the additional refrigerant . In that case, standard additional refrigerant quantity is 1.1 lb (0.5kg) per one time.
c h □ □	Abnormal Termination	Find out the cause of abnormal termination as shown below. After resolving the cause of abnormal termination, restart the check refrigerant quantity operation. (1) Was the No.4 pin of DSW5 ON before the power supply was turned ON? (2) Are all indoor units ready and waiting, before the No.4 pin of DSW5 is turned ON? (3) Was the outdoor ambient air temperature within the acceptable range (32 to 109°F DB (0 to 43°C DB))? (In some cases, when the connected indoor unit number exceeds the recommended number and the outdoor ambient air temperature exceeds 95°F DB (35°C DB), this check refrigerant quantity operation cannot be performed.) (4) Is the indoor ambient air temperature within the acceptable range (50 to 90°F DB (10 to 32°C DB))? (5) Is the total indoor units operation capacity ratio 30% (indoor units capacity ratio), or less? Especially, if the indoor ambient air temperature is 15% or less, the total indoor unit operation capacity will be 30% (indoor units capacity ratio) or less and if this is the case, sometimes this refrigerant quantity check cannot be performed. (6) Is switch No.4 pin of DSW4 (compressor-forced stoppage) OFF?

INSTALLATION

- (3) Turn OFF the No.4 pin of DSW5 when the refrigerant quantity becomes sufficient.
Wait for at least three minutes after turning OFF the No.4 pin of DSW5 OFF and then the outdoor unit is ready to run.

NOTE:

During the check of refrigerant quantity operation, the 7-segment display may change over to display the protection control code by the activation of protection control. However, this is normal. As for the protection control code, refer to the spec sheet attached to the inside of the outdoor unit service cover.

- Special Attention Regarding Refrigerant Gas Leakage

Pay attention to the critical gas concentration to avoid accidental refrigerant gas leakage before installing air conditioning systems.

$$\frac{\text{Totally Charged Refrigerant Quantity in System (lbs)}}{\text{Room Space for each Indoor Unit (ft}^3\text{)}} \leq \text{Critical Concentration (lbs/ft}^3\text{)}$$

0.019 lbs/ft³ (0.3 kg/m³) *

* In case of KHK S 0010, this value should be decided according to each country's regulation.

If the calculated critical concentration is higher than 0.019 lbs/ft³ (0.3kg/m³), take the following actions:

- 1) Provide a gas leakage detector and exhaust fan(s) controlled by its gas leakage detector.
- 2) Provide each effective opening at the wall or door for ventilation to next door so that the critical gas concentration can be maintained lower than the above value.
(Provide an opening of more than 0.15% of the floor surface at the lower part of a door.)

CAUTION

1. Maximum Permissible Concentration of HFC GAS R410A

The refrigerant R410A is an incombustible and non-toxic gas.

However, if leakage occurs and gas fills a room, it may cause suffocation. The maximum permissible concentration of HFC gas, R410A in air is 0.019 lbs/ft³ (0.3 kg/m³), according to the refrigeration and air conditioning facility standard (KHK S 0010) by the KHK (High Pressure Gas Protection Association) Japan. Therefore, some effective measure must be taken to lower the R410A concentration in air below 0.019 lbs/ft³ (0.3 kg/m³), in case of leakage.

As for R410A, this consideration is applied similarly.

2. Calculation of Refrigerant Concentration

- (1) Calculate the total quantity of refrigerant R (lbs) charged into the system connecting all the indoor units, rooms.
- (2) Calculate the room space where this unit is to be installed V (ft³) of each room.
- (3) Calculate the refrigerant concentration C (lbs/ft³) of the room according to the following equation.

$$\frac{\text{R: Total Quantity of Charged Refrigerant (lbs)}}{\text{V: Room Space Where This Unit Is to Be Installed (ft}^3\text{)}} = \text{C: Refrigerant Concentration} \leq 0.019 \text{ lbs/ft}^3 \text{ (0.3 kg/m}^3\text{)} *$$

If local codes or regulations are specified, follow them.

9. Test Run

Test Run should be performed in accordance with Section 9.2. Use Table 9.1 for recording the Test Run.

WARNING

An electrical shock will occur if there is residual voltage.

Turn OFF power at the power source completely before attempting any electrical maintenance work. Verify that no residual voltage exists after turning OFF the power at the power source.

NOTICE

Do not activate the system until all issues have been examined and cleared.

Test Run of indoor unit: refer to this installation and maintenance manual which is attached to the indoor unit and change-over box.

9.1 Before Test Run

- (1) Check to ensure that the refrigerant piping and communication lines between indoor and outdoor units are connected into the same refrigerant cycle. If not, the result will be abnormal operation with a potentially serious accident.
Verify that all DIP switch settings for the refrigerant cycle numbers: (DSW1 and RSW1 [O.U.], DSW5 and RSW2 [I.U.]) and the unit number (RSW) for indoor units are applicable to the system.
Confirm that all DIP switch settings on the printed circuit board for indoor and outdoor units are correct. Pay special attention to the setting for outdoor unit number, the refrigerant cycle number, and end terminal resistance. Refer to Section 7; "Electrical Wiring".
- (2) Verify that electrical resistance is more than 1 megaohm, by measuring the resistance between ground and the terminal for electrical components. If the electrical resistance is less than 1 megohm, do not operate the system until the source of electrical current outflow is found and fixed; (Refer to "Caution for Insulation Resistance" for details.)
Do not impress the voltage on the terminals for communication lines; (Outdoor Unit: TB2 1, 2, 3, 4 / Indoor Unit: TB2 A, B, 1, 2 / Change-Over Box: TB2 1, 2, 3, 4). Otherwise, failure can result.
- (3) Verify that each wire, L1, L2, and L3, is correctly connected at the power source.
If any one of those is incorrectly connected, the unit will not operate and the wired controller will display the alarm code "05". In this case, check and change the phase of the power source according to the spec sheet attached to the reverse back surface of the service cover.
- (4) Apply power to outdoor unit(s) at least 12 hours prior to operation of the system to allow for adequate pre-heating of the compressor oil.
The outdoor unit does not operate for at most four hours after power supply (Stoppage Code d1-22). If operation resumes within four hours, release the protection control as follows:
 1. Supply power to the outdoor unit.
 2. Wait for 30 seconds.
 3. Push PSW5 on the outdoor PCB for more than three seconds in order to release the d1-22.
 If using a wired controller for release:
 - * Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds. The test run menu will be displayed.
 - * Press "Δ" or "∇" to select "Cancel Preheating Control". Press "OK" and cancel the pre-heating control.

NOTE:
As for other controllers, refer to this installation and maintenance manual attached to each controller.
- (5) Be sure to close the service cover at the front lower side when the test run is performed.

⚠ CAUTION**Caution for Insulation Resistance**

If the total unit insulation resistance is lower than one megaohm, the compressor insulation resistance may be lower, due to refrigerant being retained in the compressor. This can occur if the unit has not been used over prolonged periods of time.

1. Disconnect the cables to the compressor and measure the insulation resistance of the compressor itself. If the resistance value is over one megaohm, then an insulation failure has occurred in other electrical parts.
2. If the insulation resistance is less than one megaohm, reconnect the compressor cables from the inverter PCB. Then, turn on the main power to apply current to the crankcase heater. After applying current for more than three hours, measure insulation resistance again. (Depending on the air conditions, length of piping, or refrigerant conditions, it may be necessary to apply the current for a longer period of time.)

If the GFCI (Ground Fault Circuit Interrupter) is activated, check the recommended size shown in Table 7.1.

NOTICE

Confirm that field-supplied electrical components (main switch fuse, fuse-free breaker, Ground Fault Circuit Interrupters (GFCI's) breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data shown in Table 7.1, and ensure that these components comply with national and local electrical codes.

9.2 Test Run

This test run method is for the wired controller. As for other controllers, refer to Installation and Maintenance Manual attached to each controller.

- (1) Check to ensure that stop valves for high/low pressure gas, low pressure gas (only for Heat Recovery System), and liquid of the outdoor unit are fully opened.
(In the case of combined outdoor units, check to ensure that all stop valves of the outdoor units are fully opened.)
- (2) Perform the test run of indoor units one by one sequentially, and then check the accordance of the refrigerant piping system and the electrical wiring system. (If the multiple indoor units are operated simultaneously, the system accordance cannot be inspected.)
- (3) Perform the test run according to the following procedure. Ensure that the unit operates without any problem.

NOTE:

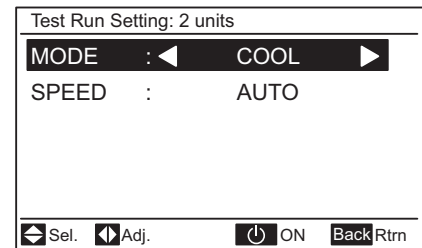
In the case that two controllers (main and sub) are installed to the system, perform the test run from the main controller.

< Test Run by Wired Controller >

- (a) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds. The test run menu will be displayed.
- (b) Select "Test Run" by pressing "△▽" and press "OK".
The test run screen will be displayed.

- The total number of indoor units connected are displayed on the Liquid Crystal Display (LCD). A twin combination (one set with two indoor units) is identified as "2 units", and a triple combination (of one set with three indoor units) is identified as "3 units".

Test Run Screen



NOTE:

When a "00 unit" is identified, the auto-address function may be activated. Cancel "Test Run" mode and reset it.

- If the indicated number is not equal to the actual number of connected indoor units, the auto-address function is not performed correctly due to incorrect wiring, or electronic noise (EMI). Turn OFF the power supply, and correct the wiring after checking the following areas: (Do not repeat turning ON and OFF within 10 seconds.)
 - * The power supply for the indoor unit is NOT turned ON or there is incorrect wiring.
 - * A loose connection between indoor units or the wired controller.
 - * Incorrect Setting of Indoor Unit Address (The indoor unit address is overlapped.)

- (c) Start the Test Run.

- Press "⏻ On/Off". The Test Run operation will start. The operation mode, the airflow volume, the airflow direction and the Test Run time can be set on the Test Run screen. Select the item by pressing "△▽" and set the detail by pressing "◀▷".
The default setting for the Test Run time is a two-hour OFF timer.
- Check the temperature conditions.
Unit operation cannot be performed if the conditions are out of range.
Refer to the table below for a working range.

< Example >



The cooling operation is not performed if the outdoor temperature is below 14°F DB (-10°C DB).

		Cooling Operation	Heating Operation
Indoor Temperature	Minimum	69°F DB/59°F WB (21°C DB/15°C WB)	59°F DB (15°C DB)
	Maximum	89°F DB/73°F WB (32°C DB/23°C WB)	80°F DB (27°C DB)
Outdoor Temperature	Minimum	14°F DB (-10°C DB) *	-4°F WB (-20°C WB) *
	Maximum	118°F DB (48°C DB) *	59°F WB (15°C WB) *

DB: Dry Bulb, WB: Wet Bulb

*: Refer to "Page i" for details.

INSTALLATION

- (d) Press “△” or “▽”, select “LOUV.” and select “” (auto swing) by pressing “◀” or “▶”. The auto-swing operation will start. Check the operating sound at the louvers. If an abnormal sound emanates from the louvers, it may be caused by a deformation in the decorative panel due to incorrect installation. In this case, carefully reinstall the decorative panel without further damage. If no weird sounds are generated, press “◀” or “▶” again to halt the auto-swing operation.
- (e) Though the temperature detections by the thermistors are invalid, the protection devices are valid during the Test Run. If an alarm is triggered, refer to Table 9.2, Alarm Code and perform troubleshooting. Then perform the Test Run again
- (f) According to the label “Checking Method by Seven-Segment Display” attached to the back side of the service cover of the outdoor unit, check the temperature, the pressure and the operation frequency of the specified portions, and check the number of the connected indoor units on 7-segment displays.
- (g) To finish the Test Run, wait two hours (as a default setting) or press “ On/Off” switch again.
- With the operation LED flashing two seconds ON and two seconds OFF, this is an indication that the system is searching for irregularities in communication between indoor units and the wired controller. This could boil down to loose or disconnected wires, components, and incorrect wiring.
 - A small sound may be heard from the outdoor unit after turning ON at the power source because the electrical expansion valve is activated to adjust the opening. Therefore, there is no mechanical fault with the unit.
 - Sound may be emitted from the outdoor unit for a few seconds after running or stopping the compressor, starting or finishing the defrosting, and so on. It generates because of the pressure difference inside the compressor piping. Therefore, there is no problem with the unit.

WARNING

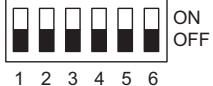
Do NOT run the air conditioner units to check the electrical wiring until the Test Run preparations have been completed.

< Test Run from Outdoor Unit Side >

The procedures for the test run from the outdoor unit side are shown below. Setting this DIP switch is possible with the power source ON.

Setting of DIP Switch (Before Shipment)

Note that the darkened squares here denote that the switch is in the "ON" position.

DSW4	
Switch for Setting of Service Operation and Function	
	<ol style="list-style-type: none">1. Test Run2. COOL/HEAT Setting (ON: Heating Operation)3. OFF (Fixed)4. Manual Compressor OFF5. OFF (Fixed)6. OFF (External Input/Output Setting)

WARNING

- Do not touch any other electrical part when operating switches on the PCB.
- Do not attach or detach a service cover when the power source for the outdoor unit is supplied and the outdoor unit is operated.
- Turn all DIP switches of DSW4 OFF when the test run operation is completed.




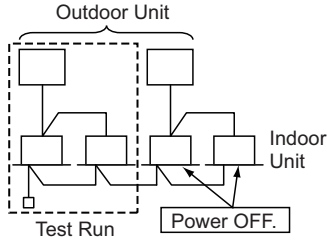


	DIP Switch Setting	Operation	Remarks
Test Run	<p>1. Setting of Operation Mode</p> <p>Cooling: Set No.2 pin of DSW4 OFF.</p>  <p style="text-align: center;">1 2 3 4 5 6</p> <p>Heating: Set No.2 pin of DSW4 ON.</p>  <p style="text-align: center;">1 2 3 4 5 6</p> <p>2. Starting Test Run</p> <p>Set No.1 pin of DSW4 ON and the operation is started after a few ~ 20 seconds.</p> <p style="text-align: center;">When heating operation, ↓ leave No.2 pin of DSW4 at ON.</p>  <p style="text-align: center;">1 2 3 4 5 6</p>	<ol style="list-style-type: none"> 1. The indoor unit automatically starts operating when the test run of the outdoor unit is set. 2. The ON/OFF operation can be performed from the wired controller or No.1 pin of DSW4 of the outdoor unit. 3. The operation continues for two hours without Thermo-OFF. 	<p>* Note that indoor units operate in conjunction with the test run operation for the outdoor unit.</p> <p>* If the test run is started from the outdoor unit and stopped from the wired controller, the test run function of the wired controller is canceled. However, the test run function of the outdoor unit is not canceled. Check to ensure that the No.1 pin of DSW4 of the outdoor unit PCB is turned OFF.</p> <p>* If multiple indoor units are connected with one wired controller, perform the test run operation individually for each refrigerant system, one by one. Then, make sure to turn the power source OFF for the indoor units in other refrigerant systems not selected for the test run operation.</p> <div style="text-align: center;">  </div> <p>* A setting of DSW4 is not required for the test run from the wired controller.</p>
Manual OFF of Comp.	<p>1. Setting</p> <p>*Compressor Manual OFF: Set No.4 pin of DSW4 ON.</p>  <p style="text-align: center;">1 2 3 4 5 6</p> <p>2. Canceling</p> <p>*Compressor ON: Set No.4 pin of DSW4 OFF.</p>  <p style="text-align: center;">1 2 3 4 5 6</p>	<ol style="list-style-type: none"> 1. When No.4 pin of DSW4 is ON during compressor operation, the compressor shuts down immediately and the indoor unit assumes the condition of Thermo-OFF. 2. Once No.4 pin of DSW4 is placed back into the off position, the compressor will be enabled for restart following a three minute safety delay. 	<p>* Do not repeat compressor ON/OFF frequently.</p>

Table 9.1 Test Run and Maintenance Record

MODEL:	SERIAL. No.	COMPRESSOR MFG. No.
CUSTOMER'S NAME AND ADDRESS:	DATE:	

1. Is the rotation direction of the indoor fan correct?
2. Is the rotation direction of the outdoor fan correct?
3. Are there any abnormal compressor sounds?
4. Has the unit been operated at least twenty (20) minutes?

5. Check Room Temperature

Inlet:	<u> </u> No. 1 DB	<u> </u> /WB	<u> </u> °F,	<u> </u> No. 2 DB	<u> </u> /WB	<u> </u> °F,	<u> </u> No. 3 DB	<u> </u> /WB	<u> </u> °F,	<u> </u> No. 4 DB	<u> </u> /WB	<u> </u> °F
Outlet:	<u> </u> DB	<u> </u> /WB	<u> </u> °F,	<u> </u> DB	<u> </u> /WB	<u> </u> °F,	<u> </u> DB	<u> </u> /WB	<u> </u> °F,	<u> </u> DB	<u> </u> /WB	<u> </u> °F
Inlet:	<u> </u> No. 5 DB	<u> </u> /WB	<u> </u> °F,	<u> </u> No. 6 DB	<u> </u> /WB	<u> </u> °F,	<u> </u> No. 7 DB	<u> </u> /WB	<u> </u> °F,	<u> </u> No. 8 DB	<u> </u> /WB	<u> </u> °F
Outlet:	<u> </u> DB	<u> </u> /WB	<u> </u> °F,	<u> </u> DB	<u> </u> /WB	<u> </u> °F,	<u> </u> DB	<u> </u> /WB	<u> </u> °F,	<u> </u> DB	<u> </u> /WB	<u> </u> °F

6. Check Outdoor Ambient Temperature

Inlet:	<u> </u> DB	<u> </u> °F,	<u> </u> WB	<u> </u> °F
Outlet:	<u> </u> DB	<u> </u> °F,	<u> </u> WB	<u> </u> °F

7. Check Refrigerant Temperature

Liquid Temperature:	<u> </u> °F
Discharge Gas Temperature:	<u> </u> °F

8. Check Pressure

Discharge Pressure:	<u> </u> Psi
Suction Pressure:	<u> </u> Psi

9. Check Voltage

Rated Voltage:	<u> </u> V
Operating Voltage:	<u> </u> L ₁ -L ₂ <u> </u> V, <u> </u> L ₁ -L ₃ <u> </u> V, <u> </u> L ₂ -L ₃ <u> </u> V
Starting Voltage:	<u> </u> V
Phase Imbalance:	$1 - \frac{V}{V_m} =$ <u> </u>

10. Check Compressor Input Running Current

Input:	<u> </u> kW
Running Current:	<u> </u> A

11. Is the refrigerant charge adequate?
12. Do the operation control devices operate correctly?
13. Do the safety devices operate correctly?
14. Has the unit been checked for refrigerant leakage?
15. Is the unit clean inside and outside?
16. Are all cabinet panels fixed?
17. Are all cabinet panels free from rattles?
18. Is the filter clean?
19. Is the heat exchanger clean?
20. Are the stop valves open?
21. Does the drain water flow smoothly from the drain pipe?

Table 9.2 Alarm Code

Code	Category	Content of Abnormality	Leading Cause
01	Indoor Unit	Activation of Protection Device (Float Switch)	Activation of Float Switch (High Water Level in Condensation Drainage Pan, Problem with Drain Piping, Float Switch, or Condensation Drainage Pan)
02	Outdoor Unit	Activation of Protection Device (High Pressure Cut)	Activation of PSH (Pipe Clogging, Excessive Refrigerant, Inert Gas Mixing)
03	Communication	Operational Irregularities between Indoor and Outdoor	Incorrect Wiring, Loose Terminals, Disconnect Wire, Blowout of Fuse, Outdoor Unit Power OFF
04		Problem between Inverter PCB and Outdoor PCB	Inverter PCB - Outdoor PCB Communication Failure (Loose Connector, Wire Breaking, Blown of Fuse)
04.		Problem between Fan Controller and Outdoor PCB	Fan Controller - Outdoor PCB Communication Failure (Loose Connector, Wire Breaking, Blown of Fuse)
05	Supply Phase	Problem of Power Source Phases	Incorrect Power Source, Connection to Reversed Phase, Open-Phase
06	Voltage	Abnormal Inverter Voltage	Outdoor Voltage Drop, Insufficient Power Capacity
06.		Abnormal Fan Controller Voltage	Outdoor Voltage Drop, Insufficient Power Capacity
07	Cycle	Decrease in Superheated Discharge Gas	Excessive Refrigerant Charge, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Opened Position (Disconnect Connector)
08		Increase in Discharge Gas Temperature	Insufficient Refrigerant Charge, Pipe Clogging, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Closed Position (Disconnect Connector)
0A	Communication	Problem between Outdoor and Outdoor	Incorrect Wiring, Breaking Wire, Loose Terminals
0b	Outdoor Unit	Incorrect Outdoor Unit Address Setting	Duplication of Address Setting for Outdoor Units (Sub Units) in Same Refrigerant Cycle System
0C		Incorrect Outdoor Unit Main Unit Setting	Two (or more) Outdoor Units Set as "Main Unit" Exist in Same Refrigerant Cycle System
11	Sensor on Indoor Unit	Inlet Air Thermistor	Incorrect Wiring, Disconnecting Wiring Breaking Wire, Short Circuit
12		Outlet Air Thermistor	
13		Freeze Protection Thermistor	
14		Gas Piping Thermistor	
15		Outdoor Air Thermistor (ECONO)	
16		Remote Sensor (DOAS)	
17		Thermistor Built-in Remote Controller (DOAS)	
19	Fan Motor	Activation of Protection Device for Indoor Fan	Fan Motor Overheat, Lockup
21	Sensor on Outdoor Unit	High Pressure Sensor	Incorrect Wiring, Severed or Disconnecting Wiring, Short Circuit
22		Outdoor Air Thermistor	
23		Discharge Gas Thermistor on Top of Compressor	
24		Heat Exchanger Liquid Pipe Thermistor	
25		Heat Exchanger Gas Pipe Thermistor	
29		Low Pressure Sensor	

INSTALLATION

Code	Category	Content of Abnormality	Leading Cause
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit	Incorrect Capacity Code Setting of Combination Excessive or Insufficient Indoor Unit Total Capacity Code
35		Incorrect Setting of Indoor Unit No.	Duplication of Indoor Unit No. in same Refrigerant Group
36		Incorrect Indoor Unit Combination	Indoor Unit is Designed for R22
38		Problem with Protective Pickup Circuit in Outdoor Unit	Failure of Protection Detecting Device (Incorrect Wiring of Outdoor PCB)
39	Compressor	Problem with Running Current at Constant Speed Compressor	Overcurrent, Blown Fuse, Current Sensor Failure, Instantaneous Power Failure, Voltage Drop, Abnormal Power Supply
3A	Outdoor Unit	Problem with Running Outdoor Unit Capacity	Outdoor Unit Capacity > 360 MBH
3b		Incorrect Setting of Outdoor Unit Models Combination or Voltage	Incorrect Setting of Main and Sub Unit(s) Combination or Voltage
3d		Communication Problem between Main Unit and Sub Unit(s)	Incorrect Wiring, Disconnect Wire, Breaking Wire, PCB Failure
3E		Communication Problem between Inverter PCB and Outdoor PCB	Incorrect Combination between Inverter PCB and Outdoor PCB
43	Protection Device	Activation of Compression Ratio Decrease Protection Device	Defective Compression (Failure of Compressor of Inverter, Loose Power Supply Connection)
44		Activation of Low Pressure Increase Protection Device	Overload at Cooling, High Temperature at Heating, Expansion Valve Locking (Loose Connector)
45		Activation of High Pressure Increase Protection Device	Overload Operation (Clogging, Short-Pass), Pipe Clogging, Excessive Refrigerant, Inert Gas Mixing
47		Activation of Low Pressure Decrease Protection Device (Vacuum Operation Protection)	Insufficient Refrigerant, Refrigerant Piping, Clogging, Expansion Valve Locking at Open Position (Loose Connector)
48		Activation of Inverter Overcurrent Protection Device	Overload Operation, Compressor Failure
51	Sensor	Problem with Inverter Current Sensor	Current Sensor Failure
53	Inverter	Inverter Error Signal Detection	Driver IC Error Signal Detection (Protection for Overcurrent, Low Voltage, Short Circuit)
54		Abnormality of Inverter Fin Temperature	Abnormal Inverter Fin Thermistor, Heat Exchanger Clogging, Fan Motor Failure
55		Inverter Failure	Inverter PCB Failure
57	Fan Controller	Activation of Fan Controller Protection	Driver IC Error Signal Detection (Protection for Overcurrent, Low Voltage, Short Circuit), Instantaneous Overcurrent
5A		Abnormality of Fan Controller Fin Temperature	Fin Thermistor Failure, Heat Exchanger Clogging, Fan Motor Failure
5b		Activation of Overcurrent Protection	Fan Motor Failure
5C		Problem with Fan Controller Sensor	Failure of Current Sensor (Instantaneous Overcurrent, Increase of Fin Temperature, Low Voltage, Ground Fault, Step-Out)
EE	Compressor	Compressor Protection Alarm (It can not be reset from Wired Controller)	This alarm code appears when the following alarms* occurs three times within 6 hours. *02, 07, 08, 39, 43 to 45, 47
b1	Outdoor Unit No. Setting	Incorrect Setting of Unit and Refrigerant Cycle Number	There are 64 or More Number is Set for Address or Refrigerant Cycle.
b5	Indoor Unit No. Setting	Incorrect Indoor Unit Connection No. Setting	There are 17 or More Non-Corresponding to H-LINK II Units are Connected to One System.
C1	Change-Over Box	Incorrect Indoor Unit Connection	2 or More Change-Over Boxes are Connected between Outdoor Unit and Indoor Unit.
C2		Incorrect Indoor Unit Connection No. Setting	9 or More Indoor Units Connected to Change-Over Box
C3		Incorrect Indoor Unit Connection	Indoor Units of Different Refrigerant Cycle is Connected to Change-Over Box.

10. Safety and Control Device Setting

- Compressor Protection

The compressor is protected by the following devices and their combinations.

- (1) High Pressure Switch: This switch cuts out the operation of the compressor when the discharge pressure exceeds the setting.
- (2) Oil Heater: This band type heater protects against oil foaming during cold starting, as it is energized while the compressor is stopped.

< 208/230V 60Hz >				
Model	Heat Pump System	(H,Y)VAHP072B31S	(H,Y)VAHP096B31S	(H,Y)VAHP120B31S
		(H,Y)VAHR072B31S	(H,Y)VAHR096B31S	(H,Y)VAHR120B31S
High Pressure Increase Protection		Automatic Reset, Non-Adjustable		
High Pressure Increase Protection Control	psi (MPa)	551 (3.80)	551 (3.80)	551 (3.80)
Pressure Switch		(for each compressor)		
Cut-Out	psi	601 -7 -21	601 -7 -21	601 -7 -21
	(MPa)	(4.15 -0.05) -0.15	(4.15 -0.05) -0.15	(4.15 -0.05) -0.15
Cut-In	psi (MPa)	464 ±21 (3.20 ±0.15)	464 ±21 (3.20 ±0.15)	464 ±21 (3.20 ±0.15)
For Inverter Compressor		Automatic Reset, Non-Adjustable		
Over Current				
Inverter Current Protection Control	A	45.0	45.0	45.0
Breaker	A	50.0	50.0	50.0
Over Heat		Automatic Reset, Non-Adjustable		
Discharge Temperature Increase Protection Control	for 5sec	284 (140)	284 (140)	284 (140)
	for 10min	270 (132)	270 (132)	270 (132)
For Fixed Speed Compressor		Automatic Reset, Non-Adjustable		
Over Current				
Abnormality Running	208V	-	32	32
Current Control	230V	-	29	29
Breaker	A	-	32	32
Over Heat		Automatic Reset, Non-Adjustable		
Discharge Temperature Increase Protection Control	for 5sec	-	284 (140)	284 (140)
	for 10min	-	270 (132)	270 (132)
For Fan Motor		Automatic Reset, Non-Adjustable		
Over Current Protection Control	A	7	7	7
Fuse	A	16	16	16

< 460V 60Hz >				
Model	Heat Pump System	(H,Y)VAHP072B41S	(H,Y)VAHP096B41S	(H,Y)VAHP120B41S
		(H,Y)VAHR072B41S	(H,Y)VAHR096B41S	(H,Y)VAHR120B41S
High Pressure Increase Protection		Automatic Reset, Non-Adjustable		
High Pressure Increase Protection Control	psi (MPa)	551 (3.80)	551 (3.80)	551 (3.80)
Pressure Switch		(for each compressor)		
Cut-Out	psi	601 -7 -21	601 -7 -21	601 -7 -21
	(MPa)	(4.15 -0.05) -0.15	(4.15 -0.05) -0.15	(4.15 -0.05) -0.15
Cut-In	psi (MPa)	464 ±21 (3.20 ±0.15)	464 ±21 (3.20 ±0.15)	464 ±21 (3.20 ±0.15)
For Inverter Compressor		Automatic Reset, Non-Adjustable		
Over Current				
Inverter Current Protection Control	A	23.5	23.5	23.5
Breaker	A	30.0	30.0	30.0
Over Heat		Automatic Reset, Non-Adjustable		
Discharge Temperature Increase Protection Control	for 5sec	284 (140)	284 (140)	284 (140)
	for 10min	270 (132)	270 (132)	270 (132)
For Fixed Speed Compressor		Automatic Reset, Non-Adjustable		
Over Current				
Abnormality Running Current Control	A	-	14.5	14.5
Breaker	A	-	15	15
Over Heat		Automatic Reset, Non-Adjustable		
Discharge Temperature Increase Protection Control	for 5sec	-	284 (140)	284 (140)
	for 10min	-	270 (132)	270 (132)
For Fan Motor		Automatic Reset, Non-Adjustable		
Over Current Protection Control	A	7	7	7
Breaker	A	10	10	10

1.2 Change-Over Box

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1. Safety Summary

⚠ **WARNING**

- Do not perform installation work, refrigerant piping work or electrical wiring connection without referring to our installation manual.
- Check that the ground wire is securely connected.
- Connect a fuse of specified capacity.

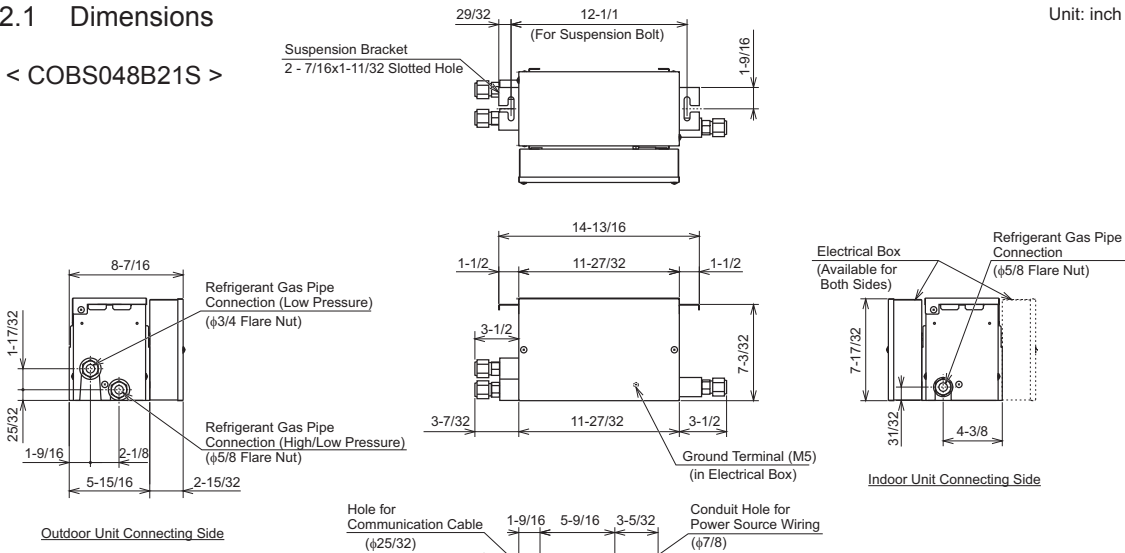
⚠ **CAUTION**

Do not install the Change-Over Box and cable within approximately 10 ft (3m) from strong electromagnetic wave radiators such as medical equipment.

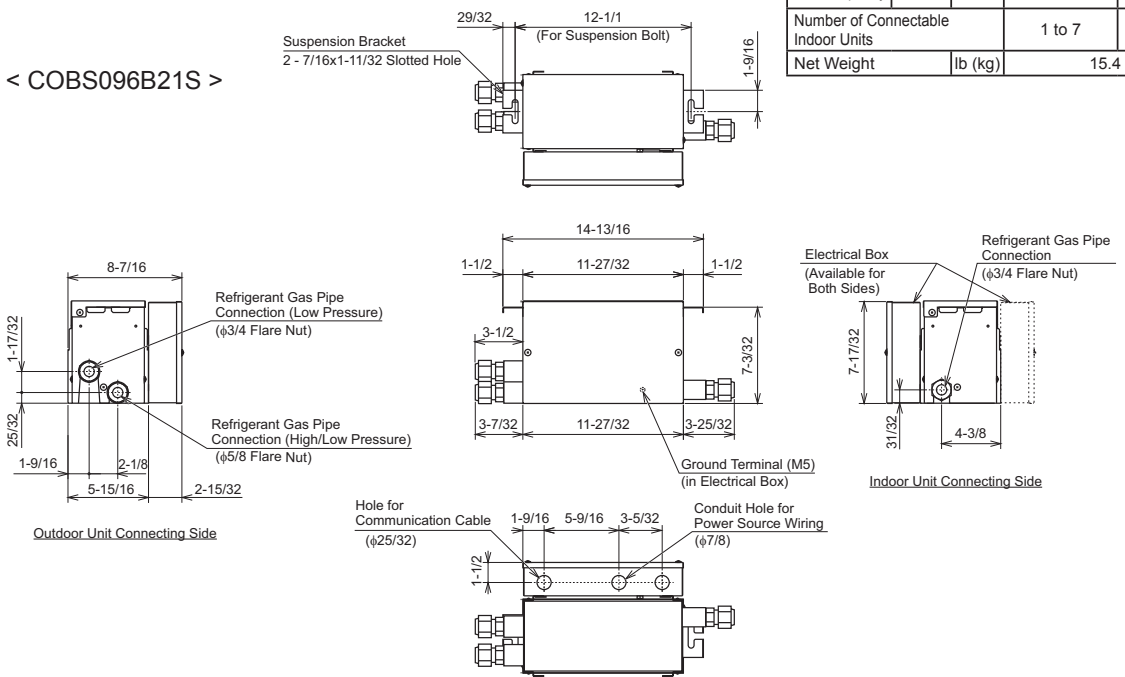
2. Structure

2.1 Dimensions

< COBS048B21S >



< COBS096B21S >



Specification

Model		COBS048B21S	COBS096B21S
Power Supply		AC 1~ 208/230V 60Hz	
Refrigerant		R410A	
Input		W	20
Connectable Indoor Unit Total Capacity	single	x1000 less than 48	54 to 96
	multiple	less than 41	42 to 71
Number of Connectable Indoor Units		1 to 7	1 to 8
Net Weight		lb (kg)	15.4 (7)

Fig. 2.1 Dimensions of Change-Over Box

2.2 Refrigeration Cycle

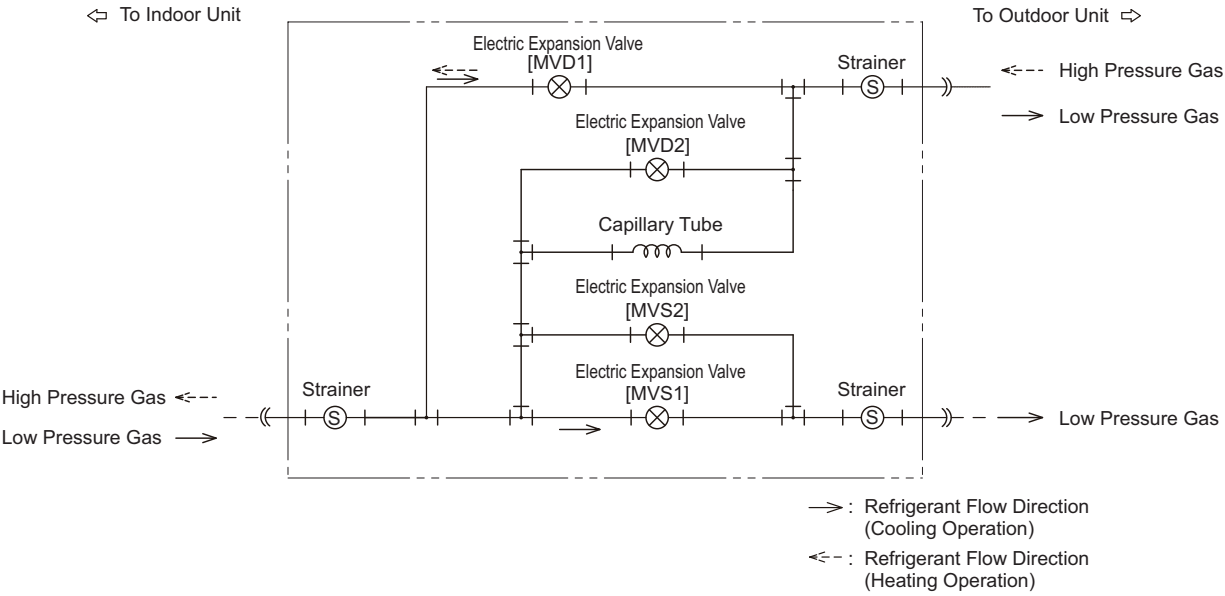


Fig. 2.2 Refrigeration Cycle Diagram

2.3 Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool
1	Handsaw	11	Wrench
2	Phillips Screwdriver	12	Charging Cylinder
3	Vacuum Pump	13	Gauge Manifold
4	Refrigerant Gas Hose	14	Cutter for Wires
5	Megohmmeter	15	Gas Leak Detector
6	Copper Pipe Bender	16	Level
7	Manual Water Pump	17	Clamper for Solderless Terminals
8	Pipe Cutter	18	Hoist (for Indoor Unit)
9	Brazing Kit	19	Ammeter
10	Hexagon Wrench	20	Voltage Meter

3. Transportation and Handling

3.1 Transportation

Transport the product as close to the installation location as practical before unpacking.

 **CAUTION**

Do not put any material on the product.

3.2 Handling of Change-Over Box

 **WARNING**

Do not put any foreign material into the indoor unit and check to ensure that none exists in the Change-Over Box before the installation and test run. Otherwise, a fire or failure, or something similar may occur.

 **CAUTION**

Be careful not to damage insulation materials of unit's surface when lifting.

3.3 Combination of Change-Over Box and Indoor Unit

Combination is as follows.

Table 3.1 Combination of Indoor Unit

Change-Over Box Model	Quantity	Indoor Unit	
		Total Capacity (x1000Btu/h)	
		Single	Multiple
COBS048B21S	1 to 7	less than 48	less than 41
COBS096B21S	1 to 8	54 to 96	42 to 71

NOTES:

- Exceeding of the total capacity may cause insufficient performance and abnormal sound. Be sure to connect within the allowable total capacity.
- If the indoor unit total capacity is 96000Btu/h for COBS096B21S, the performance may decrease approximately 5% in cooling and 10% in heating.

4. Change-Over Box Installation

⚠ DANGER

- Do not install the Change-Over Box in a flammable environment to avoid fire or an explosion.

⚠ WARNING

- Check to ensure that the ceiling slab is strong enough.
- Do not install the Change-Over Box outdoors. If installed outdoors, an electric hazard or electric leakage may occur.
- Installation **WARNING**: Ensure that all safety features, disconnects and interlocks are in place and functioning properly prior to putting the equipment into operation. Never by-pass or jump-out any safety device or switch.

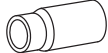
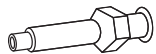

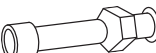










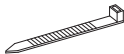



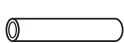
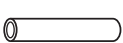
4.1 Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the Change-Over Box.

NOTE

If any of these accessories are not packed with the unit, please contact your distributor.

Table 4.1 Factory-Supplied Accessories

		inch (mm)					
No.	Accessory	COBS048B21S	PCS	COBS096B21S	PCS		
(1)	Reducer	ID 5/8 (ID 15.88) 	ID 3/4 (ID 19.05)	1	-	-	
(2)	Accessory Pipe (for Flare Nut)	OD 1/2 (OD 12.7) 	OD 5/8 (OD 15.88)	2	ID 7/8 (ID 22.2) 	OD 3/4 (OD 19.05)	2
(3)		ID 3/4 (ID 19.05) 	OD 3/4 (OD 19.05)	1	ID 3/4 (ID 19.05) 	OD 3/4 (OD 19.05)	2
(4)		-	-	-	ID 3/4 (ID 19.05) 	OD 5/8 (OD 15.88)	1
(5)		ID 5/8 (ID 16)		2		1	
(6)	ID 25/32 (ID 20)		1	-	-		
(7)	Insulation Material	ID 7/8 (ID 22)	-	-		2	
(8)		ID 1-1/2 (ID 38)		2		1	
(9)		ID 1-11/16 (ID 43)		1		2	
(10)	Clamp		6		6		
(11)			5		5		
(12)	PVC Tube	ID 7/16 (ID 11)		2		2	

4.2 Initial Check

- Install the Change-Over Box with a proper clearance around it for maintenance working space, as shown in Fig. 4.1 below.

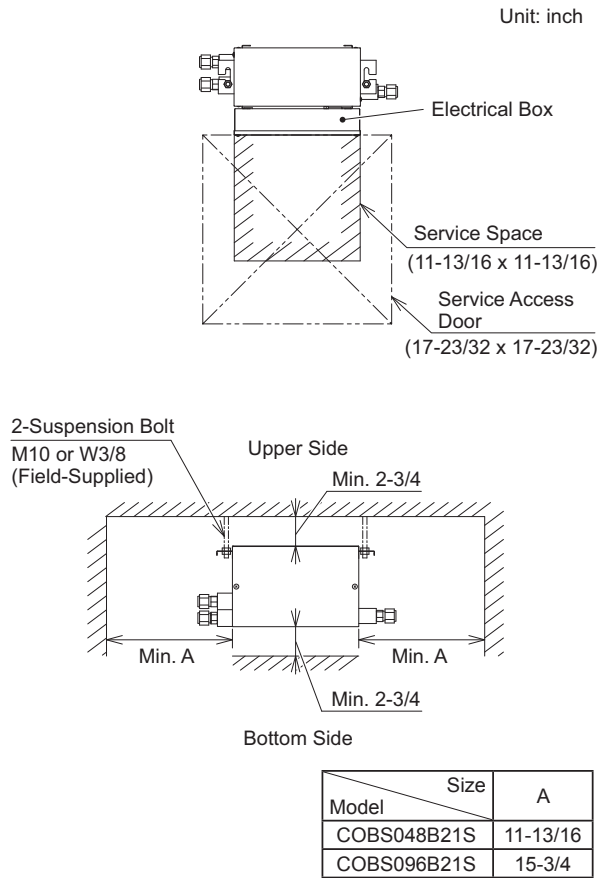


Fig. 4.1 Maintenance Space

- Check to ensure that the ceiling is sufficiently strong to sustain the Change-Over Box. If the ceiling is weak, abnormal sound and vibration may occur.
- A change in the typical refrigerant flow sounds may be heard or perceived from the Change-Over Box when the electric expansion valve in the Change-Over Box is activated. Therefore, take the following action to minimize the sound.
 - (A) Install the Change-Over Box inside the ceiling. As for the ceiling material, select a material like a plasterboard at least 1 inch (9mm), which minimizes operation sound.
 - (B) Do not install the Change-Over Box in a place near bedrooms or hospital rooms.
- A change in the typical refrigerant flow sounds may be heard or perceived from the Change-Over Box when the operation is changed to cooling/heating mode. Therefore, install the Change-Over Box in the ceiling of the corridor so that the refrigerant flowing sound may not be heard in the room.
- Do not install the Change-Over Box in a hot or humid place, such as a kitchen, to prevent condensation on the outer surface of the Change-Over Box. When installing the Change-Over Box in such places, apply additional insulation.
- Pay attention to the following points when the Change-Over Box is installed in a hospital or other facility where there are electronic waves from medical equipment.
 - (A) Do not install the Change-Over Box where the electromagnetic wave is directly radiated to the electrical box or intermediate wiring (transmission wiring).
 - (B) Install the Change-Over Box and components as far as practical or at least 10 ft (3m) from the electromagnetic wave radiator.
 - (C) Install a noise filter when the power supply emits harmful noises.
- The installation place should be convenient for the refrigerant piping or electrical wiring connection.
- Do not drill, or drive screws into the cabinet. Use only mounting points provided.

INSTALLATION

4.3 Suspension Bolts

Step 1

- (1) Select a final location and installation direction of the Change-Over Box paying careful attention to the space for the piping, wiring and maintenance.
- (2) Mount suspension bolts after selecting the final location of the Change-Over Box.
- (3) Mount the suspension bolts in the slotted hole on the electrical box side as shown in Fig. 4.2.
- (4) Contact a qualified contractor or carpenter for the ceiling treatment.

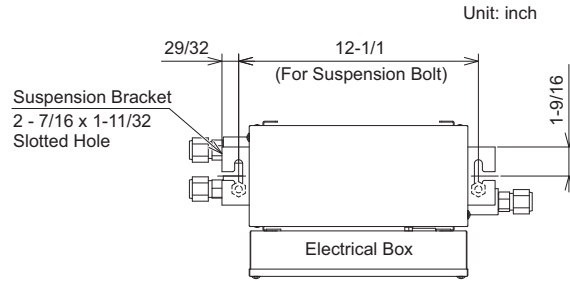
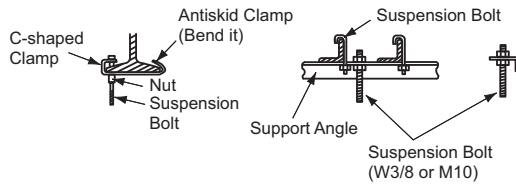


Fig. 4.2 Position of Suspension Bolts

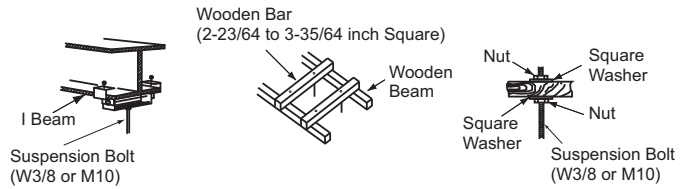
Step 2

Mount suspension bolts, as shown in Fig. 4.3.

● For Steel Beam

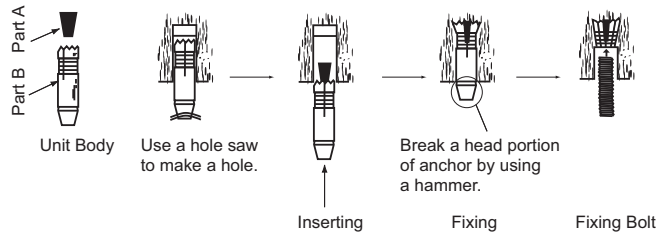


● For Wooden Beam

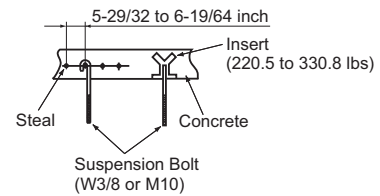


● For Concrete Slab

(1) Hole-In Anchor

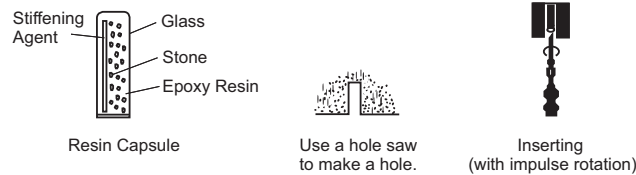


● For Reinforcing Steel

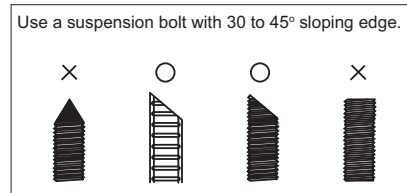


(2) Resin Capsule

Use the resin capsule within the warranty period. Resin capsules deteriorate over time and should be used within six months of the manufacturing date.



After inserting, do not rotate or put any force until resin is hardened. Required time is as shown in the table at right.



Ambient Temp.	Time
68°F (20°C)	Min. 30min.
59°F (15°C)	Min. 1hr.
50°F (10°C)	Min. 2hr.
41°F (5°C)	Min. 4hr.
32°F (0°C)	Min. 8hr.

NOTE:

- Use a suspension bolt (W3/8, Metric screw thread: M10).
- Prepare washer and nut.

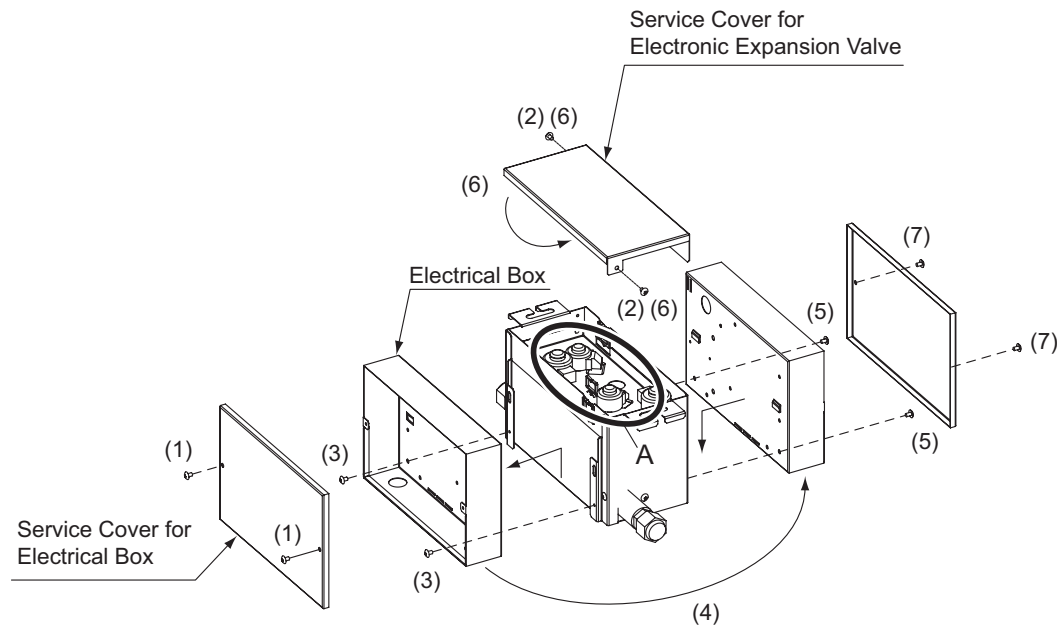
Fig. 4.3 Mounting of Suspension Bolts

4.4 Installation

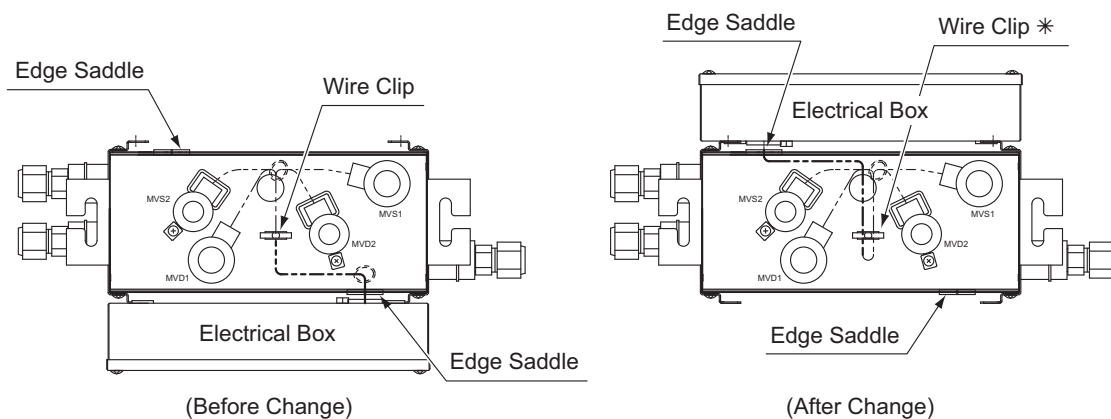
4.4.1 Changing the Location of the Electrical Box

Depending on the installation space, changing the location of the electrical box is available. When changing the location of the electrical box, follow the procedures below:

- (1) Remove the service cover for the electrical box.
- (2) Remove the service cover for the electronic expansion valve.
- (3) Remove the electrical box.
- (4) Remove the wiring from the wire clip and edge saddle, and move the electrical box. After moving the electrical box, the wiring should be put into the edge saddle and bounded with the wire clip. (Refer to "Enlarged View of A" below.)
- (5) Mount the electrical box.
- (6) Rotate the service cover for the electronic expansion valve 180 degrees and mount it.
- (7) Mount the service cover for the electrical box.



< Enlarged View of A >



* Make sure that the wiring is bound with the wire clips in order to prevent the electrical box from entering water.

INSTALLATION

4.4.2 Marking of the Positions of the Suspension Bolts and Wiring Connections

- (1) Mark the positions of the suspension bolts, refrigerant piping connections and wiring connection.
- (2) Installation dimensions are shown in Fig. 2.1.

4.4.3 Mounting and Hanging the Change-Over Box

- (1) Put nuts on each of the two suspension bolts before hanging the Change-Over Box, as shown in Fig. 4.4.
- * Mounting washers are required in order to affix the suspension bracket to the suspension bolt.

Field-Supplied Parts

- * Suspension Bolt: 2-M10 or W3/8
- * Nut: 6-M10 or W3/8
- * Washer: 4-M10 or W3/8

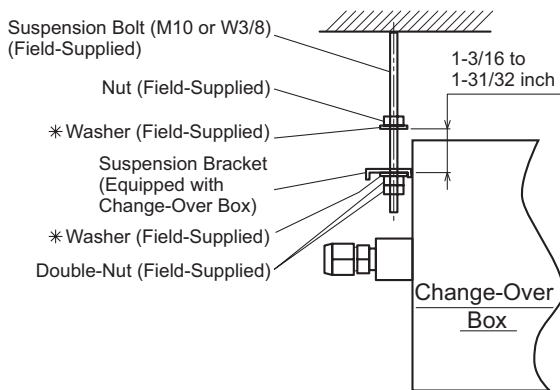


Fig. 4.4 Suspension

(2) Hanging the Change-Over Box

- (a) Hang the Change-Over Box by putting hands on the bottom of the cabinet.
- (b) Insert the suspension bolt into the groove part of the suspension bracket as shown in Fig 4.5. Ensure that the washers are correctly affixed to the suspension bracket.
- (c) After the hanging work, the piping and wiring connection work will be required inside the ceiling in the gap between the roof and ceiling so it is not visible. Therefore, determine the drawing direction of the pipe after selecting the installation location of the Change-Over Box. The piping and wiring work should be carried out up to the connecting positions before the hanging work.
- (d) Keep the Change-Over Box level to the ceiling surface. If the Change-Over Box is not level, a malfunction may occur.
- (e) Tighten the nuts of the suspension bolt with the suspension bracket after adjustment is completed. Adhesive must be applied to the nuts in order to prevent them from loosening.

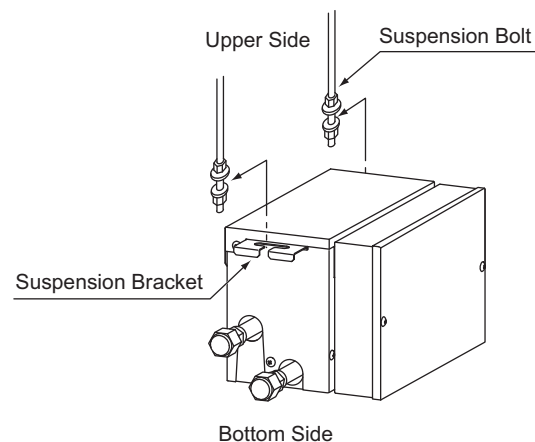


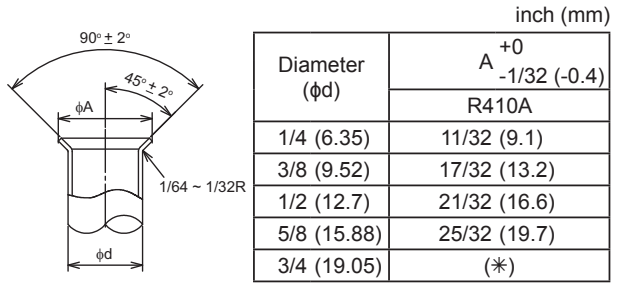
Fig. 4.5 Hanging Method

5. Refrigerant Piping Work



Use the specified non-flammable refrigerant (R410A) for the outdoor unit in the refrigerant cycle. Do not charge material other than R410A into the unit such as hydrocarbon refrigerants (propane or something similar), oxygen, flammable gases (acetylene or etc.) or poisonous gases when installing, maintaining and moving. These flammables are extremely dangerous and may cause an explosion, a fire, and injury.

- Flaring Dimension
Perform the flaring work as shown below.



(*) It is impossible to perform the flaring work with 1/2H material. In this case, use an accessory pipe (with a flare).

5.1 Refrigerant Piping

- (1) Prepare locally-supplied copper pipes.
- (2) Select clean copper tubes making sure there is no dust or moisture inside the tubes. Before connecting pipes, blow the inside of the tubes with nitrogen or dry air, to remove any dust or foreign materials.
- (3) Select the piping size as shown in the tables below. Furthermore, check for the flare nut and flaring dimension according to the following figure and table.

- Joint Selection

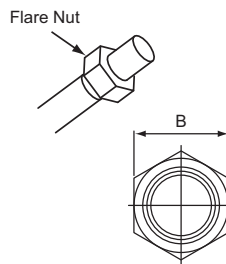
When using 1/2H material and the flaring work is not available. In this instance, use a joint selected from the chart below.

< Minimum Thickness of Joint > inch (mm)

Diameter	R410A
1/4 (6.35)	0.020 (0.5)
3/8 (9.52)	0.024 (0.6)
1/2 (12.7)	0.028 (0.7)
5/8 (15.88)	0.031 (0.8)
3/4 (19.05)	0.031 (0.8)
7/8 (22.2)	0.035 (0.9)
1-1/8 (28.58)	0.039 (1.0)
1-5/8 (41.28)	0.057 (1.45)

< Flare Nut Dimension B > inch (mm)

Diameter	R410A
1/4 (6.35)	21/32 (17)
3/8 (9.52)	7/8 (22)
1/2 (12.7)	1-1/32 (26)
5/8 (15.88)	1-5/32 (29)
3/4 (19.05)	1-13/32 (36)



NOTE:

Do not use a joint other than those specified in the table above.



- Cautions for Refrigerant Pipe Work (Example)

When installing pipe through the wall, secure a cap at the end of the pipe.

Correct

Incorrect

Attach a cap or vinyl tape.

Do not place the pipe directly on the ground.

Correct

Incorrect

Attach a cap or vinyl tape.

Correct

Incorrect

Rain water can enter.

Attach a cap or vinyl bag with rubber band.

INSTALLATION

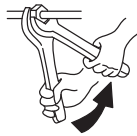
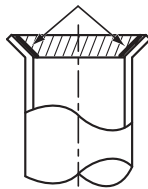
- Cautions for Piping Connection Work
 - (a) Connect the indoor/outdoor connecting pipes. Secure the pipes and pay attention not to contact with weak materials such as ceiling materials. (Otherwise, abnormal sound may be heard due to the vibration of the piping.)
 - (b) Apply refrigerant oil slightly on the sheet surface of the pipe and flare nut before the flaring work. Then tighten the flare nut with the specified tightening torque using two wrenches. Always use a back-up wrench to prevent twisting of the copper piping within the unit assembly. Perform the flaring work on the liquid piping side before the gas piping side. Check the gas leakage after the flaring work.

NOTE:

Refrigerant oil is field-supplied.
[Ethereal Oil FVC50K, FVC68D (Idemitsu Kousan Co. Ltd.)]

- (c) When temperature and humidity inside the ceiling exceed 80°F (27°C)/RH80%, apply additional insulation approximately 13/32 inch (10mm) thickness to the accessory insulation. It prevents condensation on the surface of the insulation (refrigerant pipe only) and possible damage to electronic components.
- (d) Perform the air-tight leakage test 601 psi (4.15MPa) for the test pressure. Refer to the Technical Manual for the Outdoor Unit for more details.
- (e) Perform cold insulation work by insulating and taping the flare connection and reducer connection. Also insulate all the refrigerant pipes.

Apply Refrigerant Oil.



Two wrenches required to prevent damaging the copper piping.

< Required Tightening Torque >

Pipe Size	Tightening Torque	
φ1/4 (6.35)	11 to 13 lbf-ft	(14 to 18 N·m)
φ3/8 (9.52)	26 to 31 lbf-ft	(34 to 42 N·m)
φ1/2 (12.7)	37 to 45 lbf-ft	(49 to 61 N·m)
φ5/8 (15.88)	51 to 60 lbf-ft	(68 to 82 N·m)
φ3/4 (19.05)	74 to 88 lbf-ft	(100 to 120 N·m)

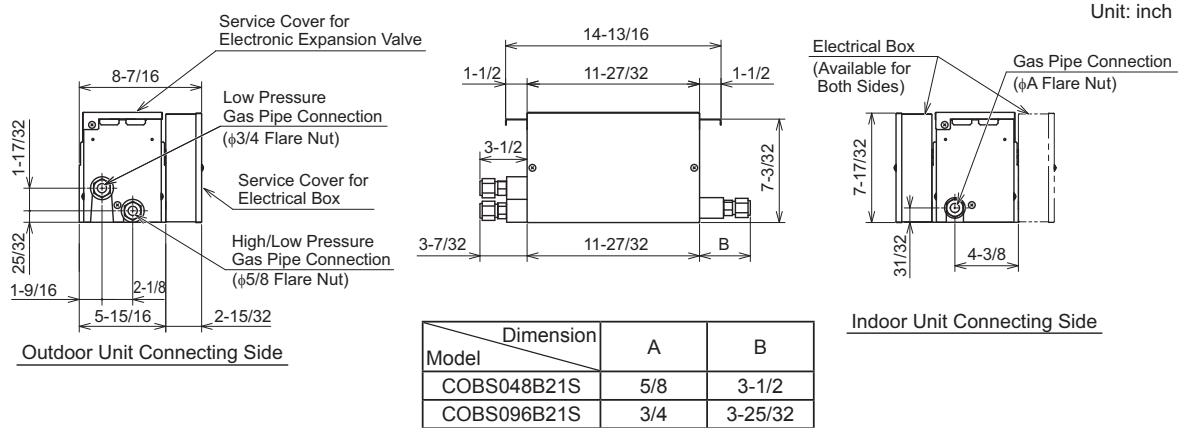
CAUTION

- Do not apply excessive force to the flare nut when tightening. Excessive force can result in the flare nut cracking and refrigerant leakage may occur. Use the specified tightening torque.
- For more details of the refrigerant piping work, vacuum pumping and refrigerant charge, refer to the Technical Manual for the Outdoor Unit.

5.2 Refrigerant Piping Work

Provide the refrigerant pipe in the field.
Make sure that the refrigerant pipe is connected to the same refrigerant cycle unit.

(1) Position of Piping Connection



(2) Selecting Piping Size

- (a) Select the size for the high/low pressure gas pipe, low pressure gas pipe and gas pipe according to Table 5.1. The size depends on the indoor unit total capacity connected downstream of the Change-Over Box.
- (b) When the piping size from Table 5.1 and the piping connection size for Change-Over Box from Table 5.2 are different, use an accessory pipe according to the item 5.2(3).
- (c) As for the multi-kit branch or header branch, refer to the Technical Manual for the Outdoor Unit.

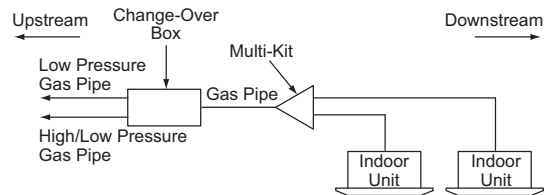
Table 5.1 Connected Indoor Unit Capacity and Piping Size

Model	Connected Indoor Unit Capacity	Low Pressure Gas Pipe	High/Low Pressure Gas Pipe	Gas Pipe
	x1000Btu/h	inch (mm)	inch (mm)	inch (mm)
COBS048B21S	6~17	φ5/8 (15.88)	φ1/2 (12.7)	φ1/2 (12.7)*
	18~29	φ5/8 (15.88)	φ1/2 (12.7)	φ5/8 (15.88)
	30~41	φ3/4 (19.05)	φ5/8 (15.88)	φ5/8 (15.88)
COBS096B21S	42~59	φ3/4 (19.05)	φ5/8 (15.88)	φ3/4 (19.05)
	60~71	φ7/8 (22.2)	φ3/4 (19.05)	φ7/8 (22.2)

*: When a branch is located downstream of the Change-Over Box and also the connected indoor unit capacity is 6~17kBtu/h, use φ5/8 inch (φ15.88mm) for the gas pipe.

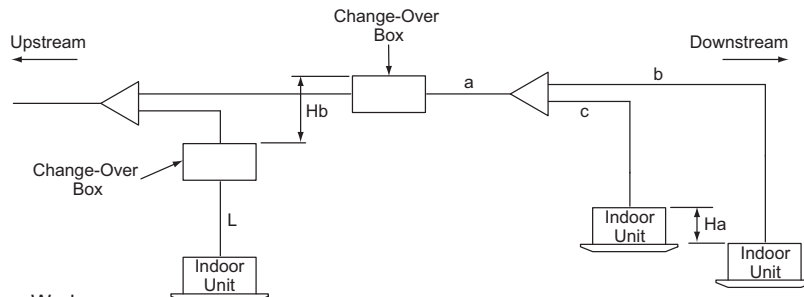
Table 5.2 Piping Connection Size for Change-Over Box

Model	Low Pressure Gas Pipe	High/Low Pressure Gas Pipe	Gas Pipe
	inch (mm)	inch (mm)	inch (mm)
COBS048B21S	φ3/4 (19.05)	φ5/8 (15.88)	φ5/8 (15.88)
COBS096B21S	φ3/4 (19.05)	φ5/8 (15.88)	φ3/4 (19.05)



• Piping Work for Change-Over Box

Perform piping work for the Change-Over Box according to the following table.



Condition of Piping Work

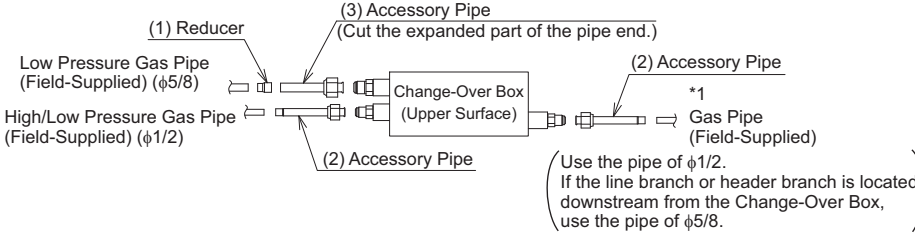
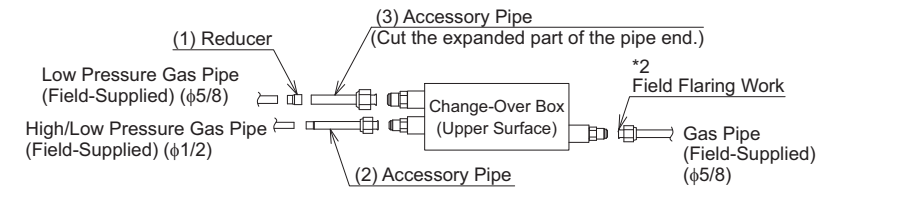
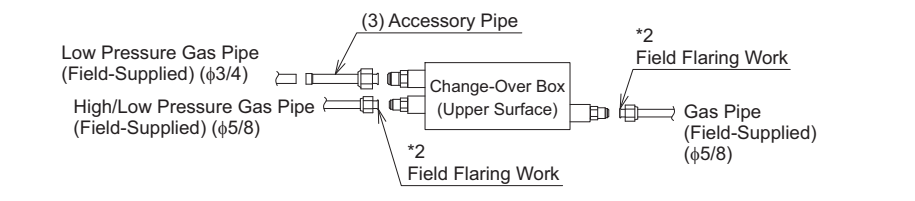
Item		Allowable Piping Length	
Total Piping Length between Change-Over Box and Indoor Unit	L a+b+c	COBS048B21S	within 98 ft (30m)
		COBS096B21S	within 32 ft (10m)
Height Difference between Indoor Units Connected to the Same Change-Over Box	Ha	within 13 ft (4m)	
Height Difference between Change-Over Boxes	Hb	within 49 ft (15m)	

INSTALLATION

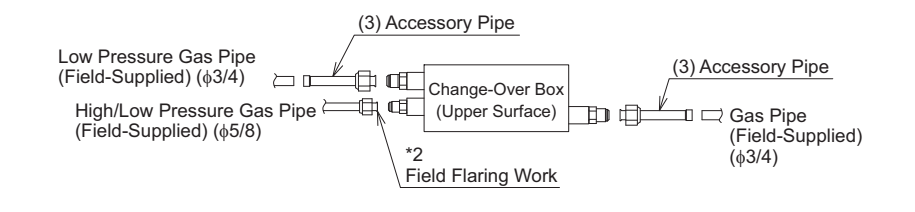
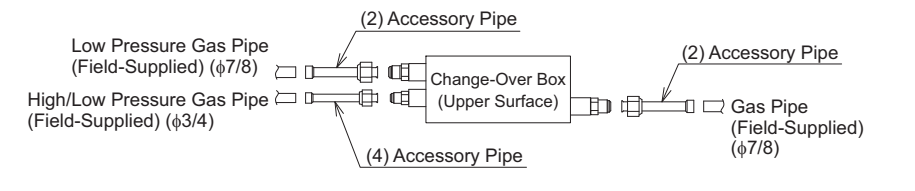
(3) Piping Connection

Perform the piping connection according to Table 5.1.

Unit: inch

Connected Indoor Unit Capacity (x 1000Btu/h)	COBS048B21S
6 to 17	
18 to 29	
30 to 41	

Unit: inch

Connected Indoor Unit Capacity (x 1000Btu/h)	COBS096B21S
42 to 59	
60 to 71	

*1: When a branch is located downstream of the Change-Over Box and also the connected indoor unit capacity is 6~17 kBtu/h, perform the flaring work of the field gas pipe and connect it to the Change-Over Box.

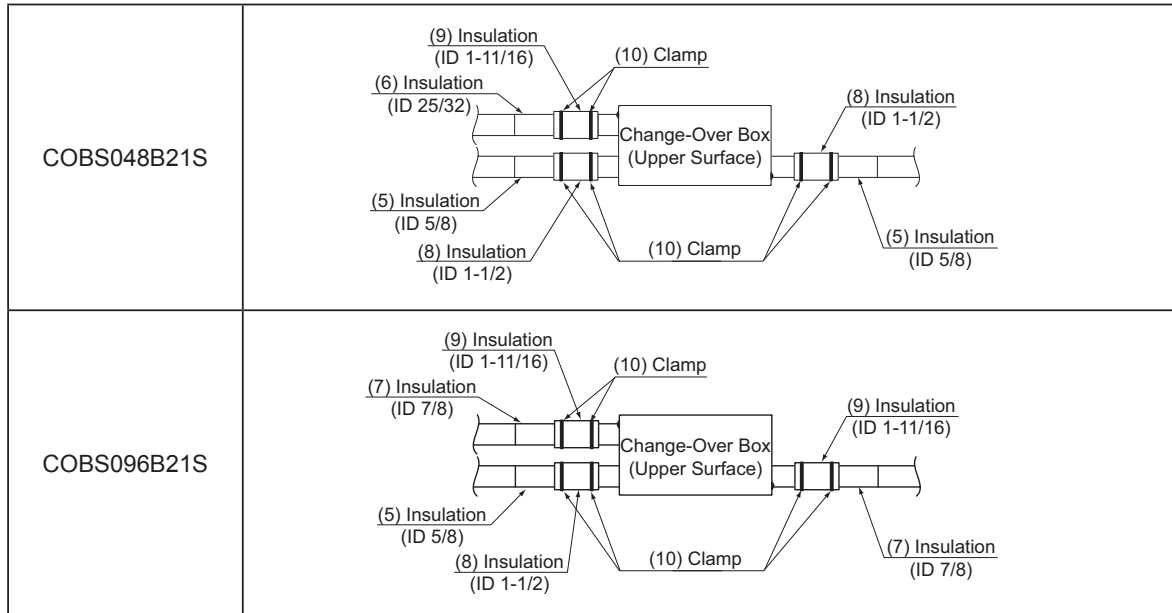
*2: Refer to the item 5.1 for the flaring work.

NOTE:

The accessory numbers are listed in Table 4.1.

(4) Piping Insulation

Unit: inch



NOTES:

1. The accessory numbers are listed in Table 4.1.
2. When the humidity inside the ceiling is high, apply additional insulation to the flare nut connection. Refer to Table 4.2 for more details.

6. Electrical Wiring

! WARNING

- **LOCK ALL ELECTRICAL POWER SUPPLY SWITCHES IN THE OFF POSITION BEFORE INSTALLING THE UNIT. FAILURE TO DISCONNECT POWER SUPPLY MAY RESULT IN ELECTRICAL SHOCK OR EVEN DEATH.**
- Turn off the main power switch to the Change-Over Box, the indoor unit and the outdoor unit before electrical wiring work or a periodical check is performed.
- Insulate electrical wiring, drain piping, and electrical components from threats posed by burrowing animals and temperature extremes. Failure to do so can over time, deteriorate system performance.
- Power wiring to the equipment must conform to National and Local Codes (NEC) by a professional electrician. Provide each unit with its own separate electrical circuit, means of circuit protection, and electrical disconnect switch. Follow current National Electrical Code ANSI/NFPA 70, CSA C22.1 C.E.C. Part 1, and state and local codes. Failure to provide these shut-off means could cause electrical shock or fire, resulting in damage, injury or death.
- Secure the cables. External forces on the terminals could lead to a fire.
- Tighten screws according to the following torque.
M4: 0.7 to 1.0 lbf-ft (1.0 to 1.3 N-m) (TB1, TB2)

! CAUTION

- Wrap the field-supplied insulation around the wires, and plug the wiring connection hole with the seal material to protect the product from any condensate water or insects.
- Tightly secure the wires with the cable clamp inside the Change-Over Box.
- Do not connect the ground wire to the gas pipe, condensate pipe or lightening conductor.
Gas pipe: An explosion and ignition may occur when gas leaks.
Water pipe: There is no effect of ground wire when a hard vinyl pipe is used.
Lightning conductor: The ground electric potential abnormally increases when a lightning conductor is used.

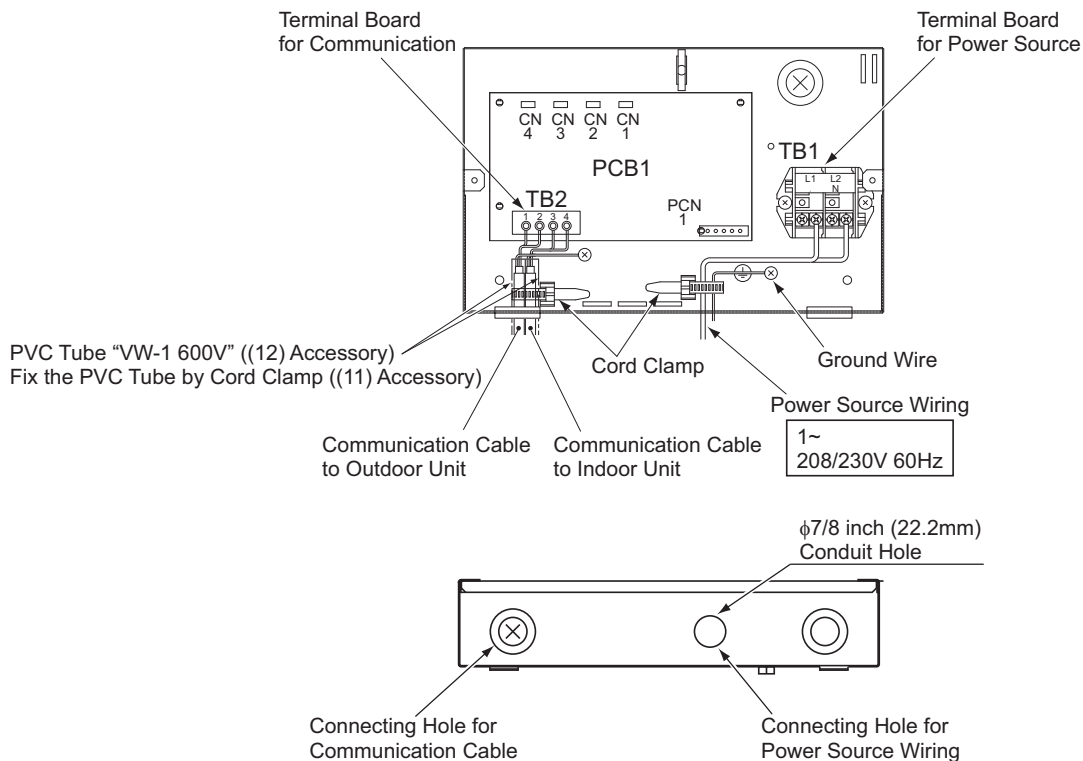
6.1 General Check

- (1) Make sure that the field-selected electrical components (main switches, fuses, GFCI (Ground Fault Circuit Interrupter), wires, conduit connectors and wire terminals) have been properly selected according to the electrical data indicated in Table 6.1. Make sure that the components comply with National Electrical Code (NEC).
- (2) Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- (3) Use shielded communication cable for communication cabling between the indoor and the outdoor unit (Max. 3,281 ft (1,000m)), and connect the shielded part to the ground screw in the electrical box.
- (4) Make sure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
- (5) Check the capacity of the electrical wires. If the power source capacity is too low, the system cannot be started due to the voltage drop.
- (6) Make sure that the ground wire is connected.

6.2 Electrical Wiring

The electrical wiring connection for the Change-Over Box is shown in Fig. 6.1.

- (1) Turn OFF the main power switch and take off the electrical box cover of Change-Over Box.
- (2) Connect the power source wiring to L1 and L2 on the terminal board TB1, and ground wire to the terminals in the electrical box.
- (3) Connect the communication cable to "1", "2", "3" and "4" on the terminal board TB2 mounted on PCB1.
- (4) Tightly clamp the wires using the cord clamp inside the electrical box.
- (5) Fix the electrical box cover after wiring work.



NOTE:

The accessory numbers are listed in Table 4.1.

Fig. 6.1 Electrical Wiring Connection

6.3 Electrical Wiring Connection

- (1) Perform the electrical wiring work for the Change-Over Boxes. Select the wire size according to the table below.
- (2) Pay attention to the marks on the terminal board when connecting wires for Change-Over Box and I.U./O.U. Refer to “Example of Electrical Wiring” for the wiring connection on the next page.

Table 6.1 Electrical Data and Recommended Wiring, Breaker Size

Model	Power Supply	Minimum Wire Thickness (AWG [mm ²])				Ground Fault Circuit Interrupter Breaker		Main Switch		MCA (Minimum Circuit Ampacity) (A)
		Power Source Wiring Size		Ground Wiring Size	Communi- cation Cable Size	Nominal Current (A)	Nominal Sensitive Current (mA)	Nominal Current (A)	Fuse (A)	
		Main	Branch							
COBS048B21S COBS096B21S	1~, 208/230V 60Hz	14 [2.1]	18 [0.82]	18 [0.82]	18 [0.82]	15	30	15	15	0.1

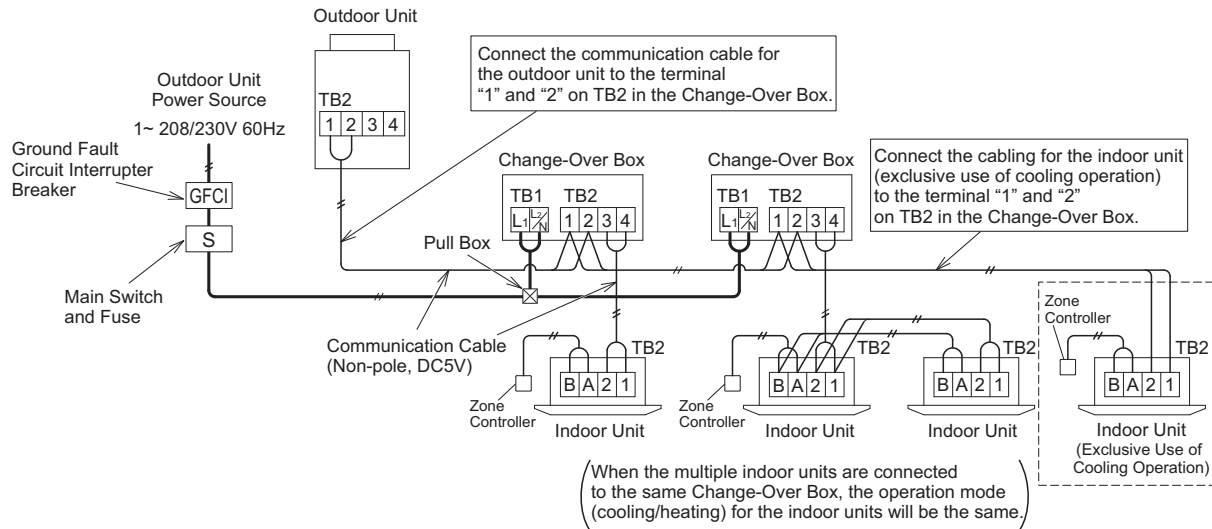
NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) Use a shielded communication cable for the communication and take shielding ground on the ground terminal. Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- 3) Select the Ground Fault Circuit Interrupter Breaker whose activation speed is 0.1 sec. or less.
- 4) Total operating current must be less than 12A.

INSTALLATION

• Example of Electrical Wiring

The following figure shows an example of electrical wiring around the Change-Over Boxes.



NOTE:

- (1) Do not apply excessive voltage to the communication cabling DC5V (non-pole) between the outdoor unit and the Change-Over Box, between the Change-Over Box and the indoor unit or between Change-Over Boxes.
- (2) Use 2-Core shielded communication cable for the communication cable. (Do not use 3-Core cable or over.)
- (3) Connect the communication cable for the outdoor unit to terminals "1" and "2" on TB2 in the Change-Over Box.
- (4) Connect the communication cabling for the indoor unit exclusively for cooling operation to the terminal "1" and "2" on TB2 in the Change-Over Box.
- (5) For a Change-Over Box in the same refrigerant cycle, an electrical power source can be supplied by one main switch.
- (6) Do not connect the power source line (208/230V) to the terminal board for transmission line.
- (7) Connect the ground wire for the outdoor/indoor units and Change-Over Box. When ground resistance is less than 100 ohms, ground wiring work should be performed by the qualified electrician.
- (8) Insert the communication cabling into the PVC tube "VW-1 600V" (Accessory) to separate them from the power source wiring in the Change-Over Box.

6.4 Setting of DIP Switches

DSWs on the PCB1 are set before shipping as shown below and no setting is required.

• DSW1



• DSW101



• DSW301



NOTE

The "■" mark indicates the position of DIP switches. Figures show setting before shipment.

CAUTION

Before setting DIP switches, turn OFF power the source and set the position of the DIP switches. If the switches are set without turning OFF the power source, the switches cannot function.

7. Test Run

NOTICE

Refrigerant piping and connecting wires should be connected to the same refrigerant cycle system. If they are connected to the dissimilar refrigerant cycle systems, a malfunction may occur.

! WARNING

- **Special Attention Regarding Refrigerant Gas Leakage**
Pay attention to the critical gas concentration to avoid accidental refrigerant gas leakage before installing air conditioning systems.

$$\frac{\text{Totally Charged Refrigerant Quantity in System (lbs)}}{\text{Room Space for each Indoor Unit (ft}^3\text{)}} \leq \text{Critical Concentration (pcf)}$$

0.019pcf *

* Pcf: pound per cubic feet for KHK S 0010, this value should be decided according to the each country's regulation such as ISO5149 and EN378.

When the calculated critical concentration is higher than 0.019pcf, take the following actions:

- 1) Provide a gas leakage detector and exhaust fan(s) controlled by its gas leakage detector.
- 2) Provide an effective opening at the wall or door for ventilation so that the critical gas concentration can be maintained lower than the above value.
 (Provide an opening more than 0.15% of floor surface at the lower part of a door.)

Test run should be performed according to the "Installation and Maintenance Manual" of the outdoor unit.

! WARNING

- **Do not operate the system until all the check points have been cleared.**
 - (A) Check to ensure that the electrical resistance is more than 1 megohm by measuring the resistance between ground and the terminal block in the electrical box. If not, do not operate the system until the electrical leakage is found and repaired.
 - (B) Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.
 - (C) Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.
- **Pay attention to the following items while the system is running.**
 - (A) Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 194°F (90°C).

8. Safety and Control Device Setting

Change-Over Box

Model	COBS048B21S, COBS096B21S	
For Control Circuit Fuse	A	5

1.3 Indoor Unit
1.3.1 Duct Type
1.3.1.1 High Static Type

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1. Introduction

Read this "Installation and Maintenance Manual" carefully before installing this product.



This is "Installation and Maintenance Manual" for the indoor unit. Read over the "Installation and Maintenance Manual" for the outdoor unit as well.

Hand over this "Installation and Maintenance Manual", and the warranty must be provided to all installers and users. Ask end users to maintain copies for future reference.


(Refrigerant Piping Work) → (Electrical Wiring Work) → (Ref. Charge Work) → (Test Run) → (User)

- For details on wiring between the indoor unit and the outdoor unit, refer to the "Installation and Maintenance Manual" for the outdoor unit.
- For details on the optional controller, refer to the "Installation and Maintenance Manual" for that optional controller module.
- For details on each optional part, refer to the "Installation and Maintenance Manual" for each optional part.
- For central station, refer to the "Installation and Maintenance Manual" for the central station.

2. Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.

INSTALLATION

- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Before servicing, turn-OFF the power supply and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

⚠ WARNING

To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.

- Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or a hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drain pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the drain pipe becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” the proper use and maintenance of this unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

⚠ WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

⚠ WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cable shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cable is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications. If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power supply when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power supply completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power supply.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wiring is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

⚠ CAUTION

- Proper handling of this unit requires two-people. Safe handling and installing the indoor unit requires the strength of two people. Mounting the unit alone may cause injury due to fall of the unit. Although the unit may be girded with steel banding, do not use it for transportation. Avoid contact with finned surfaces of the heat exchanger as sharp edges can cause severe injury to hands and fingers. Use appropriate work gloves for the job.

NOTICE

- Check to ensure that the drain hose discharges moisture properly. If connected incorrectly, it can result in leakage and damage to furniture.
- Make sure to use the factory-supplied drain hose and hose clamp. Other makes can cause moisture leakage.
- Do not bend or twist the factory-supplied drain hose. This could compromise the seal and result in moisture leakage.
- Do not apply an excessive force to the drain pipe connection. This can also compromise the seal properties of the connection.
- Verify that the installed unit is level with floor and ceiling surfaces. Any variance or inclination can cause moisture to back up into the drain pan, overflow, and seepage onto ceiling or wall surfaces, and cause damage to carpeted surfaces or furniture below.
- Do not install this system in close proximity to septic sewer lines where flammable and toxic gases can coalesce.
- Inspect the drain pan before the onset of winter to drain away all accumulated moisture in the pan.
- The heat exchanger of indoor unit overheats whenever there is a slight amount of refrigerant circulating during slowdown or stoppage. As a result, moisture in the drain pan evaporates where it can condense on ceiling or wall surfaces.
- After the drain check is completed, insert the rubber plug again and seal the gap with a silicon sealant.

Electrical Installation**⚠ WARNING**

In some cases, the packaged air conditioner may not be operated normally under the following cases:

- When electrical power for the packaged air conditioner is supplied from the same power transformer as the device*.
- When the power supply wiring for the device* and the packaged air conditioner are located close to each other:

Device*: (Example): Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor, and large-sized switch.
It consumes large quantities of electrical power.

Regarding that mentioned above, surge voltage may be inducted into the power supply wiring for the crated air conditioner due to a spike in power consumption for this device and an activation of the switch. Check the field regulations and standards before performing any electrical work in order to safeguard the power supply for the crated air conditioner unit.

3. Before Installation

3.1 Combination of Outdoor Unit and Indoor Unit

The combination capacity of indoor unit against the outdoor unit is selected depending on the outdoor unit capacity. Refer to "Installation and Maintenance Manual" for outdoor unit to decide the required combination of indoor and outdoor units, and the combination unit capacity.


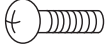


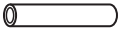
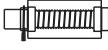

3.2 Transportation and Handling

- (1) Transport the product as close to the installation location as possible before unpacking.
- (2) Do not lay any objects on the indoor unit.
- (3) The indoor unit comes crated upside-down with the foam polystyrene drain pan positioned on top. Do not invert the unit until it is ready to be suspended above the floor. Inverting the unit while on the floor will crush the drain pan. Do not handle the unit by grabbing at the polystyrene pan and other air outlets as they are fragile and will sustain damage.
- (4) The indoor unit handle is fabricated from foam polystyrene and is susceptible to breakage if any excessive force is applied as a result of mishandling of the unit during installation.

INSTALLATION

3.3 Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the indoor unit. The screws, washers and flare nuts are packed in the pipe insulation.

Accessory	Qty.	Purpose
Washer (M10) 	8	For Unit Suspension
Screw (M4) 	16	For Fixing Flanges
Hose Clamp 	2	For Drain Pipe Connection
Cord Clamp 	5	For Fixing PVC Tube
PVC Tube 	2	For Separating Transmission Wirings and Wired Controller Wirings from Power Supply Wirings ID 15/32 inch (12mm)
Drain Hose 	1	For Drain Pipe Connection
Rubber Bush 	1	For Connecting Hole

NOTICE

The controller and branch piping are optional accessories which are not included with the indoor unit. If necessary, please contact your contractor.

3.4 Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool
1	Handsaw	11	Wrench
2	Phillips Screwdriver	12	Charging Cylinder
3	Vacuum Pump	13	Manifold Gauge
4	Refrigerant Gas Hose	14	Wire Cutter
5	Megohmmeter	15	Gas Leak Detector
6	Copper Pipe Bender	16	Level
7	Manual Water Pump	17	Clamper for Solderless Terminals
8	Pipe Cutter	18	Hoist (for Indoor Unit)
9	Brazing Kit	19	Ammeter
10	Hexagon Wrench	20	Voltage Meter

NOTE:

Use tools and measuring instruments (vacuum pump, gas hose, charging cylinder, manifold gauge) exclusively for refrigerant R410A.

4. Installation Location

(Unit: inch)

- (1) Install the indoor unit, allowing for proper clearance for operation and maintenance access, as shown in Figure 4.1.

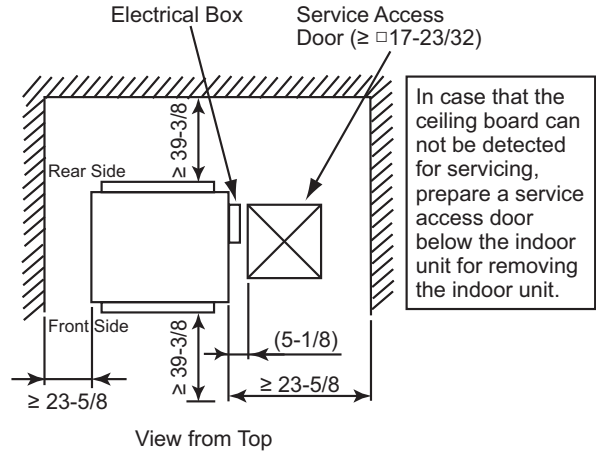


Figure 4.1 Operation and Installation Space

- (2) Consider the air distribution from the indoor unit to the space of the room, and select a suitable location so that uniform air temperature in the room can be obtained.
- (3) Do not leave combustible materials inside the service space of the indoor unit.
- (4) Avoid obstacles which may hamper the air intake or the air discharge flow.
- (5) Do not install the indoor unit in a machine shop or kitchen where vapor from oil or its mist flows to the indoor unit.
The oil will deposit on the heat exchanger, thereby reducing the indoor unit performance, and may deform and in the worst case, break the plastic parts of the indoor unit.
- (6) Pay attention to the following points when the indoor unit is installed in a hospital or other facilities where there are electronic waves from medical equipment.
 - (a) Do not install the indoor unit where the electromagnetic wave is directly radiated to the electrical box, communication cable or wired controller.
 - (b) Install the indoor unit and components as far away as practical or at least 9.8ft (3m) from any electromagnetic wave radiator.
 - (c) Prepare a steel box and install the wired controller in it. Prepare a steel conduit tube and wire the controller cable in it. Then, connect the ground wiring with the box and the tube.
 - (d) Install a noise filter when the power supply emits harmful noises.
- (7) To avoid any corrosive action to the heat exchangers, do not install the indoor unit in an acid or alkaline environment.

5. Installation Work

5.1 Suspension Bolts

- (1) Determine the final location and installation orientation of the indoor unit with respect to the space allowed for piping, wiring, and maintenance access.
- (2) Mount suspension bolts, as shown in Figure 5.1.

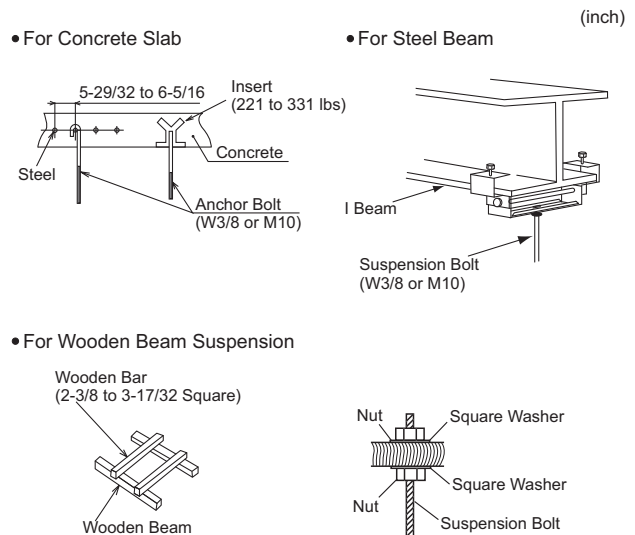
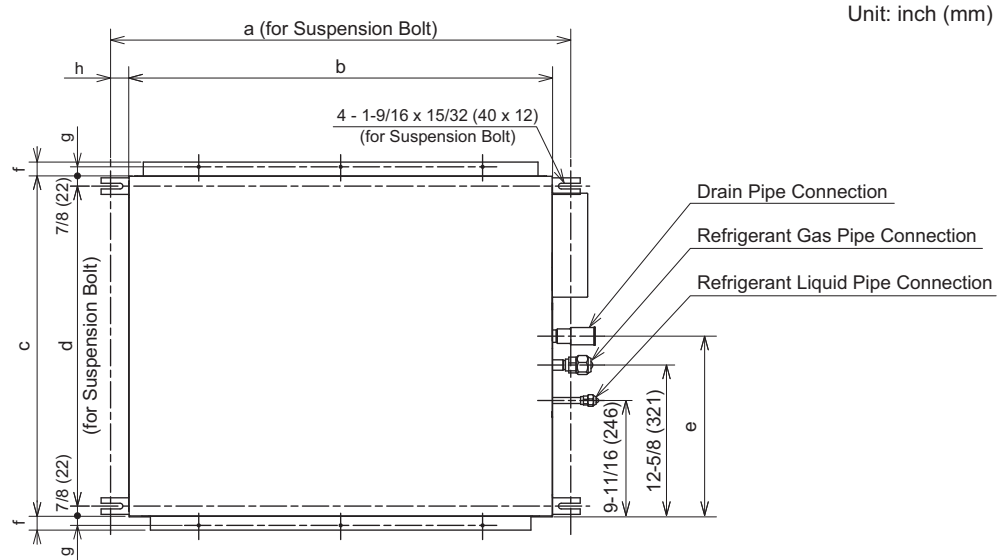


Figure 5.1 Mounting of Suspension Bolts

INSTALLATION

5.2 Marking of Positions of Suspension Bolts and Piping Connections

- (1) Mark the positions of the suspension bolts, refrigerant piping connections and drain connection.
- (2) Installation dimensions are shown in Figure 5.2.



Dimension	a	b	c	d	e	f	g	h
(H,Y)IDH018B21S	37-13/32 (950)	35-7/16 (900)	28-11/32 (720)	26-5/8 (676)	16-1/16 (408)	31/32 (25)	19/32 (15)	31/32 (25)
(H,Y)IDH024B21S (H,Y)IDH030B21S	38-19/32 (980)	35-7/16 (900)	31-1/2 (800)	29-3/4 (756)	15-13/16 (402)	1-3/16 (30)	25/32 (20)	1-9/16 (40)
(H,Y)IDH036B21S (H,Y)IDH048B21S	54-11/32 (1,380)	51-3/16 (1,300)	31-1/2 (800)	29-3/4 (756)	15-13/16 (402)	1-3/16 (30)	25/32 (20)	1-9/16 (40)

Figure 5.2 Suspension Bolts

5.3 Mounting Indoor Unit

Hang the indoor unit as shown in Figure 5.3.

Field-Supplied Parts

- * Suspension Bolts: 4-M10 or W3/8
- * Nut: 8-M10 or W3/8

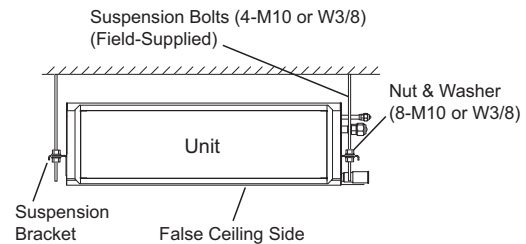


Figure 5.3 Mounting Indoor Unit

- (1) How to install Nuts or Suspension Bolts
Install nuts on each of the four suspension bolts, as shown in Figure 5.4.

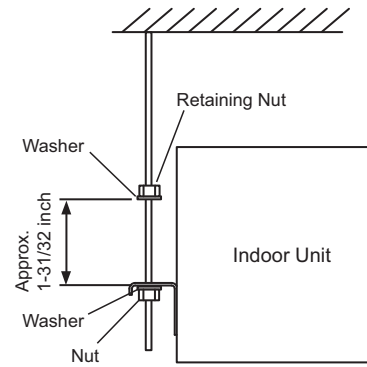


Figure 5.4 Suspension Bolts and Nuts

- (2) Suspension Indoor Unit

- * Hook the suspension bracket to the nut and washer of each suspension bolt, as shown, starting at the opposite side and working over to the service cover side.
- * After verifying that the nut and washer are correctly affixed to the retainers on the suspension bracket, hook the suspension bracket of the service cover side to the nut and washer. (Install the suspension bolts away from the unit when fastening.)

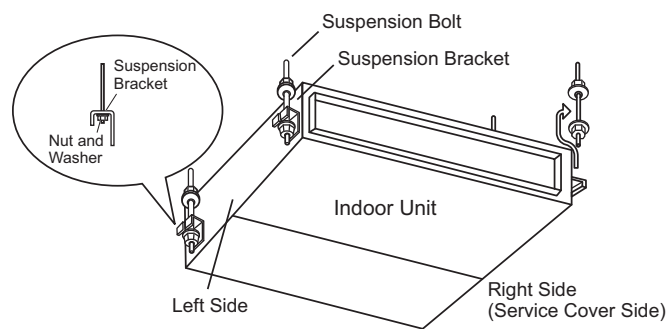


Figure 5.5 Suspended Indoor Unit

5.4 Adjusting of Unit Level

- (1) Use a level to verify that the unit is perfectly horizontal. There should be no degree of slope present.

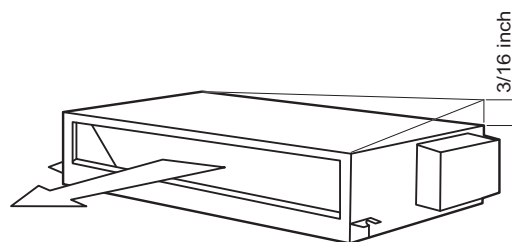


Figure 5.6 Adjusting of Unit Level

- (2) The unit should be installed so that the rear side of the unit is slightly (0 to 3/16 inch (0 to 5mm)) lower than the front side, to allow for proper drainage.
- (3) Tighten the bolts of the nuts with the suspension brackets after adjustment is completed. Adhesive must be applied to the bolts in order to prevent them from loosening.

NOTE:

During position the installation process, keep the unit well covered with vinyl cover and related components covered until it is time to hoist into position.

5.5 Connecting Supply Duct

- (1) The supply duct should be connected with the indoor unit through canvas ducts, in order to avoid abnormal sound vibration (Refer to Figure 5.7). The unit is equipped with a pre-drilled duct flange for the return and supply duct connection.
- (2) Attach the vibration proof rubber to the Suspension Bolt in order to avoid abnormal sound vibration.
- (3) Duct material should be non-flammable material.
- (4) Perform heat insulation work over the duct to prevent condensation.

⚠ CAUTION

- **If a lower sound level is required, install silencer (field-supplied).**
- **Design duct arrangement as "Unit External Static Pressure = Pressure Drop of Duct + Pressure Drop of Air Outlet and Air Inlet".**
Poorly designed duct will result in sound, comfort and water blow-off issues.

< Notice for Outdoor Air Intake (Fresh Air) >

This air conditioner unit is NOT designed for outdoor use.

The following items are to be strictly observed when designing a system for fresh air intake from the outdoors.

1) Considering Ventilation Load

Calculate the air-conditioning load properly with the load of the outdoor air intake. If the load of the outdoor air is not considered, it may cause insufficient cooling or heating operation due to an excessive air-conditioning load against the unit capacity.

2) Limits on Outdoor Air Intake

- Do NOT ingest air from the outdoors directly into the indoor unit.
If an outdoor fresh air intake is necessary for air-conditioning, Johnson Controls Inc. recommends the installation of the ERV (Energy Recovery Ventilation) (Field-supplied) system. The outdoor air shall be processed by the ERV and mixed with indoor air. Only then, is air that now intermixed can be drawn into the indoor unit.

NOTE:

The temperature of the air that is intermixed should fall within the working range as shown below.

	Heating	Cooling
Working Range of Required Indoor Room Temperature	59 to 80°F DB (15 to 27°C DB)	69°F DB/59°F WB (21°C DB/15°C WB) to 89°F DB/73°F WB (32°C DB/23°C WB)

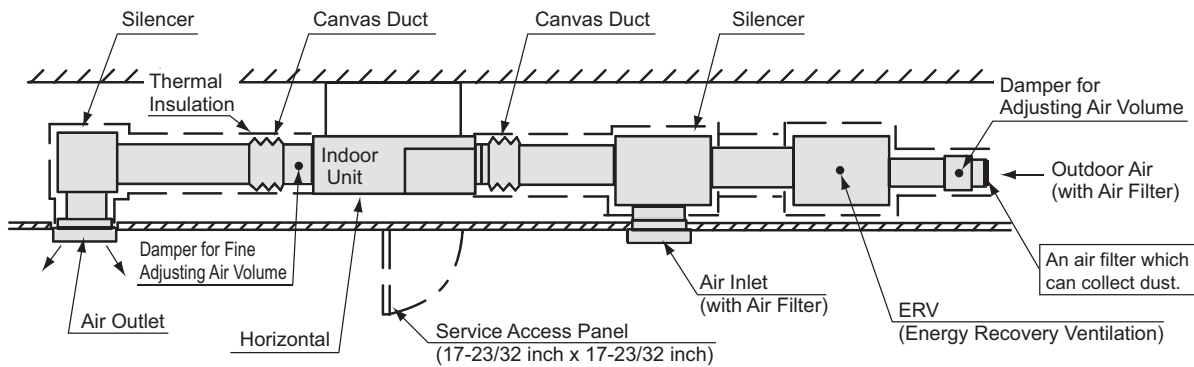
- If the ERV is not used for processing the outdoor air, it can result in insufficient heating/cooling operation or condensation build-up on the inside surfaces of the indoor unit or duct depending on the outdoor air conditions.
- The volume of fresh air is recommended to be within 20% of the airflow volume "Hi" according to the specification's table in the technical documentation. If it exceeds 20%, ingested condensation will build-up on the inside surfaces of the indoor unit and the airflow volume of the indoor unit cannot be adjusted due to increasing pressure loss of air intake caused by insufficient internal static pressure.
- When the outdoor air is ingested into the indoor unit, make sure to install an air filter capable of keeping the indoor unit free from dust.

3) Facilities for Outdoor Air Intake

- Use the damper or the duct fan to adjust fresh air volume.
- Do NOT ingest in fresh air from the outdoors directly into the indoor unit.
Installing and integrating ERV as a part of the system mix is recommended if incoming air from outdoors is routinely drawn indoors.
- When using ERV or installing a duct fan, make sure to install the interlock circuit between them and the indoor unit fan motor. Make sure to install an ERV in accordance with this "Installation and Maintenance Manual".
- Install thermal insulation on surfaces of interconnecting ducts to prevent the build-up of condensation.

CAUTION

- If a lower sound level is further required, install silencer (field-supplied).
- The facility design should be “Unit External Static Pressure = Duct Pressure Loss + Suction / Discharge Pressure Loss”.
 If the duct pressure loss drops below the external static pressure, air speed will increase and lead to the occurrence of louder noise, splashing water and activation of motor protection circuit activated. If the unit external static pressure drops below the duct pressure loss, some problems such as inability to change the air speed may occur. Set the airflow control damper or shift the static pressure control switch to adjust to almost equalize the level between the external static pressure and the duct pressure loss. (See “Setting of External Pressure” section for details.)
- Basically this unit is designed to install the ducts on the inlet side and the outlet side. Ask for more information for using the return ducts in the ceiling.



Voltage	Model	Static Pressure in.W.G.(Pa)
208V	(H,Y)IDH018 - 048B21S	0.20 ^(*) /0.60 (50 ^(*) /150)
230V		0.40 ^(*) /0.74 (100 ^(*) /185)

*: Before Shipment

Figure 5.7 Duct Connection Example

5.6 Setting of External Pressure

Refer to Section 8.6 "Static Pressure Electrical Wiring Connection".

6. Refrigerant Piping Work

! DANGER

Use the specified non-flammable refrigerant (R410A) to the outdoor unit in the refrigerant cycle. Do not charge the unit with materials other than R410A, such as hydrocarbon refrigerants (propane and isobutan), oxygen, flammable gases (acetylene, ammonia, etc.) or poisonous gases when installing, maintaining and moving the unit. These flammables are extremely dangerous and may cause explosion, a fire, or injury.

For details on refrigerant piping work, vacuum pump, and refrigerant charge, refer to the "Installation and Maintenance Manual" for the outdoor unit.

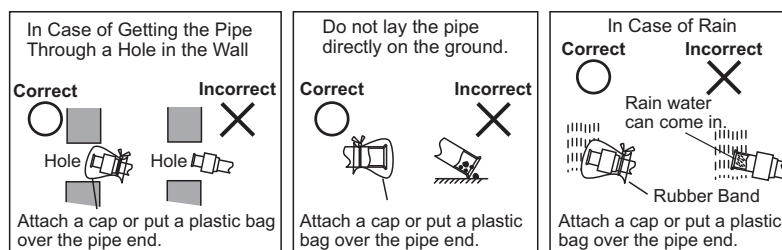
6.1 Piping Materials

- (1) The tolerance of refrigerant piping length differs depending on the combination with the outdoor unit. Refer to "Installation and Maintenance Manual" of the outdoor unit for details.
- (2) Select the piping size from the following table.

Table 6.1 Piping Size

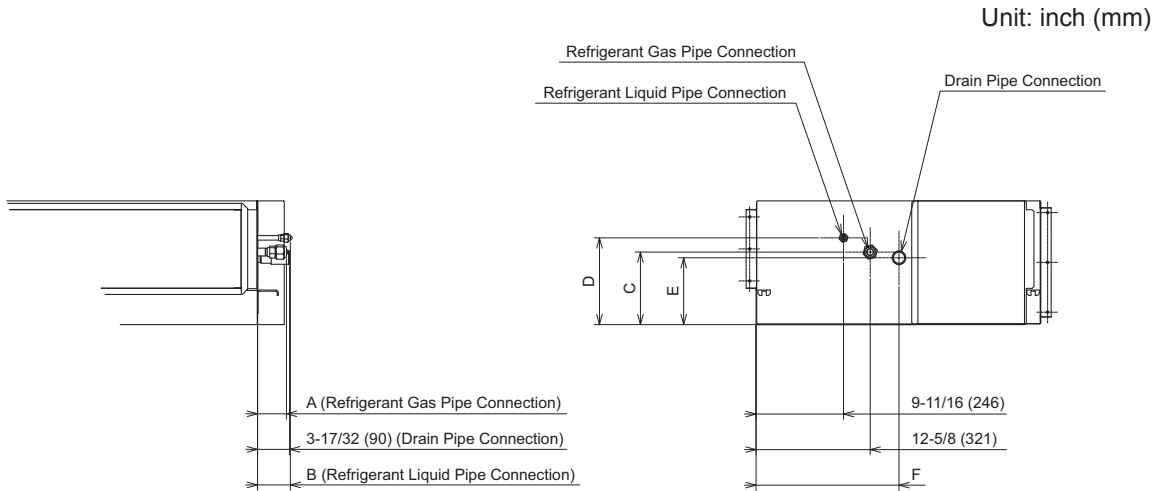
Model	inch (mm)	
	Gas Piping	Liquid Piping
(H,Y)IDH018B21S (H,Y)IDH024B21S (H,Y)IDH030B21S (H,Y)IDH036B21S (H,Y)IDH048B21S	φ5/8 (15.88)	φ3/8 (9.52)

- (3) Prepare field-supplied copper pipes.
- (4) Select clean copper pipes. Make sure there is no dust and moisture inside.
- (5) The refrigerant oil for the refrigerant R410A is susceptible to moisture, an oxide film, and fatty oil. Take special care during the installation so that moisture, contaminations or old refrigerant oil will not enter the refrigerant cycle. Otherwise, impurities may adhere to the expansion valve and it may prevent proper operation.
- (6) When cutting the pipes, use a pipe cutter to avoid grind swarf generation for the pipe cutting work. Blow the inside of pipes with nitrogen or dry air to remove any dust or foreign materials before connecting pipes. Do not use any tools which produce a lot of swarf such as a saw or a grinder.



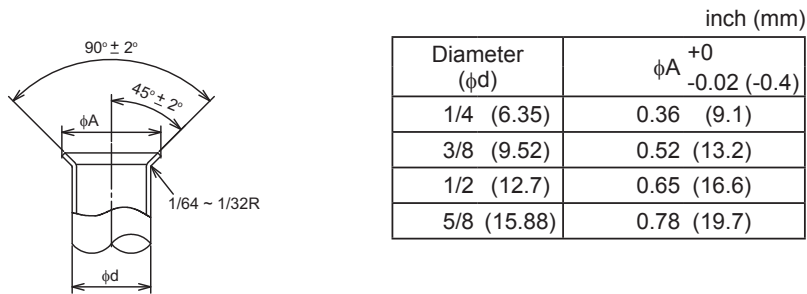
6.2 Piping Connection

(1) Position of piping connection is shown below.



Model	A	B	C	D	E	F
(H,Y)IDH018B21S	3-1/32 (77)	3-5/8 (92)	7-5/32 (182)	8-3/4 (222)	7-5/32 (182)	16-1/16 (408)
(H,Y)IDH024B21S (H,Y)IDH030B21S (H,Y)IDH036B21S (H,Y)IDH048B21S	3-5/32 (80)	3-17/32 (90)	8-1/32 (204)	9-19/32 (244)	7-13/32 (188)	15-13/16 (402)

(2) Perform the flaring work as shown below.



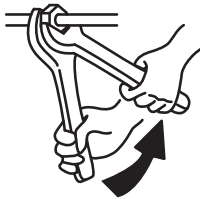
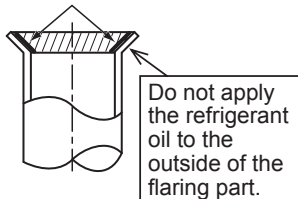
- (3) Use specific flare nut attached with the unit.
- (4) Verify that there are no scratches, burrs stuck to internal surfaces, or surface deformations at the flared opening.
- (5) Before tightening the flare nut, apply the (Field-Supplied) refrigerant oil in a thin layer over the flared part. (Do not apply the oil on other areas.) Tighten the flare nut for the liquid pipe to the specified torque with two spanners. Then, tighten the flare nut for the gas piping in the same way. After the tightening work has been completed, check that no refrigerant leakage occurs.

NOTE:

Refrigerant oil is field-supplied.

[Polyvinyl Ether Oil FVC68D (Idemitsu Lubricants America)]

Apply Refrigerant Oil.

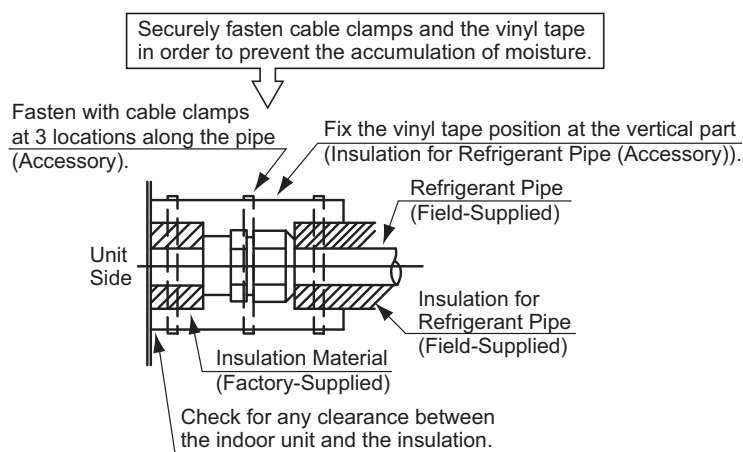


Required Tightening Torque (JIS B 8607)

Pipe Size	Tightening Torque
φ1/4 inch (6.35 mm)	10.3 - 13.3 ft·lbs (14 - 18 N·m)
φ3/8 inch (9.52 mm)	25.1 - 31.0 ft·lbs (34 - 42 N·m)
φ1/2 inch (12.7 mm)	36.1 - 45.0 ft·lbs (49 - 61 N·m)
φ5/8 inch (15.88 mm)	50.2 - 60.5 ft·lbs (68 - 82 N·m)

INSTALLATION

- (6) Wherever buried piping exists on site, make sure there is a service doorway to provide adequate access to inspect piping sockets and elbows, and for interconnecting parts.
- (7) Piping must be reinforced to withstand earthquakes so as not to be damaged by an external force.
- (8) Do not tightly secure refrigerant piping to accommodate expansion and contraction.
- (9) Prevent the pipes from contacting weak portions such as wall, ceiling, etc. (Otherwise, abnormal sound may be heard due to vibration of the piping.)
- (10) Test for air-tight integrity. The air-tight procedures should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
- (11) If temperature and humidity inside the ceiling exceed 80.6°F (27°C)/RH80%, condensation occurs on the surface of the accessory insulation. Wrap additional insulation (approximately 3/16~13/32 inch (5~10mm) thickness) around the accessory insulation of the refrigerant pipe as a preventive measure.
- (12) Insulate each flare connection without gap with accessory insulations to prevent condensation. Then insulate each refrigerant pipe as well.



⚠ WARNING

- Do not apply excessive force to the flare nut when tightening. Use the specified tightening torque.
- Make sure that the refrigerant leak test has been performed. Refrigerant (fluorocarbon) for this unit is non-flammable, non-toxic and odorless. However if the refrigerant should leak and contact with fire, toxic gas will be generated. Also because the fluorocarbon is heavier than air, it settles near the floor, which could cause suffocation.

7. Drain Piping

! WARNING

Do not put the drain pipe for the indoor unit into the drainage trench where corrosive gases occur. Otherwise, poisonous gases flow into the room, which may cause poisoning.

NOTICE

- Ensure that the drain pipe discharges water properly. If connected incorrectly, it may cause leaks leading to property damage.
- Do not provide an upward slope or a rising part for the drain pipe. Otherwise, the drain water will flow back into the unit and it may cause the water leakage when the unit operation is stopped.
- Do not connect the drain pipe with a sanitary or sewage pipe or any other drainage pipe.
- When the common drain pipe is connected with other indoor units, the connected position of each indoor unit must be higher than the common pipe. The pipe size of the common drain pipe must be large enough according to the unit size and number of units.
- After performing drain piping work and electrical wiring, ensure that water flows smoothly as in the following procedures.

Perform drain piping work and attach the insulations before refrigerant piping work.

- (1) The position of the drain pipe connection is shown in Figure 7.1.
- (2) Prepare a polyvinyl chloride (PVC) pipe with 1-1/4 inch (32mm) outer diameter.
- (3) Fasten the tube to the drain hose with the adhesive agent and the field-supplied clamp. The drain piping must be performed with a DOWN-SLOPE pitch of 1/25 to 1/100.
- (4) Insulate the drain pipe after connecting the drain hose.

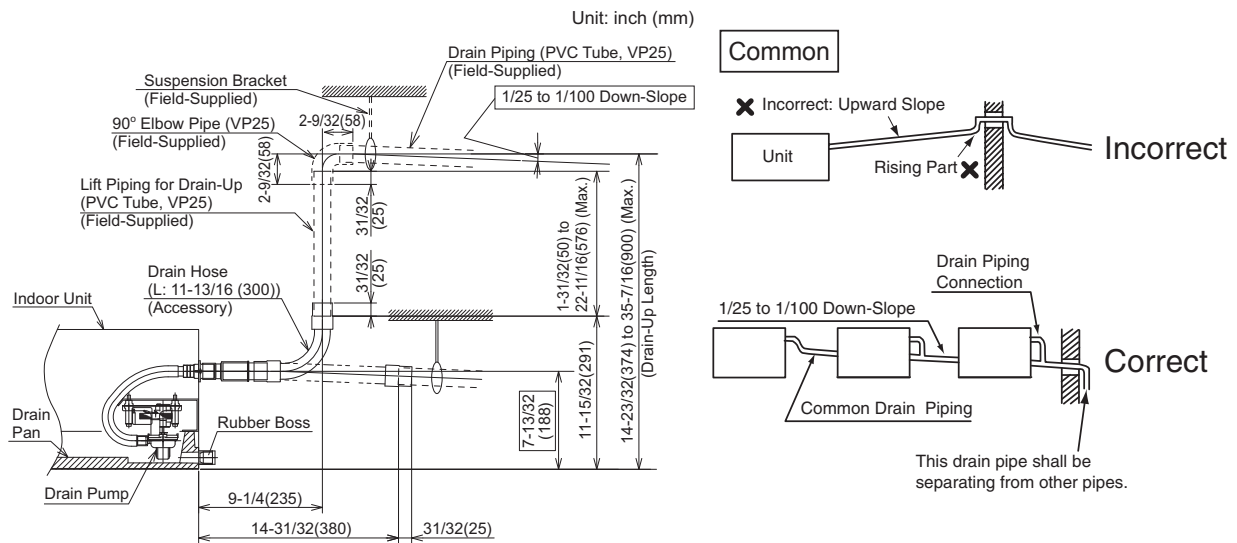


Figure 7.1 Drain Piping

NOTE:

When the relative humidity of inlet or ambient air exceeds 80%, apply an auxiliary drain pan (field-supplied) beneath the indoor unit as shown in Figure 7.2.

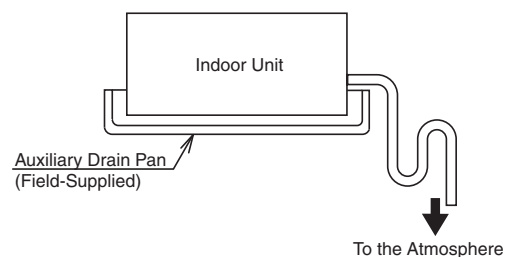


Figure 7.2 Auxiliary Drain Pan

NOTICE

After performing drain piping work and electrical wiring, verify that water flows smoothly as in the following procedure.

Checking with the Float Switch

- a. Turn ON the power supply.
 - b. Pour 68 to 84oz (2 to 2.5 liters) of water into the drain pan.
 - c. Ensure that the water flows smoothly and no water leakage occurs. When water cannot be found at the end of the drain piping, pour another 68oz (2 liters) of water into the drain pan.
-

8. Electrical Wiring

WARNING

- All electrical work must be done as outlined in this manual and in accordance with this manual. Substandard work can result in fire and damage to the unit.
- Use specified cables between units and choose the cables correctly. If not, an electrical shock or fire may occur.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply. It can result in an electrical shock.
- Turn OFF the main power switch of the indoor unit and the outdoor unit before attempting any electrical wiring work or a periodical check is performed. If not, it will result in an electric shock or a fire.
- Check to ensure that the indoor fan and the outdoor fan have stopped before attempting any electrical wiring work or for any scheduled electrical work that is being performed.
- Tighten screws according to the following torque.
 - M3.5: 0.9 ft·lbs (1.2 N·m)
 - M4: 0.7 to 1.0 ft·lbs (1.0 to 1.3 N·m)

CAUTION

- Secure all cables together with zip-ties and seal the connecting hole against the onslaught of moisture and insects.
- Run the electrical wiring through the connecting hole in the side cover when using conduit.
- Secure the wired controller cable using the cable clamp inside the electrical box.

8.1 General Check

- (1) Make sure that the field-selected electrical components: (main power switches, circuit breakers, wires, conduit connectors, and wire terminals) have been properly labeled in accordance with electrical data as specified in the Engineering Manual. Make sure that the components comply with the National Electrical Code (NEC).
- (2) Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
- (3) Check the capacity of the electrical wires.
If the power supply capacity is too low, the system cannot be started due to a voltage drop.
- (4) Verify that the ground wiring is securely connected.

8.2 Electrical Wiring Capacity

8.2.1 Field Minimum Wire Sizes for Power Supply

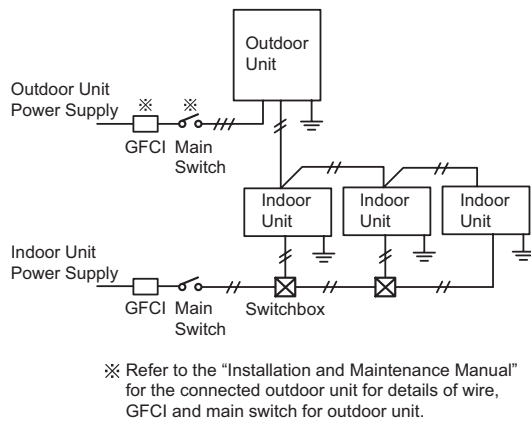
- This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches and wiring in accordance to local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements. Failure to use a GFCI can result in electrical shock or fire.
- Do not operate the system until all the check points have been cleared.
 - (A) Verify that electrical resistance is more than one megaohm by measuring the resistance between ground and the terminals of the various electrical components. If less than one megaohm, do not activate the system until the electrical current drain is found and repaired.
 - (B) Check to ensure that the stop valves for the outdoor unit are fully opened, and then start the system.
 - (C) Check to see that the main power has been switched ON for longer than 12 hours prior activating the system. Power to the crankcase heater needs this time interval to warm the compressor oil up to operating temperature.
- Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 194°F (90°C).

8.2.2 Details of Electrical Wiring Connection

The electrical wiring capacity of the outdoor unit should be referred according to the "Installation and Maintenance Manual" for the outdoor unit. Adjusting the DIP switches may be required depending on the arrangement with the outdoor unit.

Select wiring capacity according to the table 8.1. Install a GFCI (Ground Fault Circuit Interrupter) and main switch as shown in each of the system diagrams below.

< Heat Pump System >



< Heat Recovery System >

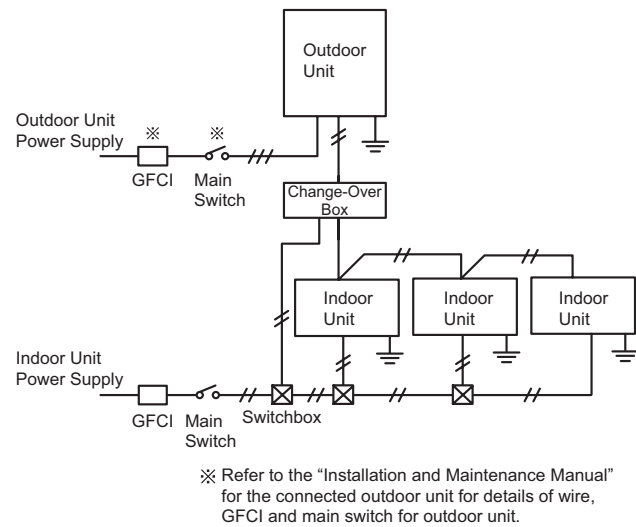


Table 8.1 Recommended Wiring Capacity and Size

Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA <Minimum Circuit Ampacity> [A]
		Power Supply Wiring Size <Main>	Ground Wiring Size	Communication Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
(H,Y)IDH018B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	1.45
(H,Y)IDH024B21S									2.10
(H,Y)IDH030B21S									2.10
(H,Y)IDH036B21S									2.88
(H,Y)IDH048B21S									3.12

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) Select a GFCI with an activation speed of 0.1 sec. or less.
- 3) Total operating current is less than 12A.

NOTICE

- Check for the recommended size GFCI shown in the table 8.1.
- Between indoor and outdoor units, use dual-conductor, AWG18 (0.82mm²) stranded copper cable for communication cable. Do not use any cable with more than two conductors. Twisted pair or shielded cable can be used in environments with excessive electrical noise to reduce the possibility of communication errors between system components. Total cable length should not exceed 3281 ft (1000m).
- Select the wiring size, GFCI (Ground Fault Circuit Interrupter) in accordance with the regulations for each region, the "Installation and Maintenance Manual", and the dedicated electrical circuit that must be used.
- Outside of the indoor unit, installation of the power supply wiring, communication cable, and wired controller cable should be spaced as far apart as possible.

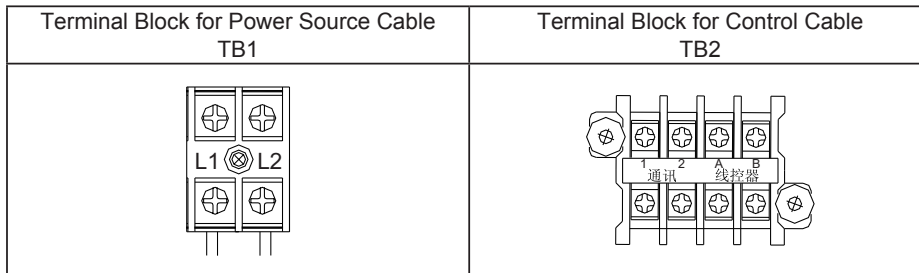
INSTALLATION

8.3 Position of Electrical Wiring Connection

- The electrical wiring connection for the indoor unit is shown in Section 8.2.2.
- The connection at the terminal block for the indoor unit is shown in the figure below. Check the outdoor unit for the combination before the wiring work. The screws at the terminal block should be performed according to the tightening torque as shown in the table below.

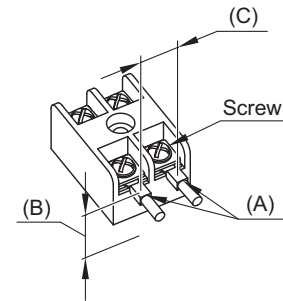
Tightening Torque for Terminals

Screw Size		Tightening Torque
TB1	M6	3.0 - 3.7 ft·lbs (4.0 - 5.0 N·m)
TB2	M4	0.7 - 1.0 ft·lbs (1.0 - 1.3 N·m)



NOTICE

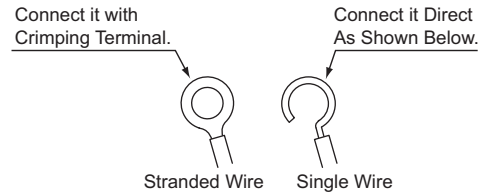
- Do not connect the main power supply wiring to the communication line (Terminals A, B, 1 and 2 of TB2). If these are connected, the printed circuit board (PCB) will be destroyed.
- Note the following for wire connections at TB1 and TB2:
 - (A) Attach a piece of insulation tape or sleeve at each terminal.
 - (B) Maintain a safe distance between the electrical box and the terminals to prevent a short circuit.
 - (C) Maintain a safe distance between the terminals.



- (1) Connect the cable for the optional controller or the optional extension cable to the terminals inside the electrical box through the connecting hole of the cabinet.
- (2) Connect the power supply and the ground wiring to the terminals in the electrical box.
- (3) Connect the cables between the indoor unit and the outdoor unit to the terminals inside the electrical box.
- (4) Connect cables to their corresponding terminal number and the similarly marked band.
- (5) Connect the communication cable between those indoor units connected to the same outdoor unit.
- (6) Do not connect the main power supply wiring to the communication line (Terminals A, B, 1 and 2 of TB2). If connected, the printed circuit board (PCB) will be destroyed.
- (7) Tightly clamp the power supply wiring and communication cables using the cable clamp inside the electrical box.

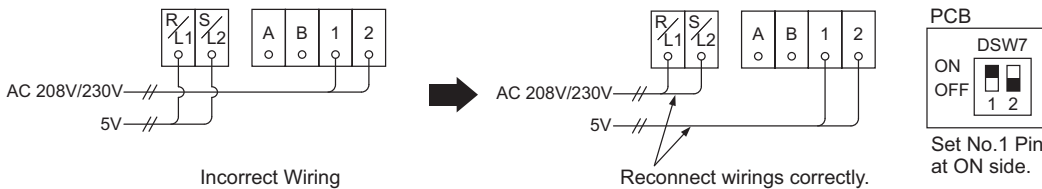
NOTE:

When the standard wire is used for the field-wiring connection, the M4 crimping terminal should be used. When the single wire is used, fashion it into the shape as shown at right and connect it in order to tighten the washer uniformly. The screws at the terminal block should be tightened according to the torque specification as shown in the table above.



- (8) All electrical work should be performed in strict accordance with electrical schematics in the "Installation and Maintenance Manual".
- (9) If Power Supply Voltage (208V/230V) is introduced into the Communication Line:
If 208V/230V are applied to the communication line at (Terminals 1 and 2 of TB2) by mistake, the fuse on the PCB for the communication line will blow. In this case, perform the recovery work as shown in the diagrams below.
 - (a) Reconnect the wirings correctly.
 - (b) Set the No.1 pin at DSW7 (on the PCB) to ON.

Upon PCB recovery after the fuse has been replaced, if 208V / 230V is reintroduced into the communication line, the PCB will be seriously damaged and will not recover.

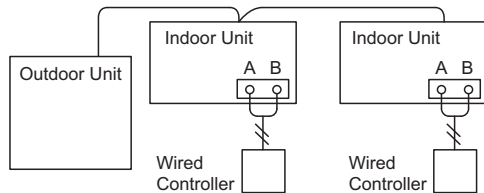


INSTALLATION

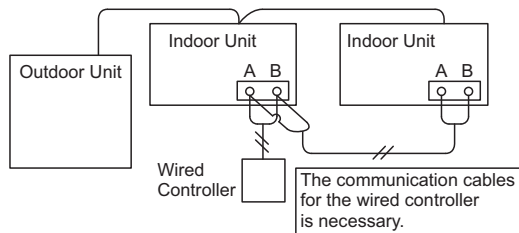
(10) Wired Controller Connection

- VRF Systems

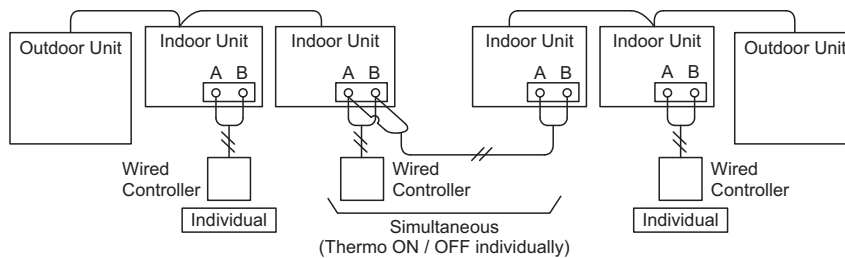
(a) Wired Controllers to each Unit for Individual Operation Setting



(b) Single Wired Controller for Individual Operation Setting



(c) Wired Controller Connections between different Refrigerant Cycles

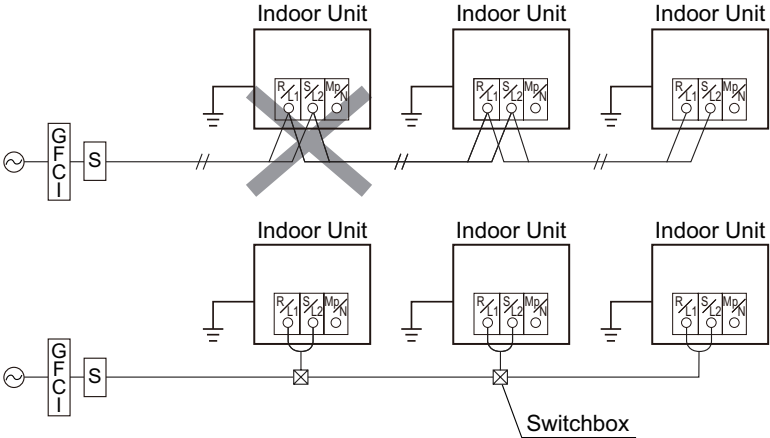


NOTICE

1. The DIP switch settings for the outdoor unit should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
2. Be aware that communication cable for the wired controller is required in these instances:
 - a. The following functions are set to the sub unit which is not installed with the wired controller.
 - Remote ON/OFF function settings, (No.1, 2, and 3), (External Input / Output Function)
 - Power supply ON/OFF functions, (No.1 and 2), (Function Selection)
 - Prohibiting the wired controller after manual stoppage (External Input / Output Function)
 - Group setting by the centralized controller
 - b. The combination of twin, triple, or quad is controlled by single wired controller.
 - c. The address for the indoor unit is changed from the wired controller.

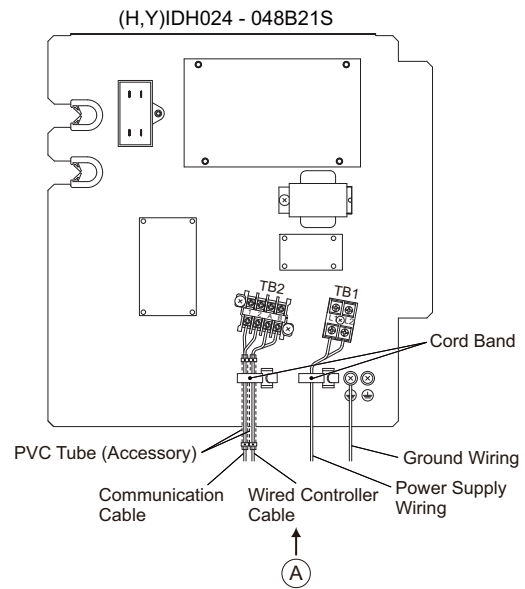
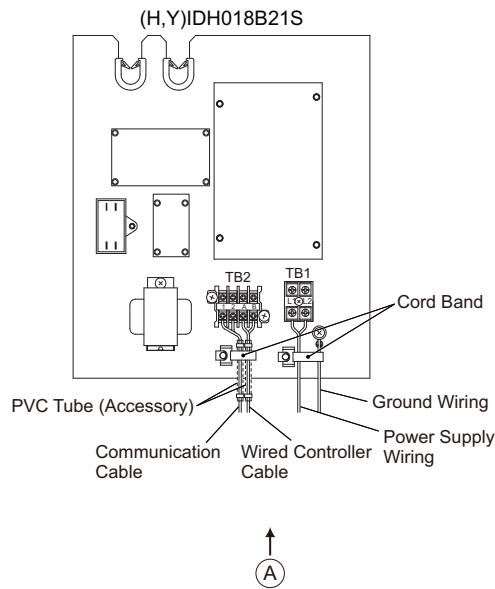
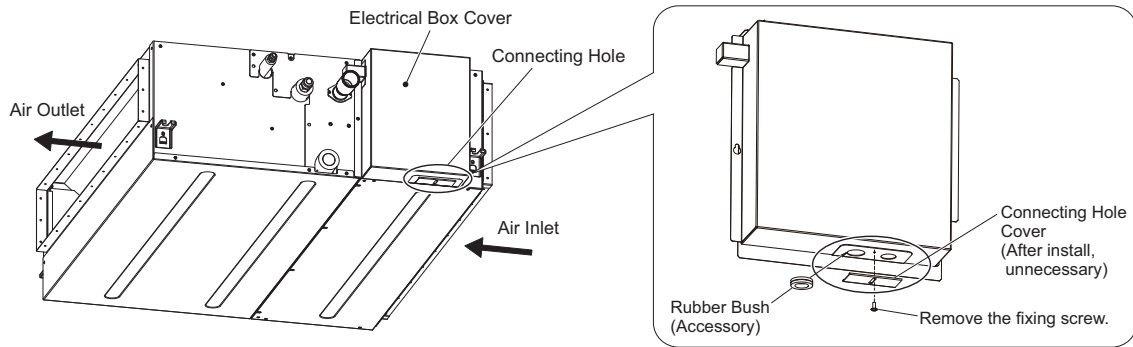
< Caution for Electrical Wiring >

- Do not connect the power supply wiring and the communication cable into one terminal.
- The manual switchbox is required when communication cable is required.



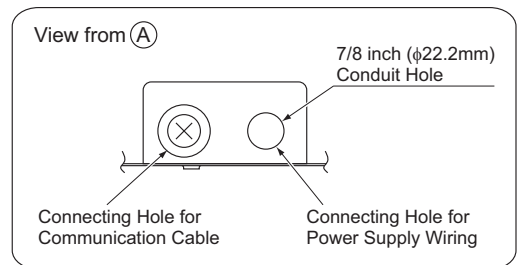
8.4 Wiring Connection

- (1) Remove the connecting hole cover of the electrical box and install the rubber bush (Accessory) to the connecting hole for communication cable.
- (2) Pass the communication cable and the wired controller cable through the connecting hole for communication cable.
Connect the communication cable to the terminals 1, 2 of TB2 in the electrical box.
Connect the wired controller cable to the terminals A, B of TB2 in the electrical box.
- (3) Pass the power supply wiring and the ground wiring through the connecting hole for power supply wiring.
Connect the power supply wiring to the terminals L1, L2 of TB1 in the electrical box.
Connect the ground wiring to the ground terminal inside the electrical box.
(When connecting the power supply wiring and the ground wiring outside of the unit, run through the conduit tube.)
- (4) Tightly clamp the power supply wiring, the ground wiring, the wired controller cable and the communication cable utilizing the cord band.



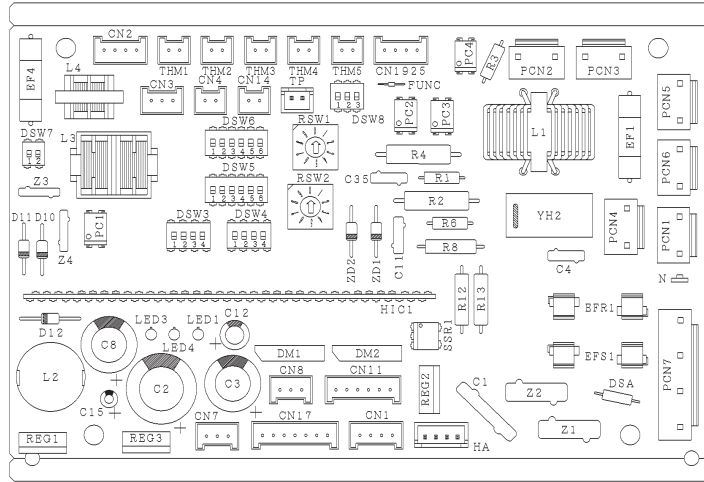
NOTE

- Insert the communication cables and wired controller cable into the PVC tube "VW-1 600V" (Accessory) to separate them from the power supply wirings in the indoor unit.
- Fix the both ends of the PVC tube by cable clamp (Accessory).
- If shielded cable is used, terminate at the ground terminal.



8.5 DIP Switches Setting

- (1) Turn OFF the power supply to both indoor and outdoor units before adjusting DIP switch settings. Otherwise, the setting will be invalidated and not take effect.
- (2) Positions of DIP switches are shown below.



- (3) **Unit No. Setting (RSW1 & DSW6)**
 Setting is not required.
 Indoor unit numbers are set by the auto-address function. If an indoor unit number setting is required, set the unit number of all indoor units respectively and sequentially by following setting position. It is recommended that you assign a number to each indoor unit from "1". A maximum of 64 indoor units per refrigerant cycle can be connected to an H-LINK II System. Though the available numbers range from zero to 63, the applicable number for the 64th indoor unit in theory supplants the number "zero". For the centralized control, this setting is required.

Unit No. Setting									
<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <th style="text-align: left;">DSW6 (Tens Digit)</th> <th style="text-align: left;">RSW1 (Units Digit)</th> </tr> <tr> <td style="text-align: center;"> </td> <td style="text-align: center;"> Setting Position </td> </tr> </table>	DSW6 (Tens Digit)	RSW1 (Units Digit)		Setting Position 	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr> <td style="width: 50%; text-align: center;"> Ex.) Set at No.16 Unit DSW6 </td> <td style="width: 50%; text-align: center;"> RSW1 </td> </tr> <tr> <td colspan="2" style="text-align: center;"> Set No.1 Pin at ON side </td> </tr> </table>	Ex.) Set at No.16 Unit DSW6 	RSW1 	Set No.1 Pin at ON side	
DSW6 (Tens Digit)	RSW1 (Units Digit)								
	Setting Position 								
Ex.) Set at No.16 Unit DSW6 	RSW1 								
Set No.1 Pin at ON side									
Before shipment, DSW6 and RSW1 are set at "0". For the units supporting H-LINK II, the unit No. can be set for Max. 64 indoor units (No.0-63).									

- (4) **Capacity Code Setting (DSW3)**
 No setting is required, due to setting before shipment. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.

Indoor Unit Capacity (kBtu/h)	18	24	30	36	48										
Setting Position	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">ON</td></tr> <tr><td style="text-align: center;">OFF</td></tr> </table>	ON	OFF	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">ON</td></tr> <tr><td style="text-align: center;">OFF</td></tr> </table>	ON	OFF	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">ON</td></tr> <tr><td style="text-align: center;">OFF</td></tr> </table>	ON	OFF	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">ON</td></tr> <tr><td style="text-align: center;">OFF</td></tr> </table>	ON	OFF	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="text-align: center;">ON</td></tr> <tr><td style="text-align: center;">OFF</td></tr> </table>	ON	OFF
ON															
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- (5) **Unit Model Code Setting (DSW4)**
 No setting is required. It is for setting the model code of the indoor unit.



INSTALLATION

- (6) Refrigerant Cycle No. Setting (RSW2 & DSW5)
This setting is required. The unit arrives with all settings in the OFF position.

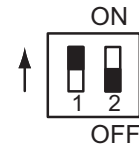
Refrigerant Cycle No. Setting

DSW5 (Tens Digit)	RSW2 (Units Digit)	Ex.) Set at No.5 Cycle
Before shipment, DSW5 and RSW2 are set at "0". For the units supporting H-LINK II, the ref. cycle No. can be set for Max. 64 cycles. (No. 0-63)		Set All Pins OFF RSW2 Set at "5"

- (7) Fuse Recover (DSW7)
* Factory Setting



* In the case of applying high voltage to the terminal 1 and 2 of TB2, the 0.5A fuse on the PCB is cut. In such a case, first reconnect the wirings correctly to TB2, and then set the No.1 pin to ON.



- (8) Optional (DSW8)
No setting is required. This is for setting the model code of the indoor unit.



NOTES:

- The "■" mark indicates setting for DIP switches. Figures show setting before shipment.
- When the unit number and the refrigerant cycle are set, record the unit number and refrigerant cycle to facilitate service and maintenance thereafter.

NOTICE

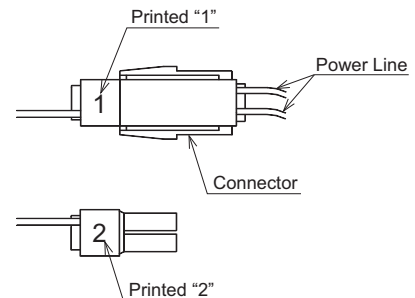
Turn OFF all power supply of the indoor units and the outdoor units before DIP switch settings. Otherwise, the setting will be invalidated and not take effect.

8.6 Static Pressure Electrical Wiring Connection

Change the connector according to the required static pressure.

Voltage	Model	Static Pressure	Printed
208V	(H,Y)IDH018 - 048B21S	0.20 in.W.G. (50 Pa) *	1
		0.60 in.W.G. (150 Pa)	2
230V		0.40 in.W.G. (100 Pa) *	1
		0.74 in.W.G. (185 Pa)	2

* Before Shipment



8.7 Function Selection by Wired Controller

Each function can be selected with the wired controller. Refer to the "Installation and Maintenance Manual" for the wired controller and the "Engineering Manual" for details.

< Circulator Function at Heating Thermo-OFF >

This function maintains fan operation by the set airflow volume at the heating Thermo-OFF. It improves temperature distribution when the unit is mounted on a high ceiling.

9. Test Run

9.1 Before Test Run

Verify that there are no problems with the installation, and do not perform Test Run until all the following conditions have been resolved.

Refer to the "Installation and Maintenance Manual" for the outdoor unit for details on Test Run operations from the outdoor unit.

Verify that refrigerant piping and the communication cable are connected to the same refrigerant cycle system. If not, it will cause an abnormal operation and damage to instrumentation.

- (1) Verify that electrical resistance is more than one megaohm, by measuring the resistance between ground and the terminal the terminus for electrical components. If the electrical resistance is less than one megaohm, do NOT operate the system until the electrical current outflow to ground is detected and repaired. Do not introduce any high voltage to the terminals of the communication cables (TB2 [A, B, 1 and 2]).
- (2) Verify that each wire is connected correctly at the correct phase for the power supply. If it is incorrectly connected, the unit will not operate and the wired controller will display the alarm code "05". In this case, check the phase for the primary power supply according to the "Attention" label affixed to the back side of the service cover. Then, with the power supply turned OFF at the power supply, remake the necessary connections.
- (3) Check to ensure that the main power supply has been turned ON for more than 12 hours, to warm up the compressor oil by the crankcase heater.
- (4) Verify that all DIP Switch settings are correct. Refer to Section 8.5 "DIP Switches Setting".

9.2 Test Run

After all installation work is completed, Test Run should be performed.

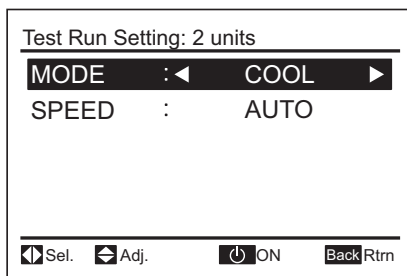
- (1) Check to ensure that stop valves (gas and liquid) for the outdoor unit are fully opened.
- (2) Whenever indoor units are connected to the VRF system, perform the Test Run for the indoor units one by one sequentially and then check the refrigerant piping system and the electrical wiring system for conformity. (If these multiple indoor units are operated simultaneously, system conformity cannot be verified.)
- (3) Perform the Test Run in accordance with the following procedure. Ensure that the Test Run is carried out without any problem. The following procedure shows a case where a wired controller is utilized. If other controllers are activated instead, refer to the "Installation and Maintenance Manual" for those other controllers.

NOTE:

The outdoor unit may not be operated depending on the indoor and outdoor temperature conditions. Refer to the "Installation and Maintenance Manual" for outdoor units for details.

- (a) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds. The Test Run menu will be displayed.
 - The Test Run menu will be displayed.

Test Run Screen

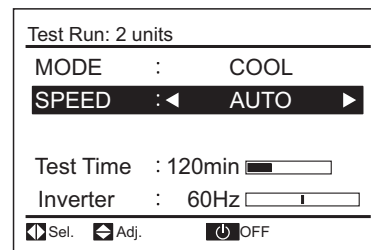


NOTE

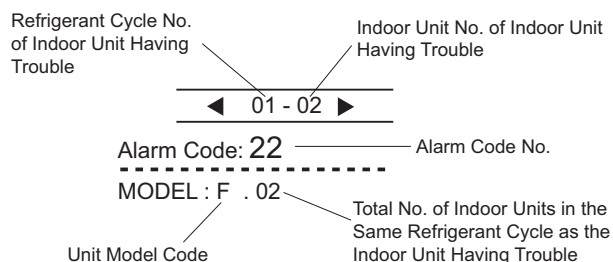
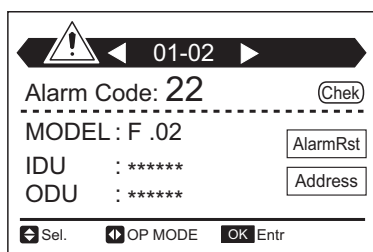
When the "00 unit" is displayed, the auto-address function may be working. Cancel "Test Run" mode and reset.

INSTALLATION

- The total number of connected indoor units is indicated on the LCD (Liquid Crystal Display). In the case of a twin combination (set of two indoor units), the total number of the connected indoor units is displayed as “**2 units**”, and where there is a triple combination (set of three indoor units), the total number of the connected indoor units is displayed as “**3 units**”.
 - If the number indicated is not equal to the actual number of connected indoor units, the auto-address function is not performing correctly due to incorrect wiring or electrical interference. Turn OFF the power supply, and resolve the wiring issue after verifying the following items; (Do not repeat turning ON and OFF within a 10 second timespan.)
 - The power supply to the indoor unit is not turned ON or there is an incorrect wiring issue.
 - Incorrect connection of the interconnecting cable between indoor units or a poorly connected controller cable.
 - Incorrect setting of the rotary switch and DIP switch for the indoor unit printed circuit board (PCB). (The setting is overlapped.)
 - Press “ On/Off” to start the Test Run.
 - Press “ ” and set each item.
- (b) Press “ On/Off”.
- The RUN indicator turns ON and the operation starts. At this time, a two-hour OFF timer will be set automatically.
- (c) Though temperature recordings by the thermistors are invalid during the Test Run phase, the protection devices are valid.
- (d) For VRF System
According to the label; “Checking Method by 7-Segment Display” affixed to the inside of the front cover of the outdoor unit, check temperature, pressure, and operation frequency, and interconnected indoor unit numbers by 7-Segment displays.
- (e) To complete Test Run, press “ On/Off” again or wait for the set Test Run time to pass.
When changing the Test Run time, press “” or “” to select “**TEST TIME**”. Then, set the test run time (30 to 600 minutes) by pressing “” or “”.



- The RUN indicator on the wired controller for the indoor unit will flash orange (0.5 second ON/ 0.5 second OFF), indicative of a fault or error having been generated with activation of protection devices during the Test Run phase. Alarm code, unit model code, and the number of interconnected indoor units will be displayed on the LCD as shown below. If the RUN indicator on the wired controller flashes for two seconds ON and two seconds OFF, the source of the problem could be a failure in the communication cable between the indoor unit and the wired controller (a loose or severed connection). In this case, verify Section 9.3 “Alarm Code” and perform the appropriate troubleshooting measures. Consult with an authorized service engineer if the problem cannot be resolved at your end.



< Unit Model Code >

The relationship between the unit model code and the unit model is shown in the table below.

Indication	Unit Model
F	VRF System
E	Except Above Models

9.3 Alarm Code

Alarm (Troubleshooting) Code Table

Code No.	Category	Nature of Problem	Likely Cause
01	Indoor Unit	Activation of a protection device (Float switch)	Activation of the float switch; (High water level present in the drain pan.) A problem exists in the piping.
02	Outdoor Unit	Activation of protection device; (Except for Alarm Code: 41, 42)	High Pressure Cut; (R410A: 601 psi (4.15MPa)), fan motor lockup during the outdoor unit cooling operation.
03	Communication	Communication failure between indoor and outdoor units	Incorrect wiring, loose terminals, disconnected wiring or a blown fuse.
04-09	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
11	Sensor on Indoor Unit	Inlet Air Thermistor failure	Loosely connected, disconnected, or a severed connection.
12		Outlet Air Thermistor failure	
13		Freeze Protection Thermistor failure	
14		Gas Piping Thermistor failure	
19	Fan Motor	Problem with Indoor Fan	Fan motor lockup, fan motor protection control device for indoor unit activated.
20-29	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
31	System	Incorrect capacity setting for indoor and outdoor units	Incorrect capacity code setting for combination, excessive or insufficient total indoor unit capacity code.
32		Incorrect setting of other indoor unit number	Problem with a different Indoor Unit in the same refrigerant cycle; (Failure at the power supply, defective PCB).
35		Incorrect setting of indoor	Indoor unit number duplicated in same refrigerant group.
36		Incorrect indoor unit combination	Indoor unit is designed for other refrigerant; (R22 or R407C).
38-59	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for the outdoor unit.)		
b0	System	Incorrect setting for unit capacity	Incorrect setting for unit capacity
b1		Incorrect setting of unit and refrigerant cycle number	Unit number or refrigerant cycle ≥ 64
b5		Incorrect setting of indoor unit number for H-LINK type	Interconnected indoor units are not supporting H-LINK II ≥ 17
EE	Compressor	Compressor protection alarm	This alarm code displays when the alarms such as damage to the compressor occur three times within a six hour period.

- When the RUN indicator flashes every four seconds, there is a communication failure between the indoor unit and the wired controller (loose connector, disconnected or incorrect wiring, or a severed connection).
- The indication of the alarm code "EE" means serious abnormality to burn out the compressor.

Refer to the "Installation and Maintenance Manual" for the indoor/outdoor unit connections.

NOTICE

Do NOT operate the air conditioning just to run checks on electrical wiring until preparations for the Test Run phase is completed.

All the installation work of the air conditioning is completed.
Handover this information to the building owner and request to maintain all the equipment manuals and warranty.

Refrigerant Leak Check

Conduct a periodic refrigerant leak check to maintain product performance and secure storage of refrigerant (Fluorocarbons). After completing installation, record the following results into this "Installation and Maintenance Manual":

1. Results of a test for air-tight integrity
2. Total refrigerant charge volume dispensed (including a trim charge added following the installation)
3. Result of the refrigerant leak check

Then hand it over to users and ask them to retain for reference.

All periodic service and maintenance procedures must be conducted only by authorized and trained personnel.

1.3.1.2 Medium Static Type

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1. Introduction

Read this "Installation and Maintenance Manual" carefully before installing this product.



This is "Installation and Maintenance Manual" for the indoor unit. Read over the "Installation and Maintenance Manual" for the outdoor unit as well.

Hand over this "Installation and Maintenance Manual", and the warranty must be provided to all installers and users. Ask end users to maintain copies for future reference.


(Refrigerant Piping Work) → (Electrical Wiring Work) → (Ref. Charge Work) → (Test Run) → (User)

- For details on wiring between the indoor unit and the outdoor unit, refer to the "Installation and Maintenance Manual" for the outdoor unit.
- For details on the optional decorative panel, refer to the "Installation and Maintenance Manual" for the optional decorative panel.
- For details on the optional controller, refer to the "Installation and Maintenance Manual" for that optional controller module.
- For details on each optional part, refer to the "Installation and Maintenance Manual" for each optional part.
- For central station, refer to the "Installation and Maintenance Manual" for the central station.

2. Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.

INSTALLATION

- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Before servicing, turn-OFF the power supply and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

WARNING

To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.

- Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or a hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drain pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the drain pipe becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” the proper use and maintenance of this unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cable shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cable is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications. If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power supply when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power supply completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power supply.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wiring is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

CAUTION

- Proper handling of this unit requires two-people. Safe handling and installing the indoor unit requires the strength of two people. Mounting the unit alone may cause injury due to fall of the unit. Although the unit may be girded with steel banding, do not use it for transportation. Avoid contact with finned surfaces of the heat exchanger as sharp edges can cause severe injury to hands and fingers. Use appropriate work gloves for the job.

NOTICE

- The optional decorative panel can become deformed if the positioning of the indoor units suspension brackets are not stable or level. Condensation can accumulate in low spots as a result due to escaping air through any resulting gaps between the indoor unit and the decorative panel.
- Check to ensure that the drain hose discharges moisture properly. If connected incorrectly, it can result in leakage and damage to furniture.
- Make sure to use the factory-supplied drain hose and hose clamp. Other makes can cause moisture leakage.
- Do not bend or twist the factory-supplied drain hose. This could compromise the seal and result in moisture leakage.
- Do not apply an excessive force to the drain pipe connection. This can also compromise the seal properties of the connection.
- Verify that the installed unit is level with floor and ceiling surfaces. Any variance or inclination can cause moisture to back up into the drain pan, overflow, and seepage onto ceiling or wall surfaces, and cause damage to carpeted surfaces or furniture below.
- Do not install this system in close proximity to septic sewer lines where flammable and toxic gases can coalesce.
- Inspect the drain pan before the onset of winter to drain away all accumulated moisture in the pan.
- The heat exchanger of indoor unit overheats whenever there is a slight amount of refrigerant circulating during slowdown or stoppage. As a result, moisture in the drain pan evaporates where it can condense on ceiling or wall surfaces.
- After the drain check is completed, insert the rubber plug again and seal the gap with a silicon sealant.

Electrical Installation**WARNING**

In some cases, the packaged air conditioner may not be operated normally under the following cases:

- When electrical power for the packaged air conditioner is supplied from the same power transformer as the device*.
- When the power supply wiring for the device* and the packaged air conditioner are located close to each other:

Device*: (Example): Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor, and large-sized switch.
It consumes large quantities of electrical power.

Regarding that mentioned above, surge voltage may be inducted into the power supply wiring for the crated air conditioner due to a spike in power consumption for this device and an activation of the switch. Check the field regulations and standards before performing any electrical work in order to safeguard the power supply for the crated air conditioner unit.

3. Before Installation

3.1 Combination of Outdoor Unit and Indoor Unit





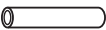


The combination capacity of indoor unit against the outdoor unit is selected depending on the outdoor unit capacity. Refer to the "Installation and Maintenance Manual" for the outdoor unit to decide the required combination of indoor and outdoor units, and the combination unit capacity.

3.2 Transportation and Handling

- Transport the product as close to the installation location as possible before unpacking.
- Do not lay any objects on the indoor unit.
- The indoor unit comes crated upside-down with the foam polystyrene drain pan positioned on top. Do not invert the unit until it is ready to be suspended above the floor. Inverting the unit while on the floor will crush the drain pan. Do not handle the unit by grabbing at the polystyrene pan and other air outlets as they are fragile and will sustain damage.
- The indoor unit handle is fabricated from foam polystyrene and is susceptible to breakage if any excessive force is applied as a result of mishandling of the unit during installation.

3.3 Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the indoor unit. The screws, washers, and flare nuts are packed in the pipe insulation.

Accessory	Qty.	Purpose
Washer (M10) 	8	For Unit Suspension
Screw (M4) 	16	For Fixing Flanges
Hose Clamp 	2	For Drain Pipe Connection
Cable Clamp 	5	For Fixing PVC Tube
PVC Tube 	2	For Separating Communication Cables and Wired Controller Cables from Power Supply Wirings ID 15/32 inch (12mm)
Drain Hose 	1	For Drain Pipe Connection
Rubber Bush 	1	For Connecting Hole

NOTICE

The controller and branch piping are optional accessories which are not included with the indoor unit. If necessary, please contact your contractor.

3.4 Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool
1	Handsaw	11	Wrench
2	Phillips Screwdriver	12	Charging Cylinder
3	Vacuum Pump	13	Manifold Gauge
4	Refrigerant Gas Hose	14	Wire Cutter
5	Megohmmeter	15	Gas Leak Detector
6	Copper Pipe Bender	16	Level
7	Manual Water Pump	17	Clamps for Solderless Terminals
8	Pipe Cutter	18	Hoist (for Indoor Unit)
9	Brazing Kit	19	Ammeter
10	Hexagonal Wrench	20	Voltage Meter

NOTE:
Use tools and measuring instruments (vacuum pump, gas hose, charging cylinder, manifold gauge) exclusively for refrigerant R410A.

4. Installation Location

(Unit: inch)

- (1) Install the indoor unit, allowing for proper clearance for operation and maintenance access, as shown in Figure. 4.1.

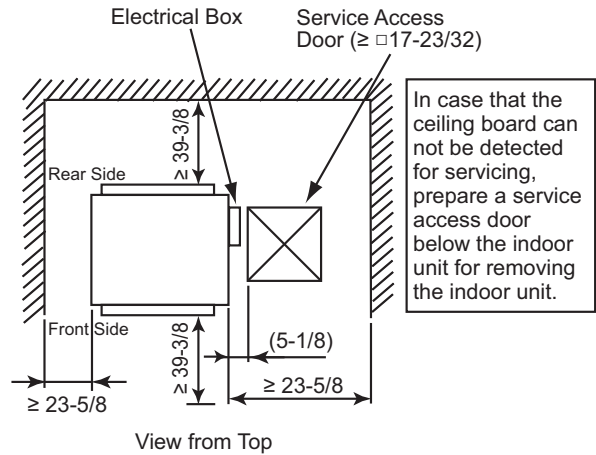


Figure. 4.1 Operation and Installation Space

- (2) Consider the air distribution from the indoor unit to the space of the room, and select a suitable location so that uniform air temperature in the room can be obtained.
- (3) Do not leave combustible materials inside the service space of the indoor unit.
- (4) Avoid obstacles which may hamper the air intake or the air discharge flow.
- (5) Do not install the indoor unit in a machine shop or kitchen where vapor from oil or its mist flows to the indoor unit.
The oil will deposit on the heat exchanger, thereby reducing the indoor unit performance, and may deform and in the worst case, break the plastic parts of the indoor unit.
- (6) Pay attention to the following points when the indoor unit is installed in a hospital or other facilities where there are electronic waves from medical equipment.
 - (a) Do not install the indoor unit where the electromagnetic wave is directly radiated to the electrical box, communication cable or wired controller.
 - (b) Install the indoor unit and components as far away as practical or at least 9.8ft (3m) from any electromagnetic wave radiator.
 - (c) Prepare a steel box and install the wired controller in it. Prepare a steel conduit tube and wire the controller cable in it. Then, connect the ground wiring with the box and the tube.
 - (d) Install a noise filter when the power supply emits harmful noises.
- (7) To avoid any corrosive action to the heat exchangers, do not install the indoor unit in an acid or alkaline environment.

5. Installation Work

5.1 Suspension Bolts

- (1) Determine the final location and installation orientation of the indoor unit with respect to the space allowed for piping, wiring, and maintenance access.
- (2) Mount suspension bolts, as shown in Figure 5.1.

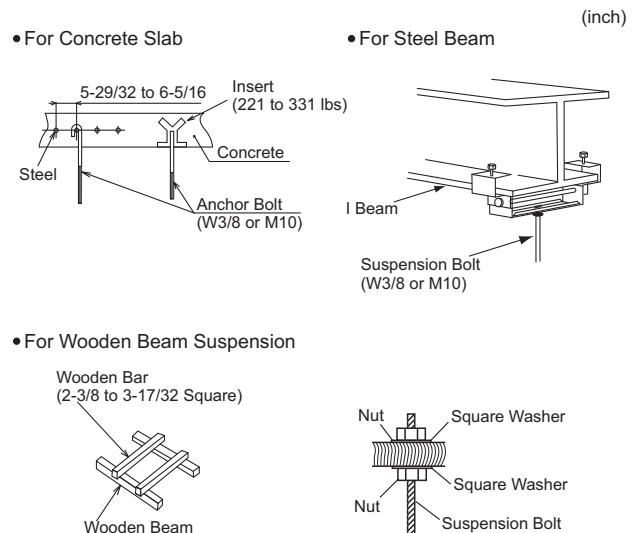
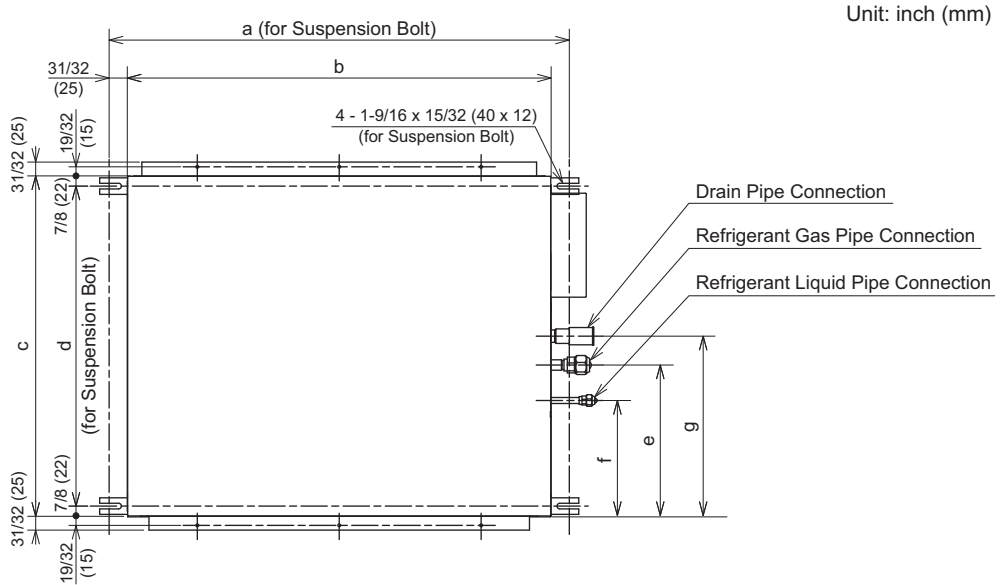


Figure. 5.1 Mounting of Suspension Bolts

5.2 Marking Positions for Suspension Bolts and Piping Connections

- (1) Mark-off the positions for the suspension bolts, refrigerant pipe connections, and drain pipe connection.
- (2) Installation dimensions are shown in Figure 5.2.



Dimension / Model	a	b	c	d	e	f	g
(H,Y)IDM006B21S (H,Y)IDM008B21S (H,Y)IDM012B21S	27-9/16 (700)	25-19/32 (650)	28-11/32 (720)	26-5/8 (676)	12-5/8 (321)	9-11/16 (246)	16-1/16 (408)
(H,Y)IDM015B21S (H,Y)IDM018B21S	37-13/32 (950)	35-7/16 (900)	28-11/32 (720)	26-5/8 (676)	12-5/8 (321)	9-11/16 (246)	16-1/16 (408)
(H,Y)IDM024B21S (H,Y)IDM030B21S	45-9/32 (1,150)	43-5/16 (1,100)	31-1/2 (800)	29-3/4 (756)	13-19/32 (345)	10-5/8 (270)	16-31/32 (431)
(H,Y)IDM036B21S (H,Y)IDM048B21S	57-3/32 (1,450)	55-1/8 (1,400)	31-1/2 (800)	29-3/4 (756)	13-19/32 (345)	10-5/8 (270)	16-31/32 (431)

Figure 5.2 Suspension Bolts

5.3 Mounting Indoor Unit

Hang the indoor unit as shown in Figure 5.3.

Field-Supplied Parts

- * Suspension Bolts: 4-M10 or W3/8
- * Nut: 8-M10 or W3/8

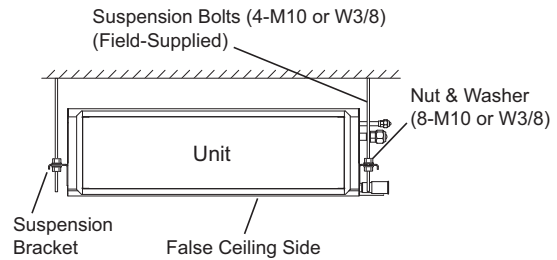


Figure 5.3 Mounting Indoor Unit

INSTALLATION

- (1) How to install Nuts or Suspension Bolts
Install nuts on each of the four hanging bolts, as shown in Figure 5.4.

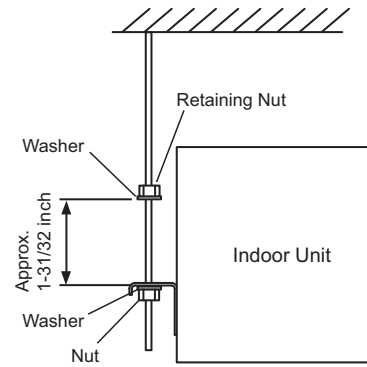


Figure 5.4 Suspension Bolts and Nuts

- (2) Suspending the Indoor Unit

- * Hook the suspension bracket to the nut and washer of each hanging bolt as shown, starting at the opposite side and working over to the service cover side.
- * After verifying that the nut and washer are correctly affixed to the retainers on the suspension bracket, hook the suspension bracket of the service cover side to the nut and washer. (Install the suspension bolts away from the unit when fastening.)

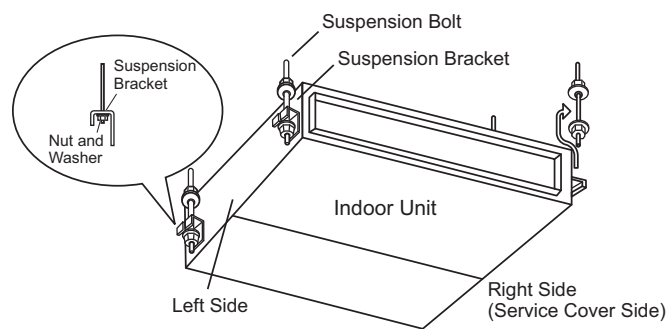


Figure 5.5 Suspended Indoor Unit

5.4 Adjusting Level of Unit

- (1) Use a level to verify that the unit base is perfectly level with the floor. There should be no degree of slope present.

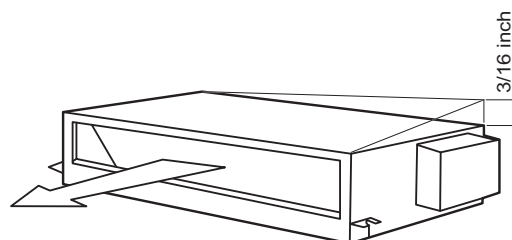


Figure 5.6 Foundation Gradient

- (2) The unit should be installed so that the rear side of the unit is slightly (0 to 3/16 inch (0 to 5mm)) lower than the front side, to allow and promote drainage discharge.
- (3) Tighten the bolts of the suspension nuts with the suspension brackets after adjustment is completed. Special plastic paint must be applied to the bolts in order to prevent them from loosening.

NOTE:

During position the installation process, keep the unit well covered with vinyl cover and related components covered until it is time to hoist into position.

5.5 Connecting the Supply Duct

- (1) The supply duct should be connected to the indoor unit through canvas ducts, in order to avoid abnormal sound vibration (Refer to Figure 5.7). The unit is equipped with a pre-drilled duct flange for the return and supply duct connection.
- (2) Attach the vibration proof rubber to the Suspension Bolt in order to minimize sound from unit operation.
- (3) Duct material should be a non-flammable material type.
- (4) Perform heat insulation work over the duct to prevent condensation.

⚠ CAUTION

- **If a lower sound level is required, install the field-supplied silencer.**
- **Design duct arrangement as "Unit External Static Pressure = Pressure Drop of Duct + Pressure Drop of Air Outlet and Air Inlet".**
Poorly designed duct will result in sound, comfort and water blow-off issues.

< Notice for Outdoor Air Intake (Fresh Air) >

This air conditioner unit is NOT designed for outdoor use.

The following items are to be strictly observed when designing a system for fresh air intake from the outdoors.

1) Considering Ventilation Load

Calculate the air-conditioning load properly with the load of the outdoor air intake. If the load of the outdoor air is not considered, it may cause insufficient cooling or heating operation due to an excessive air-conditioning load against the unit capacity.

2) Limits on Outdoor Air Intake

- Do NOT ingest air from the outdoors directly into the indoor unit.
If an outdoor fresh air intake is necessary for air-conditioning, Johnson Controls Inc. recommends the installation of the ERV (Energy Recovery Ventilation) (Field-supplied) system. The outdoor air shall be processed by the ERV and mixed with indoor air. Only then, is air that now intermixed can be drawn into the indoor unit.

NOTE:

The temperature of the air that is intermixed should fall within the working range as shown below.

	Heating	Cooling
Working Range of Required Indoor Room Temperature	59 to 80°F DB (15 to 27°C DB)	69°F DB/59°F WB (21°C DB/15°C WB) to 89°F DB/73°F WB (32°C DB/23°C WB)

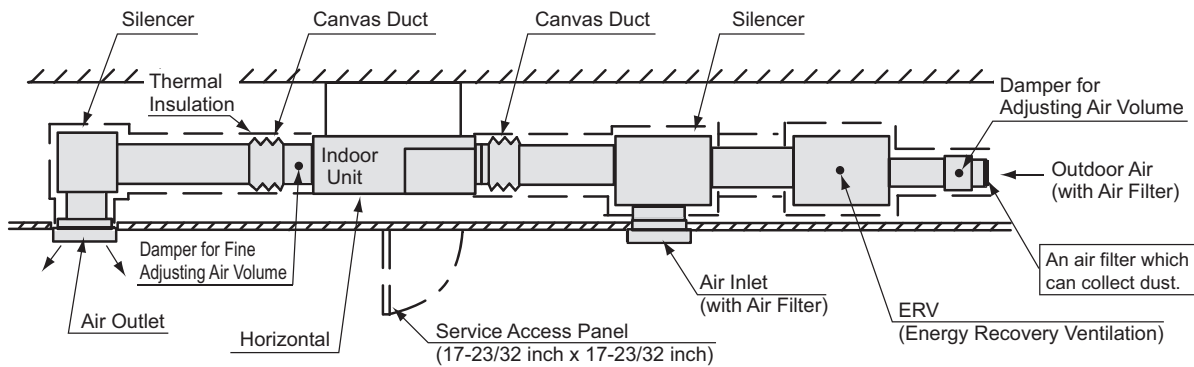
- If the ERV is not used for processing the outdoor air, it can result in insufficient heating/cooling operation or condensation build-up on the inside surfaces of the indoor unit or duct depending on the outdoor air conditions.
- The volume of fresh air is recommended to be within 20% of the airflow volume "Hi2" according to the specification's table in the technical documentation. If it exceeds 20%, ingested condensation will build-up on the inside surfaces of the indoor unit and the airflow volume of the indoor unit cannot be adjusted due to increasing pressure loss of air intake caused by insufficient internal static pressure.
- When the outdoor air is ingested into the indoor unit, make sure to install an air filter capable of keeping the indoor unit free from dust.

3) Facilities for Outdoor Air Intake

- Use the damper or the duct fan to adjust fresh air volume.
- Do NOT ingest in fresh air from the outdoors directly into the indoor unit.
Installing and integrating ERV as a part of the system mix is recommended if incoming air from outdoors is routinely drawn indoors.
- When using ERV or installing a duct fan, make sure to install the interlock circuit between them and the indoor unit fan motor. Make sure to install an ERV in accordance with this "Installation and Maintenance Manual".
- Install thermal insulation on surfaces of interconnecting ducts to prevent the build-up of condensation.

⚠ CAUTION

- If a lower sound level is required, install field-supplied silencer.
- The facility design should be “Unit External Static Pressure = Duct Pressure Loss + Suction / Discharge Pressure Loss”.
If duct pressure loss fall below the external static pressure, airspeed will increase and noise levels along with it. Also, water may splash out from unit and the motor protection circuit activated. Problems such as the inability to adjust airspeed can occur if the external unit static pressure fall below the duct pressure loss. Adjust the airflow control damper or shift the static pressure control switch to an equal level between the external static pressure and duct pressure loss. (refer to “Setting the External Pressure” section for the details.)
- Basically, this unit is configured to install the ducts on the inlet side and the outlet side. Ask for more information on using return ducts in the ceiling.



Static Pressure	in.W.G. (Pa)	0.14 - 0.20* - 0.32 (35 - 50* - 80)
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*: Before Shipment

Figure 5.7 Duct Connection Example

5.6 Setting the External Pressure

Refer to Section 8.6 "External Static Pressure Setting".

6. Refrigerant Piping Work

⚠ DANGER

Use the specified non-flammable refrigerant (HFC R410A) for the outdoor unit refrigerant cycle. Do not charge the unit with anything other than HFC R410A, such as hydrocarbon refrigerants (propane and Isobutene), oxygen, and other flammable gases (acetylene, ammonia, and so forth), or any poisonous gases when installing, maintaining and moving the unit. These substances are volatile and dangerous and can result in fire, explosion, and serious or fatal injuries.

For details on refrigerant piping work, vacuum pump, and refrigerant charge, refer to the "Installation and Maintenance Manual" for the outdoor unit.

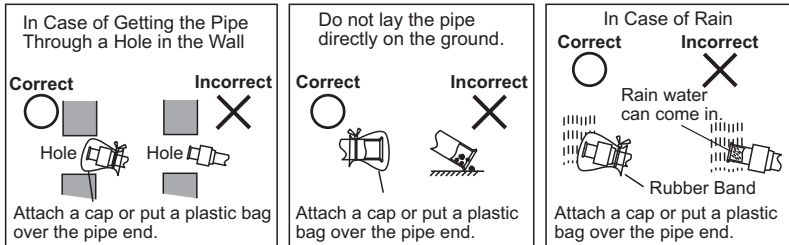
6.1 Piping Materials

- (1) Tolerances for refrigerant piping lengths depend on the combination with the outdoor unit. Refer to the "Installation and Maintenance Manual" for the outdoor unit for details.
- (2) Select the piping size from the following table.

Table 6.1 Piping Size

	inch (mm)	
Model	Gas Piping	Liquid Piping
(H,Y)IDM006B21S (H,Y)IDM008B21S (H,Y)IDM012B21S (H,Y)IDM015B21S	1/2 (12.7)	1/4 (6.35)
(H,Y)IDM018B21S (H,Y)IDM024B21S (H,Y)IDM030B21S (H,Y)IDM036B21S (H,Y)IDM048B21S	5/8 (15.88)	3/8 (9.52)

- (3) Prepare the field-supplied copper piping.
- (4) Select clean copper pipes. Make sure there is no dust and moisture inside.
- (5) The refrigerant oil used in combination with refrigerant R410A is susceptible to problems relating to moisture contamination, oxide film, oil, and fat. Exercise special care during the installation so that moisture, particulate contamination, or old refrigerant oil will not enter the refrigerant cycle. Otherwise, impurities may adhere to the expansion valve and it may prevent the proper operation.
- (6) Caution: When cutting piping, do not use conventional tools such as saws and grinding wheel cutting disks produce harmful metallic filings that can damage a refrigerant system. Use a pipe cutter to eliminate the chances of metal filings produced by the cutting operation. After the cut is made, blow out each pipe with dry compressed air or nitrogen to remove this residue before making pipe connections.

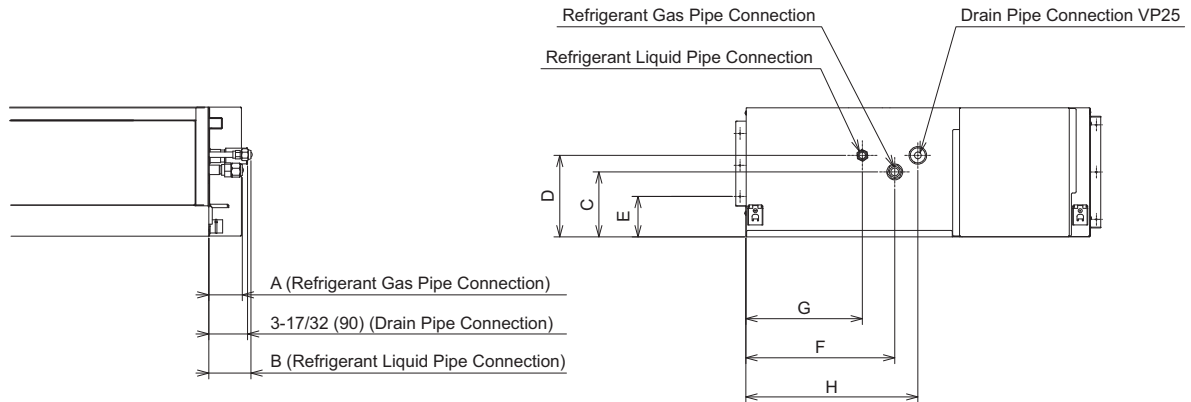


INSTALLATION

6.2 Piping Connection

(1) Position of piping connection is shown below.

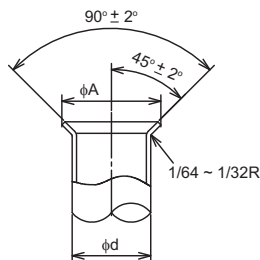
Unit: inch (mm)



Model	A	B	C	D	E	F	G	H
(H,Y)IDM006 - 008B21S	2-3/4 (70)	3-5/8 (92)	7-5/32 (182)	8-3/4 (222)	4-21/32 (118)	12-5/8 (321)	9-11/16 (246)	16-1/16 (408)
(H,Y)IDM015B21S	3-1/32 (77)	3-5/8 (92)	7-5/32 (182)	8-3/4 (222)	4-21/32 (118)	12-5/8 (321)	9-11/16 (246)	16-1/16 (408)
(H,Y)IDM018B21S	3-1/32 (77)	3-5/8 (92)	7-5/32 (182)	8-3/4 (222)	4-21/32 (118)	12-5/8 (321)	9-11/16 (246)	16-1/16 (408)
(H,Y)IDM024 - 030B21S	3-5/32 (80)	3-15/16 (100)	5-29/32 (150)	7-15/32 (190)	3-11/16 (94)	13-19/32 (345)	10-5/8 (270)	16-31/32 (431)
(H,Y)IDM036 - 048B21S	3-5/32 (80)	3-15/16 (100)	5-29/32 (150)	7-15/32 (190)	3-11/16 (94)	13-19/32 (345)	10-5/8 (270)	16-31/32 (431)

(2) Perform the flaring work as shown below.

inch (mm)



Diameter (d)	A +0 -0.02 (-0.4)
1/4 (6.35)	0.36 (9.1)
3/8 (9.52)	0.52 (13.2)
1/2 (12.7)	0.65 (16.6)
5/8 (15.88)	0.78 (19.7)

(3) Use specific flare nut attached with the unit.

(4) Verify that there are no scratches, burrs stuck to internal surfaces, or surface deformations at the flared opening.

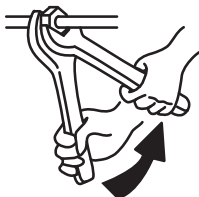
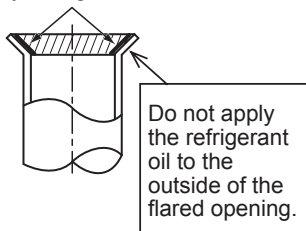
(5) Before tightening the flare nut, apply the (Field-Supplied) refrigerant oil in a thin layer over the flared part. (Do not apply the oil on other areas.) Tighten the flare nut for the liquid pipe to the specified torque with two spanners. Then, tighten the flare nut for the gas piping in the same way. After the tightening work has been completed, check that no refrigerant leakage occurs.

NOTE:

Refrigerant oil is field-supplied.

[Polyvinyl Ether Oil FVC68D (Idemitsu Lubricants America)]

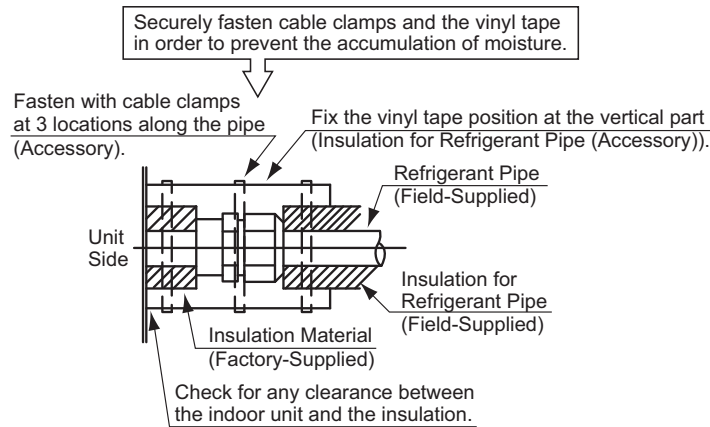
Apply Refrigerant Oil.



Required Tightening Torque (JIS B 8607)

Pipe Size	Tightening Torque
1/4 inch (6.35 mm)	10.3 - 13.3 ft·lbs (14 - 18 N·m)
3/8 inch (9.52 mm)	25.1 - 31.0 ft·lbs (34 - 42 N·m)
1/2 inch (12.7 mm)	36.1 - 45.0 ft·lbs (49 - 61 N·m)
5/8 inch (15.88 mm)	50.2 - 60.5 ft·lbs (68 - 82 N·m)

- (6) Wherever buried piping exists on site, make sure there is a service doorway to provide adequate access to inspect piping sockets and elbows, and for interconnecting parts.
- (7) Piping must be reinforced to withstand earthquakes so as not to be damaged by an external force.
- (8) Do not tightly secure refrigerant piping to accommodate expansion and contraction.
- (9) Prevent the pipes from contacting weak portions such as wall, ceiling, etc. (Otherwise, abnormal sound may be heard due to vibration of the piping.)
- (10) Test for air-tight integrity. The air-tight procedures should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
- (11) If temperature and humidity inside the ceiling exceed 80.6°F (27°C)/RH80%, condensation occurs on the surface of the accessory insulation. Wrap additional insulation (approximately 3/16~13/32 inch (5~10mm) thickness) around the accessory insulation of the refrigerant pipe as a preventive measure.
- (12) Insulate each flare connection without gap with accessory insulations to prevent condensation. Then insulate each refrigerant pipe as well.



7. Drain Piping

Perform drain piping work and attach the insulation before attempting any refrigerant piping work.

- (1) Figure 7.1 shows all drain piping connections.
- (2) Prepare a polyvinyl chloride piping with 1-1/4 inch (32mm) outer diameter.
- (3) Fasten the tube to the drain hose with the adhesive agent and the field-supplied clamp. The drain piping must be performed with a DOWN-SLOPE pitch of 1/25 to 1/100.
- (4) Insulate the drain piping after connecting the drain hose.

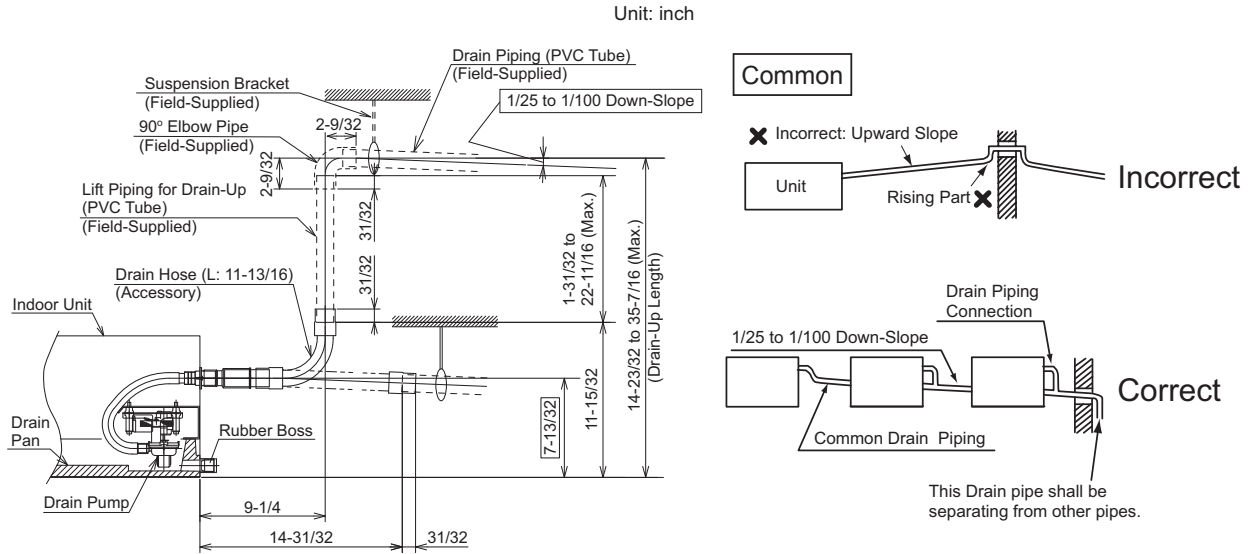


Figure 7.1 Drain Piping

NOTE:

If the relative humidity of a parcel of ambient air exceeds 80%, install a (field-supplied) auxiliary drainage pan beneath the indoor unit as shown in Figure 7.2.

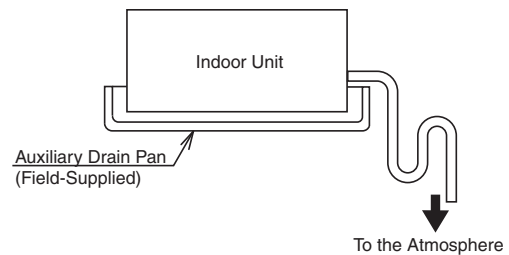


Figure 7.2 Auxiliary Drain Pan

NOTICE

After all drain piping work and electrical wiring is complete, verify that water flows smoothly as in the following procedure.

Verification using a Float Switch

- a. Turn ON the power supply.
 - b. Pour in 68 to 84oz (2 to 2.5 liters) of water into the drain pan.
 - c. Check to ensure that water flows smoothly with no leaks anywhere along the line. If no water is present at the end of the drain pipe opening, pour another 68oz (2 liters) of water into the drain pan.
-

8. Electrical Wiring

WARNING

- All electrical work must be done as outlined in this manual and in accordance with this manual. Substandard work can result in fire and damage to the unit.
- Use specified cables between units and choose the cables correctly. If not, an electrical shock or fire may occur.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply. It can result in an electrical shock.
- Turn OFF the main power switch of the indoor unit and the outdoor unit before attempting any electrical wiring work or a periodical check is performed. If not, it will result in an electric shock or a fire.
- Check to ensure that the indoor fan and the outdoor fan have stopped before attempting any electrical wiring work or for any scheduled electrical work that is being performed.
- Tighten screws according to the following torque.
 - M3.5: 0.9 ft·lbs (1.2 N·m)
 - M4: 0.7 to 1.0 ft·lbs (1.0 to 1.3 N·m)

CAUTION

- Secure all cables together with zip-ties and seal the connecting hole against the onslaught of moisture and insects.
- Run the electrical wiring through the connecting hole in the side cover when using conduit.
- Secure the wired controller cable using the cable clamp inside the electrical box.

8.1 General Check

- (1) Make sure that the field-selected electrical components: (main power switches, circuit breakers, wires, conduit connectors, and wire terminals) have been properly labeled in accordance with electrical data as specified in the Engineering Manual. Make sure that the components comply with the National Electrical Code (NEC).
- (2) Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
- (3) Check the capacity of the electrical wires.
If the power supply capacity is too low, the system cannot be started due to a voltage drop.
- (4) Verify that the ground wiring is securely connected.

8.2 Electrical Wiring Capacity

8.2.1 Field Minimum Wire Sizes for Power Supply

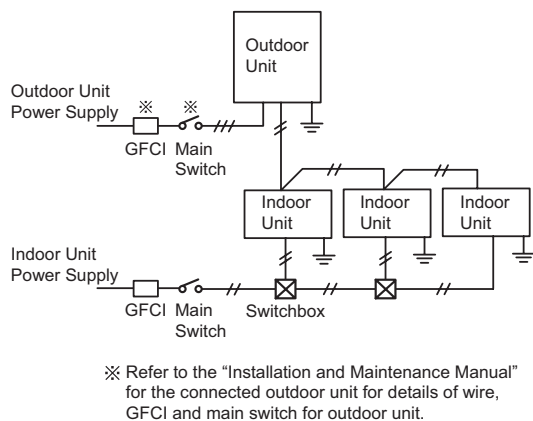
- This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches and wiring in accordance to local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements. Failure to use a GFCI can result in electrical shock or fire.
- Do not operate the system until all the check points have been cleared.
 - (A) Verify that electrical resistance is more than one megaohm by measuring the resistance between ground and the terminals of the various electrical components. If less than one megaohm, do not activate the system until the electrical current drain is found and repaired.
 - (B) Check to ensure that the stop valves for the outdoor unit are fully opened, and then start the system.
 - (C) Check to see that the main power has been switched ON for longer than 12 hours prior activating the system. Power to the crankcase heater needs this time interval to warm the compressor oil up to operating temperature.
- Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 194°F (90°C).

8.2.2 Details of Electrical Wiring Connection

The electrical wiring capacity of the outdoor unit should be referred according to the "Installation and Maintenance Manual" for the outdoor unit. Adjusting the DIP switches may be required depending on the arrangement with the outdoor unit.

Select wiring capacity according to the table 8.1. Install a GFCI (Ground Fault Circuit Interrupter) and main switch as shown in each of the system diagrams below.

< Heat Pump System >



< Heat Recovery System >

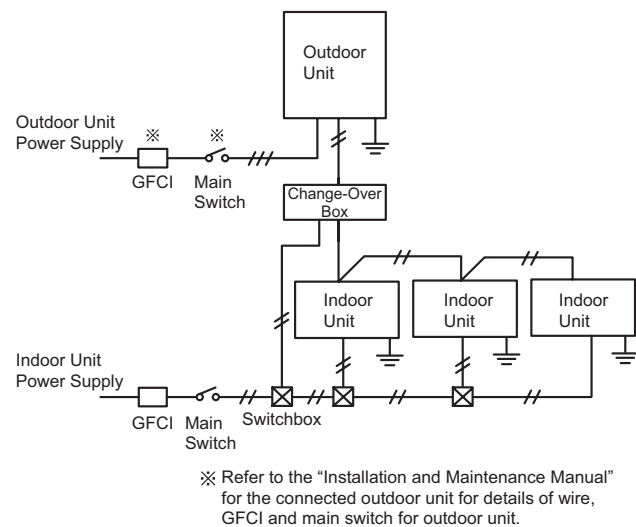


Table 8.1 Recommended Wiring Capacity and Size

Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA <Minimum Circuit Ampacity> [A]
		Power Supply Wiring Size < Main >	Ground Wiring Size	Communication Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
(H,Y)IDM006B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	0.60
(H,Y)IDM008B21S									0.60
(H,Y)IDM012B21S									0.60
(H,Y)IDM015B21S									0.60
(H,Y)IDM018B21S									0.60
(H,Y)IDM024B21S									1.01
(H,Y)IDM030B21S									1.01
(H,Y)IDM036B21S									1.01
(H,Y)IDM048B21S									1.01

NOTES:

- 1) Follow local codes and regulations when selecting field wiring.
- 2) Select a GFCI with an activation speed of (0.1 second or less).
- 3) Total operating current is less than 12A.

NOTICE

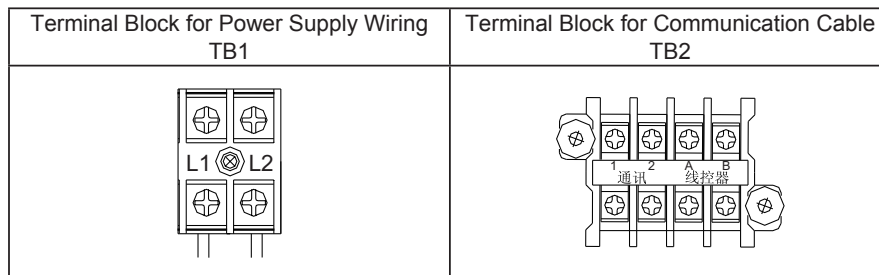
- Check for the recommended size GFCI shown in the table 8.1.
- Between indoor and outdoor units, use dual-conductor, AWG18 (0.82mm²) stranded copper cable for communication cable. Do not use any cable with more than two conductors. Twisted pair or shielded cable can be used in environments with excessive electrical noise to reduce the possibility of communication errors between system components. Total cable length should not exceed 3281 ft (1000m).
- Select the wiring size, GFCI (Ground Fault Circuit Interrupter) in accordance with the regulations for each region, the "Installation and Maintenance Manual", and the dedicated electrical circuit that must be used.
- Outside of the indoor unit, installation of the power supply wiring, communication cable, and wired controller cable should be spaced as far apart as possible.

8.3 Position of Electrical Wiring Connection

- The electrical wiring connection for the indoor unit is shown in Section 8.2.2.
- The connection at the terminal block for the indoor unit is shown below. Check the outdoor unit for the combination before the wiring work begins. Screw fasteners at the terminal block should be tightened according to recommended torque specifications as shown in the table below.

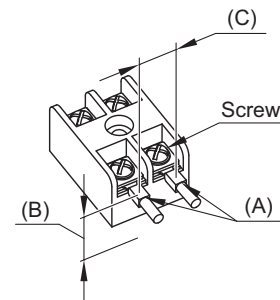
Torque Specifications for Terminals

Screw Size		Torque Specification
TB1	M4	0.7 - 1.0 ft·lbs (1.0 - 1.3 N·m)
TB2	M3.5	0.9 ft·lbs (1.2 N·m)



NOTICE

- Do not connect the main power supply wiring to the communication line (Terminals A, B, 1 and 2 of TB2). If these are connected, the printed circuit board (PCB) will be destroyed.
- Note the following for wire connections at TB1 and TB2:
 - (A) Attach a piece of insulation tape or sleeve at each terminal.
 - (B) Maintain a safe distance between the electrical box and the terminals to prevent a short circuit.
 - (C) Maintain a safe distance between the terminals.

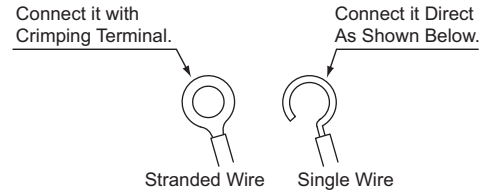


INSTALLATION

- (1) Connect the cable for the optional controller or the optional extension cable to the terminals inside the electrical box through the connecting hole of the cabinet.
- (2) Connect the power supply and the ground wiring to the terminals in the electrical box.
- (3) Connect the cables between the indoor unit and the outdoor unit to the terminals inside the electrical box.
- (4) Connect cables to their corresponding terminal number and the similarly marked band.
- (5) Connect the communication cable between those indoor units connected to the same outdoor unit.
- (6) Do not connect the main power supply wiring to the communication line (Terminals A, B, 1 and 2 of TB2). If connected, the printed circuit board (PCB) will be destroyed.
- (7) Tightly clamp the power supply wiring and communication cables using the cable clamp inside the electrical box.

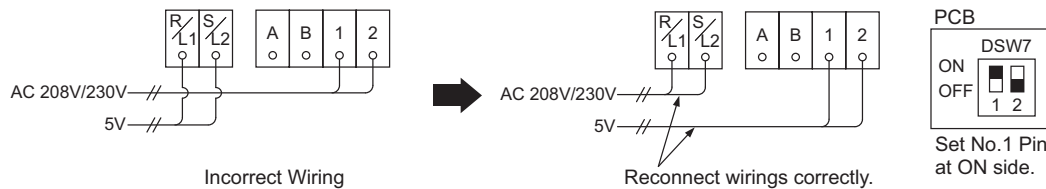
NOTE:

When the standard wire is used for the field-wiring connection, the M4 crimping terminal should be used. When the single wire is used, fashion it into the shape as shown at right and connect it in order to tighten the washer uniformly. The screws at the terminal block should be tightened according to the torque specification as shown in the table above.



- (8) All electrical work should be performed in strict accordance with electrical schematics in the "Installation and Maintenance Manual".
- (9) If Power Supply Voltage (208V/230V) is introduced into the Communication Line:
If 208V/230V are applied to the communication line at (Terminals 1 and 2 of TB2) by mistake, the fuse on the PCB for the communication line will blow. In this case, perform the recovery work as shown in the diagrams below.
 - (a) Reconnect the wirings correctly.
 - (b) Set the No.1 pin at DSW7 (on the PCB) to ON.

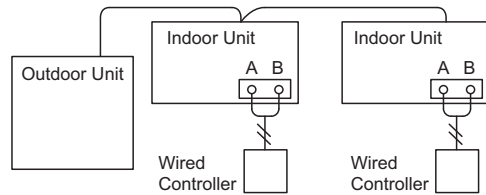
Upon PCB recovery after the fuse has been replaced, if 208V / 230V is reintroduced into the communication line, the PCB will be seriously damaged and will not recover.



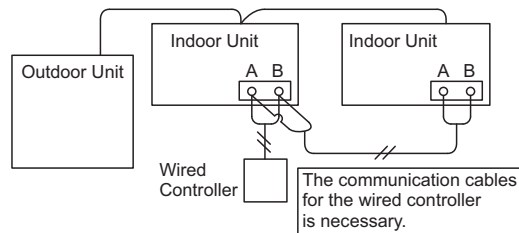
(10) Wired Controller Connection

- VRF Systems

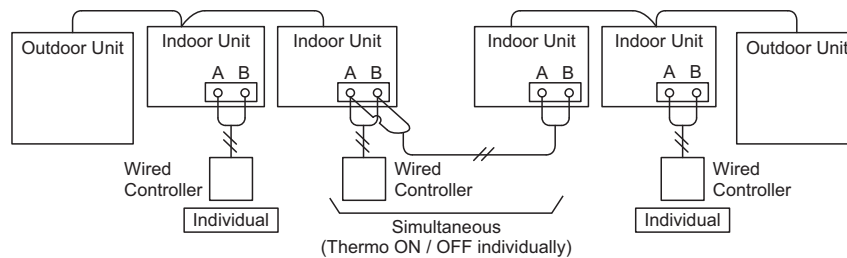
(a) Wired Controllers to each Unit for Individual Operation Setting



(b) Single Wired Controller for Individual Operation Setting



(c) Wired Controller Connections between different Refrigerant Cycles



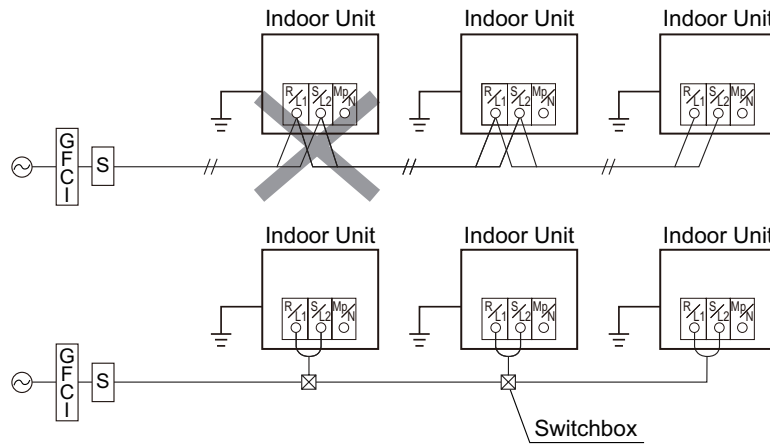
NOTICE

1. The DIP switch settings for the outdoor unit should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
2. Be aware that communication cable for the wired controller is required in these instances:
 - a. The following functions are set to the sub unit which is not installed with the wired controller.
 - Remote ON/OFF function settings, (No.1, 2, and 3), (External Input / Output Function)
 - Power supply ON/OFF functions, (No.1 and 2), (Function Selection)
 - Prohibiting the wired controller after manual stoppage (External Input / Output Function)
 - Group setting by the centralized controller
 - b. The combination of twin, triple, or quad is controlled by single wired controller.
 - c. The address for the indoor unit is changed from the wired controller.

INSTALLATION

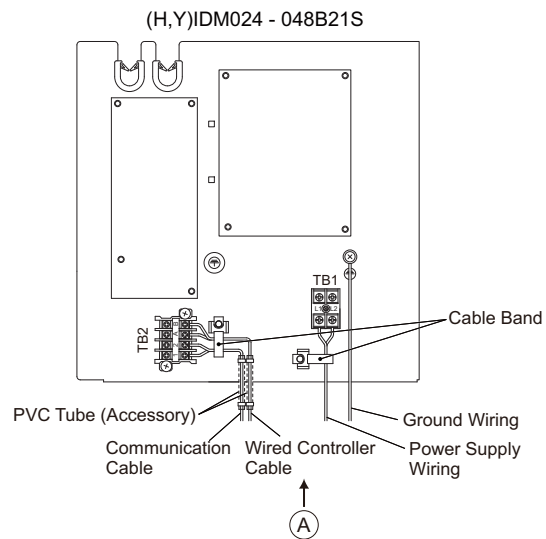
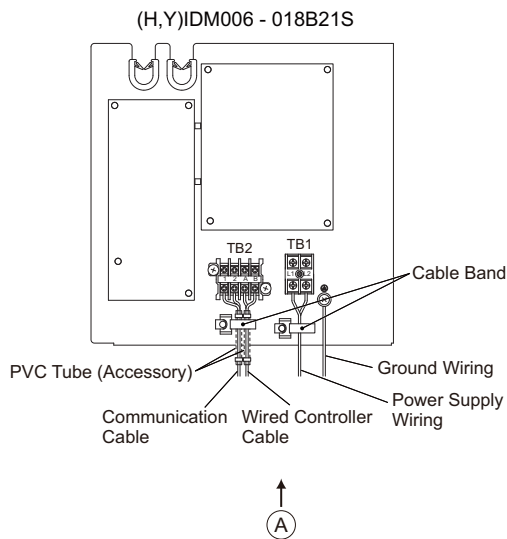
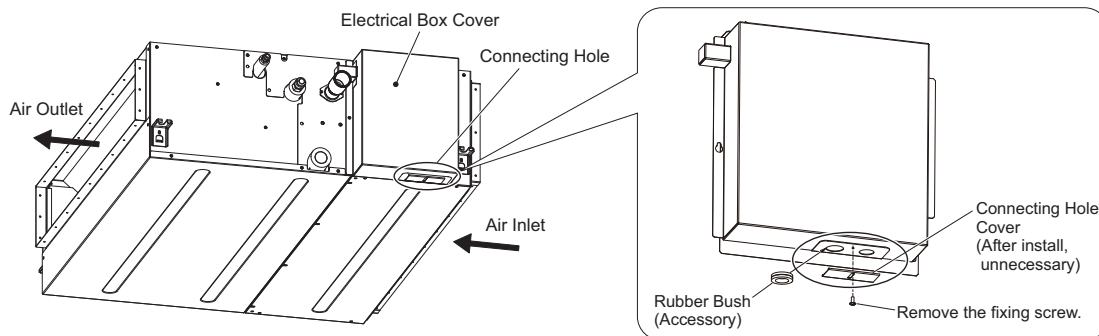
< Caution for Electrical Wiring >

- Do not connect the power supply wiring and the communication cable into one terminal.
- The manual switchbox is required when communication cable is required.



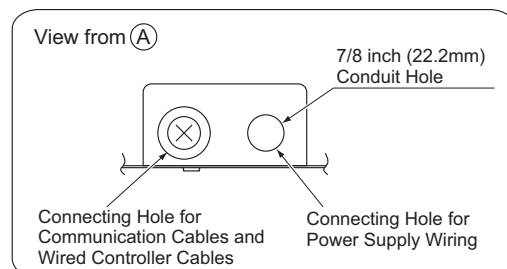
8.4 Wiring Connection

- (1) Remove the connecting hole cover of the electrical box and install the rubber bush (Accessory) to the connecting hole for communication cable.
- (2) Pass the communication cable and the wired controller cable through the connecting hole for communication cable.
Connect the communication cable to the terminals 1, 2 of TB2 inside the electrical box.
Connect the wired controller cable to the terminals A, B of TB2 inside the electrical box.
- (3) Pass the power supply wiring and the ground wiring through the connecting hole for power supply wiring.
Connect the power supply wiring to the terminals L1, L2 of TB1 inside the electrical box.
Connect the ground wiring to the ground terminal inside the electrical box.
(When connecting the power supply wiring and the ground wiring outside of the unit, run through the conduit tube.)
- (4) Tightly clamp the power supply wiring, the ground wiring, the wired controller cable and the communication cable utilizing the cable band.



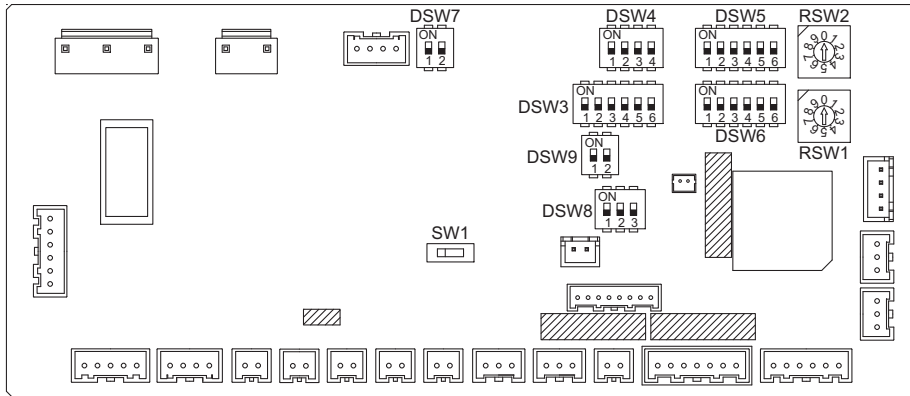
NOTE

- Insert the communication cables and wired controller cable into the PVC tube "VW-1 600V" (Accessory) to separate them from the power supply wirings in the indoor unit.
- Fix the both ends of the PVC tube by cable clamp (Accessory).
- If shielded cable is used, terminate at the ground terminal.



8.5 DIP Switches Settings

- (1) Turn OFF the power supply to both indoor and outdoor units before adjusting DIP switch settings. Otherwise, the setting will be invalidated and not take effect.
- (2) Positions of DIP switches are shown below.



- (3) **Unit No. Setting**
Setting is not required.

Indoor unit numbers are set by the auto-address function. If an indoor unit number setting is required, set the unit number of all indoor units respectively and sequentially by following setting position. It is recommended that you assign a number to each indoor unit from "1". A maximum of 64 indoor units per refrigerant cycle can be connected to an H-LINK II System. Though the available numbers range from zero to 63, the applicable number for the 64th indoor unit in theory supplants the number "zero". For the centralized control, this setting is required.

Unit No. Setting

<p>DSW6 (Tens Digit)</p>	<p>RSW1 (Units Digit)</p> <p>Setting Position</p> <p>Set by inserting slotted screwdriver into the groove.</p>	<p>Ex.) Set at No.16 Unit</p> <p>DSW6</p> <p>Set No.1 Pin at ON side</p> <p>RSW1</p> <p>Set at "6"</p>
<p>Before shipment, DSW6 and RSW1 are set at "0".</p> <p>For the units supporting H-LINK II, the unit No. can be set for Max. 64 indoor units (No.0~63).</p>		

- (4) **Capacity Code Setting (DSW3)**
No setting is required, due to setting before shipment. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.





Indoor Unit Capacity (MBH)	06	08	12	15	18
Setting Position					
Indoor Unit Capacity (MBH)	24	30	36	48	
Setting Position					

- (5) **Unit Model Code Setting (DSW4)**
No setting is required. It is for setting the model code of the indoor unit.

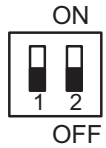


- (6) Refrigerant Cycle No. Setting (RSW2 & DSW5)
 This setting is required. The unit arrives with all settings in the OFF position.

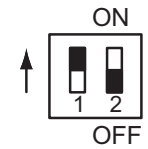
Refrigerant Cycle No. Setting

DSW5 (Tens Digit) 	RSW2 (Units Digit) 	Ex.) Set at No.5 Cycle DSW5  Set All Pins OFF RSW2  Set at "5"
Before shipment, DSW5 and RSW2 are set at "0". For the units supporting H-LINK II, the ref. cycle No. can be set for Max. 64 cycles. (No. 0-63)		

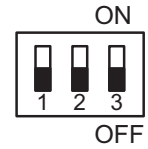
- (7) Fuse Recovery (DSW7)
 * Factory Settings



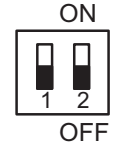
* In the case of applying high voltage to terminals 1 and 2 of TB2, the 0.5A fuse on the PCB is cut. In such a case, first reconnect the wirings correctly to TB2, and then set the number one pin to ON.



- (8) Function Setting (DSW8)
 No setting is required, due to setting before shipment.



- (9) Optional Function Setting (DSW9)
 No setting is required. Setting positions before shipment are all OFF.



NOTES:

- The "■" mark indicates setting for DIP switches. The two illustrations immediately above show settings in the OFF position.
- When the unit number and the refrigerant cycle are set, record the unit number and refrigerant cycle to facilitate service and maintenance thereafter.

NOTICE

Turn OFF all power to the indoor and outdoor units prior to adjusting DIP switch settings. Otherwise, the setting will be invalidated and not take effect.

8.6 External Static Pressure Setting

Static pressure setting on the wired controller ("C5").
 Refer to the "Installation and Maintenance Manual" for the wired controller for details.

Static Pressure	Wired Controller Set
0.32 in.W.G. (80 Pa)	C5 01
0.20 in.W.G. (50 Pa)	C5 00
0.14 in.W.G. (35 Pa)	C5 02

8.7 Function Selection by Wired Controller

Each function can be selected with the wired controller. Refer to the "Installation and Maintenance Manual" for the wired controller and the "Engineering Manual" for details.

< Circulator Function at Heating Thermo-OFF >

This function maintains fan operation by the set airflow volume at the heating Thermo-OFF. It improves temperature distribution when the unit is mounted on a high ceiling.

9. Test Run

9.1 Before Test Run

Verify that there are no problems with the installation, and do not perform Test Run until all the following conditions have been resolved.

Refer to the "Installation and Maintenance Manual" for the outdoor unit for details on Test Run operations from the outdoor unit.

Verify that refrigerant piping and the communication cable are connected to the same refrigerant cycle system. If not, it will cause an abnormal operation and damage to instrumentation.

- (1) Verify that electrical resistance is more than one megaohm, by measuring the resistance between ground and the terminal the terminus for electrical components. If the electrical resistance is less than one megaohm, do NOT operate the system until the electrical current outflow to ground is detected and repaired. Do not introduce any high voltage to the terminals of the communication cables (TB2 [A, B, 1 and 2]).
- (2) Verify that each wire is connected correctly at the correct phase for the power supply. If it is incorrectly connected, the unit will not operate and the wired controller will display the alarm code "05". In this case, check the phase for the primary power supply according to the "Attention" label affixed to the back side of the service cover. Then, with the power supply turned OFF at the power supply, remake the necessary connections.
- (3) Check to ensure that the main power supply has been turned ON for more than 12 hours, to warm up the compressor oil by the crankcase heater.
- (4) Verify that all DIP Switch settings are correct. Refer to Section 8.6 "DIP Switch Settings".

9.2 Test Run

After all installation work is completed, **Test Run** should be performed.

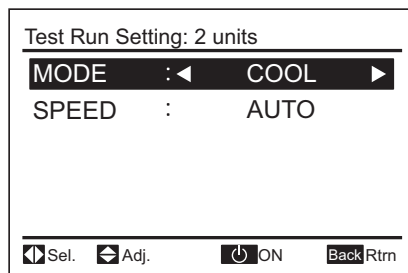
- (1) Check to ensure that stop valves (gas and liquid) for the outdoor unit are fully opened.
- (2) Whenever indoor units are connected to the VRF system, perform the **Test Run** for the indoor units one by one sequentially and then check the refrigerant piping system and the electrical wiring system for conformity. (If these multiple indoor units are operated simultaneously, system conformity cannot be verified.)
- (3) Perform the **Test Run** in accordance with the following procedure. Ensure that the Test Run is carried out without any problem. The following procedure shows a case where a wired controller is utilized. If other controllers are activated instead, refer to the "Installation and Maintenance Manual" for those other controllers.

NOTE:

The outdoor unit may not be operated depending on the indoor and outdoor temperature conditions. Refer to the "Installation and Maintenance Manual" for outdoor units for details.

- (a) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds. The **Test Run** menu will be displayed.
 - The **Test Run** menu will be displayed.

Test Run Screen

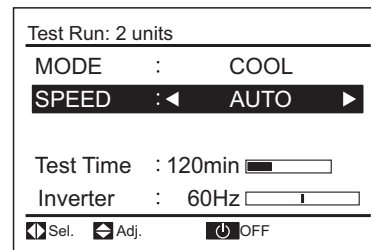


NOTE

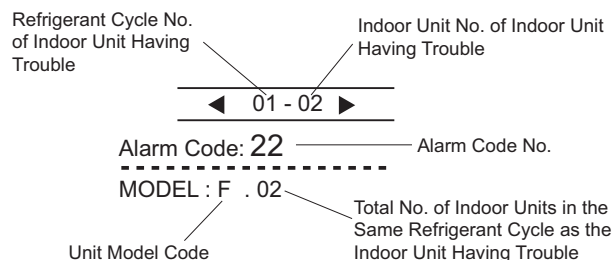
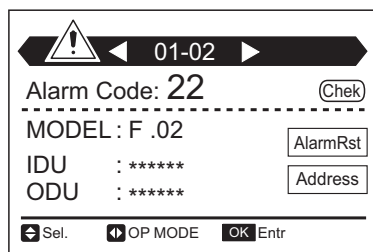
When the "00 unit" is displayed, the auto-address function may be working. Cancel "**Test Run**" mode and reset.

INSTALLATION

- The total number of connected indoor units is indicated on the LCD (Liquid Crystal Display). In the case of a twin combination (set of two indoor units), the total number of the connected indoor units is displayed as “**2 units**”, and where there is a triple combination (set of three indoor units), the total number of the connected indoor units is displayed as “**3 units**”.
 - If the number indicated is not equal to the actual number of connected indoor units, the auto-address function is not performing correctly due to incorrect wiring or electrical interference. Turn OFF the power supply, and resolve the wiring issue after verifying the following items; (Do not repeat turning ON and OFF within a 10 second timespan.)
 - The power supply to the indoor unit is not turned ON or there is an incorrect wiring issue.
 - Incorrect connection of the interconnecting cable between indoor units or a poorly connected controller cable.
 - Incorrect setting of the rotary switch and DIP switch for the indoor unit printed circuit board (PCB). (The setting is overlapped.)
 - Press “**⏻ On/Off**” to start the Test Run.
 - Press “**△ ▽ ◀ ▶**” and set each item.
- (b) Press “**⏻ On/Off**”.
- The RUN indicator turns ON and the operation starts. At this time, a two-hour OFF timer will be set automatically.
- (c) Though temperature recordings by the thermistors are invalid during the Test Run phase, the protection devices are valid.
- (d) For VRF System
According to the label; “Checking Method by 7-Segment Display” affixed to the inside of the front cover of the outdoor unit, check temperature, pressure, and operation frequency, and interconnected indoor unit numbers by 7-Segment displays.
- (e) To complete Test Run, press “**⏻ On/Off**” again or wait for the set Test Run time to pass.
When changing the Test Run time, press “**△**” or “**▽**” to select “**TEST TIME**”. Then, set the test run time (30 to 600 minutes) by pressing “**◀**” or “**▶**”.



- The RUN indicator on the wired controller for the indoor unit will flash orange (0.5 second ON/ 0.5 second OFF), indicative of a fault or error having been generated with activation of protection devices during the Test Run phase. Alarm code, unit model code, and the number of interconnected indoor units will be displayed on the LCD as shown below. If the RUN indicator on the wired controller flashes for two seconds ON and two seconds OFF, the source of the problem could be a failure in the communication cable between the indoor unit and the wired controller (a loose or severed connection). In this case, verify Section 9.3 “Alarm Code” and perform the appropriate troubleshooting measures. Consult with an authorized service engineer if the problem cannot be resolved at your end.



< Unit Model Code >

The relationship between the unit model code and the unit model is shown in the table below.

Indication	Unit Model
F	VRF System
E	Except Above Models

9.3 Alarm Code

Alarm (Troubleshooting) Code Table

Code No.	Category	Nature of Problem	Likely Cause
01	Indoor Unit	Activation of a protection device (Float switch)	Activation of the float switch; (High water level present in the drain pan.) A problem exists in the piping.
02	Outdoor Unit	Activation of protection device; (Except for Alarm Code: 41, 42)	High Pressure Cut; (R410A: 601 psi (4.15MPa)), fan motor lockup during the outdoor unit cooling operation.
03	Communication	Communication failure between indoor and outdoor units	Incorrect wiring, loose terminals, disconnected wiring or a blown fuse.
04-09	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
11	Sensor on Indoor Unit	Inlet Air Thermistor failure	Loosely connected, disconnected, or a severed connection.
12		Outlet Air Thermistor failure	
13		Freeze Protection Thermistor failure	
14		Gas Piping Thermistor failure	
19	Fan Motor	Problem with Indoor Fan	Fan motor lockup, fan motor protection control device for indoor unit activated.
20-29	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
31	System	Incorrect capacity setting for indoor and outdoor units.	Incorrect capacity code setting for combination, excessive or insufficient total indoor unit capacity code.
32		Incorrect setting of other indoor unit number	Problem with a different Indoor Unit in the same refrigerant cycle; (Failure at the power supply, defective PCB).
35		Incorrect setting of indoor	Indoor unit number duplicated in same refrigerant group.
36		Incorrect indoor unit combination	Indoor unit is designed for other refrigerant; (R22 or R407C).
38-59	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for the outdoor unit.)		
b0	System	Incorrect setting for unit capacity	Incorrect setting for unit capacity
b1		Incorrect setting of unit and refrigerant cycle number	Unit number or refrigerant cycle ≥ 64
b5		Incorrect setting of indoor unit number for H-LINK type	Interconnected indoor units are not supporting H-LINK II ≥ 17
EE	Compressor	Compressor protection alarm	This alarm code displays when the alarms such as damage to the compressor occur three times within a six hour period.

- When the RUN indicator flashes every four seconds, there is a communication failure between the indoor unit and the wired controller (loose connector, disconnected or incorrect wiring, or a severed connection).
- The indication of the alarm code "EE" means serious abnormality to burn out the compressor.

Refer to the "Installation and Maintenance Manual" for the indoor/outdoor unit connections.

NOTICE

Do NOT operate the air conditioning just to run checks on electrical wiring until preparations for the Test Run phase is completed.

All the installation work of the air conditioning is completed.
Handover this information to the building owner and request to maintain all the equipment manuals and warranty.

Refrigerant Leak Check

Conduct a periodic refrigerant leak check to maintain product performance and secure storage of refrigerant (Fluorocarbons). After completing installation, record the following results into this "Installation and Maintenance Manual":

1. Results of a test for air-tight integrity
2. Total refrigerant charge volume dispensed (including a trim charge added following the installation)
3. Result of the refrigerant leak check

Then hand it over to users and ask them to retain for reference.

All periodic service and maintenance procedures must be conducted only by authorized and trained personnel.

1.3.1.3 Slim Type

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1. Introduction

Read this "Installation and Maintenance Manual" carefully before installing this product.

This is "Installation and Maintenance Manual" for the indoor unit. Read over the "Installation and Maintenance Manual" for the outdoor unit as well.

Hand over this "Installation and Maintenance Manual", and the warranty must be provided to all installers and users. Ask end users to maintain copies for future reference.
 (Refrigerant Piping Work) → (Electrical Wiring Work) → (Ref. Charge Work) → (Test Run) → (User)

- For details on wiring between the indoor unit and the outdoor unit, refer to the "Installation and Maintenance Manual" for the outdoor unit.
- For details on the optional controller, refer to the "Installation and Maintenance Manual" for that optional controller module.
- For details on each optional part, refer to the "Installation and Maintenance Manual" for each optional part.
- For central station, refer to the "Installation and Maintenance Manual" for the central station.

2. Safety Instructions

Signal Words	
WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
----------------	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.

INSTALLATION

- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Before servicing, turn-OFF the power supply and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

⚠ WARNING

To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.

- Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or a hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drain pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the drain pipe becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” the proper use and maintenance of this unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cable shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cable is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications. If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power supply when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power supply completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power supply.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wiring is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

⚠ CAUTION

- Proper handling of this unit requires two-people. Safe handling and installing the indoor unit requires the strength of two people. Mounting the unit alone may cause injury due to fall of the unit. Although the unit may be girded with steel banding, do not use it for transportation. Avoid contact with finned surfaces of the heat exchanger as sharp edges can cause severe injury to hands and fingers. Use appropriate work gloves for the job.

NOTICE

- Check to ensure that the drain hose discharges moisture properly. If connected incorrectly, it can result in leakage and damage to furniture.
- Make sure to use the factory-supplied drain hose and hose clamp. Other makes can cause moisture leakage.
- Do not bend or twist the factory-supplied drain hose. This could compromise the seal and result in moisture leakage.
- Do not apply an excessive force to the drain pipe connection. This can also compromise the seal properties of the connection.
- Verify that the installed unit is level with floor and ceiling surfaces. Any variance or inclination can cause moisture to back up into the drain pan, overflow, and seepage onto ceiling or wall surfaces, and cause damage to carpeted surfaces or furniture below.
- Do not install this system in close proximity to septic sewer lines where flammable and toxic gases can coalesce.
- Inspect the drain pan before the onset of winter to drain away all accumulated moisture in the pan.
- The heat exchanger of indoor unit overheats whenever there is a slight amount of refrigerant circulating during slowdown or stoppage. As a result, moisture in the drain pan evaporates where it can condense on ceiling or wall surfaces.
- After the drain check is completed, insert the rubber plug again and seal the gap with a silicon sealant.

Electrical Installation**⚠ WARNING**

In some cases, the packaged air conditioner may not be operated normally under the following cases:

- When electrical power for the packaged air conditioner is supplied from the same power transformer as the device*.
- When the power supply wiring for the device* and the packaged air conditioner are located close to each other:

Device*: (Example): Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor, and large-sized switch.
It consumes large quantities of electrical power.

Regarding that mentioned above, surge voltage may be inducted into the power supply wiring for the crated air conditioner due to a spike in power consumption for this device and an activation of the switch. Check the field regulations and standards before performing any electrical work in order to safeguard the power supply for the crated air conditioner unit.

3. Before Installation

3.1 Combination of Outdoor Unit and Indoor Unit

The combination capacity of indoor unit against the outdoor unit is selected depending on the outdoor unit capacity. Refer to "Installation and Maintenance Manual" for outdoor unit to decide the required combination of indoor and outdoor units, and the combination unit capacity.





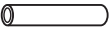
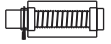

3.2 Transportation and Handling

- (1) Transport the product as close to the installation location as possible before unpacking.
- (2) Do not lay any objects on the indoor unit.
- (3) The indoor unit comes crated upside-down with the foam polystyrene drain pan positioned on top. Do not invert the unit until it is ready to be suspended above the floor. Inverting the unit while on the floor will crush the drain pan. Do not handle the unit by grabbing at the polystyrene pan and other air outlets as they are fragile and will sustain damage.
- (4) The indoor unit handle is fabricated from foam polystyrene and is susceptible to breakage if any excessive force is applied as a result of mishandling of the unit during installation.

INSTALLATION

3.3 Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the indoor unit. The screws, washers and flare nuts are packed in the pipe insulation.

Accessory	Qty.	Purpose
Washer (M10) 	8	For Unit Suspension
Screw (M4) 	8	For Fixing Flanges
Hose Clamp 	2	For Drain Pipe Connection
Cord Clamp 	5	For Fixing PVC Tube
PVC Tube 	2	For Separating Transmission Wirings and Wired Controller Wirings from Power Supply Wirings ID 15/32 inch (12mm)
Drain Hose 	1	For Drain Pipe Connection
Rubber Bush 	1	For Connecting Hole

NOTICE

The controller and branch piping are optional accessories which are not included with the indoor unit. If necessary, please contact your contractor.

3.4 Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool
1	Handsaw	11	Wrench
2	Phillips Screwdriver	12	Charging Cylinder
3	Vacuum Pump	13	Manifold Gauge
4	Refrigerant Gas Hose	14	Wire Cutter
5	Megohmmeter	15	Gas Leak Detector
6	Copper Pipe Bender	16	Level
7	Manual Water Pump	17	Clamper for Solderless Terminals
8	Pipe Cutter	18	Hoist (for Indoor Unit)
9	Brazing Kit	19	Ammeter
10	Hexagon Wrench	20	Voltage Meter

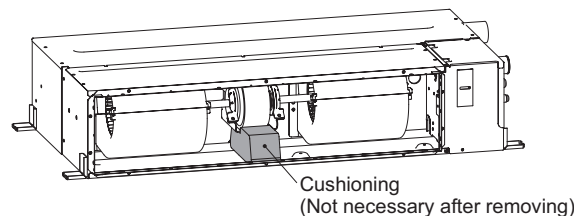
NOTE:

Use tools and measuring instruments (vacuum pump, gas hose, charging cylinder, manifold gauge) exclusively for refrigerant R410A.

3.5 Removing Cushioning

Make sure to remove the cushioning from inside of the unit.

If operating without removing the cushioning, abnormal sound and abnormal heat generation may occur.



4. Installation Location

- (1) Install the indoor unit, allowing for proper clearance for operation and maintenance access, as shown in Figure 4.1.

(Unit: inch)

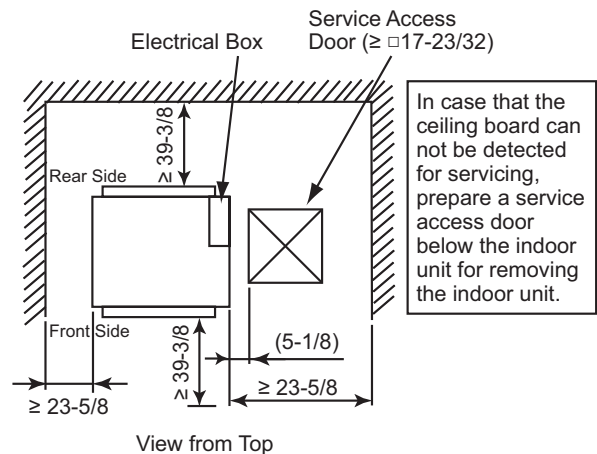


Figure 4.1 Operation and Installation Space

- (2) Consider the air distribution from the indoor unit to the space of the room, and select a suitable location so that uniform air temperature in the room can be obtained.
- (3) Do not leave combustible materials inside the service space of the indoor unit.
- (4) Avoid obstacles which may hamper the air intake or the air discharge flow.
- (5) Do not install the indoor unit in a machine shop or kitchen where vapor from oil or its mist flows to the indoor unit.
The oil will deposit on the heat exchanger, thereby reducing the indoor unit performance, and may deform and in the worst case, break the plastic parts of the indoor unit.
- (6) Pay attention to the following points when the indoor unit is installed in a hospital or other facilities where there are electronic waves from medical equipment.
- Do not install the indoor unit where the electromagnetic wave is directly radiated to the electrical box, communication cable or wired controller.
 - Install the indoor unit and components as far away as practical or at least 9.8ft (3m) from any electromagnetic wave radiator.
 - Prepare a steel box and install the wired controller in it. Prepare a steel conduit tube and wire the controller cable in it. Then, connect the ground wiring with the box and the tube.
 - Install a noise filter when the power supply emits harmful noises.
- (7) To avoid any corrosive action to the heat exchangers, do not install the indoor unit in an acid or alkaline environment.

5. Installation Work

5.1 Suspension Bolts

- (1) Determine the final location and installation orientation of the indoor unit with respect to the space allowed for piping, wiring, and maintenance access.
- (2) Mount suspension bolts, as shown in Figure 5.1.

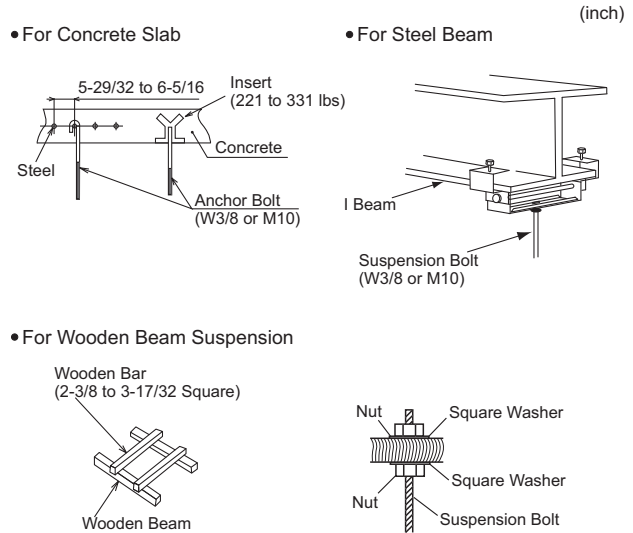


Figure 5.1 Mounting of Suspension Bolts

5.2 Marking of Positions of Suspension Bolts and Piping Connections

- (1) Mark the positions of the suspension bolts, refrigerant piping connections and drain connection.
- (2) Installation dimensions are shown in Figure 5.2.

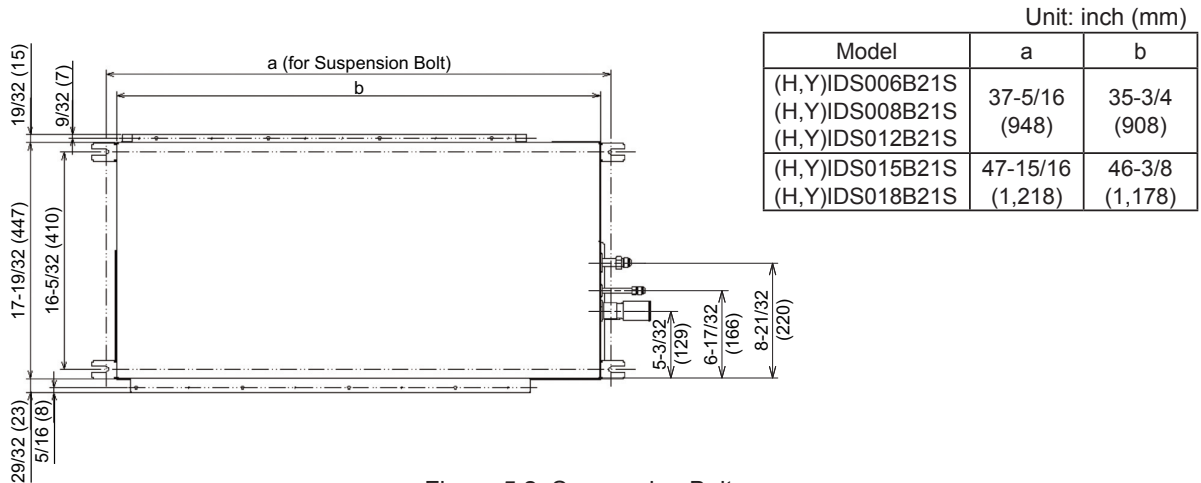


Figure 5.2 Suspension Bolts

5.3 Mounting Indoor Unit

Hang the indoor unit as shown in Figure 5.3.

Field-Supplied Parts

- * Suspension Bolts: 4-M10 or W3/8
- * Nut: 8-M10 or W3/8

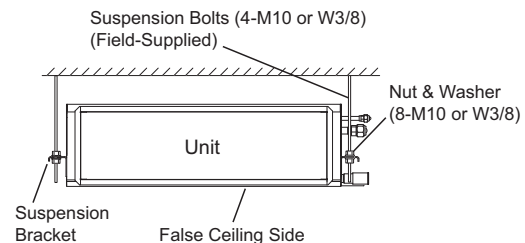


Figure 5.3 Mounting Indoor Unit

- (1) How to install Nuts or Suspension Bolts
Install nuts on each of the four suspension bolts, as shown in Figure 5.4.

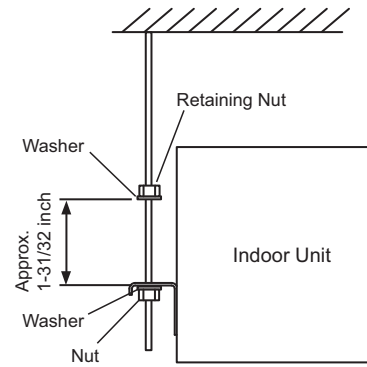


Figure 5.4 Suspension Bolts and Nuts

- (2) Suspension Indoor Unit

- * Hook the suspension bracket to the nut and washer of each suspension bolt, as shown, starting at the opposite side and working over to the service cover side.
- * After verifying that the nut and washer are correctly affixed to the retainers on the suspension bracket, hook the suspension bracket of the service cover side to the nut and washer. (Install the suspension bolts away from the unit when fastening.)

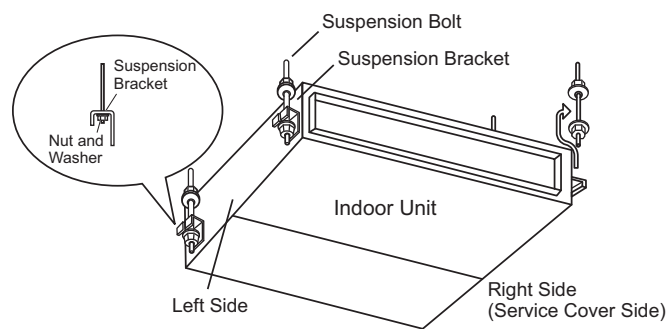


Figure 5.5 Suspended Indoor Unit

5.4 Adjusting of Unit Level

- (1) Use a level to verify that the unit is perfectly horizontal. There should be no degree of slope present.

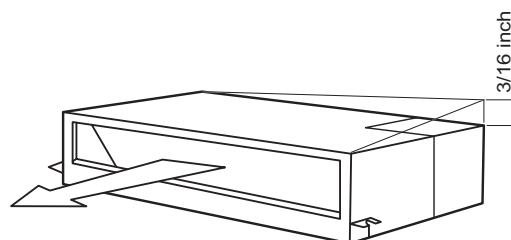


Figure 5.6 Adjusting of Unit Level

- (2) The unit should be installed so that the rear side of the unit is slightly (0 to 3/16 inch (0 to 5mm)) lower than the front side, to allow for proper drainage.
- (3) Tighten the bolts of the nuts with the suspension brackets after adjustment is completed. Adhesive must be applied to the bolts in order to prevent them from loosening.

NOTE:

During position the installation process, keep the unit well covered with vinyl cover and related components covered until it is time to hoist into position.

5.5 Connecting Supply Duct

- (1) The supply duct should be connected with the indoor unit through canvas ducts, in order to avoid abnormal sound vibration (Refer to Figure 5.7). The unit is equipped with a pre-drilled duct flange for the return and supply duct connection.
- (2) Attach the vibration proof rubber to the Suspension Bolt in order to avoid abnormal sound vibration.
- (3) Duct material should be non-flammable material.
- (4) Perform heat insulation work over the duct to prevent condensation.

⚠ CAUTION

- **If a lower sound level is required, install silencer (field-supplied).**
- **Design duct arrangement as "Unit External Static Pressure = Pressure Drop of Duct + Pressure Drop of Air Outlet and Air Inlet".**
Poorly designed duct will result in sound, comfort and water blow-off issues.

< Notice for Outdoor Air Intake (Fresh Air) >

This air conditioner unit is NOT designed for outdoor use.

The following items are to be strictly observed when designing a system for fresh air intake from the outdoors.

1) Considering Ventilation Load

Calculate the air-conditioning load properly with the load of the outdoor air intake. If the load of the outdoor air is not considered, it may cause insufficient cooling or heating operation due to an excessive air-conditioning load against the unit capacity.

2) Limits on Outdoor Air Intake

- Do NOT ingest air from the outdoors directly into the indoor unit.
If an outdoor fresh air intake is necessary for air-conditioning, Johnson Controls Inc. recommends the installation of the ERV (Energy Recovery Ventilation) (Field-supplied) system.
The outdoor air shall be processed by the ERV and mixed with indoor air.
Only then, is air that now intermixed can be drawn into the indoor unit.

NOTE:

The temperature of the air that is intermixed should fall within the working range as shown below.

	Heating	Cooling
Working Range of Required Indoor Room Temperature	59 to 80°F DB (15 to 27°C DB)	69°F DB/59°F WB (21°C DB/15°C WB) to 89°F DB/73°F WB (32°C DB/23°C WB)

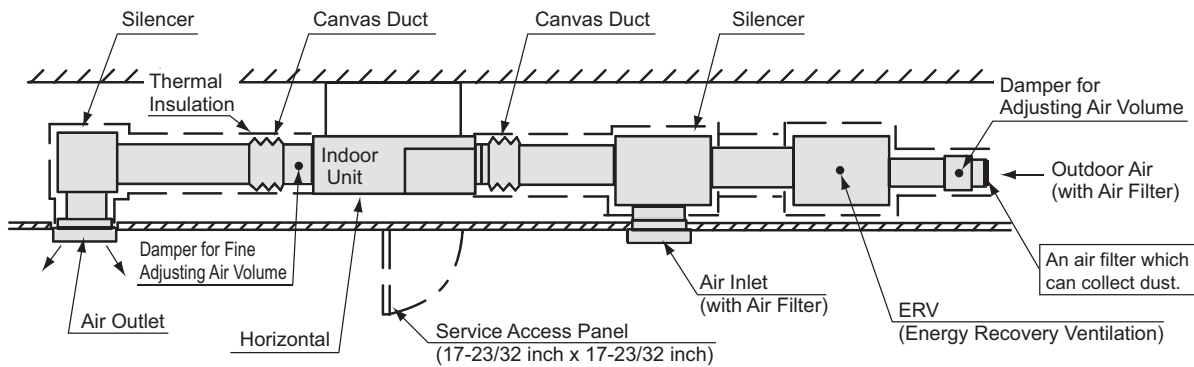
- If the ERV is not used for processing the outdoor air, it can result in insufficient heating/cooling operation or condensation build-up on the inside surfaces of the indoor unit or duct depending on the outdoor air conditions.
- The volume of fresh air is recommended to be within 20% of the airflow volume "Hi2" according to the specification's table in the technical documentation. If it exceeds 20%, ingested condensation will build-up on the inside surfaces of the indoor unit and the airflow volume of the indoor unit cannot be adjusted due to increasing pressure loss of air intake caused by insufficient internal static pressure.
- When the outdoor air is ingested into the indoor unit, make sure to install an air filter capable of keeping the indoor unit free from dust.

3) Facilities for Outdoor Air Intake

- Use the damper or the duct fan to adjust fresh air volume.
- Do NOT ingest in fresh air from the outdoors directly into the indoor unit.
Installing and integrating ERV as a part of the system mix is recommended if incoming air from outdoors is routinely drawn indoors.
- When using ERV or installing a duct fan, make sure to install the interlock circuit between them and the indoor unit fan motor. Make sure to install an ERV in accordance with this "Installation and Maintenance Manual".
- Install thermal insulation on surfaces of interconnecting ducts to prevent the build-up of condensation.

CAUTION

- If a lower sound level is further required, install silencer (field-supplied).
- The facility design should be “Unit External Static Pressure = Duct Pressure Loss + Suction / Discharge Pressure Loss”.
If the duct pressure loss drops below the external static pressure, air speed will increase and lead to the occurrence of louder noise, splashing water and activation of motor protection circuit activated. If the unit external static pressure drops below the duct pressure loss, some problems such as inability to change the air speed may occur. Set the airflow control damper or shift the static pressure control switch to adjust to almost equalize the level between the external static pressure and the duct pressure loss. (See “Setting of External Pressure” section for details.)
- Basically this unit is designed to install the ducts on the inlet side and the outlet side. Ask for more information for using the return ducts in the ceiling.



Model	Static Pressure in.W.G.(Pa)
(H,Y)IDS006 - 012B21S	0 - 0.04 ^(*) - 0.12 (0 - 10 ^(*) - 30)
(H,Y)IDS015, 018B21S	0 - 0.04 ^(*) - 0.20 (0 - 10 ^(*) - 50)

*: Before Shipment

Figure 5.7 Duct Connection Example

5.6 Setting of External Pressure

Refer to Section 8.6 "External Static Pressure Setting".

6. Refrigerant Piping Work

⚠ DANGER

Use the specified non-flammable refrigerant (R410A) to the outdoor unit in the refrigerant cycle. Do not charge the unit with materials other than R410A, such as hydrocarbon refrigerants (propane and isobutan), oxygen, flammable gases (acetylene, ammonia, etc.) or poisonous gases when installing, maintaining and moving the unit. These flammables are extremely dangerous and may cause explosion, a fire, or injury.

For details on refrigerant piping work, vacuum pump, and refrigerant charge, refer to the "Installation and Maintenance Manual" for the outdoor unit.

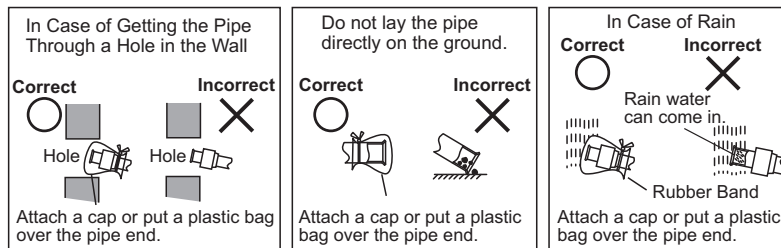
6.1 Piping Materials

- (1) The tolerance of refrigerant piping length differs depending on the combination with the outdoor unit. Refer to "Installation and Maintenance Manual" of the outdoor unit for details.
- (2) Select the piping size from the following table.

Table 6.1 Piping Size

Model	Gas Piping	Liquid Piping
(H,Y)IDS006B21S (H,Y)IDS008B21S (H,Y)IDS012B21S (H,Y)IDS015B21S	φ1/2 (12.7)	φ1/4 (6.35)
(H,Y)IDS018B21S	φ5/8 (15.88)	φ3/8 (9.52)

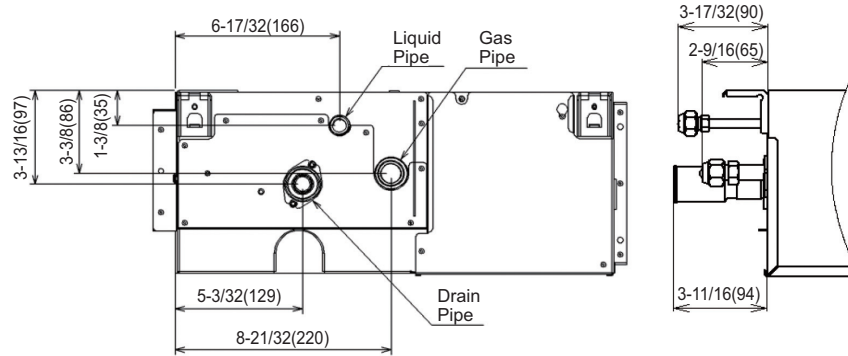
- (3) Prepare field-supplied copper pipes.
- (4) Select clean copper pipes. Make sure there is no dust and moisture inside.
- (5) The refrigerant oil for the refrigerant R410A is susceptible to moisture, an oxide film, and fatty oil. Take special care during the installation so that moisture, contaminations or old refrigerant oil will not enter the refrigerant cycle. Otherwise, impurities may adhere to the expansion valve and it may prevent proper operation.
- (6) When cutting the pipes, use a pipe cutter to avoid grind swarf generation for the pipe cutting work. Blow the inside of pipes with nitrogen or dry air to remove any dust or foreign materials before connecting pipes. Do not use any tools which produce a lot of swarf such as a saw or a grinder.



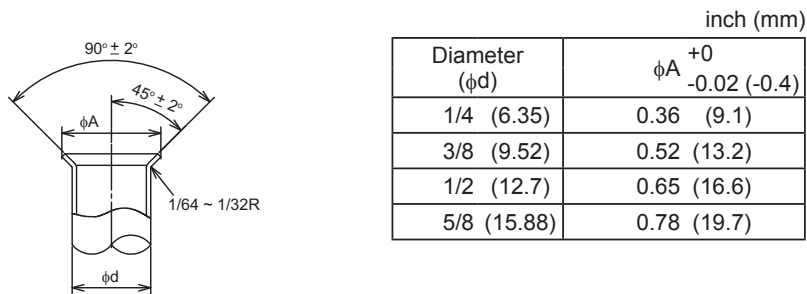
6.2 Piping Connection

(1) Position of piping connection is shown below.

Unit: inch (mm)



(2) Perform the flaring work as shown below.

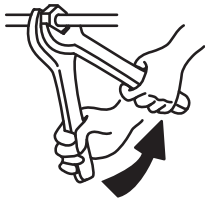
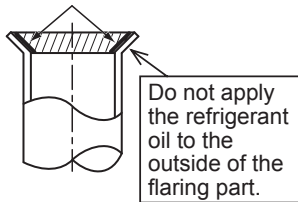


- (3) Use specific flare nut attached with the unit.
- (4) Verify that there are no scratches, burrs stuck to internal surfaces, or surface deformations at the flared opening.
- (5) Before tightening the flare nut, apply the (Field-Supplied) refrigerant oil in a thin layer over the flared part. (Do not apply the oil on other areas.) Tighten the flare nut for the liquid pipe to the specified torque with two spanners. Then, tighten the flare nut for the gas piping in the same way. After the tightening work has been completed, check that no refrigerant leakage occurs.

NOTE:

Refrigerant oil is field-supplied.
 [Polyvinyl Ether Oil FVC68D (Idemitsu Lubricants America)]

Apply Refrigerant Oil.

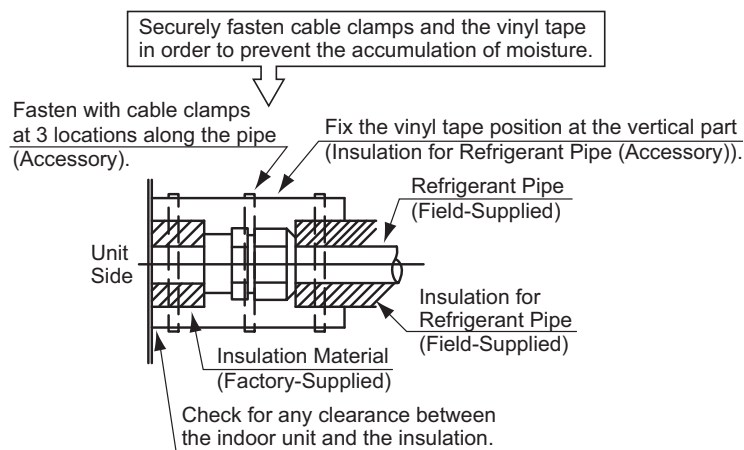


Required Tightening Torque (JIS B 8607)

Pipe Size	Tightening Torque
φ1/4 inch (6.35 mm)	10.3 - 13.3 ft·lbs (14 - 18 N·m)
φ3/8 inch (9.52 mm)	25.1 - 31.0 ft·lbs (34 - 42 N·m)
φ1/2 inch (12.7 mm)	36.1 - 45.0 ft·lbs (49 - 61 N·m)
φ5/8 inch (15.88 mm)	50.2 - 60.5 ft·lbs (68 - 82 N·m)

INSTALLATION

- (6) Wherever buried piping exists on site, make sure there is a service doorway to provide adequate access to inspect piping sockets and elbows, and for interconnecting parts.
- (7) Piping must be reinforced to withstand earthquakes so as not to be damaged by an external force.
- (8) Do not tightly secure refrigerant piping to accommodate expansion and contraction.
- (9) Prevent the pipes from contacting weak portions such as wall, ceiling, etc. (Otherwise, abnormal sound may be heard due to vibration of the piping.)
- (10) Test for air-tight integrity. The air-tight procedures should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
- (11) If temperature and humidity inside the ceiling exceed 80.6°F (27°C)/RH80%, condensation occurs on the surface of the accessory insulation. Wrap additional insulation (approximately 3/16~13/32 inch (5~10mm) thickness) around the accessory insulation of the refrigerant pipe as a preventive measure.
- (12) Insulate each flare connection without gap with accessory insulations to prevent condensation. Then insulate each refrigerant pipe as well.



! WARNING

- Do not apply excessive force to the flare nut when tightening. Use the specified tightening torque.
- Make sure that the refrigerant leak test has been performed. Refrigerant (fluorocarbon) for this unit is non-flammable, non-toxic and odorless. However if the refrigerant should leak and contact with fire, toxic gas will be generated. Also because the fluorocarbon is heavier than air, it settles near the floor, which could cause suffocation.

7. Drain Piping

WARNING

Do not put the drain pipe for the indoor unit into the drainage trench where corrosive gases occur. Otherwise, poisonous gases flow into the room, which may cause poisoning.

NOTICE

- Ensure that the drain pipe discharges water properly. If connected incorrectly, it may cause leaks leading to property damage.
- Do not provide an upward slope or a rising part for the drain pipe. Otherwise, the drain water will flow back into the unit and it may cause the water leakage when the unit operation is stopped.
- Do not connect the drain pipe with a sanitary or sewage pipe or any other drainage pipe.
- When the common drain pipe is connected with other indoor units, the connected position of each indoor unit must be higher than the common pipe. The pipe size of the common drain pipe must be large enough according to the unit size and number of units.
- After performing drain piping work and electrical wiring, ensure to ensure that water flows smoothly as in the following procedures.

Perform drain piping work and attach the insulations before refrigerant piping work.

- (1) The position of the drain pipe connection is shown in Figure 7.1.
- (2) Prepare a polyvinyl chloride (PVC) pipe with 1-1/4 inch (32mm) outer diameter.
- (3) Fasten the tube to the drain hose with the adhesive agent and the field-supplied clamp. The drain piping must be performed with a DOWN-SLOPE pitch of 1/25 to 1/100.
- (4) Insulate the drain pipe after connecting the drain hose.

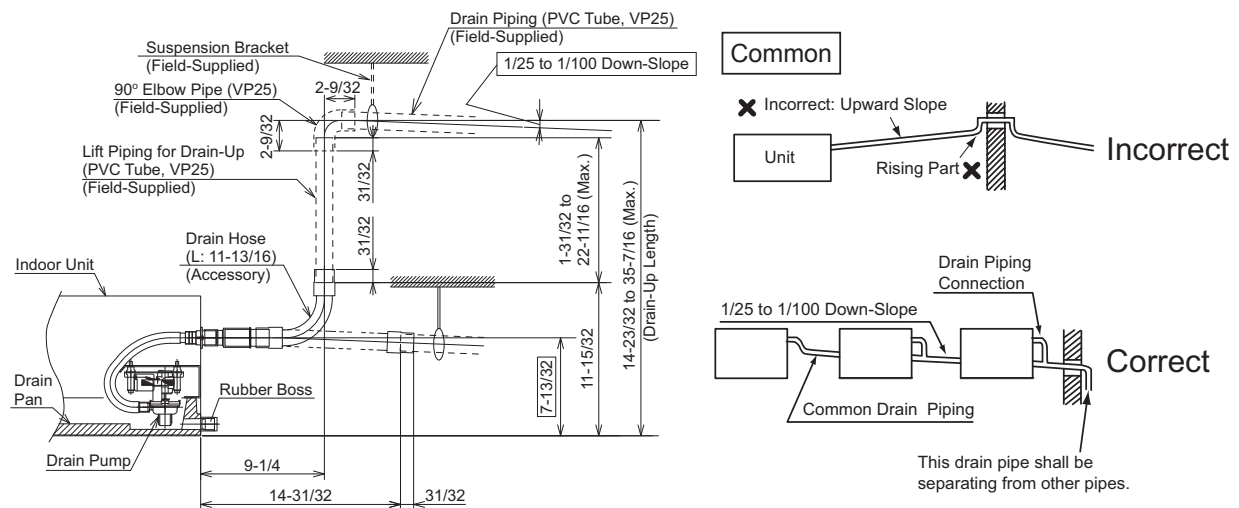


Figure 7.1 Drain Piping

NOTE:

When the relative humidity of inlet or ambient air exceeds 80%, apply an auxiliary drain pan (field-supplied) beneath the indoor unit as shown in Figure 7.2.

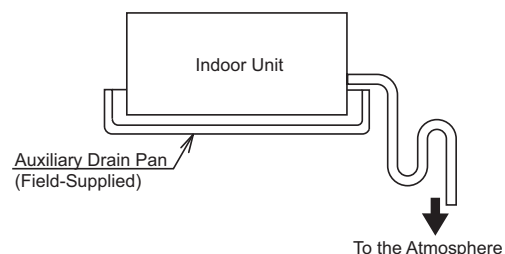


Figure 7.2 Auxiliary Drain Pan

NOTICE

After performing drain piping work and electrical wiring, verify that water flows smoothly as in the following procedure.

Checking with the Float Switch

- a. Turn ON the power supply.
 - b. Pour 68 to 84oz (2 to 2.5 liters) of water into the drain pan.
 - c. Ensure that the water flows smoothly and no water leakage occurs. When water cannot be found at the end of the drain piping, pour another 68oz (2 liters) of water into the drain pan.
-

8. Electrical Wiring

WARNING

- All electrical work must be done as outlined in this manual and in accordance with this manual. Substandard work can result in fire and damage to the unit.
- Use specified cables between units and choose the cables correctly. If not, an electrical shock or fire may occur.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply. It can result in an electrical shock.
- Turn OFF the main power switch of the indoor unit and the outdoor unit before attempting any electrical wiring work or a periodical check is performed. If not, it will result in an electric shock or a fire.
- Check to ensure that the indoor fan and the outdoor fan have stopped before attempting any electrical wiring work or for any scheduled electrical work that is being performed.
- Tighten screws according to the following torque.

M3.5: 0.9 ft·lbs (1.2 N·m)

M4: 0.7 to 1.0 ft·lbs (1.0 to 1.3 N·m)

CAUTION

- Secure all cables together with zip-ties and seal the connecting hole against the onslaught of moisture and insects.
- Run the electrical wiring through the connecting hole in the side cover when using conduit.
- Secure the wired controller cable using the cable clamp inside the electrical box.

8.1 General Check

- (1) Make sure that the field-selected electrical components: (main power switches, circuit breakers, wires, conduit connectors, and wire terminals) have been properly labeled in accordance with electrical data as specified in the Engineering Manual. Make sure that the components comply with the National Electrical Code (NEC).
- (2) Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
- (3) Check the capacity of the electrical wires.
If the power supply capacity is too low, the system cannot be started due to a voltage drop.
- (4) Verify that the ground wiring is securely connected.

8.2 Electrical Wiring Capacity

8.2.1 Field Minimum Wire Sizes for Power Supply

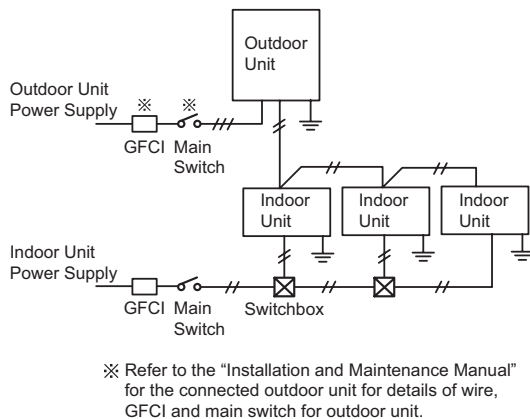
- This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches and wiring in accordance to local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements. Failure to use a GFCI can result in electrical shock or fire.
- Do not operate the system until all the check points have been cleared.
 - (A) Verify that electrical resistance is more than one megaohm by measuring the resistance between ground and the terminals of the various electrical components. If less than one megaohm, do not activate the system until the electrical current drain is found and repaired.
 - (B) Check to ensure that the stop valves for the outdoor unit are fully opened, and then start the system.
 - (C) Check to see that the main power has been switched ON for longer than 12 hours prior activating the system. Power to the crankcase heater needs this time interval to warm the compressor oil up to operating temperature.
- Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 194°F (90°C).

8.2.2 Details of Electrical Wiring Connection

The electrical wiring capacity of the outdoor unit should be referred according to the "Installation and Maintenance Manual" for the outdoor unit. Adjusting the DIP switches may be required depending on the arrangement with the outdoor unit.

Select wiring capacity according to the table 8.1. Install a GFCI (Ground Fault Circuit Interrupter) and main switch as shown in each of the system diagrams below.

< Heat Pump System >



< Heat Recovery System >

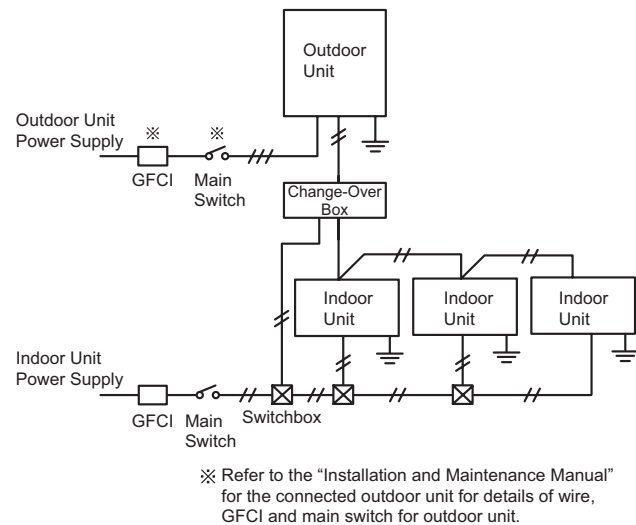


Table 8.1 Recommended Wiring Capacity and Size

Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA <Minimum Circuit Ampacity>
		Power Supply Wiring Size <Main>	Ground Wiring Size	Communication Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
(H,Y)IDS006B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	0.20
(H,Y)IDS008B21S									0.20
(H,Y)IDS012B21S									0.20
(H,Y)IDS015B21S									0.29
(H,Y)IDS018B21S									0.29

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) Select a GFCI with an activation speed of 0.1 sec. or less.
- 3) Total operating current is less than 12A.

NOTICE

- Check for the recommended size GFCI shown in the table 8.1.
- Between indoor and outdoor units, use dual-conductor, AWG18 (0.82mm²) stranded copper cable for communication cable. Do not use any cable with more than two conductors. Twisted pair or shielded cable can be used in environments with excessive electrical noise to reduce the possibility of communication errors between system components. Total cable length should not exceed 3281 ft (1000m).
- Select the wiring size, GFCI (Ground Fault Circuit Interrupter) in accordance with the regulations for each region, the "Installation and Maintenance Manual", and the dedicated electrical circuit that must be used.
- Outside of the indoor unit, installation of the power supply wiring, communication cable, and wired controller cable should be spaced as far apart as possible.

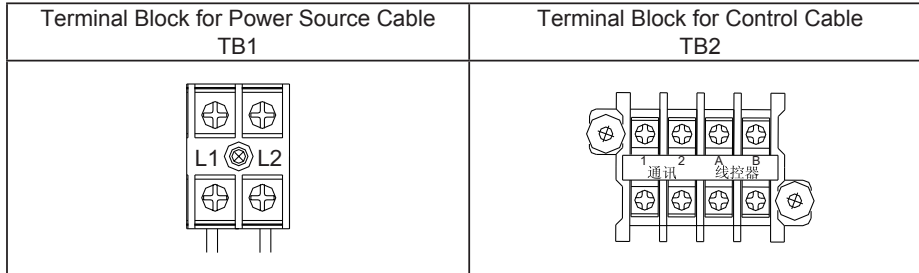
INSTALLATION

8.3 Position of Electrical Wiring Connection

- The electrical wiring connection for the indoor unit is shown in the Section 8.2.2.
- The connection at the terminal block for the indoor unit is shown in the figure below. Check the outdoor unit for the combination before the wiring work. The screws at the terminal block should be performed according to the tightening torque as shown in the table below.

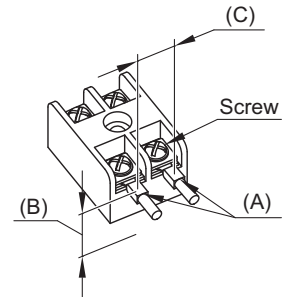
Tightening Torque for Terminals

Screw Size		Tightening Torque
TB1	M4	0.7 - 1.0 ft·lbs (1.0 - 1.3 N·m)



NOTICE

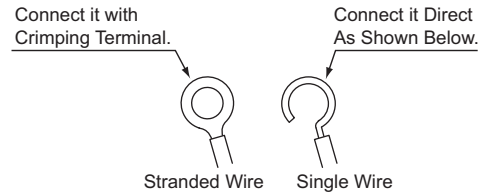
- Do not connect the main power supply wiring to the communication line (Terminals A, B, 1 and 2 of TB2). If these are connected, the printed circuit board (PCB) will be destroyed.
- Note the following for wire connections at TB1 and TB2:
 - (A) Attach a piece of insulation tape or sleeve at each terminal.
 - (B) Maintain a safe distance between the electrical box and the terminals to prevent a short circuit.
 - (C) Maintain a safe distance between the terminals.



- (1) Connect the cable for the optional controller or the optional extension cable to the terminals inside the electrical box through the connecting hole of the cabinet.
- (2) Connect the power supply and the ground wiring to the terminals in the electrical box.
- (3) Connect the cables between the indoor unit and the outdoor unit to the terminals inside the electrical box.
- (4) Connect cables to their corresponding terminal number and the similarly marked band.
- (5) Connect the communication cable between those indoor units connected to the same outdoor unit.
- (6) Do not connect the main power supply wiring to the communication line (Terminals A, B, 1 and 2 of TB2). If connected, the printed circuit board (PCB) will be destroyed.
- (7) Tightly clamp the power supply wiring and communication cables using the cable clamp inside the electrical box.

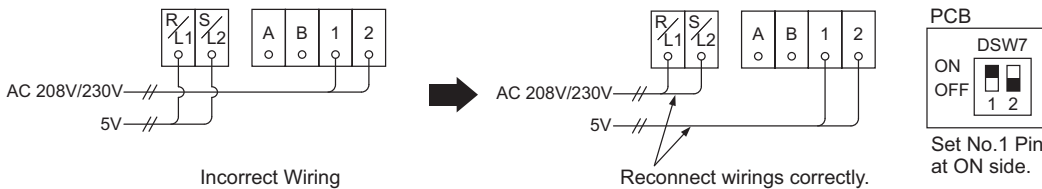
NOTE:

When the standard wire is used for the field-wiring connection, the M4 crimping terminal should be used. When the single wire is used, fashion it into the shape as shown at right and connect it in order to tighten the washer uniformly. The screws at the terminal block should be tightened according to the torque specification as shown in the table above.



- (8) All electrical work should be performed in strict accordance with electrical schematics in the "Installation and Maintenance Manual".
- (9) If Power Supply Voltage (208V/230V) is introduced into the Communication Line:
If 208V/230V are applied to the communication line at (Terminals 1 and 2 of TB2) by mistake, the fuse on the PCB for the communication line will blow. In this case, perform the recovery work as shown in the diagrams below.
 - (a) Reconnect the wirings correctly.
 - (b) Set the No.1 pin at DSW7 (on the PCB) to ON.

Upon PCB recovery after the fuse has been replaced, if 208V / 230V is reintroduced into the communication line, the PCB will be seriously damaged and will not recover.

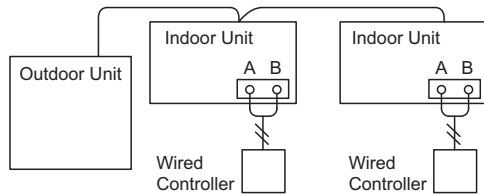


INSTALLATION

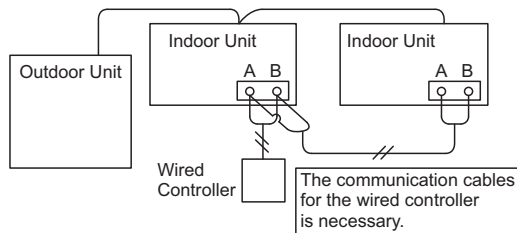
(10) Wired Controller Connection

- VRF Systems

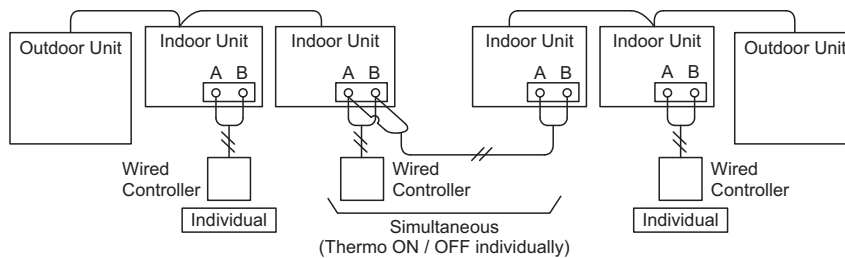
(a) Wired Controllers to each Unit for Individual Operation Setting



(b) Single Wired Controller for Individual Operation Setting



(c) Wired Controller Connections between different Refrigerant Cycles

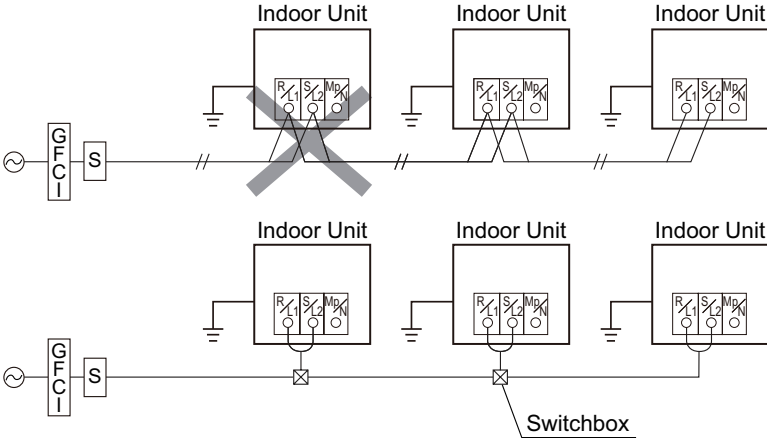


NOTICE

1. The DIP switch settings for the outdoor unit should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
2. Be aware that communication cable for the wired controller is required in these instances:
 - a. The following functions are set to the sub unit which is not installed with the wired controller.
 - Remote ON/OFF function settings, (No.1, 2, and 3), (External Input / Output Function)
 - Power supply ON/OFF functions, (No.1 and 2), (Function Selection)
 - Prohibiting the wired controller after manual stoppage (External Input / Output Function)
 - Group setting by the centralized controller
 - b. The combination of twin, triple, or quad is controlled by single wired controller.
 - c. The address for the indoor unit is changed from the wired controller.

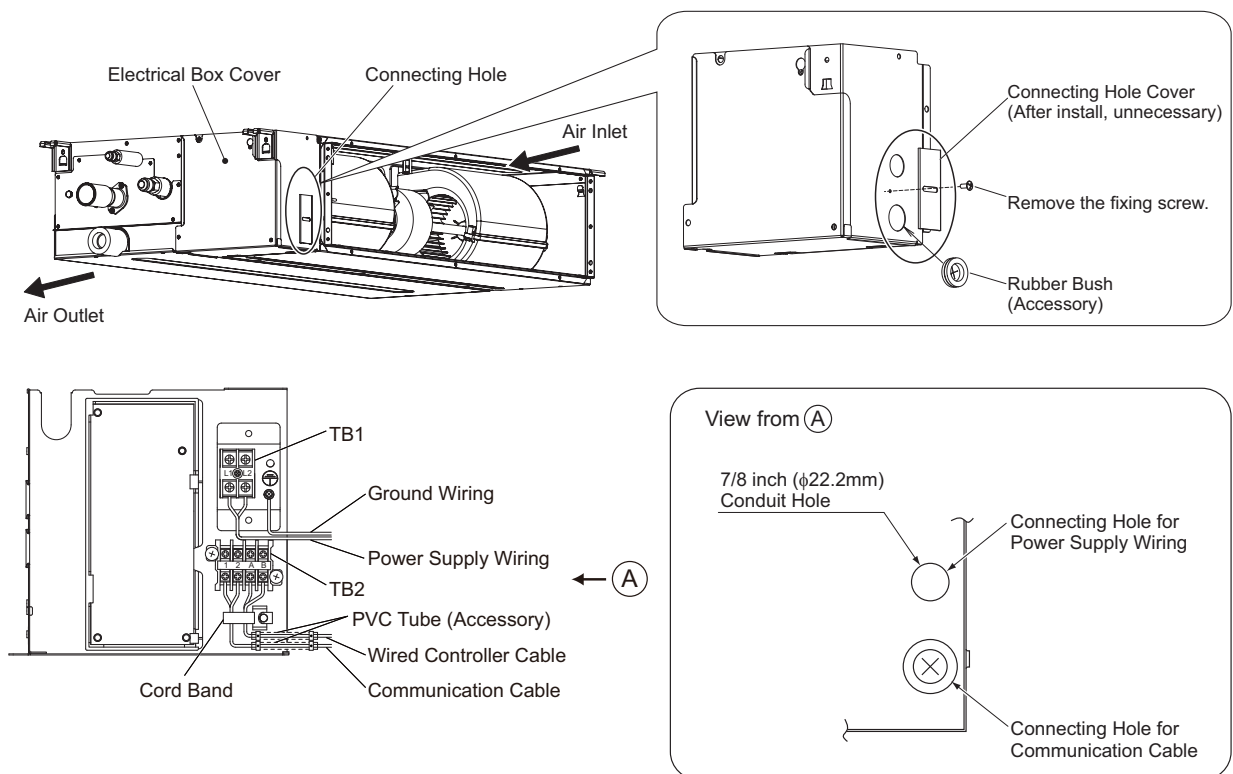
< Caution for Electrical Wiring >

- Do not connect the power supply wiring and the communication cable into one terminal.
- The manual switchbox is required when communication cable is required.



8.4 Wiring Connection

- (1) Remove the connecting hole cover of the electrical box and install the rubber bush (Accessory) to the connecting hole for communication cable.
- (2) Pass the communication cable and the wired controller cable through the connecting hole for communication cable.
Connect the communication cable to the terminals 1, 2 of TB2 in the electrical box.
Connect the wired controller cable to the terminals A, B of TB2 in the electrical box.
- (3) Pass the power supply wiring and the ground wiring through the connecting hole for power supply wiring.
Connect the power supply wiring to the terminals L1, L2 of TB1 in the electrical box.
Connect the ground wiring to the ground terminal inside the electrical box.
(When connecting the power supply wiring and the ground wiring outside of the unit, run through the conduit tube.)
- (4) Tightly clamp the power supply wiring, the ground wiring, the wired controller cable and the communication cable utilizing the cord band.

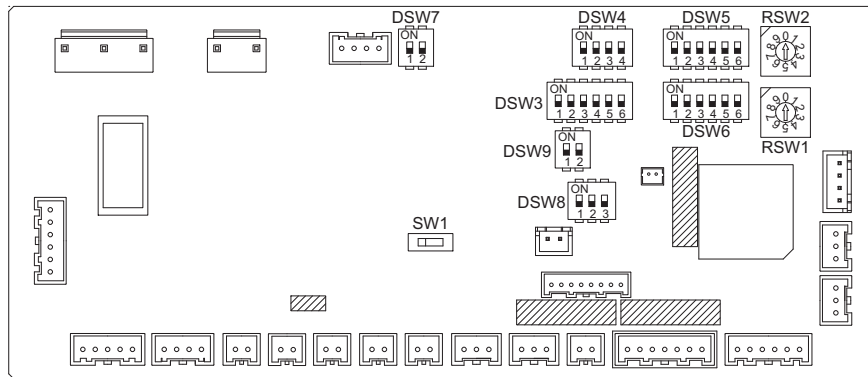


NOTE

- Insert the communication cables and wired controller cable into the PVC tube “VW-1 600V” (Accessory) to separate them from the power supply wirings in the indoor unit.
- Fix the both ends of the PVC tube by cable clamp (Accessory).
- If shielded cable is used, terminate at the ground terminal.

8.5 DIP Switches Setting

- (1) Turn OFF the power supply to both indoor and outdoor units before adjusting DIP switch settings. Otherwise, the setting will be invalidated and not take effect.
- (2) Positions of DIP switches are shown below.



(3) Unit No. Setting (RSW1 & DSW6)

Setting is not required.
Indoor unit numbers are set by the auto-address function. If an indoor unit number setting is required, set the unit number of all indoor units respectively and sequentially by following setting position. It is recommended that you assign a number to each indoor unit from "1". A maximum of 64 indoor units per refrigerant cycle can be connected to an H-LINK II System. Though the available numbers range from zero to 63, the applicable number for the 64th indoor unit in theory supplants the number "zero". For the centralized control, this setting is required.

DSW6 (Tens Digit)	RSW1 (Units Digit)	Ex.) Set at No.16 Unit
Before shipment, DSW6 and RSW1 are set at "0". For the units supporting H-LINK II, the unit No. can be set for Max. 64 indoor units (No.0-63).		Set No.1 Pin at ON side RSW1 Set at "6"

(4) Capacity Code Setting (DSW3)

No setting is required, due to setting before shipment. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.

Indoor Unit Capacity (kBtu/h)	06	08	12	15	18
Setting Position					

(5) Unit Model Code Setting (DSW4)

No setting is required. It is for setting the model code of the indoor unit.



(6) Refrigerant Cycle No. Setting (RSW2 & DSW5)

This setting is required. The unit arrives with all settings in the OFF position.

DSW5 (Tens Digit)	RSW2 (Units Digit)	Ex.) Set at No.5 Cycle
Before shipment, DSW5 and RSW2 are set at "0". For the units supporting H-LINK II, the ref. cycle No. can be set for Max. 64 cycles. (No. 0-63)		Set All Pins OFF RSW2 Set at "5"

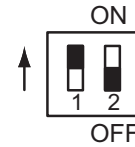
INSTALLATION

(7) Fuse Recover (DSW7)

* Factory Setting

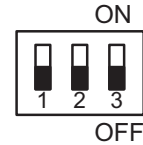


* In the case of applying high voltage to the terminal 1 and 2 of TB2, the 0.5A fuse on the PCB is cut. In such a case, first reconnect the wirings correctly to TB2, and then set the No.1 pin to ON.



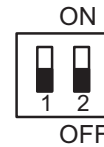
(8) Optional Function Setting (DSW8)

No setting is required, due to no function.



(9) Optional Function Setting (DSW9)

No setting is required, due to no function.



NOTES:

- The “■” mark indicates setting for DIP switches. Figures show setting before shipment.
- When the unit number and the refrigerant cycle are set, record the unit number and refrigerant cycle to facilitate service and maintenance thereafter.

NOTICE

Turn OFF all power supply of the indoor units and the outdoor units before DIP switch settings. Otherwise, the setting will be invalidated and not take effect.

8.6 External Static Pressure Setting

Static pressure setting on the wired controller ("C5").

Refer to "Installation & Maintenance Manual" of the wired controller for details.

Model	Static Pressure	Wired Controller Set
(H,Y)IDS006 - 012B21S	0.12 in.W.G. (30 Pa)	C501
	0.04 in.W.G. (10 Pa)	C500
	0 in.W.G. (0 Pa)	C502
(H,Y)IDS015, 018B21S	0.12 in.W.G. (50 Pa)	C501
	0.04 in.W.G. (10 Pa)	C500
	0 in.W.G. (0 Pa)	C502

8.7 Function Selection by Wired Controller

Each function can be selected with the wired controller. Refer to the "Installation and Maintenance Manual" for the wired controller and the "Engineering Manual" for details.

< Circulator Function at Heating Thermo-OFF >

This function maintains fan operation by the set airflow volume at the heating Thermo-OFF. It improves temperature distribution when the unit is mounted on a high ceiling.

9. Test Run

9.1 Before Test Run

Verify that there are no problems with the installation, and do not perform Test Run until all the following conditions have been resolved.

Refer to the "Installation and Maintenance Manual" for the outdoor unit for details on Test Run operations from the outdoor unit.

Verify that refrigerant piping and the communication cable are connected to the same refrigerant cycle system. If not, it will cause an abnormal operation and damage to instrumentation.

- (1) Verify that electrical resistance is more than one megaohm, by measuring the resistance between ground and the terminal the terminus for electrical components. If the electrical resistance is less than one megaohm, do NOT operate the system until the electrical current outflow to ground is detected and repaired. Do not introduce any high voltage to the terminals of the communication cables (TB2 [A, B, 1 and 2]).
- (2) Verify that each wire is connected correctly at the correct phase for the power supply. If it is incorrectly connected, the unit will not operate and the wired controller will display the alarm code "05". In this case, check the phase for the primary power supply according to the "Attention" label affixed to the back side of the service cover. Then, with the power supply turned OFF at the power supply, remake the necessary connections.
- (3) Check to ensure that the main power supply has been turned ON for more than 12 hours, to warm up the compressor oil by the crankcase heater.
- (4) Verify that all DIP Switch settings are correct. Refer to Section 8.5 "DIP Switches Setting".

9.2 Test Run

After all installation work is completed, Test Run should be performed.

- (1) Check to ensure that stop valves (gas and liquid) for the outdoor unit are fully opened.
- (2) Whenever indoor units are connected to the VRF system, perform the Test Run for the indoor units one by one sequentially and then check the refrigerant piping system and the electrical wiring system for conformity. (If these multiple indoor units are operated simultaneously, system conformity cannot be verified.)
- (3) Perform the Test Run in accordance with the following procedure. Ensure that the Test Run is carried out without any problem. The following procedure shows a case where a wired controller is utilized. If other controllers are activated instead, refer to the "Installation and Maintenance Manual" for those other controllers.

NOTE:

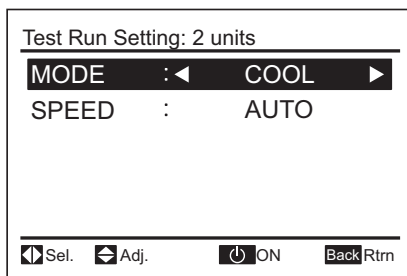
The outdoor unit may not be operated depending on the indoor and outdoor temperature conditions. Refer to the "Installation and Maintenance Manual" for outdoor units for details.

- (a) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds.

The Test Run menu will be displayed.

- The Test Run menu will be displayed.

Test Run Screen



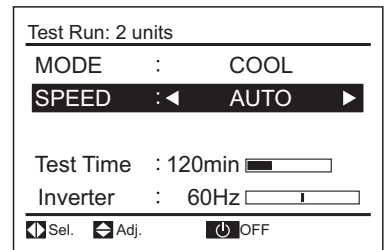
NOTE

When the "00 unit" is displayed, the auto-address function may be working.

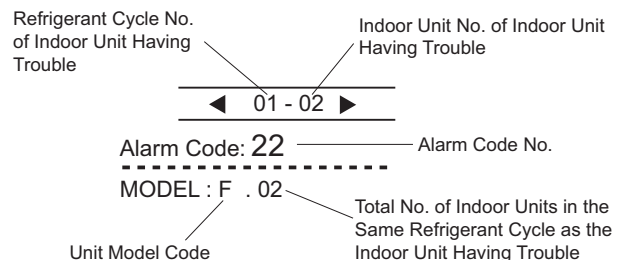
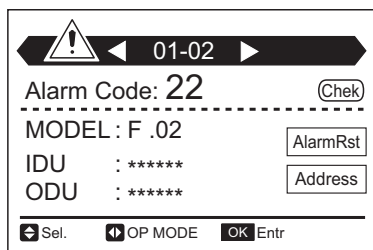
Cancel "Test Run" mode and reset.

INSTALLATION

- The total number of connected indoor units is indicated on the LCD (Liquid Crystal Display). In the case of a twin combination (set of two indoor units), the total number of the connected indoor units is displayed as “**2 units**”, and where there is a triple combination (set of three indoor units), the total number of the connected indoor units is displayed as “**3 units**”.
 - If the number indicated is not equal to the actual number of connected indoor units, the auto-address function is not performing correctly due to incorrect wiring or electrical interference. Turn OFF the power supply, and resolve the wiring issue after verifying the following items; (Do not repeat turning ON and OFF within a 10 second timespan.)
 - The power supply to the indoor unit is not turned ON or there is an incorrect wiring issue.
 - Incorrect connection of the interconnecting cable between indoor units or a poorly connected controller cable.
 - Incorrect setting of the rotary switch and DIP switch for the indoor unit printed circuit board (PCB). (The setting is overlapped.)
 - Press “ On/Off” to start the Test Run.
 - Press “ ” and set each item.
- (b) Press “ On/Off”.
- The RUN indicator turns ON and the operation starts. At this time, a two-hour OFF timer will be set automatically.
- (c) Though temperature recordings by the thermistors are invalid during the Test Run phase, the protection devices are valid.
- (d) For VRF System
According to the label; “Checking Method by 7-Segment Display” affixed to the inside of the front cover of the outdoor unit, check temperature, pressure, and operation frequency, and interconnected indoor unit numbers by 7-Segment displays.
- (e) To complete Test Run, press “ On/Off” again or wait for the set Test Run time to pass.
When changing the Test Run time, press “” or “” to select “**TEST TIME**”. Then, set the test run time (30 to 600 minutes) by pressing “” or “”.



- The RUN indicator on the wired controller for the indoor unit will flash orange (0.5 second ON/ 0.5 second OFF), indicative of a fault or error having been generated with activation of protection devices during the Test Run phase. Alarm code, unit model code, and the number of interconnected indoor units will be displayed on the LCD as shown below. If the RUN indicator on the wired controller flashes for two seconds ON and two seconds OFF, the source of the problem could be a failure in the communication cable between the indoor unit and the wired controller (a loose or severed connection). In this case, verify Section 9.3 “Alarm Code” and perform the appropriate troubleshooting measures. Consult with an authorized service engineer if the problem cannot be resolved at your end.



< Unit Model Code >

The relationship between the unit model code and the unit model is shown in the table below.

Indication	Unit Model
F	VRF System
E	Except Above Models

9.3 Alarm Code

Alarm (Troubleshooting) Code Table

Code No.	Category	Nature of Problem	Likely Cause
01	Indoor Unit	Activation of a protection device (Float switch)	Activation of the float switch; (High water level present in the drain pan.) A problem exists in the piping.
02	Outdoor Unit	Activation of protection device; (Except for Alarm Code: 41, 42)	High Pressure Cut; (R410A: 601 psi (4.15MPa)), fan motor lockup during the outdoor unit cooling operation.
03	Communication	Communication failure between indoor and outdoor units	Incorrect wiring, loose terminals, disconnected wiring or a blown fuse.
04-09	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
11	Sensor on Indoor Unit	Inlet Air Thermistor failure	Loosely connected, disconnected, or a severed connection.
12		Outlet Air Thermistor failure	
13		Freeze Protection Thermistor failure	
14		Gas Piping Thermistor failure	
19	Fan Motor	Problem with Indoor Fan	Fan motor lockup, fan motor protection control device for indoor unit activated.
20-29	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
31	System	Incorrect capacity setting for indoor and outdoor units	Incorrect capacity code setting for combination, excessive or insufficient total indoor unit capacity code.
32		Incorrect setting of other indoor unit number	Problem with a different Indoor Unit in the same refrigerant cycle; (Failure at the power supply, defective PCB).
35		Incorrect setting of indoor	Indoor unit number duplicated in same refrigerant group.
36		Incorrect indoor unit combination	Indoor unit is designed for other refrigerant; (R22 or R407C).
38-59	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for the outdoor unit.)		
b0	System	Incorrect setting for unit capacity	Incorrect setting for unit capacity
b1		Incorrect setting of unit and refrigerant cycle number	Unit number or refrigerant cycle ≥ 64
b5		Incorrect setting of indoor unit number for H-LINK type	Interconnected indoor units are not supporting H-LINK II ≥ 17
EE	Compressor	Compressor protection alarm	This alarm code displays when the alarms such as damage to the compressor occur three times within a six hour period.

- When the RUN indicator flashes every four seconds, there is a communication failure between the indoor unit and the wired controller (loose connector, disconnected or incorrect wiring, or a severed connection).
- The indication of the alarm code "EE" means serious abnormality to burn out the compressor.

Refer to the "Installation and Maintenance Manual" for the indoor/outdoor unit connections.

NOTICE

Do NOT operate the air conditioning just to run checks on electrical wiring until preparations for the Test Run phase is completed.

All the installation work of the air conditioning is completed.
Handover this information to the building owner and request to maintain all the equipment manuals and warranty.

Refrigerant Leak Check

Conduct a periodic refrigerant leak check to maintain product performance and secure storage of refrigerant (Fluorocarbons). After completing installation, record the following results into this "Installation and Maintenance Manual":

1. Results of a test for air-tight integrity
2. Total refrigerant charge volume dispensed (including a trim charge added following the installation)
3. Result of the refrigerant leak check

Then hand it over to users and ask them to retain for reference.

All periodic service and maintenance procedures must be conducted only by authorized and trained personnel.

1.3.2 4-Way Cassette Type

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1. Introduction

Read this "Installation and Maintenance Manual" carefully before installing this product.



This is "Installation and Maintenance Manual" for the indoor unit. Read over the "Installation and Maintenance Manual" for the outdoor unit as well.

Hand over this "Installation and Maintenance Manual", and the warranty must be provided to all installers and users. Ask end users to maintain copies for future reference.


(Refrigerant Piping Work) → (Electrical Wiring Work) → (Ref. Charge Work) → (Test Run) → (User)

- For details on wiring between the indoor unit and the outdoor unit, refer to the "Installation and Maintenance Manual" for the outdoor unit.
- For details on the optional decorative panel, refer to the "Installation and Maintenance Manual" for the optional decorative panel.
- For details on the optional controller, refer to the "Installation and Maintenance Manual" for that optional controller module.
- For details on each optional part, refer to the "Installation and Maintenance Manual" for each optional part.
- For central station, refer to the "Installation and Maintenance Manual" for the central station.

2. Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.

INSTALLATION

- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Before servicing, turn-OFF the power supply and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

⚠ WARNING

To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.

- Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or a hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not install the decorative panel with motion sensor and radiation sensor (P-AP160NAE1) in the following places. It may cause failure or deterioration of the sensor.
 - Ambient temperature changes drastically.
 - Where excessive force or vibration is applied to the sensor.
 - Where static electricity or electromagnetic waves may generate.
 - Where interference of infrared light such as glasses or mist is in the detecting area.
 - Where the lens for sensor is exposed in high temperature and humidity for a long time.
 - Where fluid and corrosive gas exist.
 - Where direct lights such as sunlight or headlight affect the sensor.
 - Where hot air from a heater, etc. affects directly to the sensor.
 - Where the air flow returns to the sensor by hitting obstacles such as shelf, locker, etc.
 - Where the blower devices such as ceiling fan, ventilating fan, etc. affect the air flow from the indoor unit.
 - Where weather affects directly the surface of the sensor.
 - Where the lens surface may smudge or be damaged such as a dusty environment.

Detecting function will decrease if the lens for sensor smudges.
 In this case, wipe off smudges using a cotton swab soaked with alcohol (Isopropyl alcohol is recommended.) or a soft cloth. (When wiping off smudges on the lens for sensor, do not apply excessive force. If excessive force is applied, the resin lens may be damaged and this may cause malfunctions such as misdetection or undetectable of the motion.)
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drain pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the drain pipe becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” the proper use and maintenance of this unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cable shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cable is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications. If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power supply when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power supply completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power supply.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wiring is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

CAUTION

- Proper handling of this unit requires two-people. Safe handling and installing the indoor unit requires the strength of two people. Mounting the unit alone may cause injury due to fall of the unit. Although the unit may be girded with steel banding, do not use it for transportation. Avoid contact with finned surfaces of the heat exchanger as sharp edges can cause severe injury to hands and fingers. Use appropriate work gloves for the job.

NOTICE

- The optional decorative panel can become deformed if the positioning of the indoor units suspension brackets are not stable or level. Condensation can accumulate in low spots as a result due to escaping air through any resulting gaps between the indoor unit and the decorative panel.
- Check to ensure that the drain hose discharges moisture properly. If connected incorrectly, it can result in leakage and damage to furniture.
- Make sure to use the factory-supplied drain hose and hose clamp. Other makes can cause moisture leakage.
- Do not bend or twist the factory-supplied drain hose. This could compromise the seal and result in moisture leakage.
- Do not apply an excessive force to the drain pipe connection. This can also compromise the seal properties of the connection.
- Verify that the installed unit is level with floor and ceiling surfaces. Any variance or inclination can cause moisture to back up into the drain pan, overflow, and seepage onto ceiling or wall surfaces, and cause damage to carpeted surfaces or furniture below.
- Do not install this system in close proximity to septic sewer lines where flammable and toxic gases can coalesce.
- Inspect the drain pan before the onset of winter to drain away all accumulated moisture in the pan.
- The heat exchanger of indoor unit overheats whenever there is a slight amount of refrigerant circulating during slowdown or stoppage. As a result, moisture in the drain pan evaporates where it can condense on ceiling or wall surfaces.
- After the drain check is completed, insert the rubber plug again and seal the gap with a silicon sealant.

Electrical Installation**WARNING**

In some cases, the packaged air conditioner may not be operated normally under the following cases:

- When electrical power for the packaged air conditioner is supplied from the same power transformer as the device*.
- When the power supply wiring for the device* and the packaged air conditioner are located close to each other:
Device*: (Example): Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor, and large-sized switch.
It consumes large quantities of electrical power.

Regarding that mentioned above, surge voltage may be inducted into the power supply wiring for the crated air conditioner due to a spike in power consumption for this device and an activation of the switch. Check the field regulations and standards before performing any electrical work in order to safeguard the power supply for the crated air conditioner unit.

3. Before Installation

3.1 Combination of Outdoor Unit and Indoor Unit

The combination capacity of indoor unit against the outdoor unit is selected depending on the outdoor unit capacity. Refer to the "Installation and Maintenance Manual" for the outdoor unit to decide the required combination of indoor and outdoor units, and the combination unit capacity.

3.2 Transportation and Handling

1. Transport the product as close to the installation location as possible before unpacking.
2. Do not lay any objects on the indoor unit.
3. The indoor unit comes crated upside-down with the foam polystyrene drain pan positioned on top. Do not invert the unit until it is ready to be suspended above the floor. Inverting the unit while on the floor will crush the drain pan. Do not handle the unit by grabbing at the polystyrene pan and other air outlets as they are fragile and will sustain damage.
4. The indoor unit handle is fabricated from foam polystyrene and is susceptible to breakage if any excessive force is applied as a result of mishandling of the unit during installation.

3.3 Factory-Supplied Accessories

1. Check to ensure that the following accessories are packed with the indoor unit.
The screws, washers, and flare nuts are packed in the pipe insulation.

Accessory	Qty.	Purpose
Pattern Board/Template (Carton Board)	1	For Adjusting Space of False Ceiling Opening and Position of Unit
Checking Scale (Cut and Take Out it from Carton Board)	1	
Cross Recessed Head Screws (M6)	4	For Fitting Paper Pattern
Washer with Insulation Material (M10)	4	For Unit Installation
Washer (M10)	4	
Drain Hose	1	For Drain Pipe Connection
Hose Clamp	1	
Pipe Insulation	1	For Refrigerant Piping Connection
Pipe Insulation	1	
Cable Clamp	2	For Fixing Wired Controller Cable, Louver Sensor and Insulation of Piping
Cable Clamp	6	
Insulation 3/16T x 1-31/32 x 7-7/8 (5T x 50 x 200)	1	For Covering Wiring Connection
Insulation 3/16T x 3-15/16 x 7-7/8 (5T x 100 x 200)	1	For Covering Drain Connection
Insulation 3/16T x 31/32 x 19-11/16 (5T x 25 x 500)	1	
PVC Tube	2	For Separating Communication Cables and Wired Controller Cables from Power Supply Wirings; 7/16 ID (11 ID)
Cable Clamp	5	

inch (mm)

NOTICE

The decorative panel, controller, and branch piping are optional accessories and are not included with the indoor unit. If necessary, please contact your contractor.

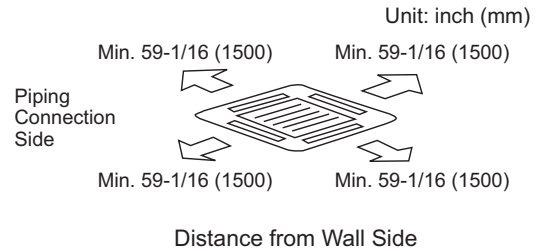
2. Do not insert or leave any foreign objects inside the indoor unit and verify that no foreign objects remain inside in the indoor unit before the installation and Test Run. Failure to do this can result in equipment failure and damage to the unit.
3. Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool
1	Handsaw	11	Wrench
2	Phillips Screwdriver	12	Charging Cylinder
3	Vacuum Pump	13	Gauge Manifold
4	Refrigerant Gas Hose	14	Wire Cutters
5	Megaohm Meter	15	Gas Leak Detector
6	Copper Pipe Bender	16	Level
7	Manual Water Pump	17	Clamp for Solderless Terminals
8	Pipe Cutter	18	Hoist (for Indoor Unit)
9	Brazing Kit	19	Ammeter
10	Hexagon Wrench	20	Voltage Meter

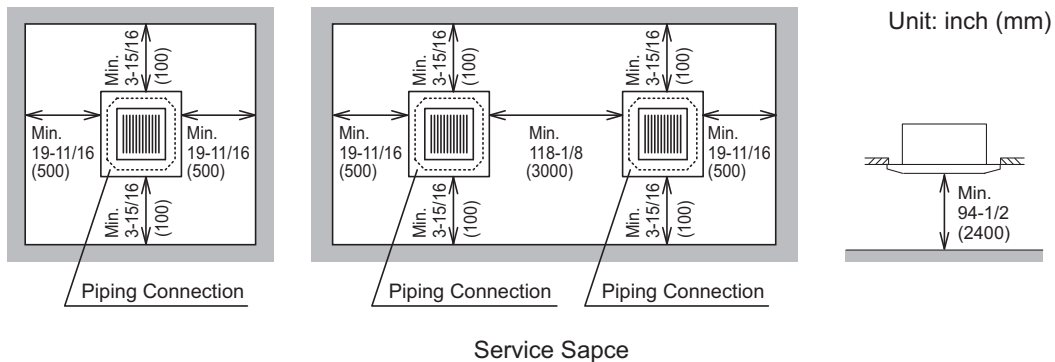
NOTE:
Use tools and measuring instruments (vacuum pump, gas hose, charging cylinder, and manifold gauge) exclusively for the refrigerant R410A.

4. Installation Location

1. Install the indoor unit at a proper distance from the walls as shown at right.



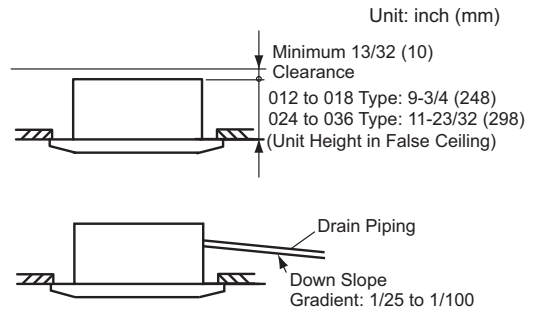
2. Install the indoor unit with sufficient space around it for operation and maintenance access as shown below. Do not leave combustible materials inside the service space of the indoor unit.



3. Select the installation location as follows:
 - Minimum Space
 - Down slope gradient for drain piping: 1/25 to 1/100
 It is recommended that the indoor unit be installed at 7.9 ft (2.4m) from floor level.

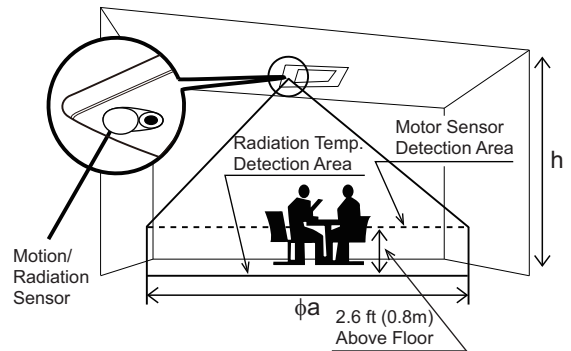
NOTE:

There must be sufficient structural integrity to support the weight of the unit. The designated ceiling surface area should allow for additional space for the optional decorative panel installation. Do not install against any sloped ceiling areas as the tilted axis will interfere with the proper flow and disposal of moisture.



4. Consider the air distribution from the indoor unit to the space of the room, and select a suitable location so that uniform air temperature in the room can be obtained. If the unit is installed on a high ceiling, it is also recommended that a three-way Outlet Parts Set (optional) be utilized so that uniform air distribution can be achieved.
5. Install the unit where there are no obstacles which can impede the suction air and discharged air.
6. Do not install the unit near a door or a window where the indoor unit come into contact with humid outside air. Otherwise, condensation may occur.
7. In the event that temperature and humidity levels inside the ceiling exceed 86°F (30°C)/RH (Relative Humidity) 80%, apply additional insulation materials to the external surface of the indoor unit to avoid condensation.
8. If installing the indoor unit to a high ceiling, the warmed air will remain near the ceiling during heating operation. Thus, a parallel installation of a circulator is recommended.
9. Do not install the indoor unit where airflow from the air outlet blows directly onto temperature detection devices such as an alarm device or a control device. It can result in a failure of either device.
10. The live sensor area of the motion sensor is shown below when applying the motion sensor with the decorative panel.

Model		012 to 024 Type	030 and 036 Type
Installation Height of Indoor Unit "h"	ft (m)	8.9 (2.7)	10.5 (3.2)
Detecting Area (Diameter) "φa"	ft (m)	Approx. 23 (Approx. 7)	Approx. 28.9 (Approx. 8.8)
Motion Detection		Human Motion	

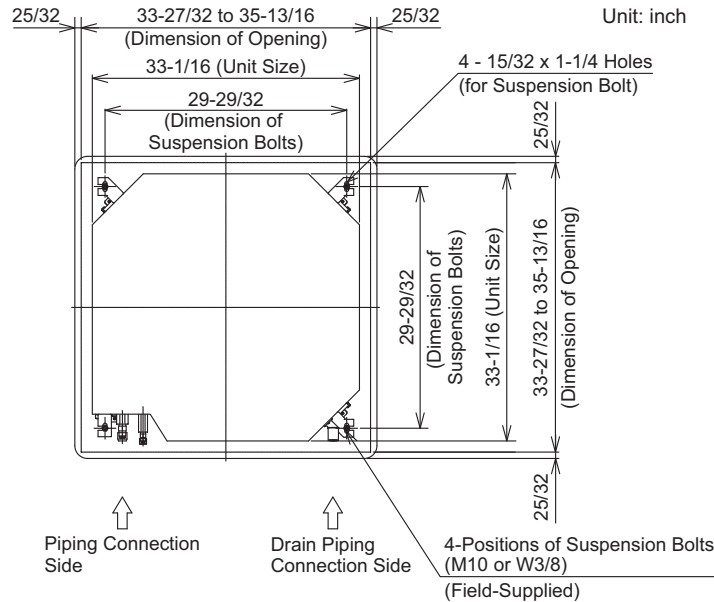


11. Do not install the indoor unit where airflow from the air outlet blows directly onto temperature sensing devices such as an alarm device or a control device. This can result in false readings and an alarm failure.

5. Installation Work

5.1 Opening of False Ceiling and Location of Suspension Bolts

1. Determine the final location and installation orientation of the indoor unit with respect to the space allowed for piping, wiring, and maintenance access.
2. Then cut away the false ceiling area for the indoor unit installation and install suspension bolts.
3. The dimensions for an opening false ceiling and location of suspension bolts are as shown below.



4. Ceiling work differs depending on the building structure. Consult with a building contractor or an interior finishing worker for more information.

NOTE:

Note: Do not install electric lighting in too close proximity to the unit as unit operation can cause the lights to flicker.

5.2 Installing Suspension Bolts

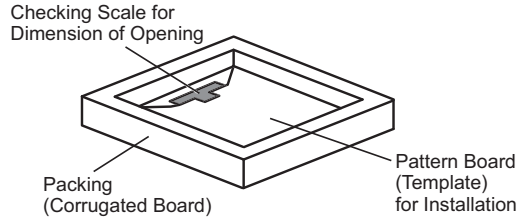
1. Reinforce the designated opening in the false ceiling area. Use approved materials of sufficient tinsel strength to allow for quality installation.
2. Strengthen suspension bolts with support plates as required in preparation for an earthquake. Use field-supplied M10 suspension bolts and support plates.

For Wooden Beam		For Steel Beam
Install the indoor unit to the tie beam (for single-storied building) or to the second floor girder (for two-storied building), and use sufficiently strong squared timber shown below.		Install suspension bolts so that it can withstand the indoor unit weight load.
inch (mm)		
Interval between Beams	Squared Timber	
$\leq 35-7/16$ (900)	2-3/8 (60) square	
$\leq 70-7/8$ (1800)	3-17/32 (90) square	Anchor Bolt (W3/8 or M10)

5.3 Working Procedure

1. Size the opening to the correct dimensions to facilitate easy and repeated installation by using the pattern board (template).

The template provided for the installation comes with a scale printed on a portion of the outer packaging. Detach this area with the printed scale to use in sizing and checking the opening. Refer to the procedure shown in Item 6.



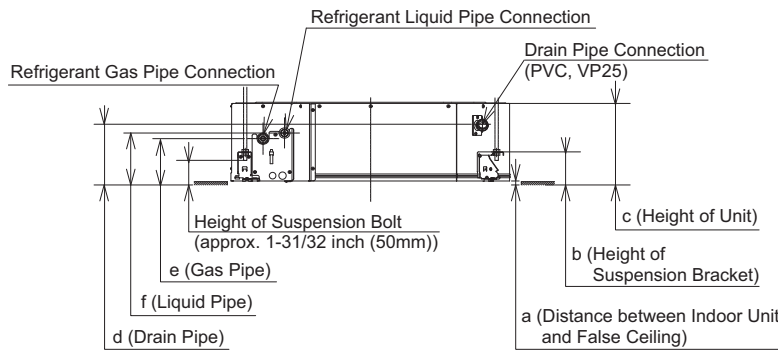
2. Mounting Position of Indoor Unit

- a. Check the mounting position of the indoor unit as shown below. The mounting position of the indoor unit can vary depending on the optional decorative panel and related parts. Before the final position for the indoor unit is determined, check to ensure which decorative panels and optional parts are used.

NOTICE

The optional decorative panel can become deformed if any one of the unit suspension brackets are not installed correctly. If the unit is not level, condensation can form and settle due to gaps and escaping air between the unit and the decorative panel.

- b. The position relationship between the indoor unit and the decorative panel is shown in the table below.



Model	Mounting Position for the Indoor unit (A)		Dimensions			
	a	b	c *	d	e	f
(H,Y)IC4012B21S (H,Y)IC4015B21S (H,Y)IC4018B21S	15/32 ^{+3/16} / ₀	3-15/16 ^{+3/16} / ₀	9-3/4 (248)	7-1/4 (184)	5-1/2 (140)	6-3/16 (157)
(H,Y)IC4024B21S (H,Y)IC4030B21S (H,Y)IC4036B21S	(12 ⁺⁵ / ₀)	(100 ⁺⁵ / ₀)	11-23/32 (298)			

* Indicates the vertical dimension between the lower surface of the indoor unit and ceiling.

INSTALLATION

3. Mounting Position of the Indoor Unit when optional parts are used (B)

When the optional parts are used with the decorative panel, add the additional value (h) to the indoor unit mounting position (A) as shown below. When the calculated value is (-) minus, the unit mounting position is lower than the ceiling surface.

$$\text{Mounting Position of Indoor Unit with Optional Parts (B)} = \left(\text{Mounting Position for Indoor Unit (A)} \right) + \text{Additional Value (h) for Optional Parts}$$

• Additional Value of Optional Parts (h) Unit: inch (mm)

Optional Parts	Filter Box	Panel Spacer	Fresh Air Intake Kit
Additional Value (h)	2-5/32 (55)	-2-7/16 (-40)	2-5/32 (55)

When multiple optional parts for this indoor unit are used, follow the example below. In addition, check the optional parts combinations according to the brochure.

<Example>

• Combination

(H,Y)IC4024B21S + Standard Decorative Panel + Panel Spacer × 2

• Calculation

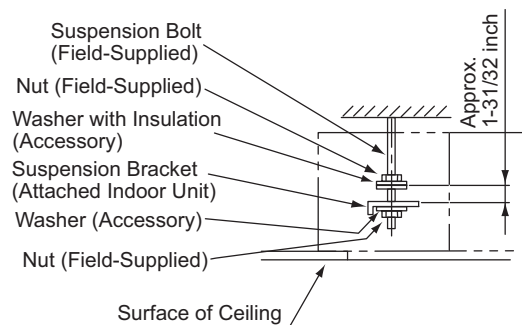
		$\left(\begin{array}{c} \text{(H,Y)IC4024B21S} \\ + \\ \text{Standard} \\ \text{Decorative Panel} \end{array} \right) +$	Panel Spacer	+	Panel Spacer		Unit: <inch> (mm)		
Mounting Position of Indoor Unit (B)	Distance between Indoor Unit and False Ceiling (a)	=	<15/32> (12)	+	<-2-7/16> (-40)	+	<-2-7/16> (-40)	=	<-3-5/16 ^{+3/16} ₀ > (-68 ⁺⁵ ₀)
	Height of Suspension Bracket (b)	=	<3-15/16> (100)	+	<-2-7/16> (-40)	+	<-2-7/16> (-40)	=	<25/32 ^{+3/16} ₀ > (20 ⁺⁵ ₀)

4. Mounting Nuts and Washers

Mount nuts and washers onto the suspension bolts before mounting the indoor unit.

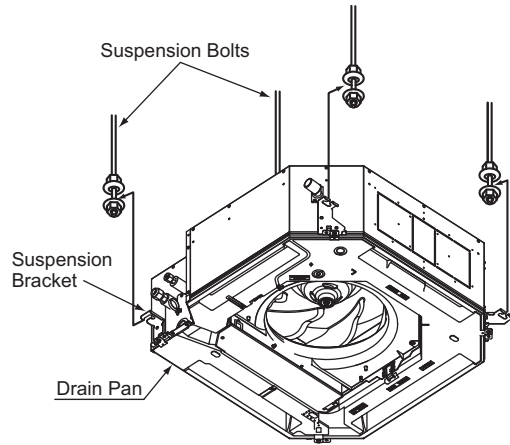
NOTE:

Make sure to use washers (accessories) for installing the suspension bolts to the suspension brackets. Install the washer with the insulation side facing down for suspended installation applications. This way, the washers themselves remain in position on the suspension bolts during the installation phase.



5. Mounting the Indoor Unit

- Hoist the indoor unit but do not apply any force against the drain pan (the air outlet portions and the drain pan portion). If there is insufficient access for a hoist, the work must be performed manually by two skilled installers.
- Suspend the unit by handling the suspension brackets at all four corners of the unit. Do not apply any pressure onto the polystyrene drain pan or pan outlets during the installation process.
- Insert the suspension bolts into the notches of the suspension brackets to capture the unit. Secure the unit using nuts and washers. Then check that the washers serve as stoppers at the rising parts of the suspension brackets.

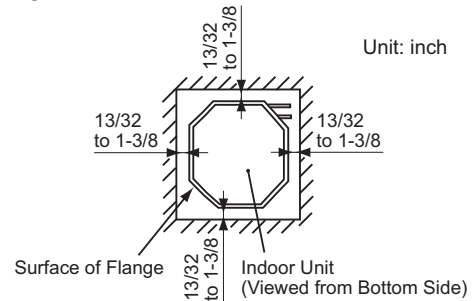


NOTE:

After securing the unit, piping and electric power needs to be installed inside the ceiling area adjacent to the unit. If a false ceiling is already in place, determine the proper pathway for piping and electrical lines before the unit is installed.

6. Spacial adjustments to accommodate the unit into a false ceiling:

- Adjust the position of the unit, as shown at right and maintain the mounting position of the unit in accordance with Items 2. and 3. on the previous pages within $^{+3/16}_0$ inch ($^{+5}_0$ mm).
- The pattern board (template) for the installation and the checking scale are printed on the packing. Cut off the checking scale for dimension of opening from packing to adjust the position of the indoor unit.



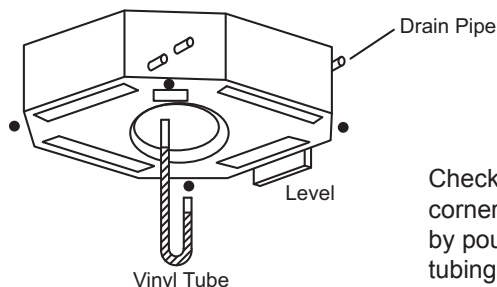
<p>a. False-ceiling applications: Detach the printed scale from the pattern board (template). Raise the unit into position and use this scale for clearance adjustments between the unit and the edge of the opening.</p>	<p style="text-align: center;">Indoor Unit Ceiling Surface Checking Scale for Dimension Opening</p> <p style="text-align: center;">Check the dimension of opening within Max. 1- 3/8 inch (35mm) Min. 13/32 inch (10mm) at each side.</p>	<p style="text-align: center;">Indoor Unit Ceiling Surface Checking Scale for Dimension Opening</p> <p style="text-align: center;">Adjust this portion of the checking scale to the ceiling surface. Adjust this portion of the checking scale to the unit bottom surface.</p>
<p>b. False-ceiling applications (without opening): Use the outer edge of the pattern board (template) to cut an opening in the false ceiling. Raise the unit into position and use this scale to make minute clearance adjustments as described in Item a.</p>	<p style="text-align: center;">Dimension for Opening Dimension for Opening Pattern Board (Template)</p>	
<p>c. Incomplete false-ceiling applications (panels not in place): Secure the pattern board (template) to the unit with the four M6 screws provided and raise as shown into position. Make minute clearance adjustments as ceiling panels are installed.</p>	<p style="text-align: center;">Dimension for Opening Dimension for Opening Pattern Board (Template) Suspension Bolt Indoor Unit Ceiling Surface Screw (M6) Pattern Board (Template)</p>	

INSTALLATION

- Tighten the nuts on the suspension brackets after adjustments are completed. LockTite thread lock compound to the suspension bolts and nuts in order to prevent them from loosening. Adjust the indoor unit into correct position, using the scale of the pattern board (template).

NOTE:

While adjusting the clearance spacing between the indoor unit and the ceiling surface, keep the indoor unit level. Otherwise, it may cause a malfunction of the float switch. Check the vertical alignment of the unit with a level.



Check the vertical alignment at each corner (•) of the unit with a level or by pouring water to the clear vinyl tubing as shown here.

5.4 Installation of Decorative Panel

NOTICE

- Install the decorative panel in accordance with the installation manual for the decorative panel.
- Check to ensure that all connections between the unit and the decorative panel have been made and are secure.

- Check the clearance dimension between the indoor unit and the false ceiling, referring to the Items 2. and 3. of Section 5.2 "Installing Suspension Bolts". The tolerance for that distance is within 0 to 3/16 inch (0 to 5mm).

If not, adjust the distance by using the scale of the pattern board (template) while maintaining the vertical alignment of the indoor unit.

- See that the fix screws for the panel are tightened. Tighten the fixing screws for the panel until touching the stopper to the suspension bracket.

NOTE:

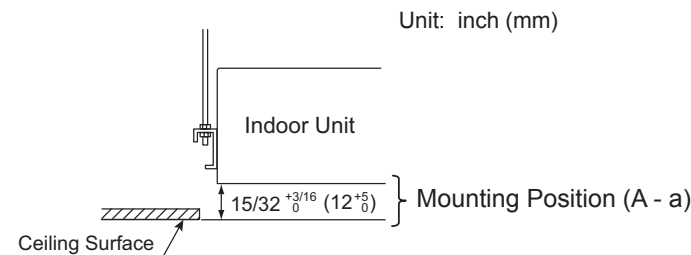
Pay attention to the distance between the indoor unit and the false ceiling. If there is more than 3/16 inch (5mm) gap from the mounting position (A-a) $^{+3/16}_0$, condensation may form due to escaping air from the seal packing.

- Secure all connections for the optional decorative panel to the unit.

The standard decorative panel: P-AP160NA2 ... (one connector)

The decorative panel with motion sensor: P-AP160NAE1 ... (two connectors)

< For Standard Decorative Panel >



If the mounting position is 7/8 inch (22 mm) or more, it can result in condensation formed by escaping air.

6. Refrigerant Piping Work



Use the specified non-flammable refrigerant (HFC R410A) for the outdoor unit refrigerant cycle. Do not charge the unit with anything other than HFC R410A, such as hydrocarbon refrigerants (propane and Isobutene), oxygen, and other flammable gases (acetylene, ammonia, and so forth), or any poisonous gases when installing, maintaining and moving the unit. These substances are volatile and dangerous and can result in fire, explosion, and serious or fatal injuries.

For details of refrigerant piping work, vacuum pump and refrigerant charging, refer to the "Installation and Maintenance Manual" for the outdoor unit.

6.1 Piping Materials

1. Tolerances of refrigerant piping lengths depend on the combination with the outdoor unit. Refer to the "Installation and Maintenance Manual" for the outdoor unit.
2. Select the piping size from the following table.

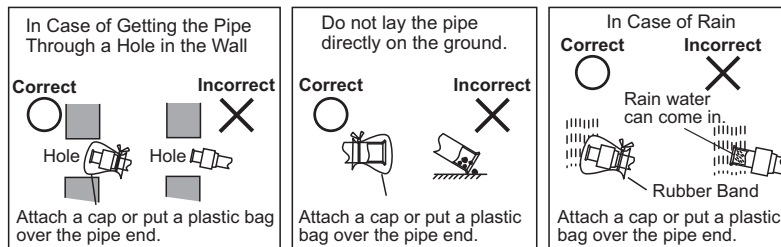
Table 6.1 Piping Size inch (mm)

Model	Gas Piping	Liquid Piping
(H,Y)IC4012B21S (H,Y)IC4015B21S	1/2 (12.7)	1/4 (6.35)
(H,Y)IC4018B21S (H,Y)IC4024B21S (H,Y)IC4030B21S (H,Y)IC4036B21S	5/8 (15.88)	3/8 (9.52)

3. Prepare field-supplied copper pipes.
4. Select clean copper pipes. Make sure there is no dust and moisture inside.
5. The refrigerant lubricating oil used in these units is Polyvinylether (PVE), a chemically stable, resilient, synthetic lubricant that, when combined with refrigerant R410A, maintains its compatibility, lubricity, and viscosity over extended periods of time and is impervious to heat, oxidation, moisture absorption and breakdown as long as it remains in a sealed system. Its chemical properties will remain intact only so long as moisture is not introduced into the system.

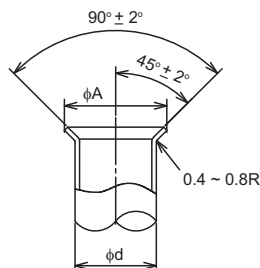
The gaseous element, PVE is a moisture magnet that, once exposed to open air and can quickly become saturated with moisture, lose its lubricity, and become useless. Minimize exposure to the open air, over the summer months, and in southern or tropical climates.

6. When cutting piping, do not use conventional tools such as saws or grinding wheel cutting disks that produce harmful metallic filings and burrs that can damage a refrigerant system. Use a pipe cutter to eliminate metal filings produced by the cutting operation. After the cut is made, blow out each pipe with dry compressed air or nitrogen to remove this residue before making pipe connections.



6.2 Piping Connection

1. Perform the flaring work as shown below.



Diameter (d)	inch (mm)
	A +0 -0.02 (-0.4)
1/4 (6.35)	0.36 (9.1)
3/8 (9.52)	0.52 (13.2)
1/2 (12.7)	0.65 (16.6)
5/8 (15.88)	0.78 (19.7)

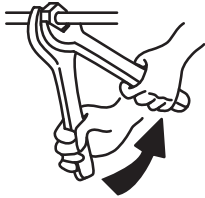
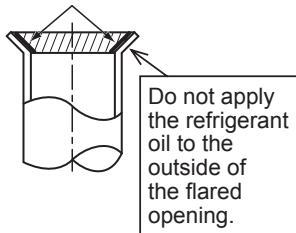
INSTALLATION

- Use specific flare nut attached with the unit.
- Verify that there are no scratches, burrs stuck to internal surfaces, or surface deformations at the flared opening.
- Before tightening the flare nut, apply the (Field-Supplied) refrigerant oil in a thin layer over the flared part. (Do not apply the oil on other areas.) Tighten the flare nut for the liquid pipe to the specified torque with two spanners. Then, tighten the flare nut for the gas piping in the same way. After the tightening work has been completed, check that no refrigerant leakage occurs.

NOTES:

- Refrigerant oil is field-supplied.
[Ethereal Oil FVC50K, FVC68D (Idemitsu Kousan Co. Ltd.)]
- If refrigerant comes into contact with decorative panel surfaces, damage in the form of cracks can occur on panel surfaces. Use with caution.

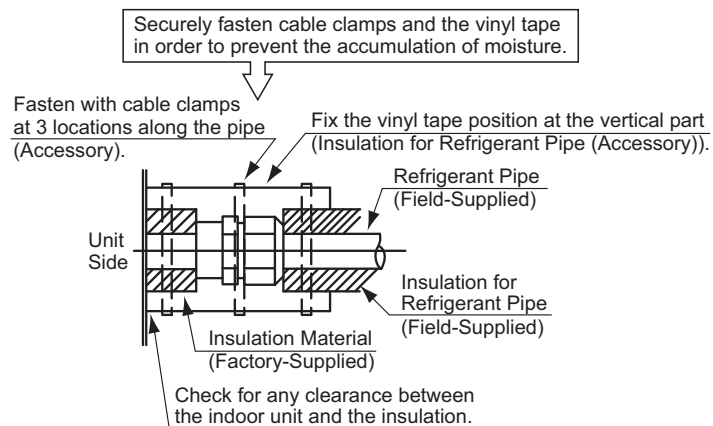
Apply Refrigerant Oil.



Required Tightening Torque (JIS B 8607)

Pipe Size	Tightening Torque
1/4 inch (6.35 mm)	10.3 - 13.3 ft·lbs (14 - 18 N·m)
3/8 inch (9.52 mm)	25.1 - 31.0 ft·lbs (34 - 42 N·m)
1/2 inch (12.7 mm)	36.1 - 45.0 ft·lbs (49 - 61 N·m)
5/8 inch (15.88 mm)	50.2 - 60.5 ft·lbs (68 - 82 N·m)

- Wherever buried piping exists on site, make sure there is a service doorway to provide adequate access to inspect piping sockets and elbows, and for interconnecting parts.
- Piping must be reinforced to withstand earthquakes so as not to be damaged by an external force.
- Do not tightly secure refrigerant piping to accommodate expansion and contraction.
- Prevent the pipes from contacting weak portions such as wall, ceiling, etc. (Otherwise, abnormal sound may be heard due to vibration of the piping.)
- Test for air-tight integrity. The air-tight procedures should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
- If temperature and humidity inside the ceiling exceed 80.6°F (27°C)/RH80%, condensation occurs on the surface of the accessory insulation. Wrap additional insulation (approximately 3/16~13/32 inch (5~10mm) thickness) around the accessory insulation of the refrigerant pipe as a preventive measure.
- Insulate each flare connection without gap with accessory insulations to prevent condensation. Then insulate each refrigerant pipe as well.



! WARNING

- Do not apply excessive force to the flare nut when tightening. If applied, the flare nut may crack due to stress fracture and refrigerant leakage may occur. Use the correct torque specifications.
- Make sure that a refrigerant leak test has been performed. Refrigerant (Fluorocarbon) for this unit is non-flammable, non-toxic, and odorless. If the refrigerant should somehow escape and come into contact with flame, toxic gas will form. This gas is heavier than air and will settle near floor areas and spread where it can cause suffocation to those nearby.

7. Drain Piping

! WARNING

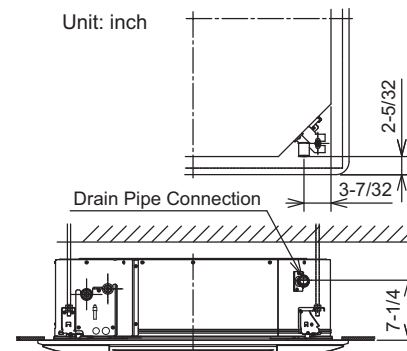
Do not run drain piping into underground areas near sanitary or sewage lines where toxic and corrosive gas can seep into the system. This creates a pathway for the flow of poisonous gas to penetrate inhabited areas.

NOTICE

- Check to ensure that the condensation drain pipe discharges moisture properly. If connected incorrectly, it can cause structural damage to indoor wall and ceiling surfaces and damage to furniture and carpeting.
- Avoid sloping the drain pipe upward as it will impede drainage. Otherwise, moisture will settle back into the unit and it may cause the water leakage when unit operation stops.
- Do not connect condensation drainage with sanitary or sewer lines or any other drain pipe.
- When the common drain pipe is connected with other indoor units, the connected position of each indoor unit must be higher than the common pipe. The pipe size of the common drain pipe must be large enough according to the unit size and number of units.
- After performing drain piping work and electrical wiring, check to ensure that water outflow is as smooth as in the following procedure.

Perform drain piping work and attach the insulation before attempting any refrigerant piping work.

1. The position of the drain pipe connection is shown at right.

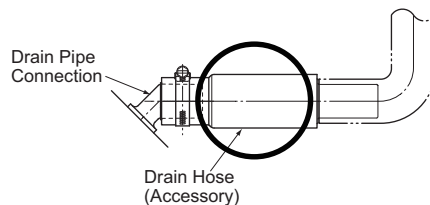


2. Prepare PVC piping with 1-1/4 inch (32mm) outer diameter and an elbow piping joint with VP25.
3. Connecting Drain Piping

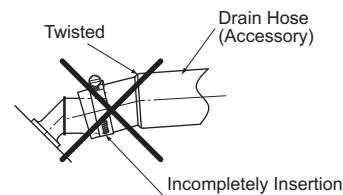
NOTE:

Follow procedures b. and c. on the next page to install the factory supplied drain hose and pipe without adhesive.

- a. Connect the factory-supplied drain hose at the drain pipe connection using PVC adhesive. Clean the affected surfaces apply the adhesive and cure in accordance with manufacturer's instructions.
- b. Insert the drain hose completely. If it is not inserted properly, or if it is twisted, water leakage can occur.



(Correct)

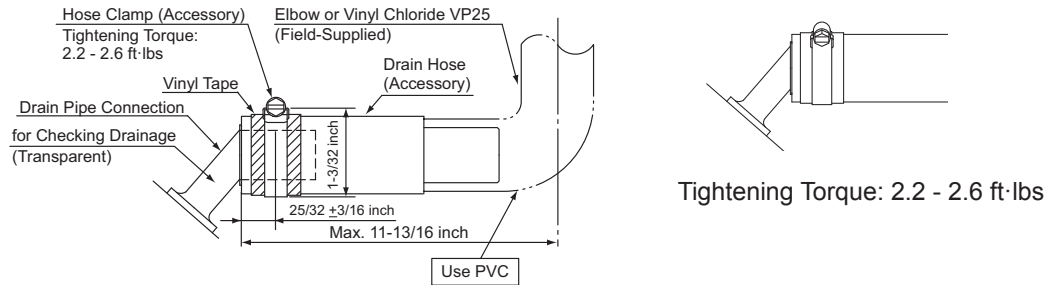


(Incorrect)

Twisted, incompletely insertion.

INSTALLATION

- c. Attach the factory-supplied hose clamp to the vinyl tape (white) attached to the drain hose. The hose clamp shall be $25/32$ inch (20mm) away from the end face of the drain hose. Then tighten the hose clamp to make sure that it is approximately $1-3/32$ inch (28mm) in length from the screw to the edge of the hose clamp as shown in the figure below.

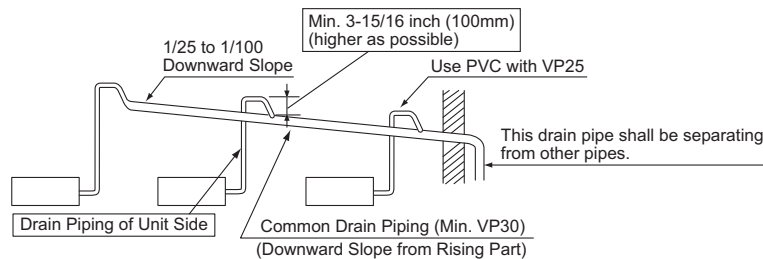


NOTICE

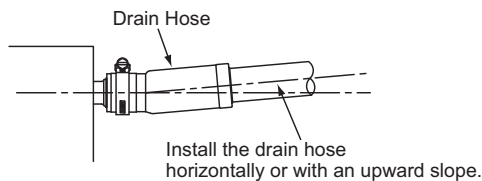
- Make sure to use the factory-supplied drain hose and hose clamp. Other makes are more susceptible to moisture leakage.
- Do not bend or twist the factory-supplied drain hose. Sealing properties of the hose can be compromised.
- Do not apply an excessive force to drain pipe connections. They can be easily damaged.

4. On-site Drain Piping Work

- Connect the factory-supplied drain hose to the drain pipe connection using the polyvinyl chloride adhesive.
- When cleaning the connection surface, applying the adhesive, inserting, retaining and curing the drain pipe, refer to information given by the adhesive manufacturer.
- Install the support parts at an interval of 3.3 ft to 4.9 ft (1m to 1.5m) in order not to bend the drain pipe.
- Install drain piping with a downward slope of $1/25$ to $1/100$ as shown below.

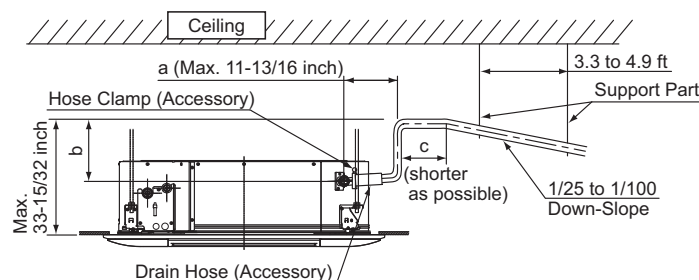


- Install the drain hose horizontally or slightly on an upward slope to prevent air pockets from forming inside it. If air pockets form, moisture will settle back into the unit, which could result in undesired sluicing, bubbling noises and spillover into the room after unit operation has stopped.



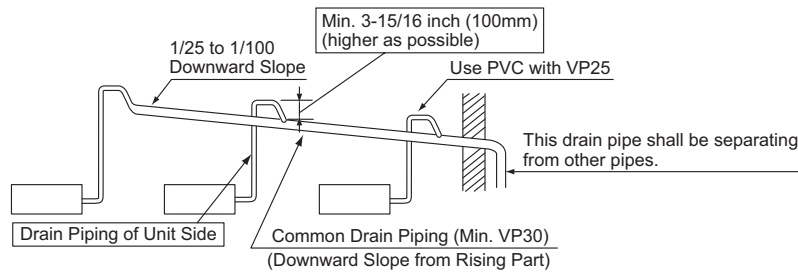
f. Raising Drain Piping

In case of raising the drain pipe, install it according to the dimension shown in the figure below. The total drain piping length of $a+b+c$ shall be within $43-5/16$ inch (1,100mm).



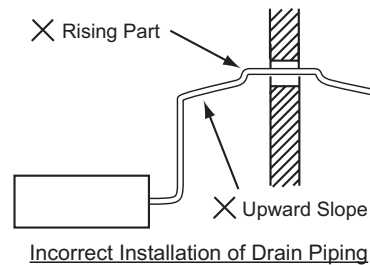
g. Installing Common Drain Piping

- Install the common drain pipe on a downward slope to make sure that it is lower than each rising part of the drain pipe from the indoor unit.
- The size for common drain pipe must be larger than VP30, the nominal diameter size of 1-3/16 inch (30mm) and, outer diameter 1-1/2 inch (38mm) according to the number of the connected indoor units.



NOTICE

- Do not allow drain piping to rise above the level of the drainage basin in the unit, away from the unit. Otherwise, moisture will settle back into the unit with the hazard of spillover when the unit has stopped.
- Do not hook up to sanitary drain lines. Connect to storm sewer lines.

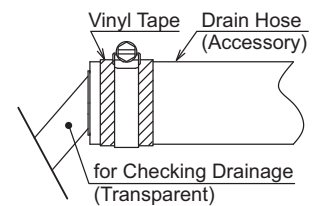
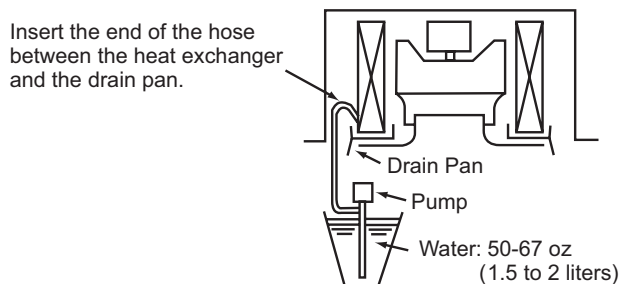


5. Drainage and Water Leakage Check

After performing the drain piping work and the electrical wiring work, check to ensure that water flows smoothly according to the following procedure.

- Drainage Operation by Float Switch
 - The following is regular procedure to check float switch operation:
 - Turn ON the power supply.
 - Pour 50 to 67oz (1.5 to 2 liters) of water gradually into the drain pan.
 - Check to ensure that the water flows smoothly inside the transparent drain piping and drained at the pipe end, and that no moisture leakage occurs.
 - If the end of the drain pipe cannot be checked visually, pour another 50 to 67oz (1.5 to 2 liters) of water to the drain pan. If the water overflows from the drain pan, there might be some failure inside the drain pipe. Inspect the drain pipe.

< In Case of Pouring Water through Air Outlet >



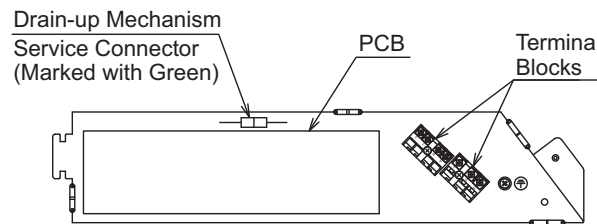
Be careful that water does not splash onto electrical components such as the fan motor, float switch, or thermistors.

NOTICE

- Moisture which has discharged into the drain pan and check for drainage in the heating season should be drained completely from the drain pan.
- The heat exchanger is heated since a slight amount of refrigerant circulates inside the indoor unit during periods of stoppage. As a result, moisture in the drain pan evaporates, causing condensation issues.
- After the drain check is completed, reinsert the rubber plug and seal the gap with a silicon sealant.
- Simplified Operation of Drain-up Mechanism
The following is the simplified operation procedure of the drain-up mechanism.
 - Turn OFF the power supply.
 - Disconnect the service connector (marked with green).
 - Turn ON the power supply and start the simplified operation of the drain-up mechanism.
 - Turn OFF the power supply.
 - Reconnect the service connector.

NOTE:

Make sure to hold the connector part. Do not remove and plug in the connector frequently (more than two or three times).

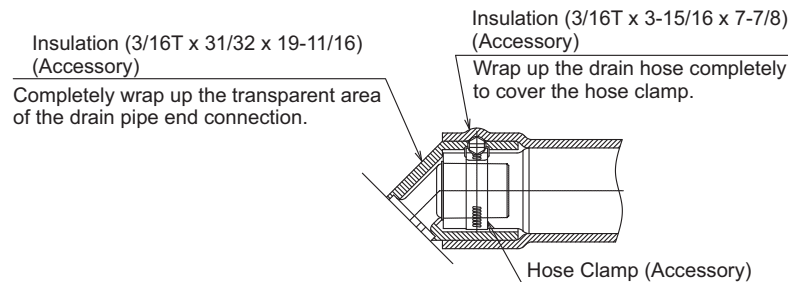


! WARNING

Turn off electrical power at the power supply when handling the service connector. An electrical shock hazard exists.

6. Insulate the drain pipe connection and the drain hose after connecting them. If improperly insulated, condensation will occur.

Unit: inch



7. Insulate the drain piping with insulation wrap as it runs through the indoor unit.

8. Electrical Wiring

WARNING

- All electrical work must be done as outlined in this manual and in accordance with this manual. Substandard work can result in fire and damage to the unit.
- Use specified cables between units and choose the cables correctly. If not, an electrical shock or fire may occur.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply. It can result in an electrical shock.
- Turn OFF the main power switch of the indoor unit and the outdoor unit before attempting any electrical wiring work or a periodical check is performed. If not, it will result in an electric shock or a fire.
- Check to ensure that the indoor fan and the outdoor fan have stopped before attempting any electrical wiring work or for any scheduled electrical work that is being performed.
- Tighten screws according to the following torque.
 - M3.5: 0.9 ft·lbs (1.2 N·m)
 - M4: 0.7 to 1.0 ft·lbs (1.0 to 1.3 N·m)

CAUTION

- Secure all cables together with zip-ties and seal the connecting hole against the onslaught of moisture and insects.
- Run the electrical wiring through the connecting hole in the side cover when using conduit.
- Secure the wired controller cable using the cable clamp inside the electrical box.

8.1 General Check

1. Make sure that the field-selected electrical components: (main power switches, circuit breakers, wires, conduit connectors, and wire terminals) have been properly labeled in accordance with electrical data as specified in the Engineering Manual. Make sure that the components comply with the National Electrical Code (NEC).
2. Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
3. Check the capacity of the electrical wires.
If the power supply capacity is too low, the system cannot be started due to a voltage drop.
4. Verify that the ground wiring is securely connected.

8.2 Electrical Wiring Capacity

8.2.1 Field Minimum Wire Sizes for Power Supply

- Use a GFCI (Ground Fault Circuit Interrupter).
Failure to use a GFCI can result in electric shock or fire.
- Do not operate the system until all check points have been cleared.
 - Check to ensure that the electrical resistance is more than one megaohm, by measuring the resistance between ground and the terminal of the electrical parts. If it is less than one megaohm, do not operate the system until the source of the electrical drain is found and repaired.
 - Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.
 - Check to ensure that the switch on the main power has been ON for more than 12 hours, to warm up the compressor oil by the crankcase heater.
- Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated to higher than 194°F (90°C).

INSTALLATION

8.2.2 Details of Electrical Wiring Connection

The electrical wiring capacity of the outdoor unit should be referred according to the "Installation and Maintenance Manual" for the outdoor unit. Adjusting the DIP switches may be required depending on the arrangement with the outdoor unit.

Select wiring capacity according to the table 8.1. Install a GFCI (Ground Fault Circuit Interrupter) and main switch as shown in each of the system diagrams below.

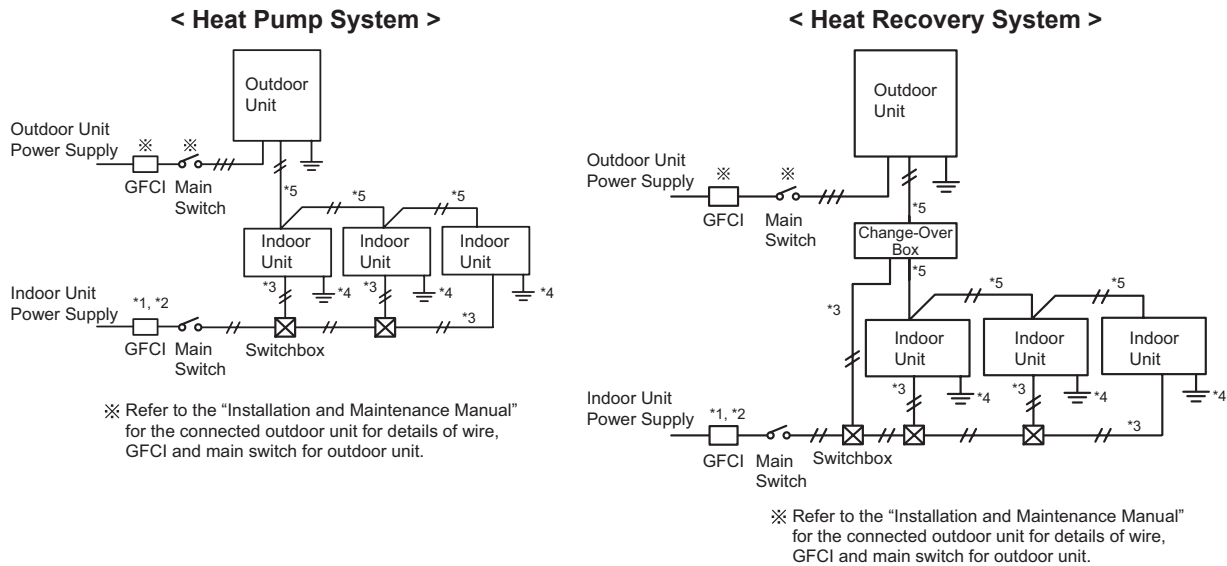


Table 8.1 Recommended Wiring Capacity and Sizes

Follow local electrical codes when selecting a GFCI device.

Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA <Minimum Circuit Ampacity>
		Power Supply Wiring Size < Main >	Ground Wiring Size	Comm. Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
(H,Y)IC4012B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	0.4
(H,Y)IC4015B21S									0.5
(H,Y)IC4018B21S									0.9
(H,Y)IC4024B21S									0.9
(H,Y)IC4030B21S									1.1
(H,Y)IC4036B21S									1.2

NOTES:

1. Follow local codes and regulations when selecting field wires.
2. Select the GFCI with activation speed of 0.1 sec. or less.
3. Total operating current is less than 12A.

NOTICE

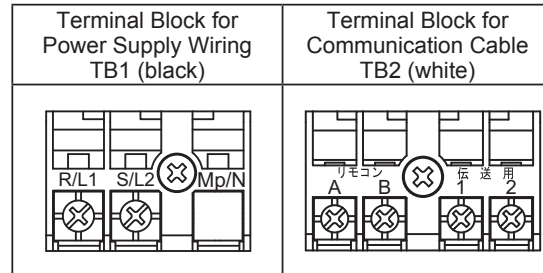
- Check for the recommended size GFCI shown in the table 8.1.
- Between indoor and outdoor units, use dual-conductor, AWG18 (0.82mm²) stranded copper cable for communication cable. Do not use any cable with more than two conductors. Twisted pair or shielded cable can be used in environments with excessive electrical noise to reduce the possibility of communication errors between system components. Total cable length should not exceed 3281 ft (1000m).
- Select the wiring size, GFCI (Ground Fault Circuit Interrupter) in accordance with the regulations for each region, the "Installation and Maintenance Manual", and the dedicated electrical circuit that must be used.
- Outside of the indoor unit, installation of the power supply wiring, communication cable, and wired controller cable should be spaced as far apart as possible.

8.3 Position of Electrical Wiring Connection

- The electrical wiring connection for the indoor unit is shown in Section 8.2.2. For details relating to the intermediate connections between the indoor unit and the decorative panel, refer to installation of the decorative panel.
- The connection at the terminal block for the indoor unit is shown in the figure below. Check the arrangement for the outdoor unit before performing any wiring. Tighten screws in the terminal block as indicated in the torque specification table shown below.

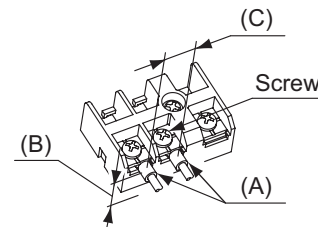
Tightening Torque for Terminals

Screw Size		Tightening Torque
TB1	M4	0.7 - 1.0 ft·lbs (1.0 - 1.3 N·m)
TB2	M3.5	0.9 ft·lbs (1.2 N·m)



NOTICE

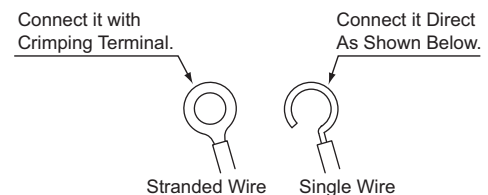
- Do not connect the main power supply wiring to the communication line (Terminals A, B, 1, and 2 of TB2). If connected, the printed circuit board (PCB) will be destroyed.
- Pay attention to following when wires are connected at the terminal block:
 - Attach a piece of insulation tape or a sleeve at each terminal.
 - Maintain the recommended distance between the electrical box and the terminals to prevent a short circuit.
 - Maintain the recommended distance between terminals.



1. Connect the cable for the optional controller or the optional extension cable to the terminals inside the electrical box through the connecting hole of the cabinet.
2. Connect the power supply and the ground wiring to the terminals in the electrical box.
3. Connect the cables between the indoor unit and the outdoor unit to the terminals inside the electrical box.
4. Connect cables to their corresponding terminal number and the similarly marked band.
5. Connect the communication cable between those indoor units connected to the same outdoor unit.
6. Do not connect the main power supply wiring to the communication line (Terminals A, B, 1 and 2 of TB2). If connected, the printed circuit board (PCB) will be destroyed.
7. Tightly clamp the power supply wiring and communication cables using the cable clamp inside the electrical box.

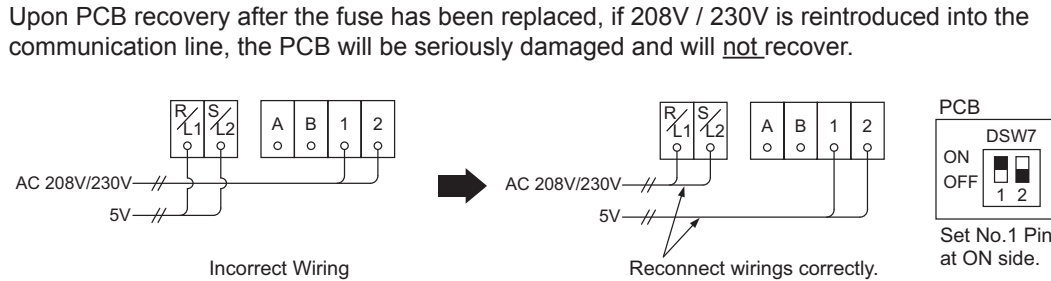
NOTE:

When the standard wire is used for the field-wiring connection, the M4 crimping terminal should be used. When the single wire is used, fashion it into the shape as shown at right and connect it in order to tighten the washer uniformly. The screws at the terminal block should be tightened according to the torque specification as shown in the table above.



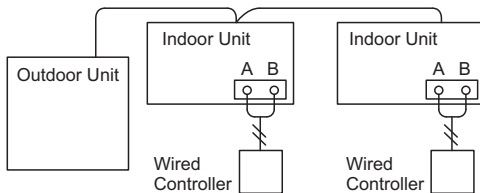
INSTALLATION

8. All electrical work should be performed in strict accordance with electrical schematics in the "Installation and Maintenance Manual".
9. If Power Supply Voltage (208V/230V) is introduced into the Communication Line:
If 208V/230V are applied to the communication line at (Terminals 1 and 2 of TB2) by mistake, the fuse on the PCB for the communication line will blow. In this case, perform the recovery work as shown in the diagrams below.
 - a. Reconnect the wirings correctly.
 - b. Set the No.1 pin at DSW7 (on the PCB) to ON.

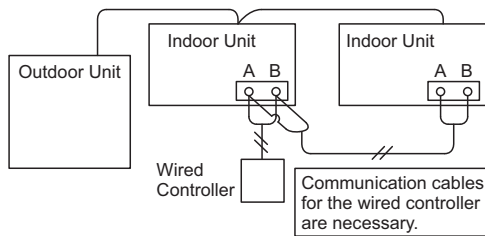


10. Wired Controller Connections

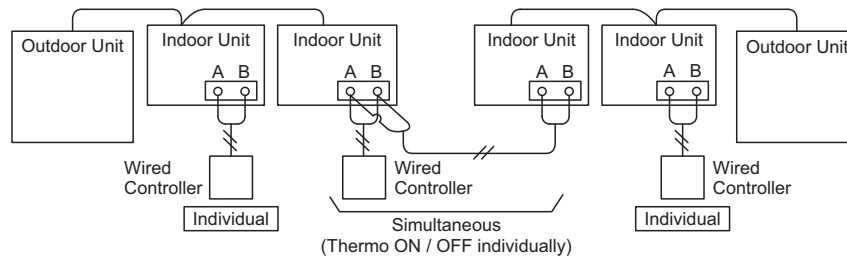
- a. Wired Controllers at each unit for an individual operation setting



- b. Single Wired Controller for an individual operation setting



- c. Wired Controller connections between different refrigerant cycles



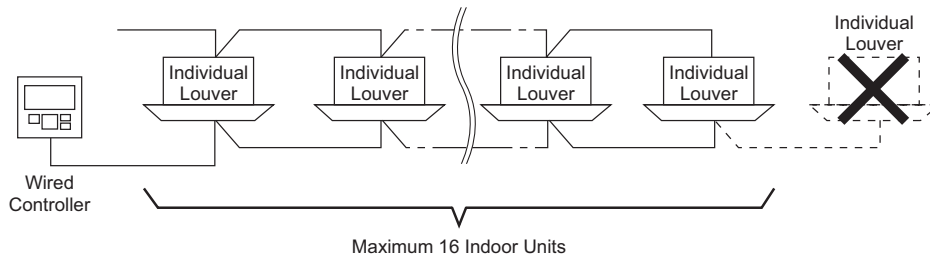
NOTICE

1. The DIP switch settings for the outdoor unit should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
 2. Be aware that communication cable for the wired controller is required in these instances:
 - a. The following functions are set to the sub unit which is not installed with the wired controller.
 - Remote ON/OFF function settings, (No.1, 2, and 3), (External Input / Output Function)
 - Power supply ON/OFF functions, (No.1 and 2), (Function Selection)
 - Prohibiting the wired controller after manual stoppage (External Input / Output Function)
 - Group setting by the centralized controller
 - b. The combination of twin, triple, or quad is controlled by single wired controller.
 - c. The address for the indoor unit is changed from the wired controller.
 - d. The multiple panels with the motion sensor are controlled by single wired controller.
-

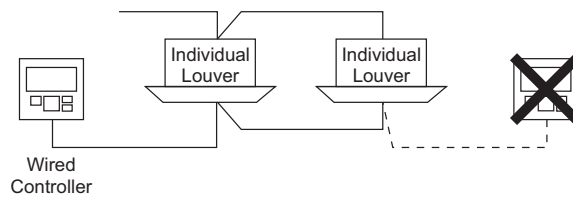
8.4 Wired Controller Cable

8.4.1 Cautions for Individual Louver Settings

1. Individual louver settings are available up to 16 indoor units by single wired controller. Connections for 17 or more indoor units is not possible.



2. Individual louver setting is NOT available with two wired controllers.



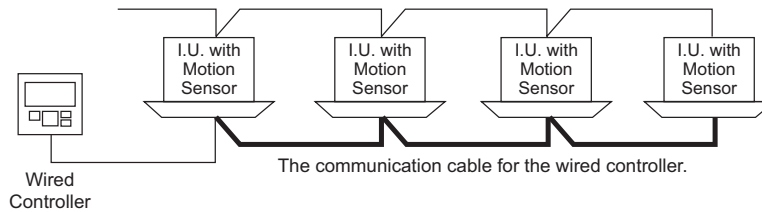
3. The individual louver function is not designed for blocking the air outlet. If the air outlets are required to be blocked, a three-way outlet parts set shall be used.

NOTE:

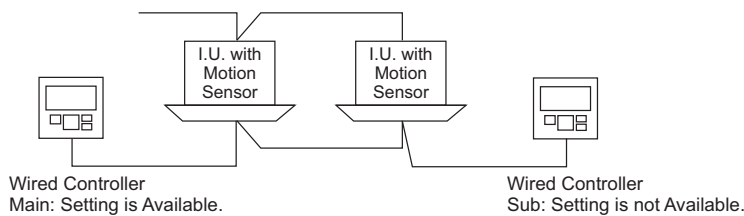
The air outlets cannot be closed individually by the individual louver setting.

8.4.2 Cautions for Decorative Panel with Motion Sensor

1. The decorative panel with motion sensor can be connected up to 16 indoor units by single wired controller. The decorative panel equipped with a motion sensor will be activated even if it is installed together with a decorative panel without motion sensor.
2. When the multiple indoor units equipped with a motion sensor are controlled by single wired controller, then communication cables to the wired controller is required of all indoor units. If not, the indoor units equipped with a motion sensor will not be activated.



3. When two wired controllers are connected, the motion sensor can be set on only the main wired controller. The sub wired controller is for display only.



4. The outdoor unit model is compatible with control by means of a motion sensor kit.
5. The motion sensor cannot be mounted to the decorative panel without motion sensor type P-AP160NA2. (Use the decorative panel with motion sensor P-AP160NAE1.)
6. The motion sensor function is NOT corresponding with the indoor unit without a wired controller.
7. The motion sensor cannot be set from the centralized station.
8. The decorative panel equipped with a motion sensor cannot be used when it is connected to the same wired controller with an indoor unit in the other refrigerant cycle which is set as the simultaneous operation.
9. The room thermostat function is not available.

< Use Conditions and Precaution Statements >

- The motion sensor operates by detecting minute changes in temperature in the infrared spectrum. Moving objects or human activity with temperature differences can be distinguished from the temperature of the surrounding body.

DO NOT install the decorative panel equipped with motion sensor (P-AP160NAE1) in the following places: It can result in poorly identified or defined motion, or degraded performance of the motion sensor.

- Ambient temperature changes drastically.
- Where excessive force or vibration is applied to the sensor.
- Where static electricity or electromagnetic waves may generate.
- Where interference of infrared light such as glasses or mist is in the detecting area.
- Where the lens for sensor is exposed in high temperature and humidity for a long time.
- Where fluid and corrosive gas exist.
- Where direct lights such as sunlight or headlight affect the sensor.
- Where hot air from a heater, etc. affects directly to the sensor.
- Where the air flow returns to the sensor by hitting obstacles such as shelf, locker, etc.
- Where the blower devices such as ceiling fan, ventilating fan, etc. affect the air flow from the indoor unit.
- Where weather affects directly the surface of the sensor.
- Where the lens surface may smudge or be damaged such as a dusty environment.

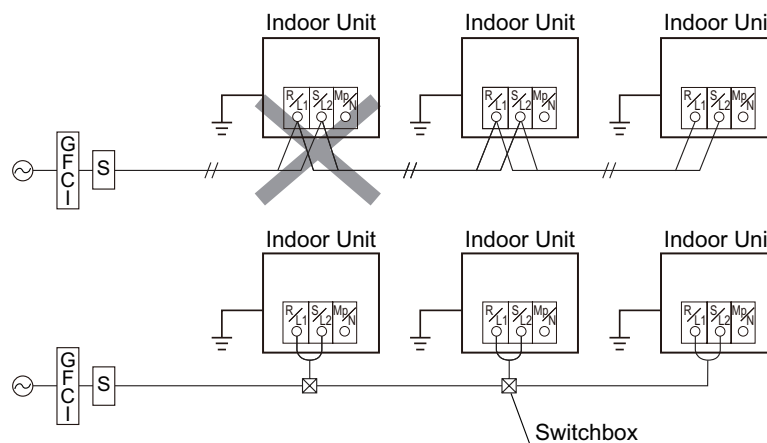
Detecting function will decrease if the lens for sensor smudges.

In this case, wipe off smudges using a cotton swab soaked with alcohol (Isopropyl alcohol is recommended.) or a soft cloth. (When wiping off smudges on the lens for sensor, do not apply excessive force. If excessive force is applied, the resin lens may be damaged and this may cause malfunctions such as misdetection or undetectable of the motion.)

- Human activity or moving objects can set off the motion detector. The sensor inside a suspended unit has a range of 13 ft (4m). Assuming there is human activity in the area, a signal is sent to activate the unit and the temperature of the area is cooled to the set temperature. When activity ceases, the unit is signaled to relax and the ambient air temperature rises, thus, energy efficiency is achieved.

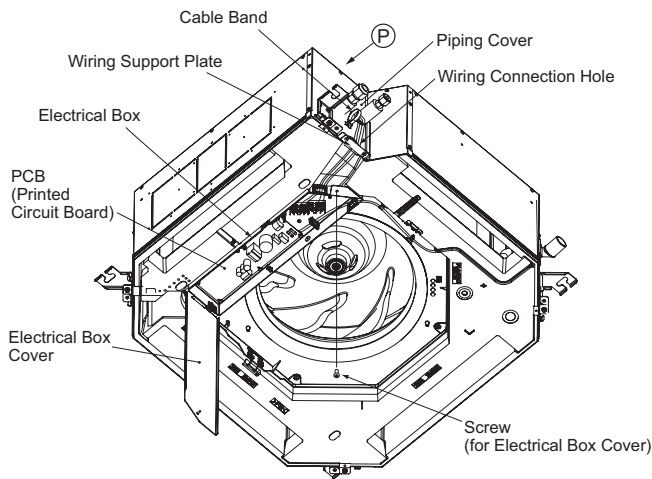
8.4.3 Caution for Electrical Wiring

Do not connect the power supply wiring and the communication cable into one terminal. The manual switchbox is required when communication cable is required.

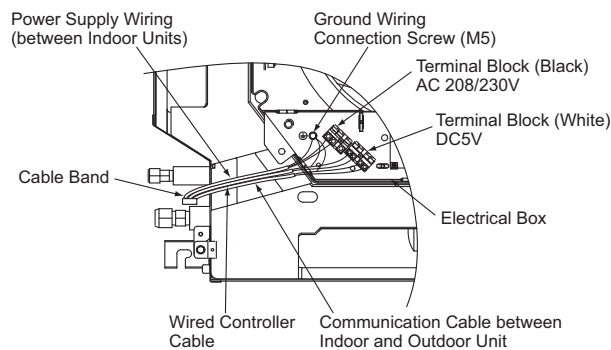
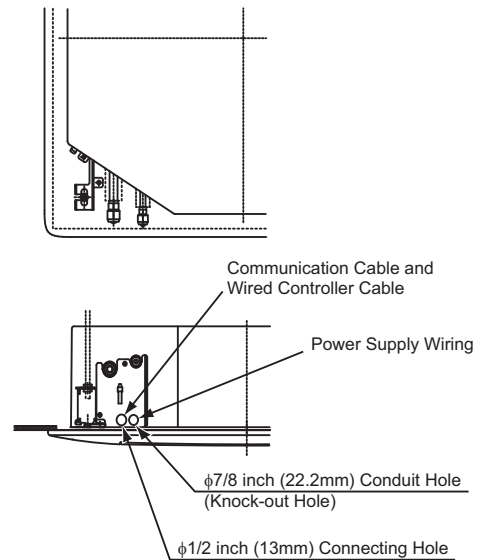


8.5 Wiring Connections

Wiring connections for the indoor unit are shown below.



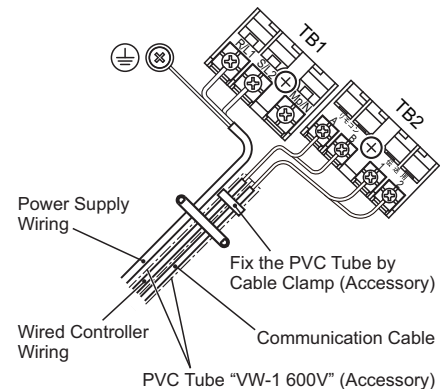
< View from (P) >



- a. Remove the electrical box cover with a single screw.
- b. Install the conduit tube into the conduit hole.
- c. Secure all wires with the wiring support plate after the wires are installed through the wiring connection to the electrical box.
- d. Secure all wires with a cable clamp at the pipe cover to avoid contact with other wires in close proximity with other components.
- e. After all wiring is complete, exercise caution when installing the electrical box.
- f. Cover any gaps near the insulation (3/16T x 1-31/32 inch x 7-7/8 inch (5T x 50 x 200mm)), factory-supplied) if there is a gap at the wiring connection.

NOTE

- Insert the communication cable and wired controller cable into the PVC tube "VW-1 600V" (Accessory) to separate from the power supply wiring for the indoor unit.
- Fix the both ends of the PVC tube by cable clamp (Accessory).
- If shielded cable is used, terminate at the ground terminal.

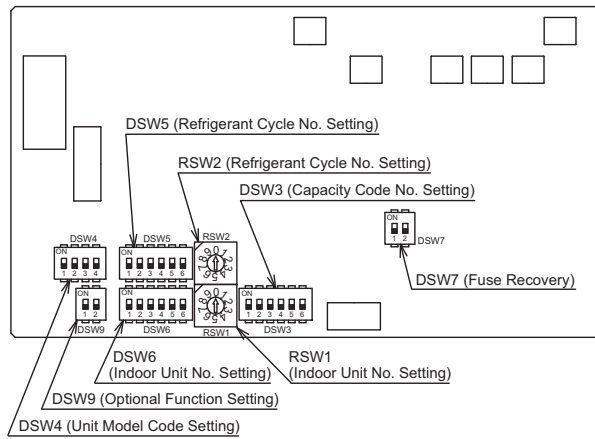


! WARNING

Install and secure all electrical wiring correctly through the connecting hole, to the terminal blocks using the cable clamps provided. Wiring should be spaced appropriately and firmly fastened to guaranty against electrical short, sparks, and flame.

8.6 DIP Switch Settings

1. Turn OFF the power supply to both indoor and outdoor units before adjusting DIP switch settings. Otherwise, the settings will be invalidated and not take effect.
2. Positions of DIP Switches on the PCB are shown below.



3. Unit No. Setting

Setting is not required.

Indoor unit numbers are set by the auto-address function. If an indoor unit number setting is required, set the unit number of all indoor units respectively and sequentially by following setting position. It is recommended that you assign a number to each indoor unit from "1". A maximum of 64 indoor units per refrigerant cycle can be connected to an H-LINK II System. Though the available numbers range from zero to 63, the applicable number for the 64th indoor unit in theory supplants the number "zero". For the centralized control, this setting is required.

Unit No. Setting

<p>DSW6 (Tens Digit)</p>	<p>RSW1 (Units Digit)</p> <p>Setting Position</p> <p>Set by inserting slotted screwdriver into the groove.</p>	<p>Ex.) Set at No.16 Unit</p> <p>DSW6</p> <p>Set No.1 Pin at ON side</p> <p>RSW1</p> <p>Set at "6"</p>
<p>Before shipment, DSW6 and RSW1 are set at "0".</p> <p>For the units supporting H-LINK II, the unit No. can be set for Max. 64 indoor units (No.0~63).</p>		

4. Capacity Code Setting (DSW3)

No setting is required, due to setting before shipment. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.

Indoor Unit Capacity (MBH)	12	15	18	24	30	36
Setting Position						





5. Unit Model Code Setting (DSW4)

No setting is required. It is for setting the model code of the indoor unit.

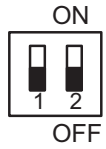


6. Refrigerant Cycle No. Setting (RSW2 & DSW5)
 This setting is required. The unit arrives with all settings in the OFF position.

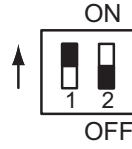
Refrigerant Cycle No. Setting

<p>DSW5 (Tens Digit)</p> 	<p>RSW2 (Units Digit)</p> <p>Setting Position</p>  <p>Set by inserting slotted screwdriver into the groove.</p>	<p>Ex.) Set at No.5 Cycle</p> <p>DSW5</p>  <p>Set All Pins OFF</p> <p>RSW2</p>  <p>Set at "5"</p>
<p>Before shipment, DSW5 and RSW2 are set at "0".</p> <p>For the units supporting H-LINK II, the ref. cycle No. can be set for Max. 64 cycles. (No. 0-63)</p>		

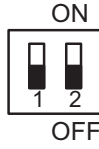
7. Fuse Recovery (DSW7)
- Factory Setting



- When introducing high voltage to terminals 1 and 2 of TB2, the (0.5A) fuse on the PCB is cut. In such a case, first, reconnect the wiring correctly to TB2, and then adjust the number 1 pin to ON.



8. Optional Function Setting (DSW9)
- No setting is required. Settings positions before shipment are all in the OFF position.



NOTES:

- The solid square "■" symbol signifies the "ON" position for DIP switches. The diagrams show original settings before shipment.
- When the unit number and the refrigerant cycle are set, record the unit number and refrigerant cycle to facilitate maintenance and servicing activities afterward.

NOTICE

All indoor and outdoor units must be shut down prior to attempting to make DIP Switch adjustments, otherwise, the settings will not take effect.

8.7 Function Selection by Wired Controller

Each function can be selected with the wired controller. Refer to this "Installation and Maintenance Manual", and the engineering manual for details.

1. High Speed Setting Function

- This function is used to set the airflow volume higher than normal airflow volume. This is used for high ceiling areas on site. Set High Speed setting (1 or 2) from the function selection menu, depending on the ceiling height as shown in the table below.
- If the "High-Speed 2" setting (02) is selected from the wired controller, airflow volume for "HIGH 2" and "HIGH" will become equal because the airflow volumes for "HIGH 2" and "HIGH" both use maximum fan speed.

Ceiling Height		High Speed Setting Function
012 to 018 Type	024 to 036 Type	
Less than 8.9ft.	Less than 10.5ft.	Standard
8.9 - 9.8ft.	10.5 - 11.8ft.	High Speed 1
9.8 - 11.5ft.	11.8 - 13.8ft.	High Speed 2

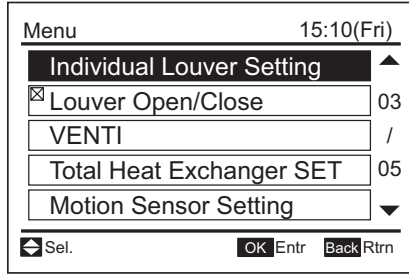
2. Circulation Function at Heating Thermo-OFF

This function maintains the fan operation by the set airflow volume at the heating Thermo-OFF. It is for improvement of temperature distribution at sites with high ceilings.

3. Individual Louver Settings (Number of Louver Outlets)

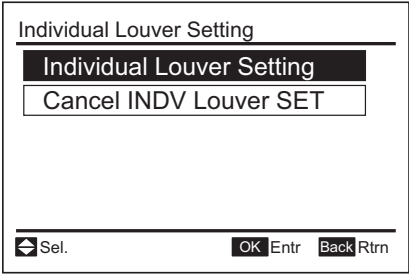
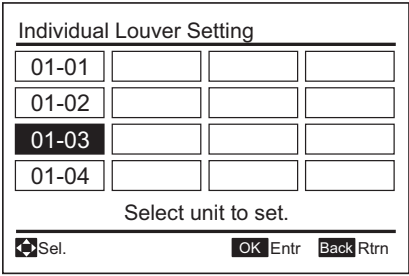
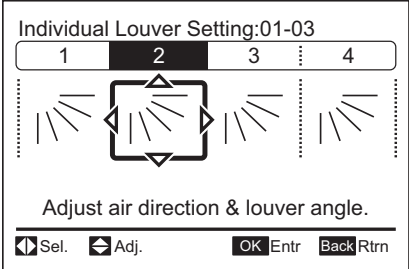
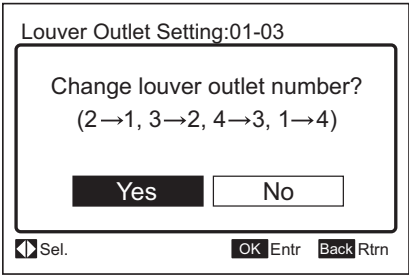
This setting is available only for the indoor unit adopting the individual louver. The number of individual louvers (louver outlet numbers 1 - 4) are changeable as shown in the following procedure. The number of individual louvers can be set when each of the louver outlet (louver outlet numbers 1 - 4) are set as the louver outlet number 1.

< Individual Louver Setting Procedure >

<p>1. Press and hold "Menu" during the normal mode (when unit is operated). The menu will be displayed.</p>	
<p>2. Select "Individual Louver Setting" from the menu and press "OK". The individual louver setting will be displayed.</p>	

To Next Page



<p>3. Select "Individual Louver Setting" from Individual Louver Setting screen and press "OK".</p>	 <p>The screenshot shows a menu titled "Individual Louver Setting" with two options: "Individual Louver Setting" (highlighted) and "Cancel INDV Louver SET". At the bottom, there are navigation buttons: "Sel.", "OK Entr", and "Back Rtrn".</p>
<p>4. Select the indoor unit to change the louver direction by pressing "△ ▽ ◀ ▶" and press "OK". (This screen is NOT displayed when only one indoor unit is connected to the wired controller. In this case, move to Item 5.)</p>	 <p>The screenshot shows a table of indoor units under the heading "Individual Louver Setting". The units are 01-01, 01-02, 01-03 (highlighted), and 01-04. Below the table is the text "Select unit to set." and navigation buttons: "Sel.", "OK Entr", and "Back Rtrn".</p>
<p>5. Press "◀ ▶" and select the louver direction. The selected louver is opened and the other louvers are closed.</p>	 <p>The screenshot shows a diagram of four louvers labeled 1, 2, 3, and 4. Louver 2 is highlighted and has arrows indicating its direction. Below the diagram is the text "Adjust air direction & louver angle." and navigation buttons: "Sel.", "Adj.", "OK Entr", and "Back Rtrn".</p>
<p>6. Press "Menu" while "Back/Help" is pressed. The confirmation screen will be displayed.</p>	 <p>The screenshot shows a confirmation screen titled "Louver Outlet Setting:01-03". The text asks "Change louver outlet number?" with a mapping "(2→1, 3→2, 4→3, 1→4)". There are "Yes" and "No" buttons. At the bottom are navigation buttons: "Sel.", "OK Entr", and "Back Rtrn".</p>
<p>7. Select "Yes" and press "OK". Screen of Item 5. will be displayed after the change of setting is confirmed. If "No" is selected and "OK" is pressed, the screen will return to Item 5.</p> <ul style="list-style-type: none"> ▫ Regarding the "Individual Louver Setting", the louver selected at Item 5. will be set as "Number 1" and the other louver numbers will be changed clockwise automatically as shown at right. 	

- This "Individual Louver Setting" is NOT available when two wired controllers are used in the same H-LINK. (This includes the combination with the wired controller and the wireless controller.)
- The individual louver setting is available for up to 16 indoor units by single wired controller.
- The individual louver settings with the same refrigerant cycle are available for up to four indoor units without the communication cable for the wired controller.

4. Condensation Control Function

This function limits the occurrence of condensation around louvers. Condensation can occur when the air conditioner has run in cooling mode over a prolonged period of time at 80.6°F DB (27°C DB) and a high rate of humidity (Relative Humidity: Approximately 80%). If there is any anticipation of upcoming operation under these conditions, set "K8:01" on the function selection menu to safeguard against condensation.

9. Test Run

9.1 Before Test Run

Verify that there are no problems with the installation, and do not perform Test Run until all the following conditions have been resolved.

Refer to the "Installation and Maintenance Manual" for the outdoor unit for details on Test Run operations from the outdoor unit.

Verify that refrigerant piping and the communication cable are connected to the same refrigerant cycle system. If not, it will cause an abnormal operation and damage to instrumentation.

1. Verify that electrical resistance is more than one megaohm, by measuring the resistance between ground and the terminal the terminus for electrical components. If the electrical resistance is less than one megaohm, do NOT operate the system until the electrical current outflow to ground is detected and repaired. Do not introduce any high voltage to the terminals of the communication cables (TB2 [A, B, 1 and 2]).
2. Verify that each wire is connected correctly at the correct phase for the power supply. If it is incorrectly connected, the unit will not operate and the wired controller will display the alarm code "05". In this case, check the phase for the primary power supply according to the "Attention" label affixed to the back side of the service cover. Then, with the power supply turned OFF at the power supply, remake the necessary connections.
3. Check to ensure that the main power supply has been turned ON for more than 12 hours, to warm up the compressor oil by the crankcase heater.
4. Verify that all DIP Switch settings are correct. Refer to Section 8.6 "DIP Switch Settings".

9.2 Test Run

After all installation work is completed, **Test Run** should be performed.

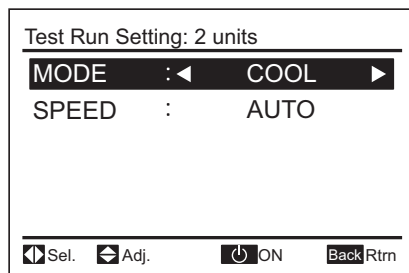
1. Check to ensure that stop valves (gas and liquid) for the outdoor unit are fully opened.
2. Whenever indoor units are connected to the VRF system, perform the **Test Run** for the indoor units one by one sequentially and then check the refrigerant piping system and the electrical wiring system for conformity. (If these multiple indoor units are operated simultaneously, system conformity cannot be verified.)
3. Perform the **Test Run** in accordance with the following procedure. Ensure that the Test Run is carried out without any problem. The following procedure shows a case where a wired controller is utilized. If other controllers are activated instead, refer to the "Installation and Maintenance Manual" for those other controllers.

NOTE:

The outdoor unit may not be operated depending on the indoor and outdoor temperature conditions. Refer to the "Installation and Maintenance Manual" for outdoor units for details.

- a. Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds. The **Test Run** menu will be displayed.
 - The **Test Run** menu will be displayed.

Test Run Screen

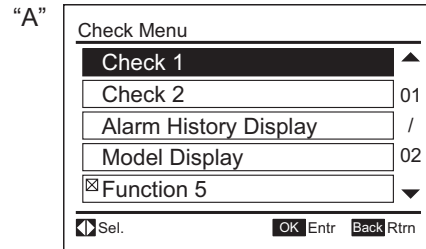


NOTE

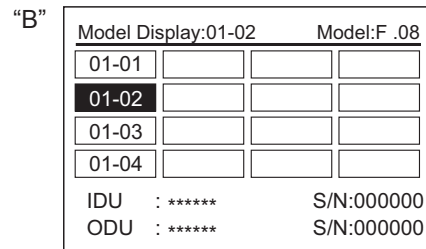
When the "00 unit" is displayed, the auto-address function may be working. Cancel "**Test Run**" mode and reset.

- The total number of connected indoor units is indicated on the LCD (Liquid Crystal Display). In the case of a twin combination (set of two indoor units), the total number of the connected indoor units is displayed as **“2 units”**, and where there is a triple combination (set of three indoor units), the total number of the connected indoor units is displayed as **“3 units”**.
 - If the number indicated is not equal to the actual number of connected indoor units, the auto-address function is not performing correctly due to incorrect wiring or electrical interference. Turn OFF the power supply, and resolve the wiring issue after verifying the following items; (Do not repeat turning ON and OFF within a 10 second timespan.)
 - The power supply to the indoor unit is not turned ON or there is an incorrect wiring issue.
 - Incorrect connection of the interconnecting cable between indoor units or a poorly connected controller cable.
 - Incorrect setting of the rotary switch and DIP switch for the indoor unit printed circuit board (PCB). (The setting is overlapped.)
 - Press “⏻ On/Off” to start the Test Run.
 - Press “△ ▽ ◀ ▶” and set each item.
- b. Press “⏻ On/Off”.
The RUN indicator turns ON and the operation starts. At this time, a two-hour OFF timer will be set automatically.
- c. Press “△” or “▽”, select “LOUVV.” and select “” (auto-swing) by pressing “◀” or “▶”. The auto swing operation will start. Check the operating sound at the louvers. If abnormal sound is not generated, press “◀” or “▶” again to stop the auto swing operation. If abnormal sound is generated from the louvers, remove the face panel and adjust the louver accordingly.

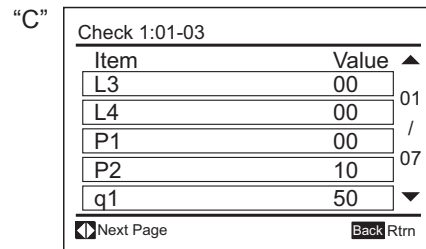
- d. Verify that the motion sensor is operating correctly as in the following steps: (in cases of the decorative panel with the motion sensor).
1. Press and hold “Menu” and “Back/Help” simultaneously for at least three seconds during the Test Run mode.
The check menu screen “A” is displayed.



2. Select **“Check 1”** at the check menu and press **“OK”**. (Screen “B” will be displayed.) (This screen is NOT displayed when only one indoor unit is connected to the wired controller. In this case, screen “C” will be displayed.)



3. Select the indoor unit by pressing “△ ▽ ◀ ▶” and press “OK”.
The check data screen “C” will be displayed.

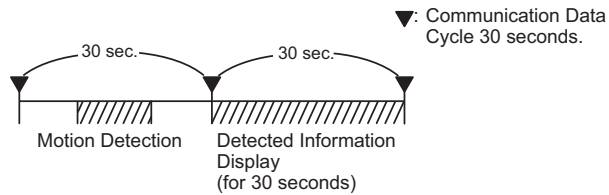


4. Press “△ ▽” to change the screen until it displays the check screen “q2” ~ “q6”.

< Check of the Motion Sensor >

1. Perform the motion detection (waving a hand, etc) under the motion sensor of the selected indoor unit for approximately 10 to 15 seconds.
2. Check the value of "q3" ~ "q6" after 30 (*1) seconds from starting the motion detection at Item 1. The detection information from the motion sensor against the motion detection is displayed a range of 0% to 100%.

(*1): The communication cable between the indoor unit and the wired controller is on a 30 second cycle. Timing for motion detection and the detected information display is shown below.



NOTE:

Refer to the operator's manual for indoor unit settings, setup of the motion sensor. ("Motion Sensor Setting", "If Absent" and "Check Interval" can be set.)

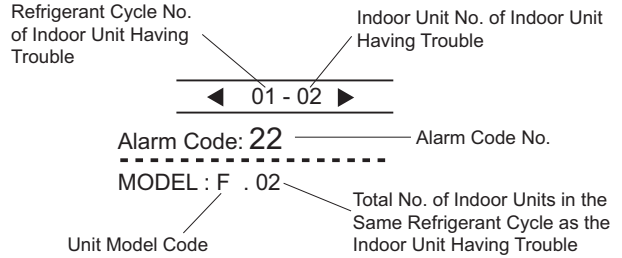
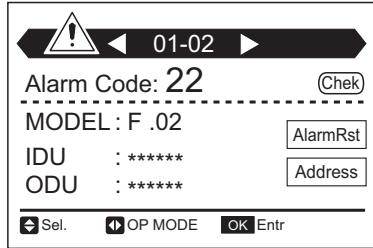
3. Check that the value of "q3" ~ "q6" is neither 0% nor 100%. If the value displayed is 0% or 100%, repeat the procedure from Item 1. If the same value reappears, it may be a malfunction of the motion sensor.

< Check of the Radiation Sensor >

1. Check the value for "q2". If that value differs greatly from the air temperature at the installation location, a failure of the radiation sensor may occur. (The radiation sensor will indicate readings from (-22 to 140°F (-30 to +60°C)).
 2. Press "Back/Help" and return to the display.
- e. Though temperature recordings by the thermistors are invalid during the Test Run phase, the protection devices are valid.
- f. For VRF System
According to the label; "Checking Method by 7-Segment Display" affixed to the inside of the front cover of the outdoor unit, check temperature, pressure, and operation frequency, and interconnected indoor unit numbers by 7-Segment displays.
- g. To complete Test Run, press "⏻ On/Off" again or wait for the set Test Run time to pass.
When changing the Test Run time, press "Δ" or "∇" to select "Test Time". Then, set the test run time (30 to 600 minutes) by pressing "◀" or "▶".

Test Run: 2 units	
MODE :	COOL
SPEED :	◀ AUTO ▶
LOUV. :	🌀
Test Time :	120min <input type="text"/>
Inverter :	60Hz <input type="text"/>
◀ Sel.	↔ Adj.
⏻ OFF	

- The RUN indicator on the wired controller for the indoor unit will flash orange (0.5 second ON/ 0.5 second OFF), indicative of a fault or error having been generated with activation of protection devices during the Test Run phase. Alarm code, unit model code, and the number of interconnected indoor units will be displayed on the LCD as shown below. If the RUN indicator on the wired controller flashes for two seconds ON and two seconds OFF, the source of the problem could be a failure in the communication cable between the indoor unit and the wired controller (a loose or severed connection). In this case, verify Section 9.3 “Alarm Code” and perform the appropriate troubleshooting measures. Consult with an authorized service engineer if the problem cannot be resolved at your end.



< Unit Model Code >

The relationship between the unit model code and the unit model is shown in the table below.

Indication	Unit Model
F	VRF System
E	Except Above Models

9.3 Alarm Code

Alarm (Troubleshooting) Code Table

Code No.	Category	Nature of Problem	Likely Cause
01	Indoor Unit	Activation of a protection device (Float switch)	Activation of the float switch; (High water level present in the drain pan.) A problem exists in the piping.
02	Outdoor Unit	Activation of protection device; (Except for Alarm Code: 41, 42)	High Pressure Cut; (R410A: 601 psi (4.15MPa)), fan motor lockup during the outdoor unit cooling operation.
03	Communication	Communication failure between indoor and outdoor units	Incorrect wiring, loose terminals, disconnected wiring or a blown fuse.
04-09	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
11	Sensor on Indoor Unit	Inlet Air Thermistor failure	Loosely connected, disconnected, or a severed connection.
12		Outlet Air Thermistor failure	
13		Freeze Protection Thermistor failure	
14		Gas Piping Thermistor failure	
19	Fan Motor	Problem with Indoor Fan	Fan motor lockup, fan motor protection control device for indoor unit activated.
20-29	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
31	System	Incorrect capacity setting for indoor and outdoor units.	Incorrect capacity code setting for combination, excessive or insufficient total indoor unit capacity code.
32		Incorrect setting of other indoor unit number	Problem with a different Indoor Unit in the same refrigerant cycle; (Failure at the power supply, defective PCB).
35		Incorrect setting of indoor	Indoor unit number duplicated in same refrigerant group.
36		Incorrect indoor unit combination	Indoor unit is designed for other refrigerant; (R22 or R407C).
38-59	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for the outdoor unit.)		
b0	System	Incorrect setting for unit capacity	Incorrect setting for unit capacity
b1		Incorrect setting of unit and refrigerant cycle number	Unit number or refrigerant cycle ≥ 64
b5		Incorrect setting of indoor unit number for H-LINK type	Interconnected indoor units are not supporting H-LINK II ≥ 17
EE	Compressor	Compressor protection alarm	This alarm code displays when the alarms such as damage to the compressor occur three times within a six hour period.

- When the RUN indicator flashes every four seconds, there is a communication failure between the indoor unit and the wired controller (loose connector, disconnected or incorrect wiring, or a severed connection).
- The indication of the alarm code "EE" means serious abnormality to burn out the compressor.

Refer to the "Installation and Maintenance Manual" for the indoor/outdoor unit connections.

NOTICE

Do NOT operate the air conditioning just to run checks on electrical wiring until preparations for the Test Run phase is completed.

All the installation work of the air conditioning is completed.
Handover this information to the building owner and request to maintain all the equipment manuals and warranty.

Refrigerant Leak Check

Conduct a periodic refrigerant leak check to maintain product performance and secure storage of refrigerant (Fluorocarbons). After completing installation, record the following results into this "Installation and Maintenance Manual":

1. Results of a test for air-tight integrity
2. Total refrigerant charge volume dispensed (including a trim charge added following the installation)
3. Result of the refrigerant leak check

Then hand it over to users and ask them to retain for reference.

All periodic service and maintenance procedures must be conducted only by authorized and trained personnel.

1.3.3 1-Way Cassette Type

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1. Introduction

Read this "Installation and Maintenance Manual" carefully before installing this product.



This is "Installation and Maintenance Manual" for the indoor unit. Read over the "Installation and Maintenance Manual" for the outdoor unit as well.

Hand over this "Installation and Maintenance Manual", and the warranty must be provided to all installers and users. Ask end users to maintain copies for future reference.


(Refrigerant Piping Work) → (Electrical Wiring Work) → (Ref. Charge Work) → (Test Run) → (User)

- For details on wiring between the indoor unit and the outdoor unit, refer to the "Installation and Maintenance Manual" for the outdoor unit.
- For details on the optional decorative panel, refer to the "Installation and Maintenance Manual" for the optional decorative panel.
- For details on the optional controller, refer to the "Installation and Maintenance Manual" for that optional controller module.
- For details on each optional part, refer to the "Installation and Maintenance Manual" for each optional part.
- For central station, refer to the "Installation and Maintenance Manual" for the central station.

2. Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.

- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Before servicing, turn-OFF the power supply and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

⚠ WARNING

To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.

INSTALLATION

- Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
- A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or a hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drain pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the drain pipe becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” the proper use and maintenance of this unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit’s intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit’s faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country’s requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.

- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cable shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cable is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications. If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.
- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power supply when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power supply completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power supply.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wiring is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

CAUTION

- Proper handling of this unit requires two-people. Safe handling and installing the indoor unit requires the strength of two people. Mounting the unit alone may cause injury due to fall of the unit. Although the unit may be girded with steel banding, do not use it for transportation. Avoid contact with finned surfaces of the heat exchanger as sharp edges can cause severe injury to hands and fingers. Use appropriate work gloves for the job.

NOTICE

- The optional decorative panel can become deformed if the positioning of the indoor units suspension brackets are not stable or level. Condensation can accumulate in low spots as a result due to escaping air through any resulting gaps between the indoor unit and the decorative panel.
- Check to ensure that the drain hose discharges moisture properly. If connected incorrectly, it can result in leakage and damage to furniture.
- Make sure to use the factory-supplied drain hose and hose clamp. Other makes can cause moisture leakage.
- Do not bend or twist the factory-supplied drain hose. This could compromise the seal and result in moisture leakage.
- Do not apply an excessive force to the drain pipe connection. This can also compromise the seal properties of the connection.
- Verify that the installed unit is level with floor and ceiling surfaces. Any variance or inclination can cause moisture to back up into the drain pan, overflow, and seepage onto ceiling or wall surfaces, and cause damage to carpeted surfaces or furniture below.
- Do not install this system in close proximity to septic sewer lines where flammable and toxic gases can coalesce.
- Inspect the drain pan before the onset of winter to drain away all accumulated moisture in the pan.
- The heat exchanger of indoor unit overheats whenever there is a slight amount of refrigerant circulating during slowdown or stoppage. As a result, moisture in the drain pan evaporates where it can condense on ceiling or wall surfaces.
- After the drain check is completed, insert the rubber plug again and seal the gap with a silicon sealant.

Electrical Installation**WARNING**

In some cases, the packaged air conditioner may not be operated normally under the following cases:

- When electrical power for the packaged air conditioner is supplied from the same power transformer as the device*.
- When the power supply wiring for the device* and the packaged air conditioner are located close to each other:

Device*: (Example): Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor, and large-sized switch.
It consumes large quantities of electrical power.

Regarding that mentioned above, surge voltage may be inducted into the power supply wiring for the crated air conditioner due to a spike in power consumption for this device and an activation of the switch. Check the field regulations and standards before performing any electrical work in order to safeguard the power supply for the crated air conditioner unit.

3. Before Installation

3.1 Combination of Outdoor Unit and Indoor Unit

The combination capacity of indoor unit against the outdoor unit is selected depending on the outdoor unit capacity. Refer to the "Installation and Maintenance Manual" for the outdoor unit to decide the required combination of indoor and outdoor units, and the combination unit capacity.

3.2 Transportation and Handling

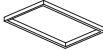

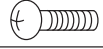
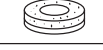



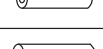
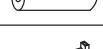


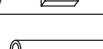
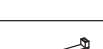
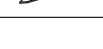
- (1) Transport the product as close to the installation location as possible before unpacking.
- (2) Do not lay any objects on the indoor unit.
- (3) The indoor unit comes crated upside-down with the foam polystyrene drain pan positioned on top. Do not invert the unit until it is ready to be suspended above the floor. Inverting the unit while on the floor will crush the drain pan. Do not handle the unit by grabbing at the polystyrene pan and other air outlets as they are fragile and will sustain damage.
- (4) The indoor unit handle is fabricated from foam polystyrene and is susceptible to breakage if any excessive force is applied as a result of mishandling of the unit during installation.

INSTALLATION

3.3 Factory-Supplied Accessories

- (1) Check to ensure the following accessories are packed with the indoor unit.
The screws and washers are put in the pipe insulation.

inch (mm)

Accessory	Qty.	Purpose
Pattern Board/Template (Carton Board) 	1	For Adjusting Space of False Ceiling Opening and Positioning of Unit
Checking Scale (Cut and Remove it from Carton Board) 	1	
Cross Recessed Head Screws (M6) 	4	For Fitting Paper Pattern
Washer with Insulation Material (M10) 	4	For Unit Installation
Washer (M10) 	4	
Drain Hose 	1	For Drain Hose Connection
Hose Clamp 	1	
Pipe Insulation 	1	For Refrigerant Piping Connection
Pipe Insulation 	1	
Cable Clamp 	2	For Fixing Wired Controller Cable
Cable Clamp 	6	For Piping Insulation
Insulation 3/16T x 10-5/8 x 10-5/8 (5T x 270 x 270) 	1	For Covering Drain Connection
PVC Tube 	2	For Separating Communication Cables and Wired Controller Cables from Power Supply Wirings 7/16 ID (11 ID)
Cable Clamp 	5	

NOTICE

The decorative panel, controller, branch piping, grille for front discharge, and air outlet shutter plate (for installing to clipped ceiling) are optional accessories and are not included with the indoor unit.
If necessary, please contact your contractor.

- (2) Do not insert or leave any foreign objects inside the indoor unit and verify that no foreign objects remain inside in the indoor unit before the installation and Test Run. Failure to do this can result in equipment failure and damage to the unit.
- (3) Necessary Tools and Instrument List for Installation

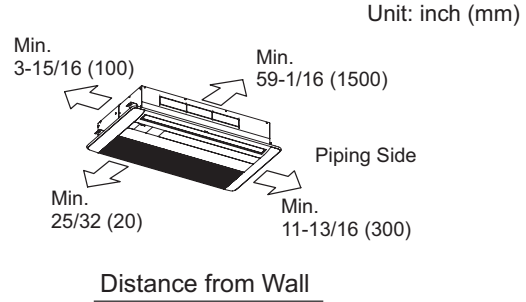
No.	Tool	No.	Tool
1	Handsaw	11	Wrench
2	Phillips Screwdriver	12	Charging Cylinder
3	Vacuum Pump	13	Gauge Manifold
4	Refrigerant Gas Hose	14	Cutter for Wires
5	Megohmmeter	15	Gas Leak Detector
6	Copper Pipe Bender	16	Level
7	Manual Water Pump	17	Clamper for Solderless Terminals
8	Pipe Cutter	18	Hoist (for Indoor Unit)
9	Brazing Kit	19	Ammeter
10	Hexagon Wrench	20	Voltage Meter

NOTE:

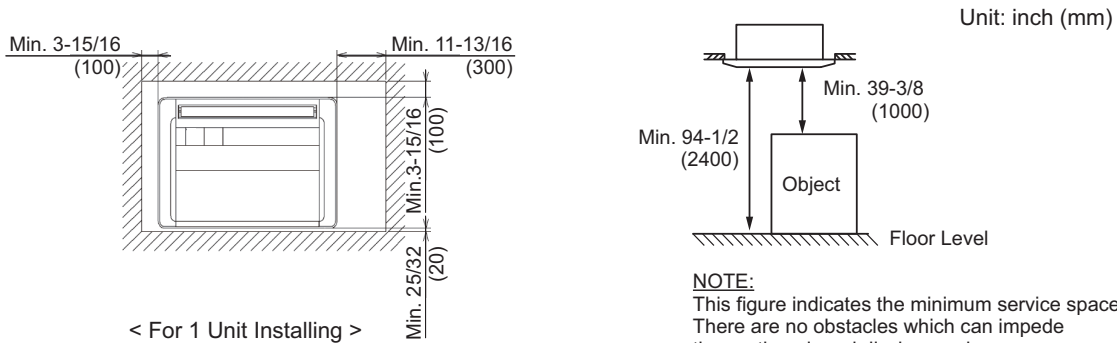
Use tools and measuring instruments (vacuum pump, gas hose, charging cylinder, and manifold gauge) exclusively for the refrigerant R410A.

4. Installation Location

- (1) Install the indoor unit with a proper distance from the walls as shown in the figure on the right.

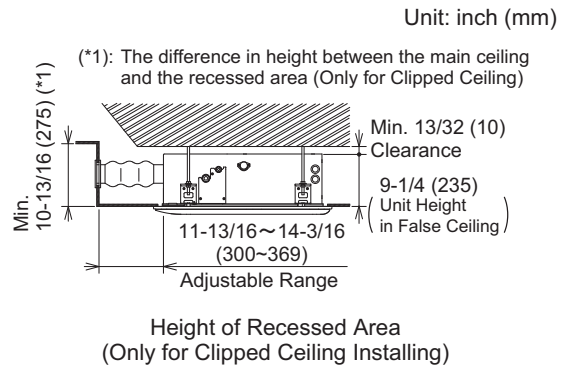


- (2) Install the indoor unit with sufficient space around it for operation and maintenance access as shown below. Do not leave combustible materials inside the service space of the indoor unit.



NOTE:
This figure indicates the minimum service space. There are no obstacles which can impede the suction air and discharge air.

- (3) Select the installation location as follows:
- Minimum Space
 - Down slope gradient of drain pipe: 1/25 to 1/100
 - The installing height for the indoor unit must be a minimum 7.9 ft (2.4m) from floor level.

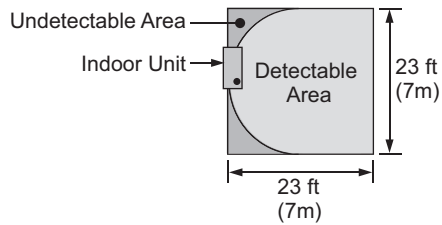


- (4) Select a suitable location for the indoor unit to allow for uniform air distribution. In addition, do not install where the ceiling height exceeds the heights indicated in the following table depending on the unit capacities.

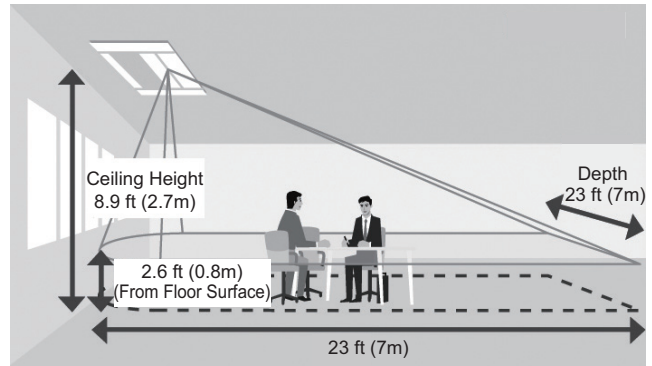
Model	Max. Ceiling Height from Floor Level
(H,Y)IC1006B21S	9.8 ft (3m)
(H,Y)IC1008B21S	
(H,Y)IC1012B21S	11.5 ft (3.5m)
(H,Y)IC1015B21S	

INSTALLATION

- (5) Install the unit where there are no obstacles which can impede the suction air and discharged air.
- (6) Check that the ceiling is strong enough to hang the indoor unit. Also check that the ceiling surface is flat and suitable for the decorative panel (option) installation. If the ceiling is not flat, drain water will not flow smoothly.
- (7) Do not install the unit near a door or a window where the indoor unit come into contact with humid outside air. Otherwise, condensation may occur.
- (8) In the event that temperature and humidity levels inside the ceiling exceed 86°F (30°C)/RH (Relative Humidity) 80%, apply additional insulation materials to the external surface of the indoor unit to avoid condensation.
- (9) If installing the indoor unit to a high ceiling, the warmed air will remain near the ceiling during heating operation. Thus, a parallel installation of a circulator is recommended.
- (10) Do not install the indoor unit where airflow from the air outlet blows directly onto temperature detection devices such as an alarm device or a control device. It can result in a failure of either device.
- (11) The detecting area for the motion sensor kit (option) is shown in the figure below.



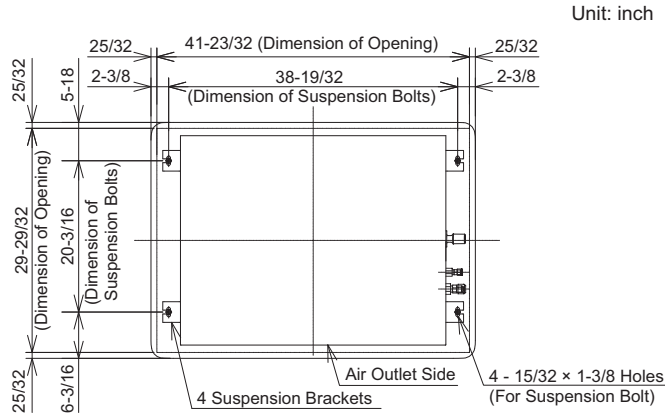
NOTE:
There is an area that the motion detector in the indoor unit cannot sense as shown in the graphics above.



5. Installation Work

5.1 Opening of False Ceiling and Location of Suspension Bolts

- (1) Determine the final location and installation orientation of the indoor unit with respect to the space allowed for piping, wiring and maintenance.
- (2) Then cut away the false ceiling area for the indoor unit installation and install suspension bolts.
- (3) The dimensions for an opening false ceiling and location of suspension bolts are as shown below.

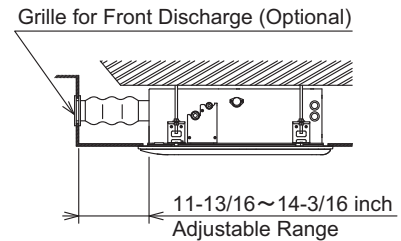


< For a Clipped Ceiling >

In the case of the installation to a clipped ceiling, adjust the distance between the grille for front discharge and the indoor unit as shown in the figure on the right.

NOTE:

Details of installing method of the optional parts for the grille for front discharge and the air outlet shutter plate are listed in each "Installation Manual".



- (4) Ceiling work differs depending on the building structure. Consult with a building constructor or an interior finish worker for more information.

NOTE:

Do not install electric lighting in too close proximity to the unit as unit operation can cause the lights to flicker.

5.2 Installing Suspension Bolts

- (1) Reinforce the designated opening in the false ceiling area. Use approved materials of sufficient tinsel strength to allow for quality installation.
- (2) Strengthen suspension bolts with support plates as required in preparation for an earthquake. Use field-supplied M10 suspension bolts and support plates.

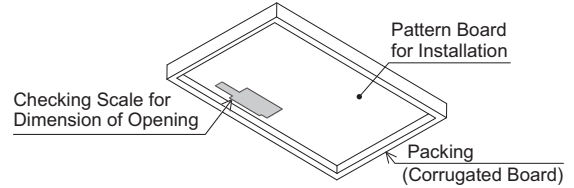
For Wooden Beam		For Steel Beam
Install the indoor unit to the tie beam (for single-storied building) or to the second floor girder (for two-storied building), and use sufficiently strong squared timber shown below.		Install suspension bolts so that it can withstand the indoor unit weight load.
inch (mm)		
Interval between Beams	Squared Timber	
$\leq 35-7/16$ (900)	$2-3/8$ (60) square	
$\leq 70-7/8$ (1800)	$3-17/32$ (90) square	Anchor Bolt (W3/8 or M10)

INSTALLATION

5.3 Working Procedure

- (1) Size the opening to the correct dimensions to facilitate easy and repeated installation by using the pattern board (template).

The template provided for the installation comes with a scale printed on a portion of the outer packaging. Detach this area with the printed scale to use in sizing and checking the opening. Refer to the procedure shown in Item 6.

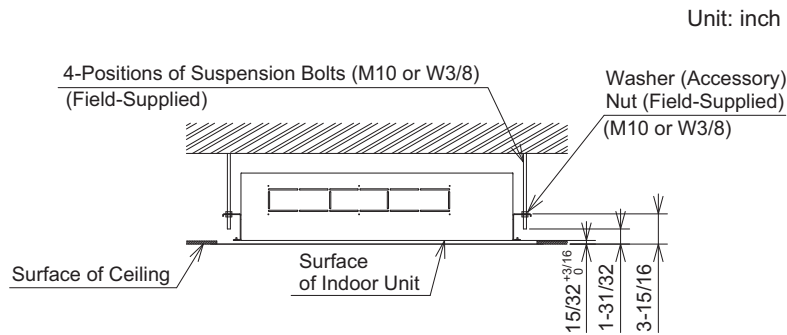


- (2) Mounting Position of Indoor Unit

The mounting position of the indoor unit is shown in the figure below.

< Field-Supplied Parts >

- Suspension Bolts (M10 or W3/8) ... Qty.: 4
- Nuts (M10 or W3/8)..... Qty.: 8



NOTICE

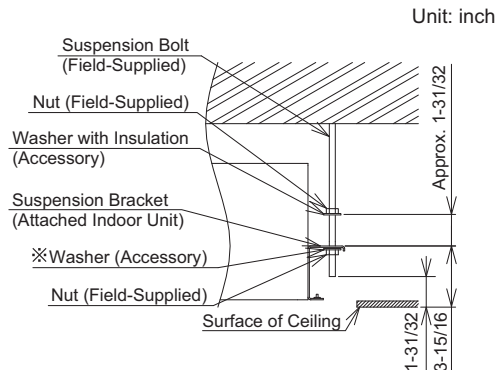
The optional decorative panel can become deformed if any one of the unit suspension brackets are not installed correctly. If the unit is not level, condensation can form and settle due to gaps and escaping air between the unit and the decorative panel.

- (3) Mounting Nuts and Washers

Mount nuts and washers onto the suspension bolts before mounting the indoor unit.

NOTE:

Make sure to use washers (accessories) for installing the suspension bolts to the suspension brackets. Install the washer with the insulation side facing down for suspended installation applications. This way, the washers themselves remain in position on the suspension bolts during the installation phase.

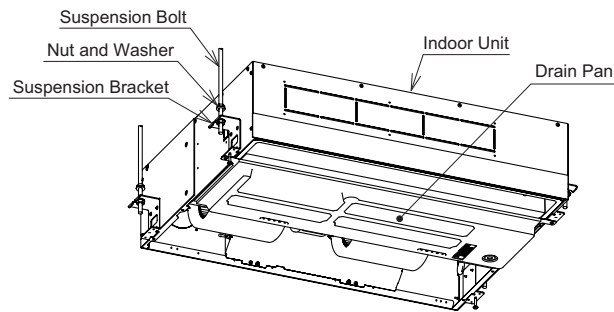
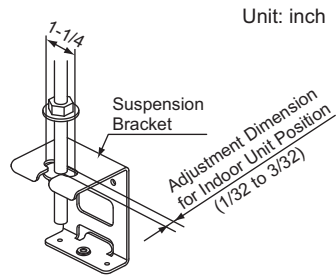


(4) Mounting the Indoor Unit

- Hoist the indoor unit but do not apply any force against the drain pan (the air outlet portions and the drain pan portion). If there is insufficient access for a hoist, the work must be performed manually by two skilled installers.
- Suspend the unit by handling the suspension brackets at all four corners of the unit. Do not apply any pressure onto the polystyrene drain pan or pan outlets during the installation process.
- Insert the suspension bolts into the notches of the suspension brackets to capture the unit. Secure the unit using nuts and washers. Then check that the washers serve as stoppers at the rising parts of the suspension brackets.

NOTE:

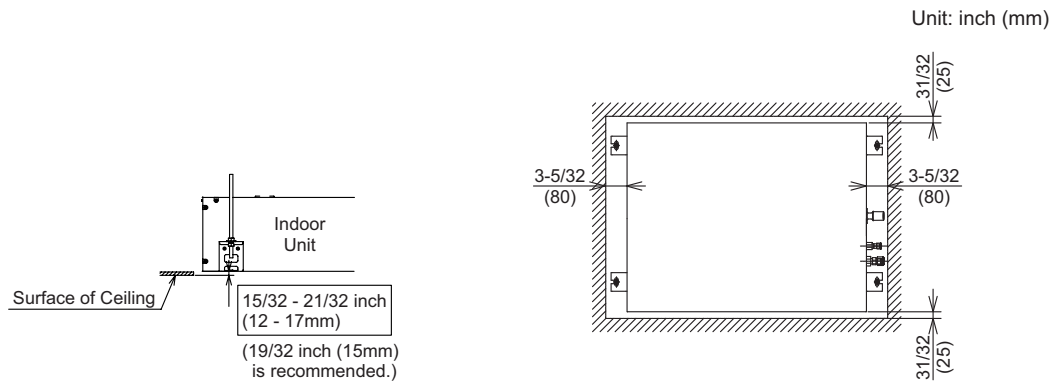
After securing the unit, piping and electric power needs to be installed inside the ceiling area adjacent to the unit. If a false ceiling is already in place, determine the proper pathway for piping and electrical lines before the unit is installed.



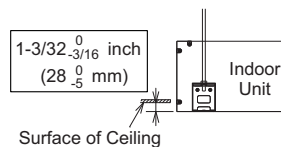
INSTALLATION

(5) Spacial adjustments to accommodate the unit into a false ceiling:

- Adjust the position of the indoor unit as shown in the figure below and keep the mounting position of the unit within 15/32 - 21/32 inch (12 - 17mm). [19/32 inch (15mm) is recommended.]
- The pattern board (template) for the installation and the checking scale are printed on the packing. Cut away the printed scale used for sizing the opening from the outer packing and use for positioning the indoor unit.



- When utilizing the optional panel spacer, the indoor unit mounting position is different from the standard one. Make sure to adjust the indoor unit mounting position as shown in the figure below. As for the panel spacer, the pattern board (template) and the checking scale are also printed on the corrugated board of its packing.



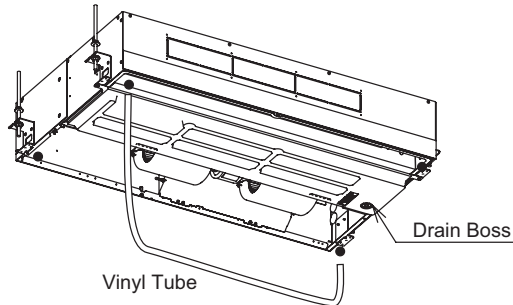
When Space Panel is Used

<p>(a) False ceiling applications:</p> <p>When installing the indoor unit to the false ceiling with an opening:</p> <ul style="list-style-type: none"> • Cut off the scale for measuring the dimension of the opening. • Adjust the clearance between the indoor unit and the opening, as shown in the figure. 	<p>Check the dimension of opening at each side.</p> <p>Checking Scale for Dimension of Opening</p> <p>Attach the scale to the bottom surface.</p> <p>Attach the scale to the ceiling surface.</p>
<p>(b) False ceiling applications (without opening):</p> <p>If there is no opening in the existing false ceiling, provide an opening in it before mounting the indoor unit:</p> <ul style="list-style-type: none"> • Cut off the checking scale for dimension of the opening from packing to adjust the opening of the false ceiling. • Cut out the false ceiling along the outline of the pattern board. • After hooking up the indoor unit, adjust the position according to the procedure (a) above. 	<p>Dimension of Opening</p> <p>Dimension of Opening</p> <p>Dimension of Opening</p> <p>Drain Pan Portion</p> <p>Packing (Corrugated Board)</p> <p>Pattern Board</p> <p>Cut a pattern board out by box cutter</p>
<p>(c) Incomplete false ceiling applications (panel not in place):</p> <ul style="list-style-type: none"> • Cut off the checking scale for dimension of the opening from packing to adjust the opening of the false ceiling. • Cut off the drain pan portion of the packing as shown in the figure. • Attach the pattern board to the indoor unit with the screw (M6), as shown in the figure. • Specify the location of the opening. • Adjust the position of the indoor unit as the procedure (a) above after ceiling is completed with the panel. 	<p>Suspension Bolt</p> <p>Indoor Unit</p> <p>Ceiling Surface</p> <p>Screw (M6)</p> <p>Pattern Board</p>

- (6) Tighten the nuts on the suspension brackets after adjustments are completed. LockTite thread lock compound to the suspension bolts and nuts in order to prevent them from loosening. Adjust the indoor unit into correct position, using the scale of the pattern board (template).

NOTE:

While adjusting the clearance spacing between the indoor unit and the ceiling surface, keep the indoor unit level. Otherwise, it may cause a malfunction of the float switch. Check the vertical alignment of the unit with a level.



Check the vertical alignment at each corner (●) of the unit with a level or by pouring water to the clear vinyl tube as shown in the figure.

NOTE:

Mount the indoor unit correctly without a downward slope from the drain boss side. Otherwise it may cause water leakage.

NOTICE

- Install the decorative panel in accordance with the "Installation Manual" for the decorative panel.
- Check to ensure that all connections between the unit and the decorative panel (except one-way airflow type for clipped ceiling) have been made and are secure.
- The details for installation work for the wired controller shall be according to the "Installation Manual" for the wired controller.

6. Refrigerant Piping Work

⚠ DANGER

Use the specified non-flammable refrigerant (HFC R410A) for the outdoor unit refrigerant cycle. Do not charge the unit with anything other than HFC R410A, such as hydrocarbon refrigerants (propane and Isobutene), oxygen, and other flammable gases (acetylene, ammonia, and so forth), or any poisonous gases when installing, maintaining and moving the unit. These substances are volatile and dangerous and can result in fire, explosion, and serious or fatal injuries.

For details of refrigerant piping work, vacuum pump and refrigerant charging, refer to the "Installation and Maintenance Manual" for the outdoor unit.

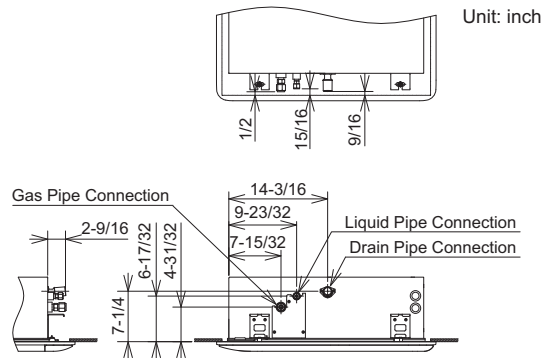
6.1 Piping Materials

- (1) Tolerances of refrigerant piping length depends on the combination with the outdoor unit. Refer to the "Installation and Maintenance Manual" for the outdoor unit.
- (2) Select the piping size from the following table.

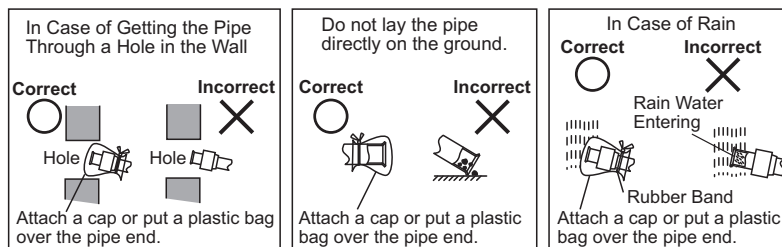
Table 6.1 Piping Size

Model	Gas Piping	Liquid Piping
(H,Y)IC1006B21S (H,Y)IC1008B21S (H,Y)IC1012B21S (H,Y)IC1015B21S	1/2 (12.7)	1/4 (6.35)

(3) Piping Connections

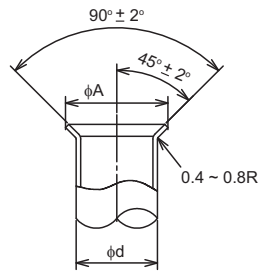


- (4) Prepare field-supplied copper pipes.
- (5) Select clean copper pipes. Make sure there is no dust or moisture inside.
- (6) The refrigerant oil for the refrigerant R410A is susceptible to moisture, an oxide film, and fatty oil. Take special care during the installation so that moisture, contaminations or old refrigerant oil will not enter the refrigerant cycle. Otherwise, impurities may adhere to the expansion valve and may prevent proper operation.
- (7) When cutting piping, do not use conventional tools such as saws or grinding wheel cutting disks that produce harmful metallic filings and burrs that can damage a refrigerant system. Use a pipe cutter to eliminate metal filings produced by the cutting operation. After the cut is made, blow out each pipe with dry compressed air or nitrogen to remove this residue before making pipe connections.



6.2 Piping Connection

- (1) Perform the flaring work as shown below.



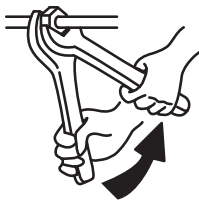
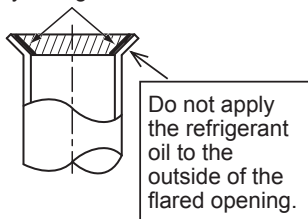
Diameter (d)	inch (mm)
	A ⁺ -0.02 (-0.4)
1/4 (6.35)	0.36 (9.1)
3/8 (9.52)	0.52 (13.2)
1/2 (12.7)	0.65 (16.6)
5/8 (15.88)	0.78 (19.7)

- (2) Use specific flare nut attached to the unit. (The flare nut is based on JIS B 8607.)
- (3) Verify that there are no scratches, burrs stuck to internal surfaces, or surface deformations at the flared opening.
- (4) Before tightening the flare nut, apply the refrigerant oil (Field-Supplied) in a thin layer over the flare. (Do not apply the oil on other portions.) Tighten the flare nut for the liquid pipe to the specified torque with two wrenches. Then, tighten the flare nut for the gas pipe in the same way. After the tightening, check that no refrigerant leak occurs.

NOTES:

- Refrigerant oil is field-supplied.
[Ethereal Oil FVC50K, FVC68D (Idemitsu Kousan Co. Ltd.)]
- If the refrigerant oil comes into contact with decorative panel, it may cause a crack. Use with caution.

Apply Refrigerant Oil.



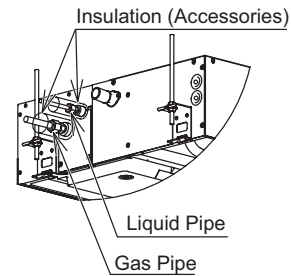
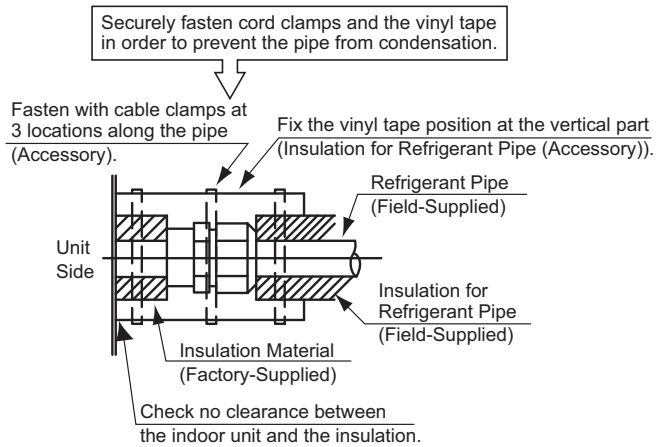
Required Tightening Torque (JIS B 8607)

Pipe Size	Tightening Torque
ϕ 1/4 inch (6.35 mm)	10.3 - 13.3 ft·lbs (14 - 18 N·m)
ϕ 3/8 inch (9.52 mm)	25.1 - 31.0 ft·lbs (34 - 42 N·m)
ϕ 1/2 inch (12.7 mm)	36.1 - 45.0 ft·lbs (49 - 61 N·m)
ϕ 5/8 inch (15.88 mm)	50.2 - 60.5 ft·lbs (68 - 82 N·m)

- (5) Wherever buried piping exists on site, make sure there is a service doorway to provide adequate access to inspect piping sockets and elbows, and for interconnecting parts.
- (6) Piping must be reinforced to withstand earthquakes so as not to be damaged by an external force.
- (7) Do not tightly secure refrigerant piping to accommodate expansion and contraction.
- (8) Prevent the pipes from contacting weak portions such as wall, ceiling, or something similar. (Otherwise, an abnormal sound may be heard due to vibration of the piping.)
- (9) Test for air-tight integrity. The air-tight procedures should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
- (10) If temperature and humidity inside the ceiling exceed 80.6°F (27°C)/RH80%, condensation occurs on the surface of the accessory insulation. Wrap additional insulation (approximately 3/16~13/32 inch (5~10mm) thickness) around the accessory insulation of the refrigerant pipe as a preventive measure.

INSTALLATION

- (11) Insulate each flare connection without gap with accessory insulations to prevent condensation. Then insulate each refrigerant pipe as well.



- Connect the gas piping after the connection work for liquid piping.
- Insulate the flare nut connections with accessory insulator.
- Wrap the accessory insulations to the piping connections without gap.

- (12) If a leak detecting foam is used, avoid contact with the decorative panel as it could cause damage. If the foam does come in contact with the decorative panel, remove completely with a clean cloth.

! WARNING

- Do not apply excessive force to the flare nut when tightening. If applied, the flare nut may crack due to stress fracture and refrigerant leakage may occur. Use the correct torque specifications.
- Make sure that a refrigerant leak test has been performed. Refrigerant (Fluorocarbon) for this unit is non-flammable, non-toxic, and odorless. If the refrigerant should somehow escape and come into contact with flame, toxic gas will form. This gas is heavier than air and will settle near floor areas and spread where it can cause suffocation to those nearby.

7. Drain Piping

! WARNING

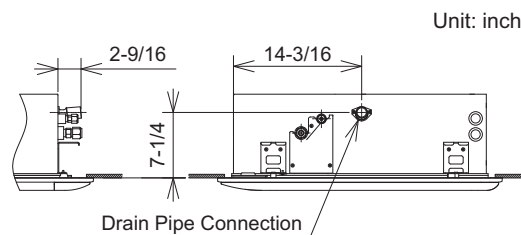
Do not run drain piping into underground areas near sanitary or sewage lines where toxic and corrosive gas can seep into the system. This creates a pathway for the flow of poisonous gas to penetrate inhabited areas.

NOTICE

- Check to ensure that the condensation drain pipe discharges moisture properly. If connected incorrectly, it can cause structural damage to indoor wall and ceiling surfaces and damage to furniture and carpeting.
- Avoid sloping the drain pipe upward as it will impede drainage. Otherwise, moisture will settle back into the unit and it may cause the water leakage when unit operation stops.
- Do not connect condensation drainage with sanitary or sewer lines or any other drain pipe.
- When the common drain pipe is connected with other indoor units, the connected position of each indoor unit must be higher than the common pipe. The pipe size of the common drain pipe must be large enough according to the unit size and number of units.
- After performing drain piping work and electrical wiring, check to ensure that water outflow is as smooth as in the following procedure.

Perform drain piping work and attach the insulations before attempting any refrigerant piping work.

- (1) The position of the drain pipe connection is shown in the figure below.



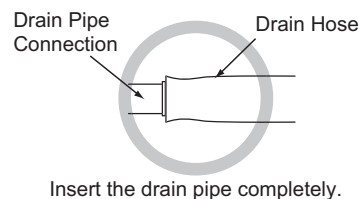
- (2) Prepare a polyvinyl chloride (PVC) pipe with 1-1/4 inch (32mm) outer diameter VP25. [VP25 (based on JIS K 6741) is recommended.]

- (3) Connecting Drain Piping

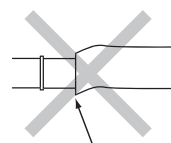
NOTE:

Follow procedures (b) and (c) on the next page to install the factory supplied drain hose and pipe without adhesive.

- (a) Connect the factory-supplied drain hose at the drain pipe connection using PVC adhesive. Clean the affected surfaces apply the adhesive and cure in accordance with manufacturer's instructions.
- (b) Insert the drain hose completely. If it is not inserted properly, or if it is twisted, water leakage can occur.



(Correct)

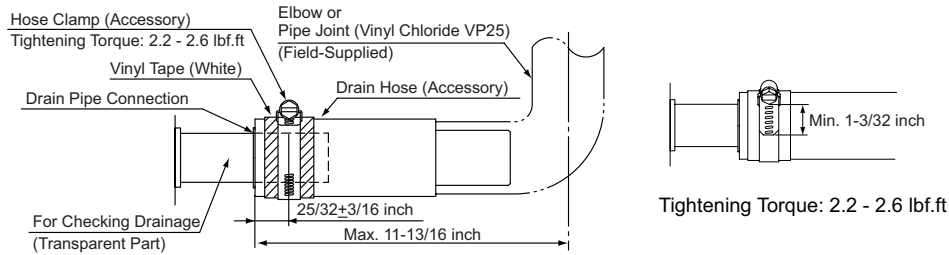


Drain hose is twisted, or the drain pipe is incompletely inserted.

(Incorrect)

INSTALLATION

- (c) Attach the factory-supplied hose clamp to the vinyl tape (white) attached to the drain hose. The hose clamp shall be 25/32 inch (20mm) away from the end face of the drain hose. Then tighten the hose clamp to make sure that it is approximately 1-3/32 inch (28mm) in length from the screw to the edge of the hose clamp as shown in the figure below.

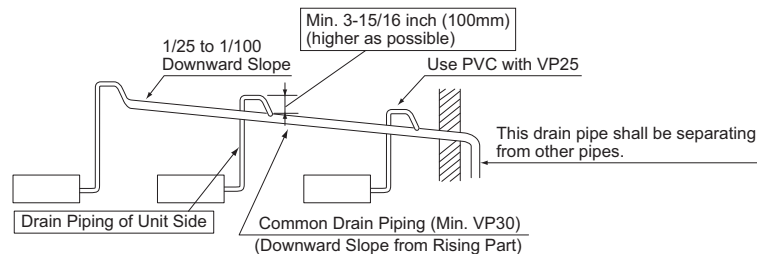


NOTICE

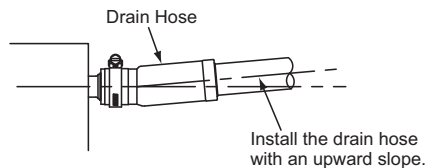
- Make sure to use the factory-supplied drain hose and hose clamp. Other makes are more susceptible to moisture leakage.
- Do not bend or twist the factory-supplied drain hose. Sealing properties of the hose can be compromised.
- Do not apply an excessive force to drain pipe connections. They can be easily damaged.

(4) On-site Drain Piping Work

- Connect the factory-supplied drain hose to the drain pipe connection using the polyvinyl chloride adhesive.
- When cleaning the connection surface, applying the adhesive, inserting, retaining and curing the drain pipe, refer to information given by the adhesive manufacturer.
- Install the support parts at an interval of 3.3 ft to 4.9 ft (1m to 1.5m) in order not to bend the drain pipe.
- Install drain piping with a downward slope of 1/25 to 1/100 as shown below.

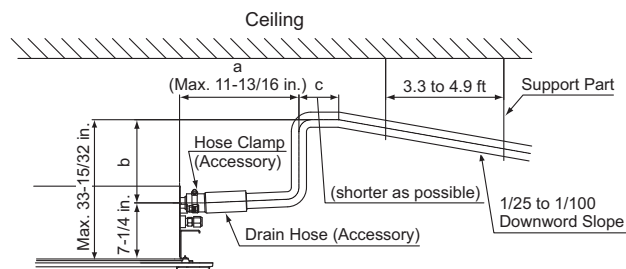


- (e) Install the drain hose horizontally or slightly on an upward slope to prevent air pockets from forming inside it. If air pockets form, moisture will settle back into the unit, which could result in undesired sluicing, bubbling noises and spillover into the room after unit operation has stopped.



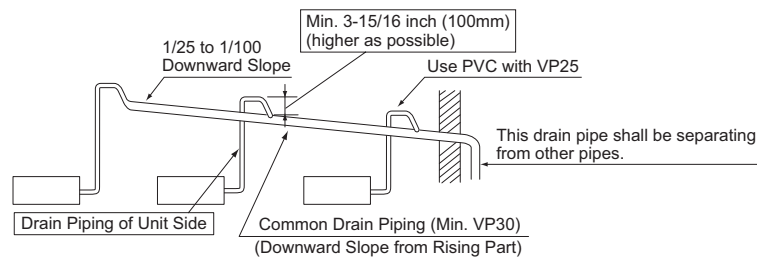
(f) Raising Drain Piping

In case of raising the drain pipe, install it according to the dimension shown in the figure below. The total drain piping length of a+b+c shall be within 39-3/8 inch (1,000mm).



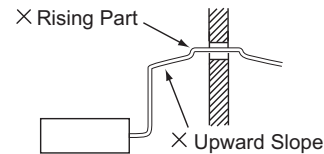
(g) Installing Common Drain Piping

- Install the common drain pipe on a downward slope to make sure that it is lower than each rising part of the drain pipe from the indoor unit.
- The size for the common drain pipe must be VP30 or more (nominal diameter 1-3/16 inch (30mm), outer diameter 1-1/2 inch (38mm)) according to the number of the connected indoor units.



NOTICE

- Do not allow drain pipe to rise or incline upward. Otherwise, the drain water will flow back into the unit and may cause water leaks when the unit is not in operation.

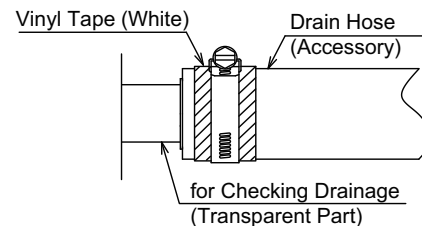
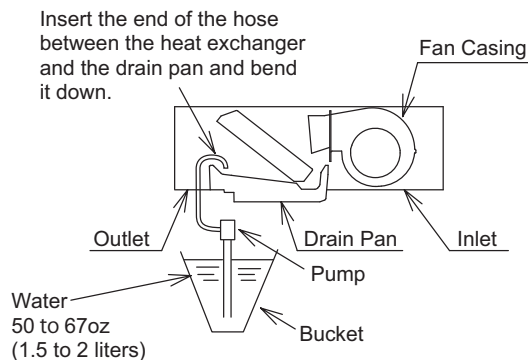


Incorrect Installation of Drain Piping

(5) Drainage and Water Leakage Check

After performing the drain piping work and the electrical wiring work, check to ensure that water flows smoothly according to the following procedures.

- Drainage Operation by Float Switch
 - The following are regular procedures to check the float switch operation.
 - a) Turn ON the power supply.
 - b) Pour 50 to 67oz (1.5 to 2 liters) of water gradually into the drain pan.
 - c) Check to ensure that water flows smoothly inside the transparent drain pipe and drained out fully at the pipe end, and that no leaks occur.
 - d) If the end of the drain pipe cannot be checked visually, pour another 50 to 67oz (1.5 to 2 liters) of water into the drain pan. If the water overflows from the drain pan, there might be some failure inside the drain pipe. Recheck the drain pipe.



Position for Checking Drainage

Be careful that water does not splash onto electrical parts such as the fan motor, float switch or thermistors.

NOTICE

- The heat exchanger is heated since the slight amount of refrigerant circulates inside the indoor unit during stoppage. As a result, moisture in the drain pan evaporates, which causes condensation issues.
- After the drain check is completed, insert the rubber plug again and seal the gap using a silicon sealant.
- Simplified Operation of Drain-up Mechanism

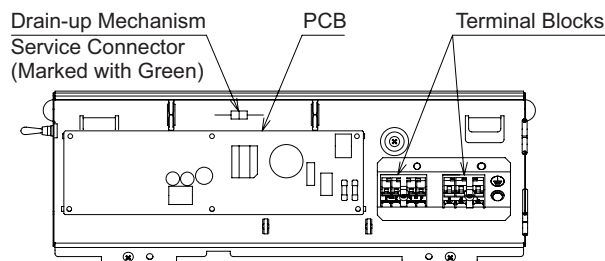
The following are the simplified operation procedures of the drain-up mechanism.

- Turn OFF the power supply.
- Disconnect the service connector (marked with green).

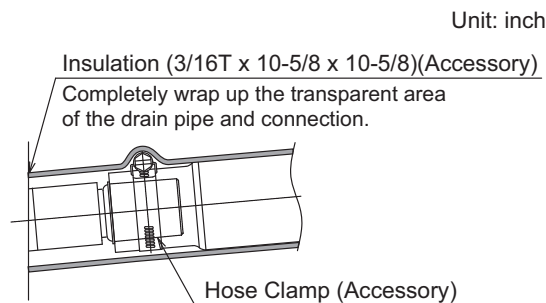
NOTE:

Make sure to hold the connector part. Do not take out and plug in the connector frequently (more than two or three times).

- Turn ON the power supply and start the simplified operation of the drain-up mechanism.
- Turn OFF the power supply.
- Reconnect the service connector.



- Insulate the drain pipe connection and the drain hose after connecting them. If improperly insulated, condensation will occur.



- Insulate the drain piping with insulation wrap.

8. Electrical Wiring

WARNING

- All electrical work must be done as outlined in this manual and in accordance with this manual. Substandard work can result in fire and damage to the unit.
- Use specified cables between units and choose the cables correctly. If not, an electrical shock or fire may occur.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply. It can result in an electrical shock.
- Turn OFF the main power switch of the indoor unit and the outdoor unit before attempting any electrical wiring work or a periodical check is performed. If not, it will result in an electric shock or a fire.
- Check to ensure that the indoor fan and the outdoor fan have stopped before attempting any electrical wiring work or for any scheduled electrical work that is being performed.
- Tighten screws according to the following torque.
 - M3.5: 0.9 ft·lbs (1.2 N·m)
 - M4: 0.7 to 1.0 ft·lbs (1.0 to 1.3 N·m)

CAUTION

- Secure all cables together with cable clamps and seal the connecting hole against the onslaught of moisture and insects.
- Run the electrical wiring through the connecting hole in the side cover when using conduit.
- Secure the wired controller cable using the cable clamp inside the electrical box.

8.1 General Check

- (1) Make sure that the field-selected electrical components (main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data given in the “Engineering Manual”. Make sure that the components comply with the National Electrical Code (NEC).
- (2) Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
- (3) Check the capacity of the electrical wires.
If the power supply capacity is too low, the system cannot be started due to the voltage drop.
- (4) Check to ensure that the ground wiring is connected.

8.2 Electrical Wiring Capacity

8.2.1 Field Minimum Wire Sizes for Power Supply

- This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers/fuses/overcurrent protection switches and wiring in accordance to local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.
- Do not operate the system until all check points have been cleared.
 - (A) Check to ensure that the electrical resistance is more than 1 megohm, by measuring the resistance between ground and the terminal of the electrical parts. If it is less than 1 megohm, do not operate the system until the electrical leakage is found and repaired.
 - (B) Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.
 - (C) Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.
- Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated to higher than 194°F (90°C).

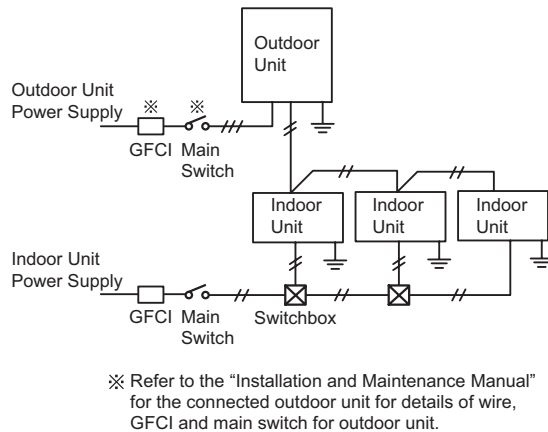
INSTALLATION

8.2.2 Details of Electrical Wiring Connection

The electrical wiring capacity of the outdoor unit should be referred to the "Installation and Maintenance Manual" for outdoor unit. Setting a DIP switch may be required depending on the arrangement with the outdoor unit.

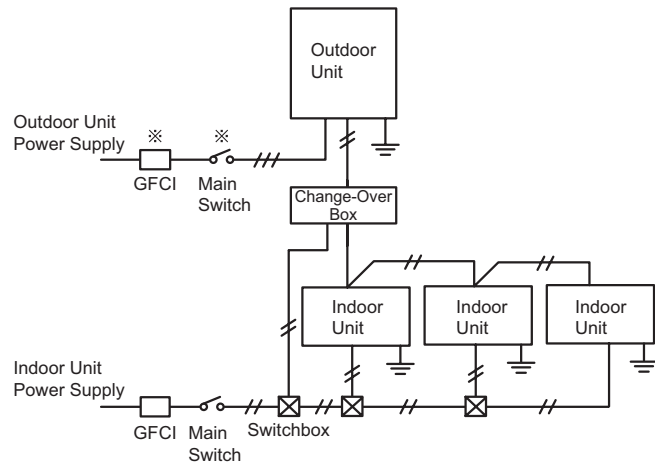
Select wiring capacity according to the table 8.1. Install a GFCI and main switch as shown in each of the system diagrams below.

< Heat Pump System >



※ Refer to the "Installation and Maintenance Manual" for the connected outdoor unit for details of wire, GFCI and main switch for outdoor unit.

< Heat Recovery System >



※ Refer to the "Installation and Maintenance Manual" for the connected outdoor unit for details of wire, GFCI and main switch for outdoor unit.

Table 8.1 Recommended Wiring Capacity and Sizes

Follow local electrical codes when selecting a GFCI device.

Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA <Minimum Circuit Ampacity> [A]
		Power Supply Wiring Size < Main >	Ground Wiring Size	Comm. Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
(H,Y)IC1006B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	0.2
(H,Y)IC1008B21S									0.3
(H,Y)IC1012B21S									0.4
(H,Y)IC1015B21S									0.5

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) Select the GFCI with activation speed of 0.1 sec. or less.
- 3) Total operating current is less than 12A.

NOTICE

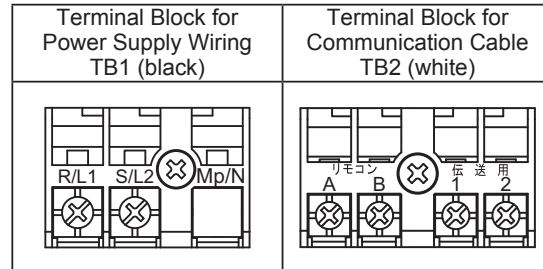
- Check for the recommended size GFCI shown in the table 8.1.
- Between indoor and outdoor units, use dual-conductor, AWG18 (0.82mm²) stranded copper cable for communication cable. Do not use any cable with more than two conductors. Twisted pair or shielded cable can be used in environments with excessive electrical noise to reduce the possibility of communication errors between system components. Total cable length should not exceed 3281 ft (1000m).
- Select the wiring size, GFCI (Ground Fault Circuit Interrupter) in accordance with the regulations for each region, the "Installation and Maintenance Manual", and the dedicated electrical circuit that must be used.
- Outside of the indoor unit, installation of the power supply wiring, communication cable, and wired controller cable should be spaced as far apart as possible.

8.3 Position of Electrical Wiring Connection

- The electrical wiring connection for the indoor unit is shown in Section 8.2.2. For details relating to the intermediate connections between the indoor unit and the decorative panel, refer to installation of the decorative panel.
- The connection at the terminal block for the indoor unit is shown in the figure below. Check the arrangement for the outdoor unit before performing any wiring. Tighten screws in the terminal block as indicated in the torque specification table shown below.

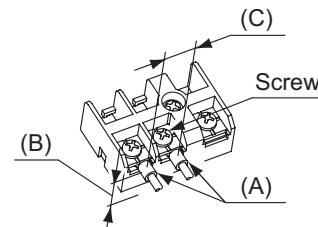
Tightening Torque for Terminals

Screw Size		Tightening Torque
TB1	M4	0.7 - 1.0 ft·lbs (1.0 - 1.3 N·m)
TB2	M3.5	0.9 ft·lbs (1.2 N·m)



NOTICE

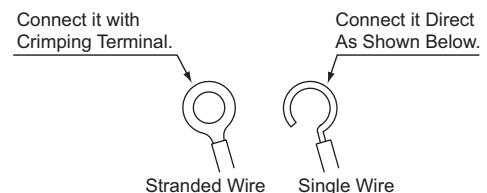
- Do not connect the main power supply wiring to the communication line (Terminals A, B, 1, and 2 of TB2). If connected, the printed circuit board (PCB) will be destroyed.
- Pay attention to following when wires are connected at the terminal block:
 - (A) Attach a piece of insulation tape or a sleeve at each terminal.
 - (B) Maintain the recommended distance between the electrical box and the terminals to prevent a short circuit.
 - (C) Maintain the recommended distance between terminals.



- (1) Connect the cable for the optional controller or the optional extension cable to the terminals inside the electrical box through the connecting hole of the cabinet.
- (2) Connect the power supply and the ground wiring to the terminals in the electrical box.
- (3) Connect the cables between the indoor unit and the outdoor unit to the terminals inside the electrical box.
- (4) Connect cables to their corresponding terminal number and the similarly marked band.
- (5) Connect the communication cable between those indoor units connected to the same outdoor unit.
- (6) Do not connect the main power supply wiring to the communication line (Terminals A, B, 1 and 2 of TB2). If connected, the printed circuit board (PCB) will be destroyed.
- (7) Tightly clamp the power supply wiring and communication cables using the cable clamp inside the electrical box.

NOTE:

When the standard wire is used for the field-wiring connection, the M4 crimping terminal should be used. When the single wire is used, fashion it into the shape as shown at right and connect it in order to tighten the washer uniformly. The screws at the terminal block should be tightened according to the torque specification as shown in the table above.



INSTALLATION

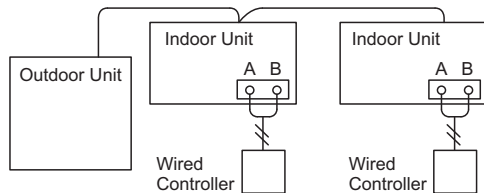
- (8) All electrical work should be performed in strict accordance with electrical schematics in the "Installation and Maintenance Manual".
- (9) If Power Supply Voltage (208V/230V) is introduced into the Communication Line:
 If 208V/230V are applied to the communication line at (Terminals 1 and 2 of TB2) by mistake, the fuse on the PCB for the communication line will blow. In this case, perform the recovery work as shown in the diagrams below.
- (a) Reconnect the wirings correctly.
 - (b) Set the No.1 pin at DSW7 (on the PCB) to ON.

Upon PCB recovery after the fuse has been replaced, if 208V / 230V is reintroduced into the communication line, the PCB will be seriously damaged and will not recover.

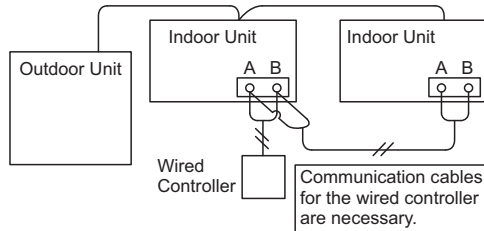


(10) Wired Controller Connection

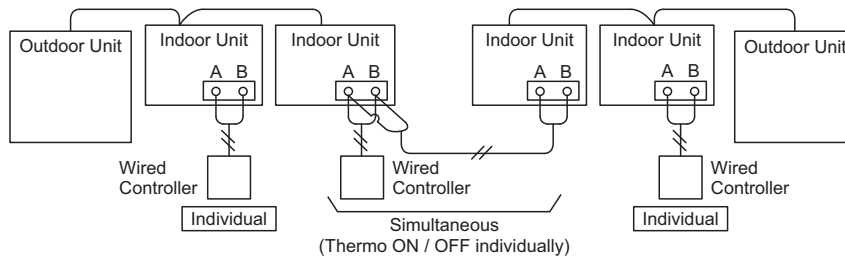
- (a) Wired Controllers to each unit for an individual operation setting



- (b) Single Wired Controller for an individual operation setting



- (c) Wired Controller Connections between different refrigerant cycles



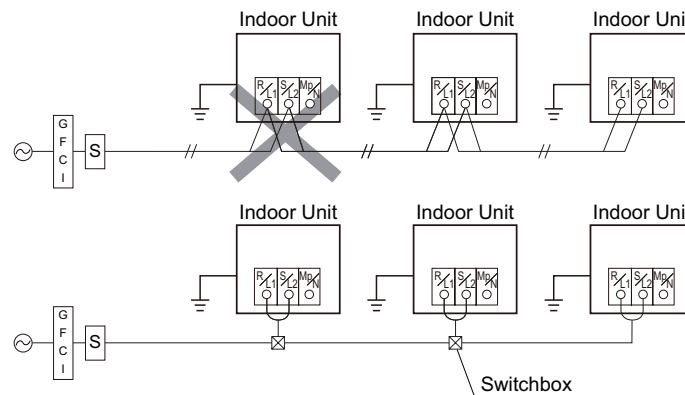
NOTICE

- The DIP switch settings for the outdoor unit should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
- Be aware that communication cable for the wired controller is required in these instances:
 - a) The following functions are set to the sub unit which is not installed with the wired controller.
 - * Remote ON/OFF function settings, (No.1, 2, and 3), (External Input / Output Function)
 - * Power supply ON/OFF functions, (No.1 and 2), (Function Selection)
 - * Prohibiting the wired controller after manual stoppage (External Input / Output Function)
 - * Group setting by the centralized controller
 - b) The combination of twin, triple, or quad is controlled by single wired controller.
 - c) The address for the indoor unit is changed from the wired controller.

8.4 Wired Controller Cable

8.4.1 Caution for Electrical Wiring

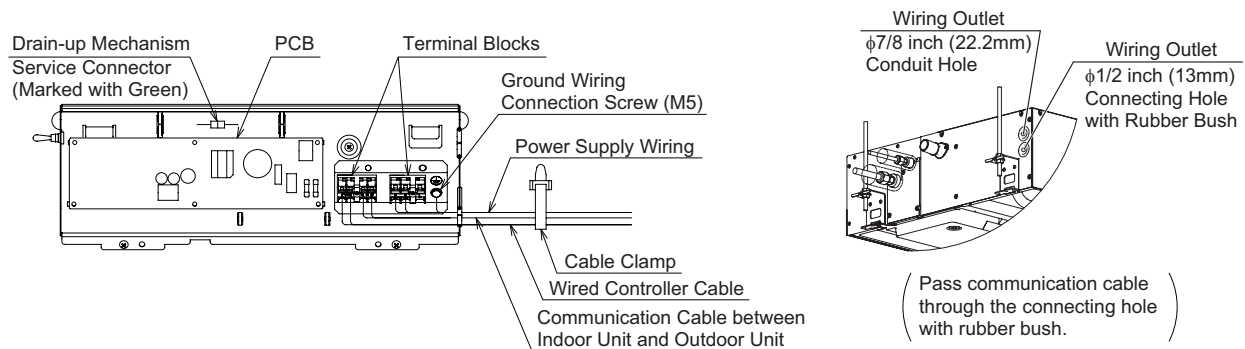
Do not connect the power supply wiring and the communication cable into one terminal.
The manual switchbox is required when communication cable is required.



INSTALLATION

8.5 Wiring Connections

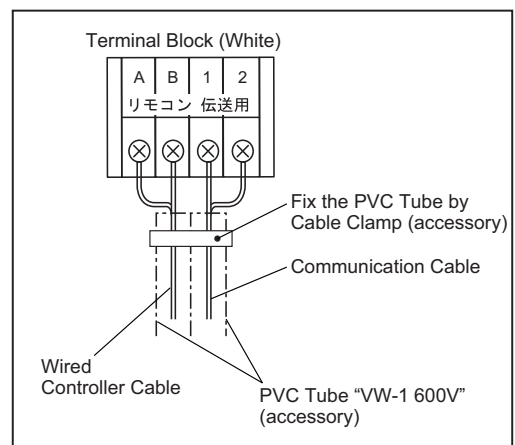
The wiring connections for the indoor unit are shown in the figures below.



- (a) Remove the electrical box cover.
- (b) Connect the communication cable, the power supply wiring and the wiring for the wired controller to each terminal block. Connect the ground wiring to the ground wiring connection screw.
- (c) Attach the electrical box cover. Pay attention not to pinch wires when attaching the electrical box.

NOTE

- Insert the communication cable and wired controller cable into the PVC tube "VW-1 600V" (Accessory) to separate from the power supply wiring for the indoor unit.
- Fix the both ends of the PVC tube by cable clamp (Accessory).
- If shielded cable is used, terminate at the ground terminal.

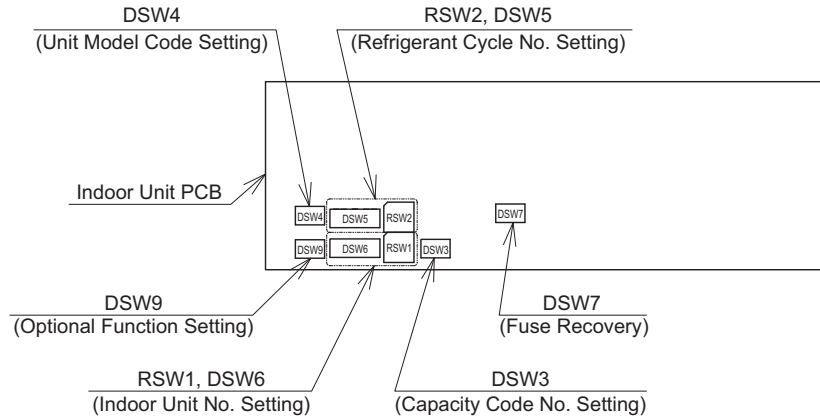


! WARNING

Install and secure all electrical wiring correctly through the connecting hole, to the terminal blocks using the cable clamps provided. Wiring should be spaced appropriately and firmly fastened to guaranty against electrical short, sparks, and flame.

8.6 DIP Switch Settings

- (1) Turn OFF the power supply to both indoor and outdoor units before adjusting DIP switch settings. Otherwise, the settings will be invalidated and not take effect.
- (2) Positions of DIP Switches on the PCB are shown in the figure below.



- (3) Unit No. Setting
Setting is not required.

Indoor unit numbers are set by the auto-address function. If an indoor unit number setting is required, set the unit number of all indoor units respectively and sequentially by following setting position. It is recommended that you assign a number to each indoor unit from "1". A maximum of 64 indoor units per refrigerant cycle can be connected to an H-LINK II System. Though the available numbers range from zero to 63, the applicable number for the 64th indoor unit in theory supplants the number "zero". For the centralized control, this setting is required.

Unit No. Setting

<p>DSW6 (Tens Digit)</p>	<p>RSW1 (Units Digit)</p> <p>Setting Position</p> <p>Set by inserting slotted screwdriver into the groove.</p>	<p>Ex.) Set at No.16 Unit</p> <p>DSW6</p> <p>Set No.1 Pin at ON side</p> <p>RSW1</p> <p>Set at "6"</p>
<p>Before shipment, DSW6 and RSW1 are set at "0".</p> <p>For the units supporting H-LINK II, the unit No. can be set for Max. 64 indoor units (No.0-63).</p>		

- (4) Capacity Code Setting (DSW3)
No setting is required, due to setting before shipment. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.

Indoor Unit Capacity (MBH)	06	08	12	15
Setting Position				




- (5) Unit Model Code Setting (DSW4)
No setting is required. It is for setting the model code of the indoor unit.



INSTALLATION

- (6) Refrigerant Cycle No. Setting (RSW2 & DSW5)
This setting is required. The unit arrives with all settings in the OFF position.

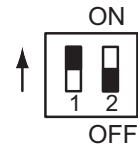
Refrigerant Cycle No. Setting

DSW5 (Tens Digit)	RSW2 (Units Digit)	Ex.) Set at No.5 Cycle
		
Before shipment, DSW5 and RSW2 are set at "0". For the units supporting H-LINK II, the ref. cycle No. can be set for Max. 64 cycles. (No. 0-63)		Set All Pins OFF RSW2 Set at "5"

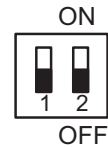
- (7) Fuse Recovery (DSW7)
* Factory Setting



- * When introducing high voltage to terminals 1 and 2 of TB2, the (0.5A) fuse on the PCB is cut. In such a case, first, reconnect the wiring correctly to TB2, and then adjust the number 1 pin to ON.



- (8) Optional Function Setting (DSW9)
No setting is required. Settings positions before shipment are all in the OFF position.



NOTES:

- The solid square "■" symbol signifies the "ON" position for DIP switches. The diagrams show original settings before shipment.
- When the unit number and the refrigerant cycle are set, record the unit number and refrigerant cycle to facilitate maintenance and servicing activities afterward.

NOTICE

All indoor and outdoor units must be shut down prior to attempting to make DIP Switch adjustments, otherwise, the settings will not take effect.

8.7 Function Selection by Wired Controller

Each function can be selected with the wired controller. Refer to "Installation and Maintenance Manual" for wired controller, and the "Engineering Manual" for details.

(1) High Speed Setting Function

This function is used to set the airflow volume higher than normal airflow volume. This is used for high ceiling areas on site. Set High Speed setting 1 from the function selection menu, depending on the ceiling height as shown in the table below.

Ceiling Height		High Speed Setting Function
006, 008 Type	012, 015 Type	
Less than 8.9ft (2.7m)	Less than 10.2ft (3.1m)	Standard
8.9 - 9.8ft (2.7 - 3.0m)	10.2 - 11.5ft (3.1 - 3.5m)	High Speed 1

(2) Circulation Function at Heating Thermo-OFF

This function maintains the fan operation by the set airflow volume at the heating Thermo-OFF. It is for improvement of temperature distribution at sites with high ceilings.

(3) Condensation Control Function

This function limits the occurrence of condensation around louvers. Condensation can occur when the air conditioner has run in cooling mode over a prolonged period of time at 80.6°F DB (27°C DB) and a high rate of humidity (Relative Humidity: Approximately 80%). If there is any anticipation of upcoming operation under these conditions, set "K8:01" on the function selection menu to safeguard against condensation.

9. Test Run

9.1 Before Test Run

Verify that there are no problems with the installation, and do not perform Test Run until all the following conditions have been resolved.

Refer to the "Installation and Maintenance Manual" for the outdoor unit for details on Test Run operations from the outdoor unit.

Verify that refrigerant piping and the communication cable are connected to the same refrigerant cycle system. If not, it will cause an abnormal operation and damage to instrumentation.

- (1) Verify that electrical resistance is more than one megaohm, by measuring the resistance between ground and the terminal the terminus for electrical components. If the electrical resistance is less than one megaohm, do NOT operate the system until the electrical current outflow to ground is detected and repaired. Do not introduce any high voltage to the terminals of the communication cables (TB2 [A, B, 1 and 2]).
- (2) Verify that each wire is connected correctly at the correct phase for the power supply. If it is incorrectly connected, the unit will not operate and the wired controller will display the alarm code "05". In this case, check the phase for the primary power supply according to the "Attention" label affixed to the back side of the service cover. Then, with the power supply turned OFF at the power supply, remake the necessary connections.
- (3) Check to ensure that the main power supply has been turned ON for more than 12 hours, to warm up the compressor oil by the crankcase heater.
- (4) Verify that all DIP Switch settings are correct. Refer to Section 8.6 "DIP Switch Settings".

9.2 Test Run

After all installation work is completed, Test Run should be performed.

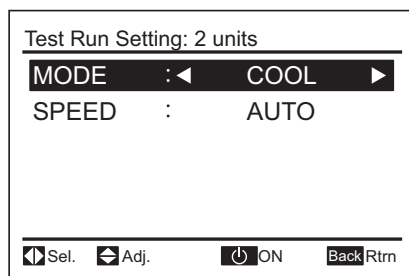
- (1) Check to ensure that stop valves (gas and liquid) for the outdoor unit are fully opened.
- (2) Whenever indoor units are connected to the VRF system, perform the Test Run for the indoor units one by one sequentially and then check the refrigerant piping system and the electrical wiring system for conformity. (If these multiple indoor units are operated simultaneously, system conformity cannot be verified.)
- (3) Perform the **Test Run** in accordance with the following procedure. Ensure that the Test Run is carried out without any problem. The following procedure shows a case where a wired controller is utilized. If other controllers are activated instead, refer to the "Installation and Maintenance Manual" for those other controllers.

NOTE:

The outdoor unit may not be operated depending on the indoor and outdoor temperature conditions. Refer to the "Installation and Maintenance Manual" for outdoor units for details.

- (a) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds.
The **Test Run** menu will be displayed.
 - The **Test Run** menu will be displayed.

Test Run Screen



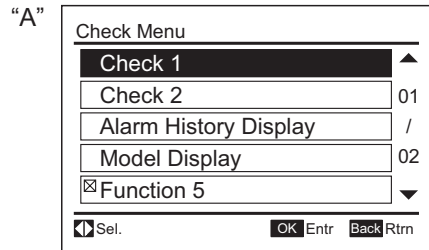
NOTE

When the "00 unit" is displayed, the auto-address function may be working. Cancel "**Test Run**" mode and reset.

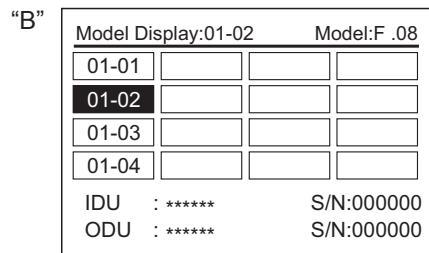
- The total number of connected indoor units is indicated on the LCD (Liquid Crystal Display). In the case of a twin combination (set of two indoor units), the total number of the connected indoor units is displayed as **“2 units”**, and where there is a triple combination (set of three indoor units), the total number of the connected indoor units is displayed as **“3 units”**.
 - If the number indicated is not equal to the actual number of connected indoor units, the auto-address function is not performing correctly due to incorrect wiring or electrical interference. Turn OFF the power supply, and resolve the wiring issue after verifying the following items; (Do not repeat turning ON and OFF within a 10 second timespan.)
 - * The power supply to the indoor unit is not turned ON or there is an incorrect wiring issue.
 - * Incorrect connection of the interconnecting cable between indoor units or a poorly connected controller cable.
 - * Incorrect setting of the rotary switch and DIP switch for the indoor unit printed circuit board (PCB). (The setting is overlapped.)
 - Press “⏻ On/Off” to start the Test Run..
 - Press “△ ▽ ◀ ▶” and set each item.
- (b) Press “⏻ On/Off”.
- The RUN indicator turns ON and the operation starts. At this time, a two-hour OFF timer will be set automatically.
- (c) Press “△” or “▽”, select “LOUV.” and select “” (auto-swing) by pressing “◀” or “▶”. The auto swing operation will start. Check the operating sound at the louvers. If abnormal sound is not generated, press “◀” or “▶” again to stop the auto swing operation. If abnormal sound is generated from the louvers, remove the face panel and adjust the louver accordingly.

(d) Verify that the motion sensor is operating correctly as in the following steps: (in cases of the decorative panel with the optional motion sensor kit).

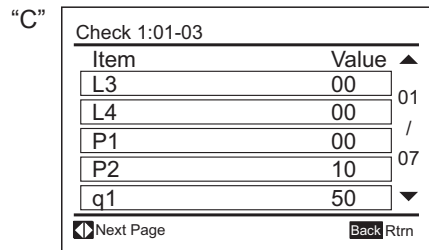
1. Press and hold “Menu” and “Back/Help” simultaneously for at least three seconds during the Test Run mode. The check menu screen “A” is displayed.



2. Select **“Check 1”** at the check menu and press **“OK”**. (Screen “B” will be displayed.) (This screen is NOT displayed when only one indoor unit is connected to the wired controller. In this case, screen “C” will be displayed.)



3. Select the indoor unit by pressing “△ ▽ ◀ ▶” and press “OK”. The check data screen “C” will be displayed.

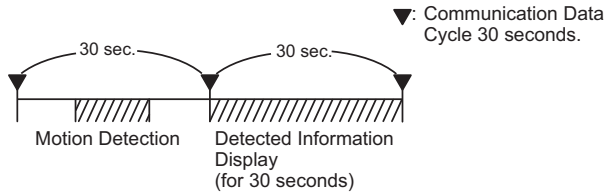


4. Press “△ ▽” to change the screen until it displays the check screen “q1”.

< Check of the Motion Sensor >

1. Perform the motion detection (waving a hand, etc) under the motion sensor of the selected indoor unit for approximately 10 to 15 seconds.
2. Check the value of "q1" after 30 (*1) seconds from starting the motion detection at Item 1. The detection information from the motion sensor against the motion detection is displayed a range of 0% to 100%.

(*1): The communication cable between the indoor unit and the wired controller is on a 30 second cycle.
Timing for motion detection and the detected information display is shown below.



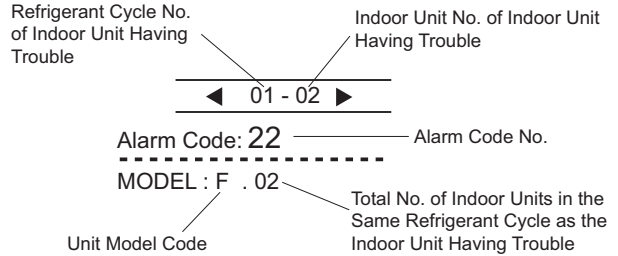
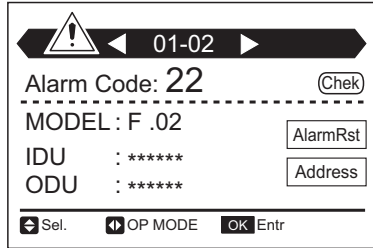
NOTE:

Refer to the "Operation Manual" for indoor unit settings for setup of the motion sensor. ("Motion Sensor Setting", "If Absent" and "Check Interval" can be set.)

3. Check that the value of "q1" is neither 0% nor 100%.
If the value displayed is 0% or 100%, repeat the procedure from Item 1. If the same value reappears, it may be a malfunction of the motion sensor.
 4. Press "Back/Help" and return to the display.
- (e) Though temperature recordings by the thermistors are invalid during the Test Run phase, the protection devices are valid.
- (f) For VRF System
According to the label; "Checking Method by 7-Segment Display" affixed to the inside of the front cover of the outdoor unit, check temperature, pressure, and operation frequency, and interconnected indoor unit numbers by 7-Segment displays.
- (g) To complete Test Run, press "⏻ On/Off" again or wait for the set Test Run time to pass.
When changing the Test Run time, press "△" or "▽" to select "Test Time". Then, set the test run time (30 to 600 minutes) by pressing "◀" or "▶".

Test Run: 2 units	
MODE :	COOL
SPEED :	◀ AUTO ▶
LOUV. :	🌀
Test Time :	120min <input type="text"/>
Inverter :	60Hz <input type="text"/>
◀ Sel.	↔ Adj. ⏻ OFF

- The RUN indicator on the wired controller for the indoor unit will flash orange (0.5 second ON/ 0.5 second OFF), indicative of a fault or error having been generated with activation of protection devices during the Test Run phase. Alarm code, unit model code, and the number of interconnected indoor units will be displayed on the LCD as shown below. If the RUN indicator on the wired controller flashes for two seconds ON and two seconds OFF, the source of the problem could be a failure in the communication cable between the indoor unit and the wired controller (a loose or severed connection). In this case, verify Section 9.3 “Alarm Code” and perform the appropriate troubleshooting measures. Consult with an authorized service engineer if the problem cannot be resolved at your end.



< Unit Model Code >

The relationship between the unit model code and the unit model is shown in the table below.

Indication	Unit Model
F	VRF System
E	Except Above Models

9.3 Alarm Code

Alarm (Troubleshooting) Code Table

Code No.	Category	Nature of Problem	Likely Cause
01	Indoor Unit	Activation of a protection device (Float switch)	Activation of the float switch; (High water level present in the drain pan.) A problem exists in the piping.
02	Outdoor Unit	Activation of protection device; (Except for Alarm Code: 41, 42)	High Pressure Cut; (R410A: 601 psi (4.15MPa)), fan motor lockup during the outdoor unit cooling operation.
03	Communication	Communication failure between indoor and outdoor units	Incorrect wiring, loose terminals, disconnected wiring or a blown fuse.
04-09	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
11	Sensor on Indoor Unit	Inlet Air Thermistor failure	Loosely connected, disconnected, or a severed connection.
12		Outlet Air Thermistor failure	
13		Freeze Protection Thermistor failure	
14		Gas Piping Thermistor failure	
19	Fan Motor	Problem with Indoor Fan	Fan motor lockup, fan motor protection control device for indoor unit activated.
20-29	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
31	System	Incorrect capacity setting for indoor and outdoor units.	Incorrect capacity code setting for combination, excessive or insufficient total indoor unit capacity code.
32		Incorrect setting of other indoor unit number	Problem with a different Indoor Unit in the same refrigerant cycle; (Failure at the power supply, defective PCB).
35		Incorrect setting of indoor	Indoor unit number duplicated in same refrigerant group.
36		Incorrect indoor unit combination	Indoor unit is designed for other refrigerant; (R22 or R407C).
38-59	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for the outdoor unit.)		
b0	System	Incorrect setting for unit capacity	Incorrect setting for unit capacity
b1		Incorrect setting of unit and refrigerant cycle number	Unit number or refrigerant cycle ≥ 64
b5		Incorrect setting of indoor unit number for H-LINK type	Interconnected indoor units are not supporting H-LINK II ≥ 17
EE	Compressor	Compressor protection alarm	This alarm code displays when the alarms such as damage to the compressor occur three times within a six hour period.

- When the RUN indicator flashes every four seconds, there is a communication failure between the indoor unit and the wired controller (loose connector, disconnected or incorrect wiring, or a severed connection).
- The indication of the alarm code "EE" means serious abnormality to burn out the compressor.

Refer to the "Installation and Maintenance Manual" for the indoor/outdoor unit connections.

NOTICE

Do NOT operate the air conditioning just to run checks on electrical wiring until preparations for the Test Run phase is completed.

All the installation work of the air conditioning is completed.
Handover this information to the building owner and request to maintain all the equipment manuals and warranty.

Refrigerant Leak Check

Conduct a periodic refrigerant leak check to maintain product performance and secure storage of refrigerant (Fluorocarbons). After completing installation, record the following results into this "Installation and Maintenance Manual":

1. Results of a test for air-tight integrity
2. Total refrigerant charge volume dispensed (including a trim charge added following the installation)
3. Result of the refrigerant leak check

Then hand it over to users and ask them to retain for reference.

All periodic service and maintenance procedures must be conducted only by authorized and trained personnel.

1.3.4 Wall Mount Type

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1. Introduction

Read this "Installation and Maintenance Manual" carefully before installing this product.



This is "Installation and Maintenance Manual" for the indoor unit. Read over the "Installation and Maintenance Manual" for the outdoor unit as well.

Hand over this "Installation and Maintenance Manual", and the warranty must be provided to all installers and users. Ask end users to maintain copies for future reference.


(Refrigerant Piping Work) → (Electrical Wiring Work) → (Ref. Charge Work) → (Test Run) → (User)

- For details on wiring between the indoor unit and the outdoor unit, refer to the "Installation and Maintenance Manual" for the outdoor unit.
- For details on the optional controller, refer to the "Installation and Maintenance Manual" for that optional controller module.
- For details on each optional part, refer to the "Installation and Maintenance Manual" for each optional part.
- For central station, refer to the "Installation and Maintenance Manual" for the central station.

2. Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.

- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Before servicing, turn-OFF the power supply and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

⚠ WARNING

To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.

INSTALLATION

- Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
- A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or a hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drain pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the drain pipe becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” the proper use and maintenance of this unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cable shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cable is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications. If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

INSTALLATION

- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power supply when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power supply completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power supply.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wiring is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

CAUTION

- Proper handling of this unit requires two-people. Safe handling and installing the indoor unit requires the strength of two people. Mounting the unit alone may cause injury due to fall of the unit. Although the unit may be girded with steel banding, do not use it for transportation. Avoid contact with finned surfaces of the heat exchanger as sharp edges can cause severe injury to hands and fingers. Use appropriate work gloves for the job.

NOTICE

- Check to ensure that the drain hose discharges moisture properly. If connected incorrectly, it can result in leakage and damage to furniture.
- Do not bend or twist the factory-supplied drain hose. This could compromise the seal and result in moisture leakage.
- Do not apply an excessive force to the drain pipe connection. This can also compromise the seal properties of the connection.
- Verify that the installed unit is level with floor and ceiling surfaces. Any variance or inclination can cause moisture to back up into the drain pan, overflow, and seepage onto wall surfaces, and cause damage to carpeted surfaces or furniture below.
- Do not install this system in close proximity to septic sewer lines where flammable and toxic gases can coalesce.
- Inspect the drain pan before the onset of winter to drain away all accumulated moisture in the pan.
- The heat exchanger of indoor unit overheats whenever there is a slight amount of refrigerant circulating during slowdown or stoppage. As a result, moisture in the drain pan evaporates where it can condense on ceiling or wall surfaces.
- When a wireless controller is used, put a distance of at least 3.3ft (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may be difficult to receive operation commands due to effect of the electric lighting.

Electrical Installation**WARNING**

In some cases, the packaged air conditioner may not be operated normally under the following cases:

- When electrical power for the packaged air conditioner is supplied from the same power transformer as the device*.
- When the power supply wiring for the device* and the packaged air conditioner are located close to each other:

Device*: (Example): Lift, container crane, rectifier for electric railway, inverter power device, arc furnace, electric furnace, large-sized induction motor, and large-sized switch.
It consumes large quantities of electrical power.

Regarding that mentioned above, surge voltage may be inducted into the power supply wiring for the crated air conditioner due to a spike in power consumption for this device and an activation of the switch. Check the field regulations and standards before performing any electrical work in order to safeguard the power supply for the crated air conditioner unit.

3. Before Installation

3.1 Combination of Outdoor Unit and Indoor Unit

The combination capacity of indoor unit against the outdoor unit is selected depending on the outdoor unit capacity. Refer to "Installation and Maintenance Manual" for outdoor unit to decide the required combination of indoor and outdoor units, and the combination unit capacity.

3.2 Transportation and Handling

- (1) Transport the product as close to the installation location as possible before unpacking.
- (2) Do not lay any objects on the indoor unit.
- (3) Take care when handling the indoor unit. Rough handling of the indoor unit can damage the unit.
- (4) The indoor unit handle is fabricated from foam polystyrene and is susceptible to breakage if any excessive force is applied as a result of mishandling of the unit during installation.
- (5) To avoid damage to the resin covers, cover it with cloth before lifting or moving the indoor unit.
- (6) Do not move the louver by hand. If moved, the louver mechanism will become damaged.

NOTES:

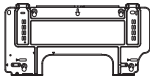
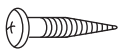
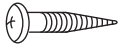
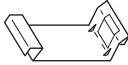
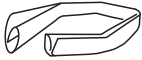
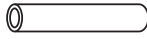
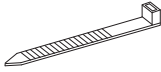


Comply with the following when using the wireless controller (CIR01).

- The built-in receiver can be used only for a single operation and individual operations for twin, triple and quad combinations. However, it cannot be used for the following operations:
 - * Operation with 2 Controllers (CIR01 and wired controller CIW01)
This is because the switch "SW2" on the DIP switch PCB must be "WIRED" when using CIW01.
 - * Simultaneous Operation of Multiple Units
- When using the wireless controller (CIR01) for simultaneous operation for twin, triple and quad combination, the optional receiver kit (CWDIRK01) is required.

3.3 Factory-Supplied Accessories

- (1) Check to ensure that the following accessories are packed with the indoor unit.

inch (mm)

Accessory	Qty.		Purpose	Usage
	006 to 012 Type	015 to 024 Type		
Mounting Plate 	1	1	For Mounting Indoor Unit	Refer to the section 5.
Screw (φ4 x 25L) 	6	8	For Fixing Mounting Plate	
Screw (φ4 x 40L) 	2	4		
Fixing Plate 	—	1	For Fixing Piping	Refer to the section 5.2.7.
Pipe Insulation 	1	1	For Refrigerant Piping Connection	Refer to the section 6.2.
PVC Tube 	2	2	For Separating Communication Cables and Wired Controller Cables from Power Supply Wirings 7/16 ID (11 ID)	Refer to the section 8.5.
Cable Clamp 	5	5		
Logo Label 	1	1	Logo Label for HITACHI Brand	Refer to the instruction paper attached together with the logo labels.
Logo Label 	1	1	Logo Label for YORK Brand	

NOTICE

The controller, and branch piping are optional accessories and are not included with the indoor unit. If necessary, please contact your contractor.

- (2) Do not insert or leave any foreign objects inside the indoor unit and verify that no foreign objects remain inside in the indoor unit before the installation and Test Run. Failure to do this can result in equipment failure and damage to the unit.

(3) Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool	No.	Tool
1	Handsaw	8	Pliers	16	Gas Leak Detector
2	Phillips Screwdriver	9	Pipe Cutter	17	Leveler
3	Vacuum Pump	10	Brazing Kit	18	Allen
4	Refrigerant Hose	11	Wrench	19	Hoist (for Indoor Unit)
5	Megohmmeter	12	Weighter	20	Ammeter
6	Copper Pipe Bender	13	Charging Cylinder	21	Voltage Meter
7	Manual Water Pump (for Indoor Unit)	14	Gauge Manifold	22	Wrench
		15	Wire Cutters		

NOTE:

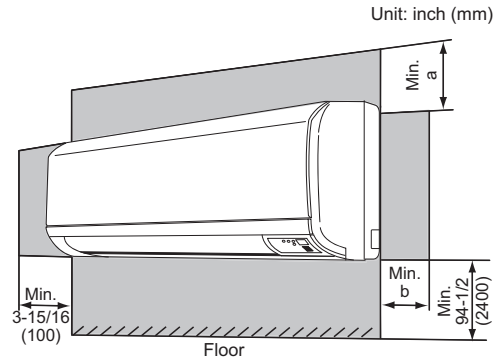
Use tools and measuring instruments (vacuum pump, gas hose, charging cylinder and manifold gauge.) exclusively for the refrigerant R410A.

4. Installation Location

- (1) Install the indoor unit with a proper clearance around it for operation, maintenance working space and safety, as shown in the illustration at right.

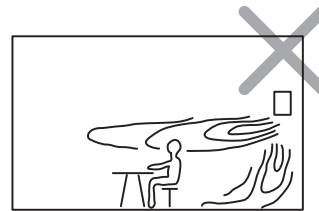
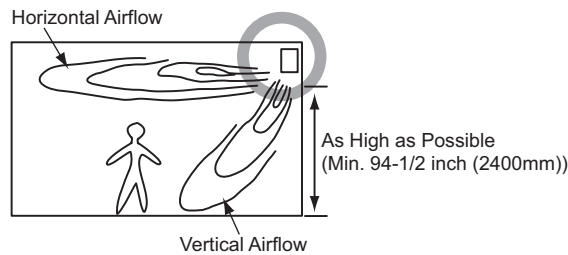
Unit: inch (mm)

Unit Type	a	b
006 to 012	5-29/32 (150)	3-15/16 (100)
015 to 018	3-15/16 (100)	7-7/8 (200)



* The above figure shows 006 and 008 type.

- (2) Consider the air distribution from the indoor unit to the space of the room, and select a suitable location so that uniform air temperature in the room can be obtained.
- (3) Install the unit where there are no obstacles such as electric lights or a partition, which can impede the suction air and discharged air.
In the case of using a wireless controller, avoid installing the indoor unit to within approximately 3.3ft (1m) from electronic type lighting so that the signal remains unaffected when transmitted to the receiver.
- (4) Check to ensure that the ceiling is able to withstand the weight of the indoor unit. If there is insufficient structural integrity, noise in the form of vibration generated by the unit is magnified.
- (5) Verify that the supporting walls are vertical and flat.
- (6) Install the indoor unit as high off the floor as possible.
If not, airflow distribution will be affected and these effects will cause discomfort to some people.



- (7) Do not install the unit near a door or ceiling where the indoor unit come into contact with humid outside air. Otherwise, condensation may occur.
- (8) Do not install the indoor unit where airflow from the air outlet blows directly onto temperature sensing devices such as an alarm device or a control device. This can result in false readings and an alarm failure.

5. Installation Work

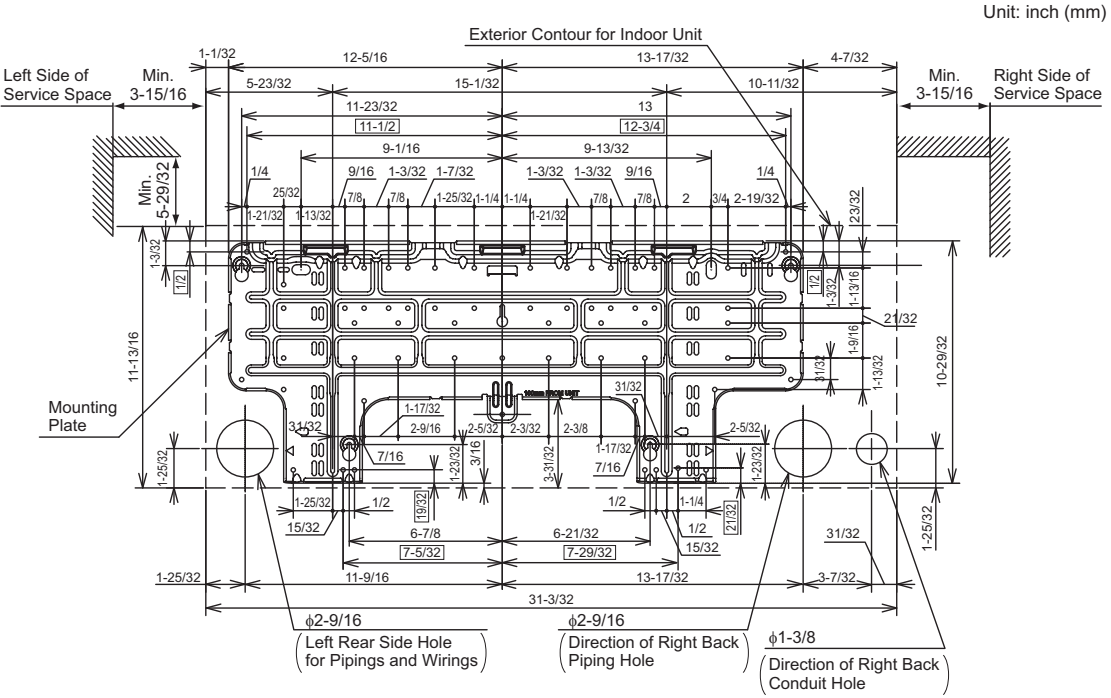
5.1 Installation

The dimensions of the mounting plate (accessory) and the unit installation are indicated in following figures.

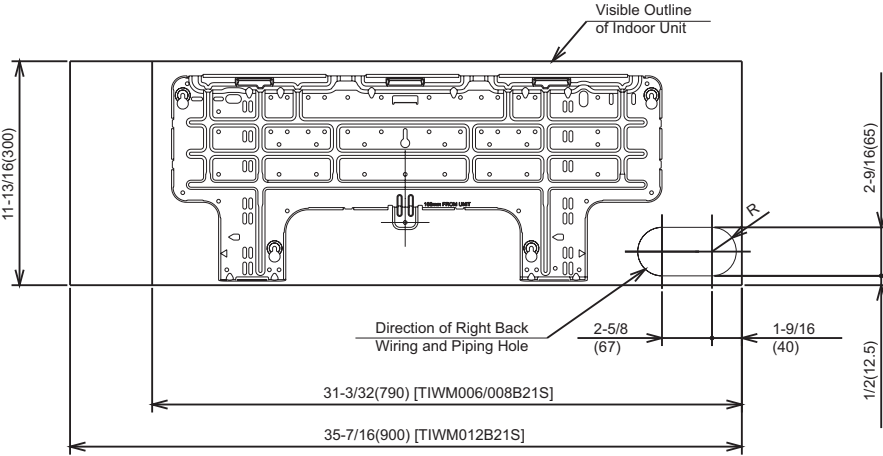
NOTE:

Install both mounting plate and air conditioning unit to conform with the drawing below.

< TIWM006B21S and TIWM008B21S >



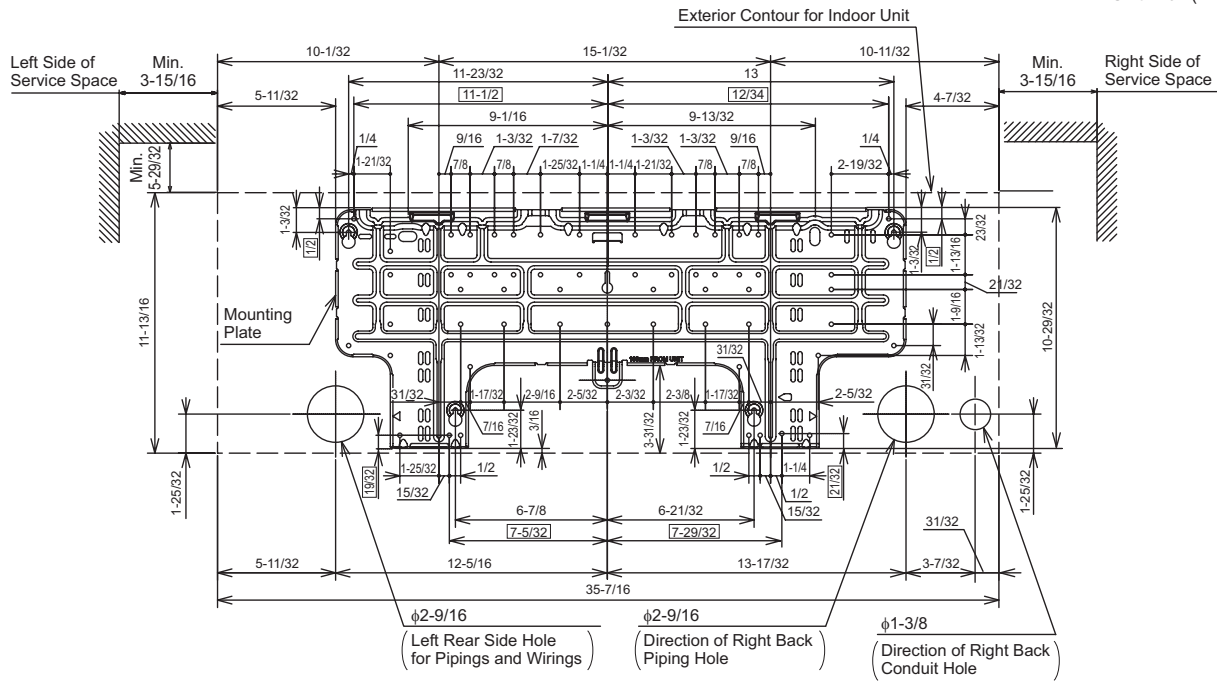
Alternative Opening Direction:



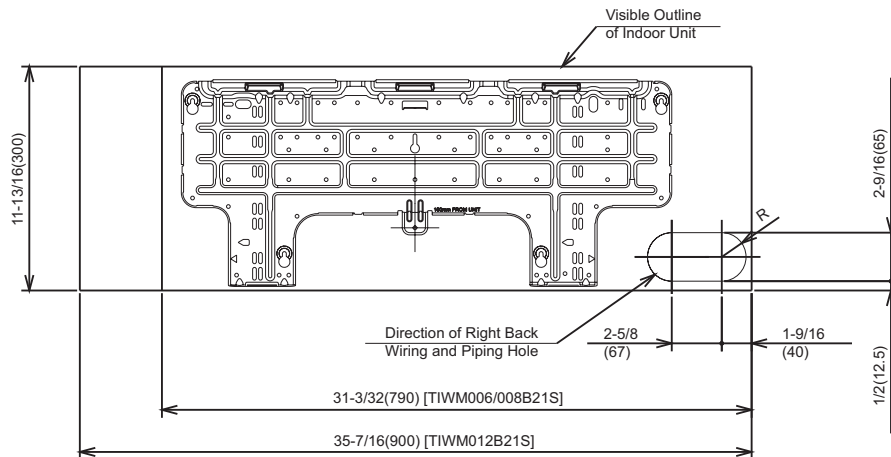
INSTALLATION

< TIWM012B21S >

Unit: inch (mm)

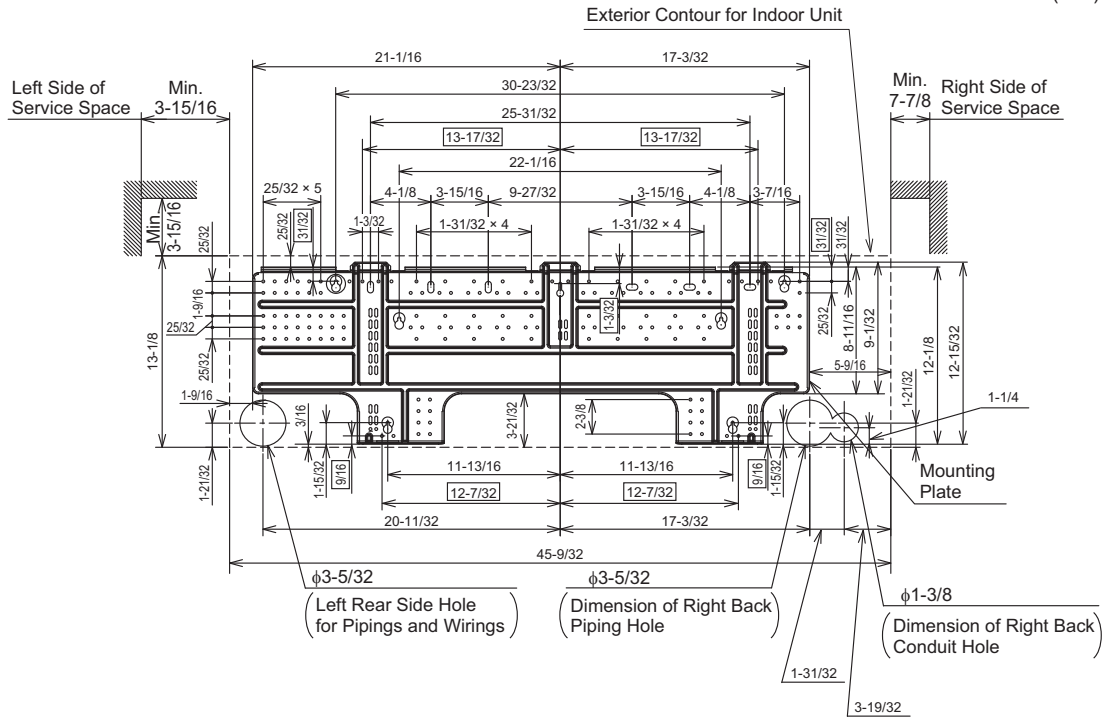


Alternative Opening Direction:

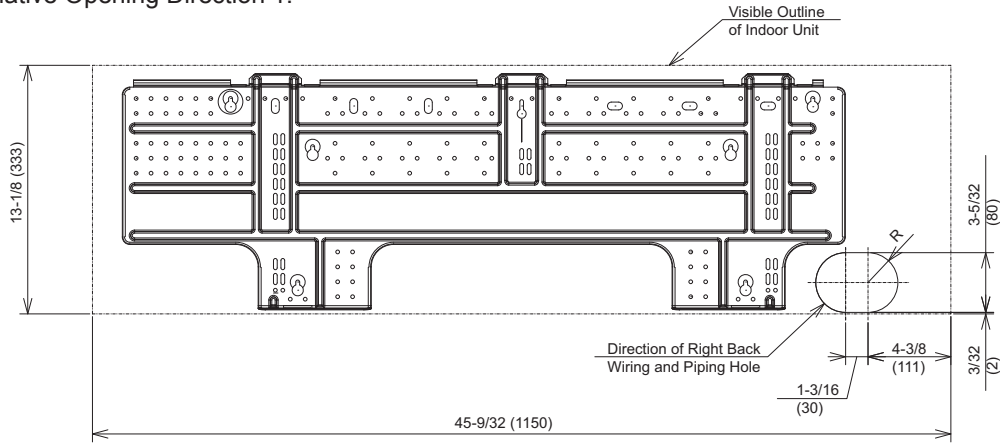


< TIWM015B21S, TIWM018B21S and TIWM024B21S >

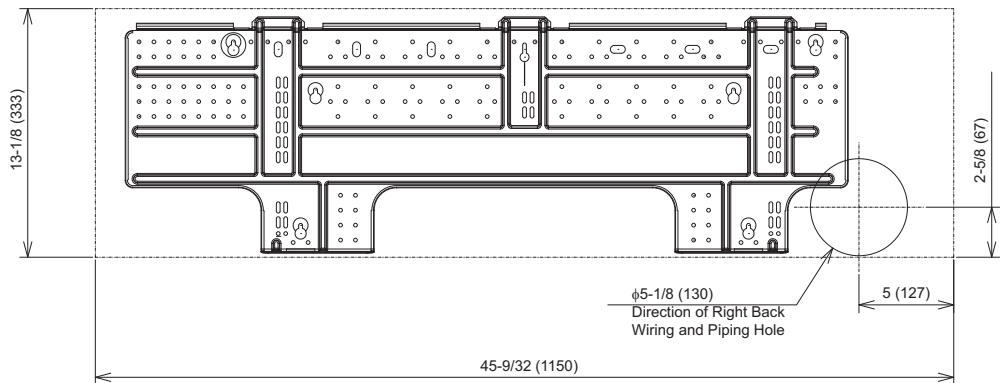
Unit: inch (mm)



Alternative Opening Direction 1:



Alternative Opening Direction 2:



INSTALLATION

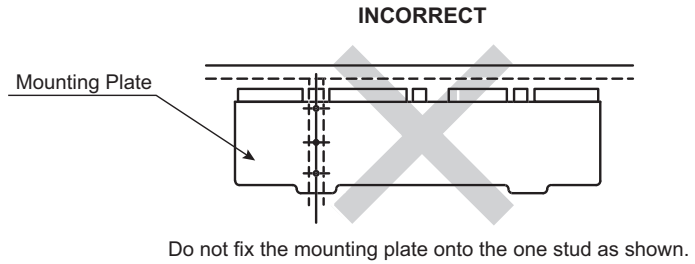
5.2 Working Procedure

5.2.1 Mounting Plate onto Wall

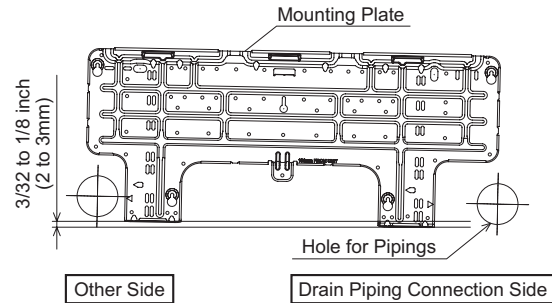
When the mounting plate is directly attached to a wood wall or a concrete wall, check to ensure that the wall is strong enough to support a weight of 450lbs. (2000N).

5.2.2 Mounting Indoor Unit between Studs

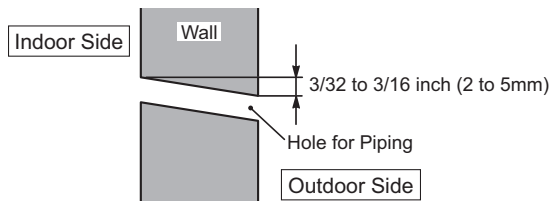
- (1) The core drill (diameter: 2-9/16 inch (65mm) for 006 to 012 type, 3-1/8 inch (80mm) for 015 to 024 type) facilitates making hole for pipings.
- (2) Do not install the mounting plate on one stud.



- (3) Mount the indoor unit in a position that offers the best advantages of weight distribution.
- (4) When installing the mounting plate, make sure that the side of drain piping connection is slightly ($3/32$ to $1/8$ inch (2 to 3mm)) lower than the other side, sloping down and away from the unit as shown in the figure at right. (Drain piping connection can be performed both right side and left side of the unit.)

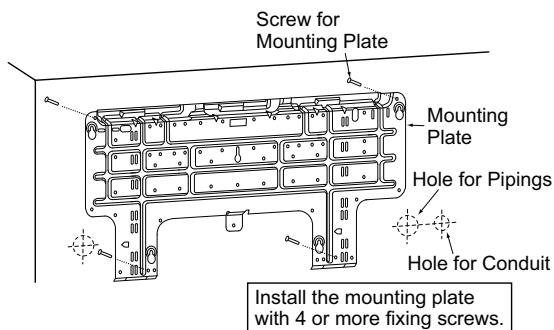


- (5) Open the piping hole slightly lower to the outside as shown in the figure below.

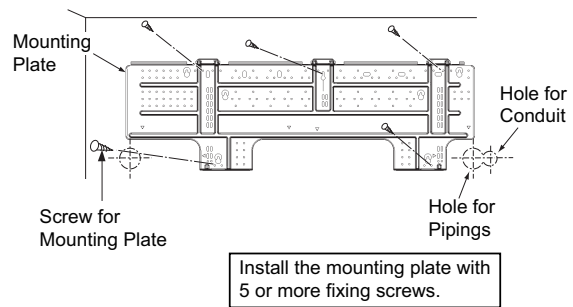


Correct Mounting on Studs

< TIWM006B21S to TIWM012B21S >



< TIWM015B21S to TIWM024B21S >

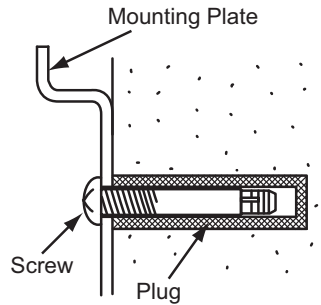


NOTE:

Refer to the dimensions of the mounting plate on section 5.1 and use the screw holes indicated with for installation. If stronger installation is required, use other holes.

5.2.3 Mounting Indoor Unit onto a Poured Concrete Wall or Concrete Block Wall

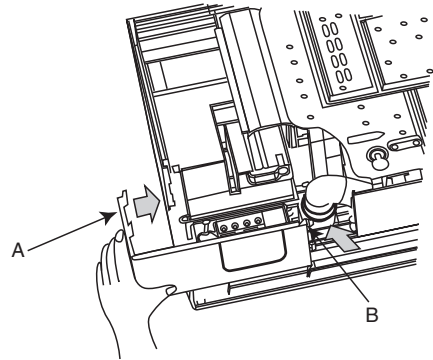
Attach the mounting plate to a concrete wall or a concrete block wall with screws and plugs (anchors). Install the mounting plate directly to the wall by the field-supplied plug as shown in the figure below. Mount the unit according to the plug depth specified by the manufacturer. Select the plug size from the table below.



Plug Size	Qty.	
	006 to 012 Type	015 to 024 Type
M4 - M5	4	5

5.2.4 Removing Lower Right Corner Cover

The lower right corner cover can be removed as shown in the figure at right. Pull the lower right corner cover while pushing A and B, and remove it.



5.2.5 Mounting Indoor Units

- (1) Hook the upper part of the indoor unit to the mounting plate.

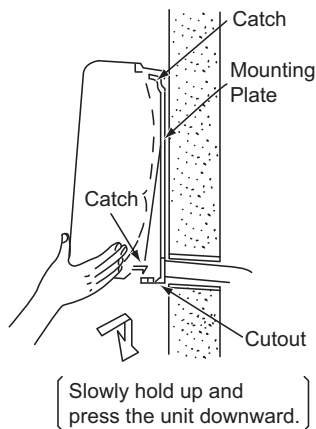
NOTE:

Avoid contact with refrigerant or refrigerant oil to the upper part of indoor unit. If the unit cover plate comes into contact with these substances, wipe them off immediately and completely.

⚠ CAUTION

Mounting this unit is a two-person job. The unit is too much to handle for one person and the risk of injury exists.

- (2) Insert the catches along the bottom of the indoor unit into corresponding locations on the mounting plate.



⚠ CAUTION

Check to ensure that the unit is securely hooked onto the mounting plate. An insecure fitting will result in unwanted vibration when the unit is running. A poorly mounted unit can separate from its mounting plate and fall to the floor with serious injuries.

When removing or replacing the unit, push upward the "PUSH" part on the bottom to release the bottom part of unit from the catches in the mounting plate.

5.2.6 Removing Flat Panel

When removing the flat panel, remove it according to the following instructions. Take care not to scratch any other plastic parts.

NOTICE

Remove and attach the flat panel with both hands. When installing or removing the front panel, do not use excessive force as it and other portions can easily break.

< TIWM006B21S to TIWM012B21S >

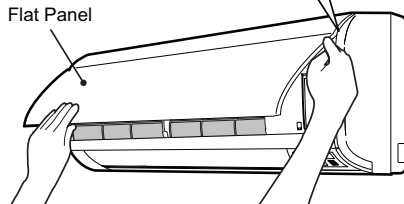
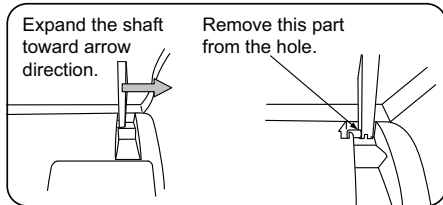
(1) Removing Flat Panel

(a) Hold both sides of the flat panel and lift it up.



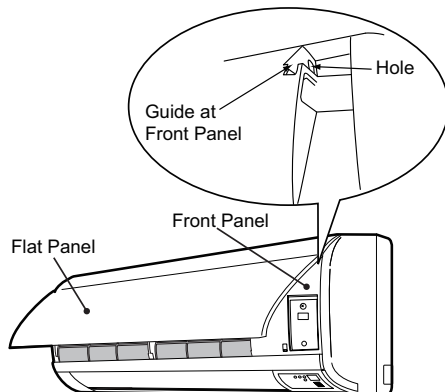
(b) Release the two (2) catches and pull the air filter downward to remove it.

(c) Open the flat panel fully and slightly extend the right arm shaft outward. After the shaft is removed from the front panel, pull the flat panel forward with the right arm shaft slightly extended outward and then remove the flat panel.



(2) Attaching Flat Panel

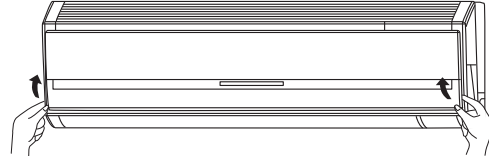
Insert the arm shafts on both sides of the flat panel into the holes on the unit body, along the guide of the front panel. After the flat panel is attached completely, insert the catches for the air filter to complete.



< TIWM015B21S to TIWM024B21S >

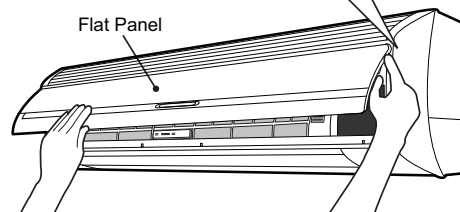
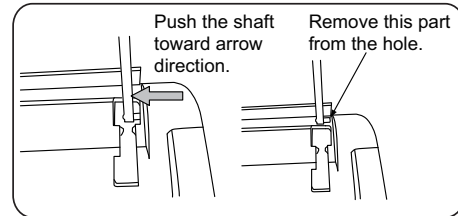
(1) Removing Flat Panel

(a) Hold both sides of the flat panel and lift it up.



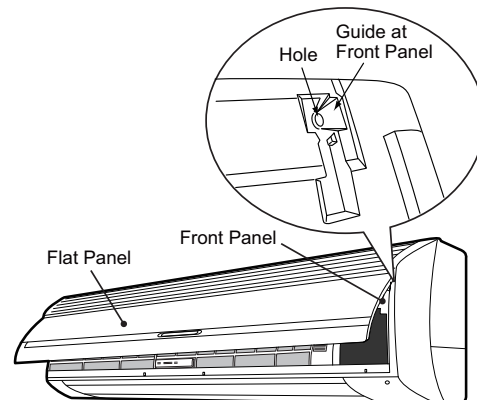
(b) Release the two (2) catches and pull the air filter downward to remove it.

(c) Open the flat panel fully and push the right arm shaft inward. After the shaft is removed from the front panel, pull the flat panel forward with the right arm shaft slightly pushed inward and then remove the flat panel.



(2) Attaching Flat Panel

Insert the arm shafts on both sides of the flat panel into the holes on the unit body, along the guide for the front panel. After the flat panel is reattached, insert the catches for air filter to complete.

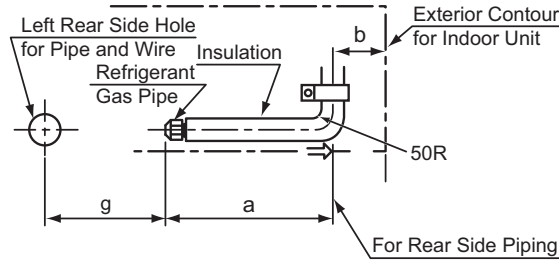


5.2.7 Position of Piping Connection

Piping can be installed from the indoor unit in the following directions: the rear side, the bottom side, and the left side of the unit.

- (1) In the case that the pipe is connected toward rear side, position the refrigerant piping as shown in the following figures.

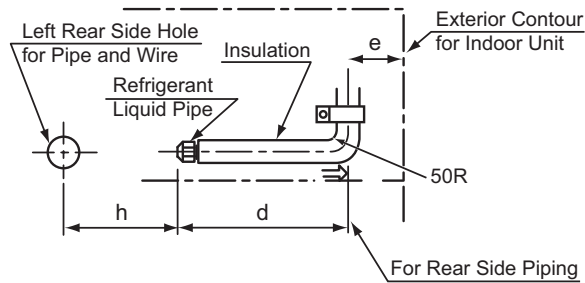
< Gas Pipe >



Unit: inch (mm)

Model	Gas Piping			
	Diameter	a	b	g
TIWM006B21S	1/2	15-9/16	4-7/32	9-9/16
TIWM008B21S	(12.7)	(395)	(107)	(243)
TIWM012B21S	1/2	15-9/16	4-7/32	10-5/16
TIWM015B21S	(12.7)	(395)	(107)	(262)
TIWM018B21S	1/2	18-29/32	5-9/16	18-17/32
TIWM024B21S	(12.7)	(480)	(141)	(471)
TIWM018B21S	5/8	18-29/32	5-9/16	18-17/32
TIWM024B21S	(15.88)	(480)	(141)	(471)

< Liquid Pipe >

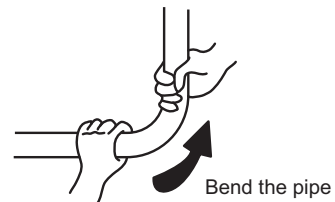


Unit: inch (mm)

Model	Liquid Piping			
	Diameter	d	e	h
TIWM006B21S	1/4	17-23/32	4-7/32	7-13/32
TIWM008B21S	(6.35)	(450)	(107)	(188)
TIWM012B21S	1/4	17-23/32	4-7/32	8-5/32
TIWM015B21S	(6.35)	(450)	(107)	(207)
TIWM018B21S	1/4	21-1/4	5-9/16	16-15/32
TIWM024B21S	(6.35)	(540)	(141)	(418)
TIWM018B21S	3/8	21-1/4	5-9/16	16-15/32
TIWM024B21S	(9.52)	(540)	(141)	(418)

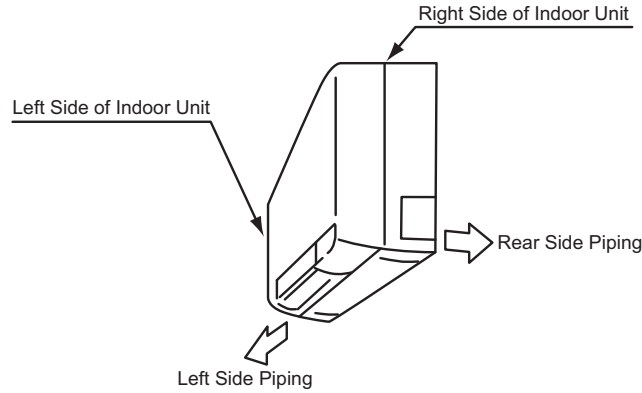
NOTES:

1. Do not twist the pipes when connecting them.
2. Use the proper bending equipment to bend piping as needed.
If fashioning 1/4-inch diameter piping by hand, hold tightly at the bending radius and proceed with the bending operation.

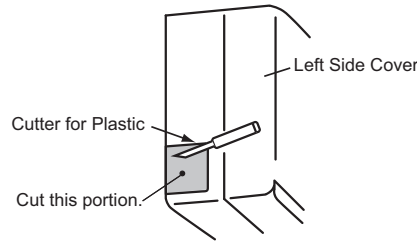


INSTALLATION

(2) Determine the direction for the piping connection according to the layout for the site of installation as shown below.



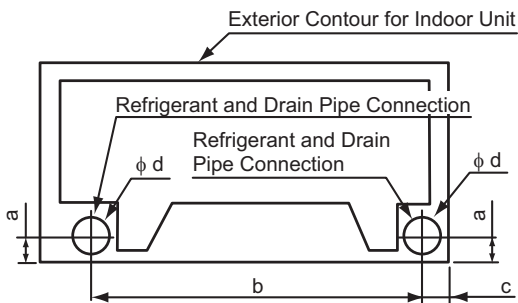
- For Left Side Piping
With the appropriate cutting tool, remove the left-side "knock-out" panel and smooth away any sharp edges. Do this before the unit is mounted onto the wall.



NOTE:

If left side piping access is selected, the drain pipe outlet should be left side and the mounting plate downslope should be adjusted to left side. It does not change the mounting plate downslope to the left side.

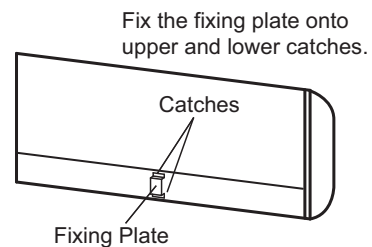
- For the pipe installation embedded in the wall, the positions for piping are as follows.



Unit: inch (mm)

Model	a	b	c	ϕd
TIWM006B21S	1-25/32 (45)	25-1/8 (638)	4-7/32 (107)	2-9/16 (65)
TIWM008B21S	1-25/32 (45)	25-7/8 (657)	4-7/32 (107)	2-9/16 (65)
TIWM012B21S	1-21/32 (42)	37-7/16 (951)	5-9/16 (141)	3-5/32 (80)
TIWM015B21S				
TIWM018B21S				
TIWM024B21S				

(3) Fix the fixing plate for pipes (accessory) as shown in the figure at right. (only for 006 to 012 Type)



6. Refrigerant Piping Work

⚠ DANGER

Use the specified non-flammable refrigerant (HFC R410A) for the outdoor unit refrigerant cycle. Do not charge the unit with anything other than HFC R410A, such as hydrocarbon refrigerants (propane and Isobutene), oxygen, and other flammable gases (acetylene, ammonia, and so forth), or any poisonous gases when installing, maintaining and moving the unit. These substances are volatile and dangerous and can result in fire, explosion, and serious or fatal injuries.

For details of refrigerant piping work, vacuum pump and refrigerant charging, refer to the "Installation and Maintenance Manual" for the outdoor unit.

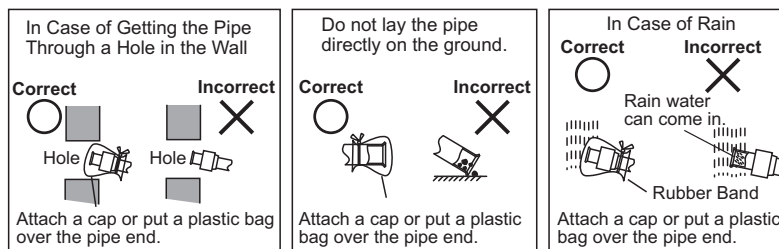
6.1 Piping Materials

- (1) Tolerances of refrigerant piping lengths depend on the combination with the outdoor unit. Refer to the "Installation and Maintenance Manual" for the outdoor unit.
- (2) Select the piping size from the following table.

Table 6.1 Piping Size

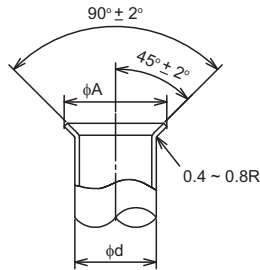
Model	inch (mm)	
	Gas Piping	Liquid Piping
TIWM006B21S TIWM008B21S TIWM012B21S TIWM015B21S	1/2 (12.7)	1/4 (6.35)
TIWM018B21S TIWM024B21S	5/8 (15.88)	3/8 (9.52)

- (3) Prepare field-supplied copper pipes.
- (4) Select clean copper pipes. Make sure there is no dust and moisture inside.
- (5) Make sure that moisture, old refrigerant, and other contaminants do not enter the refrigeration system. Impurities can adhere to the expansion valve and can impair system operation.
- (6) When cutting piping, do not use conventional tools such as saws or grinding wheel cutting disks that produce harmful metallic filings and burrs that can damage a refrigerant system. Use a pipe cutter to eliminate metal filings produced by the cutting operation. After the cut is made, blow out each pipe with dry compressed air or nitrogen to remove this residue before making pipe connections.



6.2 Piping Connections

- (1) Perform the flaring work as shown below.



Diameter (d)	inch (mm)	
	ϕA	ϕA
1/4 (6.35)	0.36 (9.1)	0.36 (9.1)
3/8 (9.52)	0.52 (13.2)	0.52 (13.2)
1/2 (12.7)	0.65 (16.6)	0.65 (16.6)
5/8 (15.88)	0.78 (19.7)	0.78 (19.7)

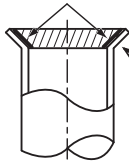
- (2) Use specific flare nut attached with the unit.
- (3) Verify that there are no scratches, burrs stuck to internal surfaces, or surface deformations at the flared opening.
- (4) Before tightening the flare nut, apply the (Field-Supplied) refrigerant oil in a thin layer over the flared part. (Do not apply the oil on other areas.) Tighten the flare nut for the liquid pipe to the specified torque with two spanners. Then, tighten the flare nut for the gas piping in the same way. After the tightening work has been completed, check that no refrigerant leakage occurs.

NOTE:

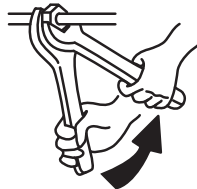
Refrigerant oil is field-supplied.

[Ethereal Oil FVC50K, FVC68D (Idemitsu Kousan Co. Ltd.)]

Apply Refrigerant Oil.



Do not apply the refrigerant oil to the outside of the flaring opening.



Use two wrenches for tightening the flare nut.

Required Tightening Torque

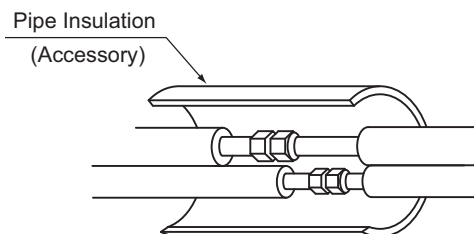
(JIS B 8607)

Pipe Size	Tightening Torque
1/4 inch (6.35 mm)	10.3 - 13.3 ft·lbs (14 - 18 N·m)
3/8 inch (9.52 mm)	25.1 - 31.0 ft·lbs (34 - 42 N·m)
1/2 inch (12.7 mm)	36.1 - 45.0 ft·lbs (49 - 61 N·m)
5/8 inch (15.88 mm)	50.2 - 60.5 ft·lbs (68 - 82 N·m)

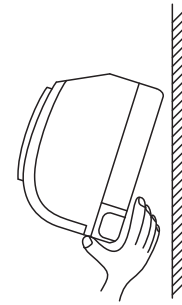
- (5) Wherever buried piping exists on site, make sure there is a service doorway to provide adequate access to inspect piping sockets and elbows, and for interconnecting parts.
- (6) Piping must be reinforced to withstand earthquakes so as not to be damaged by an external force.
- (7) Do not tightly secure refrigerant piping to accommodate expansion and contraction.
- (8) Prevent the pipes from contacting weak portions such as wall, ceiling, etc. (Otherwise, abnormal sound may be heard due to vibration of the piping.)
- (9) Test for air-tight integrity. The air-tight procedures should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
- (10) Insulate each flare connection without gap with accessory insulations to prevent condensation. Then insulate each refrigerant pipe as well.

< Insulation for Indoor Piping Connection >

Wrap the pipe insulation accessory around the flare connection and secure it with tape as shown in the figure below.



- (11) For Left Side Piping
Perform the following piping connection work.
- (a) It is recommended that the piping connection work be performed by 2 people: one supports the indoor unit and the other performs the piping connection.



NOTICE

Take care not to uncouple the indoor unit from the mounting plate.

- (b) Correctly position piping before installing the indoor unit to the wall. For left-rear side piping connections, refer to section 5.2.7.

! WARNING

- Do not apply excessive force to the flare nut when tightening. If applied, the flare nut may crack due to stress fracture and refrigerant leakage may occur. Use the correct torque specifications.
 - Make sure that a refrigerant leak test has been performed. Refrigerant (Fluorocarbon) for this unit is non-flammable, non-toxic, and odorless. If the refrigerant should somehow escape and come into contact with flame, toxic gas will form. This gas is heavier than air and will settle near floor areas and spread where it can cause suffocation to those nearby.
-

7. Drain Piping

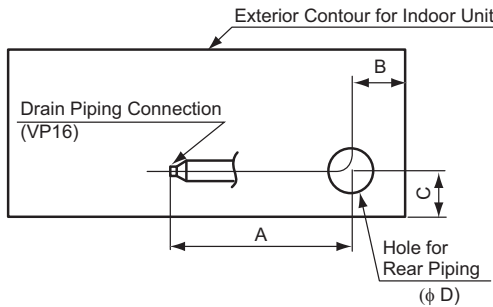
! WARNING

Do not run drain piping into underground areas near sanitary or sewage lines where toxic and corrosive gas can seep into the system. This creates a pathway for the flow of poisonous gas to penetrate inhabited areas.

NOTICE

- Check to ensure that the condensation drain piping discharges moisture properly. If connected incorrectly, it can cause structural damage to indoor wall and ceiling surfaces and damage to furniture and carpeting.
- Avoid sloping the drain piping upward as it will impede drainage. Otherwise, moisture will settle back into the unit and it may cause the water leakage when unit operation stops.
- Do not connect condensation drainage with sanitary or sewer lines or any other drain piping.
- When the common drain piping is connected with other indoor units, the connected position of each indoor unit must be higher than the common pipe. The pipe size of the common drain piping must be large enough according to the unit size and number of units.
- After performing drain piping work and electrical wiring, check to ensure that water outflow is as smooth as in the following procedure.

- (1) Standard drain connection is on the rear of the unit, viewed from the discharge grilles. The drain connection can also be connected to the left side of the unit. Refer to the section 5.2.7 for details.



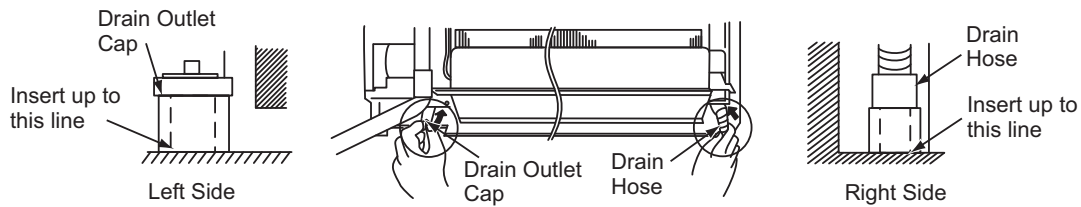
Unit: inch (mm)

Model	A	B	C	φD
TIWM006B21S				
TIWM008B21S	22-3/8	4-7/32	1-25/32	2-9/16
TIWM012B21S	(568)	(107)	(45)	(65)
TIWM015B21S				
TIWM018B21S	21-21/32	5-9/16	1-21/32	3-5/32
TIWM024B21S	(550)	(141)	(42)	(80)

NOTICE

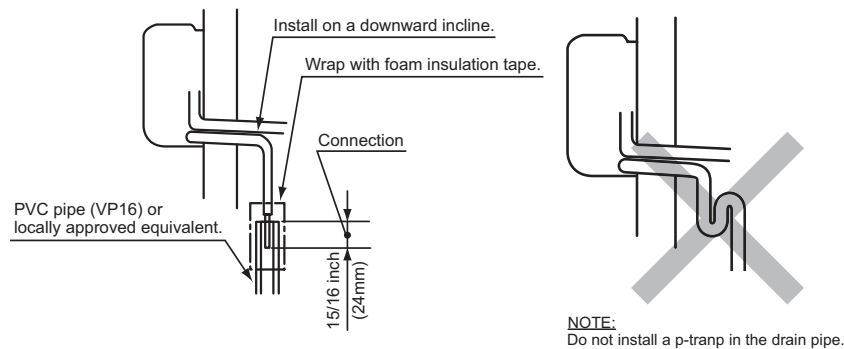
- In order to properly drain water, mount the indoor unit on a slight incline to the drain piping connection side. (Installed 3/32 to 1/8 inch (2 to 3mm) relative to the unit level.)
- When the left side piping is selected, the drain piping outlet should be left side. If it is not left side and the mounting plate is fixed onto the wall with right down slope, the condensate could flow back into the unit, causing a leak from the drain pan.

- (2) When the left side drain connection is performed, remove the cap to the left side drain, and then attach this cap to the right side drain in order to change drain connection from right side to left side. If the cap is tight, carefully remove it with pliers. (Perform this procedure before the indoor unit is hung onto the wall.)



(3) Connecting Drain Piping

- (a) Prepare PVC piping with 5/8 inch (16mm) outer diameter or locally approved equivalent for the application.
- (b) When the drain hose is used, do not twist or install on an incline.
- (c) Wrap vinyl tape or locally approved equivalent around the connection to prevent damage from condensation.
- (d) Insulate all drain piping upon completing the installation to prevent damage from condensation.



- (4) Terminate the drain piping utilizing locally approved methods and standards.
- (5) After the drain piping is completed, check that water flows smoothly by pouring water into the drain pan with a cup.
- (6) Wrap the drain piping with foam insulation tape or locally approved equivalent.
- (7) When installing the pipe, do not secure the drain piping and refrigerant pipe together.

! WARNING

Take care not to splash water on the electrical parts such as the fan motor or thermistors.

NOTICE

When the common drain piping is connected with other indoor units, the connected position of each indoor unit must be higher than the common piping to promote drainage. The size of common drain piping must be large enough according to the unit size and number of units.

8. Electrical Wiring

Perform electrical wiring work according to this manual and the "Installation and Maintenance Manual" for the outdoor unit.

WARNING

- All electrical work must be done as outlined in this manual and in accordance with this manual. Substandard work can result in fire and damage to the unit.
- Use specified cables between units and choose the cables correctly. If not, an electrical shock or fire may occur.
- Do not open the service cover or access panel for the indoor or outdoor units without turning OFF the main power supply. It can result in an electrical shock.
- Turn OFF the main power switch of the indoor unit and the outdoor unit before attempting any electrical wiring work or a periodical check is performed. If not, it will result in an electric shock or a fire.
- Check to ensure that the indoor fan and the outdoor fan have stopped before attempting any electrical wiring work or for any scheduled electrical work that is being performed.
- Protect electrical wiring, drain piping, and electrical components from threats posed by burrowing animals and temperature extremes. Failure to do so can, over time, deteriorate system performance.
- Tighten screws according to the following torque.
 - M3.5: 0.9 ft·lbs (1.2 N·m)
 - M4: 0.7 to 1.0 ft·lbs (1.0 to 1.3 N·m)
- Connect ground wiring for the outdoor / indoor unit to prevent electrical shock or an unexpected discharge. The ground resistance must be less than 1 megohm. The grounding must be performed by authorized installers.
- Disconnect or turn OFF the main power supply to prevent electrical shock when opening the service cover to perform electrical maintenance.
- Take care not to pinch electrical wiring when attaching the service cover. Electrical fire or shock can occur.
- Insulate all wiring with accessory packing and seal the connection hole against the threat of insects or moisture.

NOTICE

- Pass the wires through the knockout hole on the side cover when using conduit.
- Perform the wiring work according to this manual and "Installation and Maintenance Manual" for the outdoor unit.
- Connect correctly the power supply line phases.
- The communication cable between the indoor unit and the outdoor unit does not have any polarity. Do not apply an excessively high voltage to this cable (Rated Voltage 5V). It may cause failure.
- The controller cable (Field-Supplied) does not have any polarity. Do not apply an excessively high voltage to this cable (Rated Voltage 5V). It may cause failure.
- Maintain the rated voltage for the power supply. Voltage that is too high or too low can damage the unit.
- Make sure there is sufficient capacity for the power supply. If not, operation cannot begin due to insufficient voltage.

8.1 General Check

- (1) Make sure that the field-selected electrical components: (main power switches, circuit breakers, wires, conduit connectors, and wire terminals) have been properly labeled in accordance with electrical data as specified in the Engineering Manual. Make sure that the components comply with the National Electrical Code (NEC).
- (2) Check to ensure that the power supply voltage is within $\pm 10\%$ of the rated voltage.
- (3) Check the capacity of the electrical wires.
If the power supply capacity is too low, the system cannot be started due to a voltage drop.
- (4) Verify that the ground wiring is securely connected.

8.2 Electrical Wiring Capacity

8.2.1 Field Minimum Wire Sizes for Power Supply

- This equipment can be installed with a Ground Fault Circuit Interruptor (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches and wiring in accordance to local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements. Failure to use a GFCI could result in electric shock or fire.
- Do not operate the system until all check points have been cleared.
 - (A) Check to ensure that the electrical resistance is more than one megaohm, by measuring the resistance between ground and the terminal of the electrical parts. If it is less than one megaohm, do not operate the system until the source of the electrical drain is found and repaired.
 - (B) Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.
 - (C) Check to ensure that the switch on the main power has been ON for more than 12 hours, to warm up the compressor oil by the crankcase heater.
- Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated to higher than 194°F (90°C).

8.2.2 Details of Electrical Wiring Connection

The electrical wiring capacity of the outdoor unit should be referred according to the "Installation and Maintenance Manual" for the outdoor unit. Adjusting the DIP switches may be required depending on the arrangement with the outdoor unit.

Select wiring capacity according to the table 8.1. Install a GFCI (Ground Fault Circuit Interrupter) and main switch as shown in each of the system diagrams below.

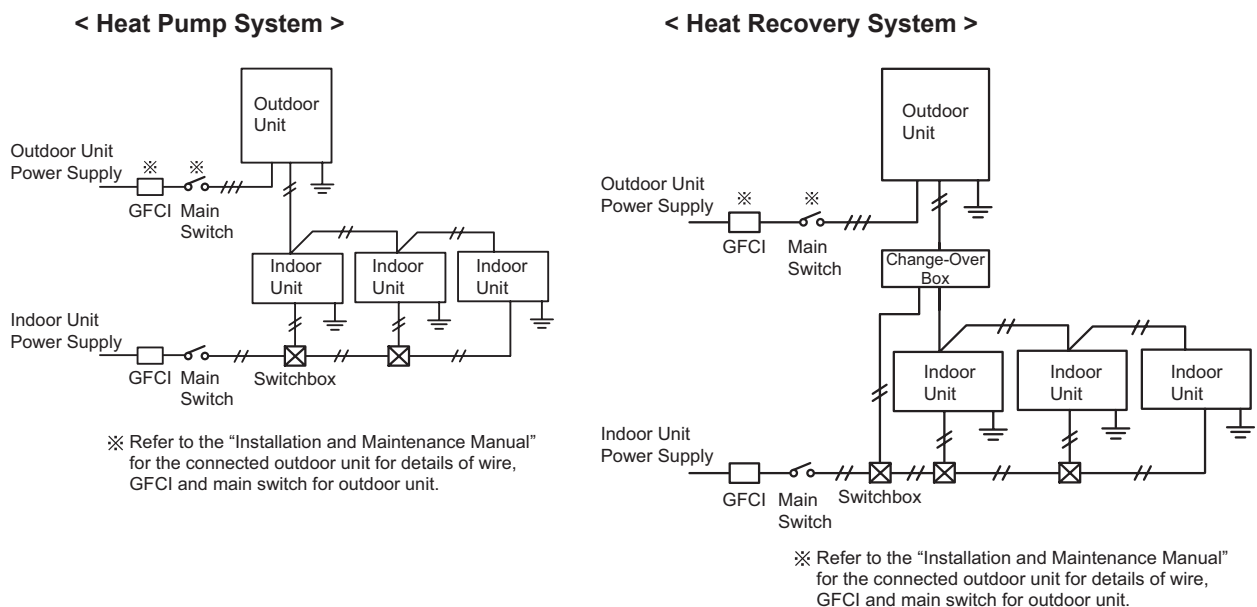


Table 8.1 Recommended Wiring Capacity and Sizes

Follow local electrical codes when selecting a GFCI device.

Model	Power Supply	Minimum Wire Thickness (AWG [mm ²])			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA <Minimum Circuit Ampacity> [A]
		Power Supply Wiring Size < Main >	Ground Wiring Size	Comm. Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
TIWM006B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	0.3
TIWM008B21S									0.3
TIWM012B21S									0.5
TIWM015B21S									0.4
TIWM018B21S									0.6
TIWM024B21S									0.7

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) Select the GFCI with activation speed of 0.1 sec. or less.
- 3) Total operating current is less than 12A.

NOTICE

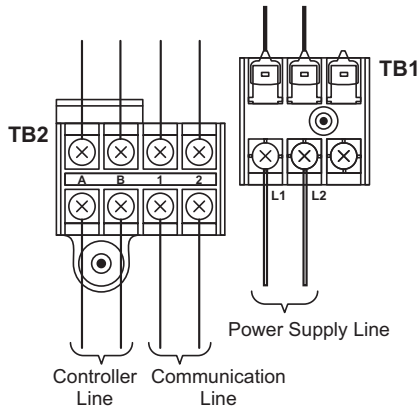
- Check for the recommended size GFCI shown in the table 8.1.
- Between indoor and outdoor units, use dual-conductor, AWG18 (0.82mm²) stranded copper cable for communication cable. Do not use any cable with more than two conductors. Twisted pair or shielded cable can be used in environments with excessive electrical noise to reduce the possibility of communication errors between system components. Total cable length should not exceed 3281 ft (1000m).
- Select the wiring size, GFCI (Ground Fault Circuit Interrupter) in accordance with the regulations for each region, the "Installation and Maintenance Manual", and the dedicated electrical circuit that must be used.
- Outside of the indoor unit, installation of the power supply wiring, communication cable, and wired controller cable should be spaced as far apart as possible.

8.2.3 Electrical Wiring for Indoor Unit

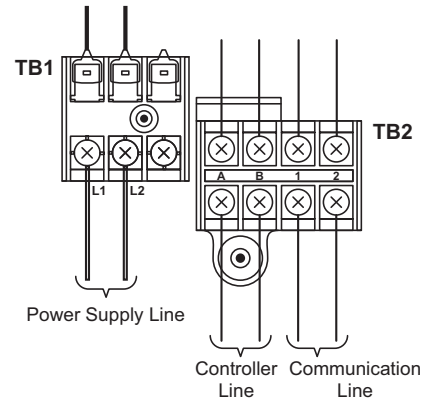
Refer to the “Installation and Maintenance Manual” for the outdoor unit for details on the electrical wiring capacity for the outdoor unit. Setting DIP switches may be required, depending on the combination with the outdoor unit.

- (1) Connect the power supply wirings (L1 and L2) to the terminal block correctly.

< TIWM006B21S to TIWM012B21S >



< TIWM015B21S to TIWM024B21S >



- (2) Connect the communication cables between the indoor unit and the outdoor unit correctly. Check to ensure that the terminal for power supply wiring (Terminals “L1” to “L1” and “L2” to “L2” for each terminal block: AC208/230V) between the indoor unit and the outdoor unit correspond correctly. If not, components will be damaged. Connect ground wiring to the terminals in the electrical box.
- (3) Use 2-conductor, AWG18 (0.82mm²), stranded, copper cable, non-shielded, non-twisted cable for the communication cable between the outdoor unit and the indoor units. They are connected to the terminals 1 and 2 of the terminal blocks. The controller cable is connected to the terminals A and B of each indoor unit terminal block.
- (4) The total cable length should not exceed 3281ft (1000m).

NOTE:

The total wiring length for the wired controller can be extended up to 1640ft (500m). If the total wiring length is less than 98ft (30m), other cable can be used.

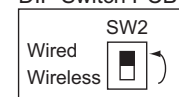
NOTICE

< In Case of Using an Optional Wired Controller or Optional Receiver Kit >

The following setting is required when the optional wired controller or the optional receiver kit is used.

- The setting before shipment is “Wireless”. Set SW2 to “Wired”. If not, the operation is not available.
- Connect the controller cables to the terminals A and B at the terminal block TB2.

DIP Switch PCB



Change to “Wired” .

< In Case of Using an Optional Wireless Controller >

- The SW2 switch setting is NOT required when the wireless controller is used with the receiver built into the indoor unit. However, the multiple indoor unit operation is not available when this wireless controller is used with the receiver built into the indoor unit. If the multiple indoor unit's operation is required with this wireless controller, use the Optional Receiver Kit.
- If there are two indoor units installed close to each other, the wireless controller may not distinguish the units. Use the function “Identifying Indoor Units Installed Side by Side”, which the wireless controller should be set to “B mode”. (Refer to the “Installation and Maintenance Manual” for the wireless controller about the “B mode” setting.)

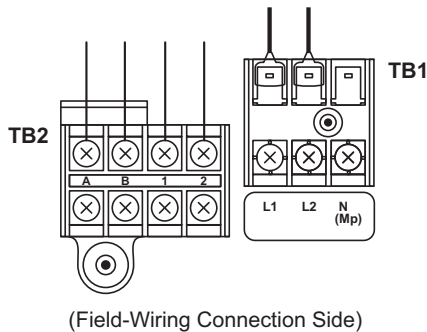
8.3 Position of Electrical Wiring Connection

⚠ WARNING

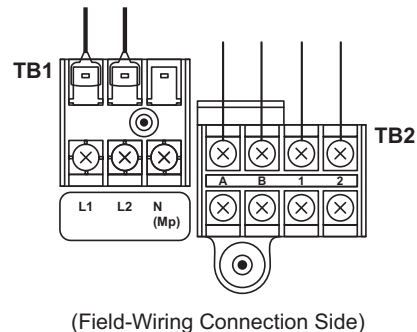
- Ensure that the wire terminals are tight to recommended torque specs. Failure to do this can result in electrical shock or fire at the terminal connection.
- Do not apply excess force when tightening cables. This can result in heat generation and fire.
- Make sure that the terminals do not come into contact with the electrical box. If the terminals are too close to the surface, it can result in the activation of the circuit protection, heat generation and fire at the terminal connection, and an electrical shock.

(1) The electrical wiring connections at the terminal block for the indoor unit are shown in the figures below. Check the outdoor unit configuration before the wiring work begins.

< TIWM006B21S to TIWM012B21S >

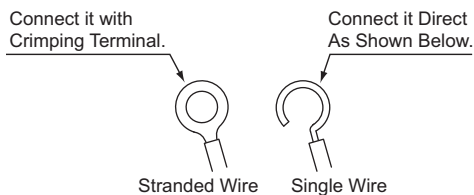


< TIWM015B21S to TIWM024B21S >



NOTE:

When standard grade electrical wire is used for field-wiring connections, an M4 terminal crimping tool should be used. When a single wire is used, reshape it as shown below. The screws at the terminal block should be tightened using the torque specs in the table at right.



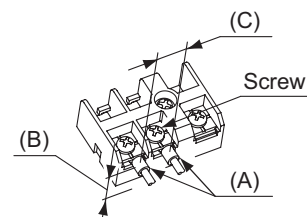
Tightening Torque for Terminals

	Size	Tightening Torque
Power Supply	M4	0.7 - 1.0 ft·lbs (1.0 - 1.3 N·m)
Communication	M3.5	0.9 ft·lbs (1.2 N·m)

- (2) Connect the cable for the optional controller or the optional extension cable to the terminals inside the electrical box through the connection hole on the cabinet.
- (3) Connect the power supply and the ground wiring to the terminals in the electrical box.
- (4) Connect the cables between the indoor unit and the outdoor unit to the terminals in the electrical box.
- (5) Connect cables to correspond with terminals of the same number or color band.
- (6) Install the communication cable between indoor units and the outdoor unit for the same system.

NOTICE

- Do not connect the main power supply wiring to the communication line (Terminals A, B, 1, and 2 of TB2). If connected, the printed circuit board (PCB) will be destroyed.
- Pay attention to following when wires are connected at the terminal block:
 - (A) Attach a piece of insulation tape or a sleeve at each terminal.
 - (B) Maintain the recommended distance between the electrical box and the terminals to prevent a short circuit.
 - (C) Maintain the recommended distance between terminals.



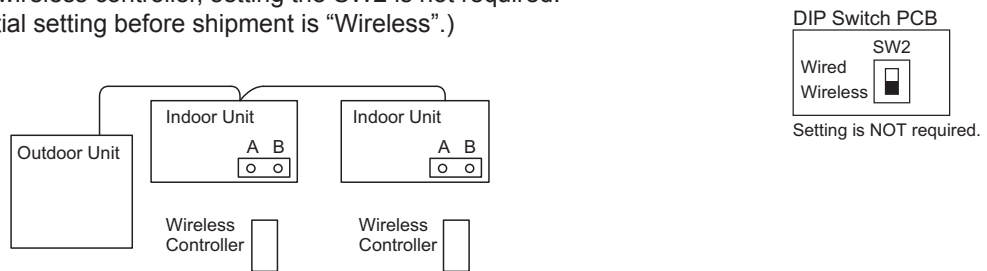
- (7) The electrical wiring connection for the indoor unit is shown in the section 8.2.2 and Fig. 8.1 below.
- (8) If Power Supply Voltage (208V/230V) is introduced into the Communication Line:
 If 208V/230V are applied to the communication line at (Terminals 1 and 2 of TB2) by mistake, the fuse on the PCB for the communication line will blow. In this case, perform the recovery work as shown in the diagrams below.
 - (a) Reconnect the wirings correctly.
 - (b) Set the No.1 pin at DSW7 (on the PCB) to ON.

Upon PCB recovery after the fuse has been replaced, if 208V / 230V is reintroduced into the communication line, the PCB will be seriously damaged and will not recover.



Fig. 8.1 Recovery from a Blown Fuse.

- (9) Wireless Controller Connection.
 For the wireless controller, setting the SW2 is not required.
 (The initial setting before shipment is "Wireless".)



NOTE:

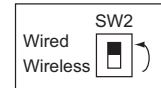
For group control (multiple unit control), with single controller, a wired controller or receiver kit is required.
 (The group control is NOT available with the wireless controller if the built-in receiver is only used.)

INSTALLATION

(10) Wired Controller Connections.

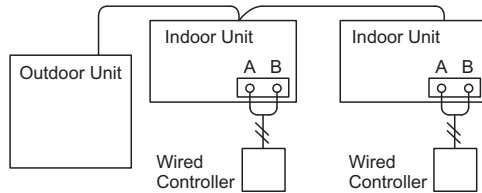
When the wired controller or receiver kit is used, the setting of SW2 is required.

DIP Switch PCB

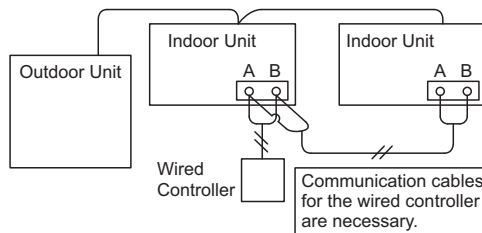


Change to "Wired" .

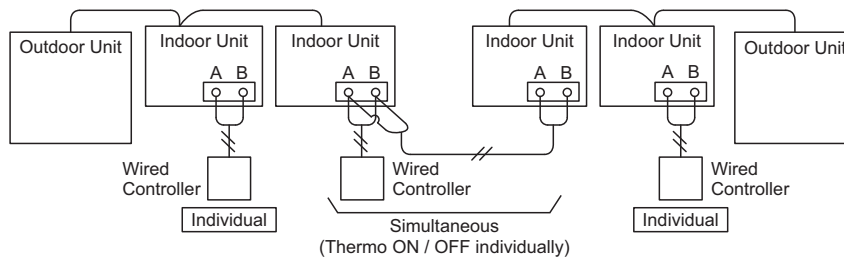
(a) Wired Controller at each unit for an individual operation setting



(b) Single Wired Controller for an individual operation setting



(c) Wired Controller connections between different refrigerant cycles



NOTICE

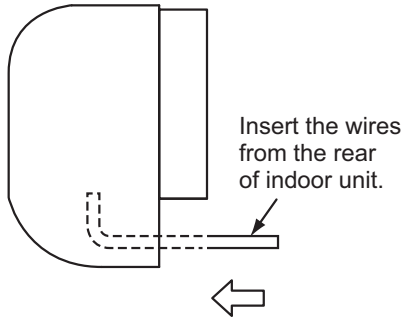
1. The DIP switch settings for the outdoor unit should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
2. Be aware that communication cable for the wired controller is required in these instances:
 - a The following functions are set to the sub unit which is not installed with the wired controller.
 - Remote ON/OFF function settings, (No.1, 2, and 3), (External Input / Output Function)
 - Power supply ON/OFF functions, (No.1 and 2), (Function Selection)
 - Prohibiting the wired controller after manual stoppage (External Input / Output Function)
 - Group setting by the centralized controller
 - b The address for the indoor unit is changed from the wired controller.

8.4 Wiring Connections

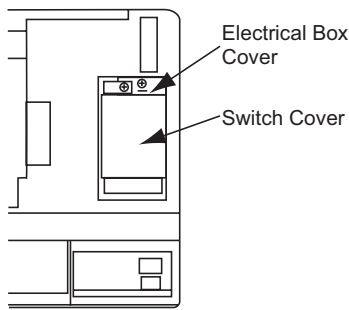
The wiring connection for the indoor unit is shown below.

< TIWM006B21S to TIWM012B21S >

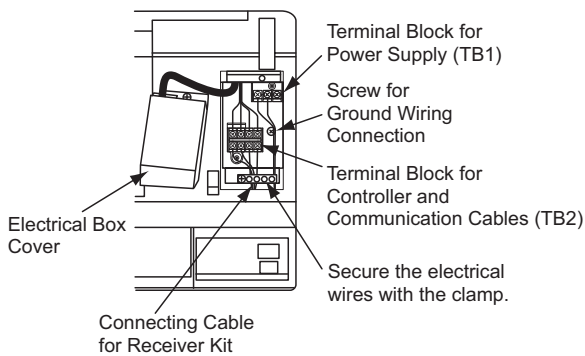
- (1) Insert the wires from the rear of indoor unit as shown in the figure below.



Position of Electrical Box Cover
The figure below shows the front panel removed. The electrical box cover can be opened without removing the front panel.

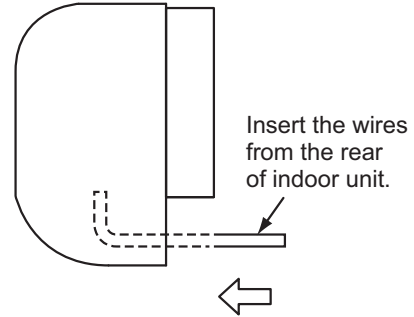


- (2) Open the electrical box cover to perform field electrical wiring work. Close the electrical box cover after the electrical wiring work is completed.

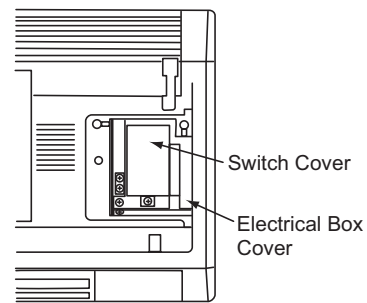


< TIWM015B21S to TIWM024B21S >

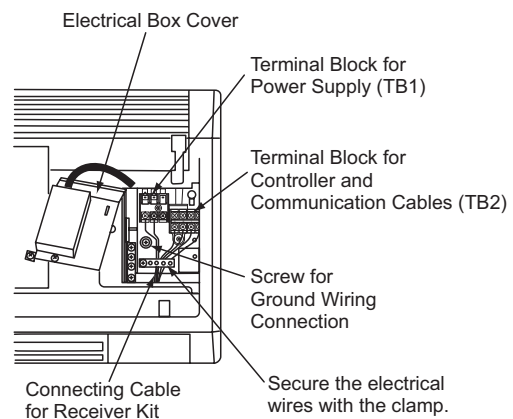
- (1) Insert the wires from the rear of indoor unit as shown in the figure below.



Position of Electrical Box Cover
The figure below shows the front panel removed. The electrical box cover can be opened without removing the front panel.



- (2) Open the electrical box cover to perform field electrical wiring work. Close the electrical box cover after the electrical wiring work is completed.



INSTALLATION

8.5 Conduit Connection

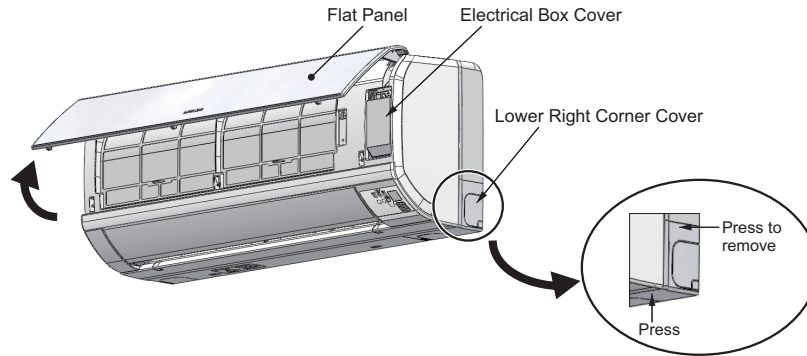
The conduit connection for this unit is shown below. Remove the front panel to connect the conduit.

< TIWM006B21S to TIWM012B21S >

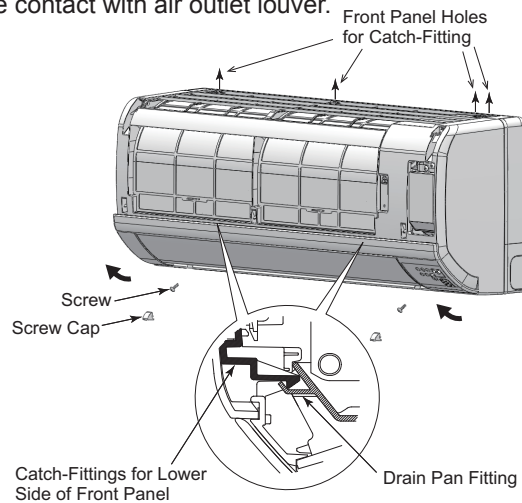
- (1) Hold both sides of the flat panel and lift it up.

Open the flat panel fully and slightly extend the right arm shaft outward. After the shaft is removed from the front panel, pull the flat panel and remove it.

Press inward two portions as shown to remove the lower right corner cover.

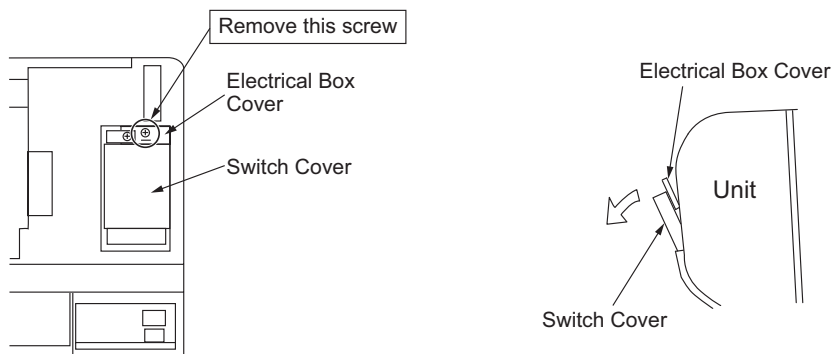


- (2) Remove the two (2) screw caps and then the two (2) screws on the lower side of the front panel. Pull the lower side of the front panel forward to release the catch-fitting. Use caution when removing this panel so as not to make contact with air outlet louver.

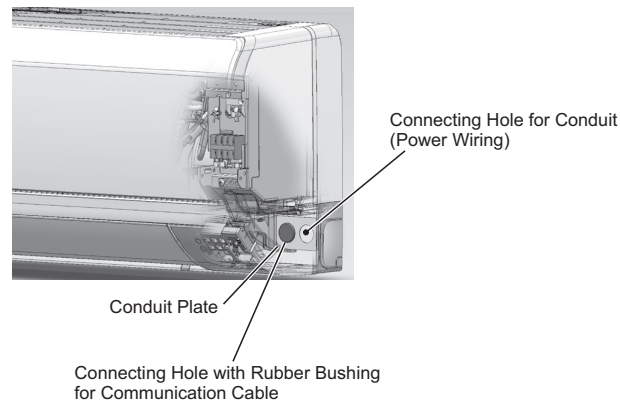


Do not use excessive force when disassembling.

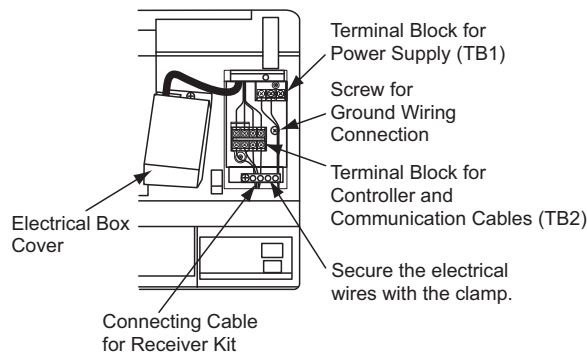
- (3) Slightly lift the front panel up to release the catch-fitting (at four locations) on the upper side of the unit. Then pull the front panel forward to remove it.
- (4) Remove the screw securing the electrical box cover and open it.



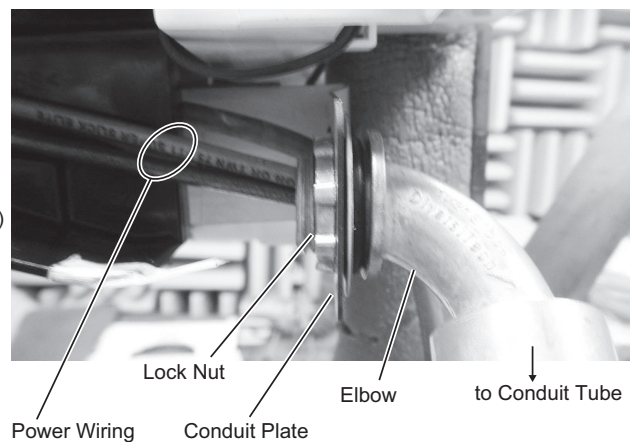
- (5) From the rear, insert the conduit for power wiring through the connecting hole on the conduit plate. Insert communication cable through the designated connecting hole (with rubber bushing), on the conduit plate. Ensure that the locknut is installed after the conduit plate as shown in the "Conduit Attachment Detail" below.



< Front View of Electrical Box >



< Conduit Attachment Detail >

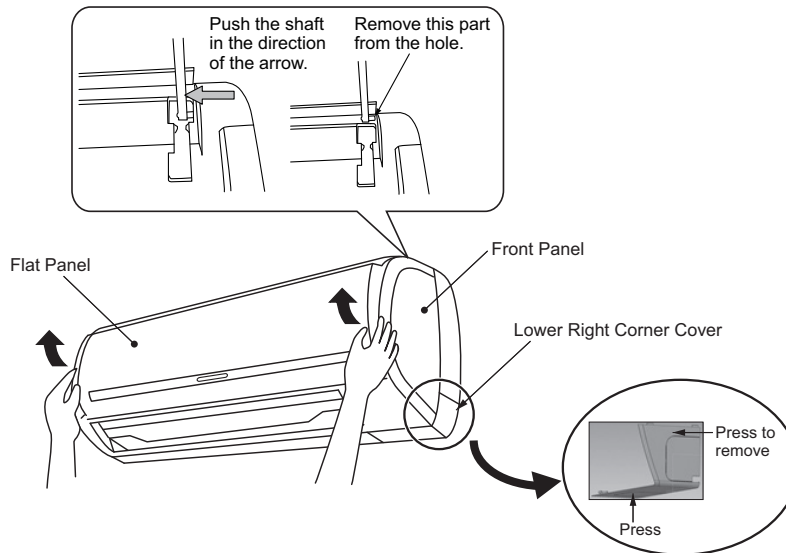


Electrical Wiring Details for Power Wiring and Communication Cable

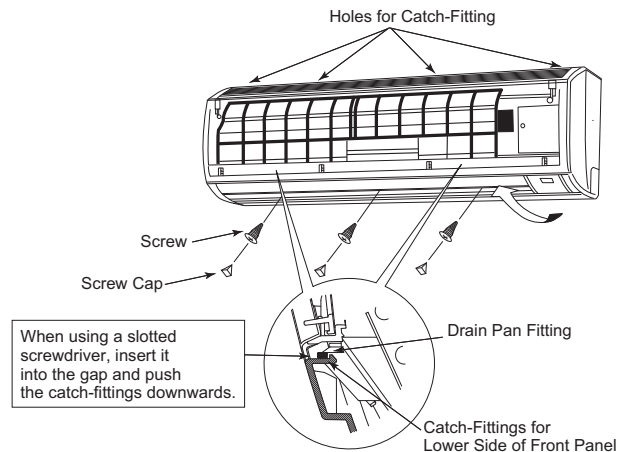
- (6) Pull the power wiring from the conduit into the unit. Connect the ground wiring to the screw for ground wiring connection first. Then connect power wiring and communication cable terminals to the terminal blocks. Allow extra length for all wiring inside the electrical box. Secure the wiring with the attached cable clamp.
- (7) Tighten the conduit locknut after the power wiring connection is made.
- (8) Close the electrical box cover. Reattach the lower right corner cover, front panel and flat panel into position. When installing the front panel, attach the air outlet side first and then the four locations on the upper side of the unit into the holes on the panel. Push the lower side of the panel to attach fittings together.
- NOTE:**
Make sure that there are no gaps nor overlapping between the front panel and the right side of the drain pan. If any gap is present, escaping air combined with condensation can leak out and spill onto unit surfaces.
- (9) Tighten two (2) screws and attach two (2) screw caps. Then install the air filter.
- (10) Insert the arm shafts on both sides of the flat panel into the corresponding holes on the unit body, along the front panel guides. After the flat panel is attached, close the flat panel.

< TIWM015B21S to TIWM024B21S >

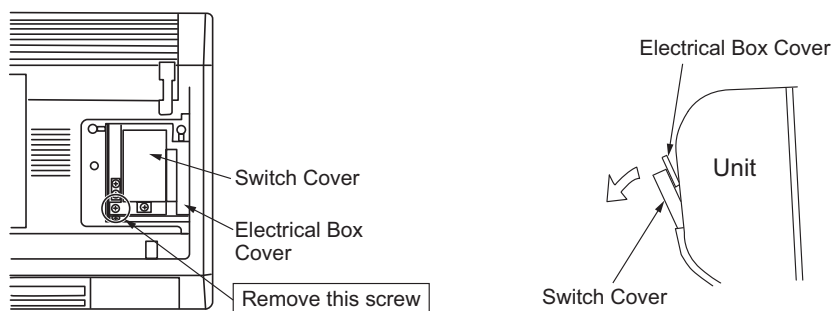
- (1) Hold both ends of the flat panel and lift up.
Open and fully extend the flat panel and push the right arm shaft inward. After the shaft is separated from the front panel, pull the flat panel forward with the right arm shaft slightly pushed inward and remove the flat panel. Remove the lower right corner cover panel by pressing inward against both ends.



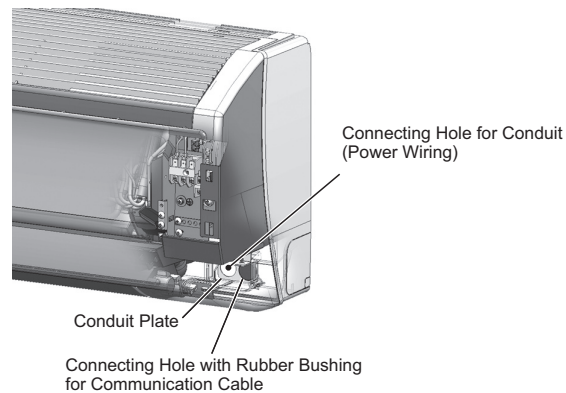
- (2) Remove the three (3) screw caps and three (3) screws as shown. Pull the lower side of the front panel (2 portions) forward to release the catch-fittings. Use a slotted screwdriver if the catch-fittings prove difficult to release. Be careful not to make contact with the air outlet louver, as the louver edges can be easily damaged.



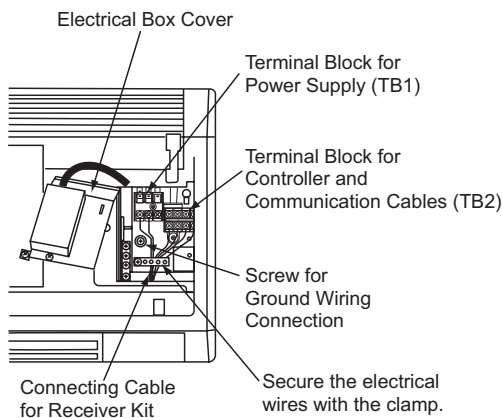
- (3) Slightly lift the front panel up to release the catch-fittings at four locations on the upper side of the unit. Then pull the front panel forward to remove it.
- (4) Remove the screw securing the electrical box cover and open it.



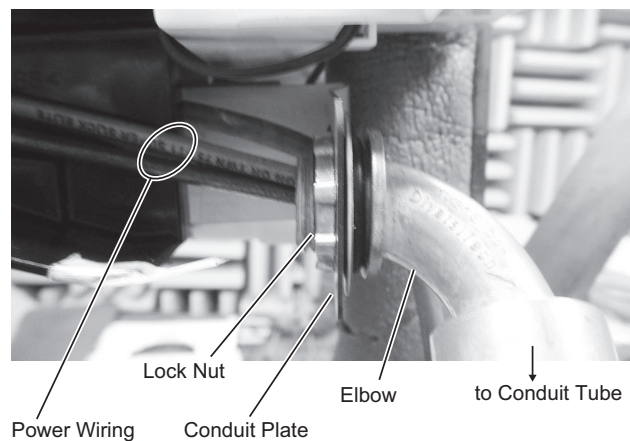
- (5) From rear of the unit, insert the conduit for power wiring through the connecting hole on the conduit plate. Insert communication cable through the designated connecting hole (with rubber bushing), on the conduit plate. Ensure that the locknut is installed after the conduit plate as shown in the "Conduit Attachment Detail" below.



< Front View of Electrical Box >



< Conduit Attachment Detail >



Electrical Wiring Details for Power Wiring and Communication Cable

- (6) Pull the power wiring from the conduit into the unit. Connect the ground wiring to the screw for ground wiring connection first. Then connect the power wiring and communication cable terminals to the terminal blocks. Allow extra length for all wiring inside the electrical box. Secure the wiring with the attached cable clamp.
- (7) Tighten the conduit locknut after the power wiring connection is made.
- (8) Close the electrical box cover. Reattach the lower right corner cover, front panel and flat panel into position. When mounting the front panel, be careful that it does not come into contact with the air outlet louver. Paying attention to both sides of the panel, secure catch-fittings (at front locations) on the upper side of the unit into the holes on the panel. Then insert the lower side of the panel (both ends) to secure these catch-fittings.

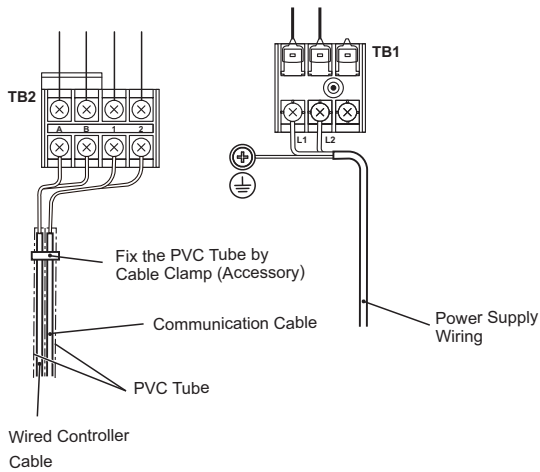
NOTE:

Make sure that there are no gaps or overlapping between front panel and left side of the drain pan. If any gap is present, escaping air combined with condensation can leak out and spill out onto unit surfaces.

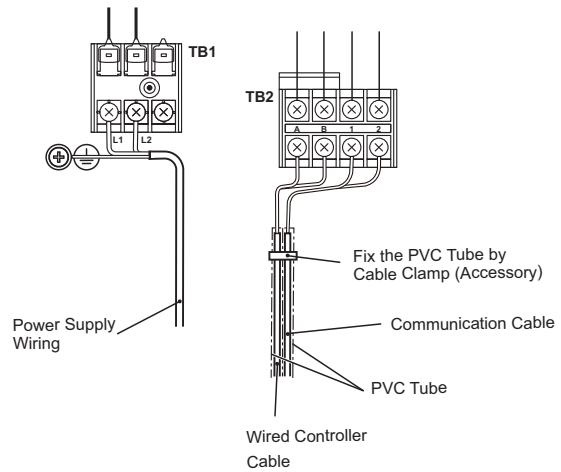
- (9) Tighten three (3) screws and attach three (3) screw caps. Then install the air filter.
- (10) Insert the arm shafts on both sides of the flat panel into the corresponding holes on the unit body, along the front panel guides. After the flat panel is attached, close the flat panel.

INSTALLATION

< TIWM006B21S to TIWM012B21S >



< TIWM015B21S to TIWM024B21S >



NOTES:

- Insert the communication cable and wired controller cable into the PVC tube “VW-1 600V” (Accessory) to separate from the power supply wiring for the indoor unit.
- Fix the both ends of the PVC tube by cable clamp (Accessory).
- If shielded cable is used, terminate at the ground terminal.

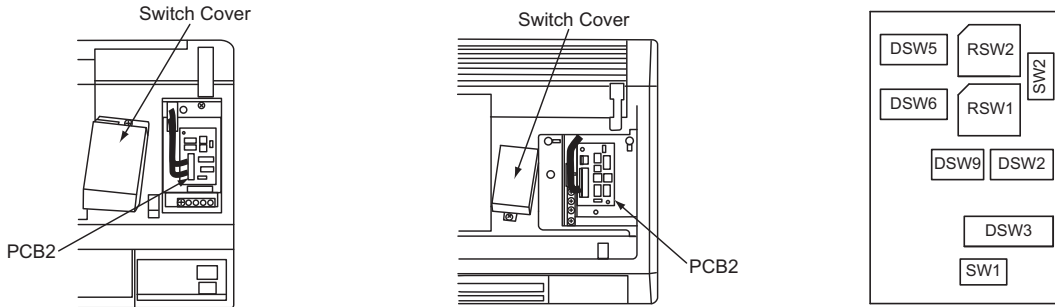
! WARNING

Install and secure all electrical wiring correctly through the connecting hole, to the terminal blocks using the cable clamps provided. Wiring should be spaced appropriately and firmly fastened to guaranty against electrical short, sparks, and flame.

8.6 DIP Switch Settings

- (1) Turn OFF the power supply to both indoor and outdoor units before adjusting DIP switch settings. Otherwise, the settings will be invalidated and not take effect.
- (2) Correct DIP switch settings are shown here. Remove the panel to make these adjustments and reattach when finished.

< TIWM006B21S to TIWM012B21S > < TIWM015B21S to TIWM024B21S > < DIP Switch PCB (PCB2) >



(3) Unit No. Setting

Setting is not required.

Indoor unit numbers are set by the auto-address function. If an indoor unit number setting is required, set the unit number of all indoor units respectively and sequentially by following setting position. It is recommended that you assign a number to each indoor unit from "1". A maximum of 64 indoor units per refrigerant cycle can be connected to an H-LINK II System. Though the available numbers range from zero to 63, the applicable number for the 64th indoor unit in theory supplants the number "zero". For the centralized control, this setting is required.

Unit No. Setting

<p>DSW6 (Tens Digit)</p>	<p>RSW1 (Units Digit)</p> <p>Setting Position: Set by inserting slotted screwdriver into the groove.</p>	<p>Ex.) Set at No.16 Unit</p> <p>DSW6</p> <p>Set No.1 Pin at ON side</p> <p>RSW1</p> <p>Set at "6"</p>
<p>Before shipment, DSW6 and RSW1 are set at "0".</p> <p>For the units supporting H-LINK II, the unit No. can be set for Max. 64 indoor units (No.0-63).</p>		

(4) Capacity Code Setting (DSW3)

No setting is required, due to setting before shipment. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.

Indoor Unit Capacity (MBH)	06	08	012	015	018	024
Setting Position						
	OFF	OFF	OFF	OFF	OFF	OFF

(5) Refrigerant Cycle No. Setting (RSW2 & DSW5)

This setting is required. The unit arrives with all settings in the OFF position.

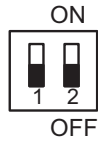
Refrigerant Cycle No. Setting

<p>DSW5 (Tens Digit)</p>	<p>RSW2 (Units Digit)</p> <p>Setting Position: Set by inserting slotted screwdriver into the groove.</p>	<p>Ex.) Set at No.5 Cycle</p> <p>DSW5</p> <p>Set All Pins OFF</p> <p>RSW2</p> <p>Set at "5"</p>
<p>Before shipment, DSW5 and RSW2 are set at "0".</p> <p>For the units supporting H-LINK II, the ref. cycle No. can be set for Max. 64 cycles. (No. 0-63)</p>		

INSTALLATION

- (6) Fuse Recovery (DSW7)
(This DIP switch is located at PCB1.)

* Factory Setting



* When introducing high voltage to terminals 1 and 2 of TB2, the (0.5A) fuse on the PCB is cut. In such a case, first, reconnect the wiring correctly to TB2, and then adjust the No.1 pin to ON.

- (7) Optional Function Setting (DSW2)

No setting is required. Setting positions before shipment are all in the OFF position.



* Setting for "Identifying Indoor Units Installed Side by Side," set No.3 pin (DSW2) to ON whenever a wireless controller is used.
(When the setting is not required, leave No.3 pin for the DSW2 "OFF" .)

For the function "Identifying Indoor Units Installed Side by Side", the wireless controller should be set to "B mode". (Refer to the "Installation and Maintenance Manual" for the wireless controller for "B mode" setting.)



Set No. 3 pin for the DSW2 to "ON" side. It is set "OFF" before shipment.

NOTE:

When using the receiver kit, setting DSW2 on the PCB for the indoor unit is not required. Set the function "Identifying Indoor Units Installed Side by Side" with the receiver kit instead. For details on this setting, refer to the "Installation Manual" for the receiver kit.

- (8) Wired Controller Setting (SW2)

* When using the wired controller and receiver kit:

The initial setting prior to shipment is "Wireless". Set SW2 to "Wired". This operation cannot be performed without this adjustment. Connect the controller cables to terminals A and B at terminal block TB2.

NOTES:

- The solid square "■" symbol signifies the "ON" position for DIP switches. The diagrams show original settings before shipment.
- When the unit number and the refrigerant cycle are set, record the unit number and refrigerant cycle to facilitate maintenance and servicing activities afterward.

- SW1 Setting

SW1 for transmission is set to "2 線" (Non-polar Setting) by default as shown at right and no setting is required. If it is set to "3 線", alarm 03 will activate.



- DSW9 Setting

This DIP switch is not used. (No setting is required.)



NOTICE

All indoor and outdoor units must be shut down prior to attempting to make DIP Switch adjustments. Otherwise, the settings will not take effect.

9. Test Run

9.1 Test Run with Wired Controller

9.1.1 Before Test Run

Verify that there are no problems with the installation, and do not perform Test Run until all the following conditions have been resolved.

Refer to the "Installation and Maintenance Manual" for the outdoor unit for details on Test Run operations from the outdoor unit.

Verify that refrigerant piping and the communication cable are connected to the same refrigerant cycle system. If not, it will cause an abnormal operation and damage to instrumentation.

- (1) Verify that electrical resistance is more than one megaohm, by measuring the resistance between ground and the terminal the terminus for electrical components. If the electrical resistance is less than one megaohm, do NOT operate the system until the electrical current outflow to ground is detected and repaired. Do not introduce any high voltage to the terminals of the communication cables (TB2 [A, B, 1 and 2]).
- (2) Verify that each wire is connected correctly at the correct phase for the power supply. If it is incorrectly connected, the unit will not operate and the wired controller will display the alarm code "05". In this case, check the phase for the primary power supply according to the "Attention" label affixed to the back side of the service cover. Then, with the power supply turned OFF at the power supply, remake the necessary connections.
- (3) Check to ensure that the main power supply has been turned ON for more than 12 hours, to warm up the compressor oil by the crankcase heater.
- (4) Verify that all DIP Switch settings are correct. Refer to Section 8.6 "DIP Switch Settings".
- (5) Set switch SW2 to "Wired" because the initial setting prior to shipment is "Wireless". Unit operation cannot be performed without this adjustment.

NOTE:

The RUN indicator on the indoor unit is turned ON even when the wired controller is used. However, any indication of timer settings will be displayed only on the wired controller.

9.1.2 Test Run

After all installation work is completed, **Test Run** should be performed.

- (1) Check to ensure that stop valves (gas and liquid) for the outdoor unit are fully opened.
- (2) Whenever indoor units are connected to the VRF system, perform the **Test Run** for the indoor units one by one sequentially and then check the refrigerant piping system and the electrical wiring system for conformity. (If these multiple indoor units are operated simultaneously, system conformity cannot be verified.)
- (3) Perform the **Test Run** in accordance with the following procedure. Ensure that the Test Run is carried out without any problem. The following procedure shows a case where a wired controller is utilized. If other controllers are activated instead, refer to the "Installation and Maintenance Manual" for those other controllers.

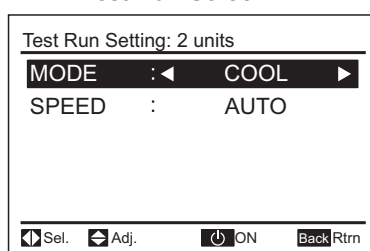
NOTE:

The outdoor unit may not be operated depending on the indoor and outdoor temperature conditions. Refer to the "Installation and Maintenance Manual" for outdoor units for details.

- (a) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds.
The **Test Run** menu will be displayed.

- The **Test Run** menu will be displayed













Test Run Screen



NOTE

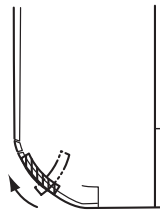
When the "00 unit" is displayed, the auto-address function may be working. Cancel out of "Test Run" mode and reset it.

INSTALLATION

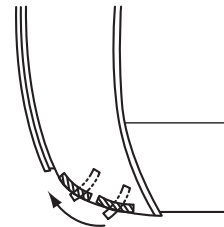
- The total number of connected indoor units is indicated on the LCD (Liquid Crystal Display). In the case of a twin combination (set of two indoor units), the total number of the connected indoor units is displayed as “**2 units**”, and where there is a triple combination (set of three indoor units), the total number of the connected indoor units is displayed as “**3 units**”.
 - If the number indicated is not equal to the actual number of connected indoor units, the auto-address function is not performing correctly due to incorrect wiring or electrical interference. Turn OFF the power supply, and resolve the wiring issue after verifying the following items; (Do not repeat turning ON and OFF within a 10 second timespan.)
 - * The power supply to the indoor unit is not turned ON or there is an incorrect wiring issue.
 - * Incorrect connection of the interconnecting cable between indoor units or a poorly connected controller cable
 - * Incorrect setting of the rotary switch and DIP switch for the indoor unit printed circuit board (PCB). (The setting is overlapped.)
 - Press “ On/Off” to start the Test Run.
 - Press “   ” and set each item.
- (b) Press “ On/Off”.
- The RUN indicator turns ON and the operation starts. At this time, a two-hour OFF timer will be set automatically.
- (c) Press “ ” or “ ”, select “LOUV.” and select “ ” (auto-swing) by pressing “ ” or “ ”. The auto swing operation will start. Check the operating sound at the louvers. If abnormal sound is generated, press “ ” or “ ” again to stop the auto swing operation. If there are any abnormal sound, remove the front panel and make necessary adjustments.

< Louver Operation >

- When the power supply is turned ON, the louver is set at closed position temporarily.
- Automatic Setting of Louver
The swing louver is stationary and movement is controlled only by the wired controller. The angle of the louvers will rise until the air outlet temperature increases to 86°F (30°C) during the heating operation. After that, it is adjusted lower. When the “Stop” switch is engaged by the wired controller, the swing louver will close down automatically and the operation will stop.





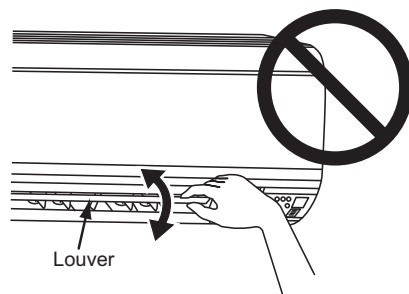
TIWM006B21S to TIWM012B21S



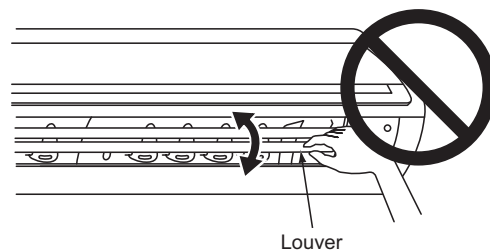
TIWM015B21S to TIWM024B21S

NOTE:

Do not move the louver by hand. It could damage the louver mechanism and the airflow direction may not be set correctly. Change the airflow direction by “ ” or “ ” on the wired controller.

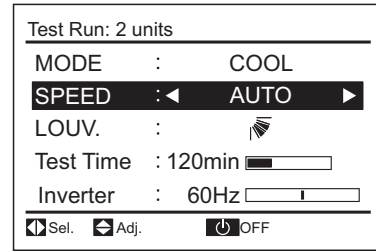


TIWM006B21S to TIWM012B21S

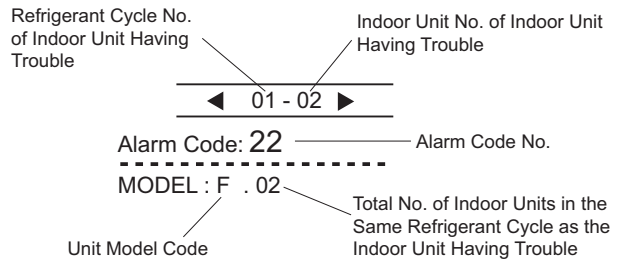
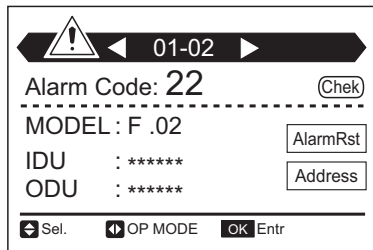


TIWM015B21S to TIWM024B21S

- (d) Though temperature recordings by the thermistors are invalid during the Test Run phase, the protection devices are valid.
- (e) For VRF System
According to the label; "Checking Method by 7-Segment Display" affixed to the inside of the front cover of the outdoor unit, check temperature, pressure, and operation frequency, and interconnected indoor unit numbers by 7-Segment displays.
- (f) To complete Test Run, press "⏻ On/Off" again or wait for the set Test Run time to pass.
When changing the Test Run time, press "△" or "▽" to select "Test Time". Then, set the test run time (30 to 600 minutes) by pressing "◀" or "▶".



- The RUN indicator on the wired controller for the indoor unit will flash orange (0.5 second ON/ 0.5 second OFF), indicative of a fault or error having been generated with activation of protection devices during the Test Run phase. Alarm code, unit model code, and the number of interconnected indoor units will be displayed on the LCD as shown below. If the RUN indicator on the wired controller flashes for two seconds ON and two seconds OFF, the source of the problem could be a failure in the communication cable between the indoor unit and the wired controller (a loose or severed connection). In this case, verify Section 9.3 "Alarm Code" and perform the appropriate troubleshooting measures. Consult with an authorized service engineer if the problem cannot be resolved at your end.



< Unit Model Code >

The relationship between the unit model code and the unit model is shown in the table below.

Indication	Unit Model
F	VRF System
E	Except Above Models

9.2 Test Run with Wireless Controller

NOTICE:

- When operating multiple indoor units simultaneously with the wireless controller, an optional receiver kit is required. (This operation is NOT available if a receiver is installed with indoor units.)
- Referring to the attached wireless controller connected to the unit, the value for "Identifying Indoor Units Installed Side by Side" shall be set to "b" mode. Refer to the "Installation and Maintenance Manual" for wireless controller for details about how to execute this setting.

9.2.1 Before Test Run

Verify that there are no problems arising from installation. Do not perform Test Run until all of the following items have been dealt with.

Refer to the "Installation and Maintenance Manual" for the outdoor unit for details about the Test Run operation for the outdoor unit.

- (1) Check to ensure that refrigerant piping and communication cable are connected to the same refrigerant cycle system. Failure to do this will result in impaired performance and damage to the system.
- (2) Check to ensure that electrical resistance is more than 1 megohm by measuring the resistance between ground and terminals for the various electrical components. If electrical resistance is less than 1 megohm, do NOT operate the system until the source of any electrical current drain has been found and repaired. Do not apply high voltage to terminals for communication cables at: (TB2 [A, B, 1 and 2]).
- (3) Check to ensure that each wire is connected correctly at the power supply. If not, the unit will shut down and the wireless controller will display the alarm code "05". In this case, check the phase for the primary power supply shown on the caution label inside of the service cover. Then, make the proper connections with the power supply turned OFF.
- (4) Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.

9.2.2 Test Run

After installation work is completed, Test Run should be performed.

- (1) Check to ensure that stop valves (gas and liquid) on the outdoor unit are fully opened.
- (2) Perform Test Run according to the following procedure. Ensure that Test Run is carried out without any problem.

NOTE:

The outdoor unit may not be operated depending upon indoor and outdoor temperature conditions. Refer to the "Installation and Maintenance Manual" for the outdoor unit for details.

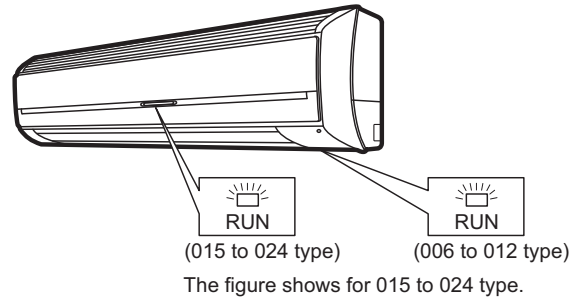
- (a) Set the Test Run mode by pressing and holding the "Louver" and "On Timer" switches simultaneously for more than three seconds. And then set the OFF timer for two hours. The LCD displays this setting at right.
- (b) Set the operation mode by pressing the "Mode" switch.
- (c) Adjust the temperature by pressing "Δ" or "▽".




- (d) Operate Test Run by pointing the transmitter towards the receiver of the indoor unit and press the “On” switch. When the commands are received by the indoor unit, the “RUN” indicator (orange) of the receiver is turned ON.

NOTE:

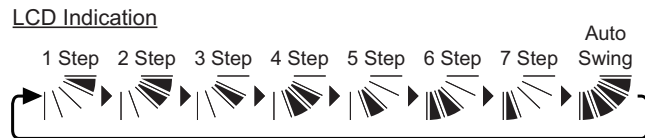
If the “RUN” indicator does not turn ON, the signal may not have reached the receiver. Re-send the commands.



- (e) Press the “Louver” switch to select the “” (auto-swing). The auto-swing operation starts. Check the sound of operation as the louvers move. If abnormal noises are heard from the air outlet, press the “Louver” switch again to stop the auto-swing operation. Open the front panel and make necessary adjustments.


< Louver Operation >

The louver indication will be changed as follows.

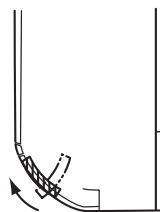


NOTES:

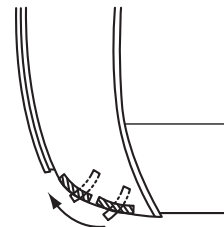
1. Louver angles are only available from 1 step through 5 step and auto-swing in the cooling and dry operation modes.
2. The louver angle adjusts automatically during cooling, heating, or dry operation.

 : Auto-swing operation starts.
At this time, an animated digital representation of the auto-swing operation is displayed on the LCD display.

- When the power supply is turned ON, the louver is set at closed position temporarily.
- Automatic Setting of Louver
The swing louver is stationary and movement is controlled only by the wired controller. The angle of the louvers will rise until the air outlet temperature increases to 86°F (30°C) during the heating operation. After that, it is adjusted lower. When the “Stop” switch is engaged by the wired controller, the swing louver will close down automatically and the operation will stop.



TIWM006B21S to TIWM012B21S

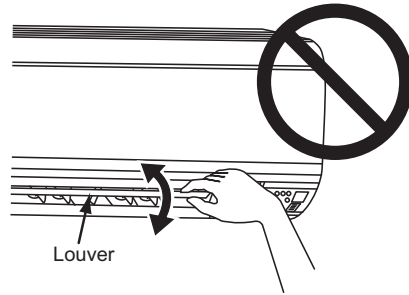


TIWM015B21S to TIWM024B21S

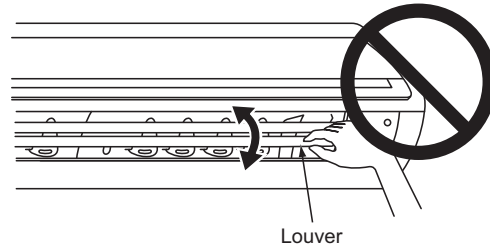
INSTALLATION

NOTE:

Do not move the louver by hand. It could damage the louver mechanism and the airflow direction may not be set correctly. Change the airflow direction by “<” or “>” on the wired controller.



TIWM006B21S to TIWM012B21S



TIWM015B21S to TIWM024B21S

- (f) Though temperature readings detected by the thermistors are invalid during the Test Run phase, the protection devices are valid.
- (g) Test Run automatically stops after two hours or by pressing the “On” switch again.

- When problems such as safety device activations occur during Test Run or normal operation, the RUN indicator (orange) will flash in intervals: (0.5 second ON / 0.5 second OFF).
- Alarm code status is indicated by the number of times the “TIMER” (green) and the “FILTER/DEF” (yellow) flash.

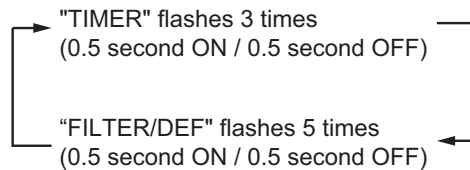
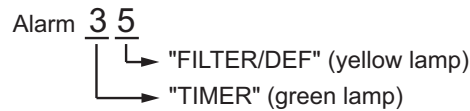
“TIMER” (green):

The tens digit of the Alarm Code is shown by the number of times “TIMER” (green) flashes.

“FILTER/DEF” (yellow):

The ones digit of Alarm Code is shown by the number of times “FILTER/DEF” (yellow) flashes.

< Example >



These messages are repeated until the alarm is reset.

9.3 Alarm Code

Alarm (Troubleshooting) Code Table

Code No.	Category	Nature of Problem	Likely Cause
01	Indoor Unit	Activation of a protection device (Float switch)	Activation of the float switch; (High water level present in the drain pan.) A problem exists in the piping.
02	Outdoor Unit	Activation of protection device; (Except for Alarm Code: 41, 42)	High Pressure Cut; (R410A: 601 psi (4.15MPa)), fan motor lockup during the outdoor unit cooling operation.
03	Communication	Communication failure between indoor and outdoor units	Incorrect wiring, loose terminals, disconnected wiring or a blown fuse.
04-09	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
11	Sensor on Indoor Unit	Inlet Air Thermistor failure	Loosely connected, disconnected, or a severed connection.
12		Outlet Air Thermistor failure	
13		Freeze Protection Thermistor failure	
14		Gas Piping Thermistor failure	
19	Fan Motor	Problem with Indoor Fan	Fan motor lockup, fan motor protection control device for indoor unit activated.
20-29	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for outdoor units.)		
31	System	Incorrect capacity setting for indoor and outdoor units.	Incorrect capacity code setting for combination, excessive or insufficient total indoor unit capacity code.
32		Incorrect setting of other indoor unit number	Problem with a different Indoor Unit in the same refrigerant cycle; (Failure at the power supply, defective PCB).
35		Incorrect setting of indoor	Indoor unit number duplicated in same refrigerant group.
36		Incorrect indoor unit combination	Indoor unit is designed for other refrigerant; (R22 or R407C).
38-59	Problem with the outdoor unit; (Refer to the "Installation and Maintenance Manual" for the outdoor unit.)		
b0	System	Incorrect setting for unit capacity	Incorrect setting for unit capacity
b1		Incorrect setting of unit and refrigerant cycle number	Unit number or refrigerant cycle ≥ 64
b5		Incorrect setting of indoor unit number for H-LINK type	Interconnected indoor units are not supporting H-LINK II ≥ 17
EE	Compressor	Compressor protection alarm	This alarm code displays when the alarms such as damage to the compressor occur three times within a six hour period.

- When the RUN indicator flashes every four seconds, there is a communication failure between the indoor unit and the wired controller (loose connector, disconnected or incorrect wiring, or a severed connection).
- The indication of the alarm code "EE" means serious abnormality to burn out the compressor.

Refer to the "Installation and Maintenance Manual" for the indoor/outdoor unit connections.

NOTICE

Do NOT operate the air conditioning just to run checks on electrical wiring until preparations for the Test Run phase is completed.

All the installation work of the air conditioning is completed.
Handover this information to the building owner and request to maintain all the equipment manuals and warranty.

Refrigerant Leak Check

Conduct a periodic refrigerant leak check to maintain product performance and secure storage of refrigerant (Fluorocarbons). After completing installation, record the following results into this "Installation and Maintenance Manual":

1. Results of a test for air-tight integrity
2. Total refrigerant charge volume dispensed (including a trim charge added following the installation)
3. Result of the refrigerant leak check

Then hand it over to users and ask them to retain for reference.

All periodic service and maintenance procedures must be conducted only by authorized and trained personnel.

1.3.5 Decorative Panel for 4-Way Cassette

- Table of Contents -

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7. Electrical Wiring.....	1-341
8. Control settings after installing Corner Pocket Cover with Motion Sensor	1-342
9. Test Run	1-343

1. Introduction

Read this installation manual carefully before installing this optional decorative panel.

This is the installation manual for the optional decorative panel. Familiarize yourself with the installation and maintenance manual for the indoor unit as well.

Hand over this installation manual and the warranty must be provided to all installers and users. Ask end users to maintain copies of the following for future reference.

(Unit Installation) > (Refrigerant Piping Work) > (Electrical Wiring Work) > (Test Run) > (User)



Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc..
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, Warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.


Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc.. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

2. Important Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.

- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

<div style="border: 1px solid black; padding: 2px; display: inline-block;"> WARNING </div>	<p>To reduce the risk of serious injury or death, the following installation precautions must be followed.</p>
---	--

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not install the decorative panel with motion sensor and radiation sensor (P-AP160NAE1) in the following places. It may cause failure or deterioration of the sensor.
 - Ambient temperature changes drastically.
 - Where excessive force or vibration is applied to the sensor.
 - Where static electricity or electromagnetic waves may generate.
 - Where interference of infrared light such as glasses or mist is in the detecting area.
 - Where the lens for sensor is exposed in high temperature and humidity for a long time.
 - Where fluid and corrosive gas exist.
 - Where direct lights such as sunlight or headlight affect the sensor.
 - Where hot air from a heater, etc. affects directly to the sensor.
 - Where the air flow returns to the sensor by hitting obstacles such as shelf, locker, etc.

INSTALLATION

- Where the blower devices such as ceiling fan, ventilating fan, etc. affect the air flow from the indoor unit.
- Where weather affects directly the surface of the sensor.
- Where the lens surface may smudge or be damaged such as a dusty environment.

Detecting function will decrease if the lens for sensor smudges.

In this case, wipe off smudges using a cotton swab soaked with alcohol (Isopropyl alcohol is recommended.) or a soft cloth. (When wiping off smudges on the lens for sensor, do not apply excessive force. If excessive force is applied, the resin lens may be damaged and this may cause malfunctions such as misdetection or undetectable of the motion.)

- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution



To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit’s intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit’s faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country’s requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.

- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment and tools suited for this installation.
- Only use electrical protection equipment.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.
- Do not run the relay wiring for motion sensor and power supply wiring in parallel. It may cause malfunction of sensor by noise, etc.

3. Applicable Model

This decorative panel is compatible with any of the following indoor unit models.

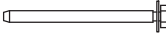
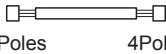
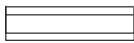



Decorative Panel	Indoor Unit Model
P-AP160NA2 (Standard)	(H,Y)IC4012B21S, (H,Y)IC4015B21S, (H,Y)IC4018B21S, (H,Y)IC4024B21S, (H,Y)IC4030B21S, (H,Y)IC4036B21S
P-AP160NAE1 (with Motion Sensor and Radiation Sensor)	

4. Transporting and Handling

- Avoid unpackaging the decorative panel until it has arrived at the installation site.
- Mount the decorative panel as soon as possible after unpacking.
- When the decorative panel is placed on the floor after unpacking, position it with the rear surface facing downward; (the surface that faces the unit when installed), or upon soft packing insulation material. Any superficial damage to this item can compromise its moisture sealing qualities. Be careful not to come into contact or place with the louver side down as the louvers are fragile and are easily damaged by contact with any horizontal or floor surfaces.
- Do not attempt to move the louver manually. The louver auto-swing mechanism can be damaged.

5. Before Installation

1. Check to ensure that the following accessories and fasteners are packed with the decorative panel.

Name	Qty.		Purpose
	P-AP160NA2	P-AP160NAE1	
Long Screw (M6 Cross Screw) 	4	4	For Securing the Decorative Panel
Relay Wire  4Poles 4Poles	-	1	For Sensor
Wiring Cover 	-	1	For Protection of Relay Connector
Zip-Tie 	-	3	For Clamping Wiring Cover and Relay Connector
Logo Label 	1	1	Logo Label for HITACHI Brand
Logo Label 	1	1	Logo Label for YORK Brand

If any of these accessories are not included in the packing, please contact your contractor.

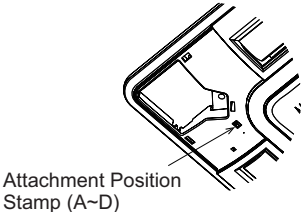
2. Attachment for Corner Pocket Cover with Sensor <For P-AP160NAE1>

- a. The corner pocket cover with sensor can be attached to any of corners (three directions, (A), (B) and (D)). Determine the best location in line with user's requirements.

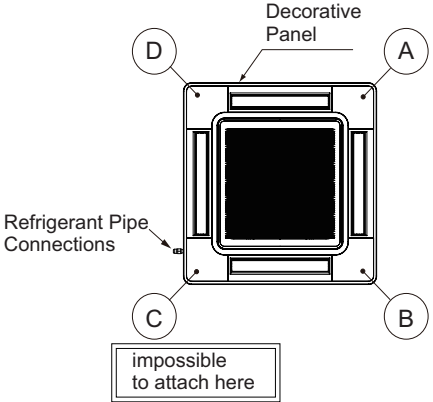
The corner pocket cover encasing the Motion Sensor needs to be attached at the corner nearest to the wired controller. Choose any one of the position stamps and corner locations for points: (A), (B), or (D) of the decorative panel. Record the position stamp in the box below. As for the placement procedure for attachment, **see Section 8**: "Control settings after installing Corner Pocket Cover with Motion Sensor". When attached at location (A), there is no need for the control setting on the wired controller.

NOTE: It is impossible to attach at location (C).

Removed form of
Corner Pocket Cover with Sensor



Attachment Position
Stamp (A~D)



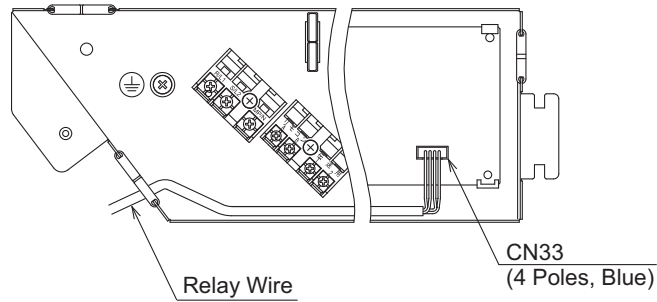
Decorative Panel

Refrigerant Pipe Connections

impossible to attach here

Recording Box for Position Stamp

- b. Remove the electrical box cover and connect the relay wire (attached inside the decorative panel) at CN33 in the electrical box as shown below.



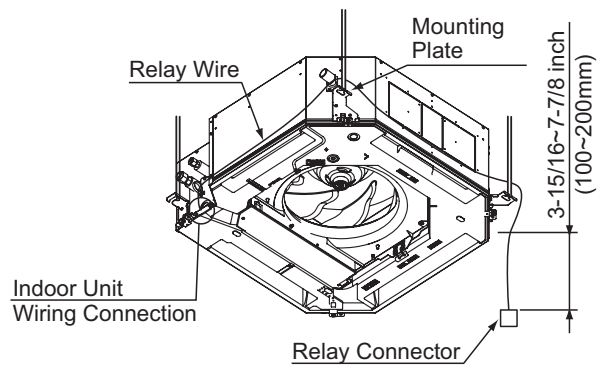
NOTE:
Consult the installation and maintenance manual (optional accessories), for wiring connections and DIP switch settings for optional accessories.

INSTALLATION

- c. Indoor Units: Run the relay wire from CN33 to the corner pocket cover with motion sensor through top of the mounting plate. Then measure the distance 3-15/16 inch (100mm) to 7-7/8 inch (200mm) from the corner pocket cover to the relay connector as shown below.

NOTE:

With the relay wire connected, coil and band-up all the slack wiring with a zip-tie and store inside the ceiling.



6. Installation

CAUTION

Exercise caution when performing installation work from an elevated position using a stepladder. The hazard for serious injury exists.

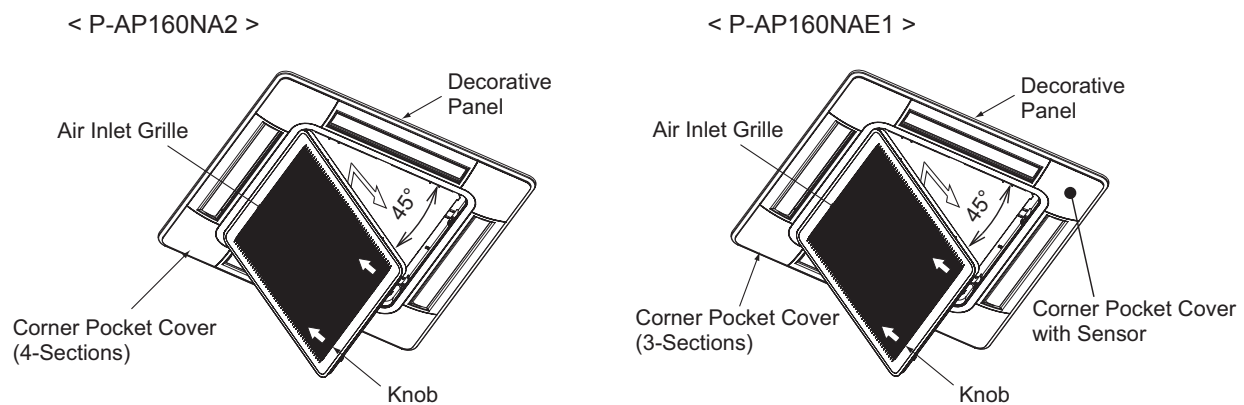
NOTICE

Do not attempt to move any louver manually. The louver auto-swing mechanism can be damaged. Similarly, do not apply excessive force to the air discharge vent as it will also be damaged.

1. Refer to the indoor unit installation manual to determine the proper mounting height of the product.
2. Do not touch the louver during the installation work.
3. Inlet Grille: Push-in at both ends to release the grille as shown and drop the inlet grille down to a 45° angle. Remove the special tape strips holding the grillwork in place.

NOTES:

The air inlet grille is part of the decorative panel and can be opened to a full 90° but cannot be separated from the panel.



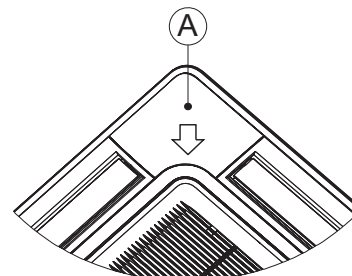
4. Remove the corner pocket covers.

< P-AP160NA2 > and < P-AP160NAE1 >

All corner pocket covers can be removed by pulling in the direction of the arrow at point (A) as shown below.

NOTICE

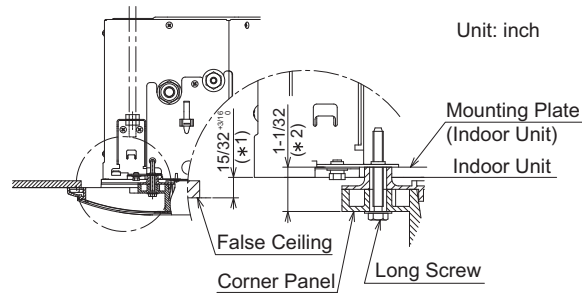
Fixing hooks of the corner pocket covers can be easily damaged when removed by pulling at point other than (A). Remove with caution.



INSTALLATION

- Verify that the distance between the under surface of the indoor unit and the under surface of the false ceiling is 15/32 inch (+3/16 inch) or 12 mm (+ 5.0 mm) (*1) as shown below. Tighten the long screws until they make contact with the stopper on the mounting plate. Verify that the distance between the under surface of the mounting plate and the under surface of the corner panel is 1-1/32 inch (26mm) (*2) as shown.

The long screws are tightened to seal against moisture incursion and that no gap should exist between the false ceiling surface and the indoor unit. However, during tightening the panel may be slightly deformed. This is considered normal.



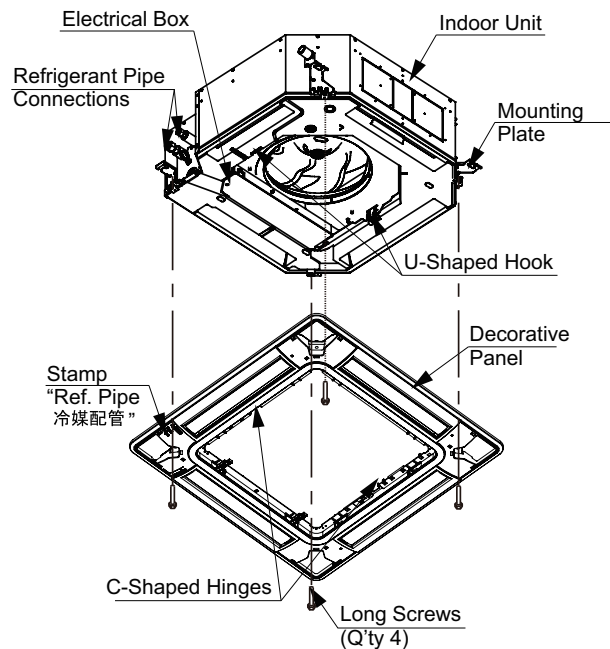
NOTICE

- The standard installation dimension between the indoor unit under surface for the false ceiling surface is 15/32 inch (+3/16 inch) or 12 mm (+ 5.0 mm). If the suspended unit is not consistently level and the position is not correct, the decorative panel can not be installed correctly.
- If the decorative panel is mounted with an optional filter box accessory, refer to the installation and maintenance manual for the filter box to assure proper installation.

- Pull down the two "U" shaped hooks found on the indoor unit.
- Remove the corner pocket covers and temporarily mount the decorative panel in place. Fit the corner position for the refrigerant pipe connection at the indoor unit with the position stamped as "Ref. Pipe 冷媒配管". Then, fasten the C-shaped hinges to the U-shaped hooks (two portions).
- Affix the decorative panel to the mounting plate with the factory-supplied long screws (M6 cross screws).

NOTE:

Before mounting the decorative panel, remove the corner pocket covers. Holes for long screws are located in the corner pockets.

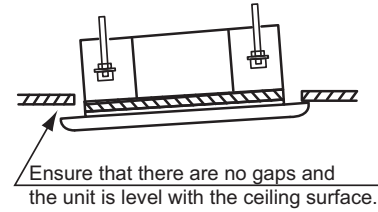
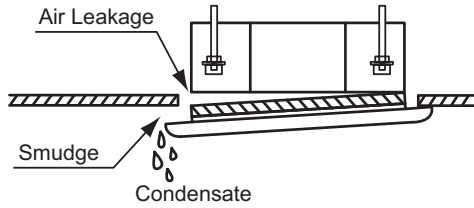


NOTICE

Securely fit the corner position for the refrigerant pipe connection at the indoor unit with the position stamped as "Ref. Pipe 冷媒配管". Otherwise, it may cause air leakage.

NOTICE

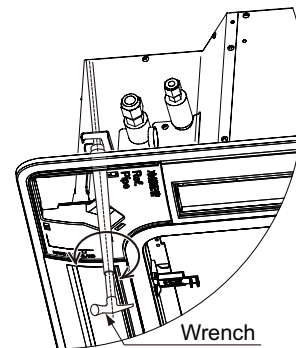
- Firmly tighten the long screws. Failure to tighten and seal sufficiently will allow moisture and condensation to spread, and cause damage to the unit.
- If a gap is still remains after securing all screws, readjust the height of the unit.



- The indoor unit can be leveled by accessing the adjustment at the corners of the panel.

NOTE:

Over-adjustment for height will cause moisture leakage from the condensation pan.



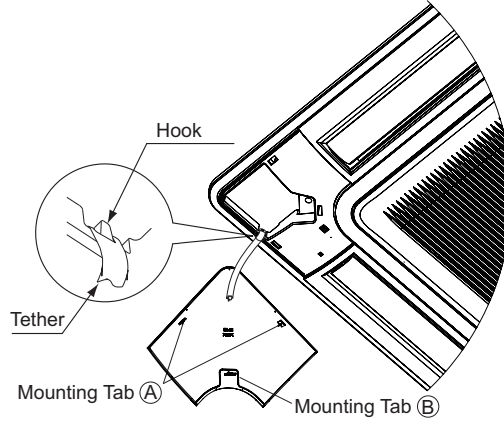
INSTALLATION

9. Attachment of the Corner Pocket Cover

< For P-AP160NA2 >

Attach all four corner pocket covers after the decorative panel is fastened into place.

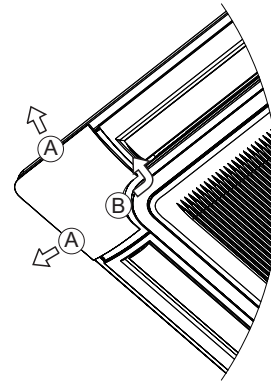
- a. Install the corner tether onto the hook as shown below.



CAUTION

Securely attach the tether to the hook. Failure to secure the corner cover can cause it to drop to the floor with possible injury to those nearby.

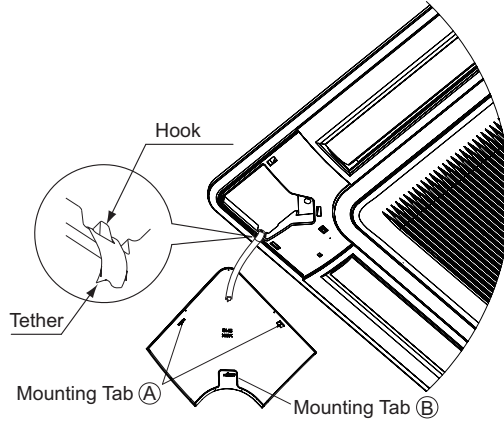
- b. Insert both mounting tabs at point (A) into the decorative panel and insert the mounting tab at point (B) on the decorative panel.



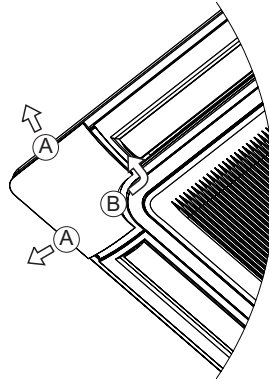
< For P-AP160NAE1 >

Attach all three other corner pocket covers first and then attach the one with the motion sensor after the decorative panel is secured into position.

- a. Install the corner tether onto the hook as shown below (for the other three corners).

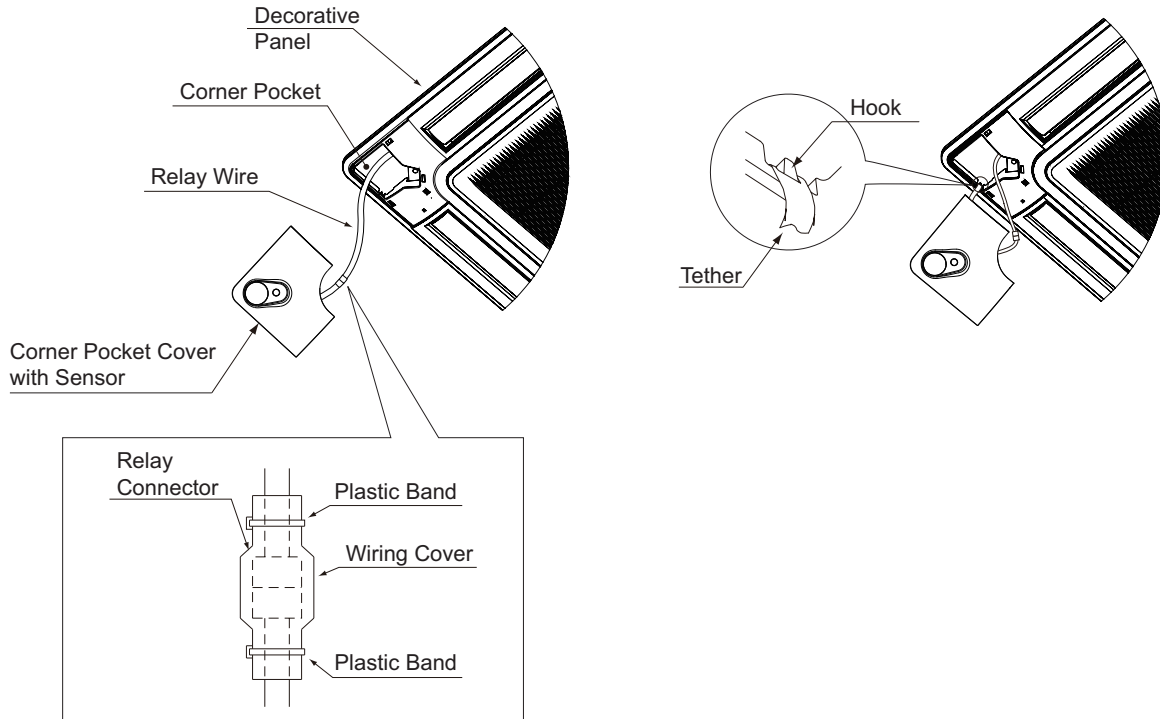


- b. Insert the both mounting tabs at point (A) into the decorative panel and insert the mounting tab at point (B) on the decorative panel (at the other three corners).



INSTALLATION

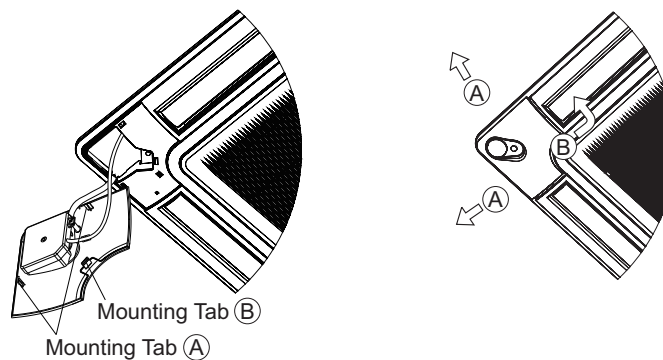
- c. Access the relay wire from the corner pocket of the decorative panel. Then connect the wiring for the sensor to the relay connector as shown in the diagram below. After making the connection, cover the relay with the wiring cover and install the plastic bands as shown in the diagram below.
- d. Install the corner tether onto the hook as shown below.



CAUTION

Failure to secure the corner pocket cover can cause it to drop to the floor with possible injury to those nearby.

- e. As you insert wiring into the corner pocket, insert the other two mounting tabs corresponding to points (A) (into the squared slots on the decorative panel) and slide the corner pocket cover in the direction of the arrows at points (A). Then, insert the mounting tab into the squared slot (of the decorative panel) at point (B).



NOTICE

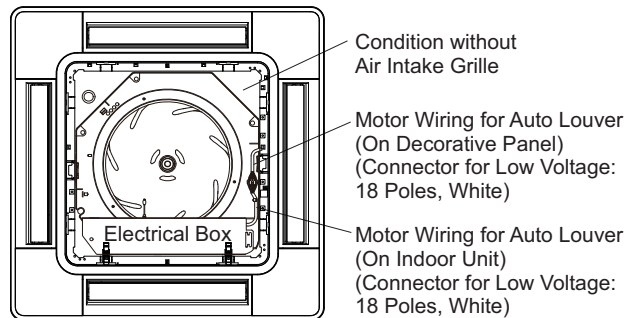
Secure the couplings in the corner pocket cover that support the decorative panel to keep it in place. If left unsecured, they could be damaged.

7. Electrical Wiring

⚠ WARNING

- All electrical installation work must be performed by certified personnel and all work must be complete and conform to local and NEC (National Electrical Code) standards. Failure to uphold these standards can result in damage, flame, electrical shock, and serious or fatal injury.
- Cables at the terminals should be tightened only to recommended torque specs. Excessive force can fracture the terminal connections and can result in electrical short and fire at the terminal connection.

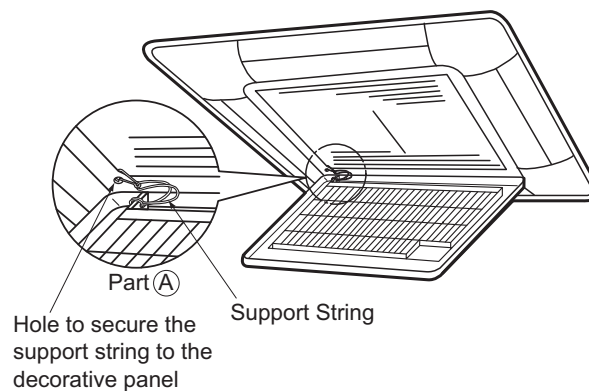
1. The following connectors are used in the decorative panel. Remove the tape securing the wiring connectors to the decorative panel and remove as shown below. Reconnect them with the wiring connectors on the indoor unit.



NOTICE

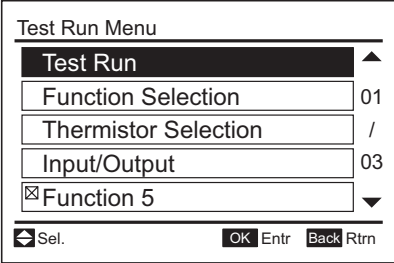
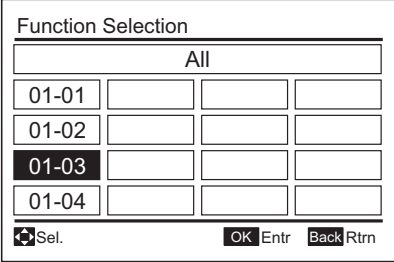
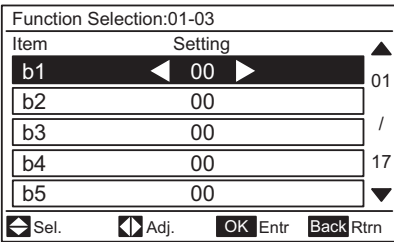
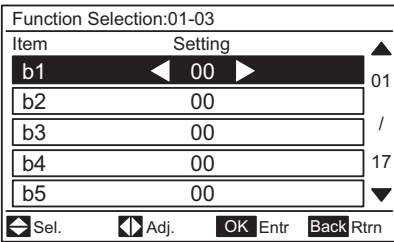
Turn OFF the power source before performing the electrical work. If the connectors are connected without turning OFF the power source, the auto swing louver can not activate.

2. After wiring connections are completed at the decorative panel, secure the air inlet grille in the reverse order that it was removed (See Section 6: "Installation"). Fasten the other end of the support string to the corresponding hole at part (A) in the panel as shown. The air inlet grille being square means it can be rotated to be attached from any direction.



8. Control settings after installing Corner Pocket Cover with Motion Sensor

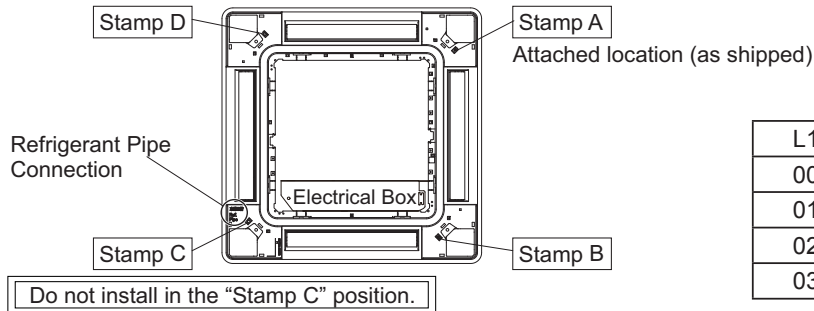
Depending on the location of the corner pocket with motion sensor, setting on the wired controller is also necessary.

<p>1. Press and hold "Menu" and "Back/Help" simultaneously for at least three seconds with power applied and the indoor unit is not operating. The Test Run menu will be displayed.</p>	
<p>2. Select "Function Selection" from the Test Run menu and press "OK".</p>	
<p>3. Select the indoor unit by pressing "$\Delta \nabla \triangleleft \triangleright$" and press "OK". Note: (This screen is NOT displayed when only one indoor unit is connected to the wired controller. In this case, move to 4.)</p>	
<p>4. Press "$\Delta \nabla$" and select "L1".</p>	

Set "L1" according to the table below by pressing " $\triangleleft \triangleright$ " and press "OK".

When the products are shipped, the menu key should be set to "L1=00", which indicates motion sensor is located at stamp A.

< Figure without Corner Covers >

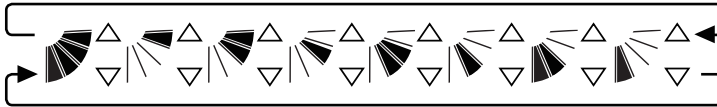



L1	Attaching Place (Stamp)
00	A [No Setting Required]
01	B
02	- [Impossible to set]
03	D

9. Test Run

1. After completing installation of the decorative panel, **Test Run** should be performed according to installation and maintenance manual for the indoor unit.
2. Perform the louver operation during **Test Run**. Do not move the louver manually or damage will occur.
 - a. Press “⏻ On/Off”, and the unit operation is started. Select airflow direction by pressing the “◀” or “▶” buttons on the controller.
 - b. The louver angle is changed by pressing “△” or “▽” buttons on the controller.

< LCD Display Indicator >



Auto swing operation is started by selecting “” (auto-swing). When Auto Swing is selected, the LCD indicator displays the swing operation repeatedly.

NOTICE

- Adequate and optimal airflow is dependent on application and installation practices which include positioning of office equipment, room structure, and office cubicle or furniture layout. Adjust airflow for maximum comfort.
- The position of the louvers may not coincide with the louver position indicator on the LCD during auto swing operation. When adjusting the louver angle, set it according to the louver position on the LCD.
- Even if the “△” or “▽” are pressed to stop the auto swing function, the louver is not stopped immediately.
- If the cooling operation is performed with greater than 80% relative humidity, condensation may form on the decorative panel or louver surfaces.

After installation is complete, hand over this installation manual, as well as the warranty information to the building owner or tenant.

1.3.6 Decorative Panel for 1-Way Cassette

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1. Introduction

Read this "Installation Manual" carefully before installing this optional decorative panel.

This is the "Installation Manual" for the optional decorative panel. Familiarize yourself with the "Installation and Maintenance Manual" for the indoor unit as well.

Hand over this "Installation Manual" and the warranty must be provided to all installers and users. Ask end users to maintain copies of the following for future reference.

(Unit Installation) > (Refrigerant Piping Work) > (Electrical Wiring Work) > (Test Run) > (User)



Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc..
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, Warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.


Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc.. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

2. Important Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
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- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
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- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain pan and could run inside of the electrical box, possibly causing electrical failures.

- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions



To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the drain piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.

INSTALLATION

- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution



To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit’s intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit’s faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country’s requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026 lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment and tools suited for this installation.

- Only use electrical protection equipment.
- Use specified cables between units.
- Communication cable shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cable is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power supply when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power supply completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power supply.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wiring is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

3. Applicable Model

This decorative panel is applicable to the following indoor unit models.

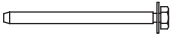


Decorative Panel	Indoor Unit Model
P-AP36CNA	(H,Y)IC1006B21S, (H,Y)IC1008B21S
P-AP56CNA	(H,Y)IC1012B21S, (H,Y)IC1015B21S

4. Transporting and Handling

- Avoid unpackaging the decorative panel until it has arrived at the installation site.
- Mount the decorative panel as soon as possible after unpacking.
- When the decorative panel is placed on the floor after unpacking, position it with the rear surface facing downward; (the surface that faces the unit when installed), or upon soft packing insulation material. Any superficial damage to this item can compromise its moisture sealing qualities. Be careful not to come into contact or place with the louver side down as the louver is fragile and is easily damaged by contact with any horizontal or floor surfaces.
- Do not attempt to move the louver manually. The louver auto-swing mechanism can be damaged.

5. Before Installation

Check to ensure that the following accessories are packed with the decorative panel.

Name	Qty.	Purpose
Long Screw (M6 Cross Screw) 	4	For Securing the Decorative Panel
Logo Label 	1	Logo Label for HITACHI Brand
Logo Label 	1	Logo Label for YORK Brand

If any of these accessories are not included in the packing, please contact your contractor.

6. Installation

CAUTION

Exercise caution when performing installation work from an elevated position using a stepladder. The hazard for serious injury exists.

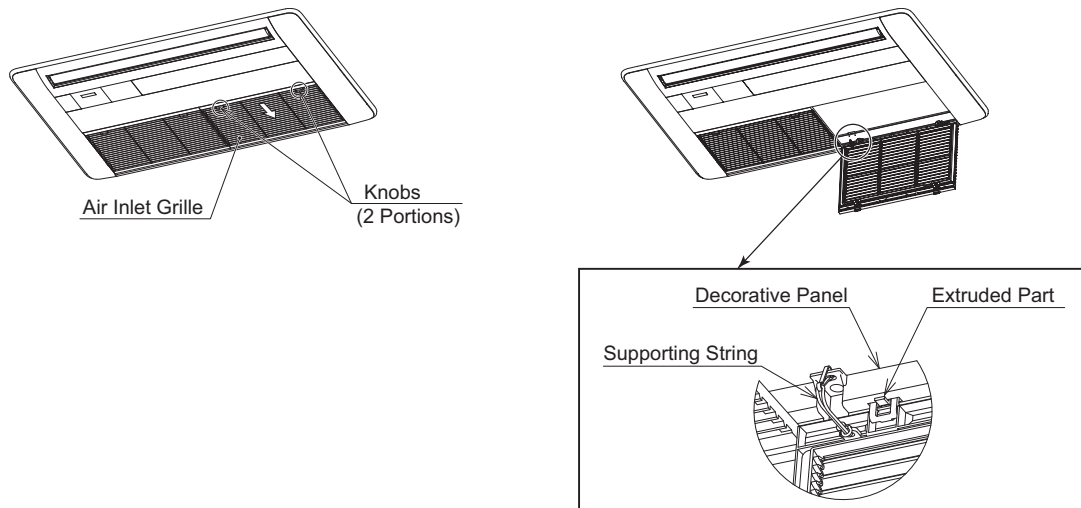
NOTICE

Do not attempt to move any louver manually. The louver auto-swing mechanism can be damaged. Similarly, do not apply excessive force to the air discharge vent as it will also be damaged.

- 1) Refer to the "Installation and Maintenance Manual" for the indoor unit to determine the proper mounting height of the product.
- 2) Do not touch the louver during the installation work.

Air Inlet Grille:

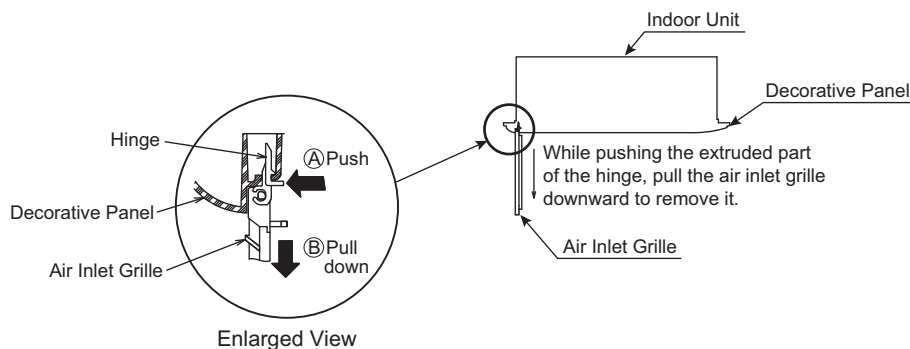
- (a) The air inlet grille can be opened by pushing the knob at the air inlet grille backward.
- (b) Remove the hook of the supporting string from the decorative panel.



- (c) Open the air inlet grille. The air inlet grille can be removed by pushing the extruded part of the grille toward arrow direction, and pulling the air inlet grille downward as shown in the figure below.

NOTE:

When removing the air inlet grille after installing the decorative panel on the ceiling, follow the directions above.



NOTICE

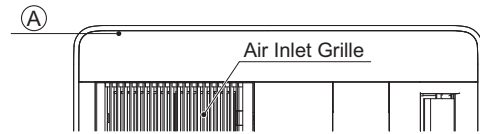
When installing and removing the air inlet grille, do not twist the air inlet grille forcibly. Otherwise, hooking part at the air inlet grille can be easily damaged.

INSTALLATION

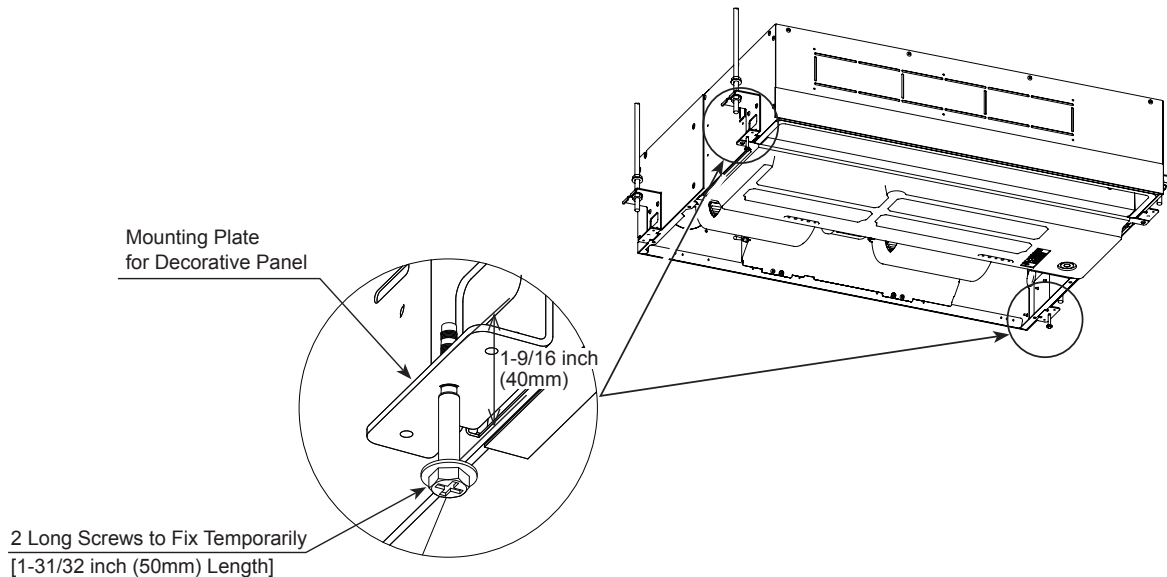
- 3) Remove the side pocket covers.
The side pocket covers can be removed pulling (A) in the figure below.

NOTICE

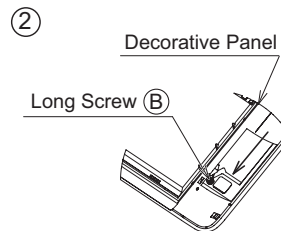
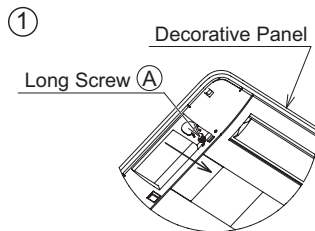
Do not apply excessive force to remove the side pocket cover. Otherwise, it may cause deformation or breakage of the fixing hook of the side pocket cover as well as cause injury.



- 4) Fix the accessory long screws (1-31/32 inches (50mm)) temporarily to the mounting plate as shown in the figure. (Remaining nominal length approx. 1-9/16 inches (40mm))



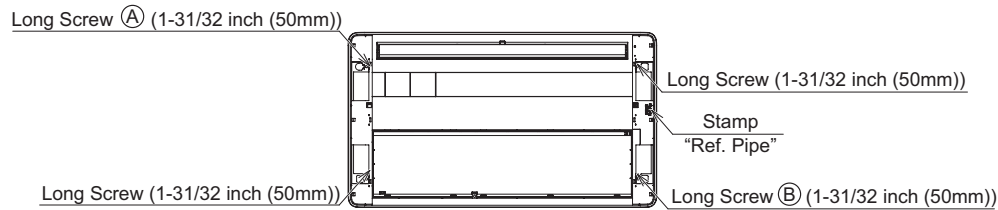
- 5) Mount the decorative panel temporarily to the unit as shown.
- Insert the accessory long screw (A) through the decorative panel hole as shown in the figure (1).
 - Slide the decorative panel toward the arrow direction shown to hang it.
 - Rotate the decorative panel toward the arrow direction shown and hang it to the accessory long screw (B) as shown in figure (2).



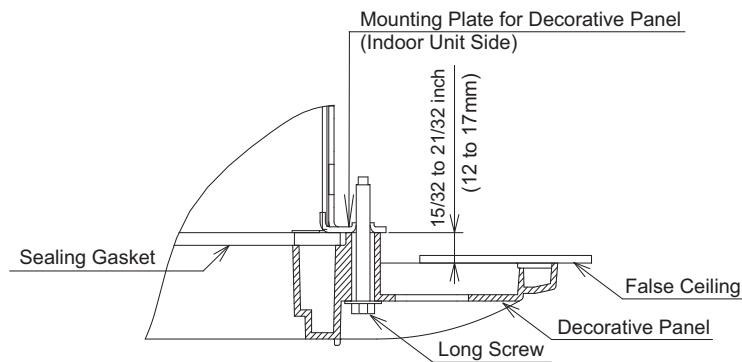
NOTICE

Adjust the stamp "Ref. Pipe" at the corner of the decorative panel with the refrigerant piping connection part of the indoor unit. If not adjusted, it may cause air leakage.

- 6) Mount the decorative panel to the mounting plate of the indoor unit by the rest of the accessory long screws and the other screws (A) and (B) which were affixed temporarily on the indoor unit. The positions of the long screws are as shown in the figure below.



- 7) Check to ensure that the distance between the indoor unit under surface and the false ceiling under surface is 15/32 to 21/32 inch (12 to 17mm) as shown in the figure below. Make sure the long screws are well tightened. When tightening the long screws to prevent air leakage and to be no gaps between the false ceiling surface and the indoor unit, the inner circumference of the panel (the position to attach the air inlet grille) may be slightly deformed. However, it is not an abnormality.

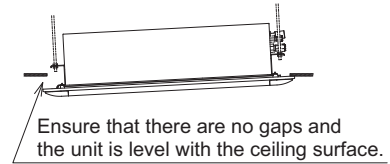
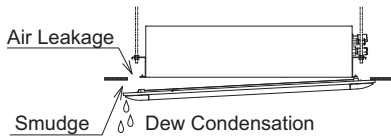


NOTICE

The standard installation dimension between the indoor unit under surface and the false ceiling surface is 19/32 inch (15mm). If the suspended unit is not consistently level and the position is not correct, the decorative panel can not be installed correctly.

NOTICE

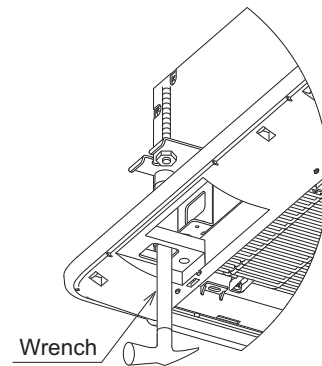
- Firmly tighten the long screws. Failure to tighten and seal sufficiently will allow moisture and condensation to spread, and cause damage to the unit.
- If a gap is still remains after securing all screws, readjust the height of the unit.



- The indoor unit can be leveled by accessing the adjustment at the both sides of the corner hole of the panel.

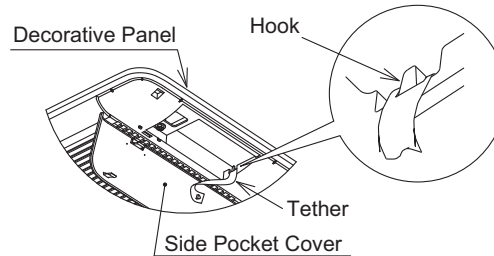
NOTE:

Over-adjustment for height will cause moisture leakage from the drain pan.

**CAUTION**

If leak detection foam is used after installation, make sure it does not contact the decorative panel.
If the leak detection foam contacts the decorative panel, completely wipe it off.

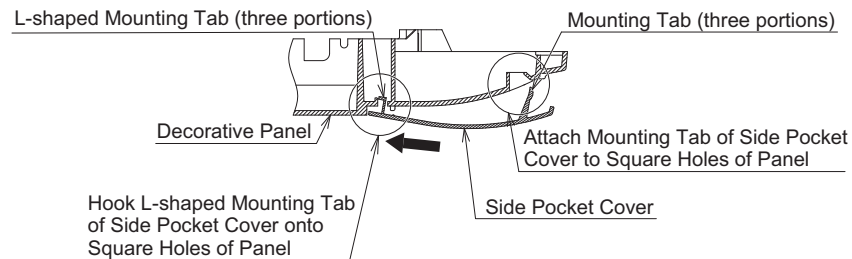
- 8) After mounting the decorative panel, attach the side pocket covers (two portions). The side pocket cover shapes are different between the right cover (R) and the left cover (L). Be careful not to incorrectly attach them.
- (a) Attach the tether at the rear side of the side pocket cover to the hook at the decorative panel as shown in the figure below.



CAUTION

Securely attach the tether to the hook. Failure to secure the corner cover can cause it to drop to the floor with possible injury to those nearby.

- (b) Hook the L-shaped mounting tabs (three portions) of the side pocket cover into the square holes of the decorative panel. Push the side pocket cover toward the arrow direction shown below to attach it to the square holes of the panel by the mounting tabs (three portions).



NOTICE

Firmly hook the L-shaped mounting tabs of the side pocket cover to the decorative panel. If not firmly hooked, the L-shaped mounting tabs will be damaged.

7. Electrical Wiring

! WARNING

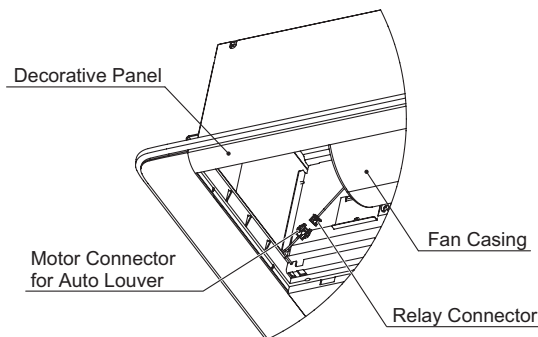
- All electrical installation work must be performed by certified personnel and all work must be complete and conform to local and NEC (National Electrical Code) standards. Failure to uphold these standards can result in damage, flame, electrical shock, and serious or fatal injury.
- Cables at the terminals should be tightened only to recommended torque specs. Excessive force can fracture the terminal connections and can result in electrical short and fire at the terminal connection.
- Communication cable shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cable is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cable must be considered per application and local code requirements.

- 1) The following connectors are used in the decorative panel. Remove the tape fixing the wiring connector (motor connector for auto louver) on the decorative panel and pull it out as shown in the figure below.
- 2) Connect the motor connector for the auto louver to the relay connector on the indoor unit.

NOTE:

When the one-way type indoor unit is installed at, or adjacent to, a sloped ceiling, disconnect the discharge louver motor from the relay connector (see diagram) to prevent undesirable drafts.

One-Way Airflow Type: One of the installing types. Refer to Section 8 for details.



- 3) After completing the wiring connection of the decorative panel, attach the air inlet grille. (Refer to Section 6)

NOTE:

Make sure to install the swivel of the supporting string to the decorative panel.

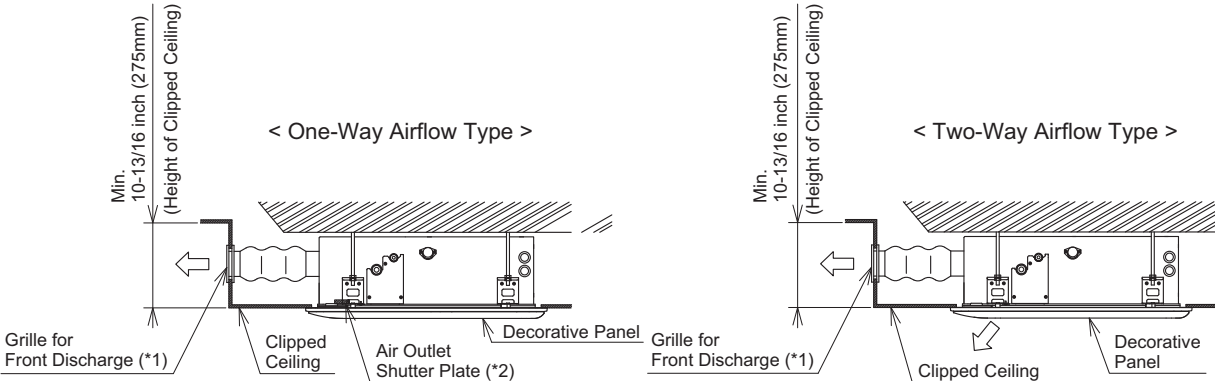
8. Installing to Clipped Ceiling

This indoor unit can be installed to a clipped ceiling as shown below.

When installing this indoor unit to a clipped ceiling, prepare the optional parts according to the selected installation type as shown in the table at the right.

The installation details for optional parts are according to the each "Installation Manual".

Type	Model	
	Grille for Front Discharge (*1)	Air Outlet Shutter Plate (*2)
One-Way Airflow Type	DG-56SW1 x 1	PIS-56LS x 1
Two-Way Airflow Type	DG-56SW1 x 1	-



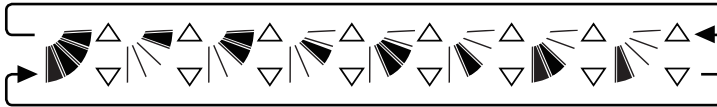
NOTE:

In the case of one-way airflow type, the optional parts "Grille for Front Discharge (*1)" and "Air Outlet Shutter Plate (*2)" are required.

9. Test Run

- 1) After completing installation of the decorative panel, Test Run should be performed according to "Installation and Maintenance Manual" for the indoor unit.
- 2) Perform the louver operation during Test Run. Do not move the louver manually or damage will occur.
 - a. Press "⏻ On/Off", and the unit operation is started. Select airflow direction by pressing the "◀" or "▶" buttons on the controller.
 - b. The louver angle is changed by pressing "△" or "▽" buttons on the controller.

< LCD Display Indicator >



Auto swing operation is started by selecting "Auto Swing" (auto-swing). When Auto Swing is selected, the LCD indicator displays the swing operation repeatedly.

NOTICE

- Adequate and optimal airflow is dependent on application and installation practices which include positioning of office equipment, room structure, and office cubicle or furniture layout. Adjust airflow for maximum comfort.
- The position of the louver may not coincide with the louver position indicator on the LCD during auto swing operation. When adjusting the louver angle, set it according to the louver position on the LCD.
- Even if the "△" or "▽" are pressed to stop the auto swing function, the louver is not stopped immediately.
- If the cooling operation is performed with greater than 80% relative humidity, condensation may form on the decorative panel or louver surfaces.

After installation is complete, hand over this "Installation Manual", as well as the warranty information to the building owner or tenant.

1.4 Control Device
1.4.1 Wired Controller

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Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc. or York.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. and York. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

1. Safety Summary

Signal Words

WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
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- This system, including this controller, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.

- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least 3 ft. (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.
- If the wired controller is installed in a location where electromagnetic radiation is generated, make sure that the wired controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35° to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions

⚠ WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- If the remote sensors are not used with this controller, then do not install this controller...
 - In a room where there is no thermostat.
 - Where the unit is exposed to direct sunshine or direct light.
 - Where the unit will be in close proximity to a heat source.
 - Where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - In areas with poor air circulation and ventilation.
- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

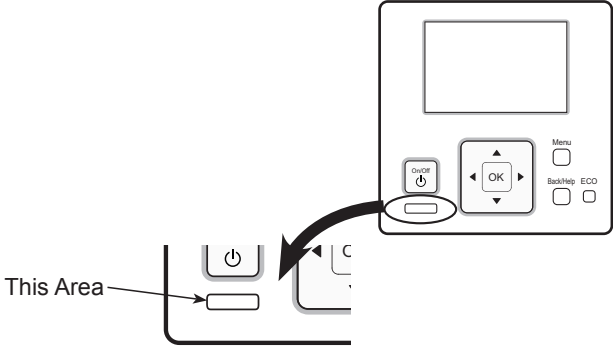
Electrical Precautions**⚠ WARNING**

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Only use electrical protection equipment and tools suited for this installation.
- Insulate the wired controller against moisture and temperature extremes.
- Use specified cables between units and the controller.
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

2. Brand Label

Select the accessory brand label according to the production order. (HITACHI or YORK)
 Attach the accessory brand logo label to this area.



The box is to verify your work. Check-off each task to verify that it has been done.

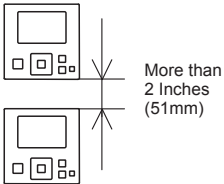
3. Installation Work

[3.1 Selection of Installation Place]

- 1. Select a suitable staging area in which to assemble the unit. With the customer's approval, determine the best placement of the assembled unit. Choose a safe, sequestered area where the inquisitive can't reach it, and keep it out the way of any direct air discharge.

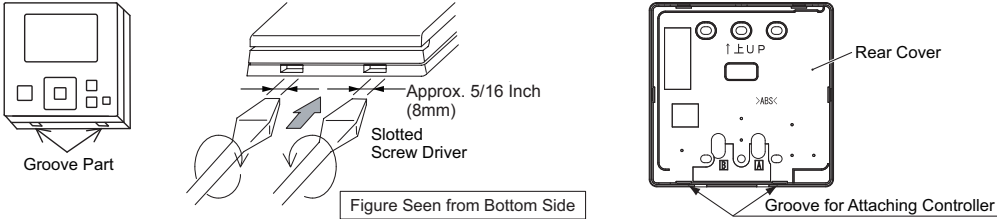
[3.2 Prior to Installation]

- 1. This packing contains the following parts.
 - [A] Wired Controller (Qty.: 1 - For Operation Control)
 - [B] Screw <M4x16L> (Qty.: 2, For securing the mounting bracket to the wall.)
 - [C] Operation Manual (Qty.: 1)



[3.3 Installation Procedures]

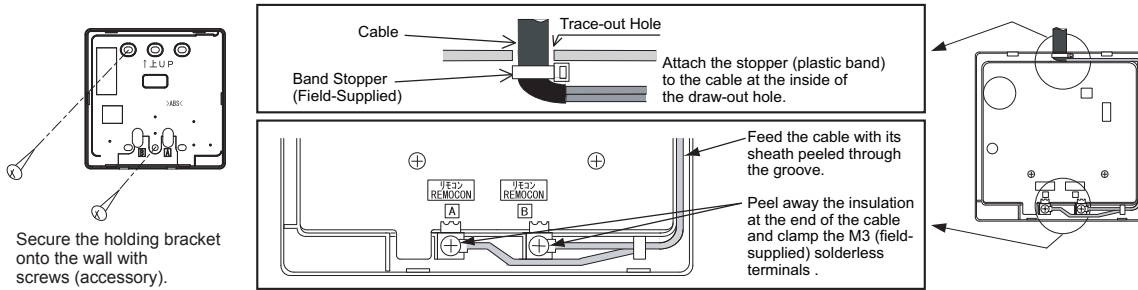
- 1. Insert the edge of the slotted screwdriver into the groove at the bottom of the holding bracket, push and turn the slotted screwdriver to separate and remove the controller from the holding bracket.



INSTALLATION

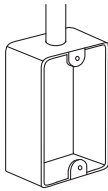
- 2. Attach the controller to the holding bracket and connect the cable as follows.

A. In Case of Exposing the Controller Cable

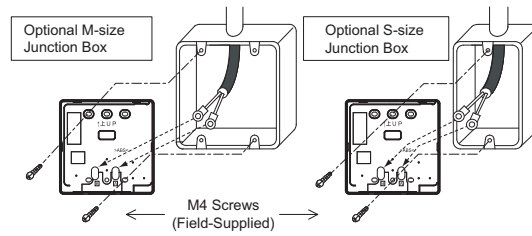


B. When Using Junction Box

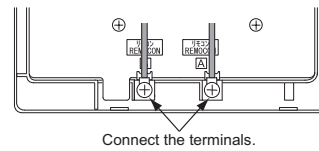
- 1. Prepare the optional field-supplied Implanted Junction Box.



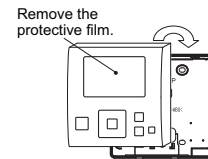
- 2. Feed the cable through the conduit tubing in the wall.



- 3. Cut away the insulation at the end of the cable and clamp the M3 solderless terminals (field-supplied).



- 3. Attach the controller body to the mounted holding bracket. Be careful not to pinch the cable when attaching it.
- 4. Peel away the protective film from the liquid crystal display.

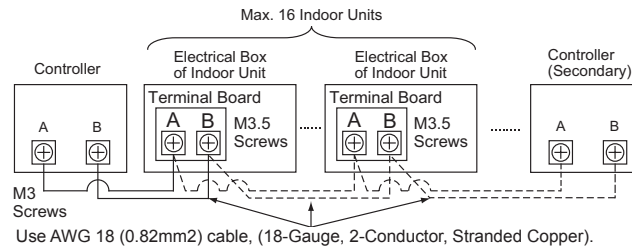


4. Electrical Wiring

Example of Communication Cabling:

ATTENTION:

Disconnect all power at the main power source before performing electrical work. Failure to do this can result in fire, damage to internal components and severe or fatal electrical shock.



NOTICE

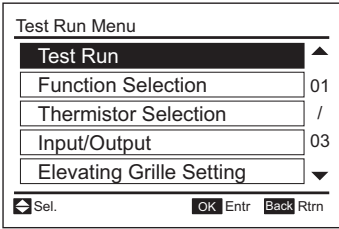
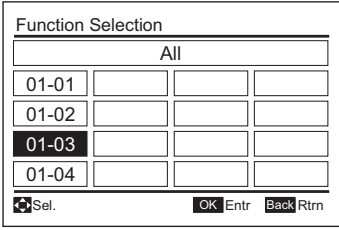
- A. Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements. The use of any other grade of cable other than that specified above can result in damage from electronic interference (EMI).
- B. Maintain a distance more than 11-13/16 inches (30cm) between the communication cables, (controller cable and communication cables) and power source of the indoor units. If this is not done, the unit can malfunction due to electromagnetic interference (EMI) generated by incoming power cables from the power source.
- C. In systems where multiple indoor units are in synchronized control under a single controller, assign the refrigerant cycle numbers and address for indoor units without duplication.
- D. Refer to the Technical Catalog provided with each indoor unit when performing electrical wiring work between the controller and indoor units for setting the refrigerant cycle number and the indoor unit address.
- E. No gap should exist between the controller cable and the cable access inlet of the controller box casing. If there is a gap, cover and seal the gap with vinyl tape. Failure to insulate against the penetration of moisture and insects can result in degraded performance and damage to the unit.
- F. If case of operating with two controllers (Primary and Secondary), set the primary and secondary controllers by selecting the appropriate function for those controllers. Refer to Section 6. After this is set, turn OFF the power supply to all indoor units connected to these controllers.

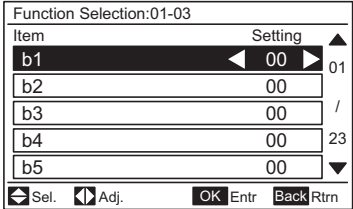
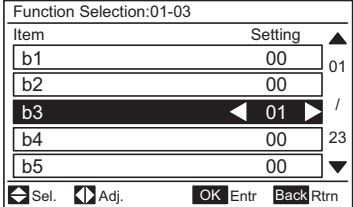
5. Checking Procedures

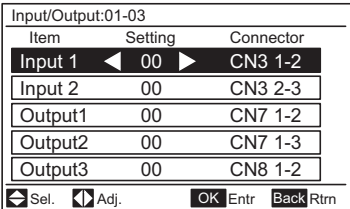
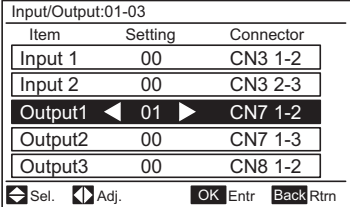
<p><input type="checkbox"/> 1. Turn ON the power supply for all the indoor units.</p>	<p><input type="checkbox"/> 5. Test Run</p> <ul style="list-style-type: none"> • The Test Run screen is displayed. <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p>Test Run Setting: 2 units</p> <p>MODE: ◀ COOL ▶</p> <p>SPEED: ▲</p> <p>⏪ Sel. ◀ Adj. ⏩ ON Back/Retm</p> </div> <div style="border: 1px solid black; padding: 5px; margin: 5px 0; text-align: center;"> <p>NOTE</p> <p>When "00" is displayed, the auto-address function may be activated. Cancel "Test Run" mode and set it again.</p> </div> <ul style="list-style-type: none"> • Press "⏻" (On/Off) to again to activate Test Run. • Press "▲ ▼ ◀ ▶" and set each item.
<p><input type="checkbox"/> 2. For models equipped with an auto-address function, wait approximately 3 minutes. This function is being automatically performed. (There is a built-in five minute requirement according to the setting condition.) After that, select using language from the "Menu". Refer to the operation manual for details.</p>	<ul style="list-style-type: none"> * The total number of the indoor units connected is indicated on the LCD (liquid crystal display). * If a number other than a correct number is displayed, the auto-address function will not work properly due to improper wiring or electrician interference and so forth. Turn OFF the power supply, check the following items and perform the correct connection. (Do not repeat turning ON and OFF within 10 seconds.) <ol style="list-style-type: none"> 1. The power supply to the indoor unit was not turned ON or there is an incorrect wiring issue. 2. There was an incorrect connection issue regarding interconnecting cables between indoor units or of the controller cable. 3. There was an incorrect setting of the rotary switch and DIP switches (the settings were overlapped), on the printed circuit board (PCB) for the indoor unit.
<p><input type="checkbox"/> 3. Press and hold "Menu" and "Back/Help" simultaneously for at least three seconds. The Test Run menu will display.</p>	<p><input type="checkbox"/> 6. Canceling "Test Run" Mode</p> <ol style="list-style-type: none"> 1. When the unit is not in operation, press "Back/Help". 2. When the unit is in operation, press "⏻" (On/Off).
<p><input type="checkbox"/> 4. Select "Test Run" by pressing "▲ ▼" and press "OK". The Test Run screen will be displayed.</p>	

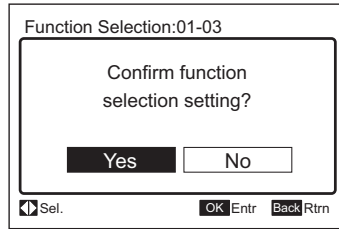
6. Function Selection and Input/Output Setting from the Controller

• Setting from Test Run Menu

<p>1. Press and hold "Menu" and "Back/Help" simultaneously for at least three seconds during the normal mode (when unit is not operated). The Test Run menu will be displayed.</p>	
<p>2. Select "Function Selection" or "Input/Output" from the Test Run menu and press "OK".</p>	

<p>4. Press "△ ▽" and select the item.</p> 
<p>5. Press "< >" and change the setting.</p> 

<p>4. Press "△ ▽" and select the item.</p> 
<p>5. Press "< >" and change the setting.</p> 

<p>6. Press "OK" so that the confirmation screen will be displayed.</p>	 <p>(Figure for Function Selection)</p>
<p>7. Select "Yes" and press "OK". The Test Run menu will be displayed after the setting is confirmed. If "No" is selected, the screen will return to "4".</p>	
<p>8. Press "Back/Help" on the Test Run menu to return to the normal mode.</p>	

To set other units, press "Back/Help" at "4" and "5" so that the screen will return to "3".
 (If the number of an indoor unit connected with the controller is "1", the screen will return to "1".)

● Table A: Optional Setting Items for Function Selection

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
1	b1	Cancellation of Heating Temperature Compensation due to Uneven Heat Load	○	00 01 02 03 04	Standard (Set Temp. +7°F (+4°C)) Removal Set Temp. +3°F (+2°C) (*1) Set Temp. +5°F (+3°C) Set Temp. +2°F (+1°C)	
2	b2	Circulator Function at Heating Thermo-OFF	○	00 01	Not Available Available	
3	b3	Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Not Available Available	
4	b4	Change of Filter Cleaning Time	○	00 01 02 03 04	Standard 100 hrs 1,200 hrs 2,500 hrs No Indication	
5	b5	Selecting the Operation Mode	×	00 01	Standard Fixed	
6	b6	Selecting the Temperature Setpoint	×	00 01	Standard Fixed	
7	b7	Designated Operation Cooling Unit	×	00 01	Standard Fixed	
8	b8	Automatic COOL/HEAT Operation	×	00 01	Not Available Available	
9	b9	Selecting the Fan Speed	×	00 01	Standard Fixed	
10	bA	Not Prepared	-	-	Not Used	
11	bb	Cooling Temperature Compensation due to Uneven Heat Load	×	00 01 02	Standard (No Compensation) Set Temp. -2°F (-1°C) Set Temp. -3°F (-2°C)	
12	bC	Not Prepared	-	-	Not Used (Use as 00 conditions)	
13	bd	Not Prepared	-	-	Not Used (Use as 00 conditions)	
14	bE	Not Prepared	-	-	Not Used (Use as 00 conditions)	
15	C1	Not Prepared	-	-	Not Used (Use as 00 conditions)	
16	C2	Not Prepared	-	-	Not Used	
17	C3	Not Prepared	-	-	Not Used	
18	C4	Not Prepared	-	-	Not Used	
19	C5	High-Speed (Except for Hi-Speed at Heating Thermo-OFF)	○	00 01 02	Not Available Hi Speed 1 (*2) Hi Speed 2	
20	C6	High-Speed at Heating Thermo-OFF	○	00 01	Not Available Available	
21	C7	Canceling of Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Standard Cancellation	
22	C8	Thermistor for the Controller	○	00 01 02	(*3)	
23	C9	Not Prepared	-	-	Not Used	
24	CA	Not Prepared	-	-	Not Used	
25	Cb	Reason for Forced Stoppage	×	00 01	Forced Stoppage Input: A Contact Forced Stoppage Input: B Contact	
26	CC	Not Prepared	-	-	Not Used (Use as 00 conditions)	
27	Cd	Not Prepared	-	-	Not Used (Use as 00 conditions)	
28	CE	Not Prepared	-	-	Not Used (Use as 00 conditions)	
29	CF	Change of Louver Swing Angle	○	00 01 02	Standard (7-Step Operation) Cold Draft Prevention (5 Steps: lower 2 steps cut off) High Ceiling (5 Steps: upper 2 steps cut off)	

INSTALLATION

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
30	d1	Power Supply ON/OFF 1	○	00 01	Not Available Available	
31	d2	Not Prepared	-	-	Not Used	
32	d3	Power Supply ON/OFF 2	○	00 01	Not Available Available	
33	d4	Prevention for Cooling Discharge Air Temp. Decrease	○	00 01	Not Available Available	
34	d5	Prevention for Heating Discharge Air Temp. Decrease	○	00 01	Not Available Available	
35	d6	Room Temp. Control for Energy Savings	○	00 01	Not Available Available	
36	d7	Fall Distance for Elevated Panel	○	00 01 02 03 04 05 06 07	6.6 ft. (2m) (Standard) 3.3 ft. (1m) 4.9 ft. (1.5m) 6.6 ft. (2m) 8.2 ft. (2.5m) 9.8 ft. (3m) 11.5 ft. (3.5m) 13.1 ft. (4m)	
37	E1	Ventilation Mode (*4)	○	00 01 02	Automatic Ventilation Ventilation by Total Heat Exchanger Bypass Ventilation (No Total Heat Exchanging)	
38	E2	Increasing Supply Air Volume (*4)	○	00 01	Not Available Available	
39	E3	Not Prepared	-	-	Not Used (Use as 00 conditions)	
40	E4	Precooling / Preheating Period (*4)	○	00 01 02	None 30 min. 60 min.	
41	E5	Not Prepared	-	-	Not Used (Use as 00 conditions)	
42	E6	Indoor Fan Operation Time After Cooling Operation Stoppage	○	00 01 02	Not Available 60 min. 120 min.	
43	E7	Not Prepared	-	-	Not Used (Use as 00 conditions)	
44	E8	Fan Operation Control at Heating Thermo-OFF	○	00 01	Not Available SLOW	
45	E9	Not Prepared	-	-	Not Used (Use as 00 conditions)	
46	EA	Not Prepared	-	-	Not Used (Use as 00 conditions)	
47	Eb	Fan Operation Control at Cooling Thermo-OFF	○	00 01 02	Not Available LOW SLOW	
48	EC	Forced Thermo-ON Stoppage at Cooling	○	00 01	Not Available Available	
49	Ed	Not Prepared	-	-	Not Used (Use as 00 conditions)	
50	EE	Automatic Fan Speed Control	○	00 01	Not Available Available	
51	EF	Automatic Fan Speed Control (HIGH 2 compliant)	○	00 01	Not Available Available	
52	F0	Not Prepared	-	-	Not Used	
53	F1	Automatic OFF Timer Setting * Do not set the functions "OC"~"OF" when 2 (two) controllers are used in the same remote control group.	×	00 01 02 • • • 23 24 0A 0B 0C 0D 0E 0F	No Function OFF Timer by 1 hr OFF Timer by 2 hrs OFF Timer by 23 hrs OFF Timer by 24 hrs OFF Timer by 30 min. OFF Timer by 90 min. OFF Timer by 40 min. OFF Timer by 45 min. OFF Timer by 50 min. OFF Timer by 55 min.	
54	F2	Controller Primary-Secondary Setting	×	00 01	Primary Secondary	

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
55	F3	Automatic Reset of Setting Temperature (*5)	×	00 01	Not Available Available	
56	F4	Automatic Reset Time	×	00 01 02 03	30 min. 15 min. 60 min. 90 min.	
57	F5	Automatic Reset Temperature for Cooling (*6)	×	66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)	
58	F6	Automatic Reset Temperature for Heating (*7)	×	62 (17) 64 (18) 66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	62°F (17°C) 64°F (18°C) 66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)	
59	F7	Operation Stoppage Prevention by Controller Operational Error (*8)	×	00 01	Not Available Available	
60	F8	Lock Function for Operation Mode Selection	×	00 01	Not Available Available (Factory-Setting)	
61	F9	Lock Function for Temperature Setting	×	00 01	Not Available Available (Factory-Setting)	
62	FA	Lock Function for Fan Speed Selection	×	00 01	Not Available Available (Factory-Setting)	
63	Fb	Lock Function for Swing Louver Operation	×	00 01	Not Available Available (Factory-Setting)	
64	FC	Cooling Lower Limit for Setting Temperature (*6)	×	00 01 02 03 04 05 06 07 08 09 10	66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C)	
65	Fd	Heating Upper Limit for Setting Temperature (*7)	×	00 01 02 03 04 05 06 07 08 09 10 11 12	64°F (18°C) 66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)	
66	FE	Not Prepared	-	-	Not Used (Use as 00 conditions)	
67	FF	Not Prepared	-	-	Not Used (Use as 00 conditions)	

INSTALLATION

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
68	H1	Not Prepared	-	-	Not Used (Use as 00 conditions)	
69	H2	Indication of Hot Start	×	00 01	Indication No Indication	
70	H3	Not Prepared	-	-	Not Used (Use as 00 conditions)	
71	H4	Not Prepared	-	-	Not Used (Use as 00 conditions)	
72	H5	Not Prepared	-	-	Not Used (Use as 00 conditions)	
73	J1	Temperature Indication (*9)	×	00 01	Not Available Available	
74	J2	Not Prepared	-	-	Not Used	
75	J3	Run Indicator Color	×	00 01	Green Red	
76	J4	Not Prepared	-	-	Not Used (Use as 00 conditions)	
77	J5	Not Prepared	-	-	Not Used (Use as 00 conditions)	
78	J6	Not Prepared	-	-	Not Used (Use as 00 conditions)	
79	J7	Not Prepared	-	-	Not Used (Use as 00 conditions)	
80	J8	Eco-operation (*10)	×	00 01	Not Available Available	
81	J9	Not Prepared	-	-	Not Used (Use as 00 conditions)	
82	JA	Not Prepared	-	-	Not Used (Use as 00 conditions)	
83	Jb	Not Prepared	-	-	Not Used (Use as 00 conditions)	
84	K1	Not Prepared	-	-	Not Used (Use as 00 conditions)	
85	K2	Not Prepared	-	-	Not Used (Use as 00 conditions)	
86	K3	Not Prepared	-	-	Not Used (Use as 00 conditions)	
87	K4	Not Prepared	-	-	Not Used (Use as 00 conditions)	
88	K5	Motion Sensor Detection Level	×	00 01 02	Standard High Low	
89	K6	Selecting Operation Mode when Selecting Thermistor of Controller and Remote Sensor	○	00 01 02 03	ALL COOL HEAT ALL	
90	K7	Radiation Temperature Sensor Calibration	○	00 01 02 03	Normal Upper Lower Normal	
91	K8	Moisture Control and Prevention	○	00 01	Not Available Available	
92	K9,KA	Not Prepared	-	-	Not Used	
93	L1	Setting Position of Motion Sensor	○	00 01 02 03	A B - D	
94	L2	Not Prepared	-	-	Not Used	
95	L3	Louver in Power Saving	○	00 01 02 03	LOW MED HIGH OFF	
96	L4	Fan Speed Up when Power Saving Thermo OFF	○	00 01	Not Available Available	
97	L5	Louver Availability during Power Saving	○	00 01	Not Available Available	
98	L6~Lb	Not Prepared	-	-	Not Used	
99	P1	Setting Unit Temperature Setpoint	×	00 01	0.5°C 1°C	
100	P2	Not Prepared	-	-	Not Used	

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
101	P3	Sensor Temperature	×	00 01 02 03	Inlet Outlet Controller Thermo Remote Sensor	
102	P4	Display of Sensor Temperature	×	00 01	Not Available Available	
103	P5	Setting Temperature when Operation Mode is FAN	×	00 01	Display Not Available	
104	P6	Select Power Saving Button	×	00 01	Available Not Available	
105	P7	Menu Screen Transition Prohibited	×	00 01	Not Available Available	
106	P8	Not Prepared	-	-	Not Used	
107	P9	Not Prepared	-	-	Not Used	
108	PA	Daylight Saving Time	×	00 01	1 hr 2 hrs	
109	PB~PC	Not Prepared	-	-	Not Used	

- *1: The "02", "03", and "04" settings may not be available according to the type of indoor unit. When connecting multiple indoor units, create separate settings.
- *2: In case of Duct type models, 00: Increasing fan speed 1 (standard),
01: Increasing fan speed 2 (high static pressure), 02: Standard (low static pressure)
- *3: When the Thermistor for the Controller is selected:
 00: Control by the Thermistor for Indoor Inlet
 01: Control by the Thermistor for the Controller
 02: Control by Average Value of the Thermistor for the Indoor Inlet and the Thermistor for the Controller
 When the Remote Sensor is connected:
 00: Control by Average Value of the Thermistor for the Indoor Inlet and the Remote Sensor
 01: Control by the Remote Sensor
 02: Control by Average Value of the Thermistor for the Indoor Inlet and the Remote Sensor
- *4: E1 to E4: Setting for the total heat exchanger
- *5: In case that the set temperature is changed and kept within the set time at "F4", the temperature automatically changes to "F5" and "F6". (In case that the set temperature is out of range at "F5" and "F6", it is applied within upper and lower limit for the set temperature.)
- *6: Applicable to fan, cooling and dry operation modes.
- *7: Applicable to heating operation mode.
- *8: Operation is stopped by pressing the "⏻" (On/Off) switch for 3 seconds.
- *9: The sensor value at "C8" will be indicated. When the thermistor for controller is used, the average value of the thermistor for the controller and the thermistor for the indoor inlet will be displayed.
- *10: When the unit is restarted by the controller, the temperature setting automatically changes to the temperature of "F5" or "F6".

NOTES:

1. After at least three minutes time after start-up, change the optional setting.
2. When changing the "CF" setting, (change of louver swing angle), restore the power supply or allow the louver to make one complete swing fully in the auto swing mode to apply the optional setting.
3. Optional settings differ between indoor and outdoor units.
Check to ensure that the unit is or is not equipped with optional settings.
4. Record the setting conditions for each optional setting in the "Setting" column of the table.
5. The above optional functions with a corresponding "X" that denotes that the individual setting can change the condition only when "All Rooms" is set.

INSTALLATION

• Table B: Input and Output Number Display and Connectors

Input Number Display Input/Output Indication	Port	Factory Setting		Setting
		Setting Item	Indication	
Input 1	CN3 1-2	Remote ON/OFF 1 (Level)	03	
Input 2	CN3 2-3	Prohibiting Remote Control after Manual Stoppage	06	
Output 1	CN7 1-2	Operation	01	
Output 2	CN7 1-3	Alarm	02	
Output 3	CN8 1-2	Thermo-ON for Heating	06	

• Table C: Input and Output Settings and Display Codes

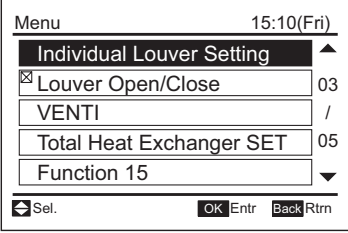
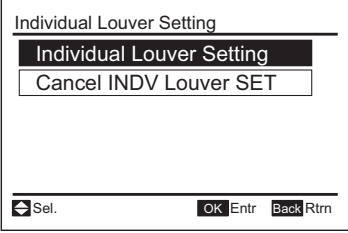
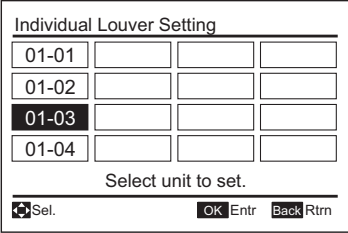
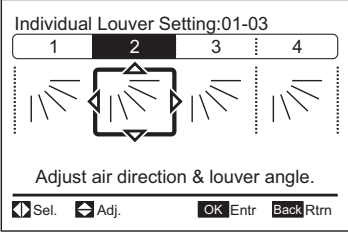
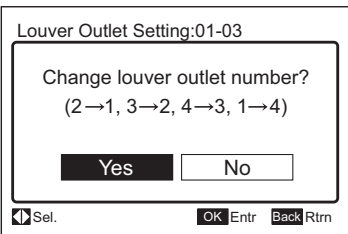
Code Indicated	Input	Output
00	Not set	Not set
01	Room Thermostat (for Cooling)	Operation
02	Room Thermostat (for Heating)	Alarm
03	Remote ON/OFF 1 (Level)	Cooling
04	Remote ON/OFF 2 (Operation)	Thermo-ON for Cooling
05	Remote ON/OFF 2 (Stoppage)	Heating
06	Forbidding Remote Control after Manual Stoppage	Thermo-ON for Heating
07	Remote Cooling / Heating Change	Total Heat Exchanger

NOTES:

- * Change the optional setting after waiting at least three minutes elapsed time after start-up.
- * Do not set the elevating grille for the total heat exchanger.
- * Record the setting conditions for each input and output in the “Setting” column of the table.

7. Individual Louver Setting

This setting is available only for an indoor unit equipped with just an individual louver. Each louver angle can be set individually as shown in the following procedure.

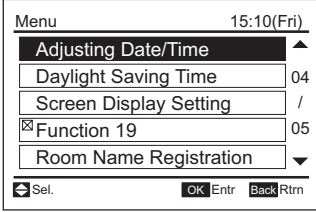
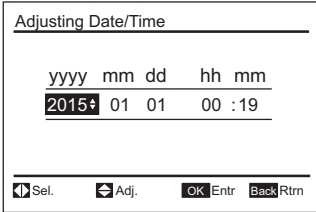
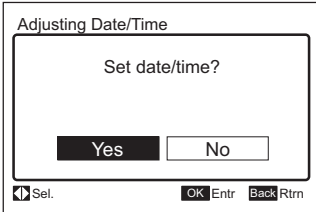
<p>1. Press and hold "Menu" while in the normal mode (when the unit is in operation). The menu will be displayed.</p>	
<p>2. Select "Individual Louver Setting" from the menu and press "OK". The louver setting will be displayed.</p>	
<p>3. Select "Individual Louver Setting" from the louver setting and press "OK".</p>	
<p>4. Select the indoor unit to change the louver direction by pressing "$\Delta \nabla < \triangleright$" and press "OK". (This screen is NOT displayed when the number of indoor unit connected with the controller is one. In this case, "5" will be displayed.)</p>	
<p>5. Press "<triangleright;" and select louver direction. The selected louver is opened and the other louvers are closed.</p>	
<p>6. Press "Menu" while "Back/Help" is pressed. The confirmation screen will be displayed.</p> <p>7. Select "Yes" and press "OK". The setting "5" will be displayed after the setting change is confirmed. If "No" is selected and "OK" is pressed, the screen will return to "5".</p> <ul style="list-style-type: none"> Regarding "Individual Louver Setting", the louver selected at "5" will be set as number "1" and the other louver number will automatically be changed clockwise as shown at right. 	

NOTE:

This "Individual Louver Setting" is NOT available when two controllers are used in the same group. (including a combination with a Wired Controller + Wireless Controller).

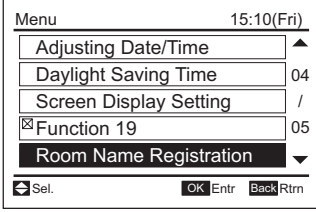
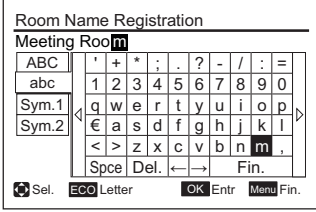
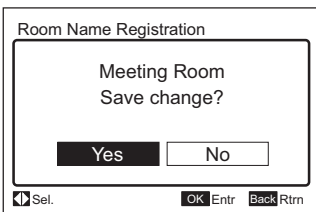
8. Adjusting Date/Time

The date and time can be set from "Adjusting Date/Time".

<p>1. Press "Menu" while in the normal mode. The menu will be displayed.</p>	
<p>2. Select "Adjusting Date/Time" from the menu and press "OK".</p>	
<p>3. Press "<>" and select "yyyy/mm/dd/hh/mm".</p>	
<p>4. Press "Δ ∇" and set the date and time. (Press or keep pressing "Δ ∇" to adjust numbers.)</p>	
<p>5. After the setting is completed, press "OK" so that the confirmation screen will be displayed.</p>	
<p>6. Select "Yes" and press "OK". The screen will return to the normal mode after the setting is confirmed. If "No" is pressed, the screen will return to "3".</p>	

9. Room Name Registration

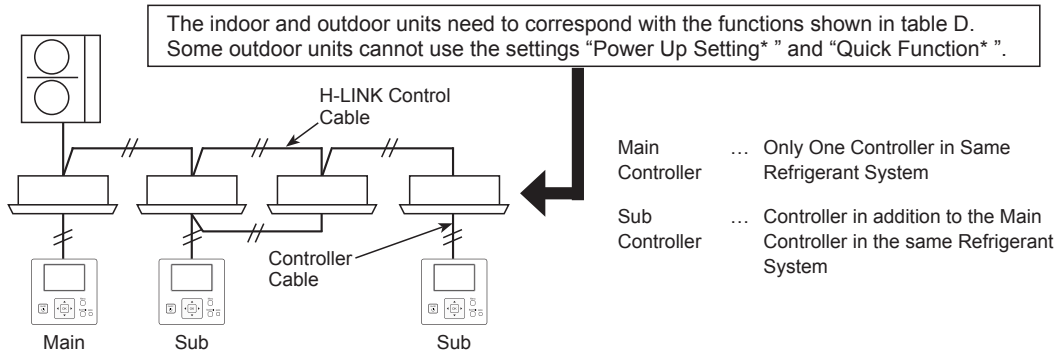
A name of the room (installation location of controller) can be registered from "Room Name Registration".

<p>1. Press "Menu" while in the normal mode. The menu will be displayed.</p>	
<p>2. Select "Room Name Registration" from the menu and press "OK".</p>	
<p>3. Press "Back/Help" to change letter type.</p>	
<p>4. Press "Δ ∇ <>" to select letter.</p>	
<p>5. Press "OK" to confirm the letter. (Maximum: 12 letters)</p>	
<p>6. Select "Fin." and press "OK", the confirmation screen will be displayed. (Also, press "Menu" and the confirmation screen will be displayed.)</p>	
<p>7. Select "Yes" and press "OK". The screen will return to the normal mode after the setting is confirmed. If "No" is pressed, the screen will return to "3".</p>	

10. Setting of Main Controller

In case of the System Constitution below, the Main or Sub Remote Control will be set automatically, after being fixed and an icon will be displayed. If opting to change over from "SUB" to "MAIN" controller, follow the steps below:

A visual example of a refrigeration environment containing a group of multiple controllers:



Concerning main and sub controllers, the range of settings may differ for the functions shown below.

• Table D: Relation between Main/Sub Controller and Setting Range

Function		Main	Sub
Power Saving Mode Setting		○	×
Outdoor Unit Capacity Control	Detailed Setting	○	×
	Power Saving Level Switch	○	×
Indoor Unit Rotation Control	Detailed Setting	○	×
	ON/OFF	○	○
Intermittent Control	Detailed Setting	○	○
	Power Saving Level Switch	○	○
Operation Noise Reduction		○	×
Power Saving Schedule	Outdoor Capacity Control	○	×
	Intermittent Control	○	○
Operation Noise Reduction Schedule		○	×
Power Up Setting*		○	×
Quick Function*		○	○

○: Available ×: Not Available

Follow the steps below to toggle from the sub controller to the main controller.

<p>1. Press and hold "Menu" and "Back/Help" simultaneously for at least three seconds while in the normal mode (while the unit is inactive). The Test Run menu will be displayed.</p>	
<p>2. Select "Main Remote Setting" from the Test Run menu and press "OK". The confirmation screen will be displayed.</p>	
<p>3. Select "YES" and press "OK". The word "Processing" will be displayed during the progression phase. Select "NO", and the Test Run menu will be displayed.</p> <p>After the change is applied, the Power Save Mode will read: "No Setting". Also, the "Power Saving Detailed Settings", "Power Saving", "Sav/Reduction Schedule", "Operation Noise Reduction", "Priority Setting" and "Power Up Setting" functions will be initialized.</p> <p>Reset the settings.</p>	<div style="border: 1px solid black; padding: 10px; width: fit-content; margin: 0 auto;"> <p style="margin: 0;">Setting of the Main Remote Control</p> <p style="margin: 5px 0;">Change to main remote even if each settings is initialized?</p> <p style="margin: 5px 0; text-align: center;"> <input type="button" value="Yes"/> <input type="button" value="No"/> </p> <p style="margin: 0; font-size: small;"> <input type="button" value="Sel."/> <input type="button" value="OK Entr"/> <input type="button" value="BackRtm"/> </p> </div>
<p>4. The display will change to the confirmation screen.</p>	
<p>5. Press "OK" to return to the Test Run menu.</p>	
<p>6. Press "Back/Help" in the Test Run menu to return to the normal mode.</p>	

NOTICE

- When using two controllers, only the primary controller can be set as the main controller. In cases where two controllers are both sub controllers, the "Main Remote Control Setting" is only accessible from the master controller.
- In cases where the primary controller is a "Main Controller" and the secondary controller is a "Sub Controller", when the primary controller and the secondary controller are changed by the function selection, Main and Sub controllers will also be switched simultaneously.
- If the sub controller is displayed, the main switch may not function normally. Please verify the cable connection.
- If a remote control group is operating with multiple refrigerant systems, the ECO function may not operate normally.

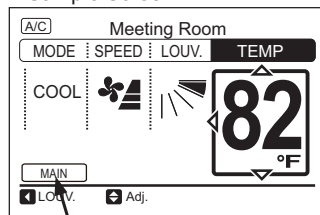
11. Main/Sub Non-display Setting

It is possible to hide the icon for Main or Sub for the controller.

1. The menu is displayed when pressing "Menu" in Normal Mode.
2. Select "Screen Display Setting" from the menu and press "OK".
3. Press " $\Delta \nabla$ " to select "Main/Sub Display".
4. Press " $\triangleleft \triangleright$ " to select "Non-display".
5. Press "OK" after the selection. The confirmation screen will be displayed.
6. Select "YES" and press "OK" to confirm the setting. The screen will return to the normal mode.
If "NO" is pressed, the screen will return to (4).

* Refer also to page 34 of the operation manual.

< Sample Screen >

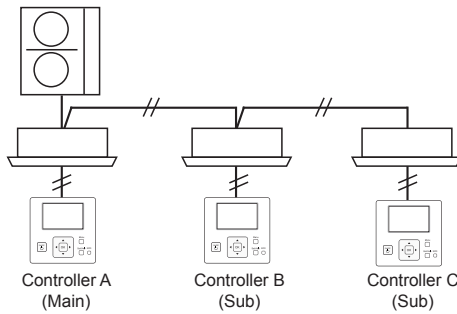


Display	Non-display
MAIN	No icon
SUB	

12. Operation Mode / Setting Temperature Priority Setting

It is feasible only to set the operation mode and unit temperature setpoint, from one specific controller (the main controller) in the same refrigerant system without having to use the central station. The sub controller will act in accordance with the settings of the main controller which is effective management of temperature depending on the interval of the priority operation mode and power saving settings.

< Example >



NOTICE

1. This controller comes normally pre-set with factory supplied default settings. It is possible to set, depending on what is pre-set in the priority settings of the Test Run menu.
2. Only the temperature setting cannot be set as priority. Also, even if operation mode is set as priority, in the case of COOL/HEAT Automatic mode, the priority will be temporary overridden.
3. When using two controllers, it is not possible to set priority.
4. If one of the devices in the same refrigerant cycle is connected, the main function cannot be used.
 - Outdoor unit or Indoor unit power saving capabilities are not available.
 - Receiver Kit
 - Central Station
 - Controller set "ON" with the selected operation mode, setting adjustment of Temperature Setpoint, and setting adjustment for cooling.
 - Cooling/Heating Changeover Switch Unit
5. It is not possible to operate at the same time cooling and heating mode in the same refrigerant system. If multiple RC exist within the same refrigerant system, only one RC will give the right to set the operation mode.

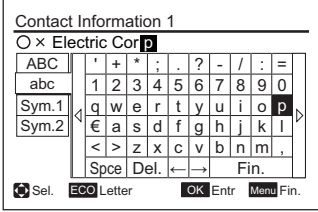
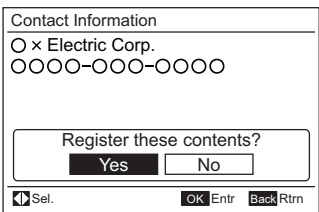
Priority Setting		Remote Selection		
		Controller A (Main)	Controller B and C (Sub)	
		Operation Mode Temperature Setpoint	Operation Mode	Temperature Setpoint
Without Priority			○	○
With Priority	Operation Mode	○	▲	○
	Operation Mode + Temperature Setpoint		▲	×

- : Selection Possible
 ▲: Selection Possible Partially
 - Operation Mode + FAN set by Controller A (Main)
 - Only when COOL mode COOL↔DRY
 ×: Selection not possible (Apply to setting temperature of Controller A (Main))

1. Press and hold "Menu" and "Back/Help" simultaneously for at least three seconds while in the normal mode (when unit is not operated). The Test Run menu will be displayed.
2. Select "Priority Setting" from the Test Run menu and press "OK".
3. Press "<|>" to change the settings in the following order "Not available" ↔ "Operation Mode" ↔ "Operation Mode" + Setting Temperature".
4. Select "YES" and press "OK" to confirm and display the Test Run menu. If "NO" is pressed, the screen will return to step (3).
5. Press "Back/Help" on the Test Run menu to return to the normal mode.

13. Contact Information Registration

Contact information can be registered from the Contact Information screen.

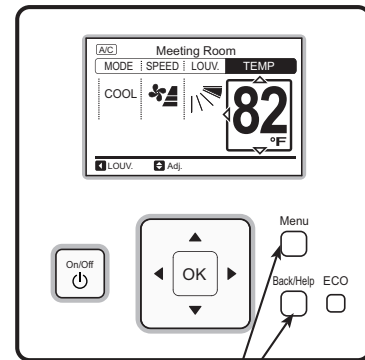
1. Press and hold "Menu" and "Back/Help" simultaneously for at least three seconds during the normal mode (when unit is not in operation). The Test Run menu will be displayed.	
2. Select "Contact Information" from the Test Run menu and press "OK". Contact Information Screen One will be displayed.	
3. Press "Back/Help" to change font type.	
4. Press "Δ ∇ < >" to select a letter.	
5. Press "OK" to confirm the letter. (Maximum: 28 characters)	
6. Select "Fin." and press "OK" (or simply press "Menu"), (7) will be displayed.	
7. Repeat steps (3)~(5) to register the Contact Information Two screen. Select "Fin." and press "OK", the confirmation screen will be displayed. (Also, press "Menu" and the confirmation screen will be displayed.)	
8. Select "Yes" and press "OK". The Test Run menu will be displayed after the setting is confirmed. If "No" is pressed, the screen will return to (3).	

14. Check Menu

Each "Check Menu" item and its function is explained in the following table.

Check Menu Item	Function
Check 1	Sensor condition of the heat pump will be monitored and displayed.
Check 2	Sensor data from the heat pump prior to alarm occurrence will be displayed.
Alarm History Display *	Previous alarm record data: (date, time, alarm code) will be displayed.
Model Display	Model name and manufacturing number will be indicated.
Check PCB of the Units	The result of PCB check will be displayed.
Self Checking	A checkout of the controller will then begin.

*To delete Alarm History
 Press "OK" when an alarm or fault is recorded and displayed. After that, a confirmation screen will appear.
 Select "Yes" and press "OK" so that the alarm record is deleted.



Press and hold "Menu" and "Back/Help" simultaneously for three seconds during the normal mode.

1.4.2 Simplified Wired Controller

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Important Notice



- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc. or York.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival


1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. and York. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system, including this controller, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.

- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least 3 ft. (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.
- If the controller is installed in a location where electromagnetic radiation is generated, make sure that the controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35° to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions

⚠ WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- If the remote sensors are not used with this controller, then do not install this controller...
 - In a room where there is no thermostat.
 - Where the unit is exposed to direct sunshine or direct light.
 - Where the unit will be in close proximity to a heat source.
 - Where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - In areas with poor air circulation and ventilation.
- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions

WARNING

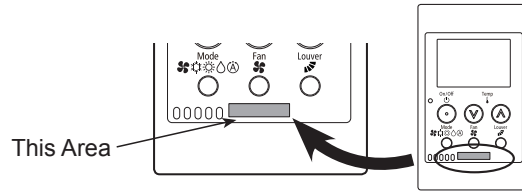
Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Only use electrical protection equipment and tools suited for this installation.
- Insulate the controller against moisture and temperature extremes.
- Use specified cables between units and the controller.
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

Check the boxes below as you complete each item.

2. Brand Label

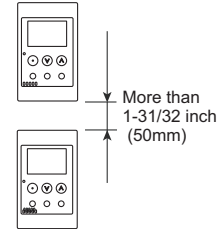
Select the accessory brand label according to the production order. (HITACHI or YORK)
Attach the accessory brand logo label to "This Area".



3. Installation Work

[3.1 Selection of Installation Place]

- 1) Select a suitable place for handling and determine the installation place of the controller with the customer's acceptance. Do not install the controller in such locations as:
- where children can touch
 - where the air from the air conditioner is directly discharged

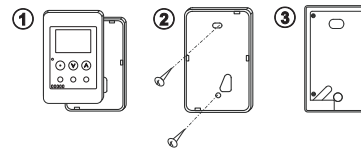


[3.2 Before Installation]

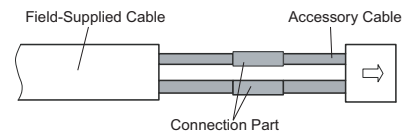
- 1) This packing contains the following parts.
- | | |
|-------------------------------|--|
| - Simplified Wired Controller | Qty: 1 - for operation control |
| - Screw <M4x16L> | Qty: 2 - for securing the holding bracket onto the wall. |
| - Cable with Connector | 7-7/8 inches (20cm) |

[3.3 Installation Procedures]

- 1) Remove the controller from the holding bracket.



- 2) Connection of cable:
Connect the accessory cable to the field-supplied cable by soldering. Insulate the connecting part with tape.



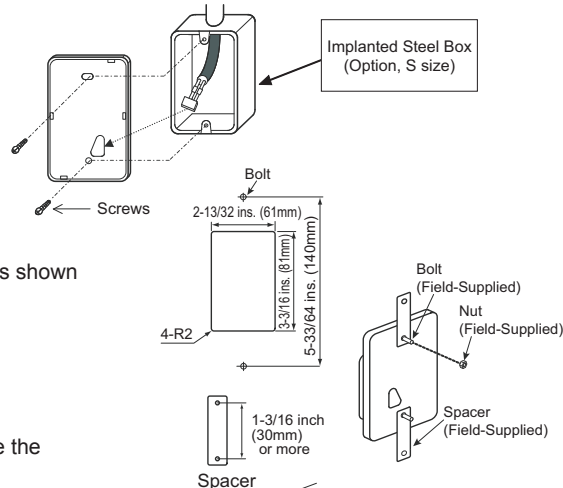
- 3) Attach the controller to the holding bracket and connect the cable as follows.

A. When Exposing Controller Cable

Secure the holding bracket with the cable (accessory) onto the wall using 2-M4 screws (accessory).

B. When Using Steel Box

Prepare steel box (option).
Secure the holding bracket (accessory) on the wall with 2-M4 screws (field-supplied).



C. When Using a Table

1. Cut an installation hole to expose the controller as shown in the figure at the right.
2. Prepare the bolts.

NOTE:

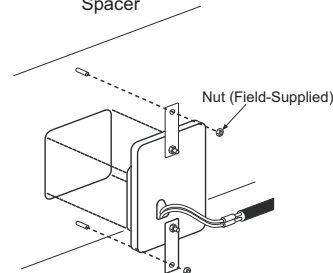
Determine the bolt layout depending on the spacers (field-supplied).

3. Place the bolts on the holding bracket and secure the spacers with the nuts.
 - Bolt (field-supplied)
 - Nut (field-supplied)
 - Spacer (field-supplied)

NOTE:

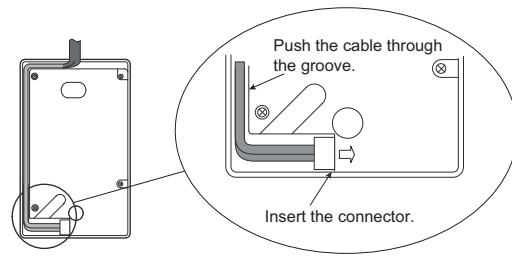
Allow a distance of more than 2 inches (50mm) between spacer holes.

4. Remove the front decorative cover and attach the controller using the installation hole.

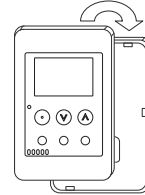


INSTALLATION

- 4) Attach the controller to the holding bracket and connect the cable as shown in the figure.



- 5) Attach the controller onto the holding bracket. Begin by attaching the upper side, and then the lower side.



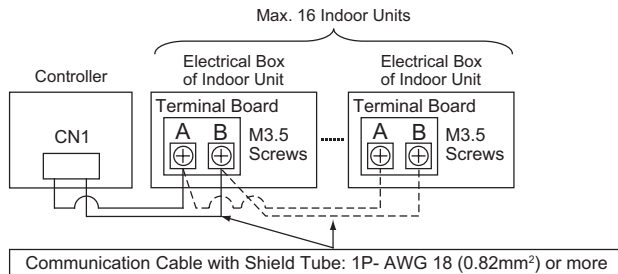
4. Electrical Wiring

Wiring Example (Using communication cable with shield tube)

ATTENTION:

Always make sure to turn off the power of the indoor unit when performing electrical wiring work. Performing electrical wiring work with the power on can damage the circuit boards of the indoor unit and the controller.

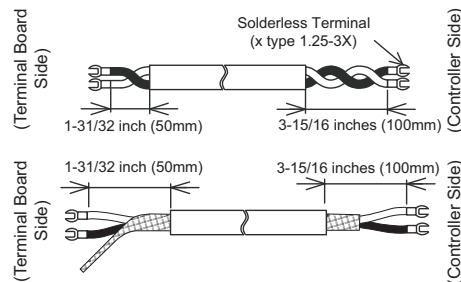
Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.



• Communication Cable (Field-Supplied)

*Option 1:
Communication Cable 2 × AWG 18 (0.82mm²)
(Maximum Total Length: 656.2 ft. (200m))

*Option 2:
Standard Communication Shielded Cable 2 × AWG 18
(0.82mm²)
connecting the shield to the ground at the electrical box side.
(Maximum Total Length: 656.2 ft. (200m))



NOTICE

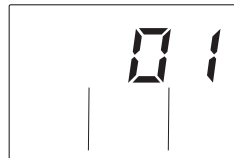
- A. Use AWG 22 (0.32mm²) to AWG 18 (0.82mm²) cable with a maximum total cable length 98.4 ft. (30m).
If the total cable length is longer than 98.4 ft. (30m), use communication cable of 1P to AWG 18 (0.82mm²)
Maximum total cable length 1640.5 ft. (500m). When using with the control timer, the maximum total cable length is 328.1 ft. (100m).
Using other cables may cause a malfunction because of Electromagnetic Interference (EMI).
- B. Maintain a distance of more than 12 inches (30cm) between the controller / indoor unit communication cables and the power cables.
- C. If installed within 12 inches (30cm), put the cables in a conduit tube and ground (type-D; ≤100Ω), one end of the pipe. Without this procedure, malfunction or failure of the air conditioner because of Electromagnetic Interference (EMI) may occur.
- D. When multiple indoor units are simultaneously controlled, set addresses for the refrigerant cycle and indoor units. Specifically, when the indoor units from multiple refrigerant cycles are simultaneously controlled, a communication issue may develop due to address duplication.
- E. For more information about wiring controller-indoor units and setting indoor unit addresses, see the indoor units "INSTALLATION MANUAL".
- F. Do not leave any space at the cable opening of the remote controller case. If there is any space, cover it with, for example, tape to avoid trouble caused by condensation or insects entering the controller case.

5. Checking Procedures

This controller is not equipped with the Test Run mode.
The test running shall be performed from the outdoor units.

1. Turn ON the power for all indoor units.
2. Models with automatic addressing will take three to five minutes to complete the setting.
3. Set the Test Run mode from the outdoor units.
4. Cancellation the Test Run mode.
The Test Run mode can be canceled when:
 - Test Run will be finished automatically after two hours running time.
 - Cancel Test Run from the outdoor units.
 - Stop Test Run by pressing the On/Off switch at the controller.

The total number of the indoor units connected will be indicated on the temperature display.



NOTE:
Display indication when one indoor unit is connected.

If the indicated number of connected units is incorrect, any communication abnormality because of an incorrect wiring/ addressing or Electromagnetic Interference (EMI) issue may exist. In such a case, turn OFF the power supply and check the following.

(Do NOT repeat the ON/OFF operation at the main switch within 10 seconds).

- (1) Indoor unit(s) power supply not turned ON, or incorrect wiring
- (2) Incorrect wiring connection between indoor units or controllers
- (3) Incorrect setting of rotary switch (overlapped setting)

ATTENTION:

This controller memorizes a Test Run operation mode. The unit(s) will start in the Test Run mode if the mode of operation is not changed from the central control equipment which will be used with the unit after Test Run, or from the controller. Change the mode of operation using these devices or refer to Section 6. "Function Selection and Input/ Output Setting from Controller" (H3 Operation Mode Change Restriction - 02: Unlimited operation) after Test Run.

6. Function Selection and Input/Output Setting from Controller

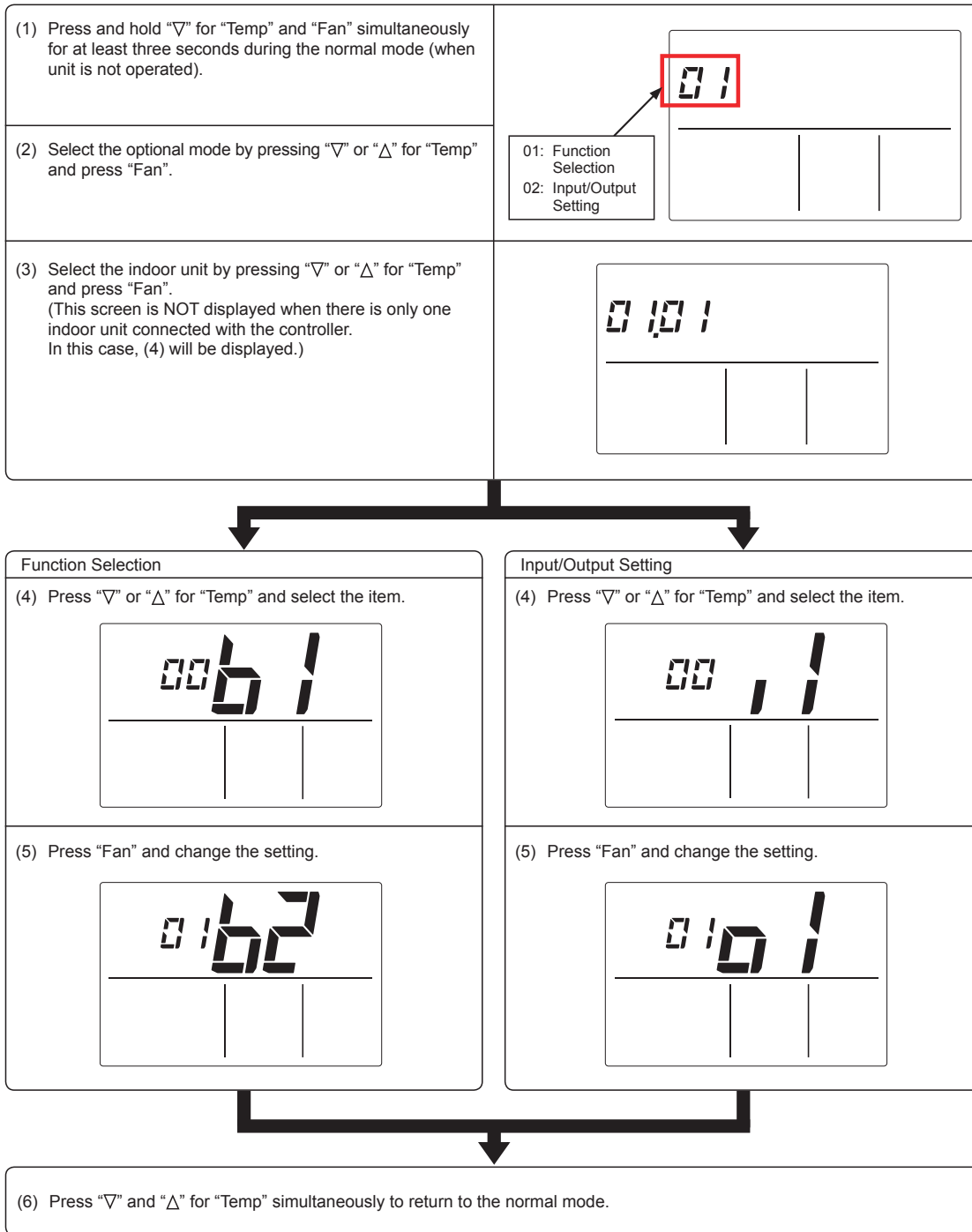


Table A Optional Setting Items for Function Selection

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
1	b1	Cancellation of Heating Temperature Compensation due to Uneven Heat Load	○	00 01 02 03 04	Standard (Set Temp. +7°F (+4°C)) Removal Set Temp. +3°F (+2°C) (*1) Set Temp. +5°F (+3°C) Set Temp. +2°F (+1°C)	
2	b2	Circulator Function at Heating Thermo-OFF	○	00 01	Not Available Available	
3	b3	Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Not Available Available	
4	b4	Change of Filter Cleaning Time	○	00 01 02 03 04	Standard 100 hrs 1,200 hrs 2,500 hrs No Indication	
5	b5	Fixing of Operation Mode	×	00 01	Standard Fixed	
6	b6	Fixing of Setting Temperature	×	00 01	Standard Fixed	
7	b7	Fixing of Operation as Exclusive Cooling Unit	×	00 01	Standard Fixed	
8	b8	Automatic COOL/HEAT Operation	×	00 01	Not Available Available	
9	b9	Fixing of Fan Speed	×	00 01	Standard Fixed	
10	bA	Not Prepared	-	-	Not Used	
11	bb	Cooling Temperature Compensation due to Uneven Heat Load	×	00 01 02	Standard (No Compensation) Set Temp. -2°F (-1°C) Set Temp. -3°F (-2°C)	
12	bC	Not Prepared	-	-	Not Used (Use as 00 conditions)	
13	bd	Not Prepared	-	-	Not Used (Use as 00 conditions)	
14	bE	Not Prepared	-	-	Not Used (Use as 00 conditions)	
15	C1	Not Prepared	-	-	Not Used (Use as 00 conditions)	
16	C2	Not Prepared	-	-	Not Used	
17	C3	Not Prepared	-	-	Not Used	
18	C4	Not Prepared	-	-	Not Used	
19	C5	Hi Speed (Except for Hi Speed at Heating Thermo-OFF)	○	00 01 02	Not Available Hi Speed 1 (*2) Hi Speed 2	
20	C6	Hi Speed at Heating Thermo-OFF	○	00 01	Not Available Available	
21	C7	Canceling of Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Standard Cancellation	
22	C8	Thermistor of Controller	○	00 01 02	(*3)	
23	C9	Not Prepared	-	-	Not Used	
24	CA	Not Prepared	-	-	Not Used	
25	Cb	Selection of Forced Stoppage Logic	×	00 01	Forced Stoppage Input: A Contact Forced Stoppage Input: B Contact	
26	CC	Not Prepared	-	-	Not Used (Use as 00 conditions)	
27	Cd	Not Prepared	-	-	Not Used (Use as 00 conditions)	
28	CE	Not Prepared	-	-	Not Used (Use as 00 conditions)	
29	CF	Change of Louver Swing Angle	○	00 01 02	Standard (7-Step Operation) Cold Draft Prevention (5 Steps: lower 2 steps cut off) High Ceiling (5 Steps: upper 2 steps cut off)	

INSTALLATION

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
30	d1	Power Supply ON/OFF 1	○	00 01	Not Available Available	
31	d2	Not Prepared	-	-	Not Used	
32	d3	Power Supply ON/OFF 2	○	00 01	Not Available Available	
33	d4	Prevention for Cooling Discharge Air Temp. Decrease	○	00 01	Not Available Available	
34	d5	Prevention for Heating Discharge Air Temp. Decrease	○	00 01	Not Available Available	
35	d6	Room Temp. Control for Energy Saving	○	00 01	Not Available Available	
36	d7	Fall Distance of Elevating Panel	○	00 01 02 03 04 05 06 07	6.6 ft. (2m) (Standard) 3.3 ft. (1m) 4.9 ft. (1.5m) 6.6 ft. (2m) 8.2 ft. (2.5m) 9.8 ft. (3m) 11.5 ft. (3.5m) 13.1 ft. (4m)	
37	E1	Ventilation Mode (*4)	○	00 01 02	Automatic Ventilation Ventilation by Total Heat Exchanger Bypass Ventilation (No Total Heat Exchanging)	
38	E2	Increasing Supply Air Volume (*4)	○	00 01	Not Available Available	
39	E3	Not Prepared	-	-	Not Used (Use as 00 conditions)	
40	E4	Precooling / Preheating Period (*4)	○	00 01 02	None 30 min. 60 min.	
41	E5	Not Prepared	-	-	Not Used (Use as 00 conditions)	
42	E6	Indoor Fan Operation Time After Cooling Operation Stoppage	○	00 01 02	Not Available 60 min. 120 min.	
43	E7	Not Prepared	-	-	Not Used (Use as 00 conditions)	
44	E8	Fan Operation Control at Heating Thermo-OFF	○	00 01	Not Available SLOW	
45	E9	Not Prepared	-	-	Not Used (Use as 00 conditions)	
46	EA	Not Prepared	-	-	Not Used (Use as 00 conditions)	
47	Eb	Fan Operation Control at Cooling Thermo-OFF	○	00 01 02	Not Available LOW SLOW	
48	EC	Forced Thermo-ON Stoppage at Cooling	○	00 01	Not Available Available	
49	Ed	Not Prepared	-	-	Not Used (Use as 00 conditions)	
50	EE	Automatic Fan Speed Control	○	00 01	Not Available Available	
51	EF	Automatic Fan Speed Control (HIGH 2 compliant)	○	00 01	Not Available Available	
52	F0	Not Prepared	-	-	Not Used	
53	F1	Automatic OFF Timer Setting * Do not set the functions "0C"~"0F" when 2 (two) controllers are used in the same remote control group.	×	00 01 02 • • • 23 24 0A 0B 0C 0D 0E 0F	No Function OFF Timer by 1 hr OFF Timer by 2 hrs • • • OFF Timer by 23 hrs OFF Timer by 24 hrs OFF Timer by 30 min. OFF Timer by 90 min. OFF Timer by 40 min. OFF Timer by 45 min. OFF Timer by 50 min. OFF Timer by 55 min.	

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
54	F2	Controller Primary-Secondary Setting	x	00 01	Primary Secondary	
55	F3	Automatic Reset of Setting Temperature (*5)	x	00 01	Not Available Available	
56	F4	Automatic Reset Time	x	00 01 02 03	30 min. 15 min. 60 min. 90 min.	
57	F5	Automatic Reset Temperature for Cooling (*6)	x	66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)	
58	F6	Automatic Reset Temperature for Heating (*7)	x	62 (17) 64 (18) 66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	62°F (17°C) 64°F (18°C) 66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)	
59	F7	Operation Stoppage Prevention by Controller Operational Error (*8)	x	00 01	Not Available Available	
60	F8	Lock Function for Operation Mode Selection	x	00 01	Not Available Available (Factory-Setting)	
61	F9	Lock Function for Temperature Setting	x	00 01	Not Available Available (Factory-Setting)	
62	FA	Lock Function for Fan Speed Selection	x	00 01	Not Available Available (Factory-Setting)	
63	Fb	Lock Function for Swing Louver Operation	x	00 01	Not Available Available (Factory-Setting)	
64	FC	Cooling Lower Limit for Setting Temperature (*6)	x	00 01 02 03 04 05 06 07 08 09 10	66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C)	
65	Fd	Heating Upper Limit for Setting Temperature (*7)	x	00 01 02 03 04 05 06 07 08 09 10 11 12	64°F (18°C) 66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)	
66	FE	Not Prepared	-	-	Not Used (Use as 00 conditions)	
67	FF	Not Prepared	-	-	Not Used (Use as 00 conditions)	

INSTALLATION

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
68	H1	Maintenance Alarm	×	00 01	Show Hide	
69	H2	No Indication of Auto Control	×	00 01	Show Not Show	
70	H3	Operation Mode Change Restriction (*9)	×	00 01 02	Unlimited operation Operation mode set by central control equipment + "Fan" mode Operation mode change not available (Hide operation mode)(Factory setting)	
71	H4	Not Prepared	-	-	Not Used (Use as 00 conditions)	
72	H5	Ventilation Changeover (Total heat exchanger only)	×	00 01 02	Air Conditioning Only Ventilation Only Air conditioning + Ventilation	
73	H6	°C/°F Switching Restriction	×	00 01	Switchable Not switchable	
74	J1	Temperature Indication (*10)	×	00 01	Not Available Available	
75	J2	Not Prepared	-	-	Not Used	
76	J3	Run Indicator Color	×	00 01	Green Red	
77	J4	Not Prepared	-	-	Not Used (Use as 00 conditions)	
78	J5	Not Prepared	-	-	Not Used (Use as 00 conditions)	
79	J6	Not Prepared	-	-	Not Used (Use as 00 conditions)	
80	J7	Not Prepared	-	-	Not Used (Use as 00 conditions)	
81	J8	Eco-operation (*11)	×	00 01	Not Available Available	
82	J9	Not Prepared	-	-	Not Used (Use as 00 conditions)	
83	JA	Not Prepared	-	-	Not Used (Use as 00 conditions)	
84	Jb	Not Prepared	-	-	Not Used (Use as 00 conditions)	
85	K1	Not Prepared	-	-	Not Used (Use as 00 conditions)	
86	K2	Not Prepared	-	-	Not Used (Use as 00 conditions)	
87	K3	Not Prepared	-	-	Not Used (Use as 00 conditions)	
88	K4	Not Prepared	-	-	Not Used (Use as 00 conditions)	
89	K5	Motion Sensor Detection Level	×	00 01 02	Standard High Low	
90	K6	Selecting Operation Mode when Selecting Thermistor of Controller and Remote Sensor	○	00 01 02 03	ALL COOL HEAT ALL	
91	K7	Radiation Temperature Sensor Calibration	○	00 01 02 03	Normal Upper Lower Normal	
92	K8	Control of Dew Condensation Prevention	○	00 01	Not Available Available	
93	K9,KA	Not Prepared	-	-	Not Used	
94	L1	Setting Position of Motion Sensor	○	00 01 02 03	A B - D	
95	L2	Not Prepared	-	-	Not Used	
96	L3	Louver in Power Saving	○	00 01 02 03	LOW MED HIGH OFF	
97	L4	Fan Speed Up when Power Saving Thermo OFF	○	00 01	Not Available Available	

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	Setting
98	L5	Louver Availability when Power Saving	○	00 01	Not Available Available	
99	L6~Lb	Not Prepared	-	-	Not Used	
100	P1	Setting Temperature Unit	×	00 01	0.5°C 1°C	
101	P2	Not Prepared	-	-	Not Used	
102	P3	Sensor Temperature	×	00 01 02 03	Inlet Outlet Controller Thermo Remote Sensor	
103	P4	Display of Sensor Temperature	×	00 01	Not Available Available	
104	P5	Setting Temperature when Operation Mode is FAN	×	00 01	Display Not Available	
105	P6	Select Power Saving Button	×	00 01	Available Not Available	
106	P7	Menu Screen Transition Prohibited	×	00 01	Not Available Available	
107	P8	Not Prepared	-	-	Not Used	
108	P9	Not Prepared	-	-	Not Used	
109	PA	Daylight Saving Time	×	00 01	1 hr 2 hrs	
110	PB~PC	Not Prepared	-	-	Not Used	

- 1: The "02", "03", "04" settings may not be available depending on the type of indoor unit. When connecting multiple indoor units, do separate settings.
- 2: If Duct type models, 00: Increasing fan speed 1 (standard), 01: Increasing fan speed 2 (high static pressure), 02: Standard (low static pressure).
- 3: When the Thermistor for the Controller is selected:
 - 00: Control by the Thermistor for the Indoor Inlet.
 - 01: Control by the Thermistor for the Controller.
 - 02: Control by the Average Value of the Thermistor for the Indoor Inlet and the Thermistor for the Controller.
 When the Remote Sensor is connected:
 - 00: Control by the Average Value of the Thermistor for the Indoor Inlet and the Remote Sensor.
 - 01: Control by the Remote Sensor.
 - 02: Control by the Average Value of the Thermistor for the Indoor Inlet and the Remote Sensor.
- 4: E1 to E4: Setting for the total heat exchanger.
- 5: If the set temperature is changed and kept within the set time at "F4", the temperature is automatically changed to "F5" and "F6". (If the set temperature is out of range at "F5" and "F6", it is applied within the upper and lower limits for the set temperature.)
- 6: Applicable to the fan, cooling and dry operation modes.
- 7: Applicable to the heating operation mode.
- 8: Operation is stopped by pressing the "⏻" (On/Off) switch for three seconds.
- 9: "01" is available only when one controller is used. Do not use this setting when two (primary-secondary) controllers are used.
- 10: The sensor value at "C8" will be indicated. When the thermistor for the controller is used, the average value of the thermistor for the controller and the thermistor for the indoor inlet will be indicated.
- 11: When the unit is restarted by the controller, the temperature automatically changes to the setting temperature of "F5" or "F6".

NOTE:

1. After at least three minutes from power ON, change the optional setting.
2. When changing the "CF" setting (change of louver swing angle), restore the power supply or allow the louver to make one complete swing fully in the auto-swing mode to apply the optional setting.
3. The optional settings may be different according to the indoor and outdoor unit models. Check to ensure that the unit has the optional setting.
4. Record the setting conditions for each optional setting in the "Setting" column of the table below.
5. The above optional functions marked with an "X" at the individual setting can change the condition only when "All Rooms" is set.

INSTALLATION

Table B Input and Output Number Display and Connectors

Input Number Display Input/Output Indication	Port	Factory Setting		Setting
		Setting Item	Indication	
Input 1	CN3 1-2	Remote ON/OFF 1 (Level)	03	
Input 2	CN3 2-3	Prohibiting Remote Control after Manual Stoppage	06	
Output 1	CN7 1-2	Operation	01	
Output 2	CN7 1-3	Alarm	02	
Output 3	CN8 1-2	Thermo-ON for Heating	06	

Table C Input and Output Settings and Display Codes

Indication	Input	Output
00	Not set	Not set
01	Room Thermostat (for Cooling)	Operation
02	Room Thermostat (for Heating)	Alarm
03	Remote ON/OFF 1 (Level)	Cooling
04	Remote ON/OFF 2 (Operation)	Thermo-ON for Cooling
05	Remote ON/OFF 2 (Stoppage)	Heating
06	Forbidding Remote Control after Manual Stoppage	Thermo-ON for Heating
07	Remote Cooling / Heating Change	Total Heat Exchanger

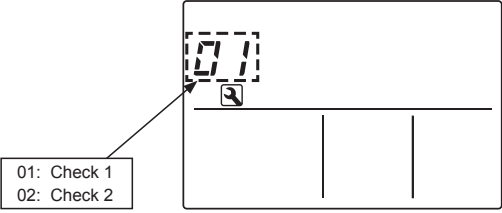
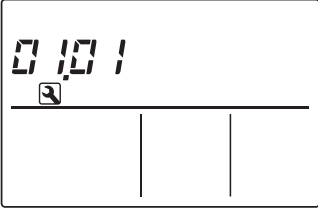
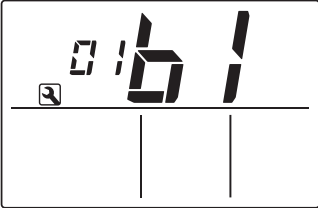
NOTE:

- * After at least three minutes from power ON, change the optional setting.
- * Do not set the elevating grille for the total heat exchanger.
- * Record the setting conditions for each input and output in the "Setting" column of the table.

7. Check Mode

Check 1: Sensor condition of the air conditioner will be monitored and indicated.

Check 2: Sensor data of the air conditioner prior to alarm occurrence will be indicated.

<p>(1) Press and hold “▽”, “△” for “Temp” and “Fan” simultaneously for at least three seconds during the normal mode.</p>	
<p>(2) Select the “Check” mode by pressing “▽” or “△” for “Temp” and press “Fan”.</p>	
<p>(3) Select the indoor unit by pressing “▽” or “△” for “Temp” and press “Fan”.</p>	
<p>(4) Press “▽” or “△” for “Temp” and select the item.</p>	
<p>(5) Press “▽” or “△” for “Temp” simultaneously to return to the normal mode.</p>	

NOTE:

The “check” items are different for each indoor unit type. Check the service manual for the indoor unit to be used for the detailed information.

1.4.3 Wireless Controller

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Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc. or York.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.


Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. and York. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

Safety Messages

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system, including this controller, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the wireless controller at a distance of at least three feet (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.

- If the wired controller is installed in a location where electromagnetic radiation is generated, make sure that the wired controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35° to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- If the remote sensors are not used with this controller, then do not install this controller...
 - In a room where there is no thermostat.
 - Where the unit is exposed to direct sunshine or direct light.
 - Where the unit will be in close proximity to a heat source.
 - Where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - In areas with poor air circulation and ventilation.
- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Only use electrical protection equipment and tools suited for this installation.
- Insulate the wired controller against moisture and temperature extremes.
- Use specified cables between units and the controller.
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.

INSTALLATION

- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

WARNING

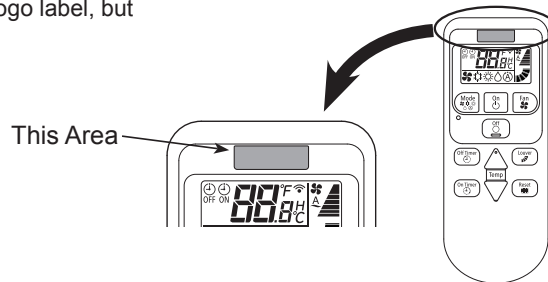
- Do not turn ON the power source, unless the preparations for the test run are completed.

NOTICE

- Read this manual together with the installation and maintenance manual of the indoor unit.

Brand Label

NOTE: Either the York or the Hitachi logo label, but not both, will be shipped with the unit.



1. Before Installation and Operation

This packing contains the following parts. Check the contents and the number of the parts.

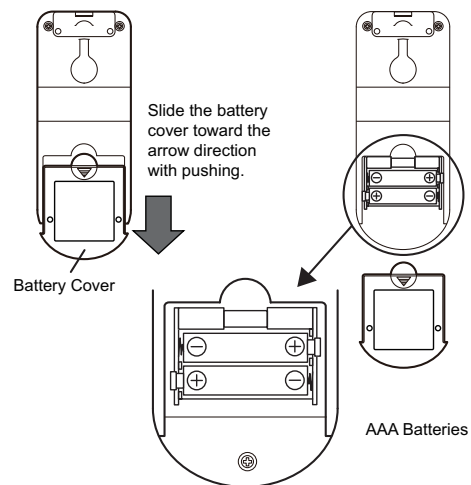
Name	Qty.	Remark
Wireless Controller	1	For Operation Control
Holding Bracket	1	For Controller
Battery (AAA/ 1.5V Dry Cell)	2	For Power Source of Controller
Screw	2	For Fixing "Holding Bracket" onto Wall
Brand Label	1	HITACHI, YORK

2. Setting Batteries

Set the batteries (AAA/1.5V × 2) for the controller as follows.

1. Remove the battery cover by sliding it toward the arrow direction part of the cover as shown at right.
2. Set the batteries. (Insert the batteries according to the marks of + and - on the case.)

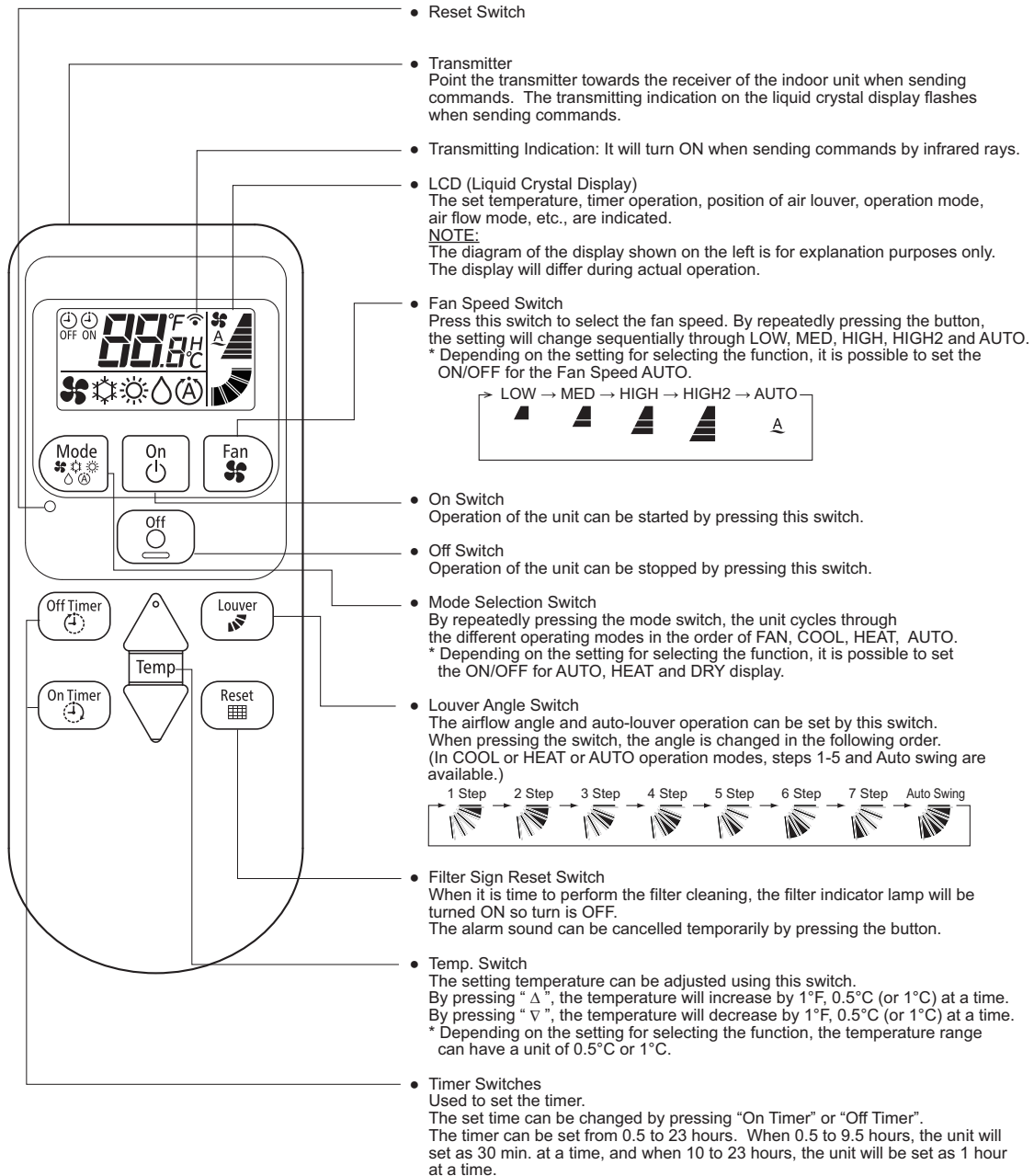
ATTENTION:
Do not press the "On" and "On Timer" switches until the preparation for the Test Run is completed.



3. Name of Parts

Controller:

- This controller is used to send commands about the operation mode and timer settings for the indoor unit. Point the transmitter of the controller toward the receiver of the indoor unit and press the button for the required operation so that commands (by infrared beam) are sent to the indoor unit.
- The distance for transmitting is approximately 20 feet (6 meters), maximum. (The capable distance for transmitting will get shorter if the angle of transmission is not vertical to the receiver or an electronic type light is used in the room.)
- Use the combination of the receiver kit and the indoor unit which are supported by this controller.



NOTE:

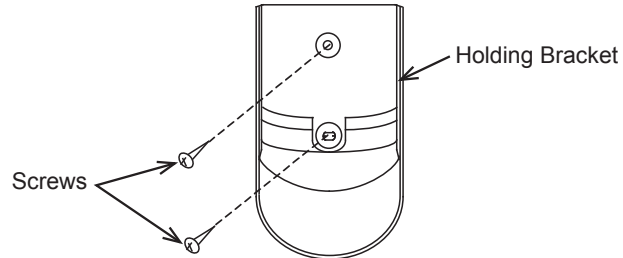
When the wireless controller is prohibited by central controller, this function is disabled even though the indoor unit is set with the wireless controller and the buzzer sounds.

4. Installation Method

When installing the wireless controller onto a wall or a pillar, fix firmly the holding bracket onto the wall and attach the controller where the receiver can receive the commands.


ATTENTION:

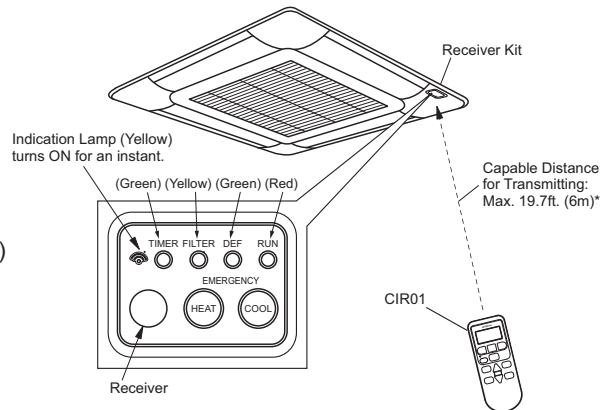
Maintain a distance more than 12 inches (31 cm) away from power cables.



5. Sending Commands from Controller

The operation commands are sent by pressing each button facing the transmitter of the controller toward the receiver of the receiver kit.

1. When the commands are sent, the indication “” on the LCD of the controller flashes once.
2. When the receiver kit receives the commands, the indication light (yellow) on the receiver kit turns ON for an instant, and the buzzer sounds.

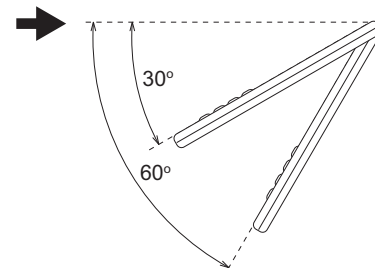


ATTENTION:

* The capable distance for transmitting using the wireless remote controller is maximum 20 feet (6 meters). (The distance may differ depending on the type of a receiver. Check the receiver kit, or refer to the Operation Manual supplied with the indoor unit.) The distance will get shorter if the angle of transmission is not vertical to the receiver or an electronic type light is used in the room.

Liquid Crystal Display (LCD) Indication

When viewed from certain angles, the LCD can be difficult to read. The viewing angle will range from an optimal angle of 60° down to 30°, as shown in the diagram at right. If the viewing angle is below 30°, those readings not displayed appear slightly faded so that it makes for a difficult read. It is a mechanical fault with of this LCD, which is not considered an irregularity.



6. Optional Function Setting

The display range of the wireless controller can be set, following the function to set the indoor unit.

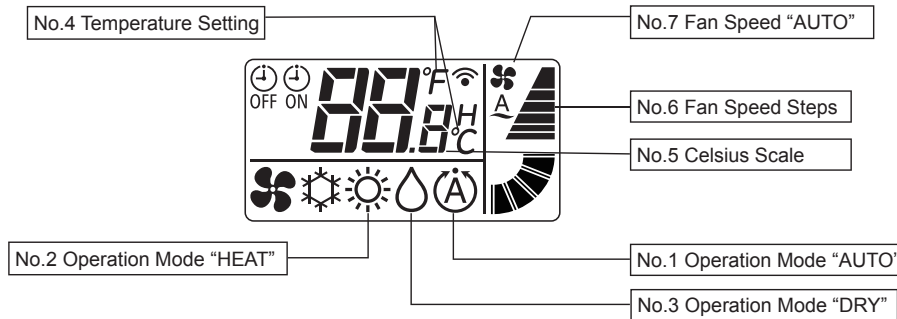
ATTENTION:

The settings cannot operate correctly even if the functions which cannot set the indoor unit, are set with the wireless controller. Concerning the functions which can set the indoor unit, refer to the operation manual of the indoor unit.

Buttons		"⏻ On" Buttons	
	1	Operation Mode "AUTO"	Display / <u>Non-display</u>
	2	Operation Mode "HEAT"	<u>Display</u> / Non-display
	3	Operation Mode "DRY"	<u>Display</u> / Non-display
	4	Temperature Setting	°C / °F
	5	Celsius Scale	1°C / <u>0.5°C</u>
	6	Fan Speed Levels	3 steps / <u>4 steps</u> / 6 steps
	7	Fan Speed "AUTO"	<u>Display</u> / Non-display

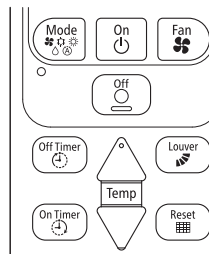
NOTE: The selected items are set when restoring settings.

Press the "○ Off" switch to exit the function selection.



■ Optional Function Setting Procedure

1. Press both "Off Timer" and "Filter Sign Reset" for three seconds.



2. If the current setting is "Non-display", the selected item will flash 0.5 seconds, then it will turn OFF. If the setting is "Display", it will light continuously.
3. The setting content "Display" or "Non-display" can be changed by pressing the "⏻ On" button.
4. Press "∇" to change the item number in ascending order. (No. → 1 → 2 → 3 ... 7 →)
Press "Δ" to change the item number in descending order. (No. → 1 → 7 → 6 ... 2 →)
5. Select the item number with "∇" or "Δ", change the setting content by pressing "⏻ On" button and finally exit the optional function setting by pressing the "○ Off" button to perform the reset.

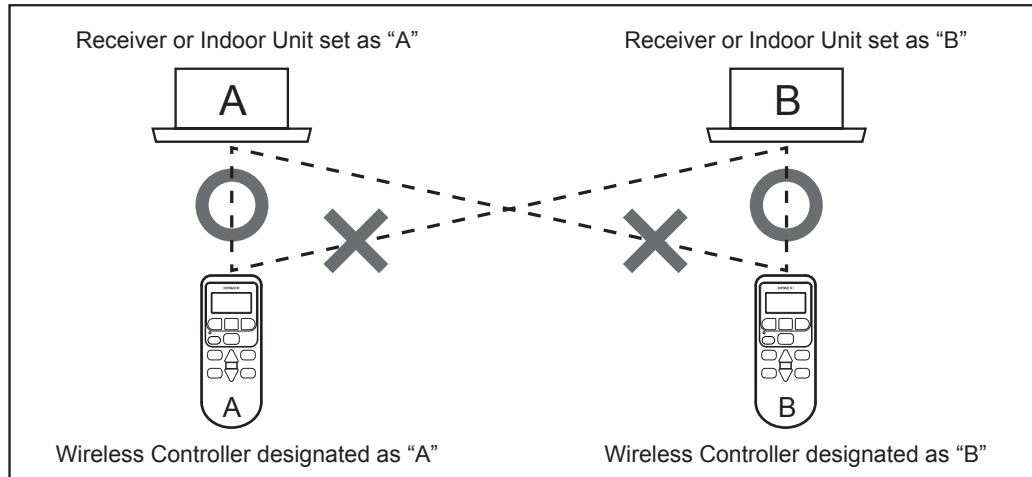
NOTES:

1. The optional function setting will automatically end and reset if no operation is performed within 60 seconds after it is displayed.
2. The setting will be recorded each time the "⏻ On" button is pressed.

7. Identifying Indoor Units Installed Side by Side Operation

• Purpose

This function is used when operating several receivers or indoor units side by side, to prevent a malfunction because of receiving incorrect signals from the wireless remote controllers used in other areas. Only the communication between the paired setting is possible, and four pairs (A, B, C, D) are available. For example, the receiver designated "A" can only receive signals from the wireless controller designated as "A". It cannot receive signals from a wireless controller set as B, C or D.



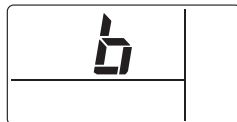
Refer to the installation and maintenance or the Operation Manual for each receiver kit or indoor unit setting. Depending on the type of the receiver kit or the indoor unit, only settings A, and B are available and not C or D. In that case, set the wireless controller as A or B also.

• Procedures for this function

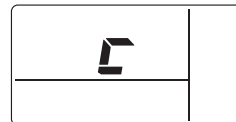
1. Press both "On Timer" and "Filter Sign Reset" for three seconds.
2. The current value set for this function will be displayed (A, B, C or D).



A Mode (A)



B Mode (b)



C Mode (c)



D Mode (d)

3. Press "▽" to change the setting in ascending order. ($\Rightarrow A \rightarrow B \rightarrow C \rightarrow D \rightarrow$)
Press "△" to change the setting in descending order. ($\leftarrow A \leftarrow B \leftarrow C \leftarrow D \leftarrow$)

NOTE:


The setting will be recorded each time "⏻ On" switch is pressed.

4. Press the "○ Off" button to exit this function and reset.

NOTE:

If no operation is performed for 30 seconds after this function is displayed, it will automatically end and reset.

8. Test Run with the Controller



- Turn ON the power supply for the indoor units.
The “” light (yellow) on the receiver kit of the indoor unit flashes (0.25 seconds ON ↔ 0.25 seconds OFF), and then turns OFF. While the light is flashing, the unit will not operate because it is initializing.
- Set the Test Run mode by pressing the “Louver” button and “On Timer” button for three seconds at OFF. The LCD will display as shown at right.
- Set the operation mode by pressing the “Mode” button.



Test Run timer mode.



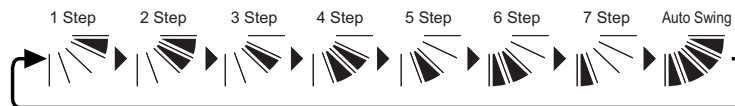
Unit is running under Test mode.


- Operate the Test Run by pressing the “ On” button. When the commands are received by the indoor unit, the “” light (yellow) of the receiver kit will come on briefly. Check that commands are received well and the operation mode selected in item number three above) is set correctly. In the Test Run mode, the red light (RUN) on the receiver kit is turned ON and the green light (TIMER) flashes (0.5 seconds ON ↔ 0.5 seconds OFF). Then set the OFF timer for two hours.
- Adjust the angle of the air louver as follows.
Verify that commands are received correctly by using the light and buzzer of the receiver kit. Use the wireless remote controller pointing the transmitter toward the receiver.

ATTENTION:

The air louver has a control mechanism for the auto-swing function. Do not attempt to manually move the louver by force.

- Select the FAN mode by pressing the “Mode” switch.
- Set the louver angle by pressing the “Louver” switch.
The louver direction is changed as follows.



- Halt the Test Run.
 - Test Run is halted automatically after two hours.
 - Test Run is halted by pressing “ OFF” button.
After Test Run is finished, check that the red light (RUN) and the green light (TIMER) are turned OFF.

1.4.4 Infrared (IR) Receiver Kit (for 4-Way Cassette Type)

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- 8. Alarm Indication 1-416

Installation Manual for Infrared (IR) Receiver Kit (for 4-Way Cassette Type)

Model	C4IRK01
Applicable Indoor Unit Model	4-Way Cassette Type
Applicable Wireless Controller	CIR01

IMPORTANT:

READ AND UNDERSTAND THIS MANUAL BEFORE USING THIS INFRARED (IR) RECEIVER KIT.
KEEP THIS MANUAL FOR FUTURE REFERENCE.

Important Notice



- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products.
As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc. or York.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, Warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival


1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. and York. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
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- This system, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least 3 ft. (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.
- If the controller is installed in a location where electromagnetic radiation is generated, make sure that the controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35 to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions**⚠ WARNING**

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Only use electrical protection equipment and tools suited for this installation.
- Insulate the infrared (IR) receiver kit against moisture and temperature extremes.
- Use specified cables between units and the infrared (IR) receiver kit.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the infrared (IR) receiver kit, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the infrared (IR) receiver kit as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

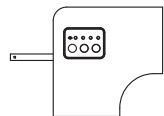

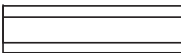

INSTALLATION

NOTICE

- C4IRK01 is only available to be used in combination with the wireless controller CIR01 and the indoor unit 4-way cassette type models.

2. Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the IR receiver kit.

No.	Accessory	Qty.	Remarks
①	IR Receiver Kit C4IRK01 	1	with Connecting Cable
②	Connecting Cable 	1	-
③	Wiring Cover 	1	for Protection of Connecting Cable
④	Plastic Band 	3	for Clamping Wiring Cover and Connecting Cable
⑤	Installation Manual	1	-
⑥	Operation Manual	1	-

3. Installation

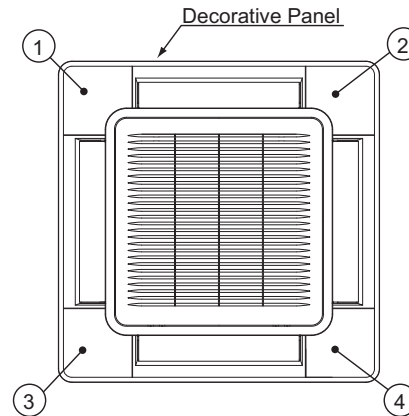
⚠ WARNING

- Turn OFF the power source completely before setting the DIP switches, installation work and electrical wiring work for IR receiver kit.
If not, it may cause an electric shock.

NOTICE

- When the IR receiver kit is installed near ambient lighting, it may not receive a signal from the wireless controller. Therefore, pay particular attention to the installation position of the IR receiver kit.
- Do not run the connecting cable for the IR receiver kit and the power source cable (208/230V) in parallel. It may cause a malfunction of the IR receiver kit.

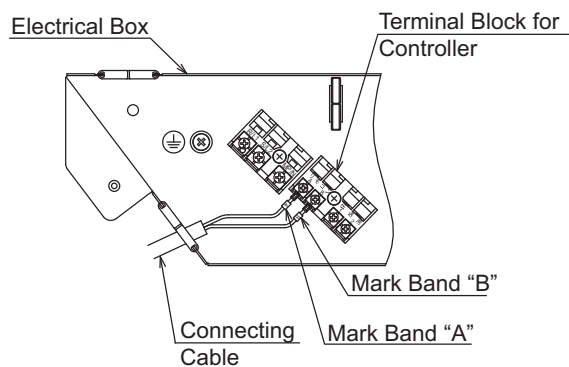
- 1 Perform the installation work for the IR receiver kit while the optional decorative panel is being attached to the indoor unit.
- 2 When the IR receiver kit is attached after the decorative panel is attached to the indoor unit, turn OFF the power source of the indoor unit, and remove the decorative panel. Removing the decorative panel should be performed according to the installation manual for the decorative panel or the service manual.
- 3 This IR receiver kit can be attached to any of four corners: ①, ②, ③ or ④). Determine the attachment location according to the purchaser's request.



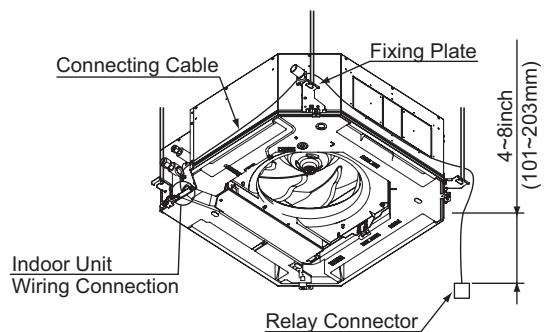
NOTE:

Setting the DIP switch for the IR receiver kit is possible at more than one function. If the optional function selection is required, perform work according to Section 3, "Optional Functions", before the IR receiver kit is attached to the decorative panel.

- 4 Connect the accessory connecting cable to the terminal block. Open the electrical box cover of the indoor unit. Attach the connecting cable to terminals A and B in the electrical box. (There is no polarity with terminals A and B.)



- 5 After attaching the connecting cable to each terminal, take it out to inside the false ceiling or outside of the unit. Connect it to the IR receiver kit. Refer to the "Installation and Maintenance Manual" of the indoor unit for indoor unit wiring instruction. When running the connecting cable, run it to the installation position of the IR receiver kit through the top of the fixing plate for the indoor unit. After running the connecting cable, take the distance (from 4 inches to 8 inches (from 101mm to 203mm) from the indoor unit undersurface to the connecting cable as shown in the figure at the right. After running the connecting cable, clamp the extra length of the connecting cable using the plastic band and store it inside the ceiling.

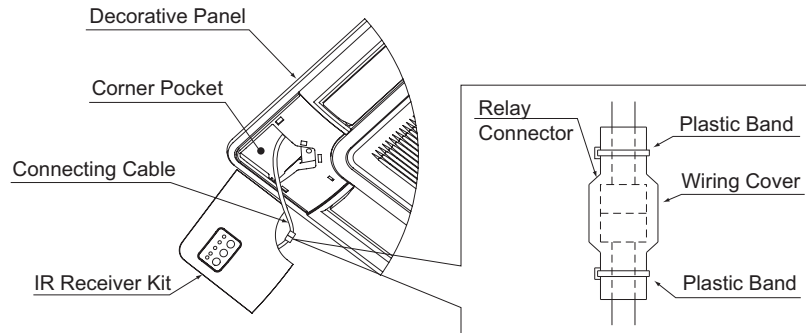


- 6 Attach the decorative panel. Refer to the installation manual for the decorative panel.

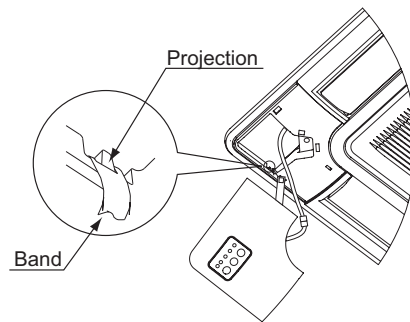
INSTALLATION

7 After the installation work for the decorative panel is completed, attach the IR receiver kit.

- (1) Take the connecting cable out from the corner pocket of the decorative panel. Connect the wiring for the IR receiver kit to the relay connector as shown below. After connecting, cover the relay connector connection with the wiring cover, and attach the wiring cover with the plastic bands.



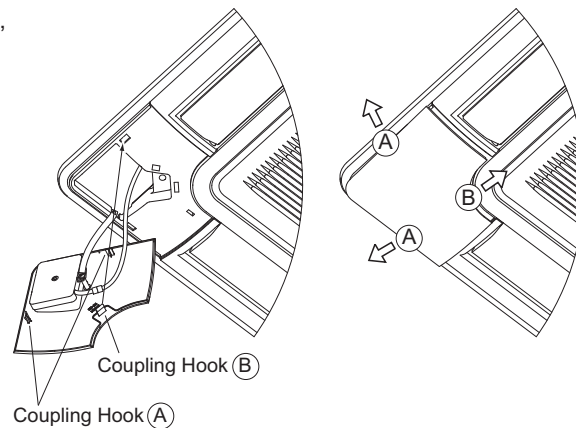
- (2) Affix the band at the rear side of the IR receiver kit onto the projection at the decorative panel as shown in the figure to the right.



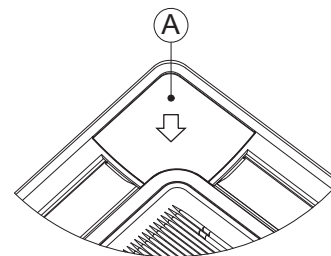
- (3) While pushing the wiring into the corner pocket, insert two coupling hooks at (A) to the square hole of the decorative panel, and push the IR receiver kit in the direction of the arrow (A) shown at the far right. Then, insert the fixing hook at (B) to the square hole of the air panel.

NOTE:

Securely affix the coupling hooks of the IR receiver kit to the decorative panel to avoid damage to the fixing hooks.



- (4) Removing Corner Pocket Cover
The corner pocket covers can be removed pulling the (A) part toward the arrow direction.



8 After the installation work for the IR receiver kit is completed, attach the corner pocket covers (3 parts). For details, refer to the installation manual for the decorative panel.

NOTE:

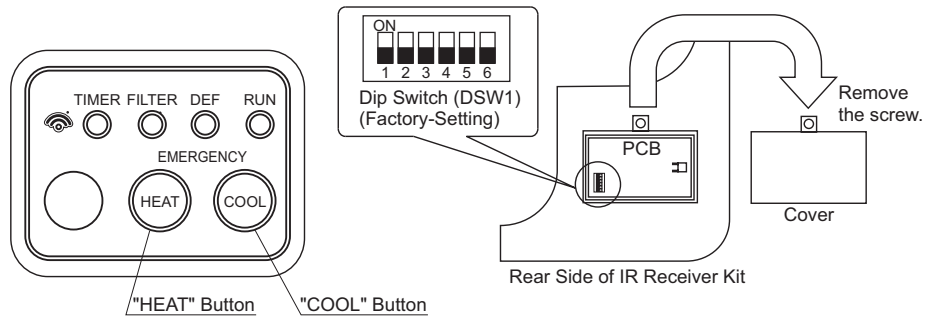
After the IR receiver kit is attached to the decorative panel, the one corner pocket cover (attached with the decorative panel) becomes unnecessary. It was attached with the decorative panel.

4. Optional Functions

WARNING

Turn OFF the power source completely before setting the DIP switch for the IR receiver kit.
Not turning off the power may cause an electric shock.

- 1 The following switches are on the IR receiver kit.



- 2 Emergency Operation Setting

“COOL” and “HEAT” button are used for emergency operation when the batteries for the wireless controller are low.

- (1) “COOL” Button: Press “COOL” so that the cooling operation is started.
Press “COOL” again so that the cooling operation is stopped.
- (2) “HEAT” Button: Press “HEAT” so that the heating operation is started.
Press “HEAT” again so that the heating operation is stopped.

NOTE:

During an emergency operation, a yellow light “” flashes (0.5 second ON/0.5 second OFF).
The temperature set-point and the fan speed for the cooling/heating operation are the same as before starting an emergency operation.

- 3 The DIP switch (DSW1) is for the optional function selection. If the optional function selection is required, set the DIP switch as follows.

Optional Function	DIP Switch Setting (DSW1)						Details
	1	2	3	4	5	6	
Main/Sub Setting	O	X	X	X	X	X	Change main (OFF setting)/ sub (ON setting) wireless controller for a two wireless controller system.
Identification of Indoor Unit	X	O	X	X	X	X	It functions as B Mode (identification of indoor unit) of the wireless controller when it is “ON”.
Invalid Emergency Operation	X	X	X	O	X	X	The switches for emergency operation are invalid.

O: ON
X: OFF

NOTICE

Review the following settings when a function for the IR receiver kit is selected from the wireless controller or the centralized controller.

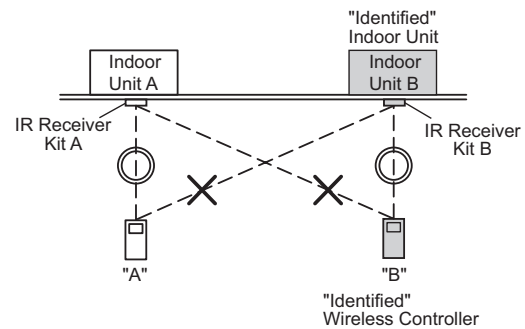
- The cooling lower limit for the temperature set-point and the heating upper limit for the temperature set-point are not available. The setting is available beyond the upper and lower limit for the temperature set-point from the wireless controller.
- The optional function setting “Fixing of Setting Temperature” is not available. When the operation mode is changed from the wireless controller, the indicated temperature on the wired controller becomes the set temperature of the wireless controller.

5. Identifying Indoor Units Installed for a Side-by-Side Operation

⚠ WARNING

Turn OFF the power source completely before setting the DIP switch for the IR receiver kit. Not doing so may cause an electric shock.

When two indoor units are installed side by side, the commands from the wireless controller may be received by both indoor units. The function, "Identifying of Indoor Units Installed Side by Side" enables operation of the individual unit correctly without interfering with the other unit's operation. As shown in the figure at the right, the indoor units of A and B are set side by side. In this instance, unit B is set as "Identifying Indoor Units Installed Side by Side".



< Setting of Identifying of Indoor Units Installed Side by Side >

- 1 IR Receiver Kit Setting
Set the Number 2 pin of the IR receiver kit DIP switch (DSW1) at the "Identified" Unit B "ON" side.
- 2 Wireless Controller
Set the wireless controller according to the Installation and Maintenance Manual for the Wireless Controller.

< Cancellation of Identifying of Indoor Units Installed Side by Side >

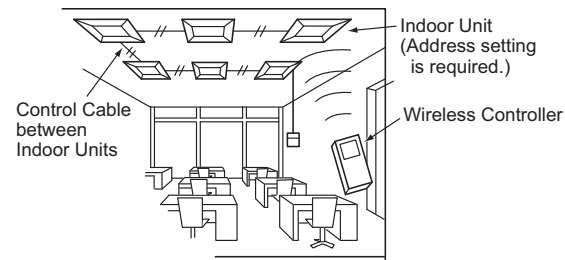
- 1 IR Receiver Kit Setting
Set the Number 2 pin of the IR receiver kit DIP switch (DSW1) "OFF" side for cancellation.
- 2 Wireless Controller
Cancel the wireless controller setting according to the Installation and Maintenance Manual for the Wireless Controller.

6. Simultaneous Operation

Up to 16 indoor units can be simultaneously controlled using one wireless controller. When multiple indoor units are installed in a large room, all the indoor units can be controlled to start/stop with only one wireless controller.

NOTE:

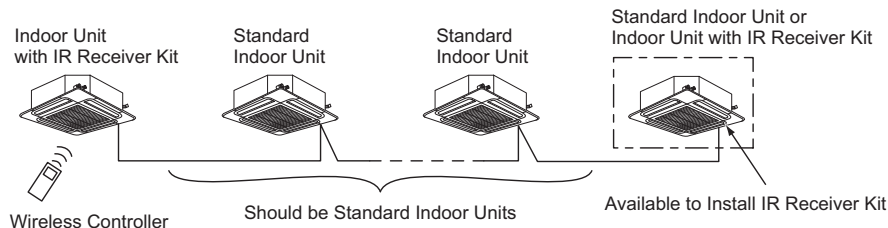
Do not apply a simultaneous operation for indoor units installed separately in different rooms. Some units may be left without turning OFF the power source.



Control Example of Simultaneous Operation of Multiple Units

< Installation of IR Receiver Kit >

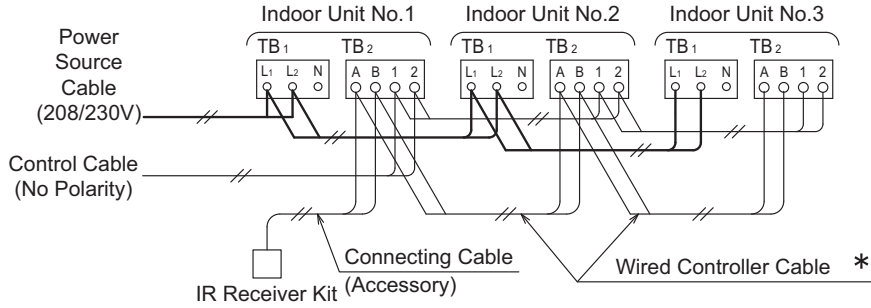
In an instance of simultaneous operation of multiple (up to 16) indoor units by the wireless controller, install the IR receiver kit only to the unit to be operated. Other units should be standard units without the IR receiver kit. If multiple IR receiver kits are required to be installed, two IR receiver kits are the maximum.



< Electrical Wiring Connecting and Setting >

- 1** Connection between Indoor Units
 Perform the connection work as shown below.

< Power Source Cable 208/230V >



* For twin, triple or quad combinations, a communication cable for the wireless controller is not required.

Use the field-supplied communication cable (AWG18) for the wired controller cable. The total length should be within 1640ft (500m). If the total length is less than 98ft (30m), AWG22 cables can be used.

- 2** Do not run the connected wireless controller cable and the power source cable (208/230V) in parallel in the indoor units.
 Stabilize the cable with plastic bands. Along with the wiring outside the indoor units, the control cables should not run with the power source cable (208/230V). Keep a separation of more than 12 inches, or run the cable through a grounded metal conduit.

- 3** Unit Number Setting
 The indoor unit numbers are set by the auto-address function. Therefore, an indoor unit number setting is not required. If the indoor unit number is fixed, set the unit number of all indoor units respectively and serially. It is recommended that the unit number settings begin with "1". The setting is set not to overlap the unit number.

Unit Number Setting

<p>DSW6 (Tens Digit)</p> <div style="text-align: center;"> </div>	<p>RSW1 (Units Digit)</p> <p style="font-size: small;">Setting Position Set by inserting slotted screwdriver into the groove.</p> <div style="text-align: center;"> </div>	<p>Ex.: Set for No. 16 Unit</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>DSW6</p> <p>Set No.1 pin ON.</p> </div> <div style="text-align: center;"> <p>RSW1</p> <p>Set at "6".</p> </div> </div>
Factory setting for DSW6 and RSW1 were set to "0". Max. 63 units are available for setting.		

7. Test Run for Wireless Controller (CIR01)

After all installations are completed, a test run should be performed.

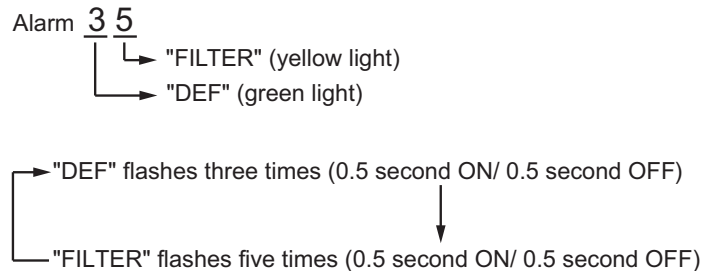
- (1) Perform the test run according to the installation manual for the wireless controller.
- (2) The test run for the wireless controller will take two hours to complete. If the TIMER indicator (green) is flashing (0.5 second ON/0.5 second OFF) after two hours, an alarm may occur. Operate the indoor unit and check for abnormality.

8. Alarm Indication

NOTICE

- If a malfunction occurs, such as a safety device actuation, during the test run or the normal operation, "RUN" (red light) flashes (0.5 second ON/0.5 second OFF).
- The alarm codes are indicated by the flashing of "DEF" (green light) and "FILTER" (yellow light).
 The first LED light is green. The number of times this LED flashes (0.5 second ON and OFF) will tell you the "DEF" Alarm Code.
 The second LED light is yellow. The number of times this LED flashes (0.5 second ON and OFF) will tell you the "FILTER" Alarm Code.

< Example >



These signals are repeated until the alarm is reset.

- "RUN" (red light) flashing (1 second ON/1 second OFF) indicates an abnormal transmission (connector loose, connector disconnection, broken wire or incorrect wiring, or something similar) between the indoor unit and the IR receiver kit.
- When the IR receiver kit is connected to multiple indoor units, the alarm code is indicated for each indoor unit in order.

< Alarm Code Table >

Further details for alarm codes can be found in the "Installation and Maintenance Manual" for the indoor unit.

1.4.5 Infrared (IR) Receiver Kit (for 1-Way Cassette Type)

- Table of Contents -

- 1. Safety Summary 1-419
- 2. Factory-Supplied Accessories..... 1-422
- 3. Installation..... 1-423
- 4. Optional Functions 1-426
- 5. Identifying Indoor Units Installed for a Side-by-Side Operation 1-427
- 6. Simultaneous Operation 1-427
- 7. Test Run for Wireless Controller (CIR01)..... 1-429
- 8. Alarm Indication 1-429

Installation Manual for Infrared (IR) Receiver Kit (for 1-Way Cassette Type)

Model	C11RK01
Applicable Indoor Unit Model	1-Way Cassette Type
Applicable Wireless Controller	CIR01

IMPORTANT:

READ AND UNDERSTAND THIS MANUAL BEFORE USING THIS INFRARED (IR) RECEIVER KIT.
KEEP THIS MANUAL FOR FUTURE REFERENCE.

Important Notice



- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products.
As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc. or York.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, Warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival


1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. and York. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	---

- This system, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least 3 ft. (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.
- If the controller is installed in a location where electromagnetic radiation is generated, make sure that the controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35 to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions**⚠ WARNING**

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Only use electrical protection equipment and tools suited for this installation.
- Insulate the infrared (IR) receiver kit against moisture and temperature extremes.
- Use specified cables between units and the infrared (IR) receiver kit.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the infrared (IR) receiver kit, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the infrared (IR) receiver kit as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

INSTALLATION

CAUTION

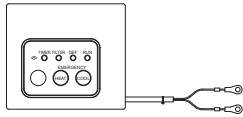


- Do not apply excessive force when removing the plastic cover. Otherwise, it may cause damage to the fixing hooks of the plastic cover, or may result in injury.
- Hold the optional decorative panel securely to prevent it from falling when it is removed. If it falls, there may be panel damage or injury.

NOTICE

- To ensure correct performance, this manual together with the “Installation and Maintenance Manual” for the indoor unit and the wireless controller. Forward this information to the building owner and request that they maintain all the equipment manuals.
- C1IRK01 is only available to be used in combination with the wireless controller CIR01 and the indoor unit 1-way cassette type models.

2. Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the IR receiver kit.

No.	Accessory	Qty	Remarks
①	IR Receiver Kit C1IRK01 	1	with Connecting Cable
②	Cable Clamp 	3	for Fixing Cable
③	Plastic Band 	3	for Fixing Cable
④	Installation Manual	1	-
⑤	Operation Manual	1	-

3. Installation

⚠ WARNING

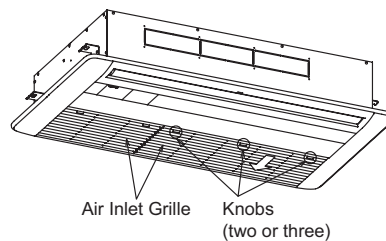
- Turn OFF the power source completely before setting the DIP switch, installation work and electrical wiring work for IR receiver kit.
If not, it may cause an electric shock.
- Perform securely the installation work referring to this installation manual.
If the installation is not completed, it may cause injury by falling down the IR receiver kit.
- Do not install the IR receiver kit where the flammable gases may generate or enter.
It may cause heat generation or a fire.
- Perform securely the electrical wiring work.
If the electrical work is not completed, heat generation at the connection, a fire or an electric shock may occur.
- Make sure that the electrical wires are securely fixed in order not to apply an external force to the terminal connections of the wirings. Not doing so may cause heat generation or a fire.

NOTICE

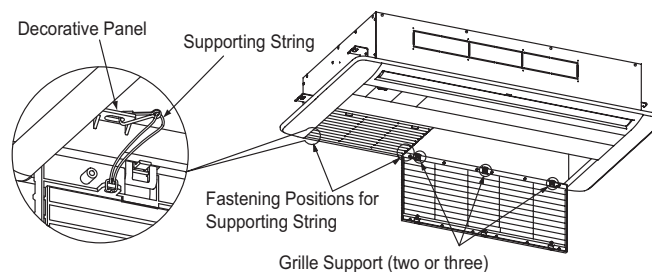
- When the IR receiver kit is near ambient lighting, it may not receive a signal from the wireless controller. Therefore, pay particular attention to the installation position of the IR receiver kit.
- Do not run the connecting cable for the IR receiver kit and the power source cable (208/230V) in parallel. It may cause a malfunction of the IR receiver kit.
- When the IR receiver kit is installed with the indoor units' installation, start from procedure [3](#).
- When the IR receiver kit is installed after the indoor units' installation, be sure to turn OFF the power source completely before starting installation.

[1](#) Air Inlet Grille Removal

- (1) The air inlet grille can be opened by pushing the knobs of the air inlet grille backward.

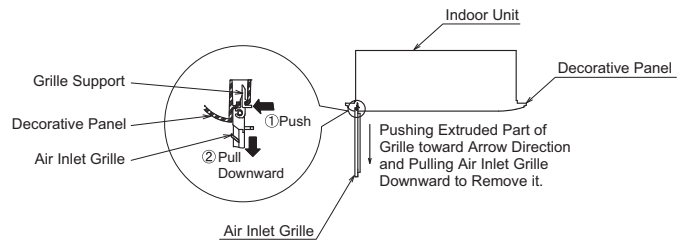


- (2) Remove the hook of the supporting string from the decorative panel.



INSTALLATION

- (3) Open the air inlet grille. The air inlet grille can be removed by pushing the extruded part of the grille in the direction of the arrow, and pulling the air inlet grille downward as shown in the figure at the right.



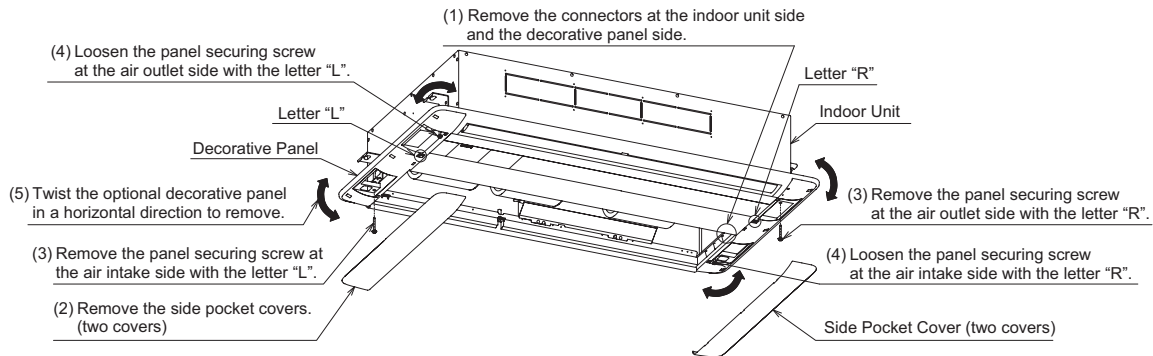
NOTICE

Be careful not to drop the air inlet grille or air filter when removing them.

2 Optional Decorative Panel Removal

Follow the procedures from (1) to (5).

At least two (2) people are required for removing.



CAUTION

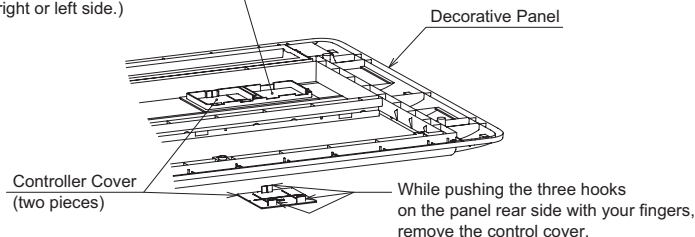
- Do not apply excessive force removing the side pocket covers. Doing so may cause damage of the coupling hooks of the side pocket covers, or may result in injury.
- Hold the decorative panel securely to prevent it from falling when it is removed.

3 Controller Cover Removal

CAUTION

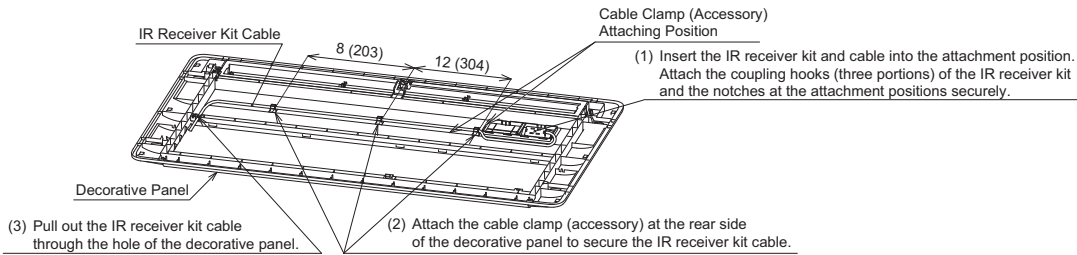
Do not apply excessive force when removing the controller cover. Doing so cause of damage of the coupling hooks of the controller cover, or may result in injury.

Attaching Position of Wireless Controller IR Receiver Kit
(Can be fixed on either right or left side.)



4 Follow the procedures from (1) to (3) to attach the IR receiver kit on the decorative panel.

Unit: inch (mm)

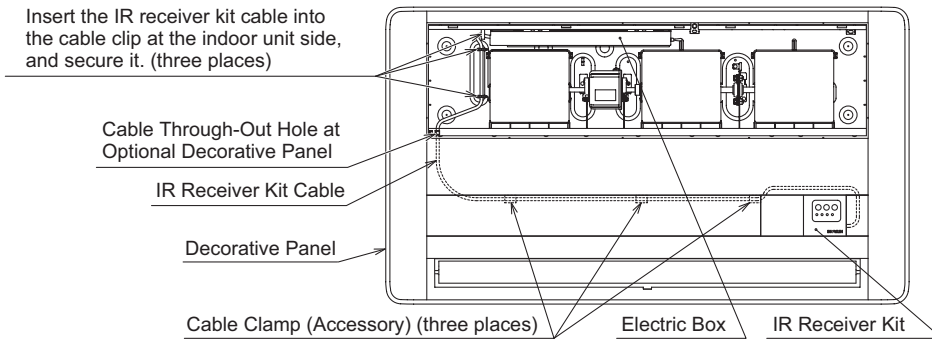


NOTICE

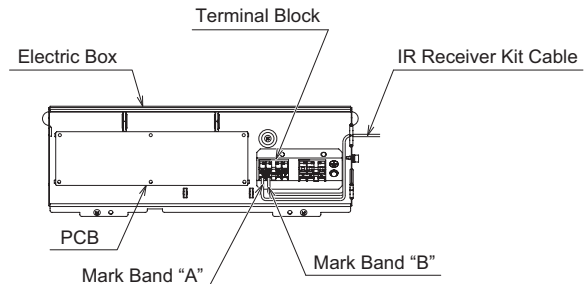
- Pay particular attention to the installation direction of the IR receiver kit. Number of coupling hooks of the IR receiver should match the notches at the installation position.
- Check to ensure that the IR receiver kit is securely installed.
- Be sure to attach the cable clamp (accessory) according to the required position. If not, condensation may occur because of a space between decorative panel and the indoor unit.

5 Install the decorative panel to the indoor unit according to the "Installation and Maintenance Manual" for the decorative panel.

6 Secure the IR receiver kit cable with the cable clamp of the indoor unit.



7 Remove the electric box cover of the indoor unit. Connect the IR receiver kit cable to the terminal blocks (A, B) in the electric box as shown at the right. (Terminals A and B have no polarity.)

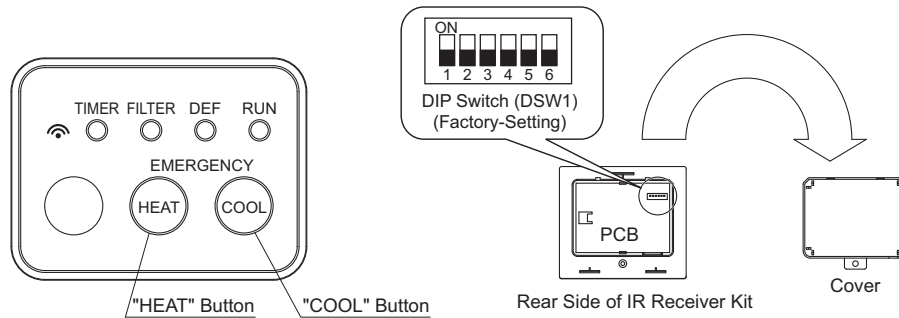


4. Optional Functions

⚠ WARNING

Turn OFF the power source completely before setting the DIP switch for the IR receiver kit. Not doing so may result in an electric shock.

1 The following switches are on the IR receiver kit.



2 Emergency Operation Setting

"COOL" and "HEAT" button are used for an emergency operation when the batteries for the wireless controller are low.

- (1) "COOL" Button: Press "COOL" so that the cooling operation is started.
Press "COOL" again so that the cooling operation is stopped.
- (2) "HEAT" Button: Press "HEAT" so that the heating operation is started.
Press "HEAT" again so that the heating operation is stopped.

NOTE:

During an emergency operation, a yellow light "📶" flashes (0.5 second ON/0.5 second OFF).
The temperature set-point and the fan speed for the cooling/heating operation are the same as before starting an emergency operation.

3 The DIP switch (DSW1) is for the optional function selection. If the optional function selection is required, set the DIP switch as follows.

Optional Function	DIP Switch Setting (DSW1)						Details
	1	2	3	4	5	6	
Main/Sub Setting	O	X	X	X	X	X	Change main (OFF setting)/ sub (ON setting) wireless controller for a two wireless controller system.
Identification of Indoor Unit	X	O	X	X	X	X	It functions as B Mode (identification of indoor unit) of the wireless controller when it "ON".
Invalid Emergency Operation	X	X	X	O	X	X	The switches for emergency operation are invalid.

O: ON
X: OFF

NOTICE

Review the following settings when the function for the IR receiver kit is selected from the wireless controller or the centralized controller.

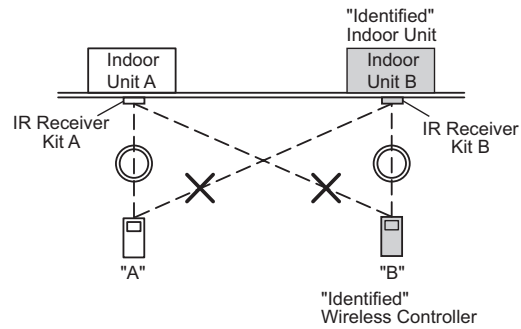
- The cooling lower limit for the temperature set-point and the heating upper limit for temperature set-point are not available. The setting is available beyond the upper and lower limit for temperature set-point from the wireless controller.
- The optional function setting "Fixing of Setting Temperature" is not available. When the operation mode is changed from the wireless controller, the indicated temperature on the wired controller becomes the set temperature of the wireless controller.

5. Identifying Indoor Units Installed for a Side-by-Side Operation

⚠ WARNING

Turn OFF the power source completely before setting the DIP switch for the IR receiver kit. Not doing so may cause an electric shock.

When two indoor units are installed side by side, the commands from the wireless controller may be received by both indoor units. The function, "Identifying of Indoor Units Installed Side by Side" enables operation of the individual unit correctly without interfering with the other unit's operation. As shown in the figure at the right, the indoor units of A and B are set side by side. In this instance, unit B is set as "Identifying Indoor Units Installed Side by Side".



< Setting of Identifying of Indoor Units Installed Side by Side >

- 1 IR Receiver Kit Setting
Set the Number 2 pin of the IR receiver kit DIP switch (DSW1) at the "Identified" Unit B "ON" side.
- 2 Wireless Controller
Set the wireless controller according to the Installation and Maintenance Manual for the Wireless Controller.

< Cancellation of Identifying of Indoor Units Installed Side by Side >

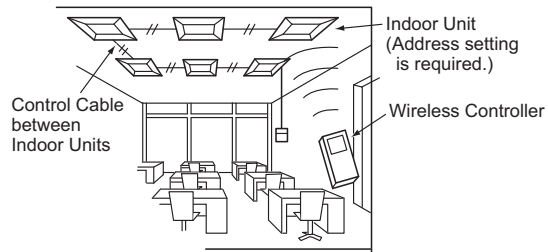
- 1 IR Receiver Kit Setting
Set the Number 2 pin of the IR receiver kit DIP switch (DSW1) "OFF" side for cancellation.
- 2 Wireless Controller
Cancel the wireless controller setting according to the Installation and Maintenance Manual for the Wireless Controller.

5. Simultaneous Operation

Up to 16 indoor units can be simultaneously controlled using one wireless controller. When multiple indoor units are installed in a large room, all the indoor units can be controlled to start/stop with only one wireless controller.

NOTE:

Do not apply a simultaneous operation for indoor units installed separately in different rooms. Some units may be left without turning OFF the power source.

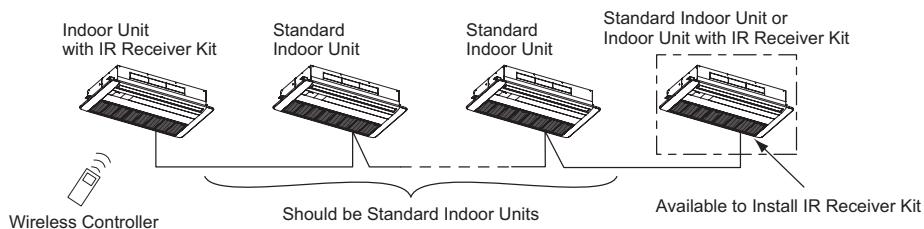


Control Example of Simultaneous Operation of Multiple Units

(The figure represents 4-way cassette type indoor units.)

< Installation of IR Receiver Kit >

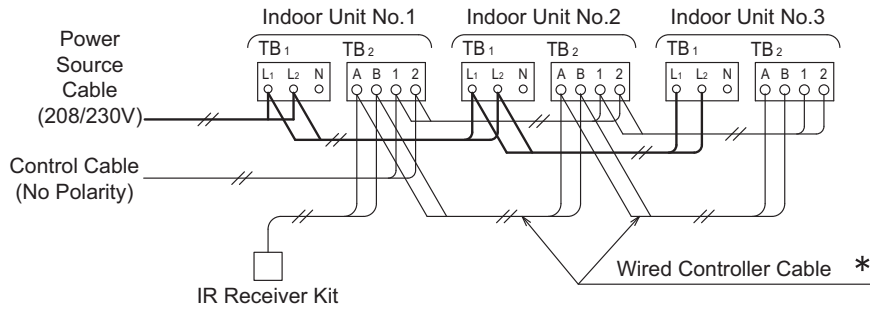
In an instance of simultaneous operation of multiple (up to 16) indoor units by the wireless controller, install the IR receiver kit only to the unit to be operated. Other units should be standard units without the IR receiver kit. If multiple IR receiver kits are required be installed, two IR receiver kits are the maximum.



< Electrical Wiring Connecting and Setting >

- 1 Connection between Indoor Units
Perform the connection work as shown below.

< Power Source Cable 208/230V >



* For twin, triple or quad combinations, a communication cable for the wireless controller is not required.

Use the field-supplied communication cable (AWG18) for the wired controller cable. The total length should be within 1640ft (500m). If the total length is less than 98ft (30m), AWG22 cable can be used.

- 2 Do not run the connected wireless controller cable and the power source cable (208/230V) in parallel in the indoor units.
Stabilize the cable with plastic bands. Along with the wiring outside the indoor units, the control cables should not run with the power source cable (208/230V). Keep a separation of more than 12 inches, or run the cable through a grounded metal conduit and ground the tube end.
- 3 Unit Number Setting
The indoor unit numbers are set by the auto-address function. Therefore, the indoor unit number setting is not required. If the indoor unit number is fixed, set the unit numbers of all indoor units respectively and serially. It is recommended that the unit number settings begin with "1". The setting is set not to overlap the unit number.

Unit Number Setting

DSW6 (Tens Digit)	RSW1 (Units Digit)	Ex.: Set for No. 16 Unit
	<p>Setting Position</p> <p>Set by inserting slotted screwdriver into the groove.</p>	<p>Set No.1 pin ON. Set at "6".</p>
<p>Factory setting for DSW6 and RSW1 were set to "0". Max. 63 units are available for setting.</p>		

7. Test Run for Wireless Controller (CIR01)

After all installations are completed, a test run should be performed.

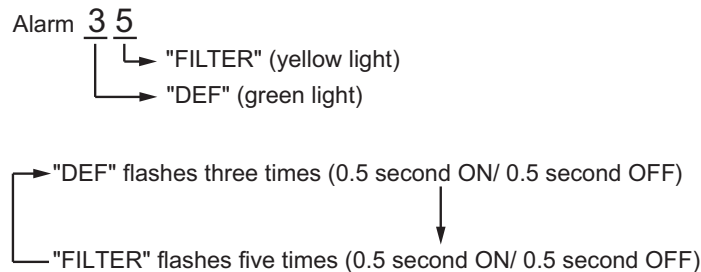
- (1) Perform the test run according to the installation manual for the wireless controller.
- (2) The test run for the wireless controller will take two hours to complete. If the TIMER indicator (green) is flashing (0.5 second ON/0.5 second OFF) after two hours, an alarm may occur. Operate the indoor unit and check for abnormality.

8. Alarm Indication

NOTICE

- If a malfunction occurs such as a safety device actuation during the test run or the normal operation, "RUN" (red light) flashes (0.5 second ON/0.5 second OFF).
- The alarm codes are indicated by the flashing of "DEF" (green light) and "FILTER" (yellow light).
 The first LED light is green. The number of times this LED flashes (0.5 second ON and OFF) will tell you the "DEF" Alarm Code.
 The second LED light is yellow. The number of times this LED flashes (0.5 second ON and OFF) will tell you the "FILTER" Alarm Code.

< Example >



These signals are repeated until the alarm is reset.

- "RUN" (red light) flashing (1 second ON / 1 second OFF) indicates the abnormal transmitting (connector loose, connector disconnection, broken wire or incorrect wiring, or something similar) between the indoor unit and the IR receiver kit.
- When the IR receiver kit is connected to multiple indoor units, the alarm code is indicated for each indoor unit in order.

< Alarm Code Table >

Further details for alarm codes can be found in the "Installation and Maintenance Manual" for the indoor unit.

1.4.6 Infrared (IR) Receiver Kit (for Wall Mount Type and Ducted Type)**- Table of Contents -**

1. Safety Summary	1-432
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5. Setting DIP Switches on Indoor Unit Side.....	1-438
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10. Alarm Indication	1-443

Installation Manual for Infrared (IR) Receiver Kit

Model	CWDIRK01
Applicable Indoor Unit Model	General-Purpose (Ducted, Cassette, Wall Mount, Ceiling Suspended and Floor Type)
Applicable Wireless Controller	CIR01

IMPORTANT:

READ AND UNDERSTAND THIS MANUAL BEFORE USING THIS INFRARED (IR) RECEIVER KIT.
KEEP THIS MANUAL FOR FUTURE REFERENCE.

Important Notice



- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products.
As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc. or York.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, Warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival


1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. and York. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	---

- This system, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least 3 ft. (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.
- If the controller is installed in a location where electromagnetic radiation is generated, make sure that the controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35 to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions**⚠ WARNING**

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions

⚠ WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

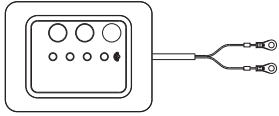




- Only use electrical protection equipment and tools suited for this installation.
- Insulate the infrared (IR) receiver kit against moisture and temperature extremes.
- Use specified cables between units and the infrared (IR) receiver kit.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the infrared (IR) receiver kit, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the infrared (IR) receiver kit as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

NOTICE

- When the IR receiver kit is installed near ambient lighting, it may not receive a signal from the wireless controller. Therefore, pay particular attention to the installation position of the IR receiver kit.
- Do not run the connecting cable for the IR receiver kit and the power source cable (208/230V) in parallel. It may cause a malfunction of the IR receiver kit.
- To ensure correct performance, read this manual together with the “Installation and Maintenance Manual” for the indoor unit and the wireless controller. Forward this information to the building owner and request that they maintain all the equipment manuals.
- CWDIRK01 is for a general-purpose IR receiver kit. It is applied for ducted, cassette, wall mount, ceiling-suspended, and floor type indoor units.

2. Factory-Supplied Accessories

Check to ensure that the following accessories are packed with the IR receiver kit.

No.	Accessory	Qty.	Remarks
①	IR Receiver Kit CWDIRK01 	1	with Connecting Cable
②	Plastic Band 	1	for Clamping Cable
③	Securing Screw 	4	for Installing IR Receiver Kit
④	Securing Screw 	2	for Fixing Cable Clamp
⑤	Cable Clamp 	2	for Clamping Cable

3. Installation

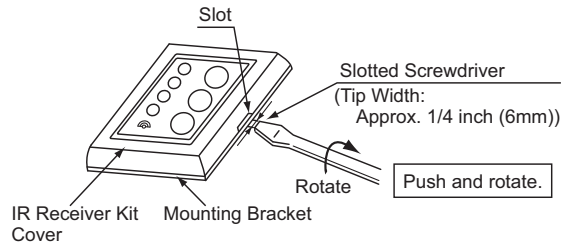
NOTICE

- When the IR receiver kit is installed near ambient lighting, it may not receive a signal from the wireless controller. Therefore, pay particular attention to the installation position of the IR receiver kit.
- Do not run the connecting cable for the IR receiver kit and the power source cable (208/230V) in parallel. It may cause malfunction of the IR receiver kit.

< Installation >

- 1 Perform the installation work for the IR receiver kit while the indoor unit is being installed.
- 2 Turn OFF the power source of the indoor unit if the IR receiver kit is attached after the indoor unit is installed.
- 3 Install the IR receiver kit using the length of connecting cable (accessory).
The cable length is approximately 17 ft (5m).

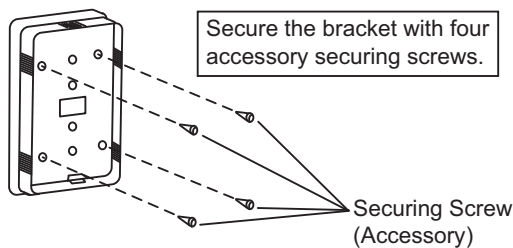
- 4 Open the cover of the IR receiver kit.
Push the slotted screwdriver with a tip width of approximately 1/4 inch (6mm) into the slot of the IR receiver kit cover and rotate it to open the cover as shown in the figure at the right.



- 5 Mount the IR receiver kit onto the wall or the ceiling surface as shown below.

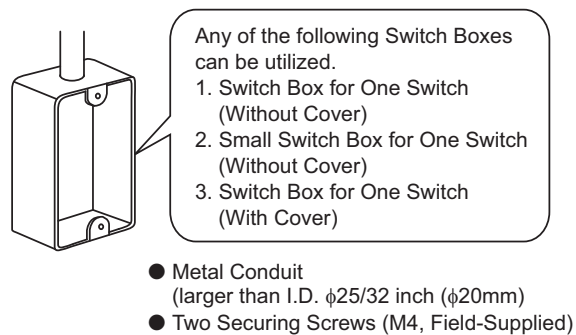
< Situation A >

- (1) Secure the bracket.

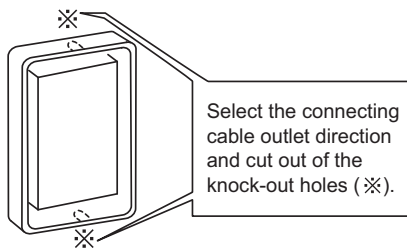


< Situation B >

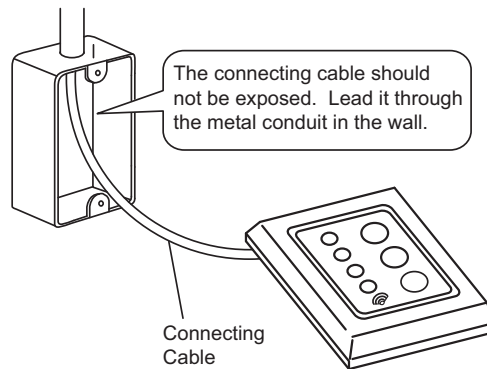
- (1) Prepare the field-supplied switch box (JIS Box). (JIS C8340)



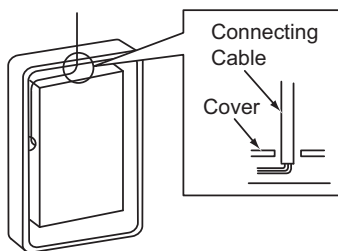
- (2) Select the connecting cable outlet direction and cut out one of the knock-out holes on the cover.



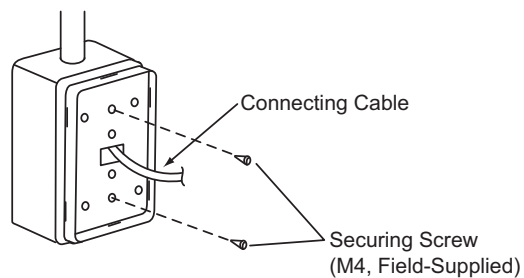
- (2) Run the connecting cable into the metal conduit.



- (3) Lead the connecting cable through the knock-out hole.

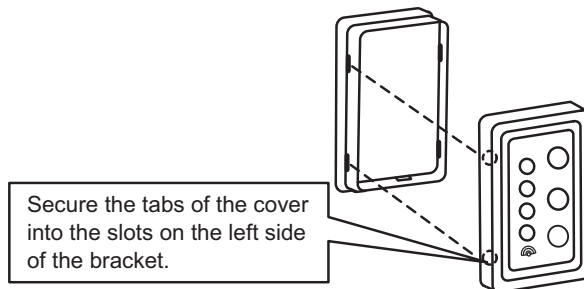


- (3) Secure the bracket.

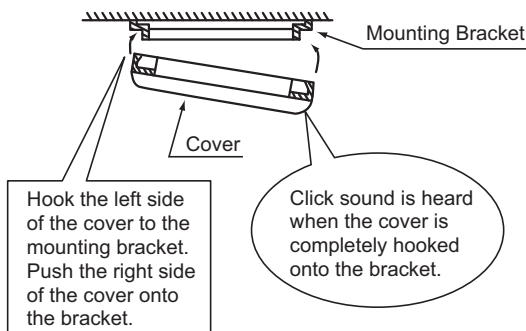


- (4) Attach the IR receiver kit.

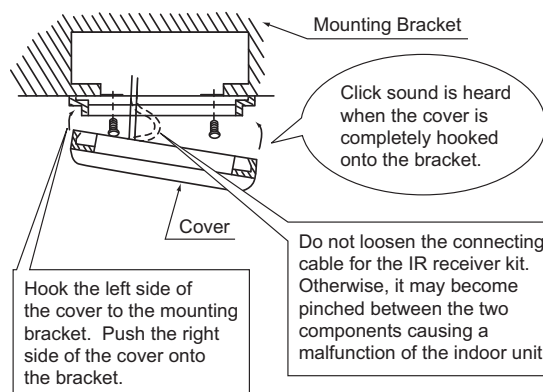
Do not pinch the cable between the bracket and the IR receiver kit cover when attaching the IR receiver kit. Attach the IR receiver kit cover following these directions.



< Situation A >



< Situation B >



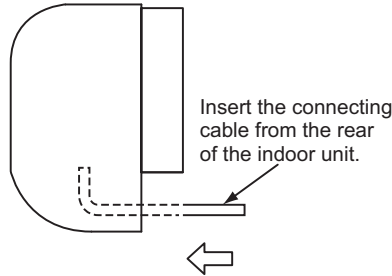
4. Electrical Wiring

The terminal block (TB2) for the controller cable is located as shown in the figure below. Connect the connecting cable for the IR receiver kit to terminals A and B at TB2. (There is no polarity between terminals A and B.) The details for wiring methods can be found in the "Installation and Maintenance Manual" for the indoor unit.

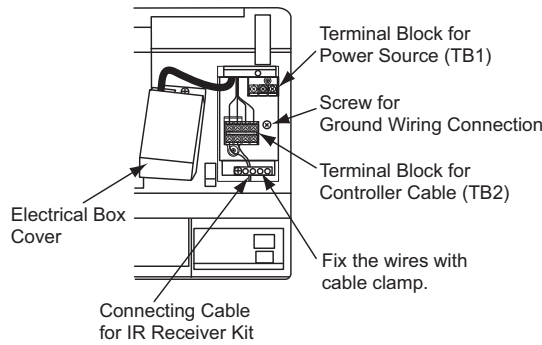
The following wiring method is an example for wall mount indoor units

NOTE:

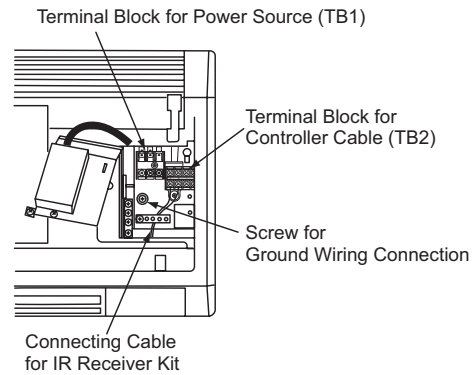
After running the connecting cable, clamp the extra length of the connecting cable using the accessory plastic band and place it in the electrical box.



< TIWM006 - 012B21S >



< TIWM015 - 024B21S >

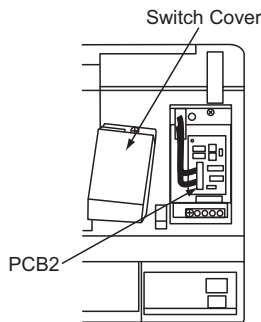


5. Setting DIP Switches on Indoor Unit Side

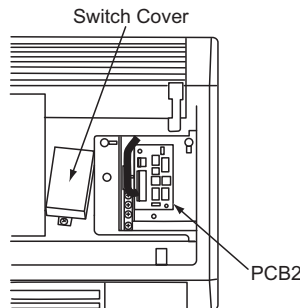
Instructions for setting DIP switches for other indoor units can be found in the "Installation and Maintenance Manual" for the indoor unit. The following DIP switch setting is an example for wall mount indoor units.

- 1 The factory setting of SW2 before shipment is "Wireless". When using an IR receiver kit (CWDIRK01), set the SW2 to "Wired". If not doing so, the operation is not available.
- 2 Turn OFF the power source of the indoor and outdoor units completely before setting the DIP switch. If not turning OFF the power, the setting becomes invalid.
- 3 The positions of the DIP switches are shown below.
Open the switch cover. After the DIP switch is set, re-attach the switch cover. The details for setting DIP switches for an indoor unit can be found in the "Installation and Maintenance Manual" for the indoor unit.

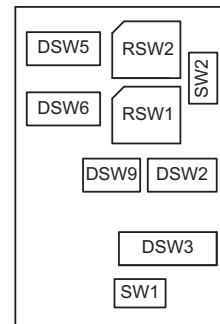
< TIWM006 - 012B21S >



< TIWM015 - 024B21S >



< DIP Switch PCB (PCB2) >



6. Setting DIP Switch on IR Receiver Kit Side

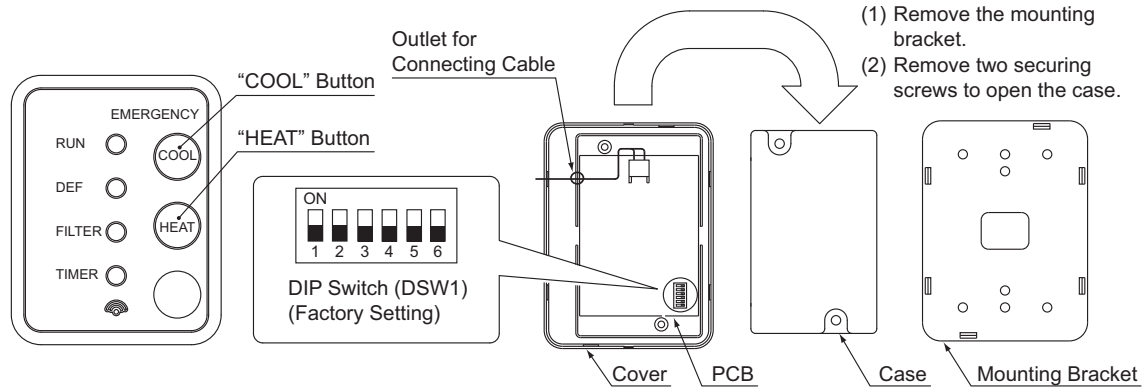
WARNING

Turn OFF the power source completely before setting the DIP switch for an IR receiver kit. Not doing so may cause an electric shock.

- 1 The following switches are on the IR receiver kit.

NOTE:

When the case is closed, pay particular attention to the outlet position for connecting cable.



- 2 Emergency Operation Setting

“COOL” and “HEAT” button are used for emergency operation when the batteries for the wireless controller are low.

- (1) “COOL” Button: Press “COOL” so that the cooling operation is started. Press “COOL” again so that the cooling operation is stopped.
- (2) “HEAT” Button: Press “HEAT” so that the heating operation is started. Press “HEAT” again so that the heating operation is stopped.

NOTE:

During an emergency operation, a yellow light “” flashes (0.5 second ON/0.5 second OFF). The temperature set-point and the fan speed for the cooling/heating operation are the same as before starting an emergency operation.

- 3 The DIP switch (DSW1) is for the optional function selection. If the optional function selection is required, set the DIP switch as follows.

Optional Function	DIP Switch Setting (DSW1)						Details
	1	2	3	4	5	6	
Main/Sub Setting	O	X	X	X	X	X	Change main (OFF setting)/ sub (ON setting) wireless controller for a two-wireless controller system.
Identification of Indoor Unit	X	O	X	X	X	X	It functions as B Mode (identifying of indoor unit) of the wireless controller when it sets to “ON”.
Invalid Emergency Operation	X	X	X	O	X	X	The switches for emergency operation are invalid.

O: ON
X: OFF

NOTICE

Review the following optional function settings when a function for the IR receiver kit is selected from the wireless controller or the centralized controller.

- The optional functions “Cooling Lower Limit for Setting Temperature” and “Heating Upper Limit for Setting Temperature” are not available with the wireless controller.
- The optional function setting “Fixing of Setting Temperature” is not available. When the operation mode is changed from the wireless controller, the indicated temperature on the wired controller becomes the set temperature of the wireless controller.

7. Identifying Indoor Units Installed for a Side-by-Side Operation

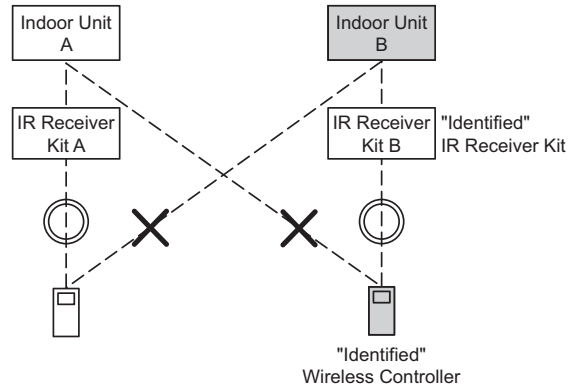
⚠ WARNING

Turn OFF the power source completely before setting the DIP switch for the IR receiver kit. Not doing so may cause an electric shock.

When two indoor units are installed side by side, the commands from the wireless controller may be received by both indoor units. The function, "Identifying of Indoor Units Installed Side by Side" enables operation of the individual unit correctly without interfering with the other unit's operation. As shown in the figure at the right, the IR receiver kit of A and B are set side by side. In this instance, unit B is set as "Identifying Indoor Units Installed Side by Side".

NOTE:

This function setting is required at the receiver side. It shall be set according to the installation manual of indoor unit. Contact your distributor for details.



< Setting of Identifying of Indoor Units Installed Side by Side >

- 1 IR Receiver Kit Setting
Set the Number 2 pin of the IR receiver kit DIP switch (DSW1) at the "Identified" Unit B "ON" side.
- 2 Wireless Controller
Set the wireless controller according to the Installation and Maintenance Manual for the Wireless Controller.

< Cancellation of Identifying of Indoor Units Installed Side by Side >

- 1 IR Receiver Kit Setting
Set the Number 2 pin of the IR receiver kit DIP switch (DSW1) "OFF" side for cancellation.
- 2 Wireless Controller
Cancel the wireless controller setting according to the Installation and Maintenance Manual for the Wireless Controller.

8. Simultaneous Operation

WARNING

- Turn OFF the power source completely before setting the DIP switch and electrical wiring work for the IR receiver kit. Not doing so may cause an electric shock.
- Accurately perform the electrical wiring work. If the electrical work is not completed accurately, heat generation at the connection, a fire, or an electric shock may occur.
- Make sure that the electrical wires are adequately clamped with a cable clamp in and not in a manner that applies too much external force to the terminal connections of the wirings. If not done correctly, the result could cause heat generation or a fire.

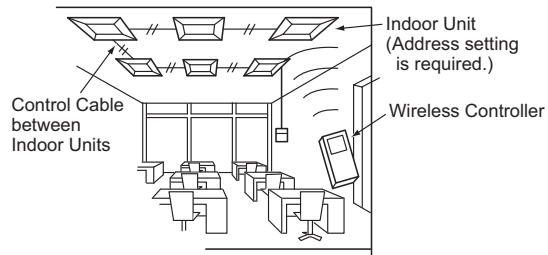
NOTICE

- Do not run the connecting cable for IR receiver kit and the power source cable (208/230V) in parallel. It may cause a malfunction of the IR receiver kit.

Up to 16 indoor units can be simultaneously controlled using one wireless controller. When multiple indoor units are installed in a large room, all the indoor units can be controlled to start/stop with only one wireless controller.

NOTE:

Do not apply a simultaneous operation for indoor units installed separately in different rooms. Some units may be left without turning OFF the power source.

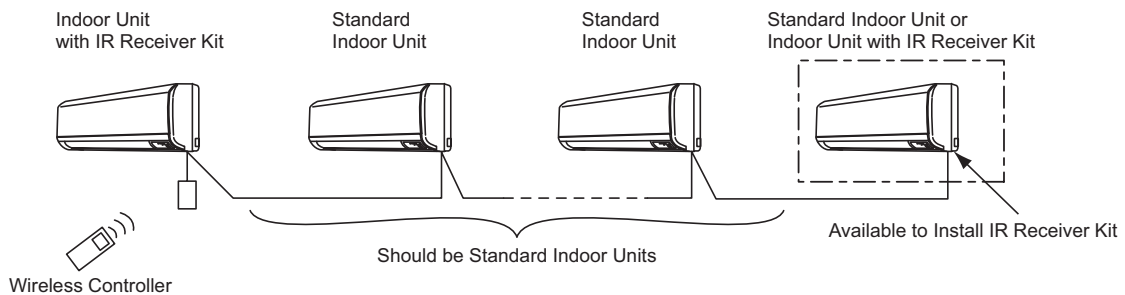


Control Example of Simultaneous Operation of Multiple Units

(Example of 4-way cassette type indoor units.)

< Installation of IR Receiver Kit >

In an instance of simultaneous operation of multiple (up to 16) indoor units by the wireless controller, install the IR receiver kit only to the unit to be operated. Other units should be standard units without the IR receiver kit. If multiple IR receiver kits are required to be installed, two IR receiver kits are the maximum.

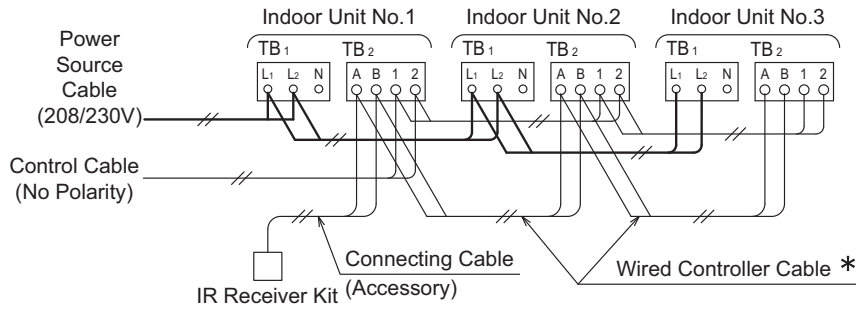


< Electrical Wiring Connecting and Setting >

1 Connection between Indoor Units

Perform the connection work as shown below.

< Power Source Cable 208/230V >



* For twin, triple or quad combinations, a communication cable for the wireless controller is not required.

Use the field-supplied communication cable (AWG18) for the wired controller cable. The total length should be within 1640ft (500m). If the total length is less than 98ft (30m), AWG22 cable can be used.

2 Do not run the connected wireless controller cable and the power source cable (208/230V) in parallel in the indoor units.

Stabilize the cable with plastic bands. Along with the wiring outside the indoor units, the control cables should not run with the power source cable (208/230V). Keep separation of more than 12 inches, or run the cable through a grounded metal conduit.

3 Unit Number Setting

The indoor unit numbers are set by the auto-address function. Therefore, an indoor unit number setting is not required. If the indoor unit number is fixed, set the unit number of all indoor units respectively and serially. It is recommended that the unit number settings begin with "1". The setting is set not to overlap the unit number.

Unit Number Setting

DSW6 (Tens Digit)	RSW1 (Units Digit)	Ex.: Set for No. 16 Unit
Factory setting for DSW6 and RSW1 were set to "0". Max. 63 units are available for setting.		Set No.1 pin ON. Set at "6".

9. Test Run by Wireless Controller (CIR01)

After all installations are completed, a test run should be performed.

- (1) Perform the test run according to the installation manual for the wireless controller.
- (2) The test run for wireless controller switch will take two hours to complete.

NOTE:

For the wall mount indoor units, if the TIMER indicator (green) is flashing (0.5 second ON/0.5 second OFF) after two hours, an alarm may occur. Operate the indoor unit, and check for abnormality.

10. Alarm Indication

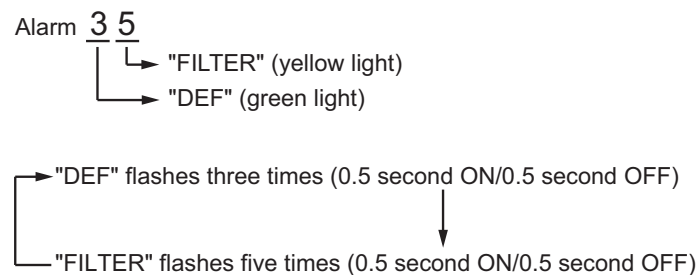
NOTICE

- If a malfunction occurs such as safety device actuation, during the test run or the normal operation, "RUN" (red light) flashes (0.5 second ON/0.5 second OFF).
- The alarm codes are indicated by the number of LED flashes of "DEF" (green light) and "FILTER" (yellow light).

The first LED light is green. The number of times this LED flashes (0.5 second ON and OFF) will tell you the "DEF" Alarm Code.

The second LED light is yellow. The number of times this LED flashes (0.5 second ON and OFF) will tell you the "FILTER" Alarm Code.

< Example >



These signals are repeated until the alarm is reset.

- "RUN" (red light) flashing (1 second ON/1 second OFF) indicates an abnormal transmission (connector loose, connector disconnection, broken wire, or incorrect wiring, or something similar) between the indoor unit and the IR receiver kit.
- When the IR receiver kit is connected to multiple indoor units, the alarm code is indicated for each indoor unit in order.

< Alarm Code Table >

Further details for alarm codes can be found in the "Installation and Maintenance Manual" for the indoor unit.

1.4.7 Motion Sensor Kit (for 1-Way Cassette Type)

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2. Before Installation Work 1-447

3. Installation 1-448

Installation Manual for Motion Sensor Kit (for 1-Way Cassette Type)

Model	SOR-NES
-------	---------

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

Read this Installation Manual carefully before installing this motion sensor kit.

This is the Installation Manual for the motion sensor kit. Read the Installation and Maintenance Manual for the indoor unit as well.

IMPORTANT NOTICE:

- Johnson Controls pursues a policy of continuous improvement in design and performance of products. We reserve the right to vary specifications without notice.
- No part of this manual may be reproduced without Johnson Controls' written permission.
- Keep this manual for future reference.
- Johnson Controls cannot anticipate every possible circumstance that might involve a potential hazard.
- This kit is designed for a combination of Johnson Control air conditioners. Do not use this kit by itself or in combination with other companies' air conditioners.
- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

▲ DANGER

: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

▲ WARNING

: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

▲ CAUTION

: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

NOTE

: Indicates an useful information for operation and/or maintenance.

- It is assumed that this motion sensor kit will be installed and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or contractor.
- This manual gives a common description and information for this motion sensor kit, as well as for other models, which you may operate.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment. Forward this information to the building owner and request that they maintain all the equipment manuals.

1. Introduction

- This product is designed for standard air conditioning only.
Do not use this product for other purposes.
- Do not install the unit in the following places. It may cause a fire, damage, corrosion or failure.
 - * Places where a fire, oil, steam or powder may directly enter the unit such as right above a kitchen.
 - * Places where oil (including machinery oil) may be present.
 - * Places where sulfide gas coalesce, such as hot springs.
 - * Places where inflammable gas may be generated or flow.
 - * Regions where dense, salt-laden airflow is heavy, such as coastal regions.
 - * Regions where the air quality is of high acidity or alkalinity.
 - * Areas where harmful gases are generated from decomposition.
- Pay attention to the following points when installing the unit in a hospital or other facility where nearby electromagnetic waves are generated from medical devices.
 - * Do not install the unit in a place where electromagnetic waves can directly radiate into the electrical box, controller cable or controller.
 - * Install the unit at least 9.8 ft. (3m) away from devices generating electromagnetic waves, such as a radio.
- Do not install the unit in a location where animals and plants can come into direct contact with the outlet air stream. It could adversely affect animals and plants.
- Do not install the motion sensor kit in the following places. It may cause misdetection, undetectable motion or the deterioration of the sensor.
 - * Places where ambient temperature change is drastic.
 - * Places where excessive force or vibration is applied to the sensor.
 - * Places where static electricity or electromagnetic waves may generate.
 - * Places where there is interference for infrared light such as mist in a detecting area.
 - * Places where the lens for the sensor is exposed to high temperature and humidity for a long period of time.
 - * Places where fluid and corrosive gases exist.
 - * Places where direct light such as sunlight or headlights affect the sensor.
 - * Places where hot air, for example from a heater, directly affects the sensor.
 - * Places where the airflow returns to the sensor by bouncing off objects.
 - * Places where blower devices such as ceiling fans or ventilating fans affect the airflow from the indoor unit.
 - * Places where weather affects the surface of the sensor.
 - * Places where the lens surface may smudge or be damaged by dust.

Be aware that the detecting function will be decreased if the lens has smudges.
If this happens, wipe off smudges using a cotton swab soaked in alcohol (isopropyl alcohol is recommended.) or a soft cloth. (When wiping off smudges on the sensor lens, do not apply excessive force. If excessive force is applied, the resin lens may be damaged leading to malfunctions such as misdetection or undetectable motions.)

Installation

⚠WARNING

- Correctly perform the installation work referred to this "Installation Manual".
If the installation is not completed correctly, there may be an injury as a result of the motion sensor kit falling.
- Do not install the motion sensor kit where flammable gases may generate or enter.
- Turn OFF the power supply completely before performing the installation work and the electrical wiring work for the motion sensor kit. Not doing so may cause an electric shock.

⚠CAUTION

- Do not apply excessive force when removing the side pocket cover. Otherwise, it may cause damage to the plastic hook, or may result in injury.
- Hold the decorative panel securely with your hands to prevent it from falling when it is removed.

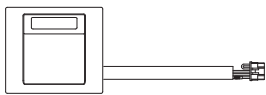


Electrical Work

⚠WARNING

- Correctly perform the electrical wiring work.
If the electrical work is not completed correctly, heat generation at the connection, a fire or an electric shock may occur.
- Make sure that the electrical wires are securely fixed so that an external force is not applied to the terminal connections of the wirings. If securing is not completed correctly, there may be heat generation or a fire.
- Turn OFF the power supply completely before performing the installation work and the electrical wiring work for the motion sensor kit. Not doing so may cause an electric shock.

2. Before Installation Work

Check to ensure that the following accessories are packed with the motion sensor kit.

No.	Accessory	Qty.	Remarks
①	Motion Sensor Kit 	1	with Connecting Cable
②	Clamp 	3	for Fixing Cable
③	Cord Band 	3	for Fixing Cable
④	Installation Manual	1	-

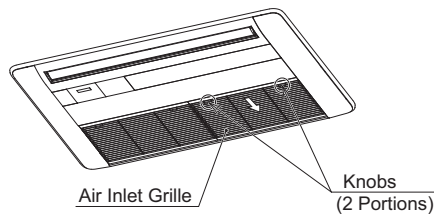
3. Installation

NOTICE

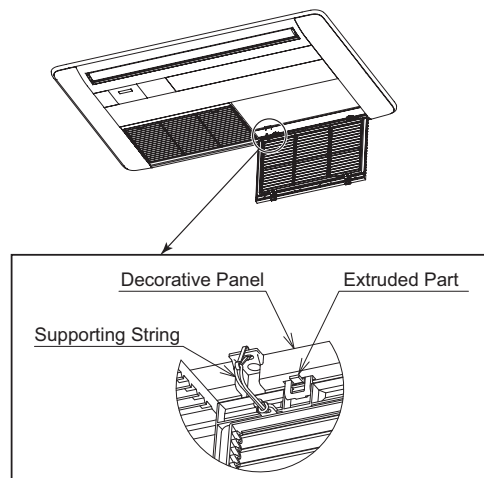
- Do not run the connecting cable for the motion sensor kit and the power supply wiring (208/230V) in parallel. It may cause a malfunction of the motion sensor kit from electromagnetic interference (EMI).
- When the motion sensor kit is installed along with the indoor unit, start from procedure 3.
- When the motion sensor kit is installed after the indoor unit's installation, be sure to turn off the power supply completely before starting installation.

1 Air Inlet Grille Removal

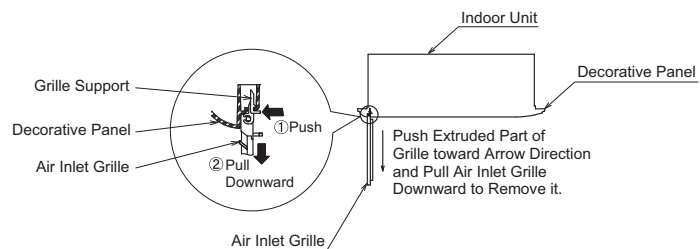
- (1) The air inlet grille can be opened by pushing the knob at the air inlet grille backward.



- (2) Remove the hook of the supporting string from the decorative panel.



- (3) Open the air inlet grille. The air inlet grille can be removed by pushing the extruded part of the grille in the direction of the arrow, and pulling the air inlet grille downward as shown in the figure at the right.



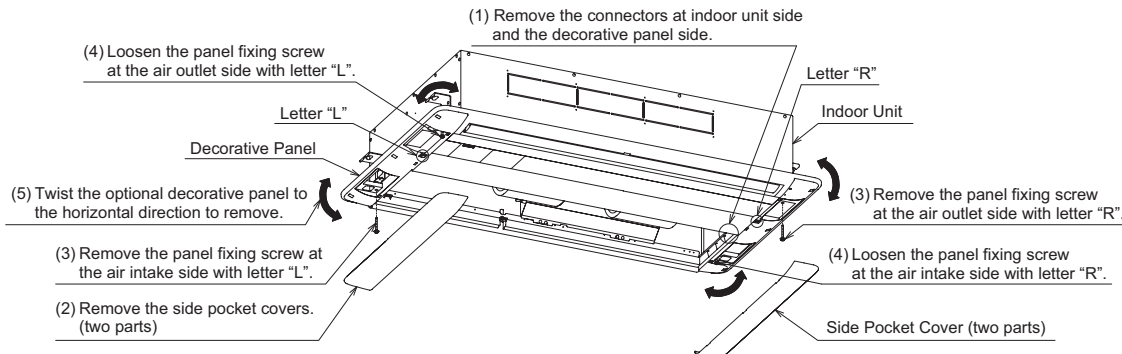
NOTICE

Be careful not to let the air inlet grille or air filter fall during removal.

2 Decorative Panel Removal

Follow the procedures from (1) to (5).

At least two personnel are required for removing.



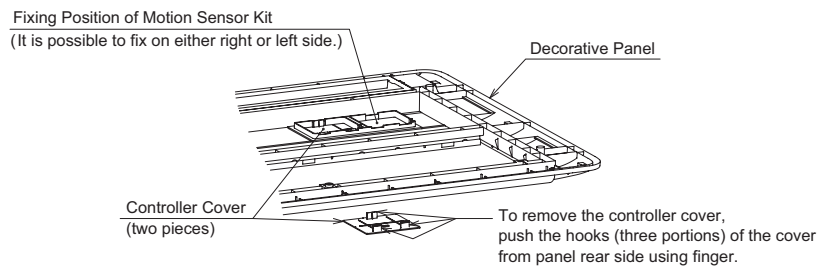
CAUTION

- Do not apply excessive force to remove the side pocket covers. Otherwise, it may cause deformation or damage to the fixing hooks of the side pocket covers, or may result in injury.
- Hold the decorative panel securely to prevent it from falling when it is removed.

3 Controller Cover Removal

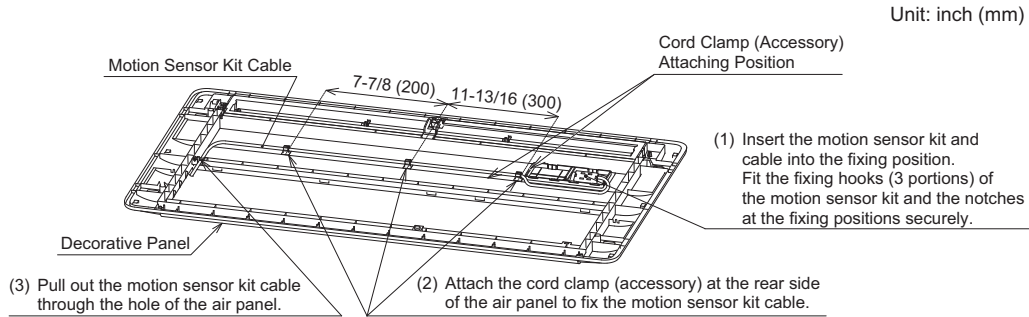
CAUTION

Do not apply excessive force to remove the controller cover. Otherwise, it may cause damage to the fixing hooks of the controller cover, or may result in injury.



INSTALLATION

- 4 Follow the procedures from (1) to (3) to install the motion sensor kit on the decorative panel.

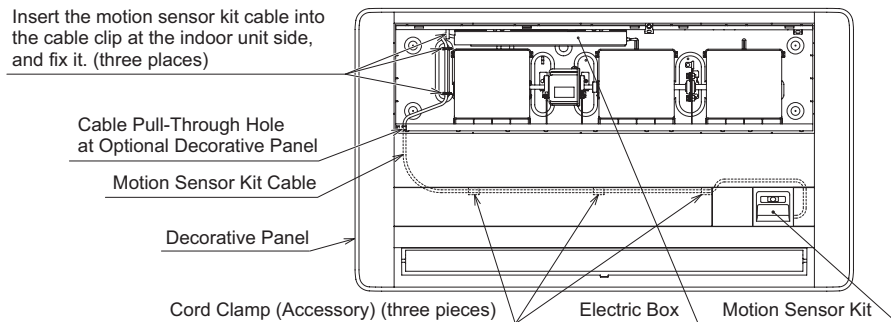


NOTICE

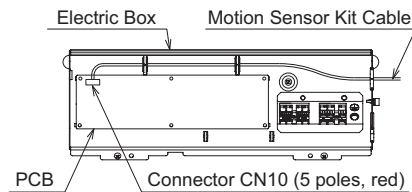
- Pay attention to the installation direction of the motion sensor kit. The number of fixing hooks of the motion sensor kit and the notches at the fixing position should match.
- Check to ensure that the motion sensor kit is installed securely.
- Be sure to attach the cord clamp (accessory) according to the required position. Otherwise, condensation may occur because of a gap between the decorative panel and the indoor unit.

- 5 Install the decorative panel to the indoor unit according to the “Installation Manual” included with the decorative panel.

- 6 Secure the motion sensor kit cable with the cord clamp of the indoor unit.



- 7 Remove the electric box cover of the indoor unit. Connect the motion sensor kit cable to the connector CN10 (5 poles, red) on the PCB as shown at the right. The DIP switch setting is not required since the motion sensor kit is automatically recognized when the power supply is turned ON.



NOTICE

- After running the sensor cords, secure the cord with a cord band and store it in the electric box.

1.4.8 Mini Central Controller

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IMPORTANT:

READ AND UNDERSTAND THIS MANUAL BEFORE USING THIS MINI-CENTRAL CONTROLLER.
KEEP THIS MANUAL FOR FUTURE REFERENCE.

IMPORTANT NOTICE:

- No part of this manual may be reproduced without the expressed written permission of Hitachi or of Johnson Controls, Inc.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. and York. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

1. Safety Summary



IMPORTANT:

READ AND UNDERSTAND THIS MANUAL BEFORE USING THIS MINI-CENTRAL CONTROLLER.
KEEP THIS MANUAL FOR FUTURE REFERENCE.


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- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system, including this controller, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake.
If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units.
Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the wireless controller at a distance of at least three feet (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.

- If the wired controller is installed in a location where electromagnetic radiation is generated, make sure that the wired controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage.
Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35° to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices.
If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- If the remote sensors are not used with this controller, then do not install this controller...
 - In a room where there is no thermostat.
 - Where the unit is exposed to direct sunshine or direct light.
 - Where the unit will be in close proximity to a heat source.
 - Where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - In areas with poor air circulation and ventilation.
- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating.
During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

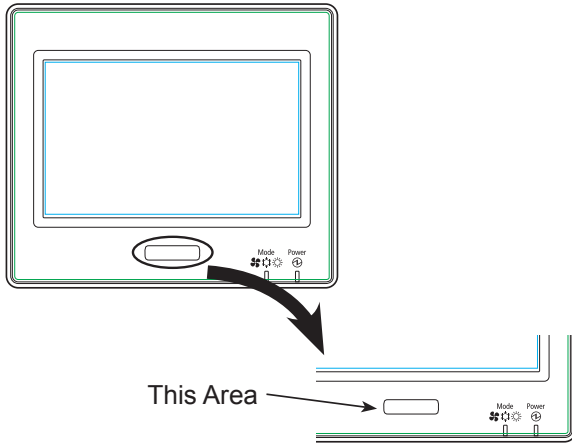
- Only use electrical protection equipment and tools suited for this installation.
- Insulate the wired controller against moisture and temperature extremes.
- Use specified cables between units and the controller.
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.

INSTALLATION

- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

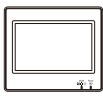



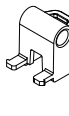




2. Brand Label

Select the applicable brand label (York or Hitachi). Apply the brand label in the designated area as shown in the picture below.



3. Before Installation

Check to ensure that the following parts are packed with the mini central controller.

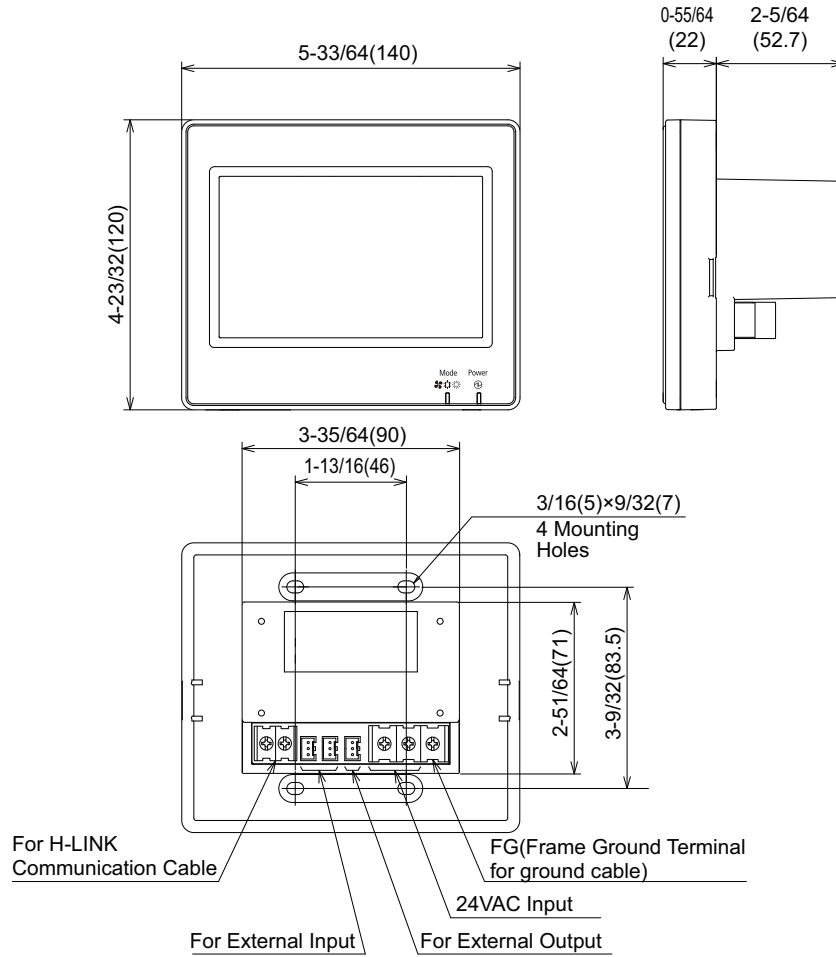
Item	Mini Central Controller	Operation Manual	Installation & Maintenance Manual	Touch Pen	Touch Pen Holder	Screw	Connector Code	Closed End Connector	Nylon Band
Appearance						 M4x0-5/8 inch			
Qty.	1	1	1	2	1	4	3	9	3

Select a suitable place for handling and determine the installation place of the wired controller with the customer's acceptance. Do not install a wired controller:

- Where accessible to children.
- Where the direct air discharge from the air conditioner is directed to toward people or pets.

4. Outer Dimensions

(Unit: inch (mm))



5. Features

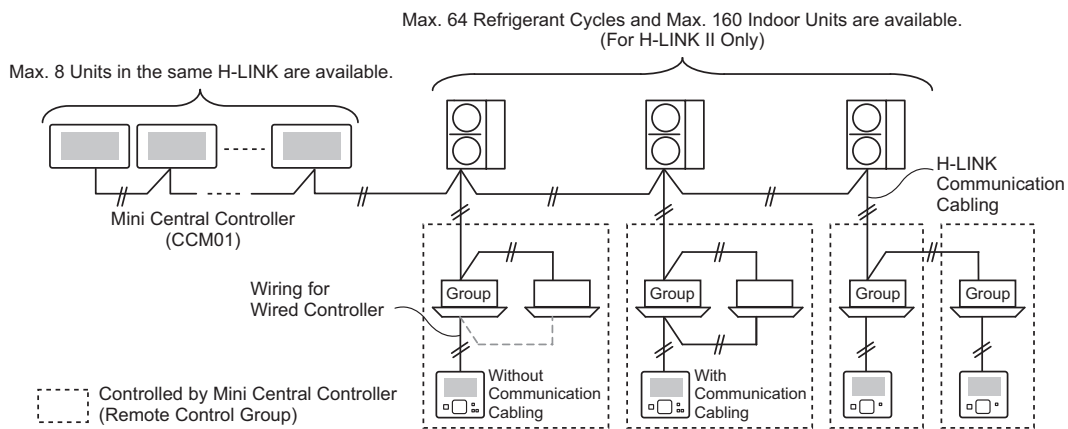
The mini-central controller (CCM01) is the controller for an air conditioner that controls and monitors a maximum of 160 indoor units and maximum 32 wired controller groups.

5.1 Specifications

Model	CCM01
Outer Dimension <WxHxD+(Built-in Part)>	5-33/64 × 4-23/32 × 0-55/64 + (2-5/64 for wall embedding) inch (140 × 120 × 22 + (52.7 for wall embedding) mm)
Net Weight	1.1 LBS (0.5 kg) (Approx.)
Installation Location	Indoor Use
Installation Method	Wall embedded using Steel Box (option)
Connected Indoor Unit (Qty.)	160 (Max.)
Clock Accuracy	± 70 Seconds/Month (at Normal Temperature)
Ambient Temperature	41 ~ 95°F (5 ~ 35°C)
Ambient Humidity	35 ~ 90%
Display	5.0" TFT Color Liquid Crystal Display (800 x 480 dots)
Rated Power Supply	24VAC, 60Hz
Electrical Power Consumption	10W (Max.)

5.2 System Configuration

This mini central controller (CCM01) is connected to H-LINK and used for the central control and monitoring of air conditioners. The system configuration example is shown in below.

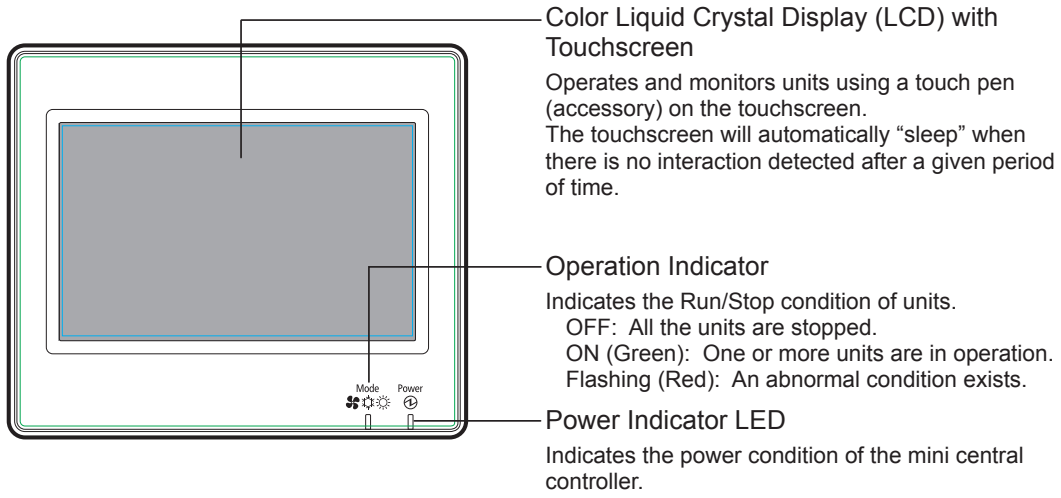


* When an indoor unit without a wired controller is connected, the mini central controller cannot be used.

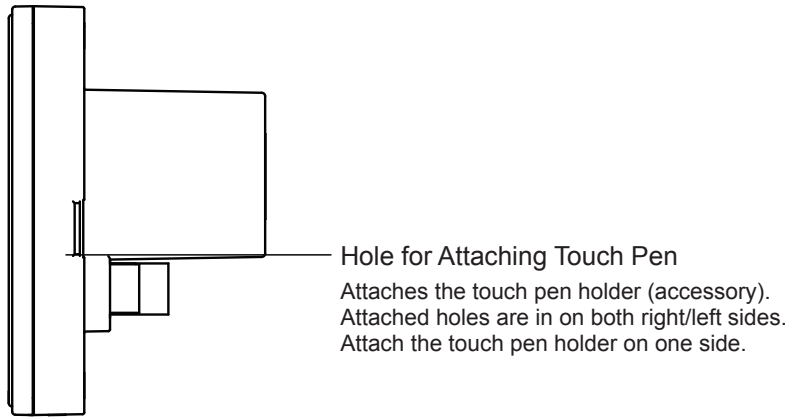
INSTALLATION

5.3 Component Names and Functions

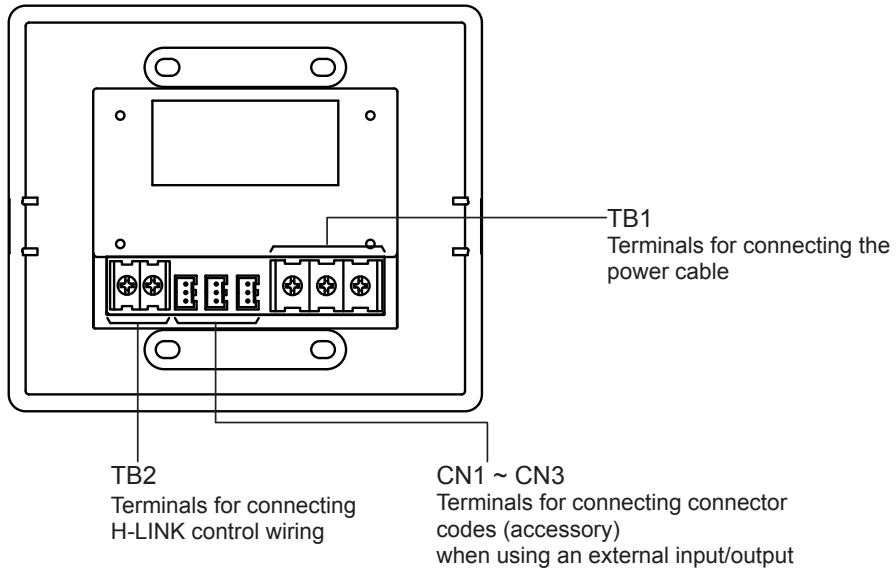
[Front Side]



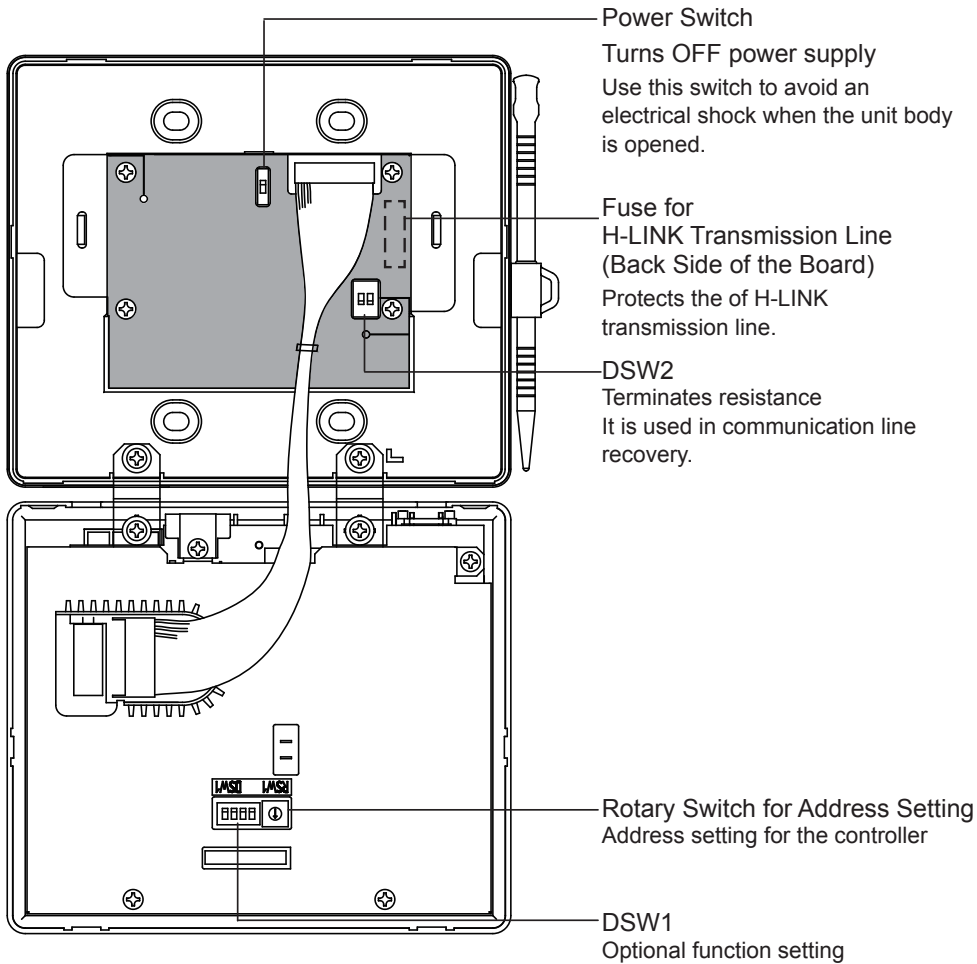
[Right Side]



[Rear Side]



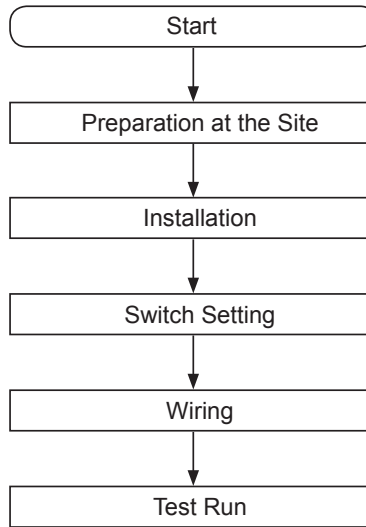
[When Unit Body is Opened]



<p>⚠ WARNING</p>	<p>Removing the covers may result in a serious electrical shock.</p>
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6. Installation Procedure

This manual informs the installer how to handle the mini central controller and the Test Run of the controller. The installation procedures are shown below.



6.1 Preparation at the Site

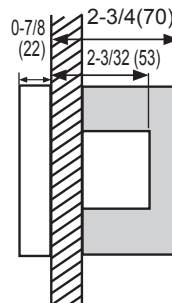
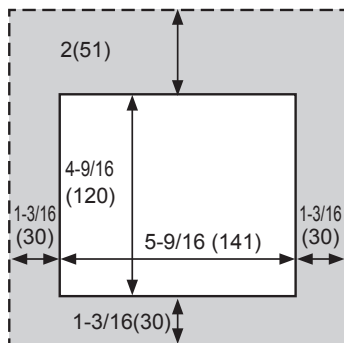
Before installing a controller, prepare the following items.

Parts	Specification
Steel Box	Option
Power Supply Cable	Cable SPEC: AWG 16(1.25mm ²) to AWG 14(2mm ²) Recommended Cable: 600V CV, CCV, CEV
H-LINK Cable (For Control)	Cable SPEC: AWG 18(0.75mm ²) to AWG 16(1.25mm ²) Recommended Cable: JKEPV-S, JKEV-S, CVV-S, CVV, 600V VCT

6.2 Installation

[Installation Space]

- Provide the installation space for the mini central controller as shown below.



Unit: inch (mm)

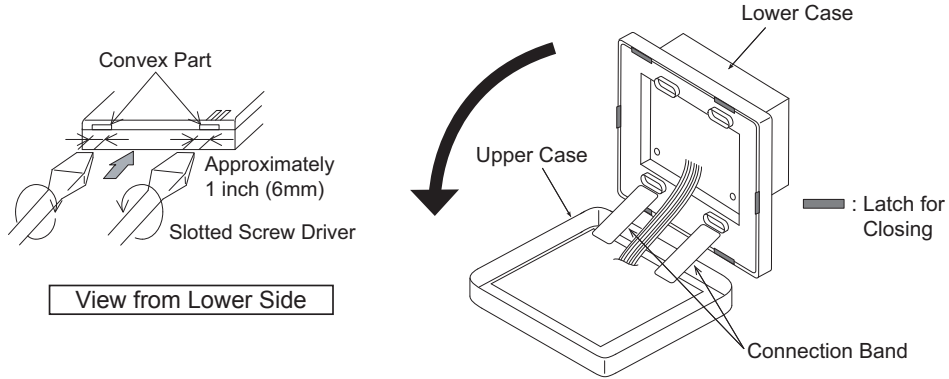
Do not attach anything in the shaded screen area "■".

When installing more than two mini central controllers in a row or in line, keep the space between each.

- Vertical Direction: 2 inches (51mm)
- Horizontal Direction: 1-3/16 inch (30mm)

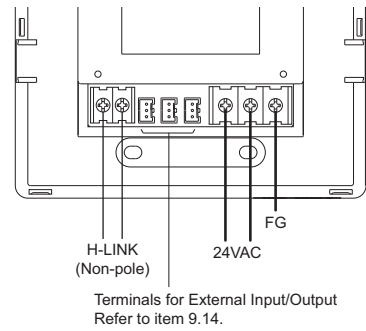
[Installation Method]

- 1. Install the steel box (option) into the wall.
- 2. Open the unit body. (The factory ships the unit body open.)
If the unit is closed, open it as shown below.
 - a. Remove the convex part of the case by pressing and rotating a screwdriver in the cut-out portions (two cut-out portions on the convex part).
 - b. When pulling up the convex part of the case, the copper will separate from the upper side and lateral side so the cover will open. The upper and lower case will be fixed with a connection band. Do not use excessive force to open the case.

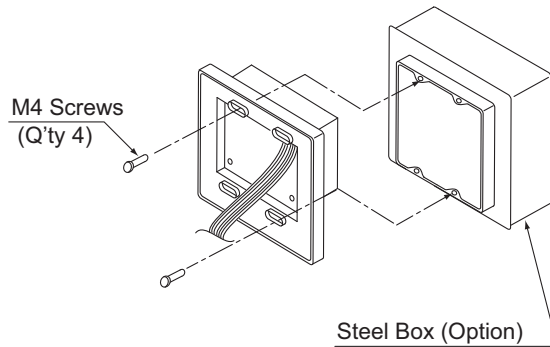


- 3. Connect the wiring to the terminal board of the mini central controller.

Terminal Board	Use	Connection Procedure
TB1	For Power Supply	M3 Screw-on terminal Round Terminal Connection Tightening Torque 0.4 ft-lbs
TB2	For H-LINK Communication	
CN1 ~ 3	For External Input/Output	Connector, three pin Insert connector cords (accessory) until hearing clicking sound.



- 4. Attach the steel box (option) with the accessory mounting screw (M4 x 0-5/8 inch).



7. Switch Setting Procedure

Switch the settings for mini central controller which are shown in the following table.

□ 1. Use the settings below:

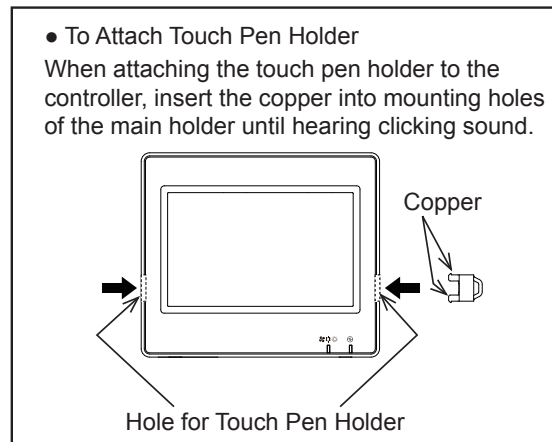
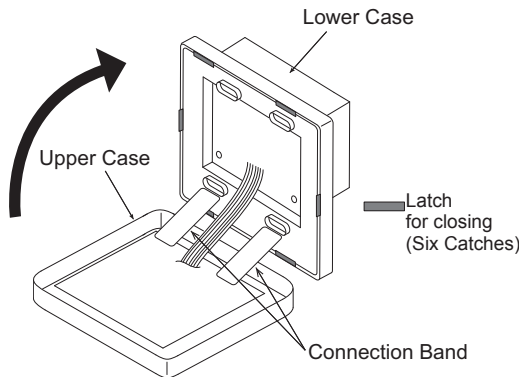
Switch	Switch No.	Usage	Factory Setting	Remarks
RSW1 (Rotary Switch 16-pole)	-	For address setting of mini central controller	0	When using multiple units
DSW1 (DIP Switch; 4-pole)	1	OFF (Fixed)	OFF	
	2	OFF (Fixed)	OFF	Not Used
	3	OFF (Fixed)	OFF	Not Used
	4	ON (Fixed)	ON	
DSW2 (DIP Switch; 2-pole)	1	ON: Terminating Resistance Enable OFF: Terminating Resistance Disable	OFF	Make sure no other terminating resistance exists on the same H-LINK when enabling the terminating resistance from the mini central controller.
	2	ON: Protection Fuse for H-LINK ... Disable (short-circuited) OFF: Protection Fuse for H-LINK ... Enable (Normal)	OFF	
SW1		ON: Turn ON Mini Central Controller OFF: Turn OFF Mini Central Controller	ON	

NOTICE

- Turn OFF the power supply when setting the DIP switches and rotary switch. Do not touch the printed circuit board and metal part to avoid a mini central controller malfunction.
- Alarm 63 will be displayed on a H-LINK II compliant central controller if a mis-configured DSW1-1 is connected. In this case, turn OFF the power supply for all central control devices and correct the settings of each central control device. Then, restart central control devices.
- When using several mini central controllers at the same time, set “RSW1” so as not to overlap.

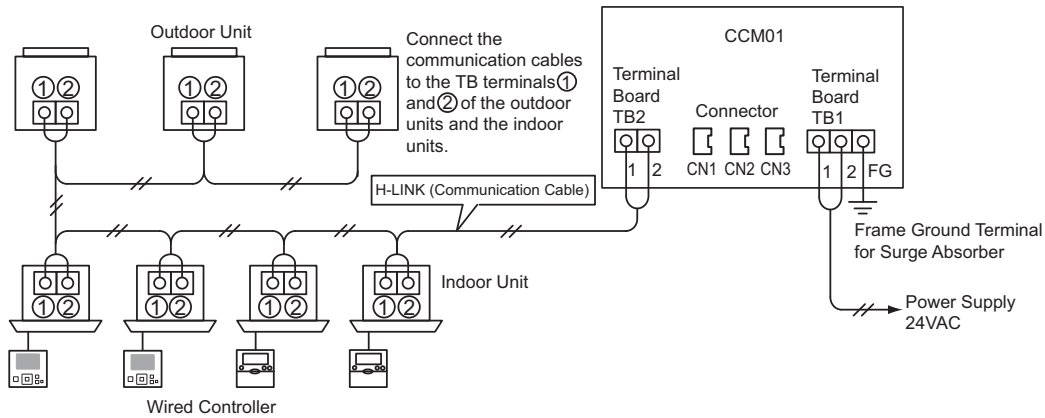
□ 2. Close the unit body until it snaps, making sure it is completely closed.

- Hook the copper to the upper side of the case.
- The upper side of the case will close when putting the copper over the lateral and lower side.



8. Electrical Wiring Procedures

- 1. The mini central controller requires wiring work of the power supply cable, air conditioner, and control wiring (H-LINK).
- 2. Wiring Method




Type of Wiring	Specification	Length of Wiring	Cable Specification	Recommended Cable Model
Power Supply Cable	24VAC	-	AWG 16 (1.25mm ²) to AWG 14 (2mm ²)	600V CV, CCV, CEV
Earth Wiring	-	-	-	-
H-LINK (Control Wire)	5VDC	3281 feet (1000m) ≥	AWG 18 (0.75mm ²) to AWG 16 (1.25mm ²)	JKPEV-S, JKEV-S, CVV-S, CVV, 600V VCT
Wiring for External Input and Output	Input: Non-voltage Normal Open Output: 12VDC, 75mA ≥	984.3 feet (300m) ≥	AWG 20 (0.5mm ²) to AWG 16 (1.25mm ²)	

- In case wire length specification on the signal communication side for external input is mentioned, use shorter wiring either ① communication side wire length specification or ② 984.3 feet (300m).

NOTICE

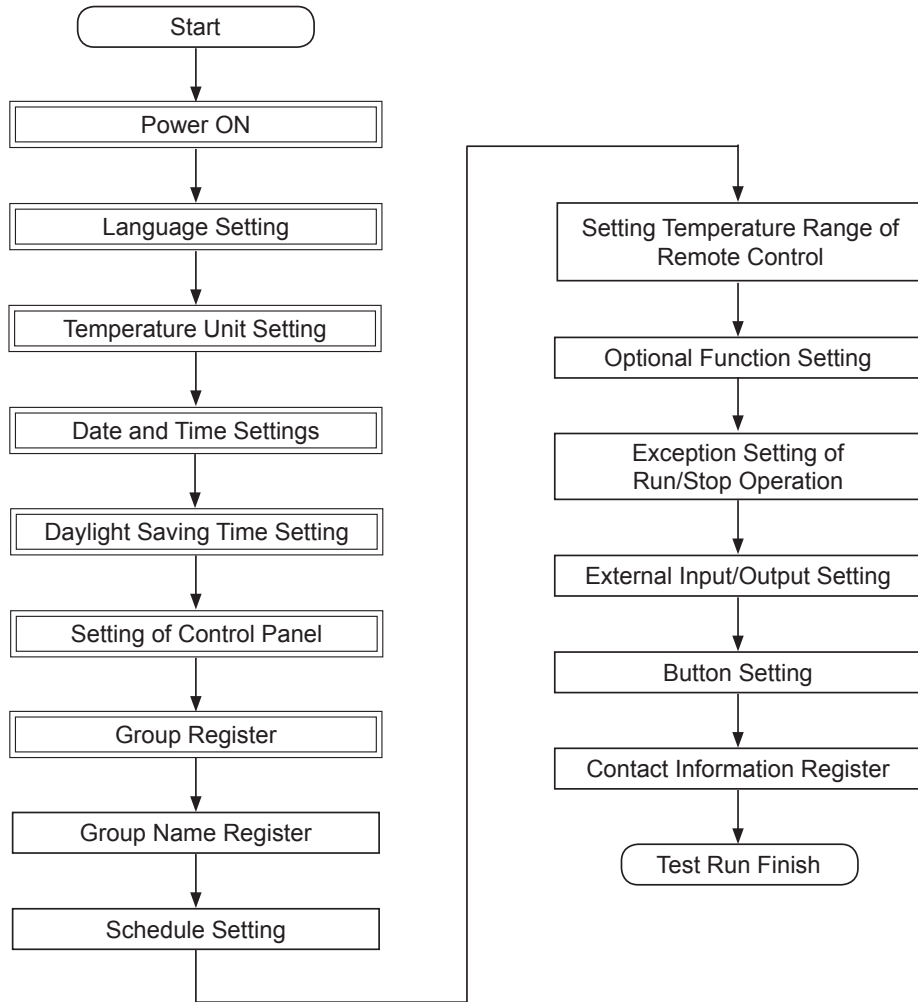
- The mini central controller may break down if wiring is correct.
- Communication cabling shall be a minimum of 18-Gauge, two-conductor, stranded copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication
- Cables must be considered per application and local code requirements.
- If wiring work is performed with the main power ON, it may cause a breakdown of the controller. Turn OFF the main power of the air conditioner and the controller before performing wiring work.
- Communication cables are required to be separated from the power supply wiring and other electrical device wiring. Keep at least 12 inches (31cm) between communication cabling and the power supply wiring. If the above is not secured, put the power supply wirings and communication cabling into the each metal conduit tube separately. One side of the metal conduit tubes should be grounded for noise reduction.
- Do not connect the power supply wiring to the terminals for transmission of the mini central controller. If the power supply wires are connected incorrectly, the fuse of the printed circuit board will short-circuit. If this happens, turn on the DSW2-pin on the printed circuit board to enable emergency operation without benefit of protective fuse safeguards.
- Remove the ground wiring for the frame ground (FG) terminal when the insulating capacity test or the withstand voltage test is performed. It may prevent operation of the mini central controller.

9. Test Run Procedure

The flow diagram below outlines Test Run procedures. The process rectangles below “” are required items.

Refer to the operation manual for the mini central controller for the Control Method settings.

NOTE: The screen image may be different from the actual screen.



9.1 Features and Functions

Item	Function	Page
Language Setting	This function is used for language selection.	17
Date and Time Settings	This function is used for adjusting the date and time.	17
Group Register	The connected indoor units are checked by the mini central controller in the same H-LINK. This function is used for the group or block registration of them.	18
Main Unit Register	This function is used for the main unit registration in the each remote control group. (The main unit is the only one for each remote control group.) The control command is sent from the mini central controller to the main unit for the remote control group.	19
Sub Unit Register	This function is used for registration of the sub units except the main unit in the same remote control group. If using the wired controllers or the receiver kits as follows, the sub units are registered automatically by the mini central controller after the main unit registration. • Infrared Receiver (IR)	20
Group Name Register	This function is used for registering the naming of a Block and Group. The registrable number of letters are a maximum 20 letters for the name of each block or group. It is also available to copy group names. If the group/block is registered without a name, it will be registered as "Group 1" or "Block 1" automatically.	20
Schedule Settings	This function is used for scheduled timer operation which can be set by each group or block.	20
Schedule Timer Setting	This function is used for setting the time (by the minute), "Run/Stop" and temperature (66~86°F (19~30°C)). For weekly schedule setting, up to 10 schedule items can be set per day. It is also possible to copy the setting information.	20
Holiday Setting	This function is used for suspending the scheduled operation temporarily. The scheduled operation will not be available when this function is set. This function is used for setting irregular holidays such as national holidays.	20
Schedule Timer ON/OFF Setting	"Schedule Timer OFF Setting" is used for suspending the scheduled operation for the target group. The scheduled operation will not be available when Schedule Timer is OFF. This function is used for a long holiday, sudden holidays, and national holidays.	20
Optional Function Setting	This function is used for setting and changing of the function for air conditioners and the mini central controller.	22
Exception Setting for Run/Stop Operation	This function is used to specify exceptional Groups/Blocks for All Run/Stop commands. • The All Run/Stop command will not affect to the specified group/block.	23
Selecting Exceptions; Operations to be Excluded	This function is used to select which the following will be excluded: • Run • Stop • Run and Stop	23
Selecting Group and Block Exceptions	This function is used to select All Run/Stop commands, but the following are excluded: * All Groups Run/Stop * Run/Stop by Block * All Groups Setting * Setting by Block	23
External Input/Output Setting	Two external input terminals and two external output terminals are equipped in the mini central controller. These terminals are used for "All Groups Run/Stop" and "Demand Function" operations for the connected air conditioners. The external output terminals are used for the operation signal output or alarm signal output of the air conditioners which are connected to the mini central controller.	23
Exception to External Input	This function is used for cancelling operation commands such as "All Groups Run/Stop", using the external input signal. "Exception External Input" is available for each external input (Input 1 and Input 2).	23
Selecting Groups of Exception External Input 1	This function is used for selecting a group to cancel an operation command from external input 1.	23
Selecting Groups of Exception External Input 2	This function is used for selecting a group to cancel an operation command from external input 2.	23
Demand Function Setting	This function is used for setting of "Demand Function" to the terminal of "Input 1". The operating condition is changed by the demand signal such as the operation to stop and Thermo-OFF. "Demand Function" is available when you do the following: 1. Select "Demand Function" at "Input 1" on the "External Input/Output Setting" screen. ("Demand Function" will not be available without this setting.) 2. Select one of "Demand Function" No.1 to No.4 at "Demand Function Setting" screen.	24
Demand Function Setting	This function is to select the action at "Demand Function" control.	24
Selecting Group for Demand Function	This function is to select the target group for "Demand Function" control.	24
Button Setting	This function specifies each button to be shown/hidden. This function also includes a specification/setting for "one-tap operation" or "press-and-hold" operation.	25
Contact Information Register	This function is used for editing the contents of contact information registration.	25

INSTALLATION

9.2 Supply Power to the Unit

1. Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.
 - Perform after a Test Run on each air conditioner and confirm that each one operates normally.
2. Turn on the power supply of the mini central controller.

Refer to the operator's manual for details.

9.3 Language Setting

After turning ON the power supply, the language setting is displayed on the touchscreen as shown at right.

(When the power supply is turned ON at the first time.)
Select the using appropriate language for operation and touch "Set".

Refer to the operator's manual for details.

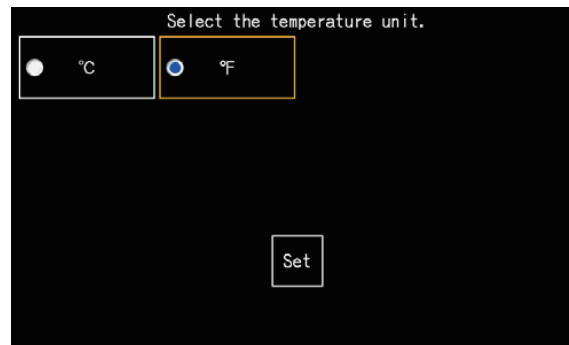


9.4 Temperature Unit Setting

After the language is set, the screen will be displayed as shown on the right.

Select the appropriate temperature unit, then touch "Set".

Refer to the operator's manual for details.



9.5 Date and Time Settings

After the temperature unit, the Date and Time settings screen is displayed on the touchscreen as shown at right.

Tap "Set" on the touchscreen display, and set the date and time according to the indicated procedure.

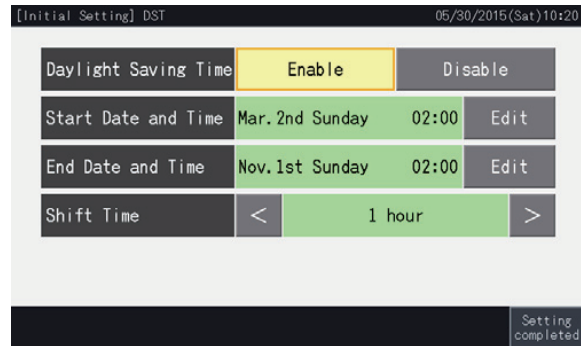
Refer to Section 8.6 in the Operation Manual for details.



9.6 Daylight Saving Time Setting

After the Date/Time function is set, the screen will be displayed as shown on the right. Set each item, then touch "Setting Completed" in the lower-right corner.

Refer to the operator's manual for details.



9.7 Setting of Control Patterns

1. After adjusting date and time settings, the control pattern screen is displayed as shown in the figure on the right. Touch "Set" on the touchscreen to display the setting screen.
2. When tapping on the control pattern button, to register a group the selected button is rimmed with an orange outline. Touch "Register Main Unit" to set the selected control pattern and the group register screen is displayed.

Refer to Section 10.3 below for details.



9.8 Group Register

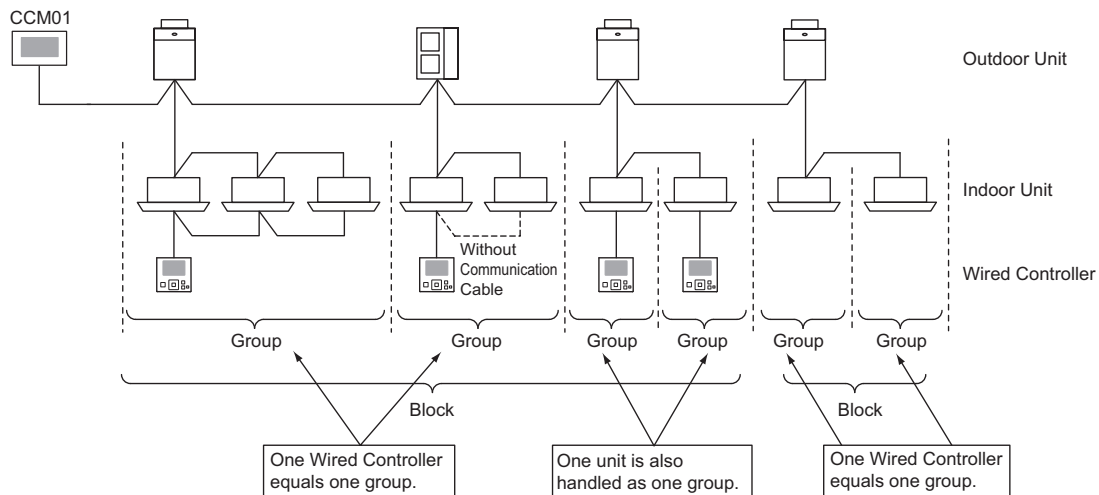
Register the indoor units confirmed for connection to the group (block) of the mini central controller.

Refer to Section 10.3 below for details.

INSTALLATION

[Group and Block]

- **Group:**
Indicates the minimum number of operational units controlled by one mini central controller. One remote control group is considered as one group, and the same setting will be applied. A maximum of 32 groups (4 blocks x 8 groups, 8 blocks x 4 groups, 2 blocks x 16 groups, 16 blocks x 2 groups) can be controlled by one mini central controller.)
- **Block:**
Indicates the number of operational units combining groups into one. The mini central controller can regulate indoor units depending on the control patterns (4 blocks x 8 groups, 8 blocks x 4 groups, 2 blocks x 16 groups, 16 blocks x 2 groups).
- **Remote Control Group:**
Indicates multiple indoor units (a maximum of 16) connected by communication line to the wired controller. Indoor units registered as same the remote control group are applied using the same settings.
- **Main Unit:**
Indicates the representative unit of the remote control group. The mini central controller transmits control commands to this representative unit.
- **Sub Unit:**
Indicates indoor units other than the main unit.



NOTICE

<Main Unit Registration>

- The main unit registration is available for only one indoor unit for one group. Thus, duplicate registration of the main unit is not possible for the same group. If the main unit registration is changed for some reason, cancel the current main unit registration, and register the new main unit again.
- When the indoor units with fan speeds of "4-touch" and "3-touch" are intermixed in the same remote control group, register the indoor unit with a fan speed of "4-touch" as the main unit. If an indoor unit with a "3-touch" fan speed is registered as the main unit, a "4-touch" fan speed setting cannot be applied for this group. In other words, designate the main unit as a "4-touch" fan speed unit.
- When the indoor unit with the automatic louver swing and the indoor unit without the automatic louver swing are mixed in same remote control group, register the indoor unit with the auto-louver as the main unit. If the indoor unit without auto-louver is registered as the main unit, the auto-louver setting cannot be applied for this group.
- If the group with the communication cable connected to the wired controller is not used, the indoor unit without the wired controller is not registered as the main unit.

<Sub Unit Registration>

- A maximum 15 sub units can be registered in the same remote group with the main unit.
- Indoor units without a wired controller cannot be registered as sub units.
- When changing the registration of the indoor unit which is already registered as a sub unit, cancel the registration setting first. Then, change the registration.

9.9 Registering Groups/Blocks Names

Register the names of groups and the blocks for the registered groups. .

The registrable number of letters are a maximum of 20 for the name of the group (block).

Set by Monitor → Menu → Group Name Register.

Refer to Section 8.9 in the Operation Manual for details.

NOTICE

- When touching "Enter" at the name registration, the name of the group or the block will be displayed in one or two lines. A maximum of eight letters or characters can be entered on one line.

9.10 Schedule Timer Operation

This function is used for the timer operation.

The schedule setting command allows for settings for each block and group.

Holiday settings that do not activate the schedule are also available.

Set by Monitor → Menu → Schedule Setting.

Refer to Section 8.4 in Operation Manual for details.

9.11 Setting Temperature Range of Remote Control

This is the function for adjusting temperature range of the wired controller operation.

Minimum/Maximum temperature of cooling or heating can be set depending in the RUN mode.

Set by Monitor → Menu → Setting Temperature Range of Remote Control.

Refer to Section 7.9 in the Operation Manual for details.

9.12 Service Menu

The Service Menu functions and detailed contents are described as follows.

- Group Register
- Optional Function Setting
- Exception Setting of Run/Stop Operation
- External Input/Output Setting
- Exception External Input
- Button Setting
- Contact Information Register
- Memo
- Restore Setting
- Checking Connection
- Alarm History

Function	Contents	Page
Group Register	The connected indoor units are checked by the mini central controller in the same H-LINK. This function is used for the group or block registration of these indoor units.	27
Setting of control patterns	Sets the control pattern.	27
Main Unit Register	This function is used for the main unit registration in the each remote control group. (The main unit is the only one in the remote control group.) The control command is sent from the mini central controller to the main unit for the remote control group.	29
Sub Unit Register	This function is used for registration of the sub units except the main unit in the same remote control group. When using wired controllers or receiver kits, the sub units are registered automatically by the mini central controller after the main unit registration. <ul style="list-style-type: none"> • IR Receiver Kit 	31
Displays a List of Registers	Displays the location of those Indoor Units which were registered in each group.	35
Optional Function Setting	This function is used for setting and changing optional functions for air conditioner units and the mini central controller.	36
Air Conditioner, Wired Controller Setting	Set or change the optional function of the air conditioner and wired controller.	36
Mini Central Controller Setting	Sets or changes the operational mode, color of the operation indicator, or the mini central controller.	37
Exception Setting for Run/Stop Operation	The factory-set group is "All Group Run (stop)", "Block run (stop)" or when "All Groups (Blocks)" operate as "Run(Stop)". This operation is not accepted.	38
External to Input/Output Setting	There are four inputs and two outputs for the external Input/Output function in the mini central controller.	39
Button Setting	This function specifies each button to be shown/hidden. This function also includes the specification/setting for "one-touch operation" or "press and hold" operation.	42
Contact Information Register	This function is used for editing the contents of contact information registration.	43
Memo	Record and Browse the Test Run and Maintenance Information.	44
Restore Setting	This function is used for restoring all the settings such as registered Groups (Blocks) and schedules.	47
Checking Connection	This function is used for checking the connected indoor unit numbers in the same H-LINK. When this function is used, the confirmation for retention of registered information such as the group names, schedules, and so forth will be indicated. If "OK" is touched, the connected indoor unit numbers are updated with the registered information. If "Cancel" is touched, the setting of the mini central controller is restored.	48
Alarm History	This function is a compilation and display list of alarm history events over the service life of the air conditioner and the controller. (Maximum 100 records)	50

9.13 Optional Function Setting

This function is used for setting and changing the function selection of air conditioner and mini central controller in the following table.

Set by Monitor → Menu → Service Menu → Optional Function Setting.

Refer to Section 10.5 for details.

Function	Description
Setting the Operation Mode	Touch "Enable" to allow the "Setting Operational Mode" to become the present operation mode. This operational mode is now selected as the present setting which cannot be changed from the wired controller and the mini central controller.
Setting the Temperature Setting	Touch "Enable" to allow a "Temperature Setting" to be set for the present temperature. The temperature setting is set as the present setting which cannot be changed from the wired controller and the mini central controller.
Cooling Only	Touch "Enable" for "Cooling Only", that is, to set the operational mode to cooling only. This function is used in heat pump models which can be operated for cooling only. The operational modes "HEAT" and "AUTO" cannot be selected from the wired controller and the mini central controller.
Auto	Touch "Enable" for "Auto" to use the automatic cooling/heating operation. It is possible to set this mode from the wired controller and the mini central controller. However, in the following instances, "AUTO" cannot be selected: <ul style="list-style-type: none"> • Connected to the model of Cooling Only. • The function "Cooling Only" is enabled.
Setting Fan Speed	Tap "Enable" of "Fixing Fan Speed" to set the fan speed. The fan speed is fixed as present setting which cannot be changed by the wired controller and the mini central controller.
Control Mode	This function is used for changing the control mode of the mini central controller. When set this function, touch "All Groups" as the target groups, and select the control mode to "Normal" or "Run/Stop Only". <ul style="list-style-type: none"> • Normal: "Setting" is displayed when tapping the group button. This mode is the factory setting. The "Normal" setting is available for each group. • Run/Stop Only: The control mode at "Monitor 1 or 2" is changed to only "Run and Stop" for each group.
Operation Indicator	Switch the color of the operation back and forth between green and red. When an error occurs, the indicator will flash red OFF and ON regardless of the setting.
All Groups Display Automatic Switch	When starting from the "All Groups" display at the beginning of the operation, set "Enable". On the Block display screen, if a mini central controller does not operate in a given time, the screen will automatically switch to the All Groups display.
Wired Controller Operation is Prohibited when Setting OFF Time?	When setting the "Stop command for the Remote Control by OFF time" and "Remote Operation Prohibited (All Items)", set the schedule function of the mini central controller to "Enable". In this case, when ON Time cancels Remote Operation Prohibited (All Items), the operation cannot be controlled by way of a command. When Remote Operation Prohibited is set (by item), this function cannot be set. Set is as "Disable".
Display Graph for Numerical Value	When displaying a graph for operation time or Thermo-On time (without displaying any numeric value), set the Operation Time display as "Disable".
Thermo-On Time Display	When running the Time display, set the Thermo-On time to "Enable" to display the time.

NOTICE

- When using the Optional Function Setting (Air Conditioner, Wired Controller setting), set the same content to the Remote Control Groups. In the same way, use the wired controller to set from the mini central controller at the Optional Function Setting (Fixed, Auto).
- Fixed operation mode of optional function setting and demand of external input output setting: the group which set both of the operation mode shift will stop regardless the operation mode when the demand signal is ON.
- When the Power ON/OFF (d1, d3) of the optional function is set, DO NOT set the prohibition of the remote control operation. When the operation of the local remote control is not restricted when using the Power ON/OFF, DO NOT use the lock function of the local remote control.

9.14 Exception Setting of Run/Stop Operation

When the group is set as All Run (all groups, all blocks) "RUN" and "STOP" cannot be accepted.

When using the exception setting Run/Stop, select from the following:

- None
- Run + Stop
- Stop
- Run

Set by Monitor > Menu > Service Menu > Exception Setting of Run/Stop Operation.

Refer to Section 10.6 for details.

NOTICE

- "All of the Run/Stop" and "Run/Stop by Block" commands will not be affected when they are set to Groups/Blocks. However, these commands are accepted as follows within this function.
 - Scheduled Timer Operation
 - "All Run/Stop" and "Run/Stop by Block" by External Input command
- The "Run/Stop" operation is available when the group is selected individually.

9.15 External Input/Output Setting

In the principal mini central controller, there is an external Input/Output function of four inputs and two outputs.

Set by Monitor > Menu > Service Menu > External Input and Output Setting.

Refer to Section 10.7 for details.

Input and Output	Connection	Function	
Input 1	CN1 1-2 Pin	<ul style="list-style-type: none"> • All Run/Stop (Level) • All Run (Pulse) • All Stop (Pulse) • No Setting (Factory Setting) 	<ul style="list-style-type: none"> • Emergency Stop (Level) • Demand (Stop/Run mode Shift/Outdoor Unit Capacity Control)
Input 2	CN1 2-3 Pin		
Input 3	CN2 1-2 Pin		
Input 4	CN2 2-3 Pin		
Output 1	CN3 1-2 Pin	<ul style="list-style-type: none"> • All Run • All Alarm 	<ul style="list-style-type: none"> • No Setting (Factory Setting)
Output 2	CN3 1-3 Pin		

■ External Input Function

1. All Run/Stop (Level)
All groups simultaneously affect the Run/Stop operation through the external input signal
2. All Run (Pulse)
All groups simultaneously affect the Run operation through the external input signal
3. All Stop (Pulse)
All groups simultaneously affect the Stop operation through the external pulse signal input
4. Emergency Stop (Level)
All groups simultaneously affect the Stop operation through the external emergency stop signal. When the "Emergency Stop" is activated, the wired controller LCD displays "Central Control" and the operation cannot be performed from the wired controller.
 - When using with another mini central controller, the "Run/Stop" operation is available from the other mini central controller even if during an emergency stop.

5. Demand Control Function (*1)

At peak demand, electrical consumption is cut by the external demand control signal.

Only the input from terminal one is available at the external demand signal.

The operational mode of a selected group will be changed by the demand signal as follows:

	Demand Signal ON	Demand Signal OFF
Stop (*2)	Indoor Unit will stop (Remote control operation prohibited).	Return to the previous operation condition. (*3)
Run Mode Shift (*2) (*4)	COOL or DRY switch to FAN (Remote control operation prohibited) HEAT switch to STOP (Remote control operation prohibited)	
Operation Unit Capacity Control (*5) (*6) (*7)	Control the value of outdoor unit capacity in the setting value. (Setting Value: 100/90/80/70/60/50/40/0%)	Cancel the capacity control.

(*1): Do not set "STOP" or "Run Mode Shift" when using simultaneously with other mini central controller. When setting outdoor unit capacity control, set one of the mini central controller and do not set the others.

(*2): Setting is only possible for Stop or Run Mode Shift. It is not possible to set multiple contact points.

(*3): Do this when "AUTO" operation is carried out, or "Fixing Operation Mode" is enabled at "Optional Function Setting".

(*4): It will stop regardless of the operating mode, as in "AUTO" or when the "operating mode fixed" in the optional function setting is enabled.

(*5): The outdoor unit capacity control can be set to multiple contact points. When there is a signal input in multiple contact points, the control with the most contact points will have the highest priority as follows (Input 1 > Input 2 > Input 3 > Input 4).

(*6): The control capacity target applies to outdoor units only. If the desired target is different than the one selected, contact your contractor for adjustments.

(*7): It is possible to control using a schedule without using demand control.

INSTALLATION

■ External Output Function

1. All Run Output

This is an external output for the indoor unit operation signal in the target group
The operation signal outputs even if only one indoor unit in the target group is operating.

2. External Output Alarm

This is an external output alarm signal for an indoor unit in the target group.
The alarm signal activates even if a fault occurs in one indoor unit within the target group.

■ External Input/Output Terminals Specification

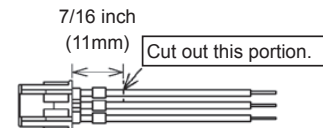
Input Terminal: Non-voltage contact (normal open) for demand signal Input 12VDC, 10mA
Switching of the contact is possible.
Pulse width is 300ms or more for pulse signal input.

Output Terminal: Contact (voltage is applied) for signal Output 12VDC
Recommended Relay: MY Relay manufactured by Omron Corporation
(Do not use a diode built-in type.)

Input/Output connection: Use the connector cord accessory.

Connection procedure:

1. When the cord is not used depending for any reason, check the connector number and cut out a portion as shown in the figure at the right. Protect the cut part using insulating tape as local code.



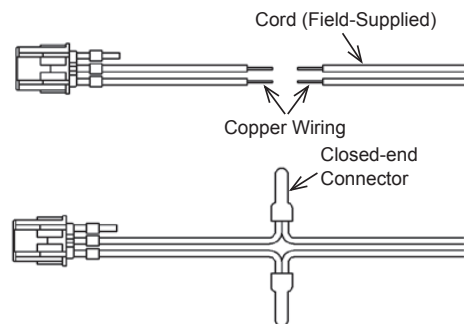
Protect the cut part using insulating tape.

2. To connect a relay or timer with cord that meets local electrical codes and connect using one of the following procedures:

a. When Soldering

Twist and solder copper wires together and insulate with electrical tape.

- b. When Caulking with a closed-end connector accessory:
Insert the closed-end connector after twisting and soldering copper wires together. Then caulk with the aid of a clamping tool. (Check by pulling up). Make sure the connection is secure by pulling up on the connection.



9.15 Button Setting

The operating button indication selection

The operating button indication can be selected to show or hide for restricting operation.

Set by Monitor > Menu > Service Menu > Button Setting.

Refer to Section 10.8 for details.

9.16 Contact Information Register

The contact information editing or registration for "Contact Info." display function. This function is used when there is an error issue with the system and an alarm code is displayed.

Set by Monitor → Menu → Service Menu → Contact Info. Register.

Refer to Section 10.9 for details.

9.17 Alarm History

The alarm history record of the air conditioner and the mini central controller

The time of alarm occurrence, abnormal unit and alarm code are recorded. The alarm history record of all deletions is performed by this function.

Set by Monitor > Menu > Service Menu > Alarm History.

Refer to Section 10.13 for details.

10. Service Menu

10.1 Display of Service Menu Screen

<Monitor (All Groups)>

<Monitor (Block)>

1. Touch "Menu" on the "Monitor (All Groups)" or "Monitor (Block)" screen.

[Menu]

2. The "Menu" screen is displayed.
3. Press and hold "Service Menu" for at least three seconds. The "Service Menu" is displayed.

[Service Menu]

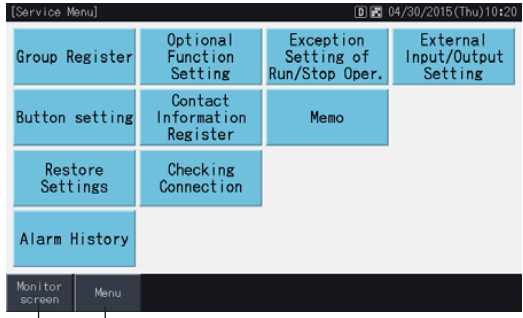
4. Select the "Service Menu" function by touching each item button. The setting screen of selected function will be displayed.

NOTICE

Depending on the operating condition of the air conditioner unit and the mini central controller (listed as 1 through 4 below), the following functions cannot be selected.

- Group Register (1)
- A/C unit and Wired Controller setting (Optional Function Setting) (2)
- External Input/Output Setting (1, 2)
- Restore Settings (1, 3, 4)
- Checking Connection (1, 2)
 1. When the External Input signal is ON
 2. When one air conditioner unit is operating
 3. When one air conditioner unit Wired Controller is restricted (Without Wired Controller not included).
 4. When one outdoor unit is operating at capacity control.

10.2 Exit Service Menu Screen

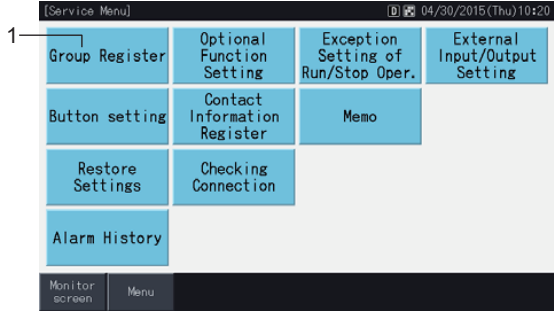


The screenshot shows the 'Service Menu' screen with a grid of options. A callout '1' points to the 'Menu' button at the bottom left. A callout '2' points to the 'Monitor screen' button at the bottom left.

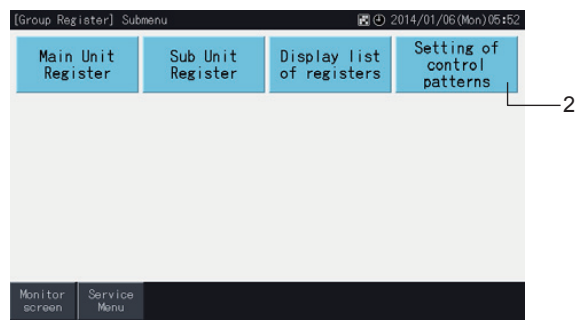
1. Touch "Menu" to return to the Menu screen.
2. Touch on "Monitor screen" to return to the Monitor screen.

10.3 Group/Block Pattern Register

10.3.1 How to Register Control Pattern



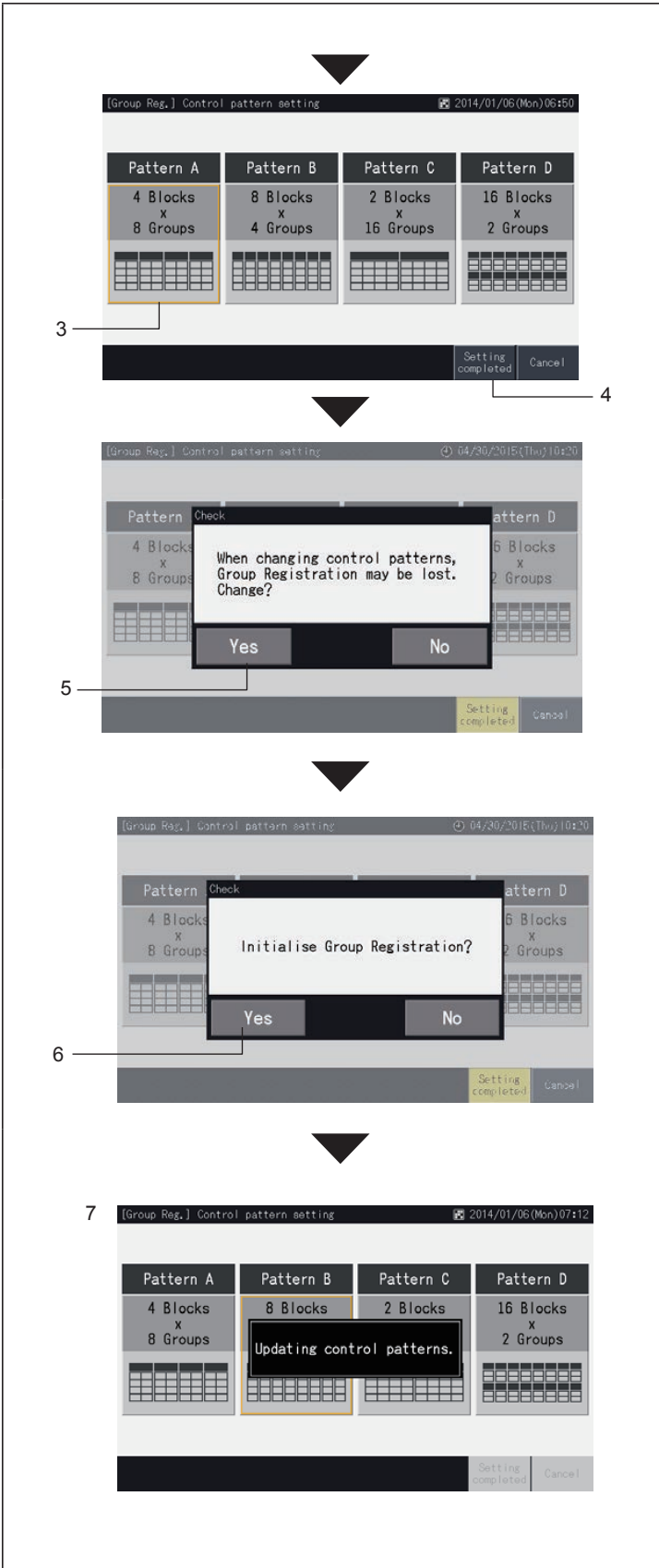
The screenshot shows the 'Service Menu' screen. A callout '1' points to the 'Group Register' button at the top left.



The screenshot shows the 'Group Register' Submenu screen. A callout '2' points to the 'Setting of control patterns' button at the top right.

Continue to Next Page

1. Select "Group Register" on the "Service Menu" screen.
2. Select "Setting of control patterns" on the "Group Register" screen.

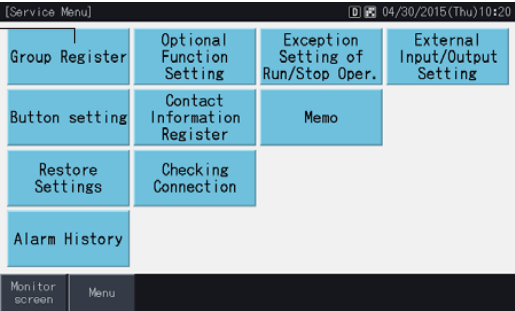


3. Set the Control Pattern.
 - When touching on the Control Pattern button, the selected button is trimmed in an orange outline.
4. Touch "Setting completed".
 - Touch "Cancel", and the screen will return to Group Register.
 - The Group Register can be deleted when modifying the Control Pattern.
5. Initialize Group Registration? Touch "Yes" on the confirmation screen.
 - Touch "No" to return to the "Setting of Control Patterns" screen.
6. Touch "Yes", and it will confirm the Control Pattern selected and cancel all the Group Registration.
 - Touch "No", and it will confirm the Control Pattern selected and even after the Control Pattern is modified, the Group within the Control range will retain the Main/Sub Unit registration.
7. The Control Pattern up-dating screen is displayed.

After up-dating the Control Pattern, the Group Register screen will display when registering the Main Unit. If the Main Unit is not to be registered, the Unregister Group screen will display.

10.4 Group Register

10.4.1 How to Register Group (Main Unit)



1

[Service Menu] 04/30/2015(Thu)10:20

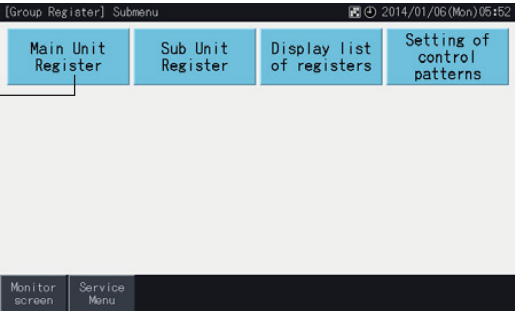
Group Register	Optional Function Setting	Exception Setting of Run/Stop Oper.	External Input/Output Setting
Button setting	Contact Information Register	Memo	
Restore Settings	Checking Connection		
Alarm History			

Monitor screen Menu

1. Select "Group Register" on the "Service Menu" screen.

NOTE:
This function cannot be selected when the external input signal is connected to the external input terminal 1 or 2.

▼



2


[Group Register] Submenu 2014/01/06(Mon)06:52

Main Unit Register	Sub Unit Register	Display list of registers	Setting of control patterns
--------------------	-------------------	---------------------------	-----------------------------

Monitor screen Service Menu

2. Select "Main Unit Register" on the "Group Register" screen.

▼



3

[Group Register] Main Unit Register 2014/01/06(Mon)06:02

Block1		Indoor Unit (01/18)									
1-1 00-00	1-2 04-00	00-00 G 1-1	00-01 G 1-1	00-02 G 1-1	00-03 G 1-1	00-04 G 1-1	00-05 G 1-1	00-06 G 1-1	00-07 G 1-1	00-08 G 1-1	00-09 G 1-1
1-3 05-00	1-4 06-00	00-10 G 1-1	00-11 G 1-1	00-12 G 1-1	00-13 G 1-1	00-14 G 1-1	00-15 G 1-1				
1-5 07-00	1-6 08-00										
1-7 09-00	1-8 10-00										

:Done :Undone :Done :Undone :Sub

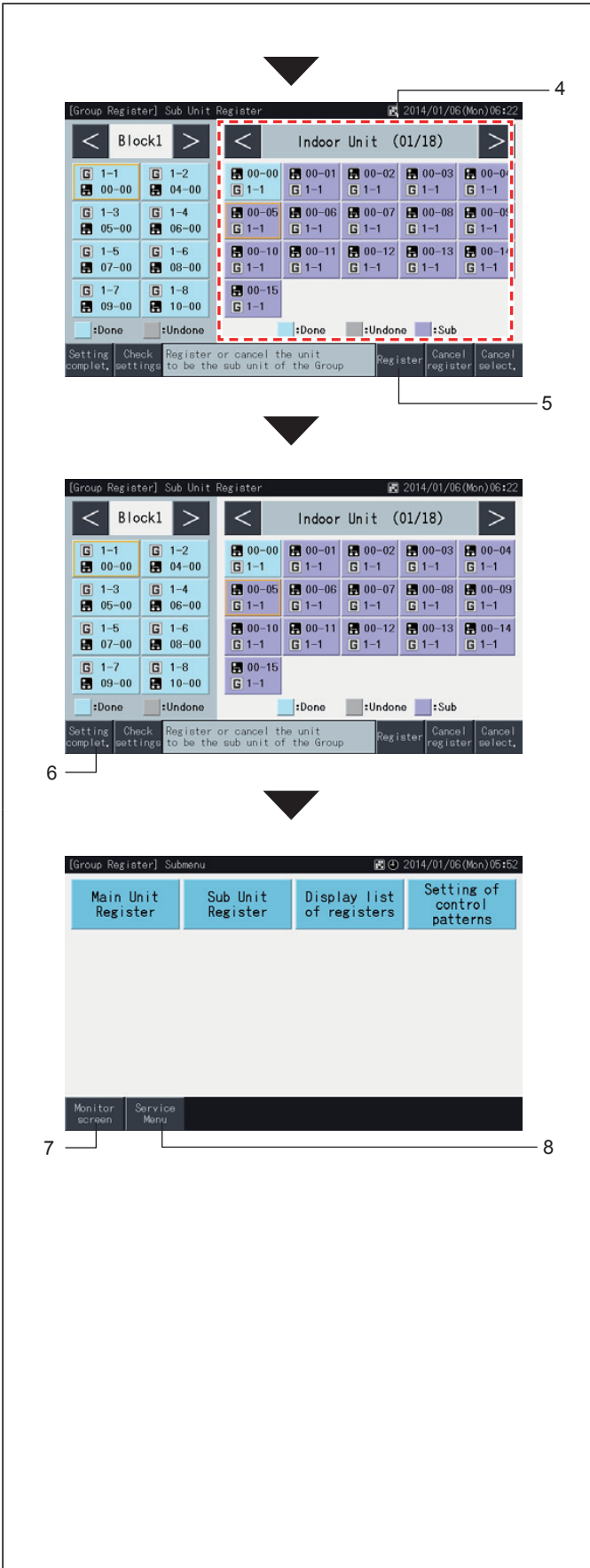
Setting Register or cancel the unit Register Cancel Cancel
complet, settings to be the main unit of the Group register register select.

3. Select a Group for the main unit to register.

- Touch "<" or ">" on the upper left of the touchscreen, to switch the block display.
- The information of Block number and Group number are indicated in the button as "Block No. - Group Name".
- Select the group button by touch. The selected button is trimmed with an orange outline. Touch the selected group button again and the group selection will be canceled.
- The Main Unit screen may be different depending on the Control Pattern. The screen on the left indicates the Setting of control patterns when Pattern A is selected (4 Blocks x 8 Groups).

▼

Continue to Next Page



4. Select the indoor unit for "Main Unit Register".
 - Touch "<" or ">" on the upper right area of the touchscreen and the indoor units display is changed.
 - The information of the refrigerant cycle numb and indoor unit address are indicated in the indoor unit button as "Refrigerant Cycle No. - Indoor Unit Address".
 - Select the indoor unit button by touch. The selected button is trimmed with an orange outline. If the selected button is touched again, the indoor unit selection is canceled.
 - The indoor unit that is already registered as the main unit cannot be selected. (The button color is blue.)
- < About the Indoor Unit Selecting >
 - The indoor unit which letters are highlighted in red cannot be registered as the main unit. In this case, the indoor unit is registered as the sub unit automatically.
 - When the indoor unit with a fan speed of Four, and fan speed setting Three becomes intermixed in the same Remote Control group, register the indoor unit with a fan speed of Four as a Main Unit.
 - When the indoor units such as "with auto louver function" and "without auto louver function" are mix-installed in the same H-LINK, register the indoor unit "with auto louver function" on the priority basis as the main unit. If the unit "without auto louver function" is registered as the main unit, the auto louver function cannot be used in this H-LINK. (The same applies to the other functions.)
5. Touch "Register" to register the main unit while the group and indoor unit are selected.
 - If the group and indoor unit for the main unit are not selected, "Register" will be displayed in gray but cannot be selected.
 - The button color of the registered group and indoor unit are changed to blue and the information is displayed in the button group shown below.
- < Group Button >

Block No. Group No.

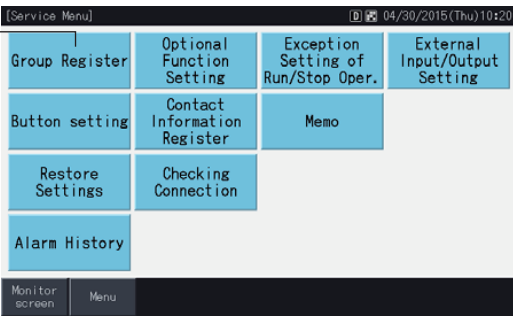
Main Unit I.U. Address

Ref. Cycle No.
- < Indoor Unit Button >

Ref. Cycle No. I.U. Address

Block No. Group No.
- Proceed to the main unit register, depending on the setting.
 - Continue "Main Unit Register" ... (3)
 - Exit "Main Unit Register" (6)
6. Touch "Setting Complete" to register the group and return to the Group Register menu screen.
7. Touch "Monitor screen" to return to Monitor screen.
8. Touch "Service Menu" to return to Service Menu screen.

10.4.2 How to Register Group (Sub Unit)



1

[Service Menu] 04/30/2015(Thu)10:20

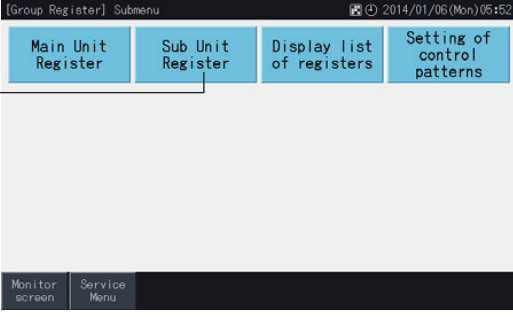
Group Register	Optional Function Setting	Exception Setting of Run/Stop Oper.	External Input/Output Setting
Button setting	Contact Information Register	Memo	
Restore Settings	Checking Connection		
Alarm History			

Monitor screen Menu

1. Select "Group Register" on the "Service Menu" screen.

NOTE:
This function cannot be selected when the external input signal is connected at external input terminal (1 or 2).

▼



2


[Group Register] Submenu 2014/01/06(Mon)06:52

Main Unit Register	Sub Unit Register	Display list of registers	Setting of control patterns
--------------------	-------------------	---------------------------	-----------------------------

Monitor screen Service Menu

2. Select "Sub Unit Register" on the "Group Register" screen.

▼



3

[Group Register] Main Unit Register 2014/01/06(Mon)06:42

Block1				Indoor Unit (01/18)			
G 1-1 00-00	G 1-2 04-00	G 00-00 1-1	G 00-01 1-1	G 00-02 1-1	G 00-03 1-1	G 00-04 1-1	G 00-05 1-1
G 1-3 05-00	G 1-4 06-00	G 00-06 1-1	G 00-07 1-1	G 00-08 1-1	G 00-09 1-1	G 00-10 1-1	G 00-11 1-1
G 1-5 07-00	G 1-6 08-00	G 00-12 1-1	G 00-13 1-1	G 00-14 1-1	G 00-15 1-1		
G 1-7 09-00	G 1-8 10-00						

:Done :Undone :Done :Undone :Sub

Setting Register or cancel the unit to be the main unit of the Group Register Cancel register Cancel select.

3. Select the group for the "Sub Unit Register".

- Touch "<" or ">" at the upper left of the touchscreen, to change the block array display.
- Touch the group button to select. The selected button is trimmed with an orange outline.
- Touch again to deselect or cancel.
- Unregistered groups appear in gray and cannot be selected. Thus, the main unit cannot be selected for an unregistered group.
- The sub unit register screen may be different, depending on the control pattern. The screen on the left indicates the setting of control patterns when pattern A is selected (4 blocks x 8 groups).

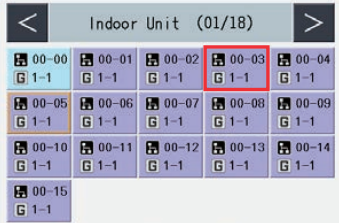
▼

Continue to Next Page



4. Select the indoor unit for the “Sub Unit Register”.

- Touch “<” or “>” at the upper right of the touchscreen, to change the block display for indoor units.
- The information of the refrigerant cycle number and indoor unit address are indicated in the indoor unit button as “Refrigerant Cycle No. - Indoor Unit Address”.



- Select the indoor unit button by touch. The selected button is trimmed with an orange outline. Touch again to deselect or cancel the indoor unit selection.
- An indoor unit that is already registered as the main unit cannot be selected. (The button color is blue.)

5. Touch “Register” to register sub units when group and indoor units are selected.

- If group and indoor units for sub units are not selected, the “Register” display is grayed-out and cannot be selected or deleted.
- The button color of the registered group and indoor unit are changed over to purple.

Proceed on to registering the sub unit depending on the setting.

- Continue with “Sub Unit Register” (3)
- Exit the “Sub Unit Register” (6)
- It is possible to register up to 15 Sub Units in the same Remote Control Group Main Unit.
- An indoor unit without a wired controller cannot be registered as a Sub Unit.

6. Touch “Setting Complete” on the “Group Register (Sub Unit Register)” to return to the “Group Register” screen.

7. Touch “Monitor screen” to return to the Monitor screen.

8. Touch “Service Menu” to return to the “Service Menu” screen.

10.4.3 How to Cancel Group Register

2

3

4

5

6

7

1. Select "Group Register" on the "Service Menu" screen. Refer to item 10.3.1 (1).
NOTE:
This function cannot be selected when the external input signal is connected at external terminal (1 or 2).
2. Select "Main Unit Register (or Sub Unit Register)" on the screen of "Group Register".
3. Select a registered group to cancel.
 - Touch "<" or ">" at the upper left of the touchscreen, to change the block array display.
 - Touch to select a group. The selected button is trimmed with an orange outline. If the selected group button is tapped again, the group selection will be canceled.
4. Touch "Cancel Register" to delete the Group Register. The Group or Indoor Unit Button turns gray.
 - Touch "Cancel Register" on the "Main Unit Register" screen, to deregister the main unit and any associated sub units.
 - Touch "Cancel Register" on the "Sub Unit Register" screen, and sub units are deregistered.
5. Touch "Setting Complete" to return to the "Group Register" screen.
6. Touch "Monitor screen" to return to the Monitor screen.
7. Touch "Service Menu" to return to "Service Menu" screen.

10.4.4 How to Check Group Register (Check Main Unit Register)

1. Select "Group Register" on the "Service Menu" screen. Refer to item 10.4.1 (1).

NOTE:
This function cannot be selected when the external input signal is joined to the external input terminal (1 or 2).

2. Select "Main Unit Register (or Sub Unit Register)" on the "Group Register" screen.

3. Touch "Check Settings" at the lower corner left of the touchscreen.

4. The screen will switch to the "Group Register" Check screen.

- The screen will switch to Group Register when "Main Unit Register" is selected.

5. Touch "Setting Completed" to register a Group. The screen will return to the "Group Register" Menu screen.

6. Touch "Monitor screen" to return to Monitor screen.

7. Touch on "Service Menu" to return to Service Menu screen.

10.4.5 How to Check Group Register (Check Register Details)

Step 1: [Group Register] Submenu. Options: Main Unit Register, Sub Unit Register, Display list of registers, Setting of control patterns. Bottom bar: Monitor screen, Service Menu.

Step 2: [Group Register] List Display. Title: All Groups. Table of registers:

Group	Block	00-00	00-01	00-02	00-03	00-04	00-06	00-08	00-09
G 1-1	Block1	00-00	00-01	00-02	00-03	00-04	00-06	00-08	00-09
Group1									
G 1-2	Block1	04-00	00-05						
Group2									
G 1-3	Block1	05-00							
Group3									
G 1-4	Block1	06-00	00-07						
Group4									

Bottom bar: Submenu. Right side: 01/08, navigation arrows.

Step 3: [Group Register] Submenu. Options: Main Unit Register, Sub Unit Register, Display list of registers, Setting of control patterns. Bottom bar: Monitor screen, Service Menu.

1. Select "Group Register" on the "Service Menu" screen. Refer to item 10.4.1 (1).
NOTE:
This function cannot be selected when the external input signal is connected with external input terminals (1 and 2).
2. Select "Display list of Registers" in the Group Register screen.
3. Select the target displayed (All Groups/Blocks).
4. Addresses for all registered indoor units are displayed for each group.

Black = Main Unit
(Other designated color) = Sub Unit
 - Move to another page by touching on "△" or "▽".
5. Touch "Sub menu" to return to the Group Register screen.
6. Touch "Monitor screen" to return to the Monitor screen.
7. Touch on "Service Menu" to return to the "Service Menu" screen.

10.5 Optional Function Setting

10.5.1 Air Conditioner Remote Control Settings

1. When the air conditioner is not operating, select "Optional Function Setting" on the "Service Menu" screen.

2. Select "Remote control setting" on the "Menu" screen.

- Cannot be selected if the air conditioner is operating.

3. Select the Optional Function target (All Groups/Block/Group).

4. Select the function concerning each option.

- The selected function button will change color.

5. Touch "Setting Completed" to confirm. Return to the "Menu" screen of the target group.

6. Touch "Cancel" to cancel the content setting. Return to the Optional Function target selection screen.

NOTE:

Depending on the unit, the setting may not apply. Please, check the installation and maintenance manual, and the operation manual of each indoor unit or remote control for more details.

10.5.2 Mini Central Controller Setting

1. Select "Optional Function Setting" on the "Service Menu" screen.

2. Select "Controller setting" on the "Optional Function Setting" screen.

3. Select a function concerning each item.

- The color of the selected function button will change.

< Concerning OFF Time Remote control prohibition >

- When setting as Enable, the Remote Operation Prohibited (by item) cannot be set. The Remote Operation Prohibited (by item) can be set but, if operating simultaneously with other controllers, then do not perform any settings.
- When all groups have Remote Operation permitted (all items) only, it is possible to switch back and forth between Enable and Disable.

4. Touch on "Setting Completed" to confirm the setting. Return to the "Optional Function Setting Menu" screen.

- After selecting Enable or Disable in the OFF time Remote Control Prohibition, touch on "Setting Completed". The confirmation screen is displayed as below.

5. Touch on "Service Menu" to complete the Optional Function Setting and return to the "Service Menu" screen.

10.6 Exception Setting of Run/Stop Operation

1. Select the "Exception Setting of the service menu Run/Stop Oper." on the "Service Menu" screen.

2. Select the operation to exclude settings.

- The color of the selected function button changes.

3. Select the exception operation target (group/block)

- Touch on the Group button to switch between "Select" and "Cancel".
- Touch the Block button to switch between "Select" and "Cancel" for all groups in a block.
- A check mark as shown will be displayed on the selected group.

4. Touch on "Setting Completed" to confirm the setting. Return to the Exception setting for the Run/Stop Operation.

10.7 External Input/Output Setting

10.7.1 External Input Setting

The screenshots illustrate the following steps:

- Service Menu:** A grid of menu items including 'Group Register', 'Optional Function Setting', 'Exception Setting of Run/Stop Oper.', 'External Input/Output Setting', 'Button setting', 'Contact Information Register', 'Memo', 'Restore Settings', 'Checking Connection', and 'Alarm History'. The 'External Input/Output Setting' option is highlighted.
- Settings List:** A list of settings for Input 1, Input 2, Input 3, Input 4, Output 1, and Output 2. All are currently set to 'No Settings'. Input 1 is highlighted with a red dashed box.
- Input 1 Settings:** A detailed menu for Input 1 with options: 'No Settings' (highlighted in yellow), 'All Run (Pulse)', 'Emergency Stop', 'All Run/Stop (Level)', 'All Stop (Pulse)', 'Demand Stop', 'Demand Outdoor unit Capacity Control', and 'Demand Operation Mode Shift*'. A 'Cancel' button is at the bottom right.
- Settings List:** The list from step 2 is shown again, but now 'Input 1' is set to 'No Settings'.

1. Select the “External Input/Output setting” on the “Service Menu” screen.

- If the air conditioner is operating, or if the external input signal contact point is ON, this cannot be selected.

2. Select the input target (from input 1 to 4) for the external input.

3. Select a function in the external input.

- The selected function button color changes. Here are the steps displayed when a function is selected.
- If “No Setting” selected, go on to step four.
- If “Demand Capacity Control” is selected, go on to step five.
- If other than those above, go on to step 10.

< “No Setting” >

4. Touch “Service Menu” to complete the External Input/Output setting. Return to the “Service Menu” screen.

5

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11

- <Outdoor Unit Capacity Control>
5. Select the outdoor unit capacity value.
 - The selected capacity value button changes color.
 6. Control capacity can be selected in the central station schedule without using a contact point. In the schedule, select Enable and the applicable time.
 - Select “Enable” or “Disable”.
 - Tap “Δ” or “∇” to set the applicable starting time and the ending time. The time adjusts for every 30 minutes.
 - When the Ending time is earlier than the Starting time, Ending time will continue on into the following day.

For example:
 Starting Time 15:00
 Ending Time 08:00,
 The capacity control will start at 15:00 and will end the next day at 08:00.
 7. Touch “Register”.
 8. Select the capacity control target (Refrigerant system).
 - The buttons of the Refrigerant system of the registered outdoor unit numbers will be displayed in blue.
 - Unregistered outdoor units will be displayed in gray. This means that these refrigerant units cannot be selected.
 - Touch the refrigerant system number button to toggle back and forth between “Select” and “Cancel”.
 - Touch “Select all refr. syst” to toggle back and forth between “Select” and “Cancel” for all refrigerant systems.
 - A check mark will display for the refrigerant selected.
 9. Touch “Setting Completed” to confirm the setting. Return to the External Input/Output Setting screen.
- < Other settings >
10. Select the External Input Control target (All Groups/Block/Group).
 - Touch the Group button to toggle between “Select” and “Cancel”.
 - Touch the Block button to toggle between “Select” and “Cancel” Blocks in all Groups.
 - Touch “Select All Groups” to toggle between “Select” and “Cancel” all Groups.
 - A red check mark (shown at left) will display for the selected Group.
 11. Touch “Setting Completed” to confirm the setting. Return to the external Input/Output Setting screen.

10.7.2 External Output Setting

The process is shown in four sequential screenshots:

- Service Menu:** A grid of menu items including Group Register, Optional Function Setting, Exception Setting of Run/Stop Oper., External Input/Output Setting (highlighted with a red dashed box and arrow 1), Button setting, Contact Information Register, Memo, Restore Settings, Checking Connection, and Alarm History.
- External I/O Setting Settings List:** A list of settings for Input 1-4 and Output 1-2. Output 1 and Output 2 are highlighted with a red dashed box and arrow 2.
- External Input/Output Setting Output 1:** A screen showing three options: No Settings (highlighted with a red dashed box and arrow 3), All Run, and External Output Alarm. A Cancel button is at the bottom right.
- External I/O Setting Settings List:** The same list as in step 2, but with the Service Menu button at the bottom left highlighted with a red dashed box and arrow 4.

1. Select "External Input/Output Setting" on the Service Menu" screen.

- When the air conditioner is operating, or when the external input signal contact point is ON, this cannot be operated.

2. Select the Output target of the External Output (Output 1, and 2).

3. Select the function used in the External Input.

- The selected function button will change color.

Touch the "Optional Function button" to confirm the setting. Return to the External Input/Output Setting screen.

4. Touch "Service Menu" to complete the external Input/Output Setting and return to the "Service Menu" screen.

10.8 Button Setting

The first screenshot shows the 'Service Menu' with the following options: Group Register, Optional Function Setting, Exception Setting of Run/Stop Oper., External Input/Output Setting, Button setting (highlighted), Contact Information Register, Memo, Restore Settings, Checking Connection, and Alarm History. The second screenshot shows the 'Button setting' screen with the following options: All Groups Run (Show/Hide), All Groups Stop (Show/Hide), All Groups Setting (Show/Hide), and Menu (One Tap/Press hold). The 'Show' buttons are highlighted in yellow. At the bottom, there are 'Setting completed' and 'Cancel' buttons.

1. Select "Button setting" on the "Service Menu" screen.

2. Select the function concerning each group.
 - The button of the selected function will change color.
3. Touch "Setting Completed" to confirm the setting control and return to "Service Menu" screen.

10.9 Contact Information Register

The process is shown in four sequential screenshots:

- Service Menu:** A grid of menu items. 'Contact Information Register' is selected and highlighted in blue. A line labeled '1' points to this button.
- Contact Information Register:** Two entries, 'Contact Information 1' and 'Contact Information 2', are shown. Each has 'Name Edition' and 'TEL. No. Edition' buttons. A red dashed box highlights these buttons, with a line labeled '2' pointing to it.
- Contact Info:** An input screen for 'Input name for contact 2'. It features a numeric keypad and a QWERTY keyboard. A line labeled '5' points to the bottom right corner of the keyboard area.
- Contact Information Register:** The screen returns to the 'Contact Information Register' screen. The 'Service Menu' button at the bottom left is highlighted, with a line labeled '7' pointing to it.

1. Select "Contact Information Register" on the "Service Menu" screen.
2. Select the "Contact Information (1 or 2) Name Edition" or the "Contact Information (1 or 2) TEL. No. Edition" to register the information.
3. Type in the telephone number.
NOTE: Only the keyboard of numeric characters and symbols can be selected when "Contact Information (1 or 2) TEL. No. Edition" is selected.
4. The maximum allowable number of characters is 60 for the name of a company and 30 characters for a phone number.
5. Touch "Register" when the character information is completed. Confirm the Contact Information and return to the Contact Information Edit screen. Proceed with the contact information register, depending on the setting.
 - Continue to register or edit contact information.(2)
 - Finish this setting.(7)
6. Touch "Service Menu" to complete this setting. The screen reverts back to the "Service Menu".

10.10 Memo

10.10.1 Register Memo

[Service Menu] 04/30/2015(Thu)10:20

Group Register	Optional Function Setting	Exception Setting of Run/Stop Oper.	External Input/Output Setting
Button setting	Contact Information Register	Memo	
Restore Settings	Checking Connection		
Alarm History			

Monitor screen Menu

1. Select "Memo" on the "Service Menu" screen.

[Memo] List 02/01/2014(Thu)02:13

--/--/----	--/--/----	--/--/----	--/--/----
--:--:--	--:--:--	--:--:--	--:--:--
--/--/----	--/--/----	--/--/----	--/--/----
--:--:--	--:~:~:~	--:~:~:~	--:~:~:~

Service Menu Delete memo

2. Select the target to register.

[Memo] Input 02/01/2014(Thu)08:44

[Green bar]												<	>	
!	@	#	£	%	"	&	^	()	Delete				
1	2	3	4	5	6	7	8	9	0					
Q	W	E	R	T	Y	U	I	O	P	SpC				
€	A	S	D	F	G	H	J	K	L					
<	>	Z	X	C	V	B	N	M	,	↵				
ABC		abc		Symbols 1		Symbols 2		Symbols 3		Register		Cancel		

3. The character input screen is displayed.

4. Select a registered character or symbol from the character list.

5. Input characters. Touch "Delete" to erase the character on the left side of the cursor.

- The number of characters possible to enter is 52 characters maximum.

[Memo] List 02/01/2014(Thu)02:13

--/--/----	--/--/----	--/--/----	--/--/----
--:~:~:~	--:~:~:~	--:~:~:~	--:~:~:~
--/--/----	--/--/----	--/--/----	--/--/----
--:~:~:~	--:~:~:~	--:~:~:~	--:~:~:~

Service Menu Delete memo

6. Touch "Register" when character input is completed. Confirm the memo and return to the Memo display screen.

7. Touch "Service Menu" to return to "Service Menu" screen.

10.10.2 Delete Memo

The diagram illustrates the process of deleting a memo through four sequential screenshots:

- Service Menu:** A grid of menu items including 'Group Register', 'Optional Function Setting', 'Exception Setting of Run/Stop Oper.', 'External Input/Output Setting', 'Button setting', 'Contact Information Register', 'Memo', 'Restore Settings', 'Checking Connection', and 'Alarm History'. The 'Memo' option is highlighted with a blue box and a callout line labeled '1'.
- Memo List:** A screen showing a list of memo entries, each with a date and time placeholder (e.g., --/--/---- --:--). A 'Delete memo' button is located at the bottom right, with a callout line labeled '2'.
- Memo Delete:** The same memo list is shown, but with a red dashed rectangular box highlighting the entire list area. Below the list, there are buttons for 'Return to list', 'Select memo to clear.', 'Proceed', and 'Cancel selection'. A callout line labeled '3' points to the 'Proceed' button.
- Memo Delete (Selected):** The memo list is shown with red checkmarks in the top-left corner of the first two memo entries. The 'Proceed' button is now highlighted, with a callout line labeled '4'.

Continue to Next Page

1. Select "Memo" on the "Service Menu" screen.
2. Touch "Delete Memo" to select a memo to delete.
3. Select the memo to delete.
 - Touch the Memo button to toggle back and forth from "Select" and "Cancel".
 - It is possible to select multiple Memos.
 - A red check mark is appears on the selected memo(s).
4. Touch "Proceed" to clear the memo.

5

6

5. Touch "Return to List" to return to the Memo screen.

6. Touch "Service Menu" to return to "Service Menu" screen.

10.11 Restore Setting

1. Select "Restore Settings" on the "Service Menu" screen.

NOTE:
This function cannot be selected when the wired controller operation is prohibited, the external input contact point is ON, or outdoor unit capacity control is not cancelled. Cancel these parameters when performing "Restore settings".

2. Touch "Yes" at the confirmation screen.

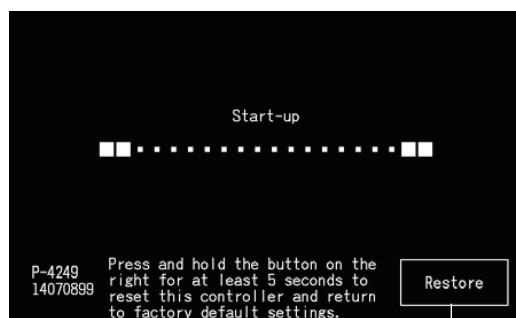
NOTE:
If "No" is selected, the screen will be returned to the "Service Menu".

3. The confirmation screen is displayed again, touch "Yes" to restore the setting. After several seconds, the screen is changed and the connection check of the system is started.

NOTE:
If "No" is selected, the screen will be returned to the "Service Menu".

Information

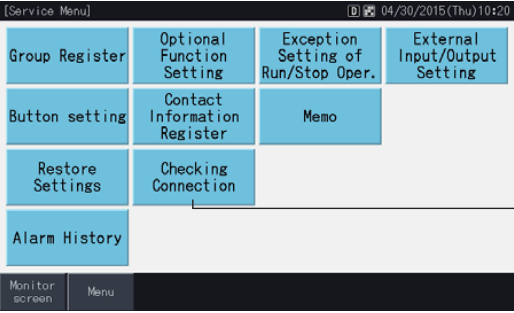
The Restore Settings option can be set when the Start-up screen is displayed.



Restore Setting

- To restore factory default settings, touch the "Restore" button in the lower right corner of the "Start-up" screen, maintaining contact for more than five seconds.
 - The "Restore settings" option is not displayed when the wired controller operation is prohibited, the external input contact point is ON, or that the outdoor unit capacity control is not cancelled.
- In a few seconds, the connection check process begins.
- When the connection verification process is complete, the "Date and Time Settings" screen is displayed.
(Refer to "Date and Time Settings" in Section 9.5.)

10.12 Checking Connection

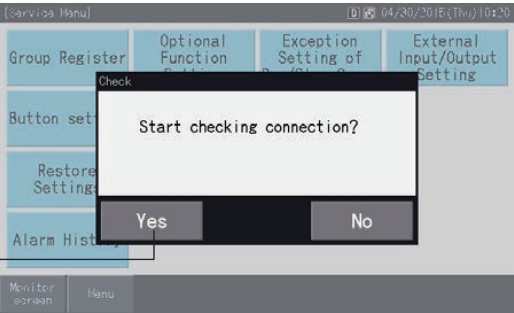


1

1. Select "Checking Connection" on the "Service Menu" screen.

NOTE:
This function cannot be selected when the air conditioner(s) is operating or that the external input signal is directed to external input terminal (1 or 2.)

▼



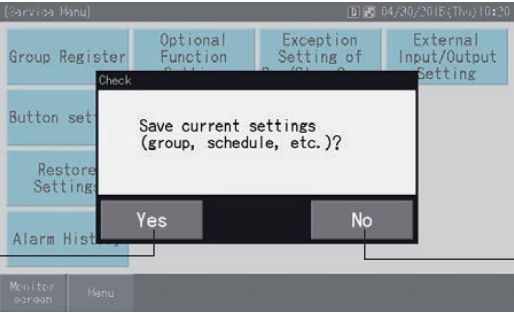
2

2. Touch "Yes" at the confirmation screen.

NOTE:
Touch on the "No" button and the screen will return to the "Service Menu". Proceed with the connection information update depending upon what is to be set later.

- Update connection information by retaining Group register and settings such as schedule setting, and so on. (Item 3 below.)
- Perform reconnection check by initializing each setting. (It is the same as the restore setting command.) (Item 7, next page.)

▼

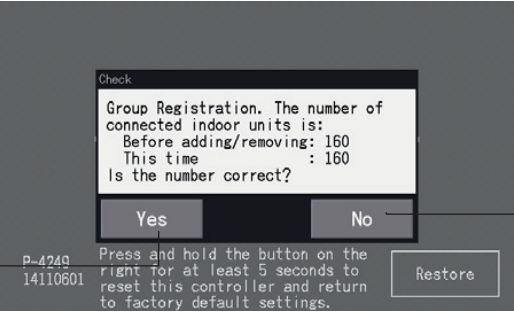


3

< Keeping the setting >

3. Touch "Yes" at the confirmation screen to save the current the setting.

▼



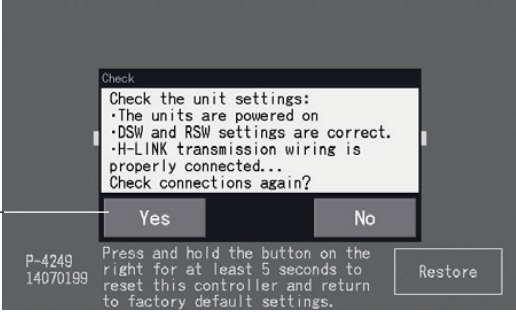
4

4. When the process for checking connections is complete, the number of connected indoor units is displayed on the confirmation screen. Touch "Yes" if the number of connected units is indicated correctly. The "Main Unit Register" screen will be displayed. Refer to Section 10.4.1 (3).

5. If the number of connected units indicates something different from actual number, touch "No".

▼

Continue to Next Page




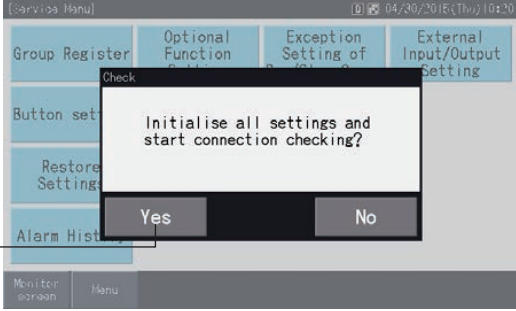
6

6. Because the Confirmation screen is displayed again, check the air conditioner and touch on "Yes".

NOTE:
Touch "No" to return to the "Service Menu" screen.

- This function cannot be selected when the wired controller operation is prohibited, external input contact point is ON, or the outdoor unit capacity control is not cancelled. Cancel these parameters when performing "Restore Settings".





8

< Not keeping the setting >

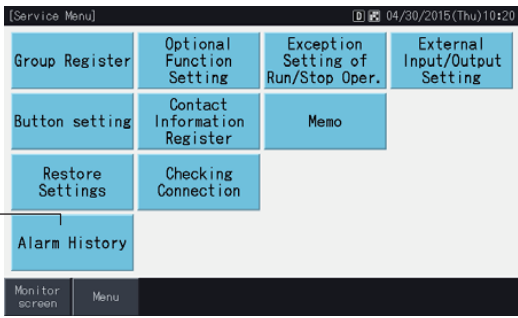
7. Touch "No" at the confirmation screen.

8. Touch "Yes" on the initialization screen display.

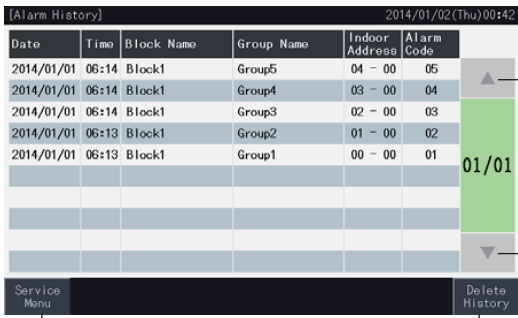
- The initialization for each model setting and connection confirmation processing will start.
- The RCS operation can not be selected when set as prohibited.
- Please cancel the "RCS operation prohibited" setting.

NOTE:
Touch "No" to return to the "Service Menu" screen.

10.13 Alarm History



▼



1. Select "Alarm History" on the "Service Menu" screen.

2. The "Alarm History" screen is displayed. If there are more than 11 alarm records, touch "△" or "▽" to go onto the next page.
 - If the alarm records number less than 10, it is not possible to advance to the next page.
 - A maximum of 100 records can be stored in the memory.
3. Touch "Delete History" to delete an alarm history record, Touch "OK" at the confirmation screen, and all alarm history records are deleted.
 - Touch "Cancel" to restore deleted files and return to the "Alarm History" screen.
4. Touch "Service Menu" to terminate Alarm History display and return to the Service Menu Screen.

1.4.9 Large Central Controller

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1. Safety Summary**Important Notice**

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc. or York.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. and York. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

Signal Words

⚠ WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
⚠ CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

⚠ WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
------------------	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could settle inside of the electrical box, possibly causing electrical failures.

INSTALLATION

- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- When a wireless controller is used, locate at a distance of at least 3.3 ft. (approximately 1 meter) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain boss. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Damp or uneven areas: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area (only for Heat Pump Model): Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine, or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.

- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left behind inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions”, the proper use and maintenance of the unit to the customer according to the information in all manuals that came with the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precautions



To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit’s intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit’s faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country’s requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.42 kg/m³ based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

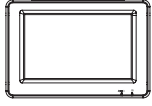
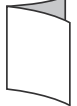



- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume that electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.

INSTALLATION

- Communication cabling shall be a minimum of 18-Gauge, two-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cable clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After operation shutdown, be sure to wait at least five minutes before turning OFF the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground cable is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground cables.
- If there are frequent occurrences with blown fuses or flipped circuit breakers, shut down the system immediately and contact your service contractor.

2. Before Installation

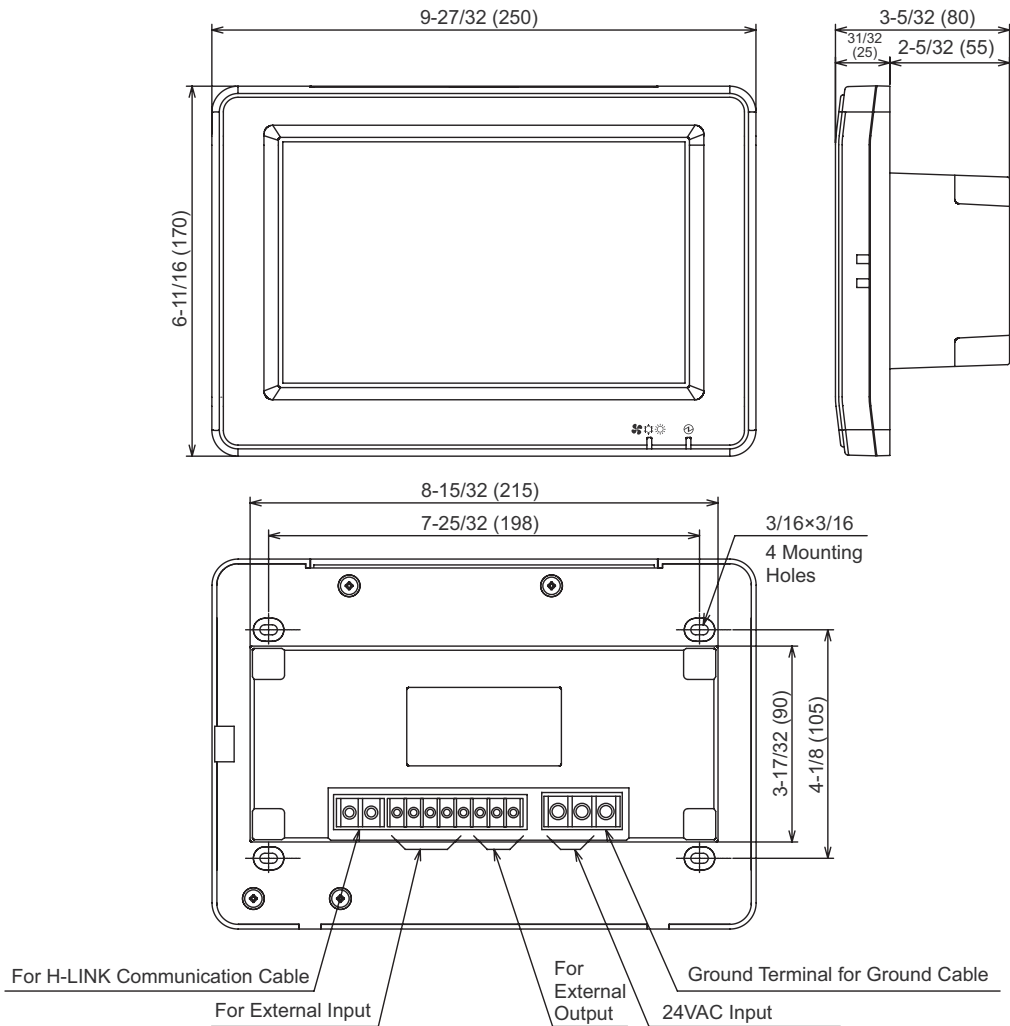
☐ Check to ensure that the following parts are packed with the large central controller.

Item	Large Central Controller CCL01	Operation Manual and Installation and Maintenance Manual	Touch Pen	Touch Pen Holder	Screw
Appearance					
Qty.	1	1 Each	2	1	M4 x 16mm 4

- ☐ Select a suitable place for handling and determine the installation location of the wired controller with the customer's acceptance. Do not install the wired controller in such locations as:
- where children can come into direct contact
 - where the airflow discharge from the air conditioner is directed toward people or pets.

3. Outer Dimensions

(Unit: inch(mm))



4. Features

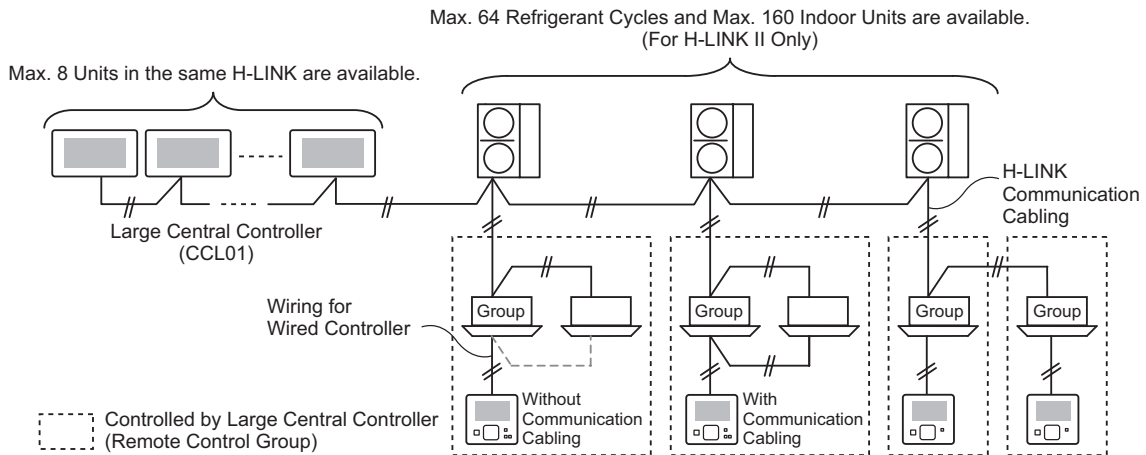
This CCL01 is the remote controller for air conditioning system that controls and monitors maximum 160 indoor units.

4.1 Specification

Model	CCL01
Outer Dimension <W x H x D+(Built-in Part)>	9-27/32 x 6-11/16 x 31/32 + (2-5/32) inch (250 x 170 x 25 + (55) mm)
Net Weight	3.3 LBS (1.5 kg) (Approx.)
Installation Location	Indoor
Installation Method	Wall Built-in with Steel Box (Option)
Connected Indoor Units (Qty.)	160 (Maximum)
Clock Accuracy	± 70 Seconds/Month (at Normal Temperature)
Ambient Temperature	41 ~ 95°F (5 ~ 35°C)
Ambient Humidity	35 ~ 90% (No Dew Condensation)
Display	8.5" TFT Color Liquid Crystal Display (800 x 480 dots)
Rated Power Supply	24VAC, 60Hz
Electrical Power Consumption	30W (Max.)

4.2 System Configuration

This large central controller (CCL01) is connected to H-LINK and used for the central control and monitoring of the air conditioners. The system configuration example is shown in below.

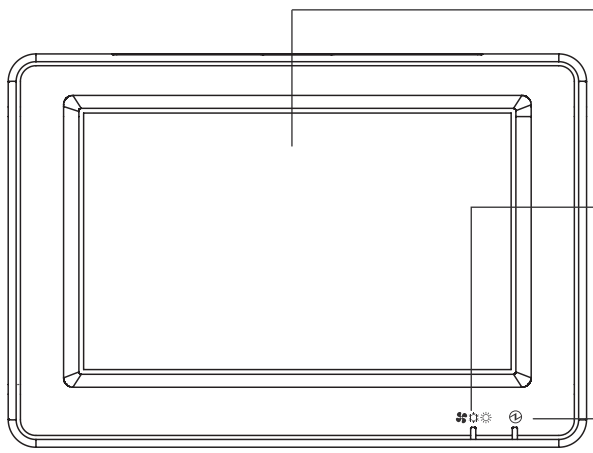


NOTICE

- When an indoor unit not equipped with a wired controller is connected, the controller cannot be simultaneously used.

4.3 Component Names and Functions

[Front Side]

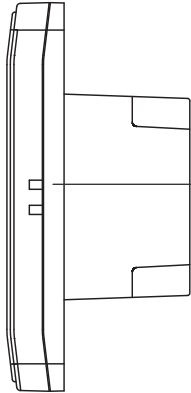


Color LCD Display with Touchscreen
Operates and monitors the units using the touch pen accessory. The touchscreen display will be automatically turn OFF after a dormant period.

Operation Indicator
Indicates the Run/Stop condition of the units:
OFF: All the units are stopped.
ON (Green): One or more units are in operation.
Flashing (Red): In an abnormal condition

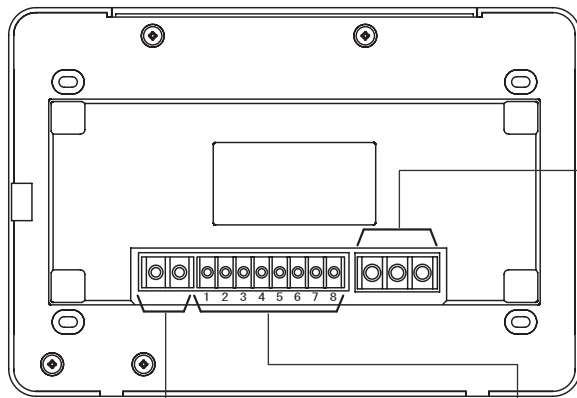
Power Indicator
To indicate the power condition at the large central controller
OFF (lamp): Power is turned OFF
ON (lamp): Power is turned ON

[Right Side]



Mounting Slots for Touch Pen Holder

[Rear Side]



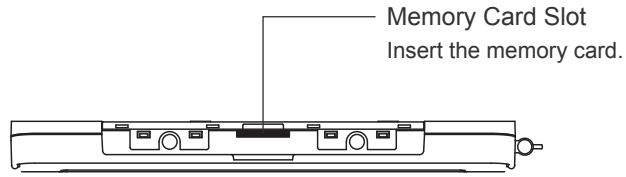
TB1
Terminals for Connecting Power Cable

TB2
Terminals for Connecting H-Link Control Wiring (Non-Pole)

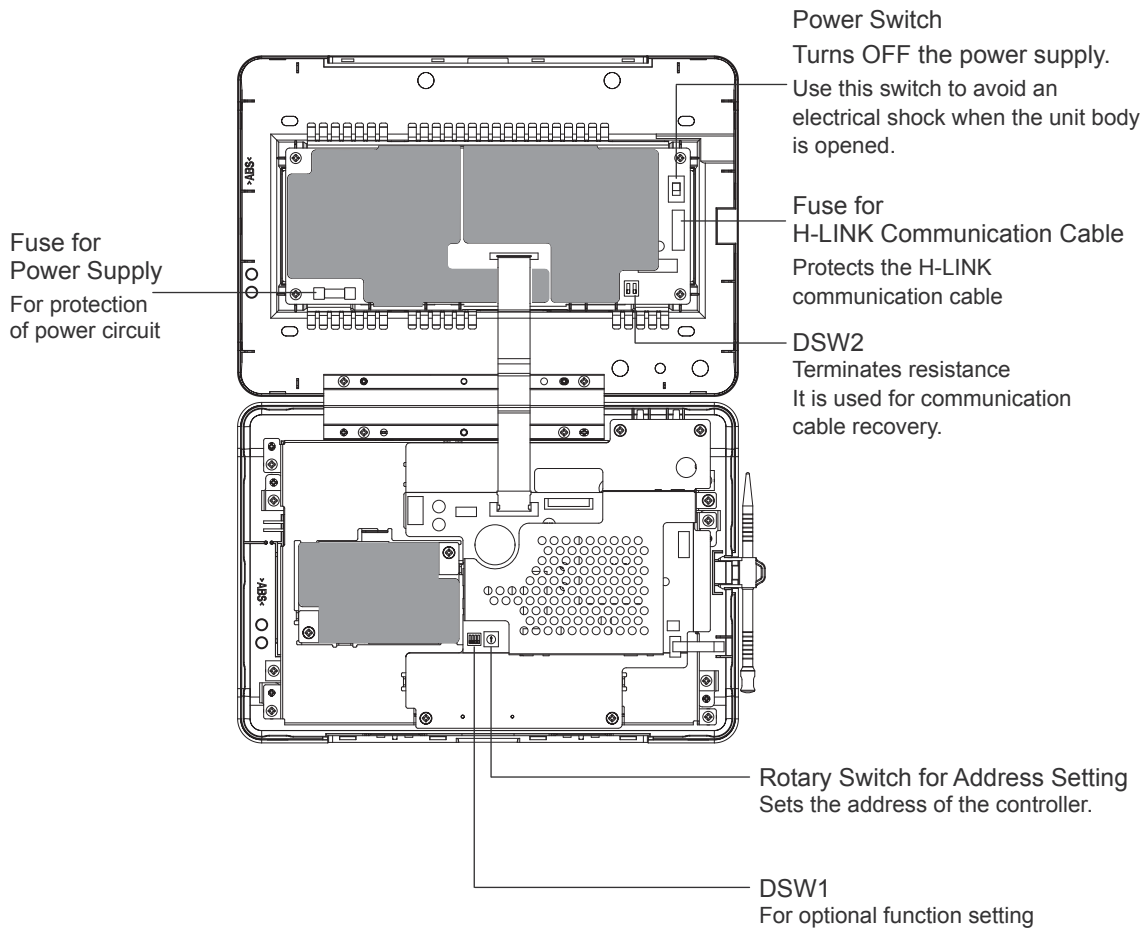
TB3
Terminals for External Input/Output
1-5: External Input 1 6-8: External Output 1
2-5: External Input 2 7-8: External Output 2
3-5: External Input 3
4-5: External Input 4

INSTALLATION

[When Slot Cover is Opened]



[When Unit Body is Opened]

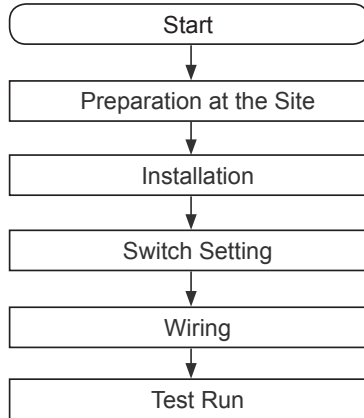


⚠ WARNING

For safety, DO NOT remove the covers marked with " [REDACTED] ".
Removing covers may result in a serious electrical shock.

5. Installation Procedure

This manual informs the installer how to handle the large central controller and the test run for the controller. The installation procedures are as shown below.



5.1 Preparation at the site

Before installing a controller, prepare the following items.

Parts	Specification
Steel Box	Option
Power Supply Cable	Cable SPEC: AWG 16(1.25mm ²) to AWG 14(2mm ²) Recommended Cable: 600V CV, CCV, CEV
H-LINK Cable (For Control)	Cable SPEC: AWG 18(0.75mm ²) to AWG 16(1.25mm ²) Recommended Cable: Communication Cable with Shield, Over AWG 18(0.75mm ²) (Equivalent to KPEV-S)

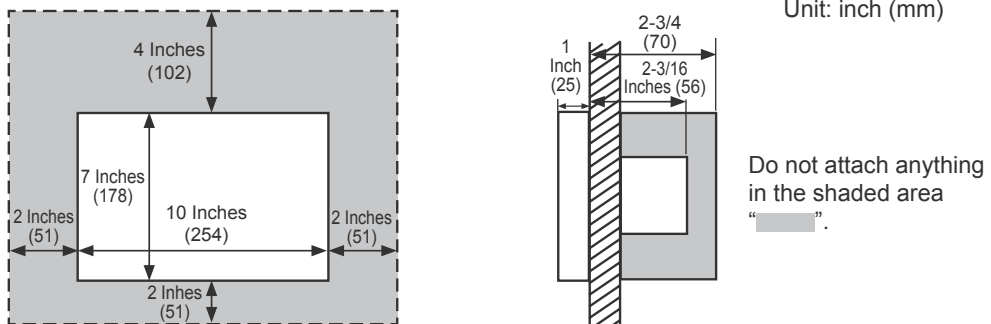
NOTE:

Communication cabling shall be a minimum of 18-Gauge, Two-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.

5.2 Installation

[Installation Space]

- Maintain sufficient space for the installation of the large central controller as shown below.



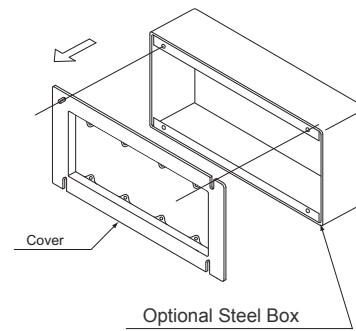
When installing more than two large central controllers in row or in line, maintain adequate spacing between each.

- * Vertical Direction: 4 Inches (102mm)
- * Horizontal Direction: 2 Inches (51mm)

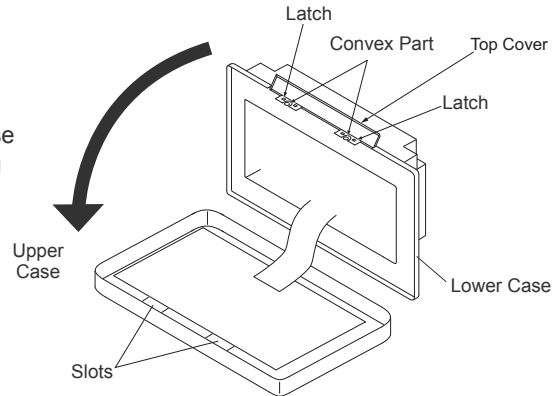
INSTALLATION

[Installation Method]

- 1. Remove the cover attached to the optional steel box.
- 2. Install the optional steel box into the wall.



- 3. The factory ships the unit body open.
If the unit is closed, open it as shown at right.
 - a. Open the lid of unit body.
 - b. While pressing both latches, the top of the case can be opened since the catches for mounting have been removed.

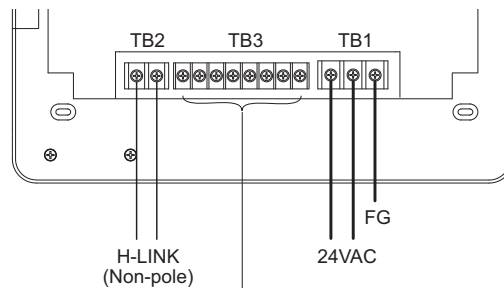


- 4. Connect the wiring to the terminal board of the large central controller.

TB1: Terminal Board for Power Supply

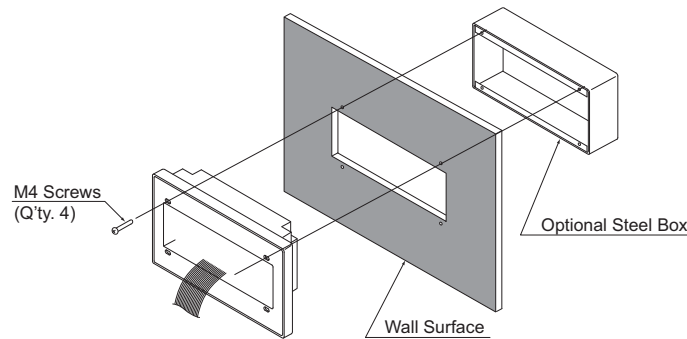
TB2: Terminal Board for H-LINK

TB3: Terminal Board for External Input and Output



Terminals for external input/output
Refer to item 8.11.

- 5. Mount the optional steel box with the M4 x 5/8 inch accessory mounting screws.



6. Switch Setting Procedure

Switch settings for the large central controllers are identified in the following table.

□ 1. Use the settings below.

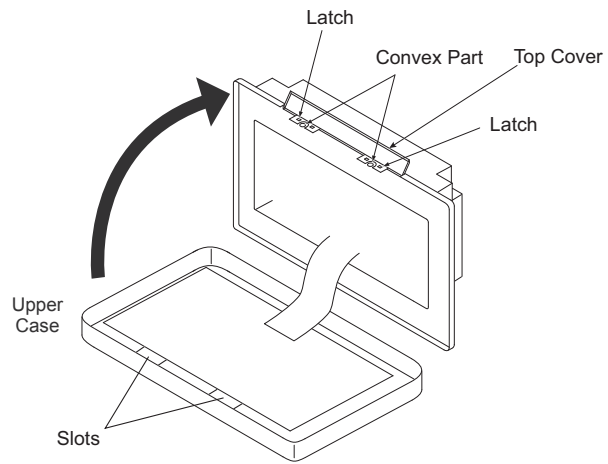
Switch	Switch No.	Usage	Factory Setting	Remarks
RSW1 (Rotary Switch 16-poles)	-	For address setting of large central controller	0	When using multiple units.
DSW1 (DIP Switch 4-poles)	1	OFF (Fixed)	OFF	
	2	OFF (Fixed)	OFF	Not Used
	3	OFF (Fixed)	OFF	Not Used
	4	OFF (Fixed)	OFF	Not Used
DSW2 (DIP Switch 2-poles)	1	ON: Terminating Resistance Enable OFF: Terminating Resistance Disable	OFF	Make sure no other terminating resistance exists on the same H-LINK when enabling the terminating resistance from the large central controller.
	2	ON: Protection Fuse for H-LINK ... Disable (Short-circuited) OFF: Protection Fuse for H-LINK ... Enable (Normal)	OFF	
SW1		ON: Turn ON Large Central Controller OFF: Turn OFF Large Central Controller	ON	

NOTICE

- Turn OFF the power supply when setting the DIP switches and rotary switch. Do not touch the printed circuit board (PCB) or the metal to avoid a malfunction of the large central controller.
- Alarm 63 will be displayed on a H-LINK II compliant central controller if a mis-configured DSW1-1 is connected. In this case, turn OFF the power supply for all central control devices and correct the settings of each central control device. Then, restart central control devices.
- When using several mini central controllers at the same time, set "RSW1" so as not to overlap.

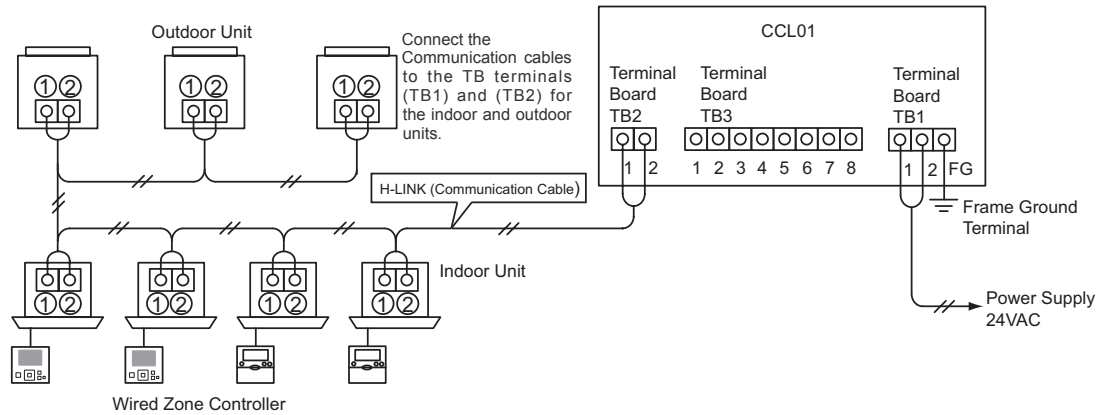
INSTALLATION

- 2. Close the unit body until it snaps, making sure it is tightly closed.



7. Electrical Wiring

- 1. The large central controller requires wiring work of the power supply cable, air conditioner, and control wiring (H-LINK).
- 2. Wiring Method



Type of Wiring	Specification	Length of Wiring	Cable Specification	Recommended Cable Model
Power Supply Cable	24VAC	-	AWG16(1.25mm ²) to AWG14(2mm ²)	600V CV, CCV, CEV
Ground Cabling	---	---	---	---
H-LINK (Control Cable)	5VDC	3281feet (1000m) ≥	AWG18 (0.75mm ²) to AWG16 (1.25mm ²)	Communication Cable with Shield ≥ AWG18(0.75mm ²) (Equivalent to KPEV-S)
Wiring for External Input and Output	Input: Non-voltage Normal Open Output: 12VDC, 75mA _≥	230 feet (70m) ≥	AWG18 (0.75mm ²) to AWG16 (1.25mm ²)	JKPEV-S, JKEV-S, CVV-S, CVV, 600V VCT

NOTICE

- The large central controller may break down by an incorrect wiring.
- Communication cabling shall be a minimum of 18-Gauge, two-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- It is a requirement that communication cables be separated from the power supply wiring and other electrical device wiring. Maintain at least 12 inches (30cm) separation between communication cables and wiring from the power supply. If wiring and cables are not secured separately, they should be run through separate metal conduit tubing. One side of the metal conduit tubing should be grounded for noise reduction.
- Do not connect the power supply wiring to the large terminals for communication at of large central controller. If the power supply wires are connected incorrectly, the fuse of the printed circuit board will blow out for protection. If this happens, turn ON DIP switch (DSW2-pin) on the printed circuit board (PCB), to proceed with unprotected (no fuse) emergency operation.
- When an insulating capacity test or voltage test is performed, firmly remove the ground wiring of the ground fault terminal.

8. Use of Memory Card

Use a memory card to write setting data to the memory card.

■ Usable Memory card

SD memory cards or SDHC memory cards based on the SD Standard are acceptable. However, some cards may not operate properly.



- These memory cards are considered acceptable by Johnson Controls.
 - SanDisk Ultra® SD™/SDHC™ card
 - SanDisk® SD™/SDHC™ card (standard type)

■ Insert the memory card.

1. Unlock the write protection lock of the memory card.

2. Open cover/lid (a). Then insert memory card (b).

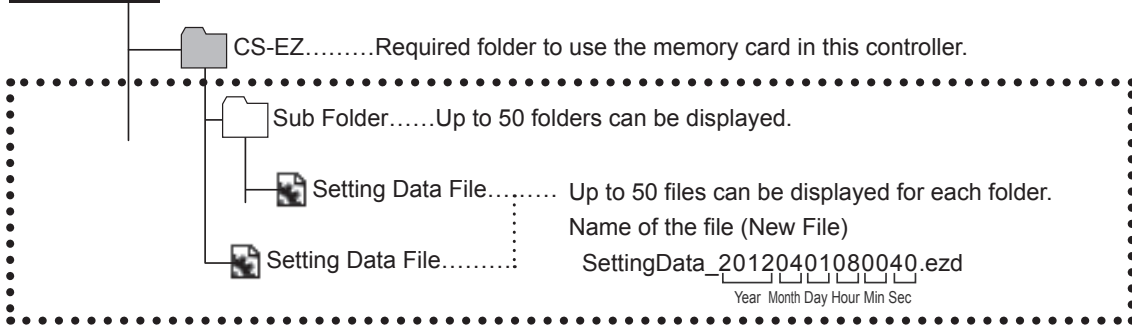
■ Remove the memory card.

1. Push the memory card (a) down until you hear the "click". The card is released and can be removed.

2. Close the lid (b).

■ Folders and Files

Memory Card



- If unavailable characters are included in the name, the character will be replaced by "?". In that case, the file or folder may not be accessible.
- Enter the name of the subfolder or the file within 240 characters. File names are limited to 240 characters.
- File setting data is saved as a ".ezd" file. There is no need to include ".ezd" in the characters.
- When the number of files in each sub-folder exceed 50, a warning message will be displayed and the screen will return to the Memory Card menu.

■ Notes for using the memory card

- The recommendation is to use the SD formatter when using the memory card for the first time. (See items 1 and 2 below.) Note that all data in the memory card will be erased by formatting the card.

NOTICE:

*1: Download the SD formatter software from the SD association site. (<http://www.sdcard.org/home>)

*2: When formatting the memory card improperly, it may fail to read/write data or take a long time for reading.

- When formatting the memory card, it may not completely erase the data on the memory card. If disposing of, or transferring information, it is recommended that the data-erasing program on your PC be used to completely erase the data.
- Do NOT remove the memory card or turn OFF the power while the memory card is reading or writing information. It will most likely damage the memory card surfaces, cause loss of data, or become unable to function under the following conditions:


NOTICE:

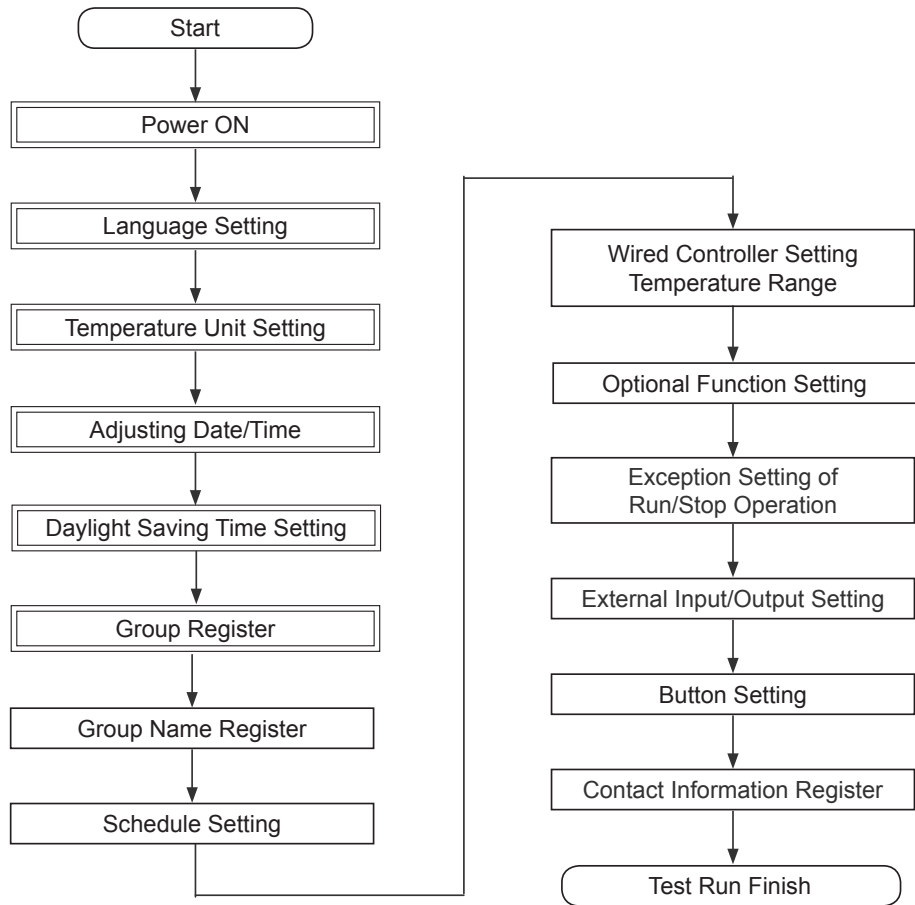
1. While the memory card icon is flickering.
 2. While the message "Recognizing Memory Card" is displayed.
 3. Immediately following "Read", "Write", or "Yes" messages after reading or writing data; (Immediately after the "Read" "Write" operation and the "Yes" buttons under the item 10.9.2.)
- When carrying or storing the memory card, do NOT leave it where static or electronic noise can be directly radiated to memory card. If affected, it may ruin the data on the memory card.
 - It is recommended that you back up important data to other storage media regularly. Hitachi or York cannot be held responsible for loss of data due to a damaged memory card.



DO NOT insert into this slot any memory card other than the specified memory card. Doing so may lead to failure of the unit, electric shock, or fire.

9. Test Run Procedure

The procedures for the test run are shown below. Those procedures displayed within a dual border “” are required items.



9.1 List of Features and Functions

Feature	Function	Page
Language Setting	This function is used for language selection.	20
Temperature Unit Setting	This function is used for changing the temperature unit.	20
Adjusting Date/Time	This function is used for adjusting the date and time.	20
Daylight Saving Time Setting	This function is used for setting daylight savings time operations.	21
Group Register	The connected indoor units are checked by the large central controller in the same H-LINK. This function is used for the group or block registration of them.	21
Main Unit Register	This function is used for the main unit registration in each remote controlled group. (There is one main unit for each remote controlled group.) A control command is sent from the large central controller to the main unit for the remote control group.	22
Sub Unit Register	This function is used for registration of the sub units except the main unit in the same remote control group. If using wired controllers or the receiver kits in the following scenario, sub units are registered automatically by the large central controller after the main unit registration. ● IR Receiver Kit	22
Display List of Registers	Displays the addresses for the indoor units which were registered in each group.	23
Group Name Register	This function is used for registering names of blocks and groups. The registrable number of letters are maximum of 20 letters for the name of each block or group. The name can also be copied. If the group/block is registered without a name, it will be registered as "Group 1" or "Block 1" automatically.	23
Schedule Setting	This function is used for scheduled timer operation which can be set for each group or block.	23
Schedule Timer Setting	This function is used for setting the time (by the minute), "Run/Stop" and temperature (66~86°F) (19~30°C)). For weekly schedule settings, up to 10 scheduled items can be set per day. It is also possible to copy the settings information.	23
Holiday Setting	This function is used for suspending the schedule operation temporarily. The schedule operation will not be available when this function is set. This function is used for setting irregular holidays such as national holidays.	23
Schedule Timer ON/OFF Setting	"Schedule Timer OFF Setting" is used for suspending the schedule operation for the target group. The schedule operation will not be available when Schedule Timer is OFF. This function is used for a long holiday, sudden holidays, national holidays, etc.	23
Optional Function Setting	This function is used for setting and changing of the function for air conditioners and large central controllers.	23
Air Conditioner, Wired Controller Setting	Set or modify the optional function of the air conditioner and wired controller.	23
Central Controller Setting	Set or modify the operational mode or the color of the operation indicator of the central controller.	24
Exception to Setting of Run/Stop Operation	This function is used to specify an exception setting of Groups/Blocks for the "All Run/Stop" command. The All Run/Stop command will not be affected to the specified group/block.	25
External Input/Output Setting	Four external input terminals and two external output terminals are available in the large central controller. These terminals are used for "All Groups Run/Stop" and "Demand Function" operations for the connected air conditioners. The external output terminals are used for the operation signal output or alarm signal output of the air conditioners which are connected to the large central controller.	25
Button Setting	This function specifies each button to be shown/hidden. This function also includes specification/setting for "one-touch operation" or the "press and hold" operation.	27
Contact Information Register	This function is used for editing contact information registration.	27

INSTALLATION

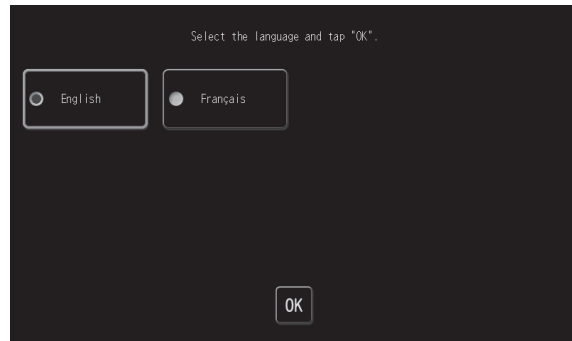
9.2 Supply Power to the Unit

1. Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.
 - Perform after the test run for each air conditioner and confirming that all the air conditioners operate normally.
2. Turn the power supply ON to the large central controller.

9.3 Language Setting

Several minutes after turning ON the power supply, the language setting screen is displayed on the touchscreen as shown at right.

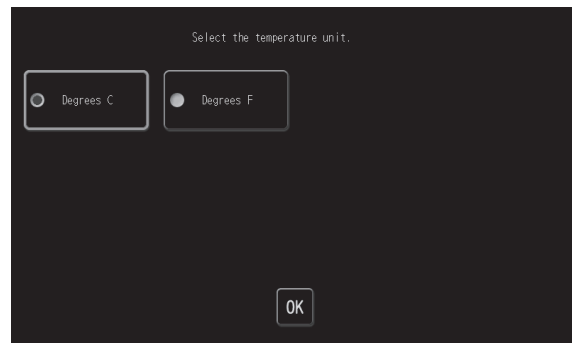
(When the power supply is turned ON at the first time.)
Select the appropriate language for operation and touch "OK".



9.4 Temperature Unit Setting

After the language is set, the screen displays as shown at right.

Select the appropriate temperature unit and touch "OK".



9.5 Adjusting Date/Time

After language setting, the "Setting Date/Time" screen is displayed on the touchscreen as shown at right.

Touch "Set" on the touchscreen display, and set the date and time in accordance with designated procedure.

Refer to the Operation Manual for details.



9.6 Daylight Saving Time Setting

After the Date/Time function is set, the screen will be displayed as shown on the right. Set each time and touch “Done” in the lower right corner.

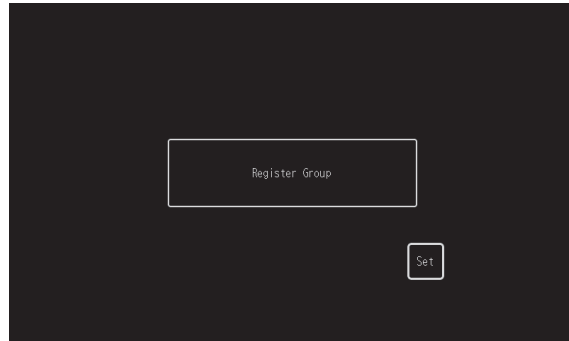


“Done” Button

9.7 Group Register

Register the indoor units confirmed for connection to the group (block) of the large central controller. Touch “Set” on the touchscreen and the Settings Screen is displayed (when the power supply is turned ON for the first time).

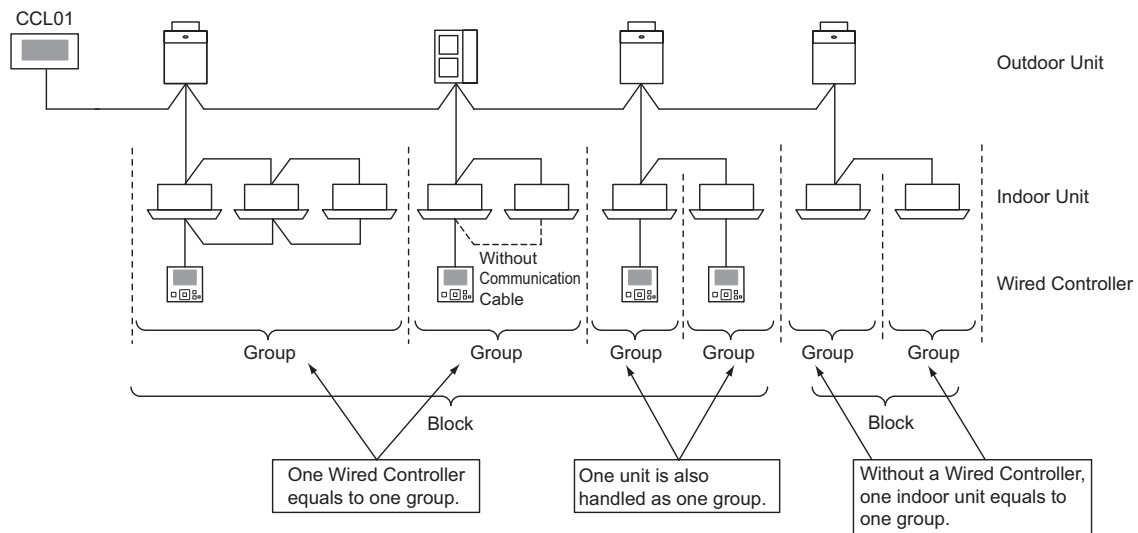
Refer to Section 10.3 for details.



INSTALLATION

[Group and Block]

- **Group (Remote Control Group):**
A group indicates the minimum number of operating units controlled by the large central controller, with multiple indoor units, with a maximum of 16 units, are connected by way of communication cables. The indoor units in the same group are controlled in the same operation with a maximum of 64 groups (4 blocks x 16 groups), controlled by a single large central controller.
- **Block:**
A block is an operation unit for a group. A maximum of 16 groups can be registered within one block. A maximum of four blocks can be controlled by the one large central controller.
- **Main Unit:**
The main unit registration is available for only one indoor unit per one group. A control command is sent from the large central controller to the main unit for the group.
- **Sub Unit:**
The sub unit is an indoor unit except the main unit in the same group. Sub units are controlled by the same operation with the main unit.



NOTICE

<Main Unit Registration>

- The main unit registration is available for only one indoor unit for one group. Thus, duplicate registration of the main unit is not possible in the same group. If the main unit registration is changed for some reason, cancel the current main unit registration, and register the main unit again.
- When the indoor unit with a fan speed of 4-touch and 3-touch are paired together in the remote control group, register as the main unit, that indoor unit equipped with a 4-touch fan speed. Note that if a 3-touch is registered as main unit, the group fan speed setting will be 3-touch only.
- When an indoor unit equipped with automatic louver swing and an indoor unit not equipped with automatic louver swing are co-mingled into the same group, do not register the indoor unit without automatic louver swing as the main unit. If it is registered as the main unit, this group cannot utilize the louver setting function.
- If a group in which the communication cabling connecting a wired controller is not used, the indoor unit without a wired controller should not be registered as the main unit.

<Sub Unit Registration>

- It is possible to register up to 15 sub units in the same remote control group with a main unit. (It is not possible to register more than 16 sub units.)
- The indoor unit not equipped with a wired controller cannot be registered as a sub unit. Always register it as a main unit only.
- If a sub unit is registered in another group, cancel the registration of target sub unit and register it again to a different group.

9.8 Registering Groups/Blocks Name

Register the names of the groups and the blocks for the registered groups.
 The registrable number of letters are a maximum of 20 for the name of the group (block).
 Set by Monitor 1 or 2 > Menu > Group Name Register.

Refer to the Operation Manual for details.

NOTICE

If you touch "Enter" at name registration, the name of the group or the block can be input in two lines using a total of 20 characters (10 characters for each line).

9.9 Schedule Operation

This function is used for the timer operation.
 It is possible to schedule a setting for a block and each group.
 Holiday settings that do not activate the schedule are also an option.
 Set by Monitor 1 or 2 > Menu > Schedule Settings.

Refer to the Operation Manual for details.

9.10 Wired Controller Temperature Setpoint Range

This function is used for restricting the temperature setpoint range of the local remote control operation.
 For RUN mode, it is possible to set a minimum cooling temperature or maximum heating temperature.
 Set by Monitor 1 or 2 > Menu > Setting Temp. range of the remote control.

Refer to the Operation Manual for details.

9.11 Optional Function Setting

This display is used for setting and changing the function selection for an air conditioner and a large central controller in the following table.
 Set by Monitor 1 or 2 > Menu > Service Menu > Optional Function Setting.

Refer to Section 10.4 for details.

Function		Description
Air Conditioner; Wired Controller Setting	Setting Operational Mode	Touch "Enable" in "Setting Operation Mode" to set the present operational mode. Operation mode is established as the present setting which cannot be changed from the wired controller and the large central controller.
	Setting Temperature Setpoint	Touch "Enable" of "Setting Temperature Setpoint" to set the present set temperature. The setting temperature is established as the present setting and which cannot be changed from the wired controller or the large central controller.
	Cooling Only	Touch "Enable" of "Cooling Only" to fix the operation mode as cooling. This function is used for heat pump models which can be operated such as the cooling only models. The operational modes "HEAT" and "AUTO" cannot be selected from the wired controller or the large central controller.
	Auto	Touch "Enable" in "Auto" to access and utilize the cooling/heating automatic operation. It is possible to set this mode from the wired controller and the large central controller. However, in the following cases, "AUTO" can no longer be selected: <ul style="list-style-type: none"> • Connected to the model of Cooling Only. • The function "Cooling Only" is enabled.
	Setting Fan Speed	Touch "Enable" in "Setting Fan Speed" to set fan speed. Fan speed set to the present setting by the wired controller and the large central controller cannot be changed.

INSTALLATION

Central Controller Setting	Control Mode	<p>This function is used for changing the control mode for the large central controller.</p> <p>When setting this function, touch "All Groups" as the target group, and select the control mode from "Normal" or "Run/Stop Only".</p> <ul style="list-style-type: none"> ● Normal: "Setting" is displayed when tapping the group button. This mode is the factory setting which normal setting is available by each group. ● Run/Stop Only: The control mode at "Monitor 1 or 2" is changed to only "Run and Stop" by each group.
	Operation Indicator	<p>It is possible to set this indicator in green or red.</p> <p>When an error occurs, this indicator will flash ON and OFF in red, regardless of the setting.</p>
	All Groups Display Automatic Switch	<p>Touch "Enable" to start from the "All Groups" display when initiating the operation.</p> <p>On the Block display screen, if a controller does not start within a given amount of time, the screen automatically switches to "All Groups" display.</p>
	Remote Control Switch (RCS) Operation Prohibited to Set OFF Time	<p>Touch "Enable" to set "Prohibited Remote Control Operation (All items)" and "Stop" simultaneously during the "OFF time" phase.</p> <p>At this time, the "Prohibited Remote Control Operation (All items)" command is cancelled and a "Run" command will not be sent.</p> <p>This function is not an option when setting the "Prohibited Remote Control Operation (By item)". Touch "Disable".</p>
	Display Graph for Numerical Values	<p>Touch "Disable" to display the graph for Operation Time or the Thermo-ON Time (without a numerical value displayed).</p>
	Thermo-ON Time Display	<p>Touch "Enable" to display the Thermo-ON Time in the Operation Time display.</p>

NOTICE

- "Optional Function Setting" information is set to the group by the large central controller. Check the setting from the wired controller in the same group. If this setting is not displayed, set the same information by the wired controller. In the same way, "Optional Function Setting" information such as "Setting Operation Mode", "Setting Temperature Setpoint", "Cooling Only", "Fixing Fan Speed", or "Auto" are set to the group by the wired controller. Check the setting from the large central controller. If this setting is not displayed, reset this same information at the large central controller.
- Demand of the operation mode fixed of optional function setting and external input/output setting: the group which set both of the operation mode shift will stop regardless the operation mode when the demand signal is ON.
- When the power ON/OFF (d1, d3) of the optional function is set, DO NOT set the "Prohibit" on of the remote control operation. If the operation of the local remote control is not restricted when using the power ON/OFF, DO NOT use the lock function of the local remote control.

9.12 Exception to Setting of Run/Stop Operation

This function is used as an exception to the command: “All Groups Run/Stop” and “Run/Stop by Block” operations for those selected Groups or Blocks.

Selecting Exception Settings for the Run/Stop Operation (All Groups/Block) are available as follows.

- Run and Stop
- Run
- Stop

Set by Monitor 1 or 2 > Menu > Service Menu > Exception Setting Run/Stop Operation.

Refer to Section 10.5 for details.

NOTICE

- None of the “All Run/Stop” and “Run/Stop by Block” commands will be affected when they are set to the groups/blocks. However, these commands are accepted as follows even if this function is set.
 - Scheduled Timer Operation
 - “All Run/Stop” and “Run/Stop by Block” by External Input command
- The “Run/Stop” operation is available when the group is selected individually.

9.13 External Input/Output Setting

The external input/output of each of two terminals are optional.

Their assigned functions are shown below.

Set by Monitor 1 or 2 > Menu > Service Menu > External Input/Output Setting.

Refer to Section 10.6 for details.

Input and Output	Connection	Function	
Input 1	TB3 1-5 Pin	*All Run/Stop (Level)	*Emergency Stop (Level)
Input 2	TB3 2-5 Pin	*All Run (Pulse)	*Demand Function (Input 1 only)
Input 3	TB3 3-5 Pin	*All Stop (Pulse)	*No Setting (Factory Setting)
Input 4	TB3 4-5 Pin		
Output 1	TB3 6-8 Pin	*All Run	
Output 2	TB3 7-8 Pin	*All Alarm	
		*No Setting (Factory Setting)	

■ External Input Function

1. All Run/Stop (Level)
All groups simultaneously execute the Run/Stop operation by way of the external input signal.
2. All Run (Pulse)
All groups simultaneously execute the Run operation by way of an external input signal.
3. All Stop (Pulse)
All groups simultaneously Stop operation by the external pulse signal input

Emergency Stop (Level)

All groups simultaneously execute the Stop operation by way of an external emergency stop signal. While “Emergency Stop” is performed, the wired controller LCD displays “Central Control” and the operation can not be controlled from the wired controller.

- When in use with other large central controllers, the “Run/Stop” operation is available from other large central controllers even if it is during an emergency stop.
- Do not set Emergency Stop when using simultaneously with other central controllers.

Demand Control Function

At peak demand, electrical consumption is reduced by the external demand control signal.

Only input terminal 1 is now available from the external demand signal.

The operation mode of a selected group will be changed by the demand signal as follows:

	Demand Signal ON (*1)	Demand Signal OFF (*2)
Stop (2) (See list below)	Indoor Unit Operation Stop with RCS Operation Prohibited Mode	The operating condition returns to previous status. (3)
Run Mode Shift (2) (4)	Cooling or Dry Operation ↓ Fan Operation with RCS Operation Prohibited Mode Heat Operation ↓ Operation Stop with RCS Operation Prohibited Mode	
Outdoor Unit Capacity Control (5) (6) (7)	Control the value of outdoor unit capacity in the setting value. (Setting value: 100/90/80/70/60/50/40/0%).	Cancel the capacity control.

1. Do not set "STOP" or "Run Mode Shift" when used simultaneously with another central controller.
When setting outdoor unit capacity control, set one of the central controllers but do not set the others.
2. Setting is only possible for Stop or Run Mode Shift. It is not possible to set multiple contacts.
3. The target group: "Demand Function" is controlled, starting from a small, numbered group at intervals of 15 seconds.
4. It will stop, regardless of the operating mode as in Auto or when the "Operating Mode Fixed" in the optional function setting is enabled.
5. Outdoor unit capacity control can be set to multiple contacts.
When there is a signal input in multiple contacts, the control with the highest contact will be done in the order of priority as follows: (Input 1 > Input 2 > Input 3 > Input 4).
6. The control target is only the outdoor unit corresponding to the outdoor unit capacity control.
Because the outdoor unit like compliant/non-compliant or settings available to capacity value may be different, contact your distributor for detailed information.
7. It is possible to control by way of a schedule without having to use demand control.

■ External Output Function

1. All Run Output
External output for indoor unit operation signal in the target group:
The operational output signal displays, even if only one indoor unit in the target group is in operation.
2. External Output Alarm
External output alarm signal for indoor unit in the target group
The alarm signal outputs even if one indoor unit abnormality occurs in the target group.

■ External Input/Output Terminals Specification

Input Terminal: The non-voltage contact (normally open) for the demand signal Input 12VDC, 10mA
Switching the contact is optional.
Pulse width is 300ms or more for pulse signal input.

Output Terminal: Contact (voltage is applied) for signal Output 12VDC

NOTE: Recommended Relay: MY Relay manufactured by Omron Corporation
(Do not use a diode built-in type.)

9.14 Button Setting

The operating button indicator selection

The operating button can be selected to show or hide restricting operations.

Set by: Monitor 1 or 2 > Menu > Service Menu > Button Setting.

Refer to Section 10.7 for details.

9.15 Contact Information Register

The contact information editing or registering for "Contact Information" function:

Set by: Monitor 1 or 2 > Menu > Service Menu > Contact Information Register.

Refer to Section 10.8 for details.

9.16 Alarm History

The alarm history record of the air conditioner unit and the large central controller:

The time of alarm occurrence, suspect unit and alarm code information are recorded, and the alarm history record can be initiated using this function.

Set by Monitor 1 or 2 > Menu > Service Menu > Alarm History.

Refer to Section 10.13 for details.

10. Service Menu

Service Menu functions and detailed information are described as follows.

- Group Register
- Optional Function Setting
- Exception Setting of Run/Stop Operation
- External Input/Output Setting
- Exception External Input
- Demand Function Setting
- Button Setting
- Contact Information Register
- Restore Setting
- Checking Connection
- Alarm History

Function	Information	Page
Group Register	The connected indoor units are verified by the large central controller within the same H-LINK. This function is used for group or block registration of these units.	31
Main Unit Register	This function is used for the main unit registration in the each remote control group. (The main unit is the only one in the one remote control group.) A control command is sent from the large central controller to the main unit for the remote control group.	31
Sub Unit Register	This function is used for registration of sub units except for the main unit within the same remote control group. When using the wired controllers or the receiver kits as follows; sub units are registered automatically by the large central controller after main unit registration. ● IR Receiver Kit	34
Display List of Registers	Displays the address of the indoor units which were registered in each group.	37
Optional Function Setting	This function is used for setting and changing of the optional functions for the air conditioners and the large central controllers.	38
Air Conditioner, Wired Controller Setting	Set or modify the optional function of the air conditioner and wired controller.	38
Central Controller Setting	Set or modify the operational mode or color of the operational display indicator for the central controller.	40
Exception Setting of Run/Stop Operation	This function is used to specify exceptional Groups/Blocks for All Run/Stop command. ● The All Run/Stop command will not affected specified groups/blocks.	41
External Input/Output Setting	The central controller has four external input terminals and two external output terminals. These terminals are used for "All Groups Run/Stop" and "Demand Function" operations for connected air conditioners. The external output terminals are used for the operation signal output of the air conditioner units connected to the large central controller.	42
Button Setting	This function specifies each button to be shown/hidden. This function also includes specification/setting for "one-touch operation" or the "press and hold" operation.	45
Contact Information Register	This function is used for editing the contents of contact information registration.	46
Memory Card	Save or restore the setting of each group/block from the controller using the memory card.	47
Write to the Memory Card	Save the data "Group Name" "Schedule" "Contact Information" and "Memo" on the memory card.	47
Read from the Memory Card	Restore the data for "Group Name", "Schedule", "Contact Information", and "Memo" from the memory card.	51
Memo	Record and browse through Test Run and Maintenance information.	56
Restore Setting	This function is used for restoring all the settings such as registered Groups (Blocks) and schedules.	60
Checking Connection	This function is used for checking those connected indoor unit numbers within the same H-LINK. When this function is used, the confirmation for saving registered information such as the group names, schedules, and so forth is indicated. Touch "OK" and those connected indoor unit numbers are updated with registered information. Touch "Cancel" and the setting for the large central controller is all restored.	61
Alarm History	This function, when activated, displays the complete alarm history of this air conditioner unit and the controller (maximum of 100 records).	63

10.1 Display of Service Menu Screen

Monitor 1 (All Groups)

Monitor 2 (Block)

↓

2

↓

Service Menu

1. Touch "Menu" on the "Monitor 1" or "Monitor 2" screen.

2. The "Menu" screen is displayed.
3. Press and hold "Service Menu" for at least three seconds. The "Service Menu" screen is displayed.

4. Select the service menu function by touching each function button. The settings screen of selected function will be displayed.

NOTICE

Depending on the operating condition of the air conditioner unit and the central controller, the following items cannot be selected. The number in parenthesis indicates the circumstances listed below.

- Group Register (1)
- A/C Unit and Wired Controller Setting (Optional Function Setting) (2)
- External Input/Output Setting (1) (2)
- Memory Card (3)
- Restore Setting (1) (4) (5)
- Checking Connection (1) (2)
 1. When the external Input signal is ON.
 2. When an air conditioner unit is operating.
 3. When a memory card is not inserted.
 4. When an air conditioner unit wired controller is restricted. (Without wired controller not included.)
 5. When an outdoor unit is operating at capacity control.

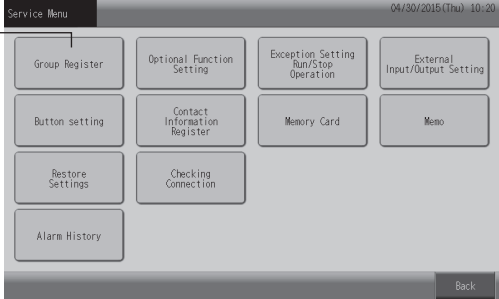
10.2 Exit Service Menu Screen

The diagram illustrates the process of exiting the Service Menu. It shows two screens: the 'Service Menu' and the 'Menu'. The 'Service Menu' screen (top) contains buttons for 'Group Register', 'Optional Function Setting', 'Exception Setting Run/Stop Operation', 'External Input/Output Setting', 'Button setting', 'Contact Information Register', 'Memory Card', 'Memo', 'Restore Settings', 'Checking Connection', and 'Alarm History'. A 'Back' button is located at the bottom right of this screen, with a line pointing to the number '1'. A downward-pointing arrow indicates the transition to the 'Menu' screen (bottom). The 'Menu' screen contains buttons for 'Filter Sign Reset', 'Schedule Settings', 'Setting temp. range of the remote control', 'Date and time Settings', 'Display of screen for cleaning', 'Touchscreen Calibration', 'Group Name Register', 'Screen Display Setting', 'Accumulated Operation Time', 'Contact Information', and 'Daylight Saving Time Setting'. A 'Service Menu' button is also present at the bottom right of the 'Menu' screen. A 'Back' button is located at the bottom right of the 'Menu' screen, with a line pointing to the number '2'.


1. Touch "Back" on "Service Menu" to return to the "Menu" screen.
2. Touch "Back" to return to the "Monitor 1 (All Groups)" or "Monitor 2 (Block)" screen.

10.3 Group Register

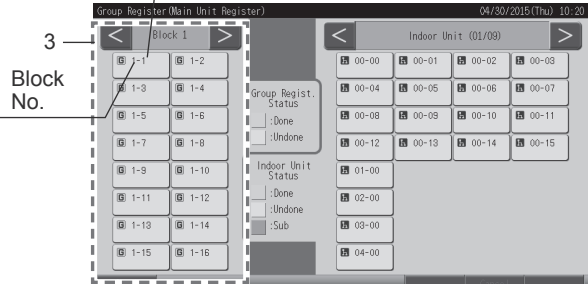
10.3.1 How to Register Group (Main Unit)



▼



▼



▼

Continue on to Next Page

1. Select "Group Register" on the "Service Menu" screen.

NOTE:
This function cannot be selected when the external input signal is input to external input terminal 1 or 2.

2. Select "Main Unit Register" on the "Group Register" screen.
3. Select a group for main unit to register.
 - When touching "<" or ">" at the upper left of the touchscreen, the block display is switched.
 - The information for Block No. and Group number is indicated on the button as "Block No. - Group Name".
 - Select the group button by touch. The selected button is trimmed with an orange outline. If the selected group button is touched again, the group selection is cancelled.

4. Select the indoor unit for “Main Unit Register”.

- Touch “<” or “>” at the upper right of the touchscreen, to switch the indoor unit display.
- Information on the system number and indoor unit addresses are indicated on the Indoor Unit button as “Refrigerant Cycle No. - Indoor Unit Address”.
- Select the Indoor Unit button by touch. The selected button is trimmed with orange outline. If the selected button is touched again, the indoor unit selection is cancelled.
- The indoor unit that is already registered as the main unit cannot be selected. (The button color is blue.)

< About the Indoor Unit Selecting >

- The indoor unit which letters are (red) cannot be registered as the main unit. In this case, the indoor unit is registered as the sub unit automatically.
- When the indoor unit with a fan speed of 4-touch and 3-touch are co-mingled into the same remote control group, register as the main unit, the indoor unit with a 4-touch fan speed.
- When the indoor units such as “with auto louver function” and “without auto louver function” are both installed within the same H-LINK, register the indoor unit “with the auto louver function” as the main unit. If the unit “without auto louver function” is registered as the main unit, the auto louver function is lost and cannot be used in this H-LINK. (This applies to the other functions.)

5. Touch “Register” at the bottom of the touchscreen to register the main unit when the group and indoor unit are selected.

- If the group and indoor unit for the main unit are not selected, the “Register” indication is grayed-out and cannot be touched.
- The button color of the registered group and indoor unit change to blue and the information is indicated in the buttons shown below.

< Group Button >

Block No. Group No.

Main Unit Ref. Cycle No. I.U. Address

1-1 00-00

< Indoor Unit Button >

Ref. Cycle No. I.U. Address

00-00 1-1

Block No. Group No.

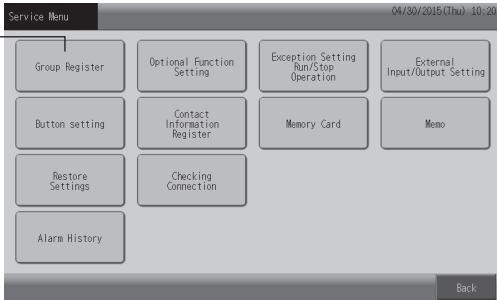
Proceed with the main unit registration depending on the next setting.

- Continue “Main Unit Register”(step 3).
- Exit “Main Unit Register” (step 6).

6. Touch "Done" on "Group Register (Main Unit Register)" to return to the "Group Register" screen.

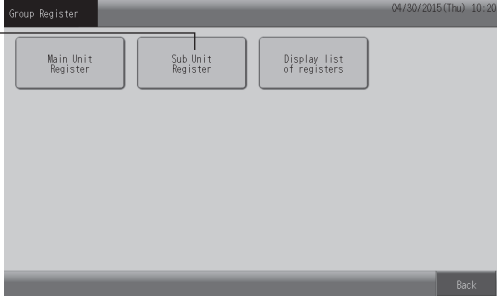
7. Touch "Back" on "Group Register" to return to the "Service Menu" screen.

10.3.2 How to Register Groups: (Sub Unit)



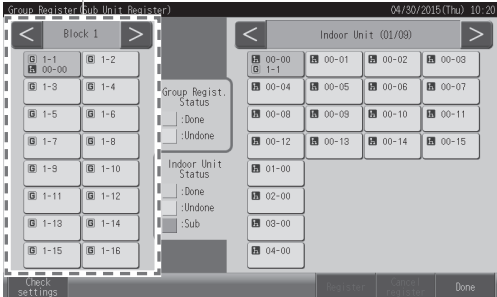
1

▼



2

▼



3

▼

Continue on to Next Page

1. Select "Group Register" on the "Service Menu" screen.
NOTE:
This function cannot be selected when the external input signal is input to the external input terminal 1 or 2.

2. Select the "Sub Unit Register" button on the "Group Register" screen.

3. Select the group for the "Sub Units Register".
 - Touch "<" or ">" at the upper left of the touchscreen to switch the block display.
 - Touch to select the group button. The selected button is trimmed in an orange outline.
 - Touched the selected group button again and the selection will be canceled.**NOTE:**
A white colored button indicates that the unit has not been registered, therefore it cannot be selected.

Ref. Cycle No. Indoor Unit Address

4

5

6

7

4. Select the indoor unit from the “Sub Unit Register”.
 - Touch “<” or “>” at the upper right of the touchscreen to change the display of indoor units.
 - The information for the refrigerant cycle number and indoor unit address are indicated on the indoor unit button as: “Refrigerant Cycle No. - Indoor Unit Address”.
 - Select the indoor unit button by touch. The selected button is trimmed with an orange outline. Touch the selected button again, and the indoor unit selection is cancelled.
 - The Indoor unit that is already registered as main unit cannot be selected. (The button color is blue.)
5. Touch “Register” to register the sub units when group and indoor units are selected.
 - If the group and indoor units for the sub units are not selected, the “Register” field is grayed-out which cannot be touched.
 - The button color of the registered group and indoor unit are changed to purple.

Proceed with sub unit registration, depending on the setting afterwards.

- Continue “Sub Unit Register” (step 3).
- Exit “Sub Unit Register”(step 6).

6. Touch “Done” on the “Group Register (Sub Unit Register)” to return to the “Group Register” screen.
7. Touch “Back” to return to the “Service Menu” screen.

NOTICE

It is possible to register up to 15 sub units in the same remote control group with the main unit. (It is not possible to register more than 16 sub units.) The indoor unit without a wired controller cannot be registered as a sub unit.

10.3.3 How to Unregister Group

1. Select “Group Register” on the “Service Menu” screen. Refer to item 10.3.1 (1).
NOTE:
This function cannot be selected when the external input signal is connected to external input at terminal 1 or terminal 2.
2. Select “Main Unit Register (or Sub Unit Register)” on the “Group Register” screen.
3. Select a registered group to cancel.
 - Touch “<” or “>” at upper left of the touchscreen and the block selection is switched.
 - Select the group button by touch and the selected button is trimmed with an orange outline.
 - Touch the selected group button again and the group selection will be cancelled.
4. Touch “Cancel Register” and a registered group is now unregistered. The button color for this group and the indoor unit change to white.
 - Touch “Unregister” on the “Main Unit Register” screen and the main unit and associated sub units are now unregistered.
 - Touch “Unregister” on the “Sub Unit Register” screen and sub units are now unregistered.
5. Proceeding on to the next step to unregister, the group provides the following options:
 - Continue Unregister; Group Register (step 3)
 - Exit Unregister; Group Register (step 5)
6. Touch “Done” to return to the “Group Register” screen.
7. Touch “Back” on the “Group Register” to return to “Service Menu” screen.

10.3.4 How to Check Group Register (Check of Registration Details)

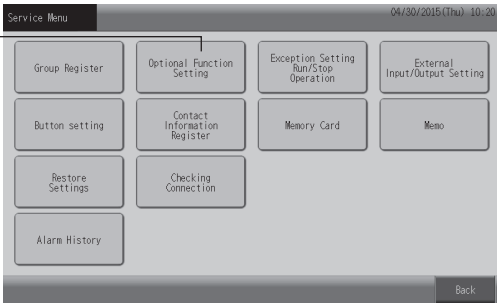
The process is shown in three steps:

- Select "Group Register" on the Service Menu screen. (Refer to Section 10.3.1.)
- Select "Display list of registers" on the Group Register screen.
- Select the target to display (All Groups/Blocks).
- All the Refrigerant system addresses for the indoor unit, registered in each group, are displayed:
 Black : Main Unit
 Others : Sub Unit
 • Change the screen by touching on "△" or "▽".
- Touch "Done" to return to the Group Register screen.
- Touch "Back" to return to the Service Menu screen.


NOTE:
 This function cannot be selected when the external input signal is ON.

10.4 Optional Function Setting

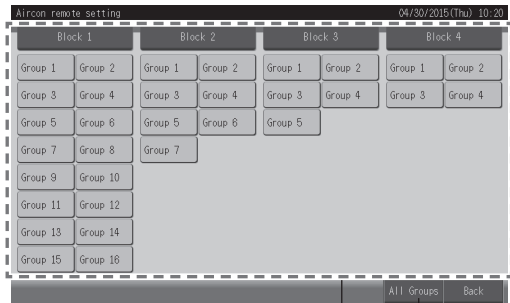
10.4.1 Air Conditioner/Remote Control Setting



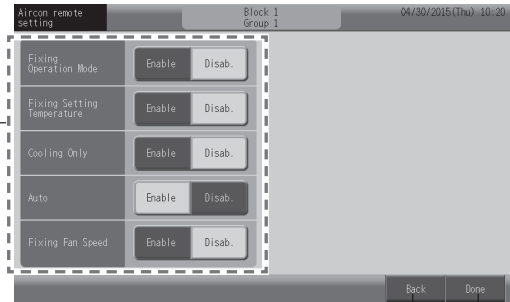
1



2



3



4

5

6

1. Select "Optional Function Setting" on the "Service Menu" screen.

2. Select "Aircon remote setting" on the Menu screen.
NOTE:
 This function cannot be selected while air conditioners are operating.


3. Select the target groups or block for "Optional Function Setting". Touch "All Groups", "Block", or "Group".
 - Select "All Groups" for optional function settings when the following item settings are changed:
 - Operation mode
 - Display of Accumulated Operating Time

4. Select "Enable" or "Disable" for the each function.
 - The button color of any selected function changes to yellow with an orange outline.
 Proceeding to the next step provides the following options:
 - Set the optional function of other group; step (4).
 - Exit the optional function setting; step (5).

5. Touch "Back" to return to the "Optional Function Setting" screen. Repeat steps (2) and (3) to set an "Optional Function Setting".

6. Touch "Done" to return to "Optional Function Setting" Menu screen.

Continue on to Next Page



The screenshot shows a touch-screen interface for 'Optional Function Setting'. At the top left, it says 'Optional Function Setting' and at the top right, it shows the date and time '04/30/2015(Thu) 10:20'. There are two buttons: 'Aircon remote setting' and 'Controller setting'. At the bottom right, there is a 'Back' button. A line points from the number '7' to the 'Back' button.

- 7. Touch "Back" to finish this setting. The screen returns to the "Service Menu" screen.

10.4.2 Setting Related to Central Controller

1. Select "Optional Function Setting" on the screen of "Service Menu".

2. Select "Controller Setting" on the "Optional Function Setting" screen.

3. Select "Enable" or "Disab." for each function.

- The button color of any selected function changes to yellow with orange outline.

<Concerning the OFF time Remote control Prohibition setting>

- When set to "Enable", the Remote Operation Prohibited (by item), cannot be set. The Remote Operation Prohibited (all items), can be set. However, do NOT set the "Remote Operation Prohibited" (all items), when operating simultaneously with other controllers.
- When all groups show only "Remote Operation Permitted" (all items), it is possible to change "Enable" ↔ "Disab."

4. Touch "Done" to return to "Optional Function Setting" Menu screen.

NOTE:
When switching between "Enable" ↔ "Disab." on the OFF time Remote prohibition setting, touch "Setting completed" and the confirmation screen will be displayed. Touch: "OK" to restart.

5. Touch "Back" to finish this setting. The screen returns to the "Service Menu".

10.5 Exception Setting of Run/Stop Operation

The figure illustrates the process of setting exception run/stop operations through three sequential screens:

- Service Menu:** The user selects "Exception Setting Run/Stop Operation" from the menu.
- Exception Set. Run/Stop Oper.:** The user selects the "Run and Stop" operation button.
- Exception of Run/Stop Oper.:** The user selects specific groups within blocks. In the screenshot, Block 1 and Block 2 have Group 2 and Group 4 selected, respectively. A "Done" button is at the bottom right.

1. Select "Exception Setting Run/Stop Operation" on the "Service Menu" screen.

2. Select the operation button for exception.
 • The selected button is trimmed with an orange outline.

NOTE:
 None of the operation buttons have factory settings.

3. Touch "Next".

NOTE:
 When the exception operation is not set, "Next" cannot be selected.

4. Select the exception operation target (group/block).

- Touch the Group button to switch back and forth between "Select" ↔ "Cancel".
- Touch the Block button to switch back and forth between "Select" ↔ "Cancel" of all groups in a block.
- A checkmark symbol "✓" will be displayed on the selected group.

5. Touch "Done" to end the Exception Setting of the Run/Stop Operation and return to the "Service Menu" screen.

10.6 External Input/Output Setting

10.6.1 External Input Setting

1. Select "External Input/Output Setting" on the "Service Menu" screen.

NOTE:
When the air conditioner is operating, or when the external input signal contact light is ON, this cannot be selected.

2. Select the input target (from Input options 1 to 4) for the external input.

3. Select the function using external input.

- The selected function button changes color.

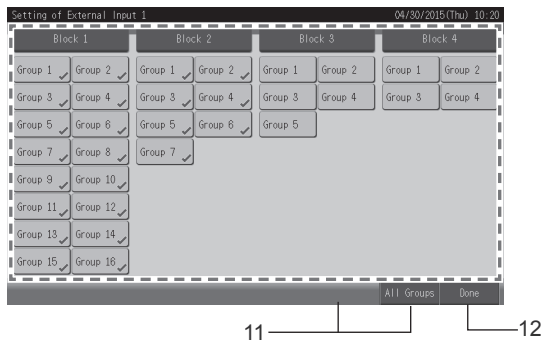
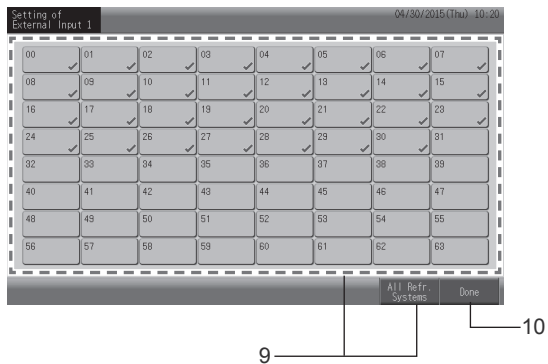
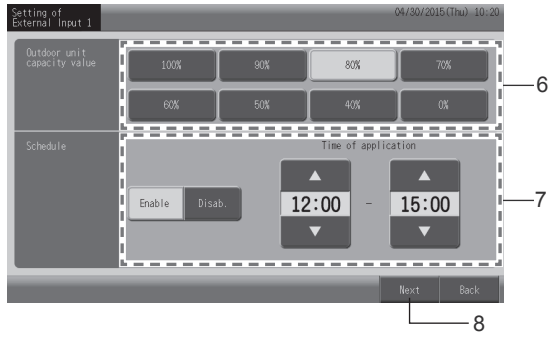
4. Touch "Next" and proceed, according to the steps below when selecting a function.

- If "No Settings" is selected, go to step (5).
- If "Outdoor unit Capacity Control" is selected, go to step (6).
- If other than those above, go to step (11).

<No Setting>

5. Return to the External Input/Output Setting screen. Touch "Back" to end the External Input/Output Setting and return to the "Service Menu" screen.

Continue on to Next Page



<Outdoor Unit Capacity Control>

6. Select the outdoor unit capacity value.
 - The selected capacity value button changes color.
7. Control capacity value can be selected in the central station schedule without using contact point. In the schedule, select Enable and the applicable time.
 - Select "Enable" or "Disab."
 - Touch "△" or "▽" to set the applicable starting time and ending time. The time adjusts for each 30 minutes.

NOTE:

When the ending time is earlier than the starting time, the ending time will continue until the next day. For example: Starting Time 15:00 Ending Time 08:00. Capacity control will start at 15:00 and will end the next day at 08:00.

8. Touch "Next".
9. Select the capacity control target (refrigerant system).
 - The button of the refrigerant system number of the registered outdoor unit will be indicated in blue.
 - The button of the system number of the unregistered outdoor unit will be displayed in white. This refrigerant system cannot be selected.
 - Touch the refrigerant system number button to change between "Select" ↔ "Cancel".
 - Touch "All Refr. Systems" to change "Select" ↔ "Cancel" of all refrigerant system.
 - A checkmark "✓" will be displayed in the number of the selected refrigerants.
10. Touch "Done" to return to the External Input/Output Setting screen.

<Other Settings>

11. Select the External Input Control target (All Groups/Block/Group).
 - Touch a Group button to switch between "Select" ↔ "Cancel".
 - Touch a Block button to switch between "Select" ↔ "Cancel" for all Groups in the Block.
 - Touch "All Groups" to switch between "Select" ↔ "Cancel" for all Groups.
 - A checkmark "✓" will be displayed in the selected Group.
12. Touch "Done" to return to the External Input/Output Setting screen.

10.6.2 External Output Setting

The diagram illustrates the process of setting external outputs through a series of four screenshots:

- Service Menu:** The 'External Input/Output Setting' option is selected from the top row of menu items.
- External I/O Setting:** The 'Output 1' and 'Output 2' options are highlighted with a dashed box.
- Setting of Ext. Output 1:** The 'External Output Alarm' option is selected from the list of functions.
- External I/O Setting:** The screen returns to the main 'External I/O Setting' menu after the configuration is complete.

1. Select “External Input/Output Setting” from the “Service Menu” screen.

NOTE:
When the air conditioner is operating, or when the external input signal contact is ON, this cannot be selected.

2. Select the Output target of the External Output (Output 1, Output 2).

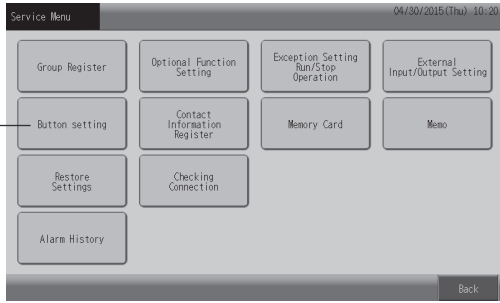
3. Select the function used in External Input.

- The selected function button changes color.

4. Touch “Done” to return to the External Input/Output Setting screen.


5. Touch “Back” to exit the External Input/Output Setting and return to the “Service Menu” screen.

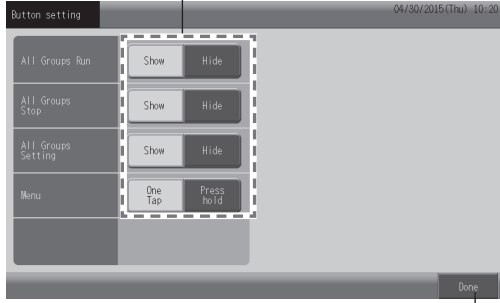
10.7 Button Setting



The screenshot shows the 'Service Menu' screen with a grid of options. The 'Button setting' option is highlighted with a callout '1'. Other options include Group Register, Optional Function Setting, Exception Setting Run/Stop Operation, External Input/Output Setting, Contact Information Register, Memory Card, Menu, Restore Settings, and Checking Connection. A 'Back' button is at the bottom right.

1. Select "Button setting" on the "Service Menu" screen.





The screenshot shows the 'Button setting' screen. A list of functions is on the left: All Groups Run, All Groups Stop, All Groups Setting, and Menu. For each function, there are 'Show' and 'Hide' buttons. The 'Show' button for 'All Groups Run' is highlighted with a callout '2'. A 'Done' button is at the bottom right.

2. Select "Show" or "Hide" for the operating button indication of each function.
The selected button color is changed.
3. Touch "Done" to finish this setting.
The screen is returned to "Service Menu".

10.8 Contact Information Register

The diagram illustrates the process of registering contact information through a series of four screenshots:

- Service Menu:** The 'Contact Information Register' option is selected from the menu.
- Contact Info. Register:** The 'Contact Information 1 Name Edition' option is selected to edit the name.
- Input name for contact 1:** A keyboard is displayed for text entry. Below the keyboard, character type options are selected: 'Upper Case', 'Lower Case', 'Symbol 1', and 'Symbol 2'.
- Contact Info. Register (Final):** The screen shows the registered contact information: 'Contact Information 1' with the name 'Electric Corp.' and the phone number '0000-000-0000'.

1. Select "Contact Information Register" on the "Service Menu" screen.

2. Select "Contact Information 1(or 2)", "Name Edition" or "Contact Information 1(or 2) TEL. No. Edition" to register the information.

3. Select the type of characters from "Upper Case", "Lower Case", "Symbol 1", and "Symbol 2".

NOTE:

Only numbers and symbols can be used for "Contact Information 1(or 2) TEL. No. Edition".

4. Input the information.
Enter up to a maximum of 50 characters. Touch "Delete" to erase a character on the left side of the cursor.

5. Touch "Close" to finish.
The screen is returned to "Contact Information Register".

6. Proceed with the contact information register, depending on the setting.

- Continue to register or edit the contact information; step (2)
- Finish this setting; step (7)

7. Touch "Done" to finish this setting.
The screen returns to the "Service Menu".

10.9 Memory Card

10.9.1 Save Setting in New File

1. Insert the memory card into the Controller. Refer to “8. Use of Memory Card”.

2. Select “Memory Card” from the Service Menu screen.

NOTE:
This function is not available when the memory card has not been inserted.

3. Select “Write to the memory card” from the Memory Card Menu.

- If there is no /CS-EZ folder in the memory card, a confirmation screen will be displayed. Select “Yes” to create a /CS-EZ folder.

4. Select the folder to save.

- In the folder field, a folder under the /CS-EZ folder of the memory card that will be displayed.

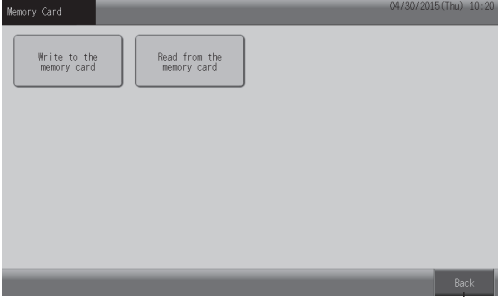
5. Touch “New file”.

6. Touch “Write” to start saving the data. Refer to Section 8: “Use of Memory Card”.

7. Touch “Completed” from the confirmation screen to return to the “Memory Card Menu” screen.

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INSTALLATION



The screenshot shows a touch-screen interface titled "Memory Card" at the top left. The top right corner displays the date and time: "04/30/2015 (Thu) 10:20". The main area contains two buttons: "Write to the memory card" on the left and "Read from the memory card" on the right. At the bottom right corner, there is a "Back" button. A line points from the number "8" to the "Back" button.

8. Touch "Back" to return to the Service Menu screen.
9. Remove the memory card out from the controller. (Refer to Section 8: Use of the Memory Card".)

10.9.2 Save Setting in Existing File

1. Insert the memory card into the controller. (Refer to Section 8: “Use of Memory Card”.)

2. Select “Memory Card” from the “Service Menu” screen.

NOTE:
This function is not available if the memory card has not been inserted.

3. Select “Write to the memory card” from the “Memory Card Menu”.

- If there is no /CS-EZ folder in the memory card, a confirmation screen will be displayed. Select “Yes” to create a /CS-EZ folder.

4. Select the folder to save.

- In the folder field, the folder right under the /CS-EZ folder of the memory card will be displayed.

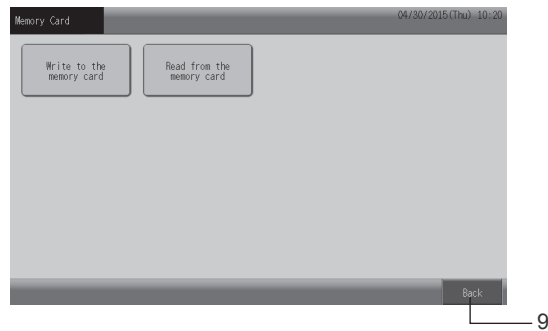
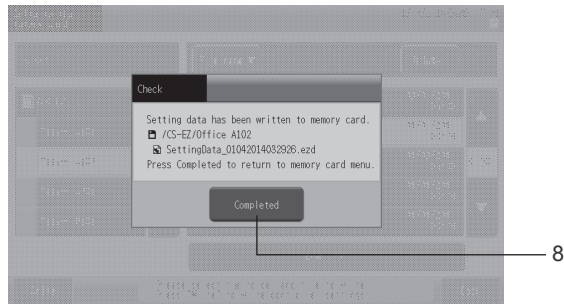
5. Select the file to save.

- In the folder field, the setting data file (extension file ezd) right under the folder selected will be displayed.
- Touch “File name” to rearrange the order depending on the name of the file. “▽” is for descending order and “△” is for ascending order.
- Touch “Update” to rearrange the order depending on the date of modification. “▽” is for descending order and “△” is for ascending order.

6. Touch “Write”.

7. Touch “Yes” on the confirmation screen to save the data.

Continue on to Next Page



8. Touch “Completed” on the confirmation screen to return to “Memory Card Menu” screen.

9. Touch “Back” to return to the “Service Menu” screen.

10. Remove the memory card out from the controller. (Refer to Section 8. “Use of Memory Card”.)

10.9.3 Restore Setting (Read from Existing File)

1. Insert the memory card into the controller. (Refer to Section 8. "Use of Memory Card".)

2. Select "Memory Card" from the "Service Menu" screen.

NOTE:
This function is not available when the memory card has not been inserted.

3. Select "Read from the memory card" from the "Memory Card Menu".

NOTE:
Put the file to read in the memory card.

- Under the /CS-EZ folder
- Under the subfolder of the /CS-EZ folder. (This function is not an option if the /CS-EZ folder does not exist.)

4. Select the folder to read.

- In the folder field, the folder right under the /CS-EZ folder of the memory card will be displayed.

5. Select the file to read:

- In the folder field, the settings data file under the folder selected will be displayed.
- Touch "File name" to rearrange the order depending on the name of the file. The "▽" denotes descending order and "△" denotes ascending order.
- Touch "Update" to rearrange the order depending on the date of modification. The "▽" denotes descending order and the "△" denotes ascending order.

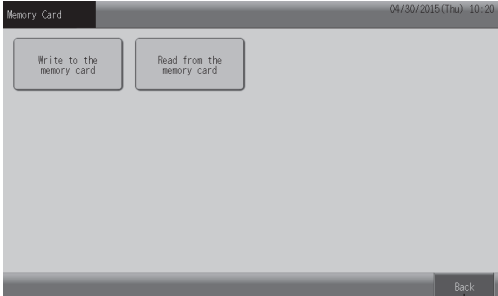
<Automatic Backup>

- * The setting data will be saved in the memory card just before reading. If incorrect data is read, the setting can be restored to the previous data. (Refer to Section 10.9.4.)
- * Only one instance of settings data will be saved on each memory card as an Automatic Backup file. Note that all settings data will be deleted except the latest data.
- * If the Automatic Backup failed, the confirmation screen will be displayed. Touch "Yes" to continue or "No" to quit.

6. Touch "Read" to start to read the data.

7. Touch "Completed" on the confirmation screen to return to "Memory Card Menu" screen.

Continue on to Next Page

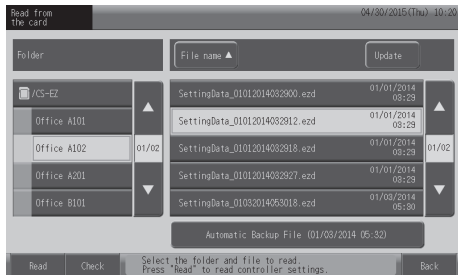


8. Touch “Back” to return to the “Service Menu” screen.

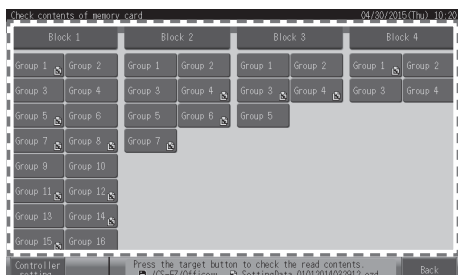
9. Remove the memory card from the Controller. (Refer to Section 8: “Use of the Memory Card”.)

Information


It is possible to check the content of the file to read when restoring the setting.

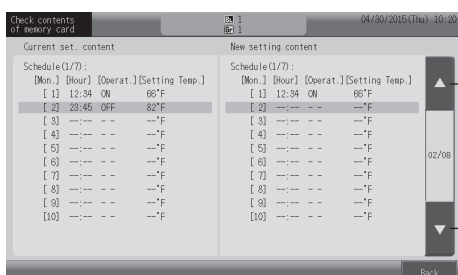


a. After selecting the files in step (5), (from the previous page), touch the “Check” button.



b. Select the display target (Block/Group/Controller setting).

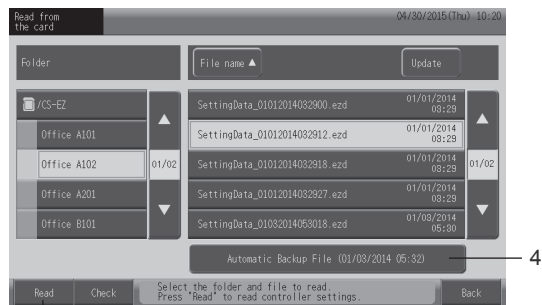
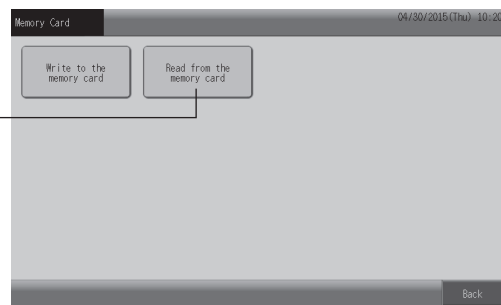
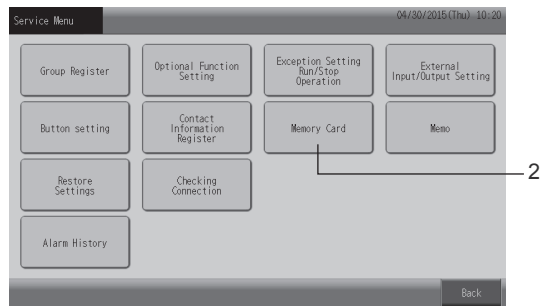
- If the content of the current setting differs from the content of the file to read, a “” icon will be displayed.



c. Setting content is displayed. The part that differs will be displayed in Blue. Touch “△” or “▽” to change the page.

d. Touch “Back” to return to the “Check Target Selection” screen.

10.9.4 Restore Setting (Read from Automatic Backup File)



Continue on to Next Page

1. Insert the memory card into the controller. (Refer to Section 8: "Use of Memory Card".)

2. Select "Memory Card" from the "Service Menu" screen.

NOTE:

This function is not available when the memory card is not inserted.

3. Select "Read from the memory card" from the "Memory Card Menu."

4. Touch "Automatic Backup File".

5. Touch "Read" to start reading the file. (Refer to the previous page for checking content in the file to read.)

<Automatic Backup>

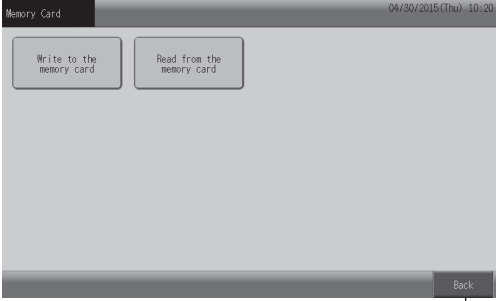
- The setting data will be saved in the memory card just before reading. If incorrect data is read, settings can be restored to the previous data.
- Only one data setting will be saved on each memory card as an Automatic Backup file. Note that all the data will be deleted except the latest saved data.
- If the Automatic Backup failed, the confirmation screen will be displayed. Touch "Yes" to continue or "No" to quit.

NOTE:

If no automatic backup was performed on data on the memory card, the file will not be readable. Be careful not to erase the backup file (AutoBackupSettingData.ezdb).

6. Touch "Completed" from the confirmation screen to return to the "Memory Card Menu" screen.

INSTALLATION



The screenshot shows a touch-screen interface titled "Memory Card" at the top left. The top right corner displays the date and time: "04/30/2015 (Thu) 10:20". Below the title bar, there are two buttons: "Write to the memory card" on the left and "Read from the memory card" on the right. At the bottom right corner of the screen, there is a "Back" button. A callout line with the number "7" points to this "Back" button.

7. Touch "Back" to return to the "Service Menu" screen.

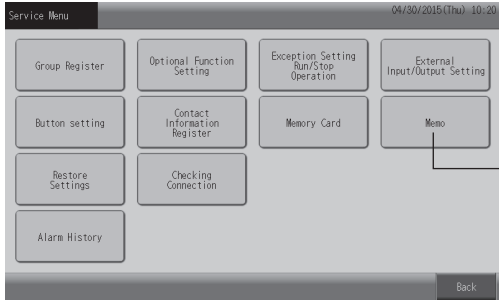
8. Remove the memory card out from the controller. (Refer to Section 8: "Use of Memory Card")

■ Message Displayed on the Screen

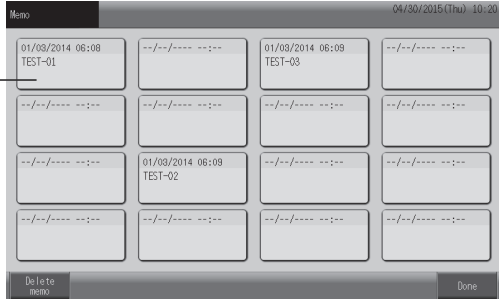
Message	Status
The memory card cannot be accessed.	The memory card cannot be accessed. Please insert it again.
Data cannot be written because the memory card is locked.	The memory card is locked as read-only. Unlock it to write data.
Data cannot be written because the capacity of the memory card is insufficient.	The data cannot be written because there is not enough space for the data in the memory card. Try again after increasing space on the memory card by deleting unnecessary data using a computer.
Error writing data to the memory card.	<ul style="list-style-type: none"> • The memory card is not compatible with the controller. (Refer to "Usable Memory Card" in Section 8.) • The memory card may be damaged. Please try again with another memory card. • The memory card may not be formatted correctly. Format the memory card correctly.
Error reading data from the memory card.	
There are no /CS-EZ folders in the memory card.	A "/CS-EZ" folder does not exist in the memory. This folder is required for reading data. Save the data in the /CS-EZ folder or its subfolder.
The data is wrong and cannot be read.	The file is not in the right format, which can read by this controller. Please use correct data or data written by this controller.
Cannot open because there are more than 51 subfolders in the /CS-EZ folder.	If the number of subfolder exceed 50 in the /CS-EZ folder, it will not be displayed. Please try again after decreasing the number of file via computer.
Cannot open because there are more than 51 files in the folder.	If the number of files exceed 50 in a folder, they will not display. Please try again after decreasing the number of files and folders using a computer.
Unknown error	<ul style="list-style-type: none"> • It is possible that a SDXC memory card has been inserted instead of an SD or SDHC memory card. (Refer to "Usable Memory Card" in Section 8.) • A file named CS-EZ may already exists in the memory card. Transfer the file to another place. • The name of the subfolder or the file may exceed 240 characters. Please shorten the name of the subfolder or the name of the file.

10.10 Register/Edit Memo


10.10.1 Register Memo



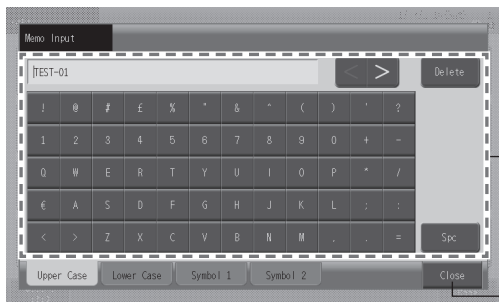
▼



▼



▼



▼

Continue on to Next Page

1. Select "Memo" on the "Service Menu" screen.

2. The Memo is displayed.
3. Select the target to register.

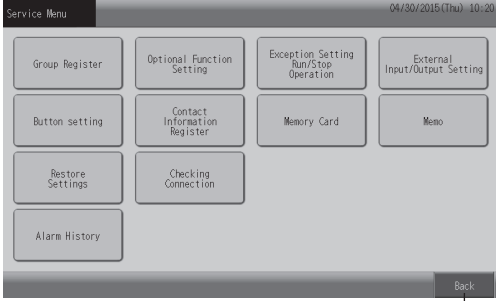
4. The "Memo Input" screen opens.
5. Select different types of characters from the tabs (5) along the bottom of the screen: "Upper Case", "Lower Case", "Symbol 1", and "Symbol 2".

6. Select a registered character from the keyboard.
7. Follow the procedures in steps (5) and (6) above and insert characters. Touch "Delete" to erase any undesired character to the left of the cursor.

NOTE:
The maximum allowable number of characters is 50.

8. Touch "Close" when the character input is completed. Return to the "Memo Display" screen.

▼



The screenshot shows a 'Service Menu' interface with a dark header bar containing the text 'Service Menu' on the left and '04/30/2015 (Thu) 10:20' on the right. Below the header is a grid of menu items: 'Group Register', 'Optional Function Setting', 'Exception Setting Run/Stop Operation', 'External Input/Output Setting', 'Button setting', 'Contact Information Register', 'Memory Card', 'Memo', 'Restore Settings', 'Checking Connection', and 'Alarm History'. A 'Back' button is located at the bottom right of the screen. A line connects the number '9' to the 'Back' button.

9. Touch "Back" to return to the "Service Menu" screen.

10.10.2 Delete Memo

1. Select "Memo" on the "Service Menu" screen.
2. The memo is displayed.
3. Touch "Delete memo".
4. Select a memo to delete.
 - Touch the Memo button to switch between "Select" ↔ "Cancel".
 - It is possible to select multiple memos.
 - A checkmark symbol "✓" is displayed on the selected memo.
5. Touch "Proceed" to delete the memo.

Continue on to Next Page

▼

Memo 04/30/2015 (Thu) 10:20

--/--/----	--/--/----	--/--/----	--/--/----
--/--/----	--/--/----	--/--/----	--/--/----
--/--/----	01/09/2014 08:09 TEST-02	--/--/----	--/--/----
--/--/----	--/--/----	--/--/----	--/--/----

Delete memo Select memo to clear. Done

▼

Memo 04/30/2015 (Thu) 10:20

--/--/----	--/--/----	--/--/----	--/--/----
--/--/----	--/--/----	--/--/----	--/--/----
--/--/----	01/09/2014 08:09 TEST-02	--/--/----	--/--/----
--/--/----	--/--/----	--/--/----	--/--/----

Delete memo Done

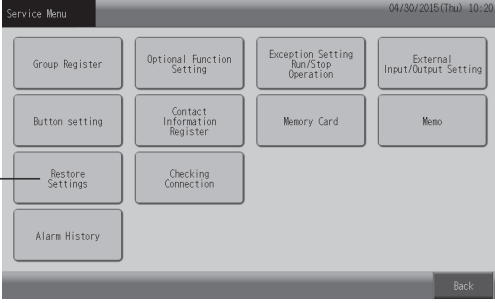
6

7

6. Touch "Done" to return to the "Memo Display" screen.

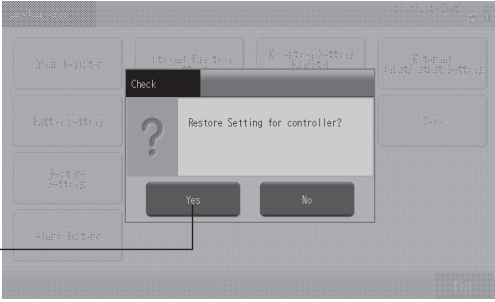
7. Touch "Done" to return to the "Service Menu" screen.

10.11 Restore Settings

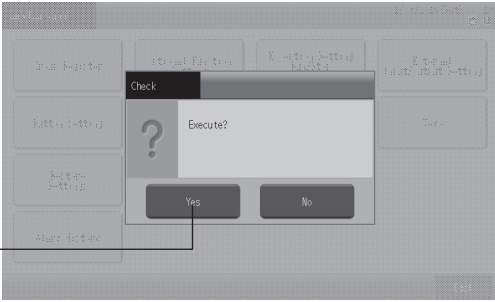


1

▼



2



3

1. Select "Restore Settings" on the "Service Menu" screen.
NOTE:
This function cannot be selected when the wired zone controller operation is prohibited.

2. Touch "Yes" at the confirmation screen.
NOTE:
Touching "No" returns you to the "Service Menu" screen.

3. The confirmation screen is displayed again. Touch "Yes" to restore the setting. After several seconds, the screen is changed and the connection check of the system is started.
NOTE:
Touching "No" returns you to the "Service Menu" screen.

Information

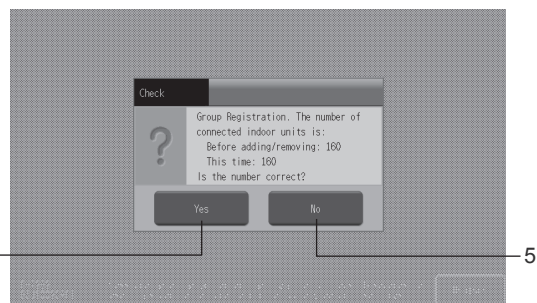
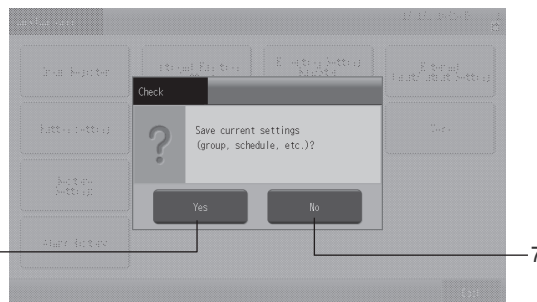
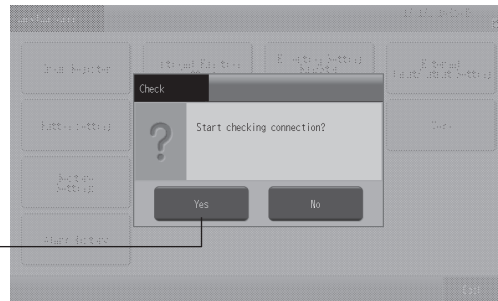
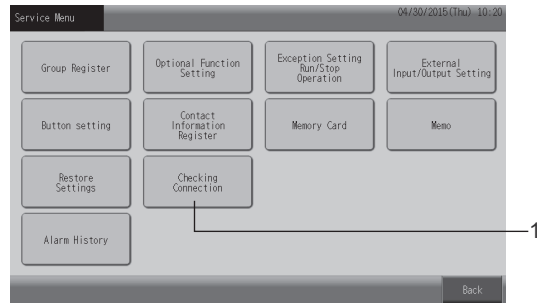
Restore settings can be set when the screen of "Starting" displayed.



Restore

1. Press "Restore" for more than 5 seconds in the lower right corner of the "Starting" screen.
2. In a few seconds, the connection check process starts.
3. When the process for the connection check is complete, "Adjusting Date/Time" screen is displayed.
(Refer to "Adjusting Date/Time" in Section 9.5.)

10.12 Checking Connections



Continue on to the Next Page

1. Select "Checking Connection" on the "Service Menu" screen.

NOTE:

This function cannot be selected while the air conditioner(s) are in operation or while an external input signal is being transmitted to the external input terminals 1 or 2.

2. Touch "Yes" at the confirmation screen.

NOTE:

If "No", the screen returns to the "Service Menu".

Proceed the connection information updating process, depending upon what is to be set later.

- Update with connection information by retaining the Group register and settings, such as schedule setting, and so forth; step (3).
- Perform reconnection checking by initializing each setting. (It is the same as restore settings; step (7)).

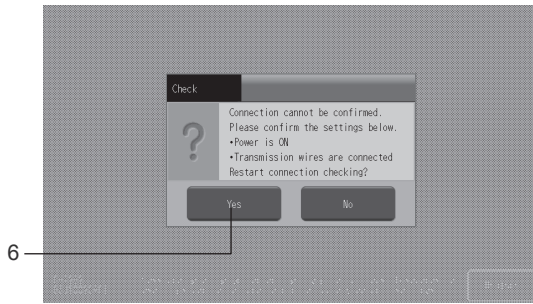
< Keeping the setting >

3. Touch "Yes" at the confirmation screen for keeping the setting.

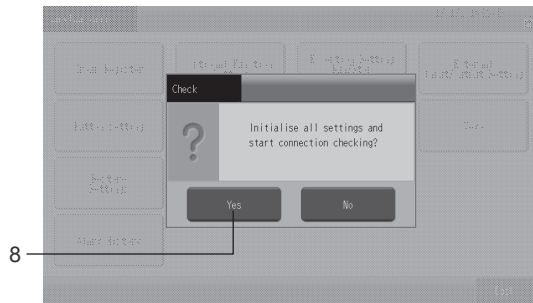
4. When the checking connections process is complete, the number of connected units are indicated on the confirmation screen.

If the number of connected indoor units is, correct, touch "Yes". The "Main Unit Register" screen will be displayed. Refer to Section 10.3.1 (3).

5. If the number of connected units indicated are different from actual number, touch "No".



6



8

6. The confirmation screen is displayed again. Check the settings in the confirmation screen for those air conditioners, and touch "Yes". The checking connections process will start again.

NOTE:

Touch "No", and the screen returns to the "Service Menu" screen.

< Not keeping the setting >

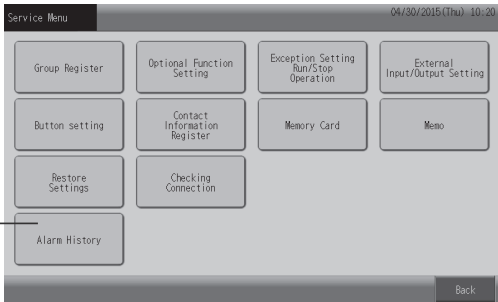
7. Touch "No" at the confirmation screen.
8. Display the confirmation screen of initialization; touch "Yes". Initialize all settings and begin checking connections.

If "Yes" cannot be selected when the "RCS Operation Prohibited" is set, set "RCS Operation Permitted".

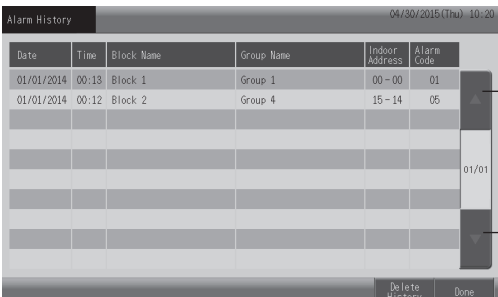
NOTE:

Touch "No", and the screen returns to the "Service Menu" screen.

10.13 Alarm History



1



2

3

4

1. Select "Alarm History" on the "Service Menu" screen.

2. The "Alarm History" screen is displayed.
 If the alarm records are more than 11, touch "△" or "▽" to go to the next page.
 - A maximum of 100 records can be stored in the memory.
3. When deleting an alarm history record, touch "Delete History". When touching "Yes" at the confirmation screen, all alarm history records are deleted.
 - Touch "No", and the screen returns to the "Alarm History" screen.
4. Touch "Done" to finish this setting. The screen returns to the "Service Menu" screen.

11. Important Notice

■ Demand Setting (Setting of an External Input)

Give careful attention to the following when using the demand function of the external input setting.

- Concerning Stop or Operation Mode Shift
Either the stop or the operation mode shift can be set. In addition, note that it is not possible to set multiple contacts.
- Concerning Outdoor Capacity Control
This function is used to save on power consumption and keep it near the set value (%). The level of power consumption conservation is not guaranteed. Power consumption theoretically cannot be zero because of standby power, even if the set value is 0%. Capacity control is not available when the outdoor unit is in start-up control or in a defrosting operation.
- After inputting the contact signal, it will require a maximum of six minutes until control begins to respond.
If there is multiple signal input into multiple contacts, control will begin from the highest priority in order of: (input 1 > input 2 > input 3 > input 4).
- The control target will only be the one outdoor unit compatible with outdoor unit capacity control. The adjustable capacity value setting or compliance/non-compliance for this function may differ depending on the type of outdoor unit. Contact your distributor for detailed information.

■ OFF Time Remote Control Prohibition

Observe the following: When setting the OFF Time Remote Control Prohibition as "Enable":

- When setting as "Enable", the Remote Operation Prohibited (By function), cannot be set.
The Remote Operation Prohibited (All functions) can be set but, DO NOT set it when operating simultaneously with other controllers. (Refer to "Using Simultaneously with Other Central Controller" on the following page.)

■ Remote Operation Prohibited (by function)

This function is used to restrict the operation of the local remote control.

When the Remote Operation is prohibited (by function), the selected functions cannot operate (RUN/ STOP, Operation Mode, Fan Speed, Louvre, and Temperature Setting). Both the indoor unit and the local remote control can be used together only if they are compatible and interconnected with this function. Pay close attention to the following groups compatible with the remote operation prohibited (by function).

- The lock function of the local remote control cannot be used when prohibition of the remote control operation is set.
- When prohibition of the remote control operation and the lock function are used at the same time, prohibition of the remote control operation assumes priority. Therefore, the lock function of the local remote control cannot be set.
- When the prohibition of the remote control operation (by function), is change to the prohibition of the remote control operation (all functions), the lock operation setting of the local remote control is cancelled.
- When a communication failure has occurred, prohibition of the remote control operation (by function), can be cancelled. If this happens, perform the setting again.

■ When Connecting an additional Wired Controller:

When using additional wired controllers, select "Checking Connection" from the Service Menu and perform the Group Register. Then, switch the power OFF and ON.

■ Using simultaneously with another Central Controller

Observe the following when using other central controllers:

- Do not set the External Input as Emergency STOP, STOP, (Demand Function setting), or Operation Mode Shift (Demand Function setting).
- Concerning the outdoor unit capacity control for the setting of External Input, perform the settings for ONLY one central controller (DO NOT perform settings for the other central controllers).
- An indoor unit without a remote control cannot be connected.

1.4.10 Computerized Central Controller Management Software

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Notice: Please provide this manual to the next operator to be referenced and kept in a safe place.
(Installer) → (Wiring electrician) → (Test run operator) → (Customer)

Please carefully read this Installation Manual before installation.

This Installation Manual applies to CCCS01 only. Also refer to the Installation Manual for “Computerized Central Controller Adapter (CCCA01)” when in combination use.

Preface

This software is intended for managing standard air conditioners combined with a “Centralized Central Controller Adapter (CCCA01)”. Install this software in accordance with the following procedures. Observe all precautions concurrent with the PC operation manual.

- Do not install computer with this software in following places.
 - Places where oil (including machine oil) mists or streams drift.
 - Places where sulfide gas form as hot spring drifts.
 - Places where inflammable gas may generate or flow.
 - Places where high in salt contents surrounding as coast regions.
 - Places where with atmosphere of acidity and alkalinity humid place.
- In case of using a medical equipment generating electro-magnetic waves, place the equipment as the surface that is emitting electro-magnetic waves does not directly face the system.
- To avoid any influence on radiation propagation in the air, install this software at least 3m away from the medical equipment and radios that may generate electro-magnetic waves.

Safety Summary

- Please carefully read this section before installation of the software.
- Contents with "DANGER" shows the certain cases where improper operation WILL result in severe personal injury or even death. For your safety, please follow this instruction.
- After installation is completed, conduct test running to ensure that no faulty condition is detected.
- Please also ensure to backup the data according to this manual upon completing installation.

[Symbols Used in This Manual]

▲ DANGER : Immediate hazards which WILL result in severe personal injury or death.

▲ CAUTION : Hazards or unsafe practices which could result in minor personal injury or product or property damage.

NOTE: This sign indicates other alert information than DANGER.

NOTICE: Useful information for operation and/or maintenance.

■ Installation and Electrical Work ■

▲ DANGER

- Contact your distributor or qualified engineer for Installation work. Improper installation can cause electric shock, fire, or unexpected accidents.
- To avoid any electric shock or accident, ask the distributor to have electrical work done by qualified electrician.
- This system is for computer use only. If using with a general audio or music reproducing device, depending on the high level of sound, it may result in device damage or effects on the body.

▲ DANGER

- Do NOT expose this system in direct sunlight or keep it in a place where there is a high temperature or humidity.

- This manual addresses System Configuration, Installation, Initial Settings, Test Run, and Service and Maintenance issues.
- Refer to Operation Manual for other operations.

System Configuration

- Upon the first use of this software, please look closely at the system configuration.

Installation

- This chapter describes how to install this software.

Initial Setting

- This chapter describes how to configure this software.

Test Run

- This chapter describes how to conduct Test Run.

Service and Maintenance

- This chapter explores software service and maintenance issues.

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Test Run

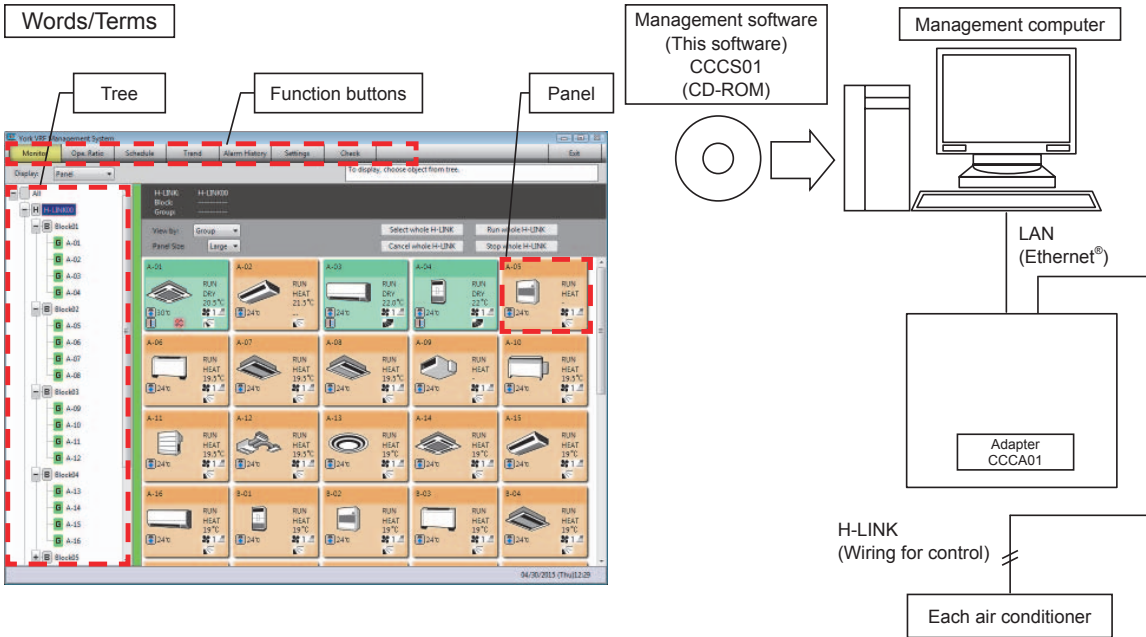
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/// Important Notice ///

- Proper control and/or monitoring may not be available due to a device failure or other unexpected conditions. Discuss an alternative plan how to react in such cases (another control monitor method by other than this system, such as by remote controller), in advance.
- Be sure to conduct a test run on all indoor units upon starting daily operation. Also, check the operation on the following day.
- When the entire air conditioning system is not running properly, perform a system reset to regain control.
- Use of this software is restricted to the management computer. Suspend operation of the DX software application if the PC will be used to run other programs or execute other computing tasks.
- Management computer, this software and the adapter are assumed to be always ON. Trend data, alarm history and check data cannot be recorded while the computer is in standby status or OFF.
- Time management is important in overall monitoring and control. If unnecessary or unauthorized changes are made to these settings, critical operations will be degraded.
- Computer management differs from air conditioning management. Upload periodically and discuss the uploading procedure in advance.
- The management computer is not included in the software package. Expenses for installation and data migration are not included with this system.
- Use the correct screen resolution to maximize screen visibility.
- This windows software application supports TOOLTIP (group name and block name are revealed as the mouse hovers) system in a prioritized tree format view. Note that a software upgrade may be required to allow TOOLTIP display all items or work on all computer terminals.
- Upon utilizing CCCS01, up to 16 adapters can be connected and controlled by one management computer terminal.
- Use the keyboard only to input characters.
- When an alarm code 60, 61, 64 or 65 is generated, a communication error between each air conditioner and this system is displayed. Therefore, each setting value of one, some, or all air conditioners may be invalid.
- The reference images printed in this manual are only examples. That which is displayed may differ from what is shown in the actual window.
- In case a pop-up window like the control window cannot appear entirely on the screen, change the size of the taskbar using the mouse so that the hidden portion of the pop-up window can be revealed.



Terms	Definitions
Non RC; (Remote controller-less) unit	Non RC equipped units display indoor units without a remote controller connected. This does not include cases where multiple indoor units are connected or set to be controlled and monitored by a single remote controller.
Facility unit	These units are monitored and controlled by this software by way of contact point(s).
UPS	UPS stands for Uninterruptible Power Supply

Software

Setup procedure

Please follow the procedure below for setup.

Installation

- 1 Installation



Initial Setting

- 1 Daylight Saving Time Setting
- ↓
- 2 Network Register
- ↓
- 3 Unit Register
- ↓
- 4 RC Group, Group, Block and Tenant
- ↓
- 5 RC Group Register
- ↓
- 6 Group Register
- ↓
- 7 Block Register
- ↓
- 8 Tenant Register
- ↓
- 9 Layout Register
- ↓
- 10 Indoor Unit Setting
- ↓
- 11 Outdoor Unit Setting
- ↓
- 12 External Input Setting
- ↓
- 13 External Output Setting
- ↓
- 14 Security Setting
- ↓
- 15 Language Setting
- ↓
- 16 Locale Setting
- ↓
- 17 Display Setting
- ↓
- 18 Other Setting 1
- ↓
- 19 Other Setting 2




Set each item as necessary.

Test Run

- 1 Monitor and Control Check
- ↓
- 2 Alarms and Errors
- ↓
- 3 Data Backup
- ↓
- 4 How to Restore with Backup Data
- ↓
- 5 Check Items before Hanging over

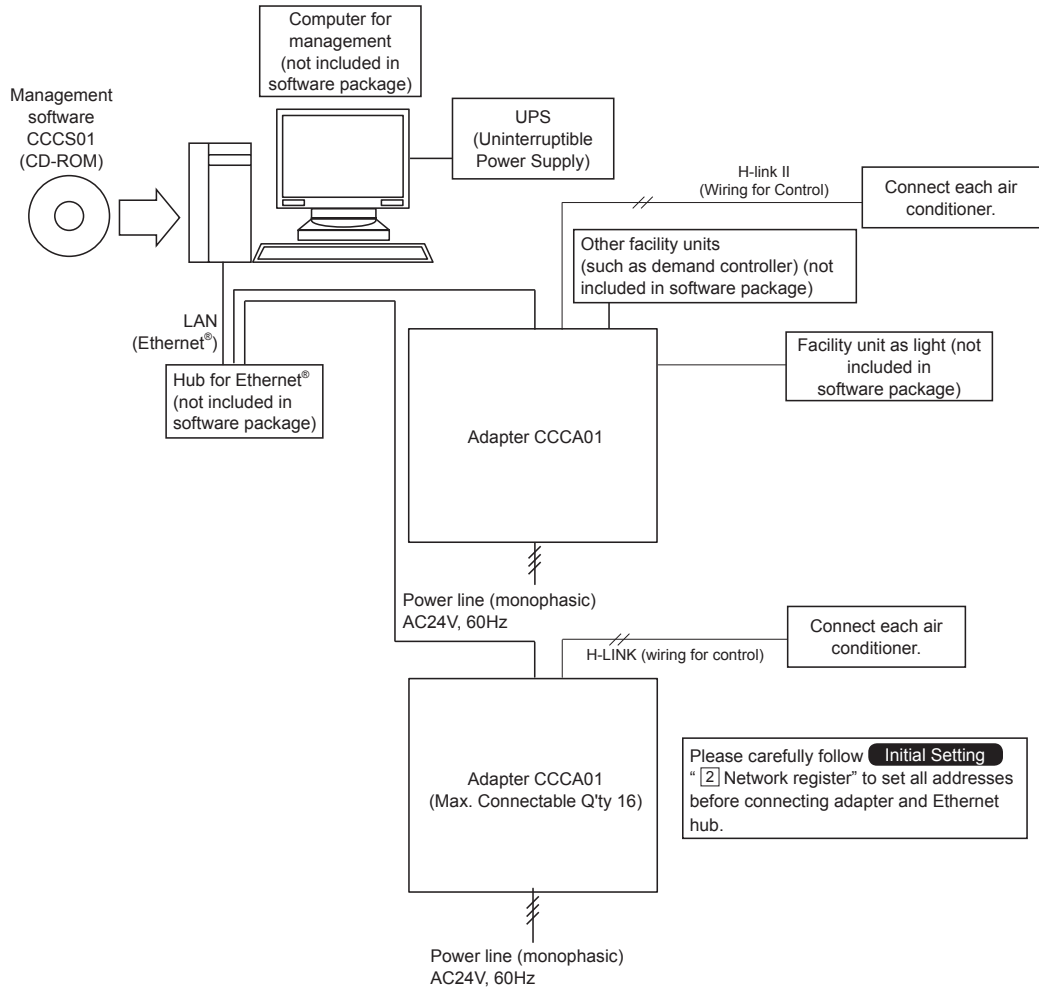
/// Before Installation ///

1. Fill in the "System Information" of the attached **Addenda** to determine each network address for each device.
2. In case of performing monitoring and controlling on the layout, it is possible to continue the setup smoothly by creating a new data for the layout before Test Run. Concerning the fabrication method for the layout data, refer to Initial Setting "  Layout Register".
In the case that the layout is displayed, prepare the picture's layout (BMP, PNG, JPEG format) for the ground plan or air view plan.
3. To install this software, installation of the adapter must be completed. Refer to the installation manual for adapter installation.

* No signal shall be input at the contact point before installation and initial settings are completed.

System Configuration

1 System Configuration



2 Device Specification

Specification for field-supplied requirement

(1) Specification for management computer

Requirements	When connecting four adapters or more When performing layout display	Other Requirement
OS	Windows® 7 (64 bit) Professional English Version	
CPU	Intel® Core™2 Duo 1.8GHz or more	Intel® Celeron® 1GHz or more
Memory	2GB or more	1GB or more
Display resolution	1024 x 768/1280 x 1024/1600 x 1200	
Browser	Internet Explorer 8, Internet Explorer 9, Internet Explorer 10	
Hard disk drive	Minimum 5GB for each adapter • If performing ope. ratio, +0.25GB for each additional REFGN Cycle. • If collecting check - Unit Trend, +16GB for each additional adapter.	
Drive	CD-ROM Drive (for upon installation only)	
Interface	IEEE802.3 (10BASE-T/100BASE-TX)(With Wake on LAN function *1)	
	USB	
	RS-232C*2	
Application	Microsoft Excel® or other spreadsheet software for displaying & editing the CSV file output from each of [Operation Ratio], [Trend], [Schedule], [Alarm History], and [Check] functions.	

- The official name for Windows is Microsoft Windows Operating System.
- Microsoft, Windows, and Microsoft Excel are trademarks registered in numerous countries of Microsoft Corporation in United States.
- Intel® Core™ 2 Duo are trademarks registered in numerous countries and Intel Corporation in United States.
- Ethernet® is a trademark registered in numerous countries for Xerox Corporations in United States.

*1: Utilize the management computer exclusively for this software.

*2: LAN with wake on LAN function or RS-232C Interface is required for UPS.

*3: Management computer is assumed to be always ON. It is strongly recommended to use the computer as a server or for industrial use, or to create a hard disk mirror.

*4: Utilize OS installed under [C:Drive].

*5: The service life of the management computer will differ from that of the air conditioning units. Upload the recommended software periodically and discuss uploading procedures in advance.

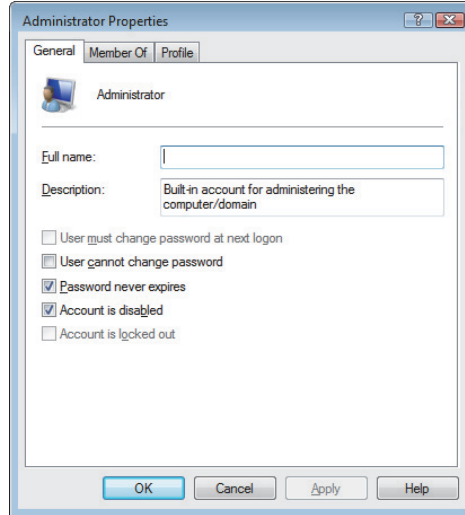
*6: Mouse must be a two-button type mouse.

NOTE:

Users Accounts Setting

1. Make changes to your user account

- Open “Administrative Tools” then “Computer Management”. Double-click on “Administrator” from “Local User and Group”, “User”.



- Uncheck “Disable the Account” from the Administrator Property then click “OK”.
- Double-click on the User Account other than “Administrator”.
- If “Account is disabled” is unchecked in the User Account Property, check it and then click “OK”.

NOTE:

Check that the setting for **All** the Users Accounts (Except Administrator) are done as explained above.

- Re-start the Management Computer. Click the Start button and see that the User Account name reads “Administrator”, then perform the operation discussed above.

2. User Account Control Settings

- Set “Never notify” for “Change User Account Control settings” of “User Account” in the Control Panel. If these settings are not performed, the system will not work.

NOTE:

Perform the following setting for the control panel.

If the settings are incorrect, monitoring and controlling functions may not operate correctly.

1. Control Panel

Set the control panel display in “Small Icon”.

2. “Personalization”

Set the theme in “Windows 7 Basic”.

3 Taskbar and “Start” Menu

For the “Taskbar appearance” of the “Taskbar”, select “Bottom” for “Using a small icon” or “Taskbar location on screen”.

- Monitoring and Controlling are dependent on the clock in the management computer. Proper operation can not be expected in case unnecessary changes are made to the clock.
- The Taskbar is displayed in the lower part up to one paragraph.

4. Power Options

Set the “Power Option” when the following items are present:

1) Select “High Performance” for the power plan. If “High Performance” is not displayed, click on “Show additional plans”.

2) Set the following items for “Change plan settings” - “Change advanced power settings”.

Items		On Battery	Plugged in
Hard disk	Turn off hard disk after	Never	Never
Sleep	Sleep after	Never	Never
	Hibernate after	Never	Never
Power buttons and lid	Lid close action	Do nothing	Do nothing
	Power button action	Shut down	Shut down
	Sleep button action	Do nothing	Do nothing

* The setting may differ depending on the computer. Check in the computer’s manual for further details.

5. Region and Language set the “First day of week” in “Monday”.

The box is for checking work. Select the box after checking.

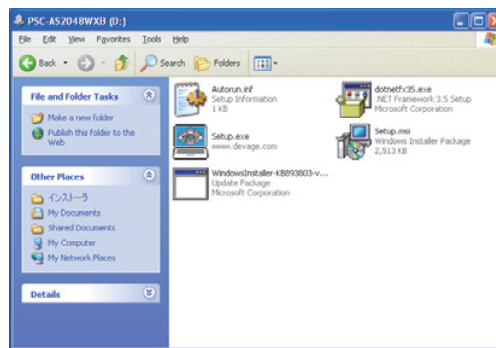
Installation

1 Installation

- (1) Management computer meeting requirements in **System Configuration** (2) Device Specification is required.
- (2) Insert the management CD into CD drive of the management computer. Installation software will boot automatically.

NOTE:

- Double-click on "Setup.exe" to manually start installation if the software does not boot.



NOTICE:

- This software must run in the .NET Framework 3.5 environment. Enable .NET Framework 3.5. The term, ".NET Framework", is a trademark registered in numerous countries on behalf of Microsoft Corporation in the United States.

- (3) Click [Next] to install the management software onto the computer.



INSTALLATION

- (4) Enter the name and serial number of the product and click [Next].

NOTE:

- In the “Serial number” box, enter the “CODE” printed on the label attached to the box it came in.

The screenshot shows the 'Customer Information' dialog box. It has a title bar 'York VRF Management System' and a subtitle 'Customer Information'. Below the subtitle, there is a text area with the instruction: 'Enter your name in the box below. The installer will use this information for subsequent installations.' Below this is a text input field containing 'Shimizu'. Further down, another text area says: 'Enter your serial number below. The installer will use this information for subsequent installations.' Below this is an empty text input field. At the bottom, there are three buttons: 'Cancel', '< Back', and 'Next >'.

- (5) Confirm the license and restrictions, and select [I Agree] to click [Next].

The screenshot shows the 'License Agreement' dialog box. It has a title bar 'York VRF Management System' and a subtitle 'License Agreement'. Below the subtitle, there is a text area with the instruction: 'Please take a moment to read the license agreement now. If you accept the terms below, click "I Agree", then "Next". Otherwise click "Cancel".' Below this is a scrollable text area titled 'Software Licensing' containing the following text: 'Concerning Computerized Central Controller Software (CCCS01) You and Johnson Controls, Inc. (hereinafter called "our company") agree to the following terms concerning the right of use of the software (hereinafter called "software contract") included in the computer which is [CCCS01] (hereinafter called "this product")' and '1. Author's copyright The software contract and its duplicates belong to our company regardless of the reason. You may not remove the notations of the author's copyright'. At the bottom, there are two radio buttons: 'I Do Not Agree' and 'I Agree', with 'I Agree' selected. There are also three buttons: 'Cancel', '< Back', and 'Next >'.

- (6) Select the folder for software installation, and click [Next].

The screenshot shows the 'Select Installation Folder' dialog box. It has a title bar 'York VRF Management System' and a subtitle 'Select Installation Folder'. Below the subtitle, there is a text area with the instruction: 'The installer will install York VRF Management System to the following folder. To install in this folder, click "Next". To install to a different folder, enter it below or click "Browse".' Below this is a text input field containing 'C:\Program Files (x86)\'. To the right of the input field are two buttons: 'Browse...' and 'Disk Cont...'. At the bottom, there are three buttons: 'Cancel', '< Back', and 'Next >'.

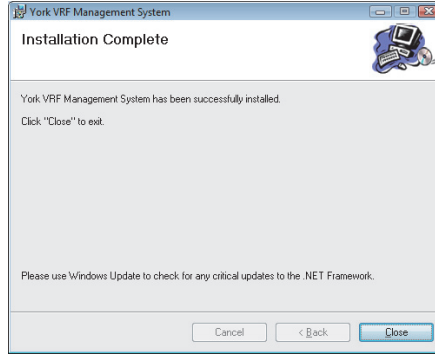
NOTICE:

- Do not change the Installation Folder if not necessary. If necessary, use C:Driver.

- (7) Installation will be initiated upon clicking on [Next].

The screenshot shows the 'Confirm Installation' dialog box. It has a title bar 'York VRF Management System' and a subtitle 'Confirm Installation'. Below the subtitle, there is a text area with the instruction: 'The installer is ready to install York VRF Management System on your computer. Click "Next" to start the installation.' At the bottom, there are three buttons: 'Cancel', '< Back', and 'Next >'.

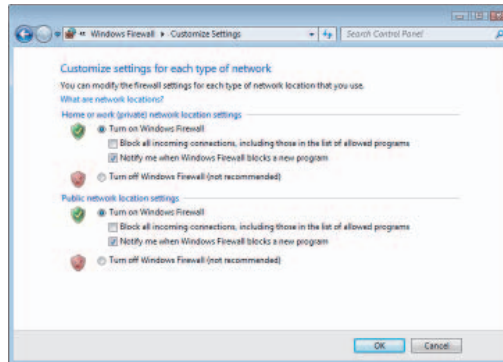
- (8) Click [Close] to complete the installation,



- (9) Check the box (at left) if the shortcut to the VRF Management System is created on the desktop display.



- (10) Set Windows Firewall (Go to: [Start] - [Control Panel]) OFF.

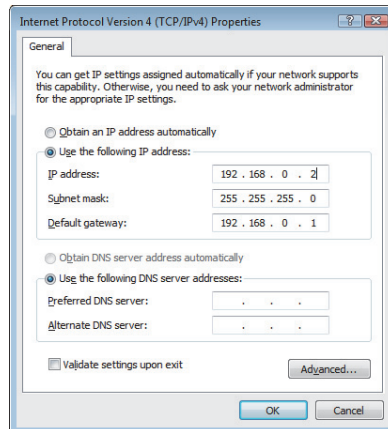


NOTICE:

- Disable all the firewall functions if commercial security software is installed. Secure network by firewall of routers.

INSTALLATION

- (11) Change the IP address of the management computer to the specified address. (for example, 192.168.0.2)



NOTICE:

- To change IP address, go to [Start] > [Control Panel] > [Network and Sharing Center] > [Local Area Connection] > [Properties] > [Internet Protocol Version 4 (TCP/IPV4)].

- (12) If the automatic shutdown function of the UPS is used, perform the following settings:

1. Open "manager_info.ini" in the folder "/centralstation/manager".
2. Change "0" to "1" for "ForceCloseOnWindowsSessionEnd=0" in [Other].
3. Overwrite: "manager_info.ini" and then close.
4. Start Management Software.
5. Check that Management Software or Management Computer ends correctly depending on the automatic shutdown function of the UPS.

NOTE:

- To show the screen saver, set the computer as follows:
Setting the items, alarm information such as "In alarm **" (** is for Alarm Code), can be shown on screen. In the event that no error has been detected, "VRF management system operating" shall be displayed.

Screen Saver "Photos"
Settings - Use pictures from "Pictures"
Slideshow speed "Medium"

- * Ensure no picture exists in this folder. Delete or copy all pictures to other folder before installation.

NOTICE:

- To change screen saver, go to [Start] - [Control Panel] - [Personalization].

Initial Setting

- 1] Daylight Savings Time is required to be set.

NOTE:

- To proceed, perform the Test Run operation for all air conditioners and installation of the adapter must be completed, and management computer, adapter, and all air conditioners must be turned ON.

1] Daylight Saving Time Setting

This chapter describes the procedure for setting Daylight Saving Time. This display is shown only first start up.

- (1) Start up the management software. [Daylight saving time setting] is displayed.

- (2) Input the required setting for daylight saving time.
 - (a) Select [Yes] or [No] for daylight saving time.
 - (b) Select Start date.
 - (c) Select End date.
 - (d) Select Shut time.
 - (e) When completing to set 1 to 4, click [Register].

NOTE:

- When registering daylight saving time by management software, this system specific time zone will be set to the OS. Do not change the time zone setting of the OS directly, otherwise this system cannot work normally. When changing the daylight saving time setting, register it by this management software.

NOTICE:

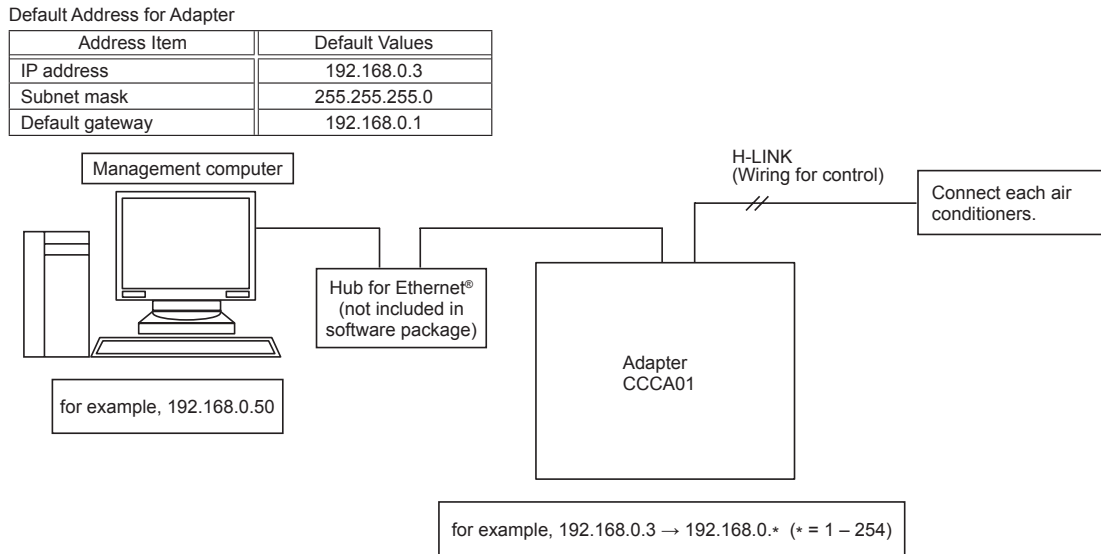
- When selecting [Cancel], management software will shut down.

2 Network Register is required to be set.

2 Network Register

This chapter discusses the procedure for setting adapter's address, and setup of availability for communication with the adapter.

- (1) When changing the default address for the configuration, connect the management computer only to the adapter by way of a LAN (Ethernet®) cable as shown below.



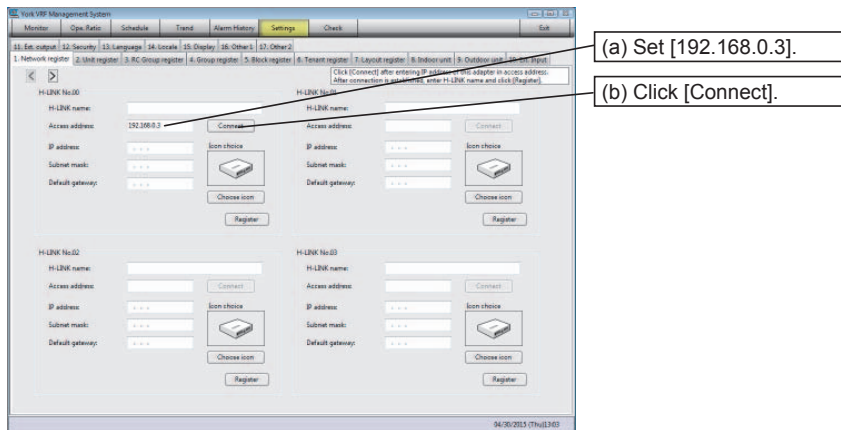
- * **Default IP address of the adapter is 192.168.0.3. Devices can not communicate on the LAN when a duplicated address exists on the same network. Set each adapter's address when connecting multiple adapters.**
- * **Use a straight cable for the LAN cable and connect management computer and adapter by way of a hub for the Ethernet®.**

NOTICE:

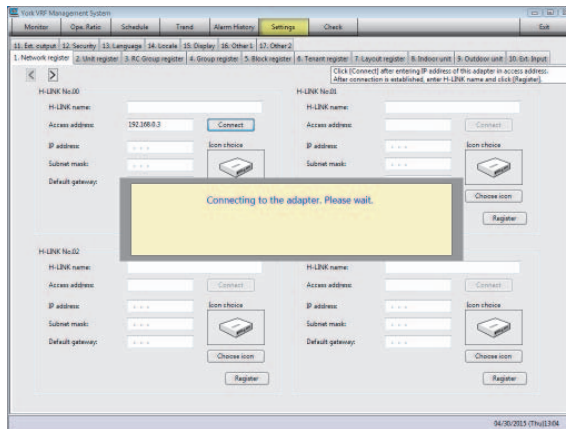
- Upon connecting single adapter only to a single adapter, the adapter with the default address: (192.168.0.3) and management computer with the adapter's default address with last digit modified (for example, 192.168.0.50) can establish a connection.

- (2) Go to [Settings] > [Network register], set [192.168.0.3] to the empty box with the smallest H-LINK number for access address and click [Connect].

**Set [192.168.0.3] to the IP address and check that there is one adapter ON.
Do not click on the “connection” button when two or more adapters are ON.**



- (3) Wait for the pop-up window to disappear.



NOTICE:

[On communication failure]

In case a pop-up message indicating that connection is not properly established is shown, check the following items and attempt to reconnect.

- If the adapter turned ON
- If the access address specifies the address of connecting adapter. (Adapter's default address is 192.168.0.3)
- Is the LAN cable correctly connected? The LAN cable is a straight cable and the Management Computer is connected to the adapter by way of a hub for the Ethernet.

[When an IP Address, Subnet Mask, or Default Gateway are not displayed],

Check the following items and perform these connections again.

- Is the setting of the adapter DSW (SW2) connection correct?
Are the adapter DSW (SW2) (1-pin and 3-pin) both ON?
(The "1-pin" is ON for Normal Mode.)
- Is the adapter connected? (Operation Control Mode)

INSTALLATION

- (4) Wait until the error pop-up message disappears, then enter H-LINK name and the desired IP address. (for example, 192.168.0.5)
Change the subnet mask and default gateway when needed.

(a) Input H-LINK name

(b) Input desired IP address

(c) Input desired subnet mask

(d) Input desired default gateway

(e) Select desired icon.

NOTE:

- **H-LINK name is a required item.**
- The following characters may not be used in the H-LINK name: “ ”, “ ”, “ ”, and “&”.

NOTICE:

- Contact the network administrator for setting the IP address, subnet mask and default gateway. No default gateway is required to connect LAN to this system. Regarding issues of network security, contact the network administrator.

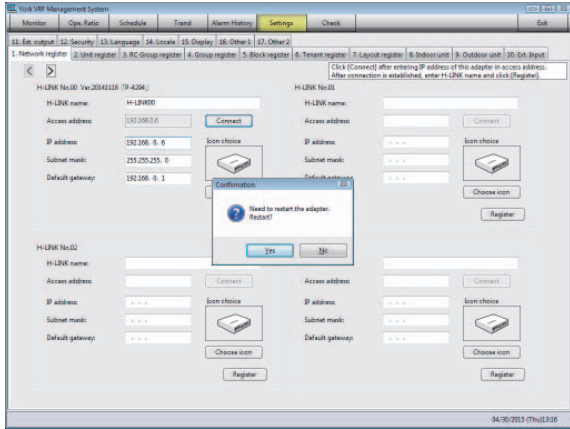
- (5) Click on [Register].
To ensure normal operation, click on the [Register] button even if no part of the H-LINK name, IP Address, Subnet mask, or default gateway is in any way changed.

(a) Click [Register].

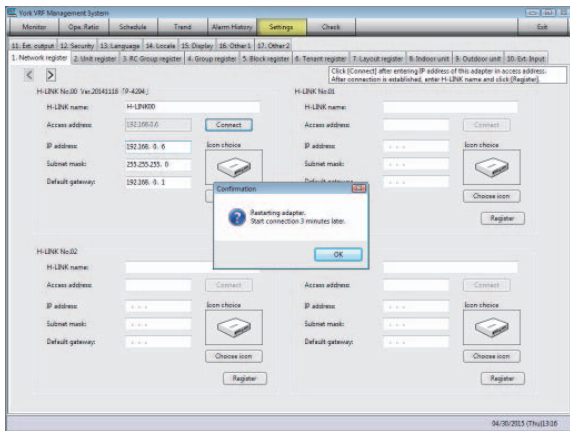
NOTICE:

- If registration isn't completed, follow item No.10 of [Service] > [3] Troubleshooting > [Initiating], then perform a clock correction of the Adapter.

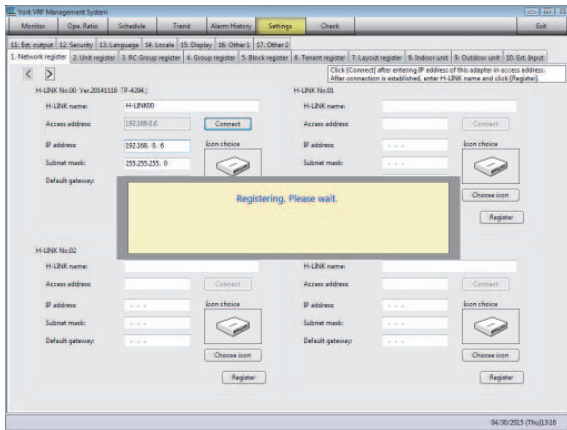
- (6) Click [Yes] in the pop-up window indicating that the adapter will restart.



- (7) Click [OK] in the confirmation pop-up.

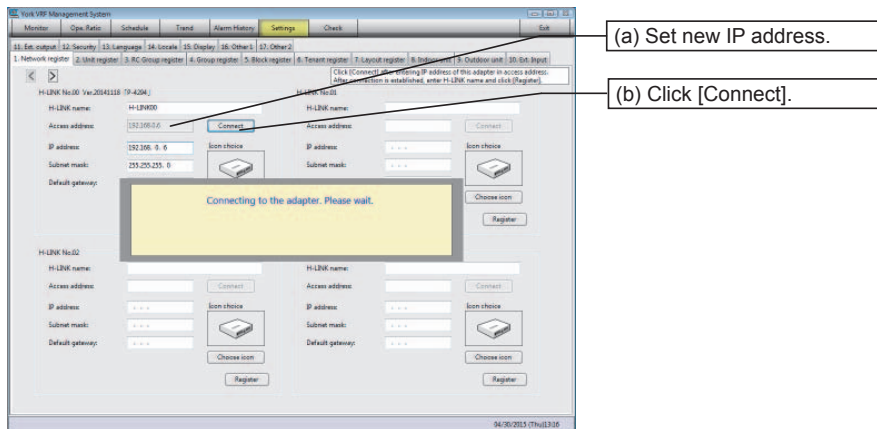


- (8) Click on [Connect] again, to actually terminate the connection with the adapter.

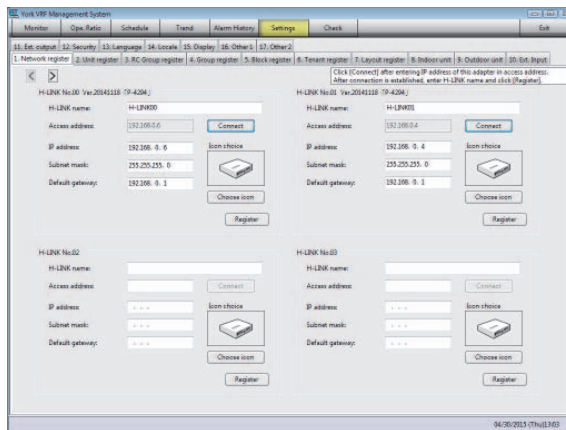


INSTALLATION

- (9) Wait three minutes and set the new IP address (for example, 192.168.0.5), and then click [Connect].



- (10) The address for the adapter has now been set. For connection with two or more adapters, repeat steps one through nine, issuing H-LINK numbers, beginning with the smallest number. When all the configuration work is done, connect all adapters to the Ethernet® hub and click [Connect] to check communication with the adapters.



NOTICE:

It is possible to check if the adapter and the Management Computer are connected by way of a LAN by following the steps below:

1. Select [Start] > [Program] > [Accessory] > [Command Prompt] from the Management Computer.
2. Enter the IP address to connect following the “ping”. (for example, ping 192.168.0.3)
3. A LAN connection will be indicated if the request “Reply from ...” is displayed. If not, “Request timed out” will be displayed.

NOTE:

When changing the settings for Subnet mask and Default Gateway, the IP address is required. After changing the unused IP address, the desired Subnet mask and the desired Default Gateway by way of steps (1 through 9), change to the desired IP address following the steps (1 through 9).

3 Unit Register is required to be set.

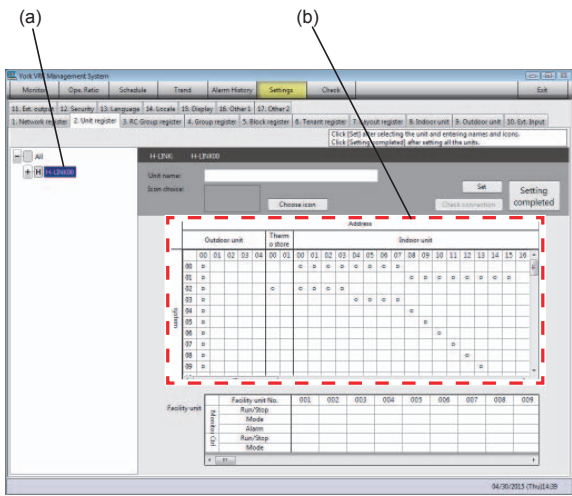
3 Unit Register

- (1) Go to [Settings] > [Unit register] and check if the refrigerant cycle, address, and the number of outdoor and indoor units, and thermal unit (shown displayed from the top to bottom in level of importance in a prioritized tree format) are all correct.

NOTICE:

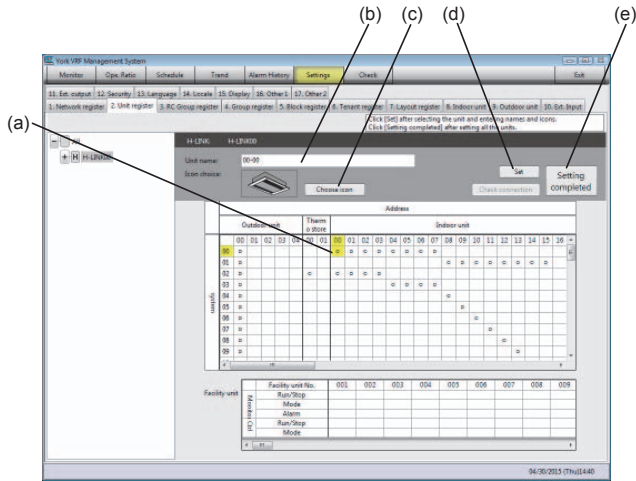
- In case the number of the unit or address are not shown correctly, there may be misconfiguration of units or improper wiring. Correct the setting or wiring and select [Check connection].
- When performing changes or corrections to the constituent structure of the unit or to the wired zone controller, click on [Check connection] and perform a recheck of the unit.
- Select [Unit] from [View by] in [Monitor] Display and check if the icon "Without Wired Zone Controller" is indicated in the units with wired zone controllers. If indicated, check [Service] > **3** Troubleshooting > [Monitor (Controlling)].
- When leaving the information and check the connection, perform a backup of [/centralstation/rcv/H-LINK**/mnt/ram/harcweb1/download/] (** is for H-LINK number), then check the connection.

- (a) Choose H-LINK.
- (b) Verify the constituent indoor and outdoor units.



INSTALLATION

- (2) Select indoor unit to set name and icon.
 - (a) Choose indoor unit.
 - (b) Set unit name.
 - (c) Select icon.
 - (d) Click [Set].
 - (e) Click on [Setting completed] when all items are set.



NOTICE:

- Each cell color denotes as follows.
 - Yellow: Selected
 - Blue: Set
 - Green: Set completed

- (3) Confirm with item 2 for the entire H-LINK.

NOTICE:

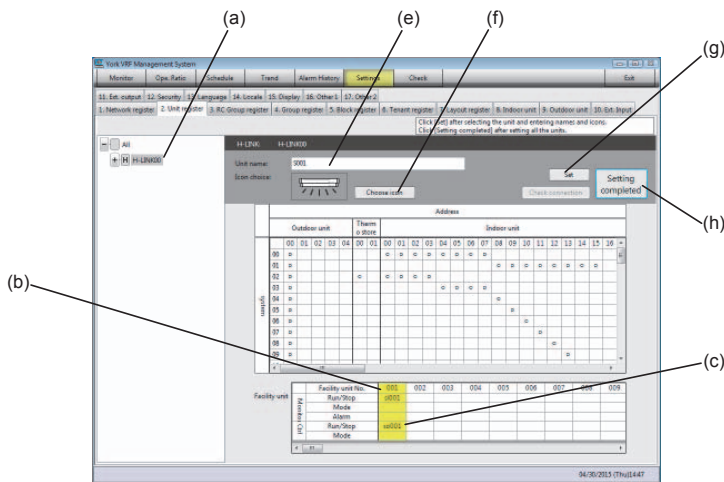
- The maximum limit for each unit name is 64 characters.
- Unit name may or may not have model number or (zero) "0" as a default value.
- The following characters cannot be used in unit name: " , " ; " and "&"
- The name and icon for the Outdoor Unit and Thermo Store Unit cannot be changed.

NOTE:

- Items (4) - (6) need to be set if only monitoring and controlling other facility units such as lighting by way of external inputs. When registering the facility unit, input data sequentially beginning at the far left. Verify that the units are registered in sequence. Skipping by one number can cause defects. Also, when deleting a unit, delete data in reverse sequence, moving left from far right.

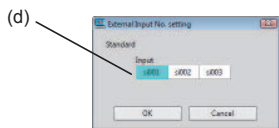
- (4) Select what to monitor and control by way of an external input and output.
- (5) Select the signal from the external input 1-3 (si001-si003) for monitoring.
- (6) Select the signal from the external output 1-3 (so001-so003) for controlling.

- (a) Choose H-LINK.
- (b) Select facility unit number.
- (c) Select what to monitor or control.
- (d) Select signal.
- (e) Set unit name.
- (f) Select icon.
- (g) Click [Set].
- (h) Click [Setting completed] when all items are set.



NOTICE:

- Each cell color denotes as follows.
 Yellow: Selected
 Blue: Set
 Green: Set completed



NOTICE:

- Each cell color denotes as follows.
 Yellow: Selected
 Blue: Set
 Green: Set completed
 Orange: Canceled

- (7) Refer to items (4) to (6) for all H-LINK(s).

NOTE:

- When using facility units, do not use refrigerant system numbers 62-63, for they are reserved as "blank".
- Do not register more than 200 units (total of Indoor units and Facility units) per a single adapter.
- Up to six facility units can be registered.
- The facility units will be displayed after existing units starting from 006 to 001.

4 RC Group, Group, Block, and Tenant

(1) RC Group

- An RC group is a set of wired units controlled by a single wired zone controller.
- A single H-LINK can consist up to 160 RC groups.
- On units not equipped with RC capabilities, a single indoor unit can constitute one RC group.
- To monitor or control indoor units, these units must be registered in an RC group.

(2) Group

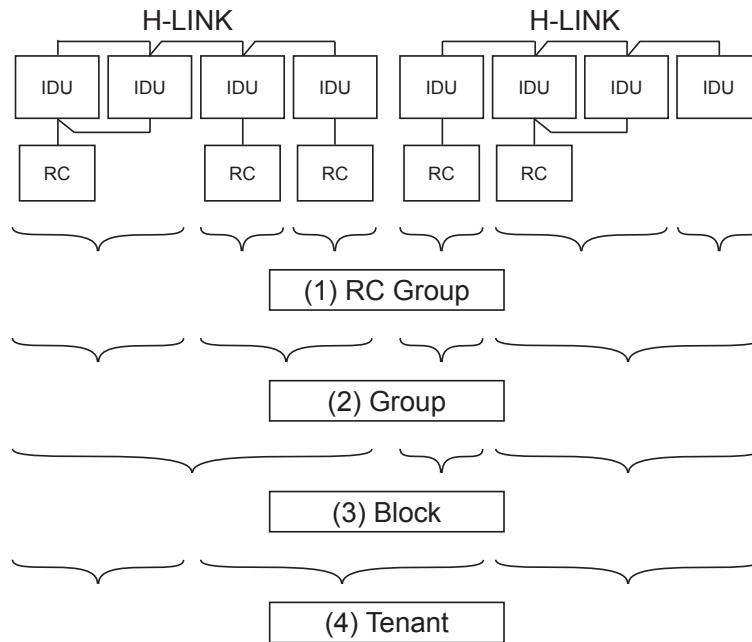
- A group is a set of units that can be monitored or controlled (or both) by this system.
- One or more RC Groups can be registered.
- Up to 128 Groups can be registered to a single H-LINK.
- Up to 160 RC Groups can be registered in a single Group.
- To monitor or Control indoor units and facility units, the units must be registered into a Group.

(3) Block

- A Block is a set of units that can be monitored or controlled (or both) by this system.
- One or more Groups can be registered.
- Up to 64 Blocks can be registered into a single H-LINK.
- Up to 128 Groups can be registered into a single Block.
- To monitor or control indoor units and facility units, the units must be registered into a Block.

(4) Tenant

- A Tenant is defined as a set of units used for operation of the ratio function of this system.
- Up to 256 Tenants can be registered by the entire system.
- Up to 128 Groups can be registered across an H-LINK within a single Tenant.
- It is necessary to register the Tenant when using the operation ratio function in Grouping across an H-LINK.



5 RC Group Register is required to be set.

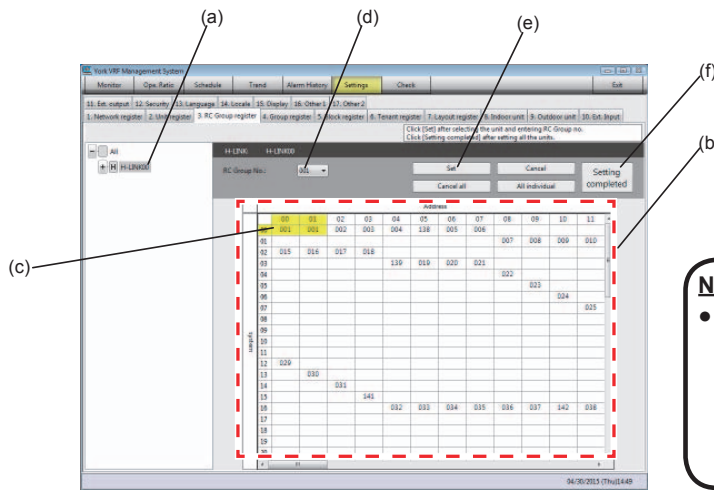
5 RC Group Register

An RC group is a set of wired units controlled by a single remote controller. (Those units may or may not be physically “wired”.) Up to 160 RC groups can be consisted within a single H-LINK. For units not equipped with RC, one indoor unit will constitute a single RC group.

To monitor or control indoor units, the units must be registered in an RC group.

- (1) Go to [Settings] > [RC Group register] and check if the group information entries for the indoor unit (top to bottom) shown in the tree are all correct. If a modification is needed or a (letter O) is displayed, select the indoor unit to set the RC group number.

- (a) Choose H-LINK.
- (b) Check the contents.
- (c) Choose indoor unit (if modification is needed).
- (d) Choose the RC group number.
- (e) Click [Set].
- (f) Click [Setting completed] when all items are set.
- (g) Check items from (a) to (f) for all of H-LINK.



NOTICE:

- Each cell color denotes as follows.
 Yellow: Selected
 Blue: Set
 Green: Set completed
 Orange: Canceled

NOTICE:

- If an RC group consists of multiple indoor units, all units within that RC group will be in control of the same command content.
- If a change is made; from the system, to a unit that belongs to an RC group, the change will affect all units in that same RC group. To control indoor units, the system sends control commands only to a single “main unit” that represents the RC group.
- The main unit of the RC group will be automatically selected by this system. The criterion is a number of configurable items, and the unit with most items within the RC group will be determined as the main unit. For example, If an indoor unit with louver and one without a louver are in the same RC group, the unit with the louver will be recognized as the main unit.
- When no difference exists in the number of control items among units, the units with the earliest refrigerant system number and address will be selected as the main unit. If the communication cables within indoor units are not in use, the unit that is connected to a remote controller will be designated as the main unit.

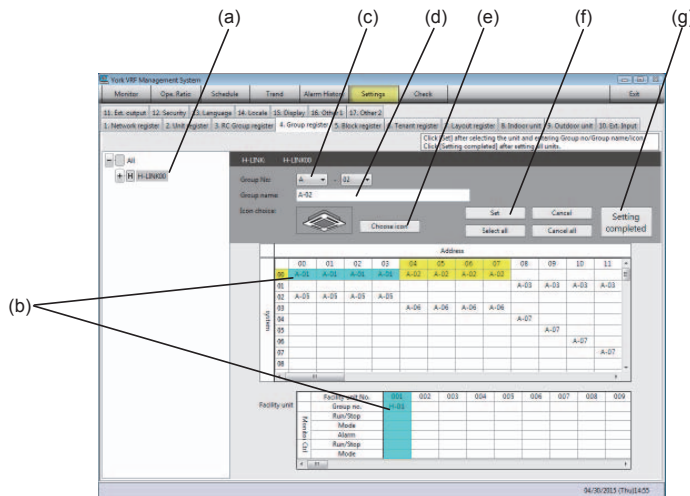
6 Group Register is required to be set.

6 Group Register

A “Group” is defined as a set of units that can be monitored or controlled (or both) by this system. One or more RC groups within a single H-LINK can be registered as Group. Up to 128 Groups can be incorporated within a single H-LINK, and up to 160 RC groups can be incorporated within a single Group. To monitor or control indoor units, these units must be registered within the Group.

- (1) Go to [Settings] > [Group register] and allocate an RC group number of indoor units in **[H]** from top to bottom to register the group name and icons.

- (a) Choose H-LINK.
- (b) Choose units. (Indoor unit or Facility unit)
- (c) Choose RC group number.
- (d) Enter group name.
- (e) Select icon.
- (f) Click [Set].
- (g) Click [Setting completed] when all items are set.
- (h) Verify all settings (a to g) for the local H-LINK environment.



NOTICE:

- Each cell color denotes as follows.
 Yellow: Selected
 Blue: Set
 Green: Set completed
 Orange: Canceled

NOTICE:

- The maximum allowable number of characters in a group name is 64.
- The following characters cannot be used in unit name: “ , ” ; ” and “&”.

NOTE:

- Erase the schedule of the Group before making any changes. Then, make those changes for the Group in the screen.

7 Block Register is required to be set.

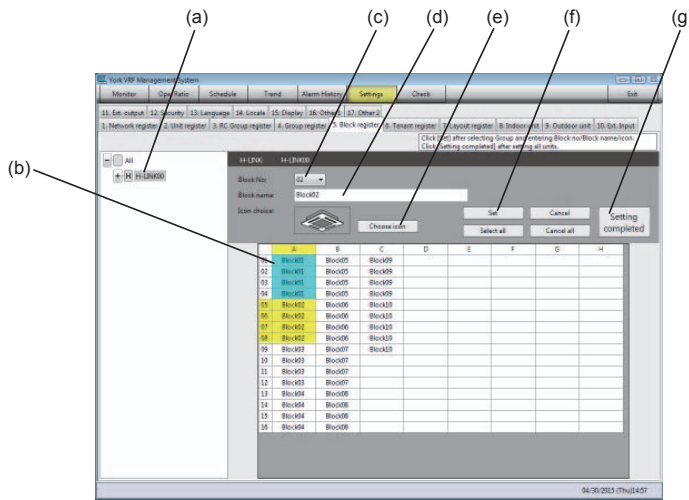
7 Block Register

A “Block” is a set of units that can be monitored or controlled (or both) by this system. One or more groups in a single H-LINK can be registered as a Block.

To monitor or control indoor units, the units must be registered within a RC group.

- (1) Go to [Settings] > [Block register] and allocate a group number for indoor units in **[H]** from top to bottom to register block name and icons.

- (a) Choose H-LINK.
- (b) Choose group.
- (c) Choose a block number.
- (d) Enter block name.
- (e) Select icon.
- (f) Click [Set].
- (g) Click [Setting completed] when all items are set.
- (h) Verify all settings (a to g) for the local H-LINK environment.



NOTICE:

- Each cell color denotes as follows.
 Yellow: Selected
 Blue: Set
 Green: Set completed
 Orange: Canceled

NOTICE:

- The maximum allowable number of characters in a block name is 64.
- The following characters cannot be used in unit name: “ , ”, “ ; ” and “&”.

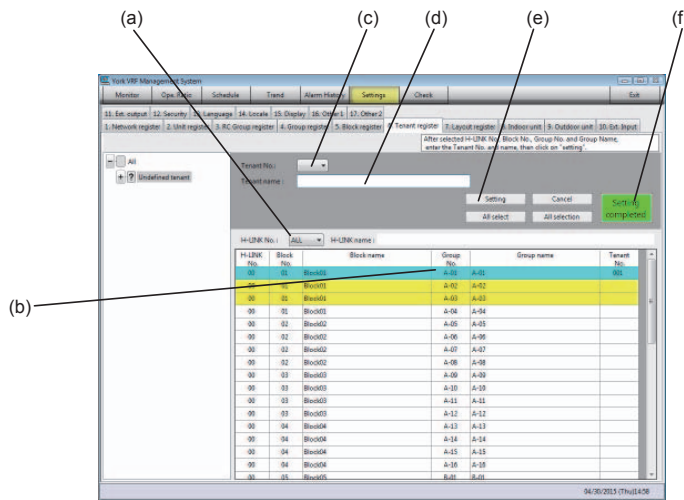
Setting of 8 Tenant Register is a local matter. Set the following items as necessary.

8 Tenant Register

A Tenant is a set of units used for an operation ratio function for this system. Up to 256 Tenant sets can be registered by the whole system. Up to 128 Groups can be registered across the H-LINK within a single Tenant. It is necessary to register the Tenant when using an operation ratio function in Grouping across an H-LINK.

□ (1) Display [Setting] > [Tenant register] and allow the group indicated in the table of the tenant and register the tenant name.

- (a) Choose H-LINK.
- (b) Choose units. (Indoor unit or Facility unit)
- (c) Choose tenant number.
- (d) Enter tenant name.
- (e) Click [Set].
- (f) Click [Setting completed] when all items are set.



NOTICE:

- Each cell color denotes as follows.
 Yellow: Selected
 Blue: Set
 Green: Set completed
 Orange: Canceled

NOTICE:

- The maximum allowable number of characters in a tenant name is 64.
- The following characters cannot be used in unit name: “ , ” , “ . ” and “ & ”.

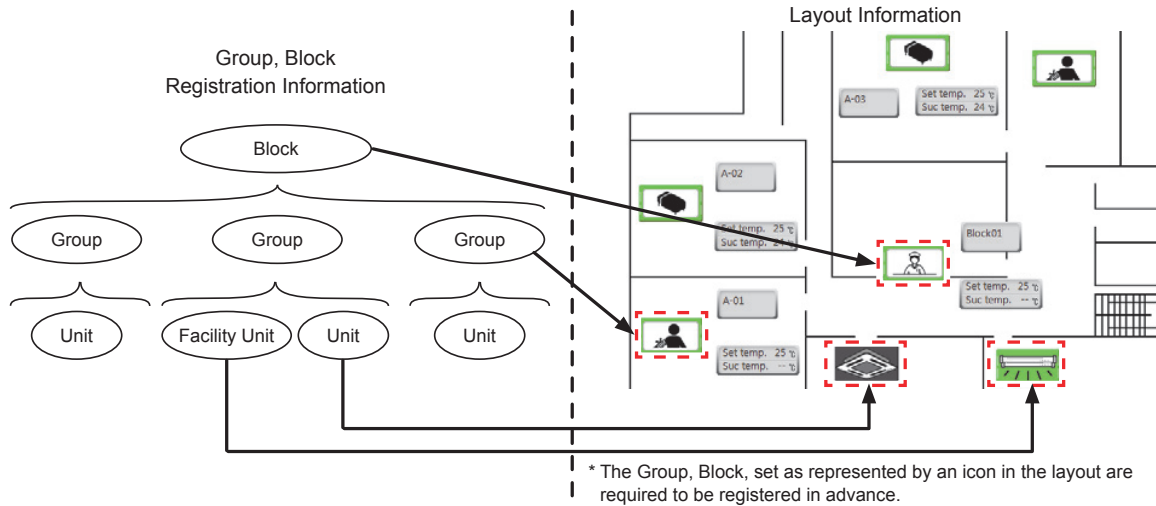
Setup of the Layout Register, 9 is a local matter. Set the following items as necessary.

9 Layout Register

Layout is a set of units that can be monitored or controlled (or both) by this system. Total up to 256 icons for Block, Group, Unit (IU), facility unit can be located within a single layout. To monitor or control the unit and facility unit on the Layout screen, the units must be registered into a layout.

[Concept]

Layout information shows Block, Group, Unit, and Facility units as a ground or air view plan shortcut (*), and then monitors, controls, and shows any apparent trends.

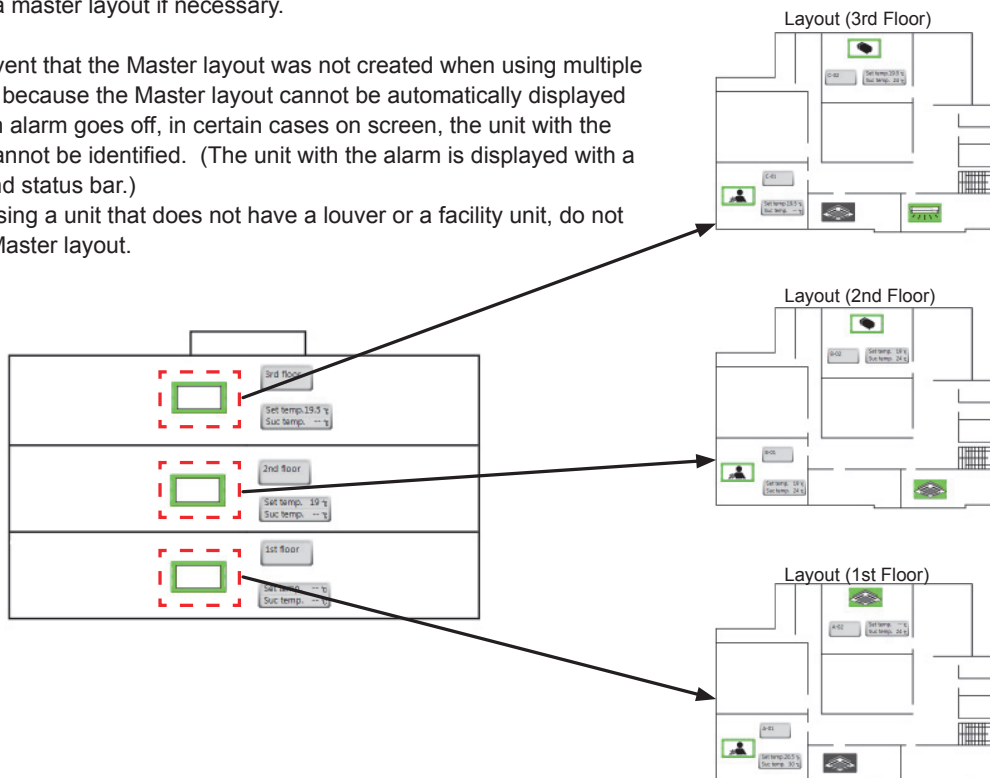


Master layout is used to show multiple layouts.
Create a master layout if necessary.

NOTE:

In the event that the Master layout was not created when using multiple layouts, because the Master layout cannot be automatically displayed when an alarm goes off, in certain cases on screen, the unit with the alarm cannot be identified. (The unit with the alarm is displayed with a scroll and status bar.)

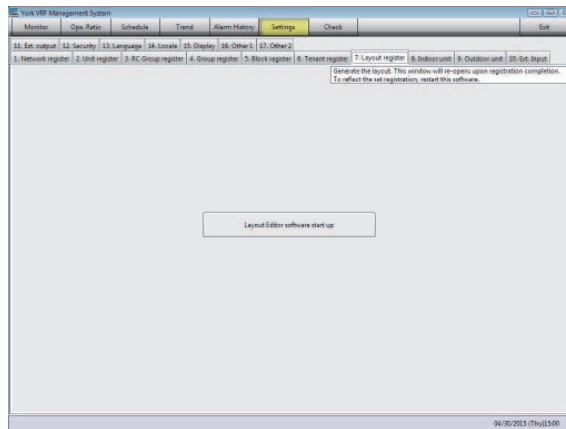
When using a unit that does not have a louver or a facility unit, do not create Master layout.



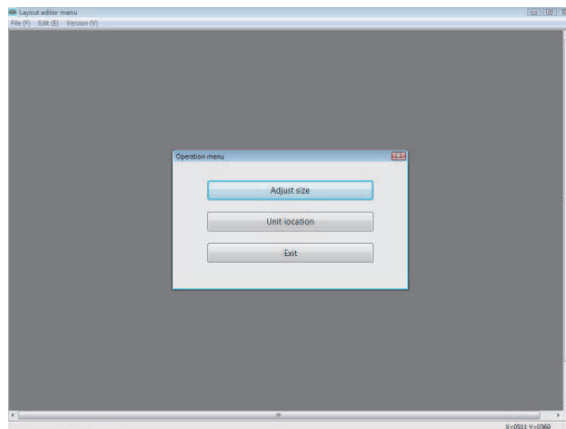
INSTALLATION

[Start up]

- (1) Go to [Settings] > [Layout register].



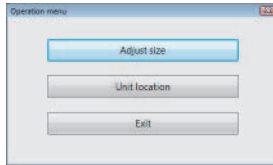
- (2) Click on [Layout Editor software start up] to boot up the software.



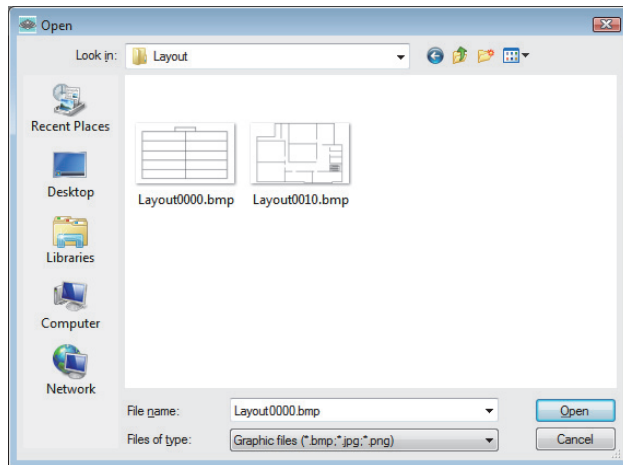
[Adjust Layout Image Size]

It is used to change the size of an image in the Layout.

- (1) Select [Adjust size] in the operation menu.



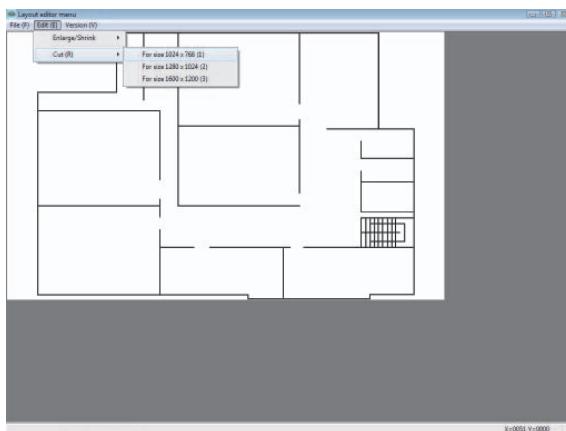
- (2) Select the image used in the Layout.



- (3) Select [Enlarge/Shrink] or [Cut] from menu [Edit].

[Enlarge/Shrink] is used to change the size of the entire image selected.

[Cut] is used to select data from a specific location and repaste it in a converted size and resolution.

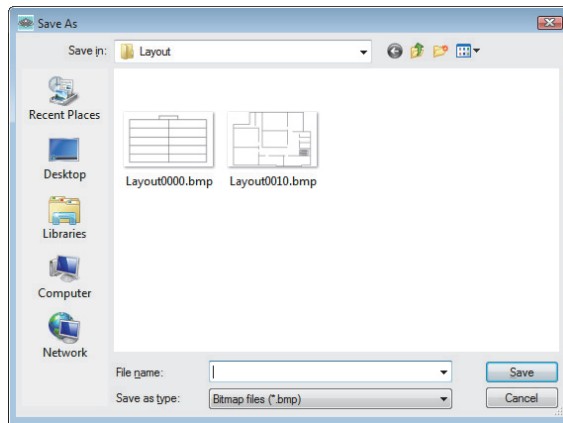


NOTICE:

- Click the right mouse button and select [Cancel] when you want to cancel [Cut].

INSTALLATION

- (4) Select [Save adjusted plan] from the [File] menu, then enter the file name.



- (5) Select [Exit] from menu [File], then return to the Operation menu.

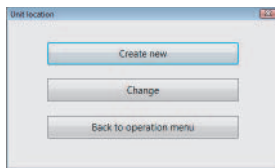
NOTE:

- Perform modification of image size before creating Layout data. If the size of the image has changed after the layout data is created, the reason may be is that the panel located cannot be displayed on screen.

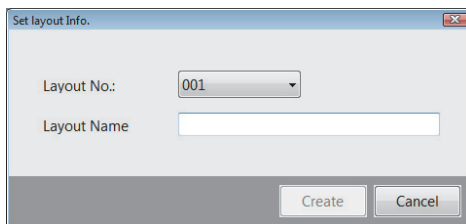
[Unit location - New File]

It is used to create a new file of Layout data to be displayed on screen. Up to 256 icons can be loaded into one single Layout for an individual Layout and up to 128 layouts can be loaded into a Master Layout.

- (1) Select [Unit location] from the operation menu to show the unit location menu.



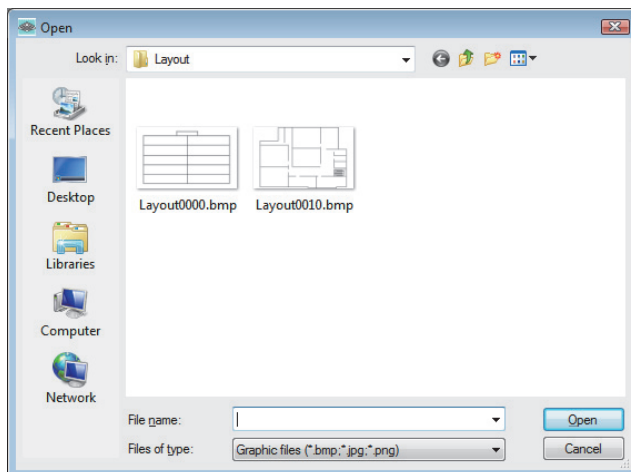
- (2) Select [Create new], select [Master layout] or [Individual layout], set the Layout number and name then click on the [create] Button. The Master Layout is used to display multiple Layouts. It can be created if needed.



NOTICE:

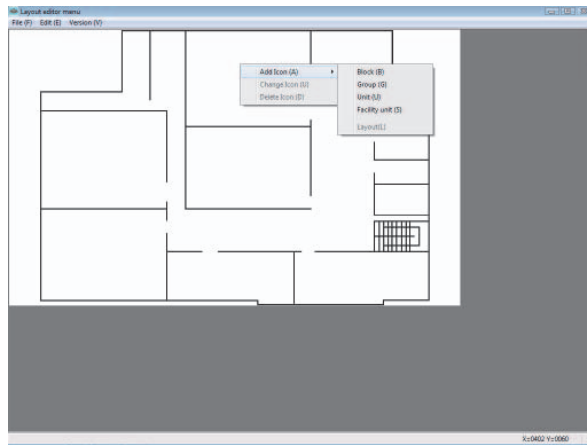
- The maximum allowable number of characters in a layout name is 64.
- The following characters cannot be used in the Layout name: "&", ":", "/", "*", "?", " ", "<", ">", "|".

- (3) Select the image to use in the Layout data.

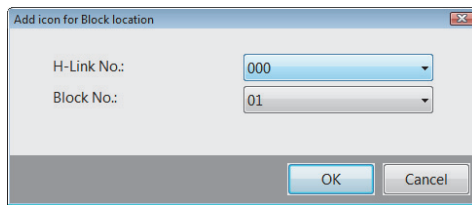


INSTALLATION

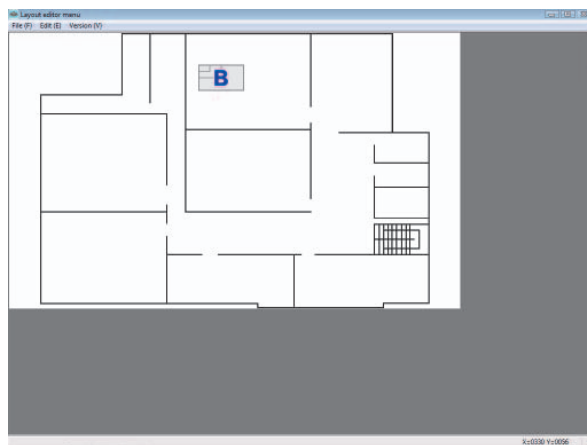
- (4) Right-click to select [Edit] or [Add Icon] and then select the type of icon to insert into the Layout data. It is possible to select Block (B), Group (G), Unit (U), and Facility unit (S) if editing an Individual Layout. If editing a Master Layout, Layout (L) can be selected.



- (5) Select the information of the icon to add.



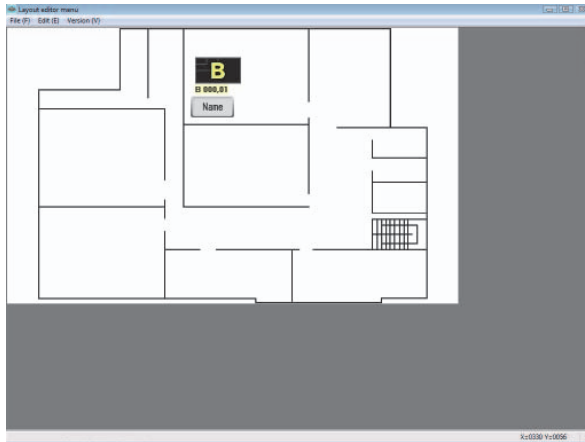
- (6) Select the location of the icon.



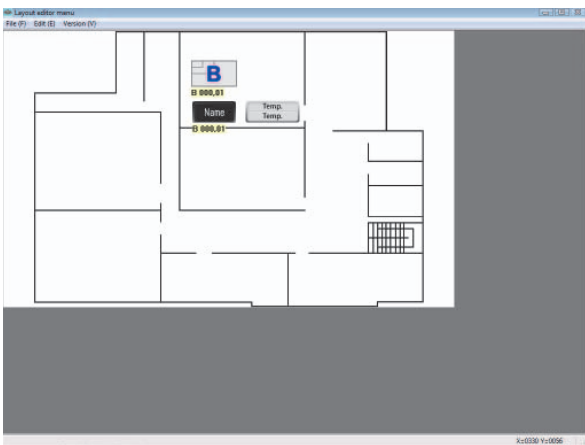
NOTICE:

- The actual icon shown in Management software is an icon set in each registration menu inside the Settings Menu. In the event that a small size icon is set, locate the icon located at the upper left.

- (7) Select the location for the icon Name. Select [Skip locating] (right-click) if not found.



- (8) Select the location of the Temperature icon. Select [Skip locating] (right-click) if not found. In the event that the Facility unit is selected, the Temperature icon cannot be located.



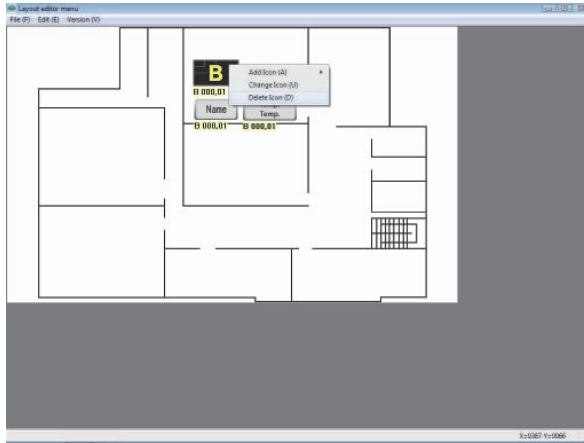
- (9) Repeat steps (4 to 8) if you want to add an icon.

NOTICE:

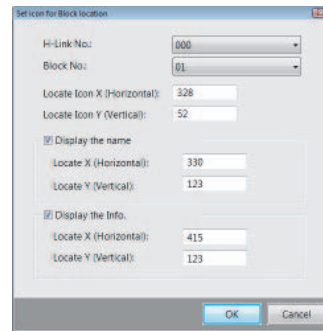
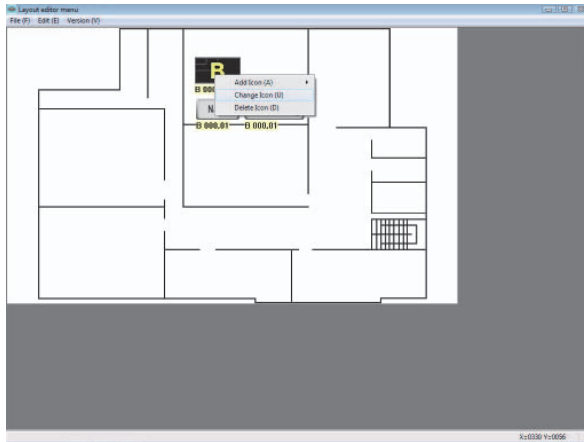
- When all the icons are shown on the monitor layout screen, position as such so as not to overlap them. When a small-sized icon is set inside Unit, Group, or Block, the possibility exists that icons can become overlapped in the registration screen. Locate the icon that displays an additional line as a reference.

INSTALLATION

- (10) To delete an icon, select the icon and do a right mouse click. Select "Delete Icon" (D) from the list of options. In the instance of the Icon Name or Icon Temperature, only selected icons will be deleted, but if icons B, G, U, S, and L are selected, the Icon Name and Icon Temperature will also be deleted.

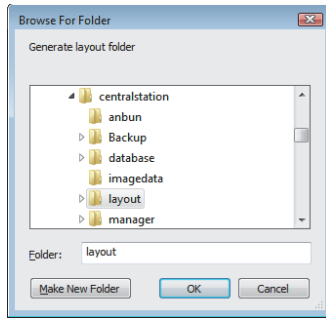


- (11) When changing the location of an icon, select it and do a right mouse click. Select [Change icon] and click on [OK] to change the settings of this icon.



- (12) To change the location of the icon, click on and drag the icon to the new location.

- (13) Select [Save the layout] from the [File] menu, select the [/centralstation/layout] folder, then click [OK].



NOTE:

- Always save in the [/centralstation/layout] folder. If not, the layout will not be displayed.
- Do not create another folder or file within the [/centralstation/layout] folder, otherwise the layout will not display correctly.
- When changing or creating from the layout editor software, always reboot this software. After rebooting, the setting will be displayed.

[Unit location - Modification]

It is for changing the layout data created.

- (1) Select [Unit location] from the operation menu to display in the Unit location menu.
- (2) Click on [Change] and then select the Layout data folder to change.
- (3) Change the Layout data after steps (4 to 12) of the [Unit location - New file]
- (4) Select [Save the layout] from the [File] Menu and then select the [/centralstation/layout] folder and click [OK].

NOTE:

- Always save in the [/centralstation/layout] folder. If not, the layout will not be displayed.
- Do not create another folder or file within the [/centralstation/layout] folder, otherwise the layout will not display correctly.
- When changing or creating from layout editor software, always reboot this software. After rebooting it, the setting will be displayed.

Setting of **10** Indoor Unit Setting is a local matter. Set the following items as necessary.

10 Indoor Unit Setting

Select function for indoor units. To change items in this section, ensure that all indoor units are turned OFF, or proper operation may not be expected.

□ (1) Go to [Settings] > [Indoor unit] and select functions in **H** from top to bottom.

- (a) Choose H-LINK.
- (b) Click [Update].
- (c) Select indoor units and make modifications.
(When changing the value, the item cell will turn in green.)
- (d) Click [Set].
- (e) When setting multiple Indoor units into the same H-LINK, repeat the steps: (c) and (d).
- (f) Click [Setting Completed] when all items are set.
- (g) Click [Update] and then check if the content set is correctly displayed.
- (h) Follow steps: (a) to (g) to set all values for H-LINK.

The screenshot shows the 'Indoor Unit Setting' window in the York VRF Management System. At the top, there are tabs for 'Monitor', 'Ops. Ratio', 'Schedule', 'Trend', 'Alarm History', 'Setting', and 'Check'. Below the tabs, there are several menu options: '1. Est. output', '2. Security', '3. Language', '4. Local', '5. Display', '6. Object', '7. Group', '8. Network register', '9. Unit register', '10. P.C. Group register', '11. Block register', '12. Tenant register', '13. Layout register', '14. Indoor unit', '15. Outdoor unit', and '16. SA Input'. The main area shows a table with columns for 'Item', 'Value', and 'Address'. The first row is highlighted in yellow. Below the table, there are buttons for 'Set', 'Initialization', 'Setting completed', and 'Update'. A red box highlights the 'Setting completed' button. Arrows labeled (a) through (f) point to these elements. A red box labeled (b), (g) points to the 'Update' button.

Item	Value	Item	Value	Item	Value	Item	Value	Item	Value	Item	Value
01	00	01	00	02	00	03	00	04	00	05	00
06	00	07	00	08	00	09	00	10	00	11	00
12	00	13	00	14	00	15	00	16	00	17	00
18	00	19	00	20	00	21	00	22	00	23	00
24	00	25	00	26	00	27	00	28	00	29	00
30	00	31	00	32	00	33	00	34	00	35	00
36	00	37	00	38	00	39	00	40	00	41	00
42	00	43	00	44	00	45	00	46	00	47	00
48	00	49	00	50	00	51	00	52	00	53	00
54	00	55	00	56	00	57	00	58	00	59	00
60	00	61	00	62	00	63	00	64	00	65	00
66	00	67	00	68	00	69	00	70	00	71	00
72	00	73	00	74	00	75	00	76	00	77	00
78	00	79	00	80	00	81	00	82	00	83	00
84	00	85	00	86	00	87	00	88	00	89	00
90	00	91	00	92	00	93	00	94	00	95	00
96	00	97	00	98	00	99	00	100	00		

NOTICE:
 • Each cell color is denotes as follows.
 Yellow: Selected
 Blue: Set
 Green: Set completed

NOTICE:

- It is possible to set the Indoor Unit function selection items b1~FF, i1~i2 and o1~o3 from this system. For other items, perform this setting from the wired zone controller.
- There exists a condition when settings will not be applied, depending on what particular indoor unit. Refer to the installation and operation manuals for each indoor unit or wired controller.
- Configurable items may vary, depending on each unit type. Refer to the installation manual for each indoor unit.
- If items associated with control functions were changed, check connections, with “utilizing registered data”, according to [3] Unit Register.
- With [Setting Completed] selected (on indoor units), any particular settings for that selected unit will not be displayed.

NOTE:

- Reset again when the control board or remote controller needs to be replaced.
- When multiple central devices are in use, ensure that these items are set from this system. Item b8, (auto cool/heat) needs to be set for all central devices so enabled to be configured.
- When using RC control prohibited, do not set the control lock for the local remote. And, do not change the setting for F8~Fb (control lock) in the function selection.
- When using the RC control prohibited function, do not set the function selections: d1, d3, (Power ON/OFF).
- None of the items including settings b5-b9 will be available when utilizing one of the following. (a) (non RC equipped units).
- To set item b4 from this system, reset the filter sign and verify that the filter sign is NOT displayed on the wired zone controller.

Setting of **11** The Outdoor Unit Setting is a local matter. Set following items as necessary.

11 Outdoor Unit Setting

Select functions for outdoor units.

- (1) Go to [Settings] > [Outdoor unit] and select those functions in **H** from top to bottom.
 - (a) Choose H-LINK.
 - (b) Click [Update].
 - (c) Select outdoor units and make modifications.
(When changing a value, the item's cell will illuminate in green.)
 - (d) Select the check-box when controlling: capacity or noise from the operation of the monitor, (or both), and by either schedule or external input (or both).
 - (e) Click [Set].
 - (f) When setting up multiple Indoor units in the same H-LINK, repeat the steps: (c) and (e).
 - (g) Click [Setting completed] when all items are set.
 - (h) Click [Update] and then check if the content set is properly displayed.
 - (i) Follow steps: (a) to (h) to set all values for H-LINK.

NOTICE:

- Each cell color denotes as follows.
- Yellow: Selected
- Blue: Set
- Green: Set completed

NOTICE:

- It is possible to set outdoor unit function selection items: HT, Hc, Hh, SC, SH, db, dE, F2 from this system. For other items, create these settings from the outdoor unit.
- There exists a condition when settings will not be applied, depending on the particular outdoor unit. Refer to the installation and operation manuals for each outdoor unit.
- Those items that can be configured may vary, depending on every unit type. Refer to the installation manual for each outdoor unit.
- The checkbox next to Capacity Control will automatically be selected when Lower Noise is selected.
- The checkbox next to Lower Noise will automatically be deselected whenever Capacity Control is not selected.

NOTE:

- There is a possibility that the capacity control function will not work correctly if an outdoor unit which cannot support the Lower Noise function is set to [Lower Noise].
- Both Capacity Control and Lower Noise functions will take affect 15 minutes after being set.

Setting of **12** External Input Setting is a local matter. Set following items as necessary.

12 External Input Setting

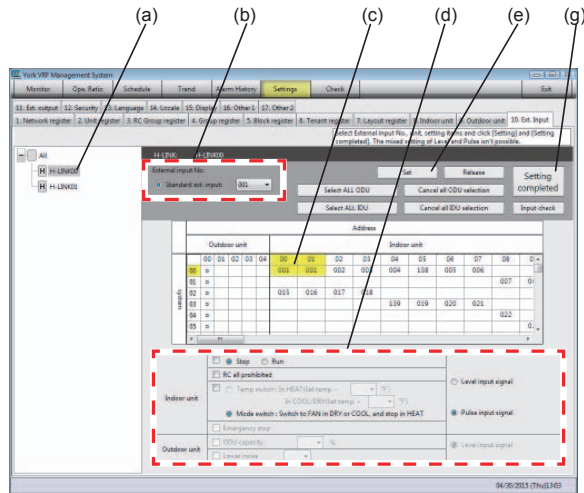
Configuration for control through the input signal from external inputs.

NOTE:

- When performing outdoor unit control, check the content [Settings] - [Outdoor unit].

□ (1) Go to [Settings] > [External Input] and set the command upon signal transmission on external inputs in **[H]** from top to bottom.

- (a) Choose H-LINK.
- (b) Select the external input number.
- (c) Select unit to configure.
- (d) Select the control command.
- (e) Click [Set].
- (f) When changing over multiple units, repeat steps (a) - (e) until all desired units are reset.
- (g) Click [Setting Completed] when all items are set.
- (h) Follow steps: (a) to (g) to set all values for H-LINK.



NOTICE:

- If [Input Check] is selected, the input signal status can be checked. The color of each cell is as follows:
White: Input is OFF
Green: Input is ON

NOTICE:

- Each cell color denotes as follows.
Yellow: Selected
Blue: Set
Green: Set completed
Orange: Canceled

NOTE:

- Intervals of five minutes or longer should be set between each input signal from external inputs.
- The standard input signal from external inputs will be controlled according to the following priority.
Register urgent signals such as "Emergency Stop" in Standard Input signal from (Priority 1) as it has the highest priority level.
Priority 1 - Standard Input signal from external Input 1
Priority 2 - Standard Input signal from external Input 2
Priority 3 - Standard Input signal from external Input 3

NOTE:

- Set all external inputs to OFF in the following cases:
 1. Changing the content of the external input setting.
 2. Changing the content of RC group setting.
 3. Check the connection.When external input is ON in the above cases, correct control cannot be achieved.
- A case exists that when it takes about five minutes until the command to all AC units is extracted, depending on the number of AC units connected and the state of communication because the external input function sent a command to AC units from this device.
Therefore, like the function for Fire Emergency Stop, it is not possible to use like the condition that is to stop absolutely all the AC devices within a designated time (for example, within one minute).
- Reestablish control again from this system in the following cases:
 1. Whenever the external input condition changed while the adapter and AC devices were OFF.
 2. Whenever the POWER to the adapter or AC device is OFF, then ON while in external input processing.
 3. Whenever the condition of the external input changes during a communication error between the adapter and the AC device: (alarm 60, 61, 64, or 65) activated.
 4. When a communication error between the adapter and the AC device (Alarm: 60, 61, 64, or 65) occurs, then restores itself while in the external input processing mode.

Emergency Stop**NOTICE:**

- [Emergency stop] is a function designed to immediately close down all indoor unit operation, those units connected to an adapter configured with the following settings:
Running state: Stop
Running mode: Fan
Set Temp: 82°F (28°C)
Fan speed: 1
Louver: 1
RC operation: All prohibited
All the above settings will be restored upon recovery from emergency stop, but RC operation will continue.
Any control can be suspended for a maximum of 15 minutes after emergency stop is canceled.
All indoor units will instantly switch running mode to Fan, and then the emergency stop signal will self-cancel.
In the event that an emergency stop has occurred (on a single unit or a network of locally controlled indoor units), check settings after the emergency stop condition has been canceled.

NOTE:

- Emergency stop applies only to Indoor Units corresponding with H-LINKII.
- Set the external input signal for emergency stop from this section of software. Though indoor units themselves can be directly set, this setting can be invalidated as to the according to scheduled timer, or other issues.
- Engage the external input signal for emergency stop for one minute or longer.
- Emergency Stop in this system is controlled over communication cables. In case of communication cable disconnection, the system cannot be controlled as expected. Turn OFF the air conditioners to cease operation in such cases.

Mode switch and Temperature switch

NOTICE:

- The [Temp switch] setting can only be used when the Temperature Display reads in degrees Celsius.
- In [Mode switch] and [Temp switch], electrical consumption is lowered when any subsequent control is manually overridden externally.
The [Mode switch] is a function command to stop when it is in "Heat" mode and to switch over to "Fan" mode when in any other running mode than "Heat".
The [Temp switch] is a function used to set "Set temp" (-X°C) when in "Heat" mode and (+Y°C) when in any other running mode than in "Heat".
- Neither the [Mode switch] or [Temp switch] are designed to guarantee lowered electricity consumption.

NOTE:

- The [Mode switch] and the [Temp switch] cannot be used at the same time.
- In the event that the [Temp switch] is activated and engaged in multiple external inputs, the change of temperature is made following an order of priority of external inputs when those external inputs are multiple and in such case that all those external inputs concerning temperature control are canceled, the temperature will return back to the last temperature setting for the external input.
- If the [Mode switch] and the "RUN" mode are set in the same external input, the unit will continue running in "HEAT" mode because the "RUN" mode has a higher priority.

Level input signal and Pulse input signal

NOTICE:

- Input signal
If the Level input signal is selected, the signal shall remain in effect only while receiving that signal.
If the Pulse input signal is selected, the signal shall remain in effect even after this signal stops.
Only Level input signal can be applicable to the Mode switch, Emergency stop, ODU capacity, and lower noise levels.

NOTE:

- If using the pulse signal in an external input, it is required that the pulse width and the pulse interval of the external input are more than 500m/sec.
 - A Level input signal and pulse input signal can NOT be set at the same time in a single adapter.
 - It is impossible to set any content which may differ with any one of the external inputs.
- Even during level signal input, modification of a setting is possible if the condition is not prohibited in this setting item.
- Even during level signal input, if a setting is set as disabled, when the level signal cancellation is done, it is not possible to return to the previous setting.
- In the event that multiple signals are input simultaneously (If the setting is a [Level input signal]), the control setup will follow the established order of precedence for external input from 1 to 3, and commands are executed accordingly.
- If [RC all prohibited] and [Level input signal] are combined, the operation direction for the indoor unit from this system will be disabled during the external input.

NOTE:

• Setting Outdoor Units

- To activate "ODU capacity" in [Monitor], [Schedule], or [External input], (or in both Schedule and External input), go to [Settings] > [Outdoor unit] and check "Capacity control".
- The [ODU capacity] is a function regarding energy consumption at the COOL rating and which is saved by near designated percent of level of energy consumption.
- The setting takes effect within around 15 minutes after external input is entered.
- Even if the capacity control performs at 0%, because the standby power consumption (*) is generated, and the consumption of power cannot amount to zero ("0").
The symbol (*): indicates that standby power consumption is a power used when an AC unit has stopped running and to prepare for the next operation.
- The [ODU capacity] is unable to function when the outdoor unit is starting control or defrosting.
- This control does not guarantee any definite power consumption amount as in the setting.
- To activate "Lower noise" from [Monitor], [Schedule], or [External input], (or both Schedule and External input), go to [Setting] > [Outdoor unit] and select "Lower noise".
- As [ODU capacity] or "Lower noise" control are performed, they are done so always set to one central controller.
- When ODU capacity or lower noise are performed, depending on the external input, ODU capacity or lower noise depending on the schedule will be disabled.

NOTE:

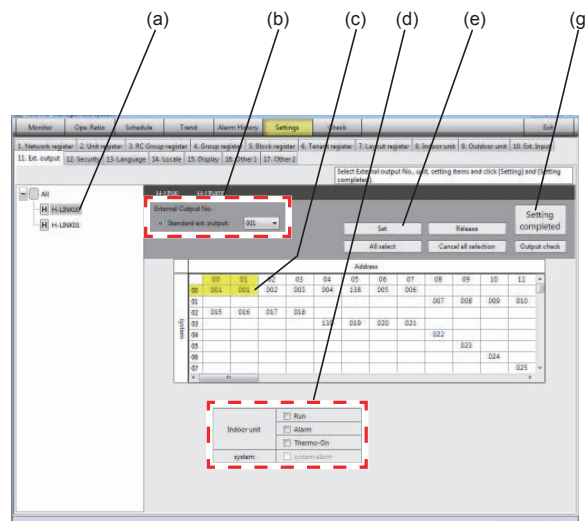
- ODU capacity follows the set order of priority for the external input and when an input is canceled, ODU capacity which is set to the other highest external input in order of priority will be performed.

Setting of **13** External Output Setting is a local matter. Set following items as necessary.

13 External Output Setting

Configuration for outputting the external output signal to transmit the signal to other devices.

- (1) Go to [Settings] > [External output] and set the command upon signal transmission on external outputs in **H** from top to bottom.
 - (a) Choose H-LINK.
 - (b) Select external output number.
 - (c) Select the unit to configure.
 - (d) Select control command.
 - (e) Click [Set].
 - (f) When changing multiple units, repeat steps (a) - (e) until all desired units are set.
 - (g) Click [Setting completed] when all items are set.
 - (h) Follow steps: (a) to (g) to set all values for H-LINK.



NOTICE:

- If [Output check], is selected, the output signal status can be checked. The color for each cell is as follows:
White: Input is OFF
Green: Input is ON

NOTICE:

- Each cell color denotes as follows.
Yellow: Selected
Blue: Set
Green: Set completed
Orange: Canceled

NOTICE:

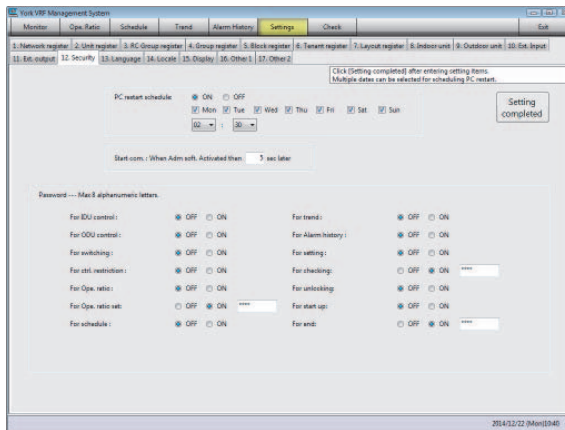
- When selecting the alarm in the output condition, perform an external output when detecting an alarm for the outdoor unit connected to this system.
- It is impossible to set the content, which can differ in one signal.

14 Security Setting is required to be set.

14 Security Setting

Setting a schedule for computer restart and password for control item and display.

- (1) Go to [Settings] > [Security] to set schedule for management computer to restart itself.
A frequency of once a week or more is strongly recommended for restarting. Set Schedule 10 minutes after current time to check if the computer properly completes restarting process before the practical use of this function.
 Set the time for restart during the overnight hours when system monitoring is inactive.



NOTICE:

- To properly complete the restarting process, unlock the password if security is set in BIOS.
- The Operation ratio will be calculated within one hour after midnight. Please avoid setting any schedule during this particular one-hour interlude.

- (2) Set the waiting time until the communication of the management software and the adapter activates. It is possible to set from zero (0) seconds to 999 seconds.

- (3) Set a password for each display and management of controlling items. The maximum length for the password is eight characters. Passwords can be set for each item, respectively.

Passwords	When to use	Notes
For IDU control	To authorize certain users to control indoor unit.	
For ODU control	To authorize certain users to control outdoor unit.	
For Switching	To authorize certain users to switch display. The following functions will be protected by this password. <ul style="list-style-type: none"> • Selecting the monitoring layout • Changing “View by” section to monitor units • Changing the panel size in the monitor • Selecting items from tree 	A prompt for a password for each display is requested upon switching display for changing display layout, panel size, and trees, or all. It is strongly recommended to set a password for each display.
For ctrl. restriction	To authorize certain users to switch control restriction.	The default password is “2468”.
For Ope. ratio	To authorize certain users to display Operation ratio window.	
For Ope. ratio setting	To authorize certain users to check or change the setting for Operation ratio.	The default password is “2468”.
For Schedule	To authorize certain users to display Schedule window.	
For Trend	To authorize certain users to display Trend window.	
For Alarm history	To authorize certain users to display Alarm history.	
For Settings	To authorize certain users to display Setting window. (Including password setting)	It is strongly recommended to set this password for security purposes.
For Check	To authorize certain users to display Check window.	The default password is “1357”.
For Unlocking	To authorize certain users to unlock the display after inactivation period is passed.	
For Start up	To authorize certain users for restarting this system.	This password will not be asked upon restarting of the scheduled restart.
For Exit	To authorize certain users for closing this system.	The default password is “2468”.

NOTE:

- As the password can be changed or canceled in the Security Setting display, it is strongly recommended to register the [Set display password] when setting password.

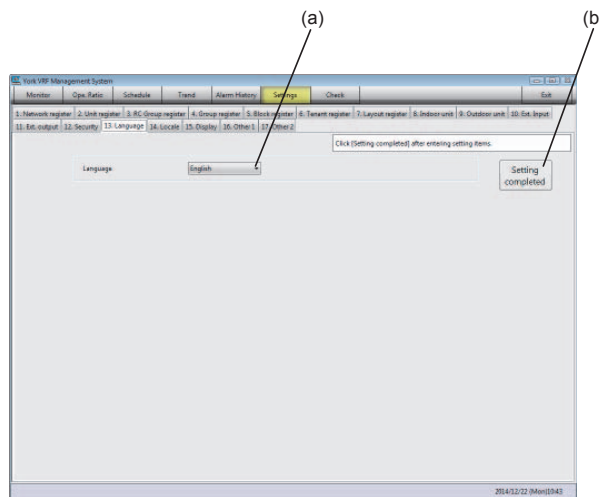
- (4) Click [Setting completed] when all items are set.

Setting of 15 Language Setting is a local matter. Set following items as necessary.

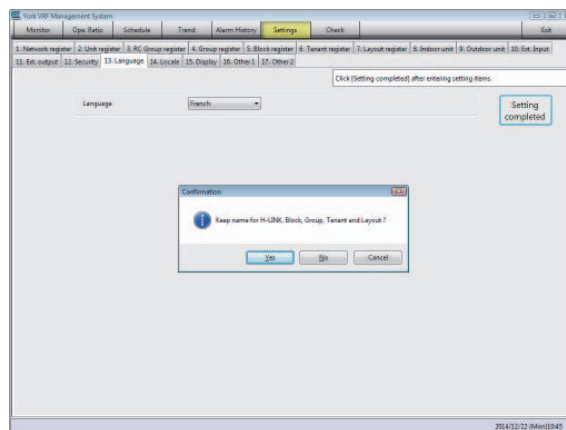
15 Language Setting

Set a language for display. This setting can be used in English and French versions. Note that it is impossible to change languages when using the English-only version.

- (1) Go to [Settings] > [Language] to set the language for display.
 - (a) Choose language.
 - (b) Click on [Setting completed].



- (2) Choose to keep or delete name data.



- (3) Management system will restart automatically. It takes a few minutes.

NOTE:

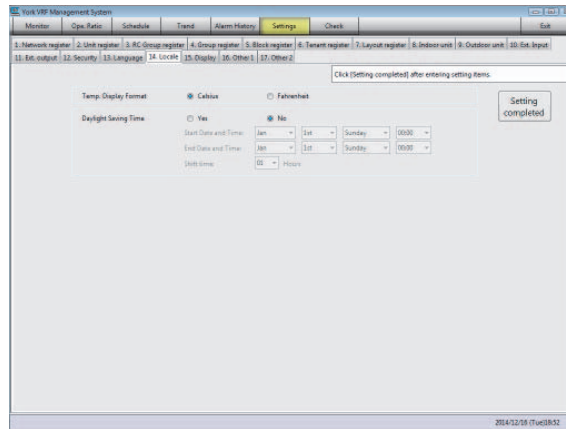
- If choosing to retain name data, some characters may not display correctly.
- When choosing to delete data, the following will be deleted:
Names of IDU, Facility unit, Layout, H-LINK, Schedule running pattern, Information about RC Group, Group, Block, Tenant, and Alarm history

Setting of 16 Locale Setting is a local matter. Set following items as necessary.

16 Locale Setting

Setting the temperature display format and daylight saving time.

- (1) Go to [Settings] > [Locale].



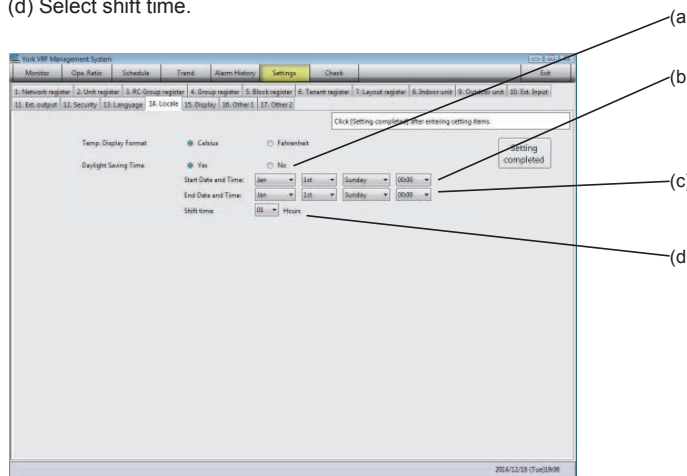
- (2) Set the temperature display format.

NOTICE:

- If [Fahrenheit] is chosen, temperature switch (external input) cannot be used.

- (3) Input the required setting for daylight savings time.

- (a) Select [Yes] or [No] for daylight savings time.
- (b) Select start date.
- (c) Select end date.
- (d) Select shift time.



NOTE:

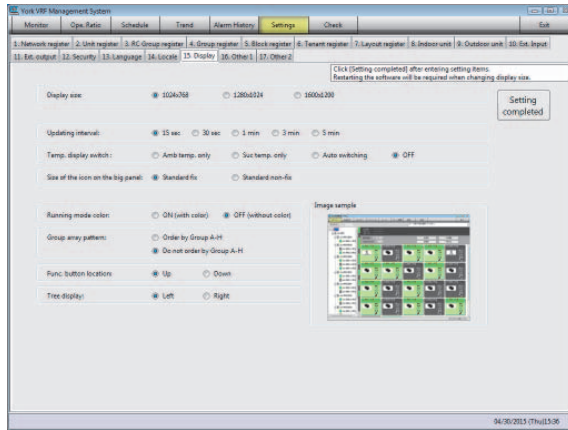
- When registering daylight savings time by way of management software, the system-specific time zone will be set to the OS. Do not change the time zone setting for the OS directly, otherwise this system cannot work normally. When changing the daylight savings time setting, register it by using this management software.

- (4) Click [Setting completed] when all items are set.

17 is required to be set.

17 Display Setting

Configuration of display for the management computer.



- (1) Go to [Settings] > [Display].
- (2) Set display size of this software.

The window cannot display correctly if the set size is larger than the size of the Management Computer screen. Some screens can be displayed smaller when clicking on the small rectangle (between the “dash” and the “X” on the windows title bar in the extreme upper right corner). It will alternate from half-size to full-screen view. Proportion each window to size in this section.

Resolution is not an important factor when scrolling to show the content that follows:

Display	Maximum number of panel display		
Display Size	1024×768	1280×1024	1600×1200
Large	5×4=20	6×6=36	8×7=56
Small	10×13=130	13×20=260	17×24=408
Layout	10-30 (approx.)	20-40 (approx.)	30-60 (approx.)

* If setting [Order by Group A-H] in the group pattern array, the number of available displays may be small.

NOTICE:











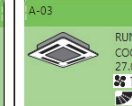
- The display size above is a standard window size. They are shown in full-window when the (rectangular box) maximize button in the far upper right corner is selected.

- (3) In the updating interval, set the update cycle to the current status.
- (4) Set the temperature display switch for the monitor.

NOTE:

- To display the ambient air temperature, perform the wired zone controller setting (Function selection C8).
- Some units cannot display the ambient air temperature or the air suction temperature.
- When using the save power function of the remote controller, the displayed ambient air temperature may differ with the actual air temperature.

- (5) Select the icon size for the large panel. To fix the standard size or use the original size when registered.

		[Standard fix]			[Standard non-fix]		
Layout	Size	Extra small	Small	Standard	Extra small	Small	Standard
	Icon						
Large Panel							

NOTICE:

- Select [Standard fix] when using a small size icon in the layout display.

- (6) Select whether or not the panels shall show the running mode by color or not.

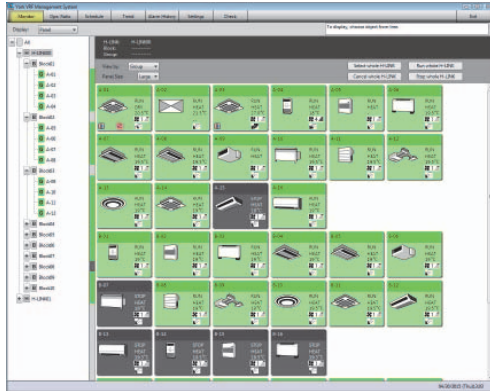
Running mode color setting	RUN (Cool)	RUN (Heat)	RUN (Dry)	RUN (Fan)	RUN (Auto)	RUN (In multiple mode)	Alarm	Stop
ON (with color)	Light Blue	Orange	Sea Green	Light Grey	Light Blue and Orange	Light Purple	Red	Grey
OFF (without mode color)	Lime Green						Red	Grey

NOTICE:

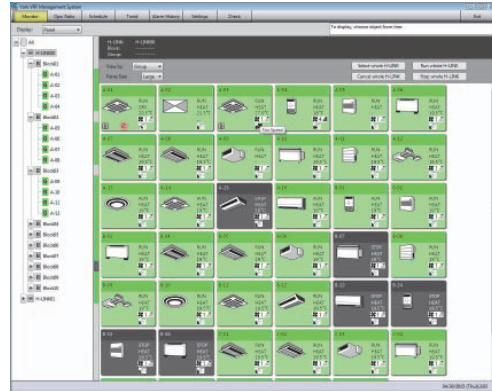
- The display size above is a standard window size. They are shown in full-window mode when the rectangular maximize button in the far upper right corner is selected.
- In case of simultaneous occurrence, the color will assume its assigned attributes according to the priority for "Alarm" > "Other status".
- In displaying a group or block (or both) that contains multiple units, the color will conform in accordance with the following priorities.
 - (a) Displays in red (alarm) if one or more units are in a alarm condition.
 - (b) Displays in a running condition of the units that is not in an alarm condition, and one or more air conditioners are running.

INSTALLATION

- (7) Select whether or not to insert line feed alphabetically.

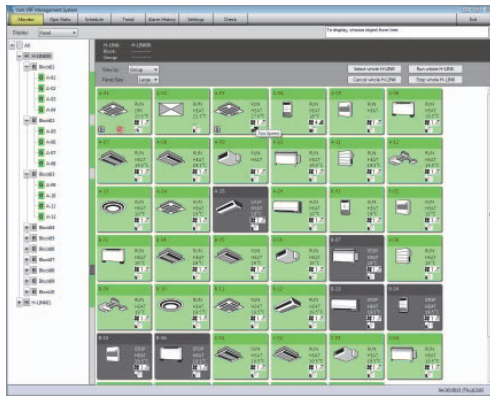


Set [Order by Group A-H]

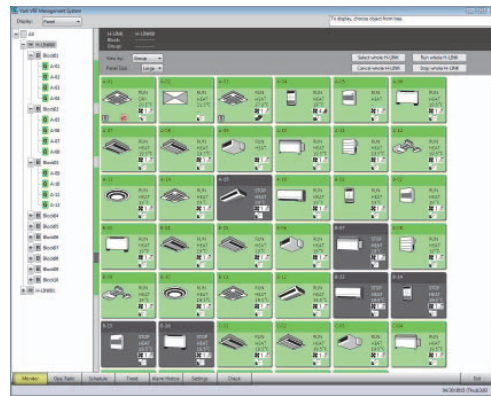


Set [Do not order by Group A-H]

- (8) Select the location of the function buttons.

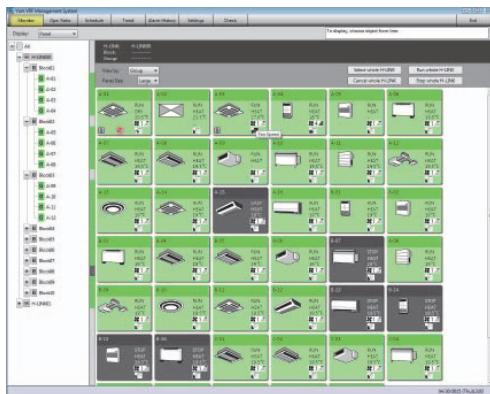


Set [Up]

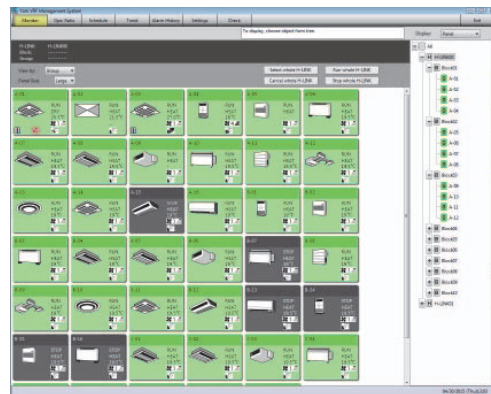


Set [Down]

- (9) Select the location of the tree.



Set [Left]



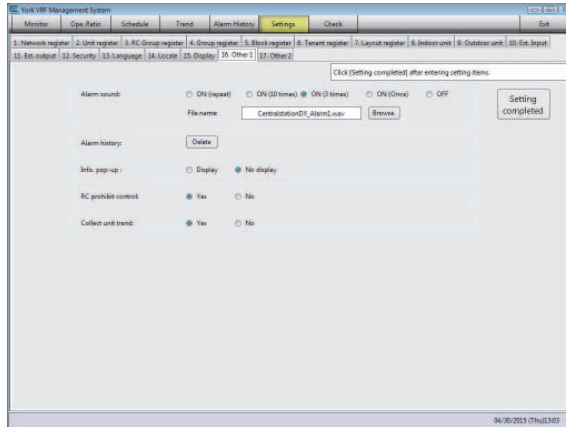
Set [Right]

- (10) Click [Setting completed] when all items are set.

Setting of **18** Other Setting 1 is a local matter. Set the following items as necessary.

18 Other Setting 1

Set miscellaneous settings related to management software.



- (1) Go to: [Settings] > [Other 1].
- (2) Select the desired sound effect and the number of the alarm upon occurrence.
- (3) Delete alarm history.

NOTICE:

- This function will be used before handing over to the customer after Test Run is completed.

- (4) Select whether or not to display any pop-up information. It will be displayed during processing external input or output.
- (5) Select whether or not to prohibit operation from the wired zone controller.
- (6) Select whether or not to collect unit trend data.

NOTICE:

- It is possible to display the trend without collecting unit trend data.

- (7) Click [Setting completed] when all items are set.

Setting of 19 Other Setting 2 is a local matter. Set following items as necessary.

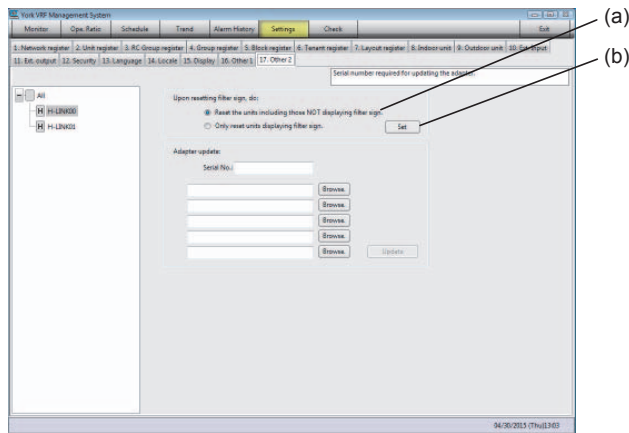
19 Other Setting 2

Miscellaneous setting for all H.

- Go to: [Settings] > [Other 2] and set each item in the H that is currently displayed.

[Modifying the operation on filter sign reset]

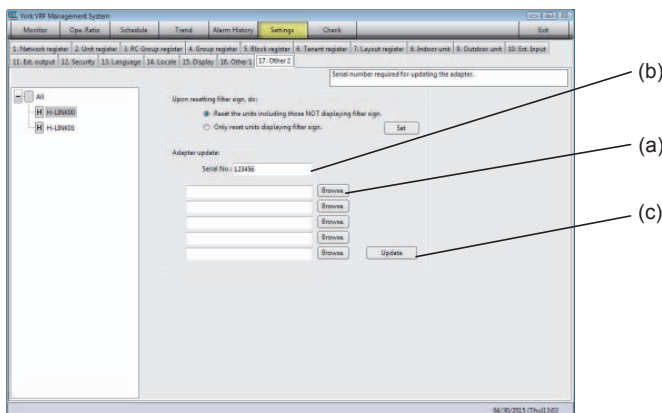
- (a) Select the operation on resetting the filter sign.
- (b) Click on the [Set] button.
- (c) This setting performs steps from (a) to (b) regarding all the necessary H-LINK.



***This functionality is intended for serviceman's use only. (Reserved for future use).**

[Updating adapter]

- (a) Click [Browse...] and select update file.
- (b) Enter serial number.
- (c) Click [Update].
- (d) Restart the adapter according to the instructions on the windows.
- (e) This setting performs steps from (a) to (d) regarding all that is needed for H-LINK.



Test Run

1 Monitor and Control Check

NOTICE:

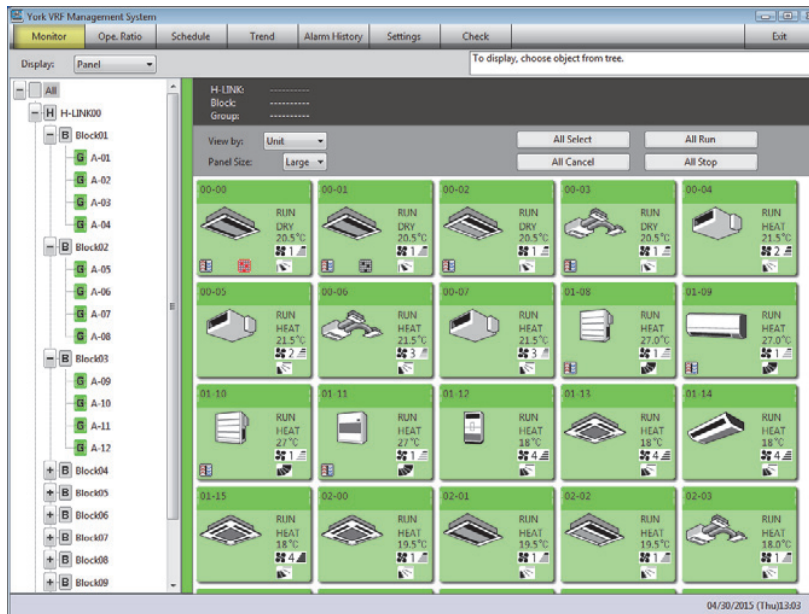
- When controlling from the monitor screen, the content of the control functions performed remain displayed for a moment (control hold time). During this time, even if controlling from the RC or other controllers, the content shown on the monitor screen will not be updated.
- The initial hold-time settings that this information is displayed is seven minutes.
- If changing this hold-time value, follow the procedure below.
 - (1) Close the management software.
 - (2) Open [manager_info.ini] in the [/centralstation/manager] folder.
 - (3) Change the time setting value [7] (choose between values from 3 to 20) of [ProvisionalResTime=7] in [Display].
 - (4) Overwrite, save, and close [manager_info.ini].
 - (5) Restart the management software.
- If the control hold time value is shortened, the possibility exists that the displayed value on the monitor and the set control content value may differ. Run the entire control procedure to adjust time for the Test Run phase.

***Refer to operation manual for how to control these items.**

Monitoring and controlling by each unit

□ (1) The priority setup in the monitor display will be as follows:

Tree	All
Display	Panel
View by	Unit
Panel size	Large



□ (2) The system will attempt to control from the remote controller, all captive AC units and verify that their status (displayed), matches the commands sent from the remote controller.

NOTICE:

- To avoid any control failure or mistaken identity, inspect all air conditioners one by one, respectively.

□ (3) The system will attempt to control all captive air conditioner unit members and to verify that their status (displayed), agrees with the commands sent from the system.

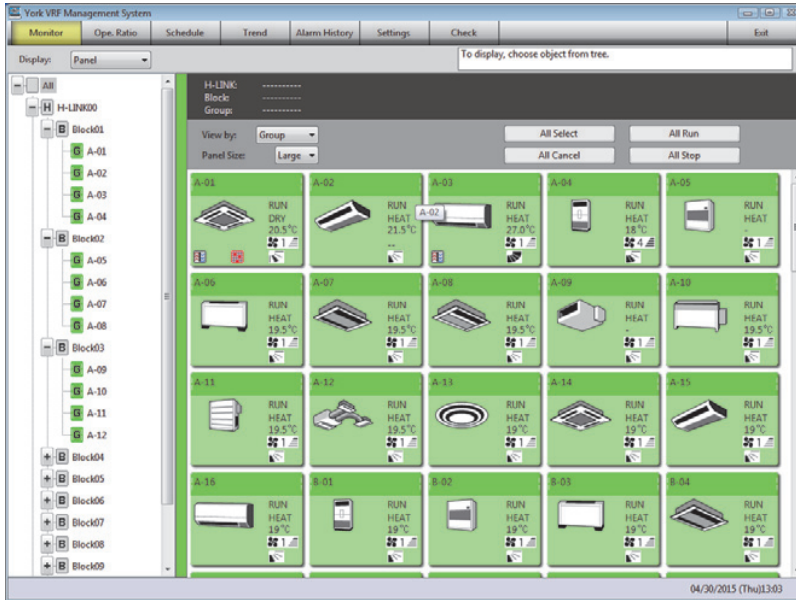
NOTICE:

- To avoid any control failure or mistaken identity, inspect all air conditioners one by one, respectively.

Monitoring and controlling by each group

- (4) The priority setup in the monitor display will be as follows:

Tree	All
Display	Panel
View by	Group
Panel size	Large



- (5) The system will attempt to control all captive air conditioner group(s) and to verify that their status (displayed), agrees with the commands sent from the system.

NOTICE:

- To avoid any control failure or mistaken identity, inspect all air conditioners group by group respectively.

- (6) The system will attempt to control all captive air conditioner group(s) and to verify that their group status (displayed), agrees with the commands sent from the system.

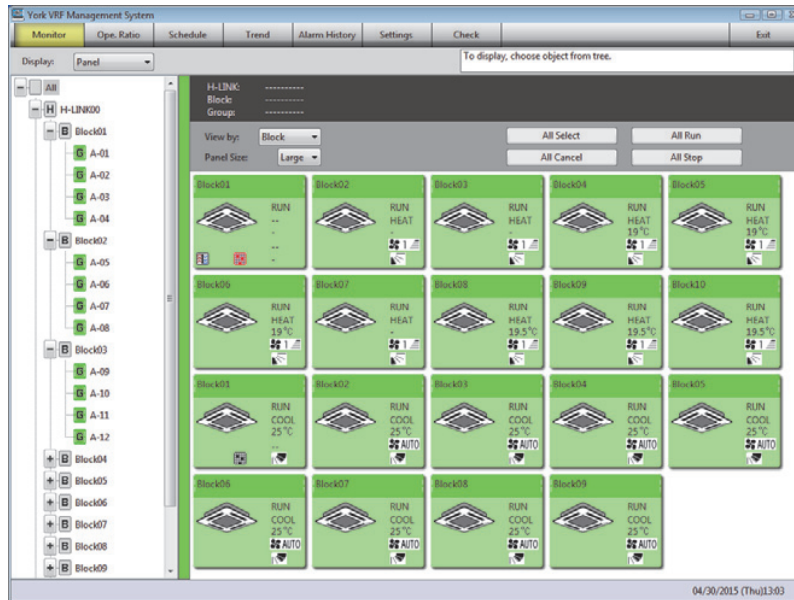
NOTICE:

- To avoid any control failure or mistaken identity, inspect all air conditioners group by group respectively.

Monitoring and controlling by each block

- (7) The priority setup in the monitor display will be as follows:

Tree	All
Display	Panel
View by	Block
Panel size	Large



- (8) The system will attempt to control all blocks of air conditioner units by way of remote control from the remote controller and to verify that their status (displayed), agrees with the commands sent from the system.

NOTICE:

- To avoid any control failure or mistaken identity, inspect all air conditioners block by block, respectively.

- (9) The system will attempt to control all block(s) of air conditioner units by way of remote control from the remote controller and verify that the block of air conditioner units status (displayed), agrees with the commands sent from the system.

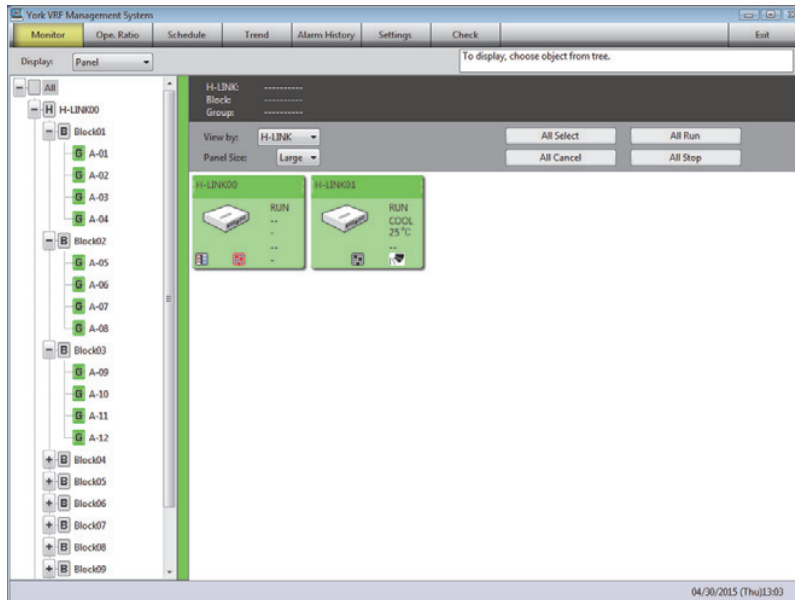
NOTICE:

- To avoid any control failure or mistaken identity, inspect all air conditioners block by block, respectively.

Monitoring and controlling by each H-LINK

- (10) The priority setup in the monitor display will appear as follows:

Tree	All
Display	Panel
View by	H-LINK
Panel size	Large



- (11) The system will attempt to control all air conditioner units in all H-LINK(s) by way of the remote controller and verify that air conditioner status across those H-LINKS agree with the commands sent from the system.

NOTICE:

- To avoid any control failure or mistaken identity, inspect all air conditioners in the H-LINK one by one, respectively.

- (12) The system will attempt to control all air conditioner units in all H-LINK(s) and verify that these units are operating in agree with the commands sent from the system.

NOTICE:

- To avoid any control failure or mistaken identity, inspect all air conditioners in the H-LINK one by one, respectively.

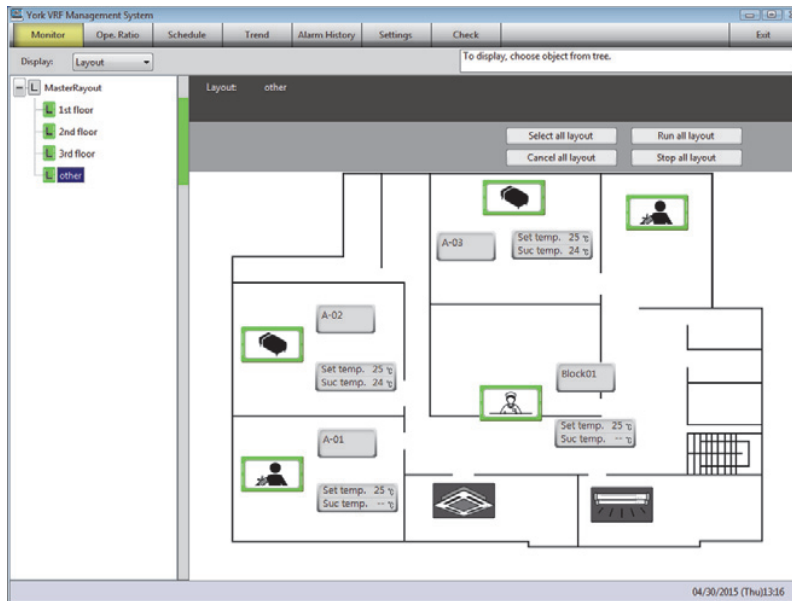
INSTALLATION

Monitoring and controlling by each layout

This check is required only when using a layout.

- (13) The priority setup in the monitor display will appear as follows:

Tree	Each layout
Display	Layout
View by	—
Panel size	—



- (14) The system will attempt to control all air conditioner units represented in all icons from the remote controller and verify that these air conditioning units are operating as they were programmed.

NOTICE:

- To avoid any control failure or mistaken identity, inspect all air conditioners in the icons one by one, respectively.

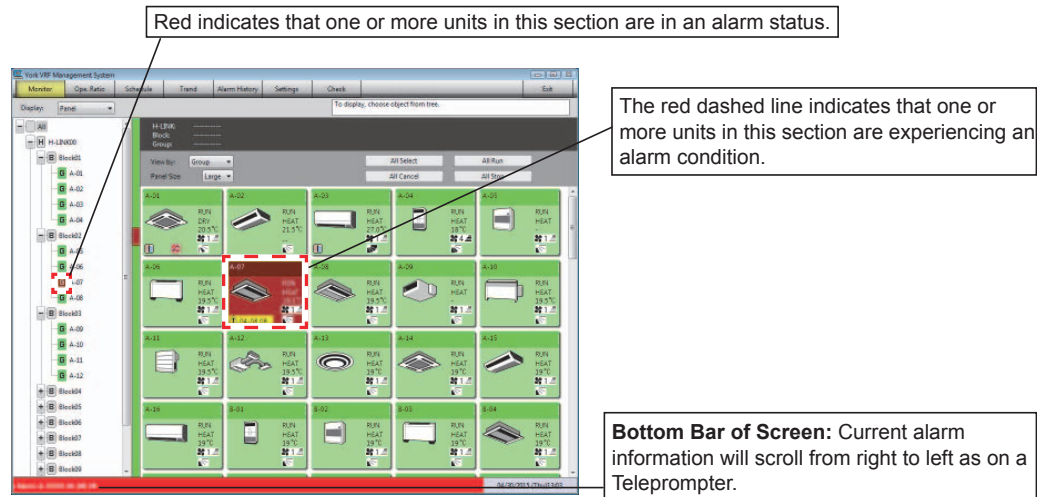
- (15) The system will attempt to control all air conditioner units represented in all icons from this system and verify that these air conditioning units are operating as they were programmed by the system.

NOTICE:

- To avoid any control failure or mistaken identity, inspect all the air conditioners in the icons one by one, respectively.

2 Alarm and Errors

This section deals with alarm codes and their descriptions.



Alarm Codes

Alarm Codes	Contents	Action to Take
00~FF (except 60,61,63, 64,65)	Alarm from air conditioners	Refer to Installation Manual and Operation Manual for each air conditioner.
60	Central controller - outdoor unit communication error (when more than 1 unit(s) are operating)	A communication error occurred on the H-LINK between the adapter for this system and the outdoor unit. Check H-LINK wiring.
61	Indoor unit - central controller communication error (when the indoor unit is operating)	A communication error occurred on the H-LINK between the adapter of this system and the indoor unit. Check H-LINK wiring.
64	Central controller - outdoor unit communication error (when all indoor units are not operating)	A communication error occurred on the H-LINK between the adapter for this system and the outdoor unit. Check H-LINK wiring.
65	Indoor unit - central controller communication error (when the indoor unit are not operating)	A communication error occurred on the H-LINK between the adapter for this system and the indoor unit. Check H-LINK wiring.
S20	Hard disk capacity shortage	Free space is less than 1GB. Clear the memory to assure that more than 1GB of free space or substitute the computer for another with larger space.
S21	Data could not be written	This error may be caused by a memory shortage or a device failure. Substitute the hard disk with another if this error frequently occurs.
S22	Data could not be read	This error may be caused by device failure. Substitute the hard disk with another if this error frequently occurs.
S23	Adapter communication failure	Check if the power to the adapter is ON, LAN is properly wired between the adapter and the management computer, and the power to the hub is ON.
S24	DST setting failure	Check if the power to the adapter is ON, LAN is properly wired between the adapter and the management computer, and the power to the hub is ON.
S41	Calculated file access error	This error may be caused by memory shortage or device failure. Substitute the hard disk with another if this error frequently occurs.
S42	Download wrong data	This error may be caused by memory shortage or device failure. Substitute the hard disk with another if this error frequently occurs. Check if the power to the adapter is ON, LAN is properly wired between the adapter and the management computer, and the power to the hub is ON.
S43	Failure of reading and writing setting data	This error may be caused by device failure. Substitute the hard disk with another if this error frequently occurs.

3 Data Backup

IMPORTANT: Perform a back-up of your data immediately after completing Test Run. Data back-up guarantees fast recovery in the event of a computer crash. Perform a data backup after creating settings, completion of Test Run, and periodically during other operation as well.

- (1) Connect the USB flash device or other external hard drive to the management computer.
- (2) Exit the management software.
- (3) The [/centralstation] folder is saved under the drive letter where the software is installed. Copy the file to a USB flash drive or any other external hard drive connected to the computer.
- (4) To remove the USB flash drive or other external hard drive, first select [Safely remove hardware] from the task bar. Then, remove the flash drive.

4 How to Restore with Backup Data

When restoring the computer with backup data saved in **3** after a computer crash or internal error, or other faults, please follow the procedure described below.

- (1) Install the management software to the new management computer and set IP address. As for the installation procedure, please refer to the **Installation** section of this manual.
- (2) Connect the USB flash drive device or other external hard drive with backup data saved in **3** (central station folder) to the new management computer.
- (3) Overwrite the [/centralstation] folder, with data from the USB flash memory or other external hard drive, in the drive in which the existing software is installed.
- (4) To remove the USB flash drive or other external hard drive, first select [Safely remove hardware] from the task bar. Then, remove the flash drive.

5 Check Items before Handing Over

Check the following before handing over.

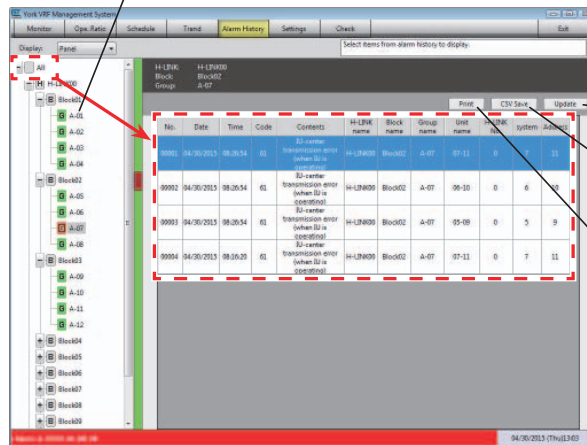
- (1) Check functions for controlling and monitoring of each unit according to the Test Run procedure in this manual.
- (2) The customer needs to realize that the service life of the management computer differs with that of the air conditioning unit. The customer should also be informed as to how to upload the computer in advance.
- (3) Management computer: this software and the adapter are assumed to be always ON. Explain to your customer that Trend data, alarm history, and check data cannot be recorded while this software is either OFF or in a hibernation state.
(The exception being for software reboot during the PC restart process)
- (4) Monitor and control functions are lost with device failure or other catastrophic events. Formulate a recovery strategy with the customer before the system enters service.
- (5) Periodically copy [/centralstation] in the management computer and back up to a USB flash device or other external memory device as backup resource.
- (6) Explain (to the customer) how to operate and how to maintain this software.
- (7) Device failure for any reason will severely impact capabilities. Discuss an alternative recovery strategy that allows you to address problems with the computer and adapter with the customer/tenant before the system enters service.

Service and Maintenance

1 Alarm History

A historical record (log) of system faults and alarms will be displayed.

This area (bounded in red) displays all alarms that have occurred in all selected H-LINKs / blocks / groups selected on the tree.



- Reload the alarm history log.
- Output for the current alarm history log in .CSV file format.
- Print out the current alarm history log.

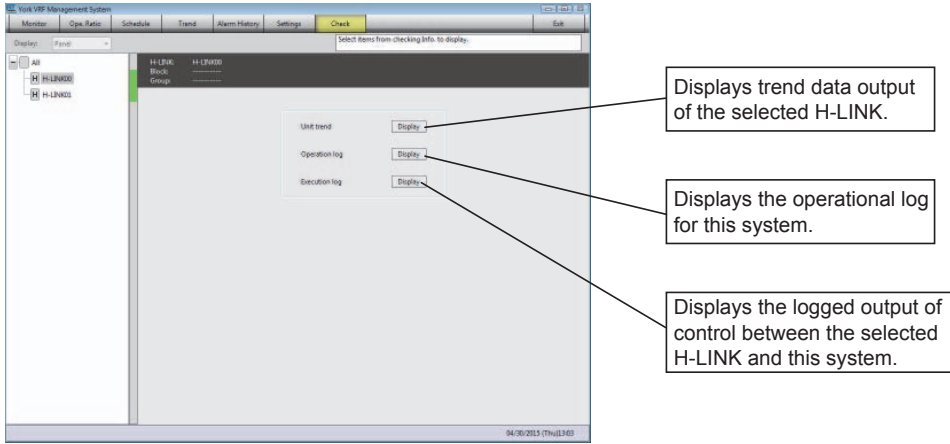
For alarm codes, refer to **Test Run** 2 Alarms and Errors.

NOTE:

- Any alarm that was triggered and resolved while this software was inactive will not be recorded into the alarm history log.

2 Check

This functional is restricted for use by service personnel only.
Each and every check-off item can be saved as a separate file from this screen.



3 Troubleshooting

The following table is a breakdown of symptoms, items to closely examine, and recommended courses of action.

Initiating

No.	Condition	Items to be Checked	Action
1	The system does not boot after double-clicking on the icon.	Check if the installation was done properly.	Install this system according to the procedure described in this manual.
		Check if the computer meets system requirements.	Install this system with the specified computer that meets system requirements in accordance with this manual.
		Is there a margin of 1GB of free memory space on the management computer?	Clear the memory to create the more than 1GB of free space required or substitute the computer with another one with larger memory space.
		Is the user account control [Never notify]?	Substitute [Never notify] for [Change User Account Control settings].
2	Connection evaluation time takes too long.	Verify that the indoor units are running.	System connection evaluation time may last up to 20 minutes after startup. System evaluation time can be reduced by turning OFF indoor units from the remote controller.
3	No units show up on the display after startup, or an Adapter communication failure (S23) is detected. (If a system restart does not resolve the problem).	Verify that the commercial security software is active.	Disable all firewall barriers if any commercial security software is installed. Secure the network with a firewall of routers.
		Are all the adapters turned ON?	Turn all the adapters ON.
		Verify that LAN is properly wired between the adapter and the management computer, and the power to the hub is ON.	Ensure that LAN is properly wired between the adapter and management computer. Also, ensure that power to the hub is ON. [NOTICE] Follow the procedure below to check connections between the adapter and the management computer. (a) Go to [Start] > [All programs] > [Accessories] > [Command Prompt] on the management computer. (b) Type in and [ping] the IP address of the adapter. (for example, ping 192.168.0.3) If [Reply from 192.168.0.3: bytes=32 time=ims TTL=64] (192.168.0.3 is the address that had been typed in step (b).) This indicates that the adapter is connected. If [Request timed out] is displayed, the LAN connection between the management computer and the adapter has <u>not</u> been established.
Is the specified LAN cable in use?	Use a category five LAN cable up to 100m in length. Use a straight LAN cable and connect the management computer and adapter to an Ethernet hub.		
4	No units show up on the display after startup. (If restarting the system does not solve this condition)	Did you click on the [Connect] button?	Go to [Settings] > [Network register] and press the [Connect] button.

No.	Condition	Items to be Checked	Action
5	No units show up after startup of the management computer or restart by the scheduled restarting, or an adapter communication failure (S23) is displayed. (When this can be solved by rebooting this software.)	Is the time period for initiating network communication on the management computer short enough?	Other software (for example, virtual environment software) can delay initiation of network communication on the management computer. This can result in no units showing up on the display for connection data that cannot be acquired. To solve this problem, disable all network communication functional on other software or uninstall all unnecessary software. Set start communication time for [Settings] > [Security] to exceed the network start time.
6	Data acquisition does not start even after entering the correct address and pressing the [Connect] button in the [Network register] section.	Is the Proxy correctly set?	If the Proxy is set, go to [Control Panels] > [Internet Properties] > [Connections] > [Local Area Network Settings] > [Advanced] > [Exceptions] and examine the contents. As for setting the Proxy, contact your network administrator.
7	Even if the [Connect] button is selected in the [Network register] section just after installation, the adapter cannot be connected.	Is the add-on software for the browser installed?	Uninstall the add-on software.
8	Even if the [Connect] button is selected in the [Network register] section, the IP address, subnet mask, or the default gateway is not displayed.	Is the DSW setting for the adapter correct?	Is DSW (SW2) are (pins 1 and 3) for the adapter ON? DSW (SW2): Is only pin-1 in the ON position for H-LINKII, compliant mode? Change settings only after referring to the adapter installation manual.
9	Just after turning ON the management computer or when doing a scheduled reboot, "Impossible to connect with communication software.." is displayed. [Impossible to connect with adapter Com. software.] is indicated.	Does it take too long time to start the adapter communication software?	Change the value for [manager_info.ini] > [Network Common] > [AdpcomStartTimeout] in the folder [/centralstation/manager].
10	Even if the [Register] button inside the [Network register] section is selected, the register action does not complete.	Is there a time setting discrepancy between the adapter and the management computer?	Reset the clock to reduce the time discrepancy to under five minutes. (a) Go to [Start] > [All programs] > [Accessories] > [Command Prompt]. (b) Enter [telnet] and the IP address of the adapter (for example, telnet 192.168.0.3). (c) Enter [root] next to login:. (d) Enter [harc] next to Password:. (e) Enter date [MMDDhhmmyyyy]. (MM for month, DD for day, hh for hour, mm for minutes, yyyy for year) (f) Enter [date] to check the current time setting for the adapter, (g) Enter [hwclock -w]. (h) Enter [hwclock] to check the current time for the adapter, (i) To exit the program, enter [exit].

INSTALLATION

No.	Condition	Items to be Checked	Action
11	The icon for units, groups and blocks has changed.	Has the H-LINK number been modified?	Follow the content below and connect the new H-LINK number to the icon. (a) Exit the management software. (b) Change the H-LINK number after changing the ** of [webcon**_data.csv] in the folder [/centralstation/manager/data]. (** is the H-LINK number before modification.) (c) Boot the management software and check if the icon has the correct content.
12	When booting the management software Communication with the adapter can't start. Verify that the adapter 7 segment LED and wiring is indicated.	Is the power to the adapter OFF or in the process of connecting?	Turn the power ON to the adapter. When the 7-segment LED for the adapter displays "00", communication starts automatically. After communication is completed, (after the pop-up shown at bottom right part of the screen disappears), go to the monitor screen and verify that all H-LINKs are displayed.
		Is the LAN cable between the adapter and the management computer disconnected? Is there power to the hub?	Check the LAN cabling between the adapter and the management computer. After communication is completed (after the pop-up shown at bottom right part of the screen disappears), go to the monitor screen and check if all H-LINKs are displayed.
13	The pop-up Error has occurred on the PC. Management software rebooted. Check PC status is displayed.	Has an error or fault occurred in the system for this computer?	Check the system for the computer.
		Does the restart schedule start while the pop-up screen is displayed?	The management software cannot be exited correctly because a pop-up screen is displayed. Do not use while the pop-up screen is visible.
14	The pop-up [Error has displayed on this PC. Management software rebooted. Check the PC status. Click on [Acquire untaken data] to acquire and calculate data. Avoid specifying data capture within the first 03 minutes of the hour.	Has an error or fault occurred in the system for this computer?	Check the system for the computer. Check each setting from [Operation ratio setting], then click on [Acquire untaken data] to acquire and calculate data. Avoid specifying data capture within the first 03 minutes of the hour.
		Does the restart sequence start while the pop-up screen is displayed?	The management software cannot be exited correctly because the pop-up screen is visible. Do not use while the pop-up screen is displayed.

Monitor (Controlling)

No.	Condition	Items to be Checked	Action
1	Any Run command issued from this system does not affect the air conditioners or remote controllers.	Is the S23 alarm on?	A communication error has occurred on the LAN between the management computer and the adapter. Check if the LAN is wired correctly, and power to the hub and adapter.
		Is the S20 alarm on?	Free space is less than 1GB. Clear the memory to ensure there is a margin of 1GB of space or substitute the computer with another with larger memory space.
		Is the S21 alarm on?	There is a data-writing failure on the management computer hard drive. Substitute this computer for a different one if this error reoccurs.
		Are any of the following alarms tripped? 60, 61, 64, 65	A communication failure has been occurred on the H-LINK. Check to see that the power to the air conditioners is ON, and that wiring and, communication status is normal.
		Is the air conditioner in [Stop] or in [Emergency Stop] mode by the external input from the adapter?	Deactivate the external input signal.
		Is the RC group correctly registered?	RC groups must be allocated to one group number between "1-160". If "O" is shown, allocate one number from "1-160".
		Did the connection of the RC change such as in the removal of the RC?	To modify the connection to the RC, execute it while the power to the AC is OFF. If the modification is performed while the AC is ON, turn the power OFF once, then turn the power back ON. Then click [Connection check] in [Settings] > [Unit register] of the management software.
		Is [Stop] or [Emergency stop] set in [Ext. input] AND the adapter is receiving either signal?	The external input signal has a precedence when the stop signal is transmitted and received. Deactivate the external input signal.
		Is the management computer clock more than one hour ahead or behind the clock for the adapter?	Set the clock so that the time difference shall fall within 5 minutes. Go to [Settings] > [Network register], to synchronize the clock on the adapter with that of the management computer. <u>NOTICE:</u> To check the adapter clock, follow the procedure described below. (a) Go to [Start] > [All programs] > [Accessories] > [Command Prompt] (b) Enter [telnet] and IP address of the adapter (for example, telnet 192.168.0.3). (c) Enter [root] next to login: (d) Enter [harc] next to Password: (e) To display the current time and date setting for the adapter, type in [date]. (f) To exit the program, click [exit].

INSTALLATION

No.	Condition	Items to be Checked	Action
2	Even operating from this system, it will stop within a certain time.	Did the connection to the RC change such as removal of the RC ?	To modify the connection to the RC, perform while the power to the AC is OFF. If this modification was performed while power to the AC was ON, shut OFF and turn back ON. Then click [Connection check] in [Settings] > [Unit register] for the management software.
3	[All run] is not affected on certain units.	Does [All run] have any effect on the unit?	Select [No control restricted] or [Whole Stop non-avail.] at the control window.
4	[All stop] is not affected on certain units.	Does [All stop] have any effect on the unit?	Select [No control restricted] or [Whole Stop not-available] at the control window.
5	RC operation prohibited is not available when the functionality is desired.	Did you select [Detail Settings>]?	Click [Detail Settings>].
6	Filter sign reset is not available when the functionality is desired.	Did you select [Detail Settings>]?	Select [Detail Settings>].
7	Control content for the control window cannot be selected when displayed in gray.	Is the item for the control restricted [All Control non-available]?	Set the item for the control restricted at the control window other than [All Control non-available].
8	RC Operational items displayed in gray are not editable and not available.	Is RC prohibition control set as Yes in [Settings] - [Other 1]?	Signify the RC prohibition control as Yes in [Settings] > [Other 1].
9	How do I close the control window?	Did you click on the [x] on the upper right corner of the window?	Click on the [x] on the upper right corner of the window.
		Did you click on the unit panel that is currently selected?	Click on the unit panel that is currently selected.
10	Capacity control items shown in gray are not accessible and are uneditable.	Did you set [Capacity control] in [Outdoor unit] for the outdoor unit?	Set [Capacity control] in [Settings] > [Outdoor unit] for the outdoor unit.
11	Electricity usage is not reduced as much as set in capacity control.	Are the outdoor unit(s) defrosting?	Capacity control will not be applied when the outdoor unit(s) is defrosting.
		Is electricity usage reduced after minutes?	The setting contents take effect within approximately 15 minutes.
		Electricity usage is reduced, but does not match the target rate.	Actual electricity usage should never be at zero even if capacity is set to 0% as stand-by electricity is always required. Supported effective range may be varied depending on outdoor unit types. As for the supported contents, contact your distributor or York/Johnson Controls customer service.
			The set value in capacity is a targeted value that does not guarantee aimed reduction.
12	Items for lower noise are displayed in gray and are unavailable.	Did you set [Lower noise] in [Outdoor unit] for the outdoor unit?	Check if the unit supports the functionality, and set [Lower noise] in [Settings] > [Outdoor unit] for the outdoor unit.
13	Operation noise is not reduced as much as set in Lower noise.	Operation noise is reduced, but does not match the target rate.	The set value in lower noise is a targeted value that does not guarantee character reduction.

No.	Condition	Items to be Checked	Action
14	Unit names on the panel do not show in full length.	Isn't the unit name too long?	The character length for unit names is limited. Point the cursor over the panel and the full name will be revealed in tool tip.
15	"Central control" is displayed and control from the remote controller is unavailable though RC operation is not prohibited from the system.	Was the power to this system ON before installing the remote controller for indoor units?	The system may determine that the unit is not RC equipped. Check the connection again, allow RC operation and observe whether "Central Control" is not indicated. Note that this system always shows [RC operation prohibited] for units not equipped with RC.
		Was the existing non RC equipped unit modified into one that is RC equipped?	Perform [Method handling when modification from non RC to RC] on page 74.
16	The unit intended to control is different than the unit actually indicating control command.	Are RC groups registered correctly?	RC group registration on the system may be misconfigured, which is different than the actual RC groups. Each RC groups must be allocated to one of group number between "1-160". If "0" is shown, allocate one number from "1-160".
17	The control window does not display even after selecting the panel.	Did you change display size, or make any change to the display?	Shut down the management software, and set "0" to "PosX=" and "PosY=" in [monitor_info.ini] in [/centralstation/manager] folder.
18	Even if the settings are changed from the RC, it will return to its preceeding setting.	Is the RC prohibited function being used? Is control performed from the central device?	In the event that an RC prohibited function is used, do not operate the RC for 10 seconds afterward. In the event that the control is managed from the central device, do not execute the operation for the RC for about 10 seconds.

INSTALLATION

Monitor (Monitoring)

No.	Condition	Items to be Checked	Action
1	System readings do not change even after the air conditioner operation by a remote controller.	What is set for update interval in [Settings] > [Display] > [Updating Interval]?	The shortest interval that can be set is 15 seconds.
		Is the S23 alarm on?	A communication error has occurred on the LAN between management the computer and the adapter. Check if the LAN is properly wired, and the power of hub and adapter.
		Is the S20 alarm on?	Free space is less than 1GB. Clear the memory to more than a margin of 1GB of free space or substitute the computer with another with larger memory space.
		Is the S21 alarm on?	There is a data-writing failure on the management computer hard drive. Substitute this computer for a different one if this error reoccurs.
		Are any of the following alarms tripped?	A communication failure has been occurred on the H-LINK. Check to see that the power to the air conditioners is ON, and that wiring and communication status is normal.
		Are the RC group, Group and Block correctly registered?	Correct the RC group registry, Group and Block according to the Installation and Operation manual.
2	What is indicated on the control display does not match what is indicated on the remote controller.	Is only a single panel selected on the monitoring window?	The contents of any panel at upper left will display if multiple panels are selected.
3	What is indicated on the remote controller does not match what is indicated on the control display.	Was the air conditioner controlled by this system?	If the air conditioner is controlled by this system, it may take up to five minutes for actual status to comply with these results.
4	The window does not show panel(s).	Has the connection check procedure been completed?	Go to [Settings] > [Unit register] and check connection.
		Is the adapter connected?	Go to [Settings] > [Network register] and check connection.
5	All of the layout icons indicate [?].	Has the connection check procedure been completed?	Go to [Settings] > [Unit register] and check connection.
		Is the adapter connected?	Go to [Settings] > [Network register] and check connection.
6	One or more layout icons are [?].	Are there units, groups, blocks, or facility units that are not presently set ?	Check if the panel set is present in [Settings] > [Unit register] / [Group register] / [Block register].
7	The displayed units: ([Group], [Block], [Units]) are changed.	Is any group in the tree selected?	Units in the group will be automatically revealed when the group is selected in the priority tree.
		Is any of All, H-LINK, or block selected in the tree?	Groups in the block, H-LINK, or in All will be automatically revealed when one of the above is selected in the tree.
		Is any alarm on?	When an alarm is triggered, the priority tree display will be automatically collapsed to [All], and the connected H-LINK will be shown on the display.
8	The priority tree display changed.	Is any alarm on?	When an alarm is triggered, the priority tree display will automatically collapsed into [All], and the connected H-LINK will be shown on the display. When in layout format, it will switch automatically in master layout. Check the alarm history.

No.	Condition	Items to be Checked	Action
9	The control panel is always illuminated in green when air conditioners are running.	Is the running mode color set in [Settings] > [Display]?	Check the running mode color in [Settings] > [Display].
10	The system has turned the air conditioner unit ON, but after time has passed, the display reads OFF.	Was remote controller removed after turning the air conditioner ON? Is the air conditioner set as [RC operation permitted] when the air conditioner unit itself is non RC equipped?	The system recognized the unit as equipped with a remote controller, remote controller, but is unable to monitor air conditioner status. Reset the air conditioner and check connections from [Settings] > [Unit register] again. Run the air conditioner from the system again to verify that the display indicator remains as ON.
11	When the [Monitor] button is selected, the display format will switch automatically.	Does [Tenant] switch to [Panel]?	Because the monitor only displays output identified on the control panel, the monitor button setting, if altered to indicate [Tenant], will automatically switch control panel readings.
12	There is a wide temperature discrepancy between what is displayed and the actual temperature.	Is the power saving function of the RC activated?	The potential exists for a discrepancy between displayed and actual temperature readings if an RC equipped unit is in power-save.
13	Set values for the monitor screen are: “ - ” or “ - - ”.	Is [Group], [Block], or [H-LINK] selected and displayed inside in [View by]?	If other than [Unit] is selected in [View by], and individual unit settings values are not uniform, values are displayed will appear as: (“-” or “- -”).
		When the adapter activates, is it disconnected from the unit or is the main power to the unit shut OFF?	When the adapter can no longer detect all units after startup, it will require about a 30 minute recovery time to indicate correct status.

Schedule

No.	Condition	Items to be Checked	Action
1	Schedule is not executed.	Has the indoor schedule been disabled over the span of a day?	Deselect [Disable IU schedule for 1 day] in the unit control panel.
		Did you click on [Done] upon completing settings?	Click on the [Done] button to apply changes and settings. The button will stop blinking after all values are set.
		Is the schedule registered on “Group”?	A schedule will be applied by each Group. Check to see if each group is set to execute that schedule.
		Is any specific schedule registered?	Specific schedule contents will be performed, even when the daily schedule is set if the current date is registered as specific in the schedule.
		Is [Overwrite only where changed] set for [Setting update mode]?	Set [Overwrite all], or re-schedule the groups.
		Have all connections been verified?	Go to [Settings] > [Unit register] and check connections.
		Is the adapter connected?	Go to [Settings] > [Network register] and check connections.
		Is the adapter turned ON?	Turn ON the adapter.

INSTALLATION

Schedule

No.	Condition	Items to be Checked	Action
2	Date settings (for the exception schedule) shown in gray are not accessible nor editable.	Is the desired date included for the Summer/Winter season?	One of the normal, summer or winter season settings may be set. Exceptions to normal seasonal scheduling cannot be set while the date is set as summer or winter. Check the season setting.
3	Exceptions for summer or winter scheduling cannot be set if the entire calendar year is displayed in gray. Anything displayed in gray is not accessible or editable.	Is Summer/Winter season set?	Click [Summer/Winter Set] to set the season.
4	Modification to schedule is denied, unavailable.	Did you click on the [Add] or [Duplicate] button?	Click on the [Modify] button to modify the existing schedule.
5	Schedule cannot be added.	Did you click on the [Modify] button?	Click [Add] to add schedule items.
		Are there 16 items already set for the date?	The maximum number of schedule items for a day is 16.
6	Operation on individual groups are not consistent with the schedule items set from the All section.	Is [Overwrite only where changed] set for [Setting update mode]?	[Specific schedule] and [Running menu] will not be changed even after changing schedule items for each day of the week if these items were [Overwrite only where changed]. Set items again and [Overwrite all] or set items for each group.
7	When the [Schedule] button is selected, the display format will switch automatically.	Does [Layout] or [Tenant] switch to [Panel]?	Because the schedule only supports what is displayed on the panel, if the [Schedule] button is selected, it will automatically return to what is displayed on that panel.
8	Specific schedule items are not executed.	Are specific schedules set every year?	A specific schedule needs to be set once a year. Erroneous entries for date: (year/month/day) if entered for the year past will not be registered and not take affect. Entries must be made affective for the following year.
9	The schedule for a specific unit is usually not executed.	Is the previous group deleted when changing the group?	Register the group previously present again and delete the schedule for the group. Complete group modifications and create settings for that schedule.
10	When creating a CSV file, a pop-up message is displayed: "CSV generation has failed" .	Does overwriting of the file fail?	When overwriting the file, check that the data being overwritten is closed.
		Is there a sufficient margin of free space on the disk for the management computer?	Delete unnecessary files to increase free space on the disk.
		Is there a "save to" disk inserted?	Check if the media to save is connected.
		Is there permission to write to this disk?	Cancel writing prohibitions to the disk or use another disk.

Trend

No.	Condition	Items to be Checked	Action
1	All values in trending graphics are shown as "0".	Is the period correctly specified?	Specify the time period in which the units were up and running.
2	Elapsed running time is the only data shown.	Is the unit facility unit?	For facility units, trend type graphics: of "Thermo ON time", and "Temperature" are unavailable. Elapsed running time is the only item shown in the graphic.
3	The window does not show panel(s).	Are all connections verified?	Go to [Settings] > [Unit register] and check the connection.
		Is the adapter connected?	Go to [Settings] > [Network register] and check the connection.
4	All of the layout icons indicate [?].	Are all connections verified?	Go to [Settings] > [Unit register] and check the connection.
		Is the adapter connected?	Go to [Settings] > [Unit register] and check the connection.
5	One or more layout icons appear as [?].	Are units, groups, blocks, or facility units that are not present set ?	Check if the panel set is present in [Settings] > [Unit register] / [Group register] / [Block register].
6	Unit names on the panel do not show in full length.	Isn' t the unit name too long?	The window for viewing unit names has limited space. Put mouse pointer on the panel and the name will be revealed in its full length in tool tip.
7	The pop-up: [No available data.] is shown.	Is the time period specified correct?	Specify the time period where the unit has been in operation.
		Is the mode [Single select]?	In the case of a single selection mode, select one or more types from temperature and one or more types from running time or thermo-ON time.
8	Only one of the type in the bar graph and the line graph each can be selectable.	Is the mode [Multi select]?	In the case of a multiple selection mode, only one of the items in the bar and linear graphs is selectable. Select [Single sel.] for multiple indications for the bar graph or the linear graph.
9	When [Trend] button is selected, the display format will switch automatically.	Does [Tenant] switch to [Panel]?	Because the trend only supports the what is displayed in the panel or in the layout, if the [Trend] button is selected in the tenant data field, it will automatically switch to panel indication.
10	The displayed temperature differs greatly with the actual temperature.	Is the power saving function for the RC used?	If the power-save function for the RC is activated, a potential temperature discrepancy can exist between that what is registered and the actual temperature.
11	When creating a CSV file, a pop-up message is displayed: "CSV generation has failed".	Does overwriting the file fail?	When overwriting the file, check that the data being overwritten is closed.
		Is there a sufficient margin of free space on the disk for the management computer?	Delete unnecessary files to increase free space on the disk.
		Is there a "destination save to" disk inserted?	Check if the media to save is connected.
		Is there permission to write to this disk?	Cancel the writing prohibitions for the disk or use another disk.
12	A pop-up message reads: [Could not be printed], while attempting to print.	Is the printer connected ?	Check the connection between the management computer and the printer.
		Is power to the printer turned ON?	Turn ON the power to the printer.
		Is data output set to PDF?	When designating the printing destination for data output and the overwriting of data, check to see if the previous overwritten data was closed.

INSTALLATION

Alarm History

No.	Condition	Items to be Checked	Action
1	Alarm(s) is not recorded in alarm history.	Did you click on the [Delete] button in [Setting] > [Other1] > [Alarm history]?	Click on the Delete button to clear all alarm history.
		Did the number of alarms exceed 50,000?	When the number of alarms reach this threshold, the oldest alarm record is deleted to accommodate the new alarm.
		Is the desired Group, Block, H-LINK, or All selected?	Select one desired Group, Block, H-LINK, or All to show the alarm history. Some alarm records appear only when "All" is selected.
		Did you click on the [Update] button?	Alarm history does not automatically update alarm information. To display the most current alarm while inside the alarm display, click on the (Update) button.
2	When [Alarm history] button is selected, the display format will switch automatically.	Does [Tenant] switch to [Panel]?	Alarm history is only what is displayed on the control panel. If the Alarm History button is selected (from inside the tenant registry), it will automatically revert back to control panel readings.
3	When creating a CSV file, a pop-up message is displayed: "CSV generation has failed".	Does the file overwrite operation fail?	When overwriting the file, check that the file being overwritten is closed.
		Is there a sufficient margin of free space on the disk for the management computer?	Delete any unnecessary files to maximize free space on the disk.
		Is the disk for saving presented?	Check if the media to save is connected.
		Is there permission to write to this disk?	Cancel the writing prohibitions for the disk or use another disk.
4	A pop-up message reads: (Could not be printed), while attempting to print.	Is the printer connected?	Check the connection between the management computer and the printer.
		Is power to the printer turned ON?	Turn ON the power to the printer.
		Is data output set to PDF?	When setting the printing destination for data output and overwriting of data, check to see if the previous overwritten data was closed.

Setting

No.	Condition	Items to be Checked	Action
1	Even though the layout register and setting modification were performed, the layout cannot be selected on the monitor screen. Or, the setting isn't yet updated.	Was the management software restarted after layout register ?	Restart the management software.
2	There is an unnecessary layout.	Was the layout deleted?	Delete the layout data following the steps: (a) Exit the management software. (b) Open the folder [/centralstation/layout]. (c) Delete any unnecessary layout data in this folder. (d) Restart the management software. (e) If this layout is registered in the master layout, delete the individual layout from the master layout following the procedure for "Initial Settings" [9] Layout Register [Unit Location - Modification], then restart the management software.
3	H-LINK information does not display in the following section(s) even after clicking H-LINK: • Unit register • RC Group register • Group register • Block register • Tenant register • Indoor unit • Outdoor unit • External input • External output	Did you click on [Cancel] while checking the connection?	Click on [Check connection].
		Was the [Connect] button in [Network register] turned OFF?	Click on [Connect] in [Network register].
4	Settings items are not shown in [Indoor unit].	Did you select units?	Select indoor units to complete the configuration process.
5	Settings items are not shown in [Outdoor unit].	Did you select units?	Select outdoor units to complete the configuration process.
6	[Settings completed] button is blinking.	Did you click on the [Setting completed] button?	Click on [Setting completed] to complete settings.
7	After clicking on the [Setting completed] button, the [Setting completed] button is still blinking in a different H-LINK.	Did you click on the [Setting completed] button in the selected H-LINK?	The [Setting completed] button needs to be selected for each H-LINK, every time any change is made. Click on the [Setting completed] button to stop blinking.

INSTALLATION

Miscellaneous

No.	Condition	Items to be Checked	Action
1	The management software doesn't exit when the UPS requests the computer to shutdown.	Is the management software NOT set to quit the current session of Windows?	Change the settings for the management software to exit the current Windows session as shown below: (a) Exit the management software. (b) Open manager_info.ini in the [/centralstation/manager] folder. (c) Change: [ForceCloseOnWindowsSessionEnd=0] to [ForceCloseOnWindowsSessionEnd=1] in [Others] section. (d) Overwrite, save and close manager_info.ini. (e) Restart the management software. (f) Check that the management software exits correctly when the UPS requests the computer to shutdown.
2	[No response] indicated on the management software title bar.	Is the process lengthy and time consuming in its execution?	If the process becomes overly time consuming, the message "No Response" will display. This is normal. Be patient and do not attempt to back out of the command. When "No Response" disappears, the process is concluded.

Modification from Non RC equipped to RC equipped units.

In any of the following procedures, cancel recognition of "Non RC equipped" and the remote control (Central Control display).

The nature of this procedure is complex. Proceed by first selecting on the check box next to the number. <When the emergency stop is available>

- (1) Repeat the connection verification procedure for this H-LINK in [Settings] > [Unit Register].
- (2) Display each unit status in [Monitor], and verify that icons (representing non RC equipped units) are not shown.
- (3) Activate the emergency stop command to exceed one minute elapsed time and then cancel out of it.
- (4) Verify that the [Central control] setting for the RC is canceled. (Verify for all indoor units of this H-LINK.)

NOTE:

Indoor Units: When performing control function selections, repeat again after canceling settings for emergency stop. The control status will display: "Stop", FAN, 82°F (28°C), LOW (fan speed) and (1), (Louver). Assume control again if necessary.

<When the emergency stop is not available>

- (1) Copy Connection_Ininfo_###.dat, Connection_Block.dat, and Connection_Group.dat in [/centralstation/rcv/H-LINK**/mnt/ram/harcweb1/download] folder to C drive.

NOTE:

1. "**" of "H-LINK**" is H-LINK No.(00-15) (that is indicated in the RC central control display).
2. "###" of Connection_Ininfo_###.dat is 01-64 is in the folder.

- (2) Copy webcon**_data.csv in [/centralstation/manager/data] to the C drive.

NOTE:

"**" of Webcon** is H-LINK No.(00~15) (that is indicated in the RC central control display).

- (3) Copy Unit_restore.bat and BlockGroup_restore.bat (that are found on the installation CD). Copy to C: Drive.
- (4) After three minute's time, remove the wire from the adapter to the H-LINK.
- (5) Verify that displayed values (in Central Control) have vanished from the RC panel screen. Verify for all indoor units in this H-LINK.
- (6) Click on [Connection check] in [Settings] > [Unit register] in the management software.
- (7) Select [No] on the [Utilize registered data?] pop-up message.
- (8) Select [Yes] in the [Deleting the registered data to start checking connection.] pop-up message.
- (9) Connect the wire from H-LINK after 10 seconds.

- (10) Execute Unit_restore.bat after all connections have been checked and verified. Enter the IP address following the message.
- (11) Execute BlockGroup_restore.bat. Enter the IP address following the message.
- (12) Click on [Connection check] in [Settings] > [Unit register] for the management software, and execute connection verification using the registered data.
- (13) Exit the management software after all connections have been verified.
- (14) Overwrite the webcon**_data.csv (copied in C Drive) in (2) to [/centralstation/manager/data].
- (15) Activate management software and verify content for all settings.

4 Periodic Check

To maintain sound operation of the entire air conditioning system, including the management computer, periodically inspect the following items:

- (1) Environment
 - Ensure that the computer (with this software) does not overheat under normal operating conditions.
 - Do not install this computer and adapter (with this software) in hot and hostile environments.
 - Ensure that the computer and adapter are kept free of dust, debris, and leftover wire clippings.
- (2) Display
 - Ensure that the data output display shows consistent results.
- (3) Installing
 - Ensure that devices and adapters are correctly wired and connected.

5 Uninstall

- (1) Go to [Start] > [Settings] > [Control Panel].
- (2) Click [Add / Remove Programs].
- (3) Select [VRF management system] and click on [Remove]
- (4) Select on the installed folder (usually in [/C:/Program Files(x64)/centralstation])

Addenda

Data Sheet for Test Run

Location information

Information	
Building/Location Name	
Location	
Date for Test Run	/ /

System information

Device name	Address items	Address	Device name	Address items	Address	
Management Computer	IP address	. . .		Adapter 2	IP address	. . .
	Subnet mask	. . .			Subnet mask	. . .
	Default gateway	. . .			Default gateway	. . .
Adapter 1	IP address	. . .		Adapter 2	Software version	
	Subnet mask	. . .		Adapter 3	IP address	. . .
	Default gateway	. . .			Subnet mask	. . .
	Software version				Default gateway	. . .
Adapter 3	IP address	. . .			Adapter 4	Software version
	Subnet mask	. . .		Adapter 5	IP address	. . .
	Default gateway	. . .			Subnet mask	. . .
	Software version				Default gateway	. . .
Adapter 5	IP address	. . .			Adapter 6	Software version
	Subnet mask	. . .		Adapter 7	IP address	. . .
	Default gateway	. . .			Subnet mask	. . .
	Software version				Default gateway	. . .
Adapter 7	IP address	. . .			Adapter 8	Software version
	Subnet mask	. . .	Adapter 9	IP address	. . .	
	Default gateway	. . .		Subnet mask	. . .	
	Software version			Default gateway	. . .	
Adapter 9	IP address	. . .		Adapter 10	Software version	
	Subnet mask	. . .	Adapter 11	IP address	. . .	
	Default gateway	. . .		Subnet mask	. . .	
	Software version			Default gateway	. . .	
Adapter 11	IP address	. . .		Adapter 12	Software version	
	Subnet mask	. . .	Adapter 13	IP address	. . .	
	Default gateway	. . .		Subnet mask	. . .	
	Software version			Default gateway	. . .	
Adapter 13	IP address	. . .		Adapter 14	Software version	
	Subnet mask	. . .	Adapter 15	IP address	. . .	
	Default gateway	. . .		Subnet mask	. . .	
	Software version			Default gateway	. . .	
Adapter 15	IP address	. . .		Adapter 16	Software version	
	Subnet mask	. . .		IP address	. . .	
	Default gateway	. . .		Subnet mask	. . .	
	Software version			Default gateway	. . .	
				Software version		

1.4.11 Computerized Central Controller Software / Operation Ratio

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INSTALLATION

Pass these manuals on to the next operator/maintenance team. Secure for safe keeping somewhere near the machine for easy access. (Installer) → (Wiring electrician) → (Operator) → (Customer)

Please carefully read this manual before installation.

This installation manual applies to CCCS01 only. Also refer to the installation manual for “Centralized Central Controller Adapter (CCCA01)” and “Centralized Central Controller Software (CCCS01)” as required.

Preface

This software is intended for managing standard air conditioners combined with a “Centralized Central Controller Adapter (CCCA01)”. Install this software in accordance with the following procedures. Observe all precautions concurrent with the PC operation manual.

- Do not install computer with this software in following places.
 - Places where oil (including machine oil) mists or streams drift.
 - Places where sulfide gas form as hot spring drifts.
 - Places where inflammable gas may generate or flow.
 - Places where high in salt contents surrounding as coast regions.
 - Places where with atmosphere of acidity and alkalinity humid place.
- In case of using a medical equipment generating electro-magnetic waves, place the equipment as the surface that is emitting electro-magnetic waves does not directly face the system.
- To avoid any influence on radiation propagation in the air, install this software at least 3m away from the medical equipment and radios that may generate electro-magnetic waves.

Safety Summary

- Please carefully read this section before installation of the software.
- Contents with "DANGER" shows the certain cases where improper operation WILL result in severe personal injury or even death. For your safety, please follow this instruction.
- After installation is completed, conduct test running to ensure that no faulty condition is detected.
- Please also ensure to backup the data according to this manual upon completing installation.

[Symbols Used in This Manual]

▲ DANGER : Immediate hazards which WILL result in severe personal injury or death.

▲ CAUTION : Hazards or unsafe practices which could result in minor personal injury or product or property damage.

NOTE: This sign indicates other alert information than DANGER.

NOTICE: Useful information for operation and/or maintenance.

■ Installation and Electrical Work ■

▲ DANGER

- Contact your distributor or qualified engineer for Installation work. Improper installation can cause electric shock, fire, or unexpected accidents.
- To avoid any electric shock or accident, ask the distributor to have electrical work done by qualified electrician.
- This system is for computer use only. If using with a general audio or music reproducing device, depending on the high level of sound, it may result in device damage or effects on the body.

▲ CAUTION

- Do NOT expose this system in direct sunlight or keep it in a place where there is a high temperature or humidity.

- This manual covers System Configuration, Operation Ratio Setting, Test Run and service and maintenance and procedures.
- Refer to the operation manual for other operational procedures.

System Configuration

- Upon first use of this software, please verify system configuration.

Operation Ratio Setting

- This chapter describes how to perform operation ratio settings.

Test Run

- This chapter explains how to perform a test run procedure.

Service and Maintenance

- This chapter describes how to maintain and upgrade this software, and what services are entailed.

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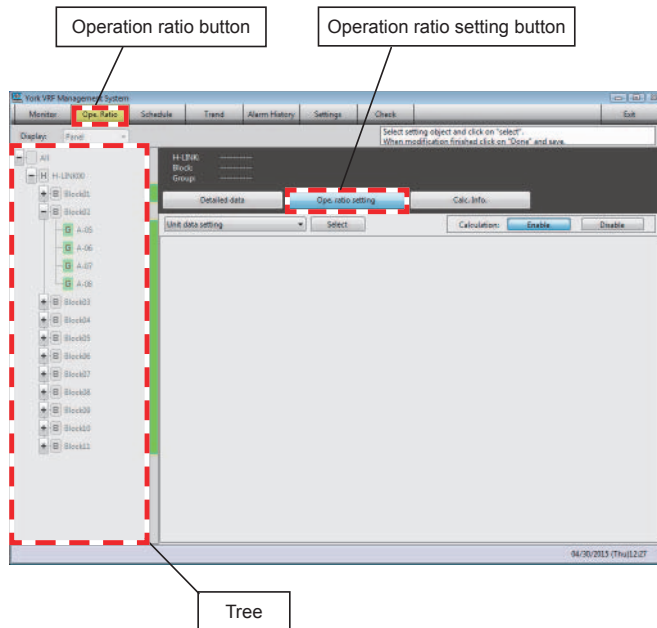
Addenda

Data Sheet..... 49

/// Important Notice ///

- Carefully read and review this installation and operation manual before putting this equipment into service.
- The system can perform normally when all its constituent parts are connected as designed. Device failure for any reason will severely impact performance capabilities. Discuss an alternative recovery strategy that allows you to address problems with the computer and adapter, with your customer/tenant before the system enters service.
- Operational functions cannot be performed when the management computer and software are OFF. With management computer ON and software launched, select “ENABLE” before entering the operational mode.
- IMPORTANT! This system performs control and save functions as governed by its internal settings for each day and hour. When set for each day, calculation data will be saved over the time period beginning at midnight to 01:30am (local time). If the management software crashes during the calculation period or while attempting to save, data is lost for that period and will not be saved. Perform and save the next day’s calculation. When set to occur each hour, the calculation will be saved each hour from 00 minutes to 30 minutes after the hour. If the management software crashes during calculating during the calculation period or while attempting to save, data is lost for that period and will not be saved. In that case, perform and save the next hours calculation.
- Supported calculation methodology can vary on different adapter devices. Refer to the **Operation Ratio Setting** [3] Operation Ratio Mode Setting Operation.
- This software supports Tooltip (reminder information). It will reveal when the mouse cursor hovers over items (group and block name) inside windows (status tree view). Please note that Tooltip might not appear on all items or displays depending on operational state.
- The reference photos printed in this manual are only a sample. The display might differ from that shown in the actual window.
- In case a pop-up window like the control window does not appear entirely on the screen, change the windows taskbar size with the point of the mouse so that the hidden part of the pop-up window can be displayed.

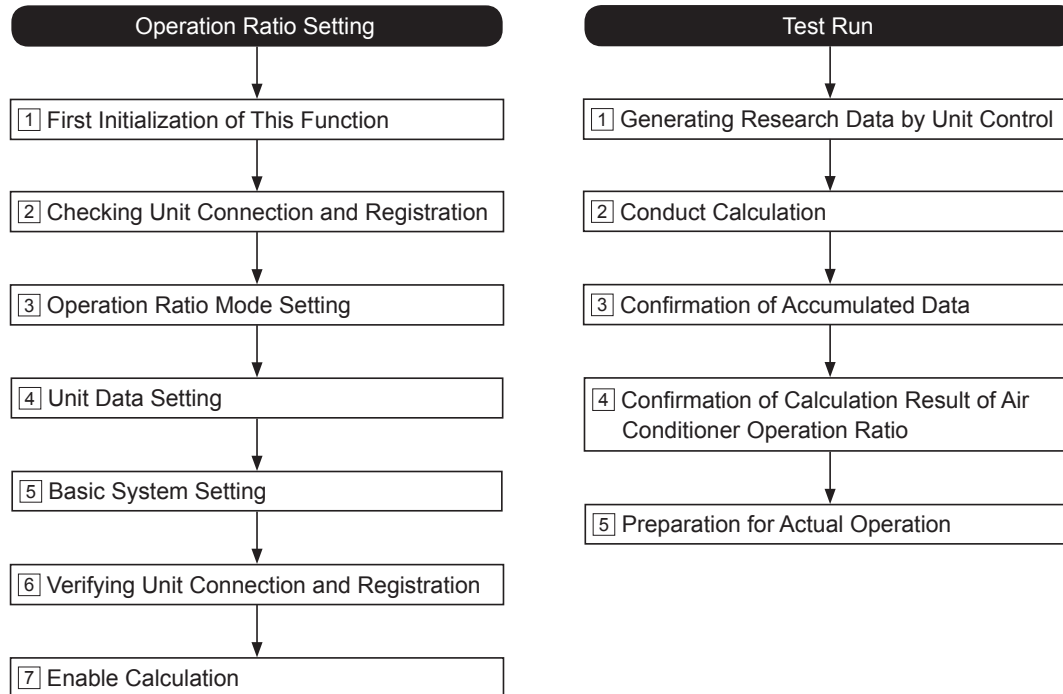
• Functions



- GHP: Stands for Gas Heat Pump air conditioner
- EHP: Stands for Electric Heat Pump air conditioner
- Facility unit: Abbreviation of the target device when monitoring and controlling facility device using external input/output of this system.

Software

This chapter describes how to perform operational ratio setting and to perform Test Run.
 The setup procedure is as follows:
 Adapter and management software need to be setup before this procedure can be run.
 Read and carefully follow "Before Installation" ahead of setup.



Before Installation

Setting the following before Test Run simplify the completion of this procedure.
 In preparation, system configuration information and reference for calculation methods will be needed.
 Fill-in the data sheet on the back of this manual (page 49) to refer to during the test run.

1. Fill-in the operation ratio mode to data sheet (1/4).
2. Fill-in setting values for unit data setting to data sheet (2/4-4/4).
 Refer to the **Operation Ratio Setting** 4 Unit Data Setting for how to set up and acquire values and data.

System Configuration

1 System Configuration

Refer to **System Configuration** 1 System configuration information from the installation manual for management software.

2 Device Specification

Refer to **System Configuration** 2 Device specification from the installation manual for management software.

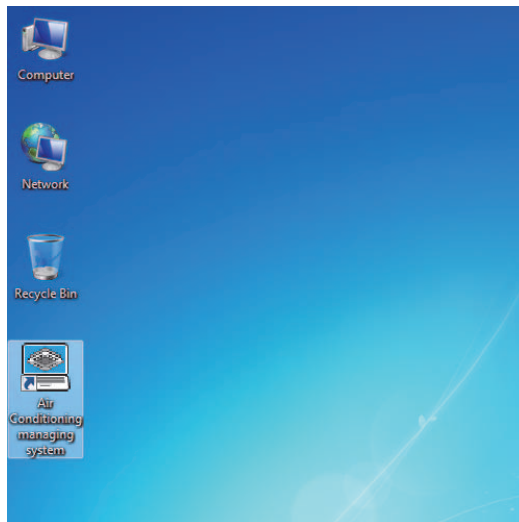
Operation Ratio Setting

Perform Test Run before initiating any of the following proceedings.
Do not perform any other operations while setting the following functions.

1 First Initialization of This Function

Click on the “Ope.ratio” button to begin the initialization procedure.

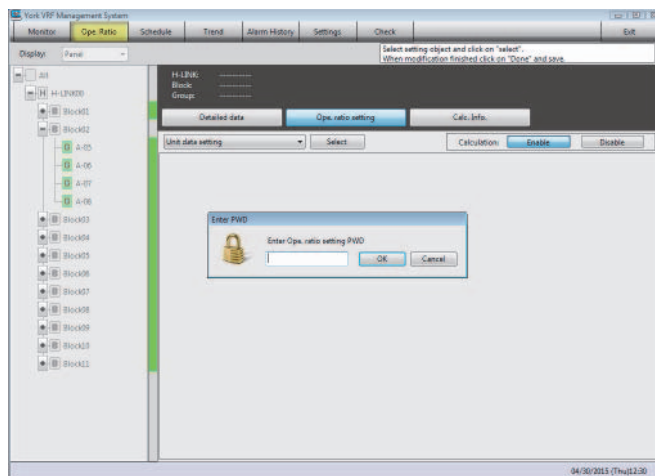
- (1) Double-click the VRF System (Shortcut) on the desktop of the management computer to boot the management software.



- (2) Click on the [Ope.Ratio] function button.

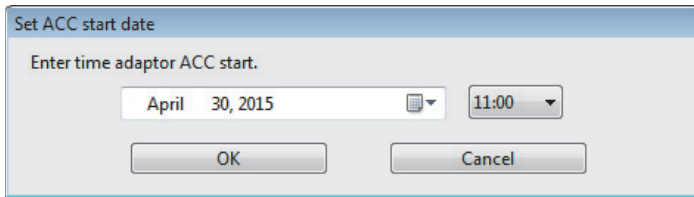
NOTICE:

- A password is pre-set for the operation ratio setting. The initial password is “2468”.



INSTALLATION

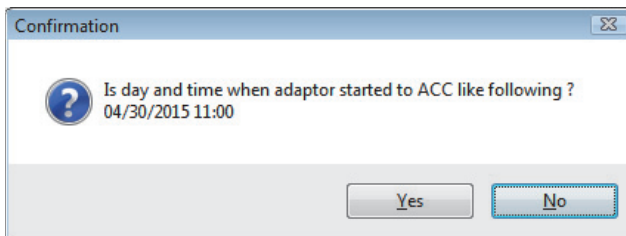
- (3) Enter the date when the adaptor initiated data accumulation and click on the [OK] button.



NOTICE:

- The start date of data acquisition will be confirmed as the date the adaptor was connected to the system.

- (4) Check the input date and click [Yes].



NOTE:

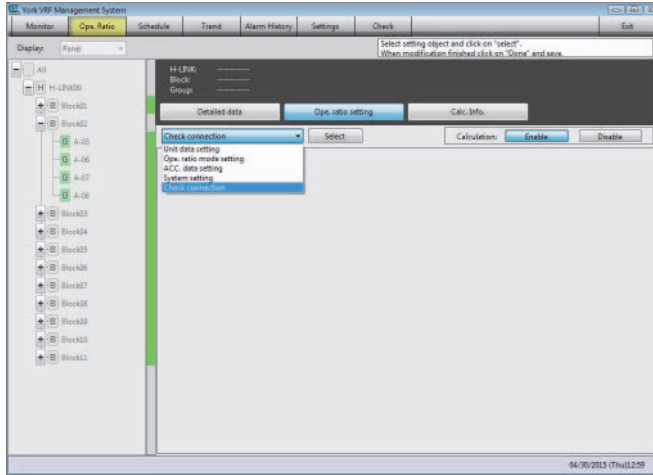
- Information indicating incomplete data will be displayed when a date earlier than the actual starting date is set.
- To modify incorrect date and time, go to: [Ope. Ratio] > [Ope. ratio setting] > [Accumulated data setting] > [Accumulation starting date].

2 Checking Unit Connection and Registration

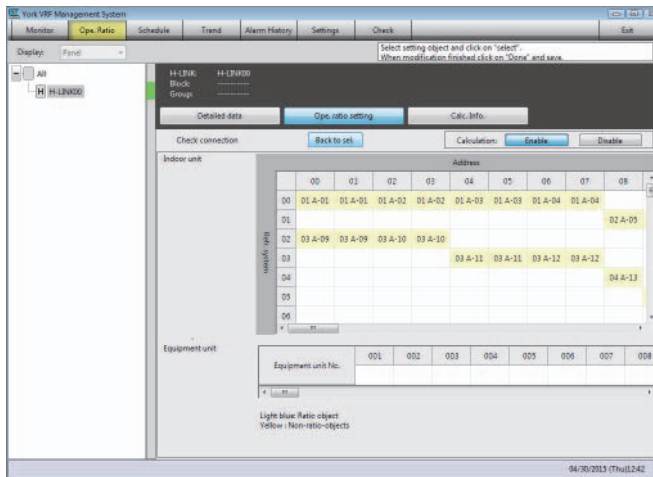
Check unit connection and registration.

Those units depicted in yellow mean (calculation not affected), because their settings profile is not complete.

- (1) Click [Ope.Ratio] > [Ope.ratio setting] > [Check connection].



- (2) Select each H-LINK from the tree and check the constitution, group, and block information.



Back ground color \ Item	Item	Block No. (01 to 64) Group No. (A-01 to H-16)	○
Blue	Units exist Registered in group/block Affects calculation		○
Yellow	Units exist Registered in group/block Not affect calculation		○

* Blank indicates "No unit exist".

NOTICE:

- Switch the H-LINK from the tree. Scroll to display all refrigerant systems and address information.
- When the symbol (○) is indicated, the system might not operate correctly. Register all units to groups and blocks.

3 Operation Ratio Mode Setting

NOTE:

- When changing settings, this function should be done while the [Disable] condition is set.

Characteristics of the Operation Ratio Mode (Calculation for AC Operation Ratio)

- (1) Calculation for air conditioner operation ratio mode
Select a method to apply for calculating the ratio of indoor unit operation.

[Mode 1]

Calculate the ratio using the thermo-ON time and the heating/cooling capacity of the indoor unit.

<Characteristics>

- Calculate using the ratio by thermo-ON time × capacity.
- The ratio may not be as close to the actual operation capacity as Mode 2.

[Mode 2]

Calculate the ratio value from the accumulated electrical load on the outdoor unit(s) and the amount of refrigerant flow.

<Characteristics>

- Calculate the ratio by the accumulated expansion valve aperture × expansion valve coefficient.
- The ratio will likely be very close to the actual ratio.

[Mode 3]

Calculate the ratio from running time and not necessarily cooling capacity of the indoor unit.

<Characteristics>

- Calculate the ratio by running time × capacity.
- The ratio may not be as close to the actual operational capacity as Mode 1 and Mode 2.

NOTICE:

- AC operation ratio output includes the ratio calculated by AC operation of indoor units in a certain refrigerant system and the ratio calculated by AC operation for all indoor units.
Either one with most appropriate ratio may be used.

- Sample case
Each mode has different characteristic.
Set the calculation mode referencing the table below.

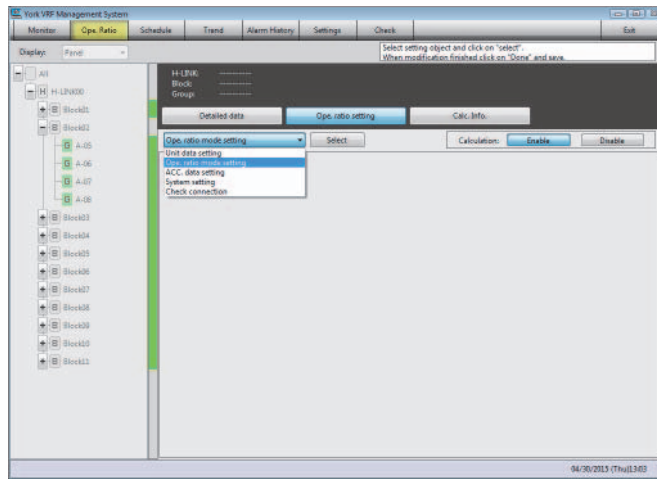
Condition	AC operational ratio calculation mode		
	Mode 1	Mode 2	Mode 3
Calculation by thermo-ON time	Recommended	Unsuitable	Unsuitable
Calculation by actual operational capacity	Applicable	Recommended	Unsuitable
Calculation by running time	Unsuitable	Unsuitable	Recommended

NOTE:

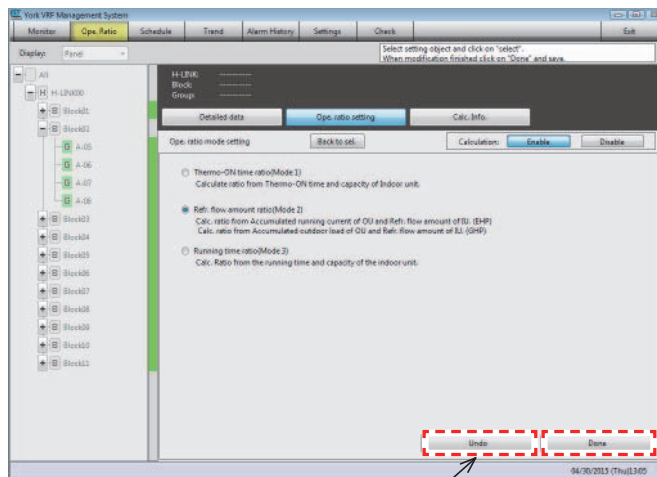
- It is not necessary to choose a calculation mode from the table above.
Select whatever is most practical for each user.

Setting Operation Ratio Mode

- (1) Click [Ope.Ratio] > [Ope. ratio setting] > [Ope. ratio mode setting].



- (2) Register calculation mode.
 - Select the ratio button for the desired calculation mode.



Undo the setting.

After completed input of all items, click on [Done] to lock in the setting.

NOTE:

- Changes in operation ratio mode setting will be affected by calculations and are applied across the duration of the calculated period.
- Operation ratio of the following types will always be 0% when the thermo-ON time ratio (Mode 1) or refrigerant flow amount ratio (Mode 2) is selected.
 - Facility unit

4 Unit Data Setting

NOTE:

- Settings should be made and changed while in the [Disable] condition.
- Changes in the unit data setting will be affected by the following calculations which are applied across the extent of the period.

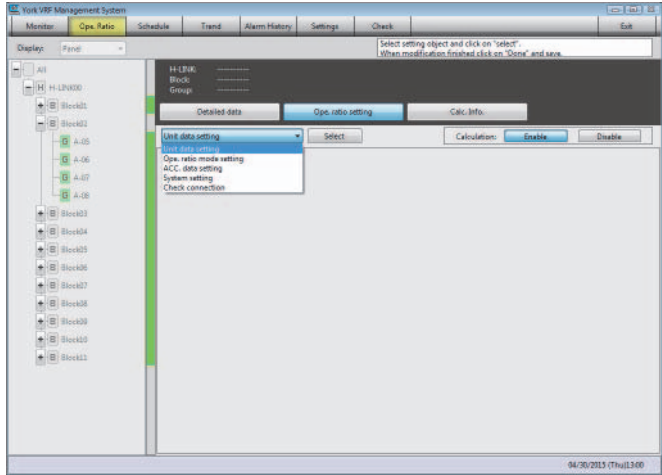
All data needed for ratio calculation will be registered in unit data settings.
Unit data includes the following.

No.	Outdoor unit	Calculation for air conditioner operation ratio
	Setting item	
(a)	ODU type	Required

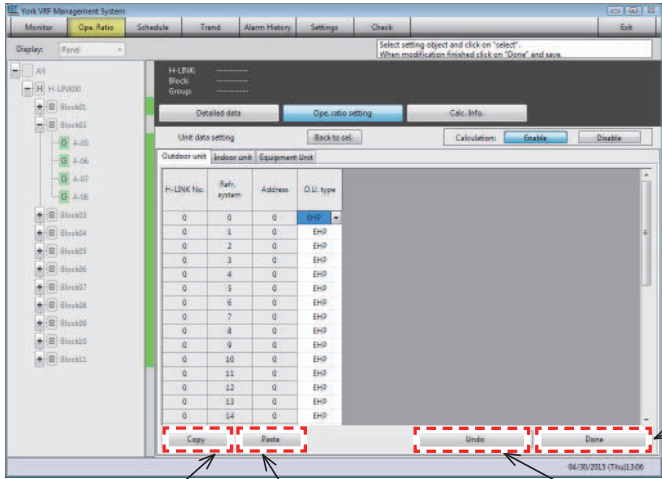
No.	Indoor unit	Calculation for air conditioner operation ratio
	Setting item	
(a)	Ope. ratio object	Required
(b)	Expansion valve coefficient	Required
(c)	Capacity	Required
(d)	Total heat exchanger usage	Required

No.	Facility unit	Calculation for air conditioner operation ratio
	Setting item	
(a)	Ope. ratio object	Required
(b)	Capacity	Required

- (1) Click on [Ope.Ratio] > [Ope. ratio setting] > [Unit data setting].



- (2) Click on [Outdoor unit].



After all item input has been entered, click on [Done] to lock in the setting.

Copy the cell or row selected.

Paste the copied cell or row. If the cell is copied, only the cell within the same row will be pasted-in. If the row is copied, paste it for the row selected.

Undo the setting.

NOTICE:

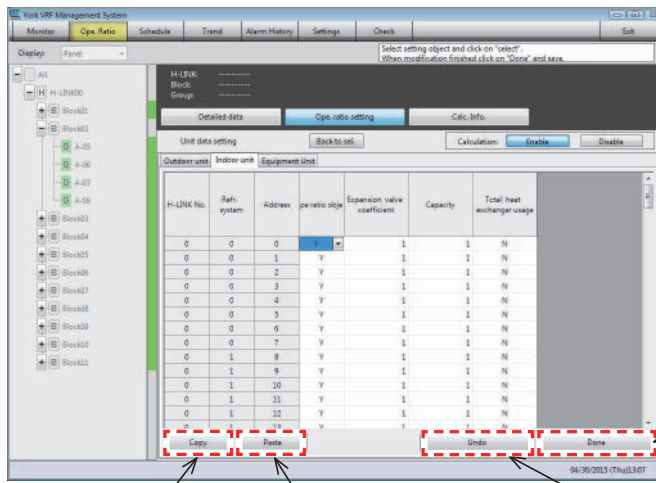
- H-LINK number, refrigerant system and outdoor unit address of identified outdoor units will be automatically displayed.

- (3) Set each outdoor units as follows:
 - (a) ODU type

- To indicate the type of outdoor unit identified.
- Verify that the identities of the outdoor unit type identified and the outdoor unit connected are the same.
- If the identified outdoor unit type is not correct, select the correct unit type from: EHP/GHP.

INSTALLATION

- (4) Check the input content data and click on [Done].
- (5) Click on [Indoor unit].



After all item input has been entered, click on [Done] to lock in the setting.

Copy the cell or row selected.

Paste the copied cell or row. If the cell is copied, only the cell within the same row will be pasted-in. If the row is copied, paste it for the row selected.

Undo the setting.

NOTICE:

- H-LINK number, refrigerant system, and indoor unit address of identified indoor units will be automatically displayed.

- (6) Set each indoor unit as follows:

(a) Ope. ratio object

- Select whether the indoor unit value should be calculated or not (Yes/No).
- Select [Y] when calculation result for the AC operation ratio for the indoor unit is desired.
- Select [N] when calculation result for the AC operation ratio for the indoor unit is NOT desired.
- (b) ~ (d) for the indoor unit may be omitted when selecting [N].

(b) Expansion valve coefficient:

- Data will be according to the table below.

Capacity (kBtu/h)	Expansion valve coefficient
0	0
001 to 015	1
018 to 030	2.12
036 or more	2.52

(c) Capacity

- The identified values will be shown.
- Check if the value matches capacity of the unit.
- Correct the capacity if the value is incorrect.
- Set the correct capacity when blank is shown.
- Set the correct capacity if the value contains “ / ” or “-”.

NOTE:

- Unit corresponding set capacitance values are shown here.

Capacity (kBtu/h)	Value to set in Capacity
006	22
008	28
012	40
015	56
018	71
024	90
030	112
036	140
048	160

(d) Total heat exchanger usage

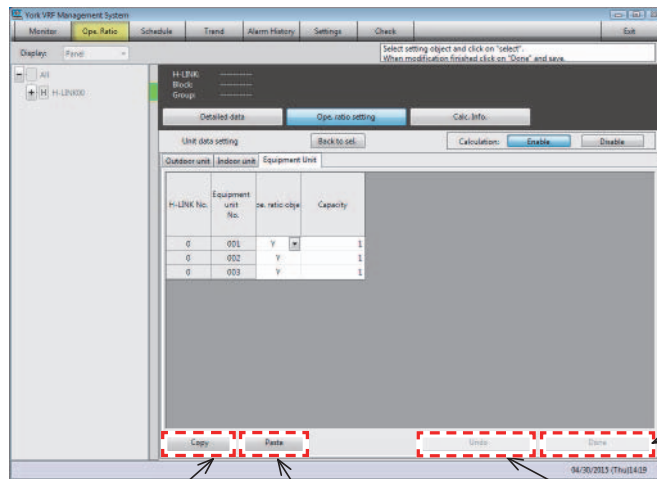
- Select [Y] if the indoor unit is a total heat exchanger.
- Select [N] if the indoor unit is not total heat exchanger.

□ (7) Check input data content and click [Done].

NOTE:

- Changes in unit data setting will be affected by the following calculations which are applied over the length of the calculation period.

- (8) Click on [Facility unit].



Copy the cell or row selected.

Paste the copied cell or row. If the cell is copied, only the cell within the same row will be pasted in. If the row is copied, paste it for the row selected.

Undo the setting.

After all item input has been entered, click on [Done] to lock in the setting.

NOTICE:

- H-LINK number, facility unit number of identified outdoor units will be automatically displayed.

- (9) Set each facility unit as follows:

(a) Ope. ratio object

- Select whether the facility unit value should be calculated or not (Yes/No).
- Select [Y] when calculation result for the AC operation ratio for the facility unit is desired.
- Select [N] when calculation result for the AC operation ratio for the facility unit is NOT desired.
- Step (b) for the facility unit may be omitted when selecting [N].

(b) Capacity

- Input the value to indicate the ratio of power consumed by each facility unit.

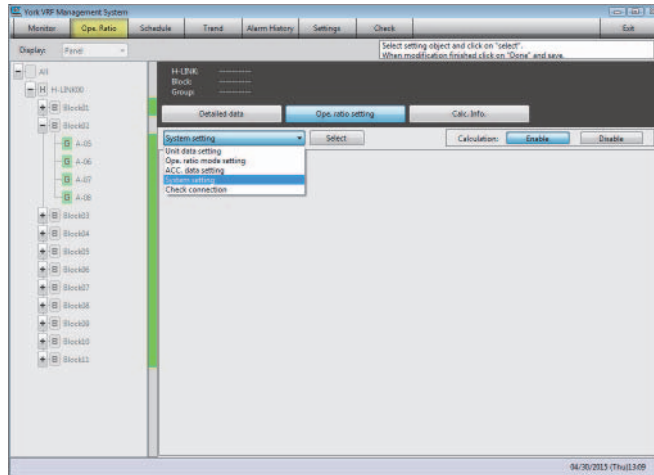
- (10) Check the input content data and click [Done].

5 Basic System Settings

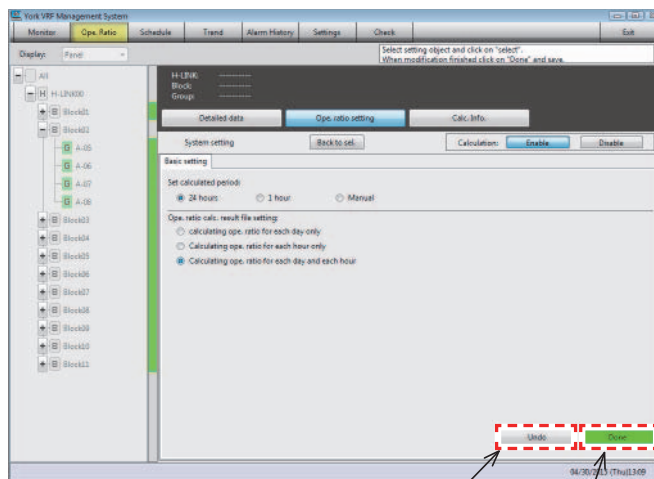
NOTE:

- When changing settings, this function should be done while the [Disable] condition is set.

- (1) Click on [Ope. Ratio] > [Ope. ratio setting] > [System setting].



- (2) Click on [Basic setting] and specify settings values as shown.



Undo the setting.

After all settings values have been entered, click [Done] to enter and lock-in the setting.

(a) Calculated period setting:

Select the calculation period for the system.

- If [1 hour] is selected, the calculation is performed each hour.
- If [24 hours] is selected, the calculation is performed once a day after midnight.
- If [Manual] is selected, the calculation cannot be performed.

Calculate manually in [Accumulated data setting] > [Acquire untaken data].

(b) Ope. ratio calc. result file setting

Select the file output mode of operation ratio calculation.

- If [Calculating ope. ratio for each day only] is selected, record the ope. ratio result file each day.
- If [Calculating ope. ratio for each hour only] is selected, record the ope. ratio result file each hour.
- If [Calculating ope. ratio for each day and each hour] is selected, record the ope. ratio result file for each day and each hour.

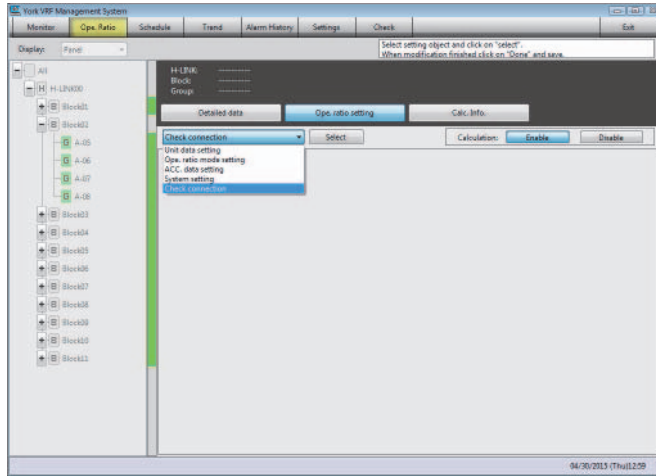
- (3) Check the input content data and click [Done].

6 Verifying Unit Connection and Registration

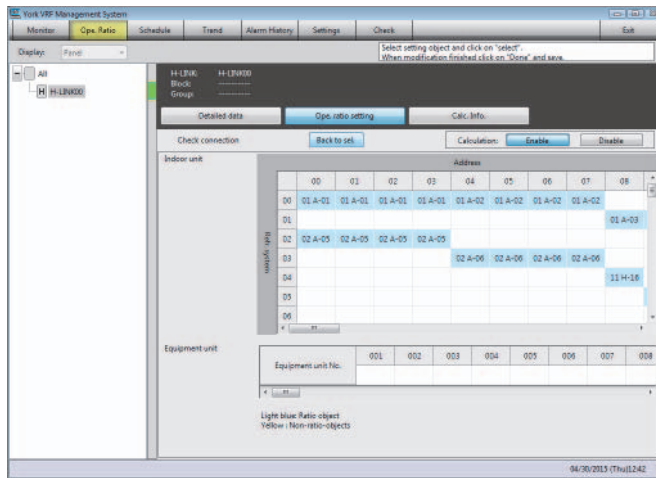
Verify unit connections and registration.

Verify that the registered units are highlighted in blue (affects calculation).

- (1) Click on [Ope.Ratio] > [Ope. ratio setting] > [Check connection].



- (2) Select the desired H-LINK to verify the contents.



Back ground color	Item	Block No. (01 to 64) Group No. (A-01 to H-16)	○
Blue		Units exist Registered in group/block Affects calculation	Units exist Not registered in group/block Affects calculation
Yellow		Units exist Registered in group/block Not affect calculation	Units exist Not registered in group/block Not affect calculation

NOTE:

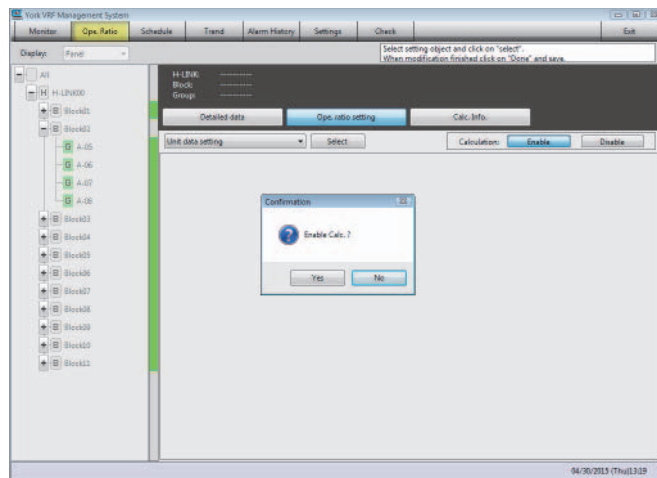
- Switch the H-LINK from the tree.
- Scroll to display all refrigerant system and address information.

7 Enable Calculation

Activating the function for operation ratio calculation.

Accumulated data collection and ratio calculation wis performed by activating the function for ratio calculation.

- (1) Click on [Ope. Ratio] > [Ope. ratio setting].
- (2) Click on calculation [Enable] button located toward the upper right corner of the screen.



- (3) The function for operation ratio calculation is now activated.

NOTICE:

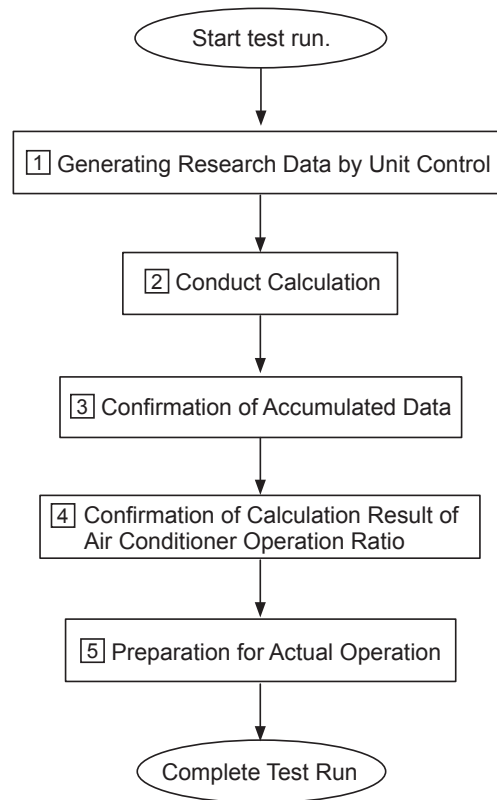
- When changed, each item will take effect in following conditions.

Unit data setting	Will be affected in the next calculation
Accumulated data setting	Upon registration
Ope. ratio mode setting	Will be affected in the next calculation
System setting	Upon registration

- If [Disable] is selected, the calculation cannot be performed. After completing all settings, click on [Enable].

Test Run

- Test Run Flow Chart



1 Generating Research Data by Unit Control

Operating data acquisition exceeding one hour will be required for the operation ratio function test run. Each unit needs to have specific data on operation time to simplify analysis of ratio calculation results. In the following steps, operate each unit so that they have specific data.

* Exercise operational control from the management display monitor.

- (1) [RUN] all units [COOL 66°F] or [HEAT 86°F] to start the thermo.

NOTICE:

- [Run] all units [COOL 66°F] or [HEAT 86°F] to calculate the accumulated value for operation time, thermo-ON time, and level of refrigerant flow.

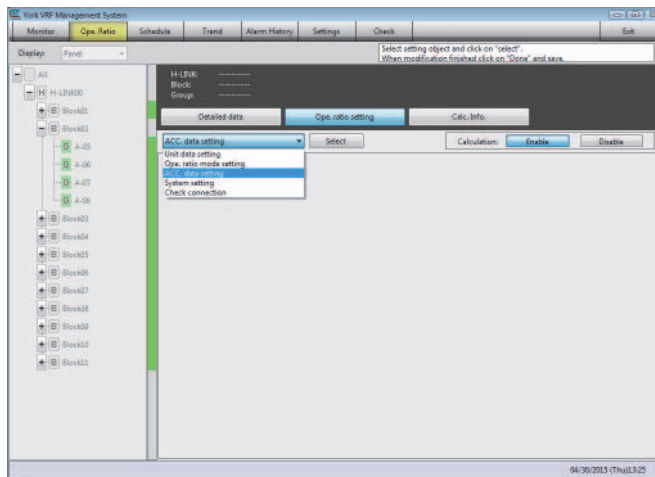
- (2) Wait until the clock signals the exact completed minute or hour.
- (3) The command, [Stop] will shut down each unit sequentially, beginning with the lowest refrigerant system number and address.

NOTICE:

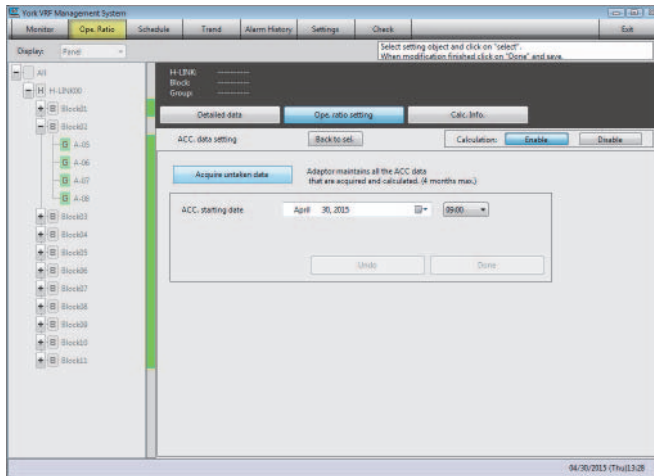
- Shutting down units one-by-one can generate and collect operational data for each unit.

2 Conduct Calculation

- (1) Click on [Ope. Ratio] > [Ope. ratio setting] > [Accumulated data setting].



- (2) Click on [Acquire untaken data] to start the calculation sequence.



NOTE:

- Calculation might take minutes, depending on the amount of data.
- In case of calculation information output, refer to **Service and Maintenance** 8 Troubleshooting.

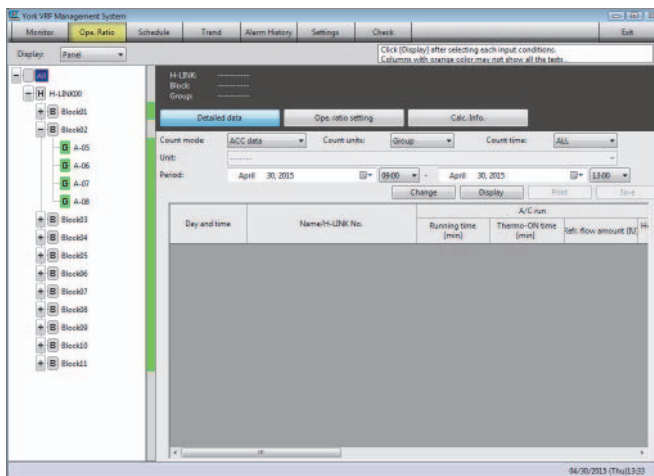
NOTICE:

- When selecting [Calculating ope. ratio for each day only], an ope. ratio result file is generated from the previous day.
- When selecting [Calculating ope. ratio for each hour only] or [Calculating ope. ratio for each day and each hour], ope. ratio result file is generated for the previous hour.

3 Confirmation of Accumulated Data

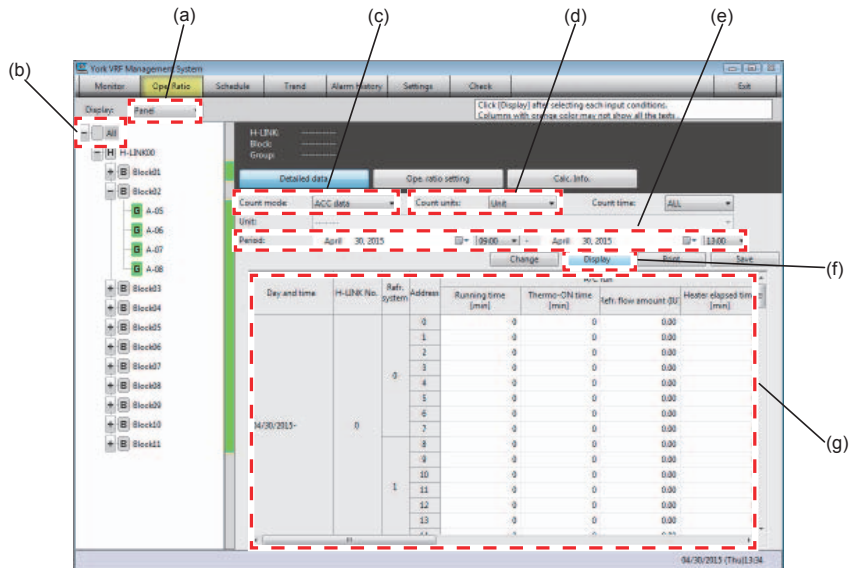
Check the operation and status of the operation ratio function.

- (1) Click on [Ope.Ratio] > [Detailed data].



INSTALLATION

- (2) Display the accumulated data to verify the consistency.
 - (a) Select [Panel] in [Display].
 - (b) Select "All" from the tree.
 - (c) Select [Accumulated data] in [Count mode].
 - (d) Select [Units] to be shown.
 - (e) Specify the period as from the time when the operation was started in
 ① Generating Research Data by Unit Control (3) and to the current time.
 - (f) Click [Display].
 - (g) Check on the accumulated data.



Check item (example)

- Operation time increases with the refrigerant system number and address.
- If using units of the same capacity, also check if thermo-ON time and refrigerant flow rate increase with the refrigerant system number and address.

NOTE:

- It can take a maximum of 45 minutes to fully display the data.
- Only the thermo-ON time and refrigerant flow rate are shown as the default settings. To display the other data, select those items by way of the [Change] button.

4 Confirmation of Calculation Result of Air Conditioner Operation Ratio

- (1) Check the calculation results from CSV file in the “/anbun/DriveRatio/Result” folder in the installed folder.

Check item (sample case)

Check if the same thermo-ON time or refrigerant flow rate ratio data as in **3** Confirmation of Accumulated Data are shown.

NOTE:

- Refer to **Calculating Air Conditioner Operation Ratio** **1** Calculation Result Reference in the operation manual for the contents of the CSV file.

5 Preparation for Actual Operation

Delete Test Run data to prepare for actual operation.

/// Data Backup ///

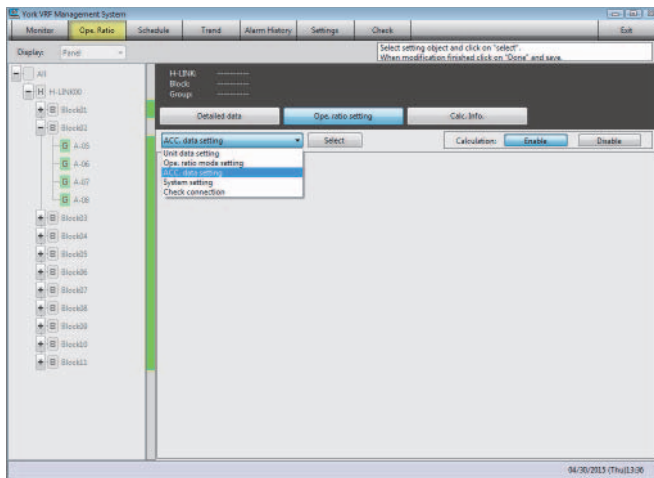
- (1) Connect a USB flash drive or other external memory device to the management computer.
- (2) Close the management software.
- (3) The “/centralstation” folder is saved under the drive in which the software is installed. Copy the file to a USB flash drive or other external memory device connected to the computer.
- (4) To remove the USB flash drive or other external memory device, select “Safety remove hardware” from the task bar.

/// Delete Test Run Data ///

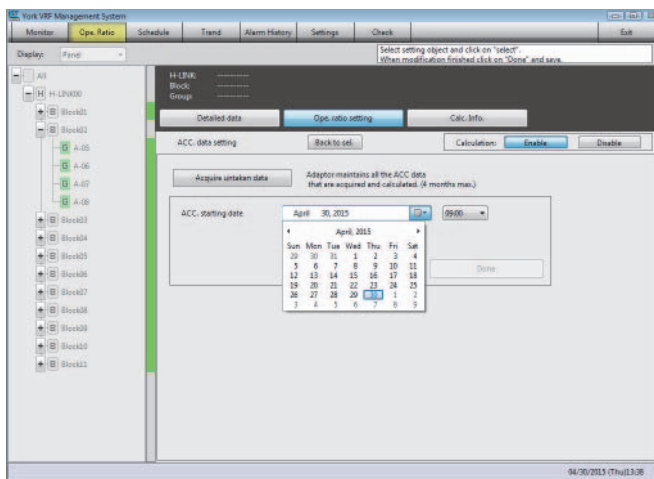
- (5) Delete all the files in the “/centralstation/anbun/DriveRatio” folder under the drive in which the software is installed.
- (6) Reboot the software.

/// Changing Start Date for Data Accumulation ///

- (7) Click on [Ope.Ratio] > [Ope ratio setting] > [Accumulated data setting].



- (8) Change [Accumulation starting date] to actual operation starting date and time.



This is the end of setup.
Refer to the operation manual for software operation.

6 Checking Items before Handing Over

Check the following items before handover.

- (1) Check all control and monitoring functions for each unit in accordance with the Test Run procedure in this manual.
- (2) The service life of the management computer will differ from that of the air conditioning unit. Explain to the customer in advance how to update the management computer.
- (3) It is assumed that management software is always running. Explain to your customer that trend data, alarm history, and check data cannot be recorded while software is OFF or in a state of hibernation. The exception to this would be a restart triggered by a timer function.
- (4) Device failure for any reason will severely impact all capabilities. Discuss an alternative recovery strategy that allows you to address and work around problems with the unit or by way of a remote controller monitor outside the system.
- (5) Periodically copy the “/centralstation” file inside the management computer to a USB flash drive or other external memory device as backup data.
- (6) Explain how to operate and maintain this software.
- (7) Accurate calculation may not be available upon device failure or other unexpected conditions. Please discuss the alternative plan (another calculation method independent from the computer and adapter condition) with your tenant before putting the system into service.

Service and Maintenance

1 Setting and Updating the Management Computer

[Procedure]

- (1) Exit the managing software
- (2) Backup data
- (3) Install to the new management computer
- (4) Extracting backup data
- (5) Reboot the management software

NOTICE:

For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour. If the calculation period is set for a 24 hour span, do not perform this procedure within the hours of midnight and 2:00am, local time. If the calculation period is set for a one hour time window, the operation ratio calculation (ope. ratio cal function) will take effect for the following hour of operation.

- (1) Exit the management software

NOTICE:

Once exited, trend information and check data will not be recorded until the initiation is completed for the next time. (Operation ratio data will be recorded.)

- (2) Backup data
Copy the file folder "/centralstation" to a USB flash drive or other external memory device.
- (3) Install to the new management computer
Install the updated managing software to the new management computer.

NOTICE:

Use the same structure (example: "/C:/Program Files(x86)/centralstation") for the drive and folder you are installing to.

- (4) Extract backup data
Overwrite data in "/centralstation" file with the backup data.
- (5) Reboot the management software
- Boot the managing software in the new management computer.
 - Check each control, monitor, and calculation operation by referencing "Test Run" in this manual and in the other installation and maintenance manual (P5415508).

2 Add, Change, and Delete Units

[Procedure]

- (1) Current result acquisition in operation ratio function
- (2) Stop operation ratio function
- (3) Exit the management software
- (4) Backup data
- (5) Confirm connection and add, change, and delete units
- (6) Restart the adapter
- (7) Restart the management software
- (8) Add and change remote controller groups
- (9) Add and change groups
- (10) Add and change blocks
- (11) Add and change tenants
- (12) Check controlling and monitoring settings
- (13) Set of operation ratio function
- (14) Restart operation ratio function

NOTICE:

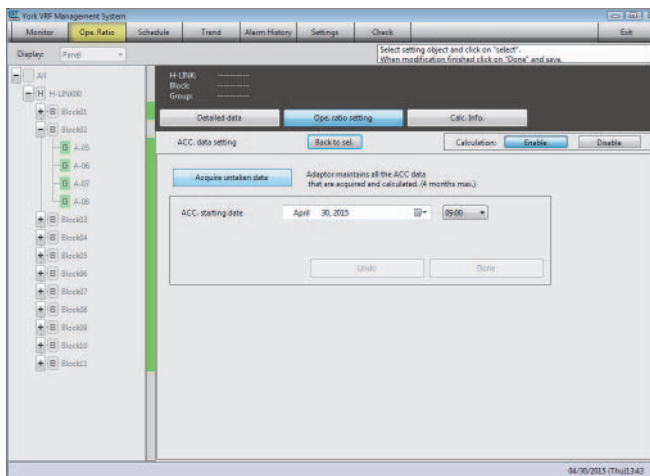
For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour. If the calculation period is set for a 24 hour span, do not perform this procedure within the hours of midnight and 2:00am, local time. If the calculation period is set for a one hour time window, the operation ratio calculation (ope. ratio cal function) will take effect for the following hour of operation.

- (1) Current result acquisition in operation ratio function
Calculate the operation ratio using current settings in cases where unit settings become modified or changed.

NOTICE:

For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour. If the calculation period is set for a 24 hour span, do not perform this procedure within the hours of midnight and 2:00am, local time. If the calculation period is set for a one hour time window, the operation ratio calculation (ope. ratio cal function) will take effect for the following hour of operation.

- (a) Click on [Ope.Ratio] > [Ope. ratio setting] > [Accumulated data setting].
- (b) Click on [Acquire untaken data] to activate calculation.

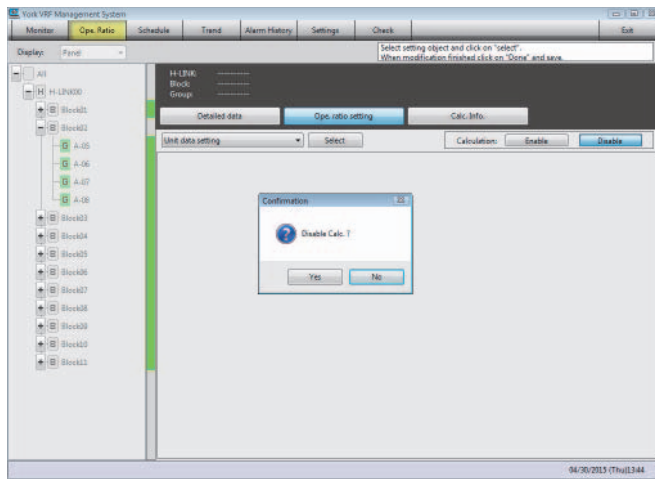


NOTE:

- Calculation might require some time, depending on the amount of data.
- In cases of calculation information output, refer to **Service and Maintenance** 8 Troubleshooting.

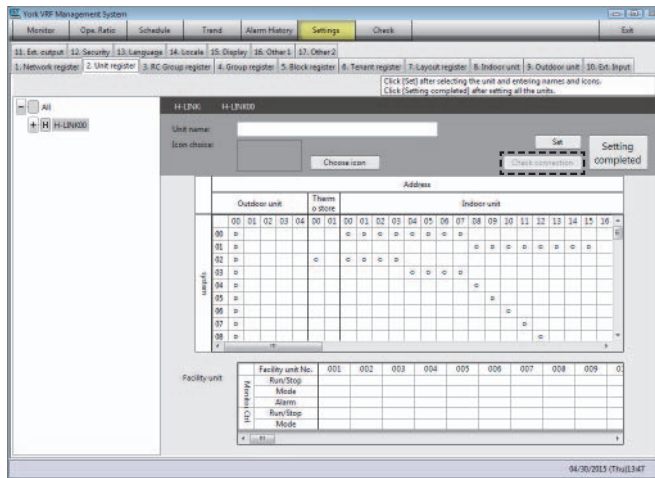
INSTALLATION

- (2) Halt the operation ratio function:
Click on calculation [Disable] in [Ope. Ratio] > [Ope. ratio setting] to disable, halt the operation ratio function.



- (3) Exit the management software.
- (4) Backup Data
Copy the file folder "/centralstation" folder to the external USB memory device.

- (5) Confirm the connection and add, change, or delete units
 - Select [Settings] > [Unit register].
 - Select an H-LINK that needs to be updated from the tree.
 - Click on [Check connection] and click on [Yes] to [Utilize registered data?].
 - Verify the connection.



When registering the facility unit, enter data sequentially beginning at the far left. Verify that the units are registered sequentially. Skipping any number can cause defects. Similarly, when deleting the unit, delete data in reverse order, starting from the far right and working left.

NOTE:

- When using facility units, do not enter refrigerant system number 63, for this number is reserved as blank.
- Facility units can be registered up to six units.

- (6) Restart the adapter
 - Turn OFF power to the adapter. After verifying that all lights are turned OFF, turn the power back ON.
- (7) Restart the management software.
- (8) Add and change remote controller groups:
 - Go to [Settings] > [RC Group register] to check modified remote controller groups of units.
 - Modify settings when needed.
- (9) Add and change groups
 - Go to [Settings] - [Group register] to check the modified groups of units.
 - Modify settings when needed.
- (10) Add and check blocks:
 - Go to [Settings] > [Block register] to check modified blocks of units.
 - Modify settings when needed.

INSTALLATION

- (11) Add and change tenants
 - Go to [Settings] > [Tenant register] to check on the modified tenants of units.
 - Modify settings when needed.

- (12) Check control and monitoring settings
 - Check the control and monitoring operation in accordance with the “Test Run” section of another installation and maintenance manual (P5415508).

- (13) Set for the operation ratio function
 - Set and verify each of the unit items according to the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 2 Check Unit Connection and Registration
- 4 Unit Data Setting
- 6 Verify Unit Connection and Registration

- (14) Restart the ratio function operation
 - Restart the operation ratio function in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 7 Enable Calculation

3 Add, Change, and Delete Groups and Blocks

[Procedure]

- (1) Current result acquisition in operation ratio function
- (2) Halt the operation ratio function
- (3) Exit the management software
- (4) Backup data
- (5) Add and change remote controller groups
- (6) Add and change groups
- (7) Add and change blocks
- (8) Add and change tenants
- (9) Check controlling and monitoring setting
- (10) Set the operation ratio function
- (11) Restart the operation ratio function

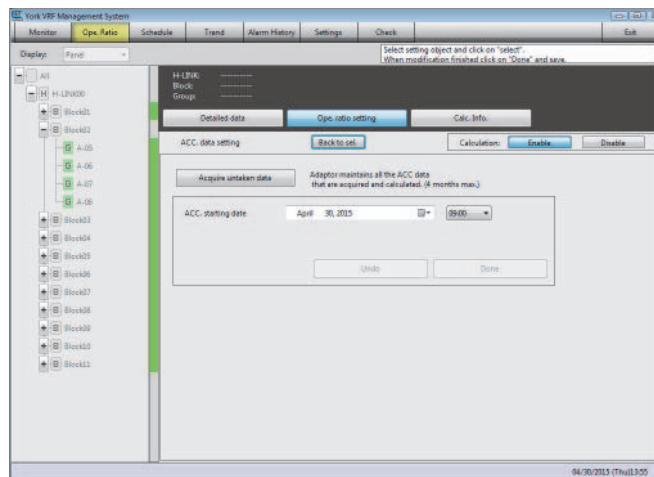
- (1) Current result acquisition in operation ratio function
Calculate the current values with current settings in cases where group/blocks are modified or changed.

NOTICE:

For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour. If the calculation period is set for a 24 hour span, do not perform this procedure within the hours of midnight and 2:00am, local time. If the calculation period is set for a one hour time window, the operation ratio calculation (ope. ratio cal function) will take effect for the following hour of operation.

(a) Click on [Ope.Ratio] > [Ope. ratio setting] > [Accumulated data setting].

(b) Click on [Acquire untaken data] to start calculation.

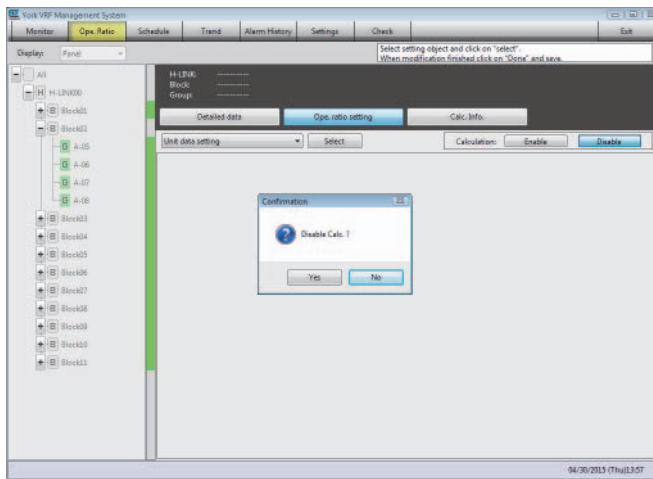


NOTE:

- Calculation can take minutes depending on the amount of data.
- In case of calculation information output, refer to **Service and Maintenance** 8 Troubleshooting.

INSTALLATION

- (2) Halt the operation ratio function
 - Click on calculation [Disable] in [Ope. Ratio] > [Ope. Ratio setting] to disable the operation ratio function.



- (3) Exit the management software.
- (4) Backup data:
 - Copy the file folder “/centralstation” to a USB flash drive or other external memory device.
- (5) Add or change remote controller groups:
 - Go to: [Settings] > [RC Group register] to check on modified remote controller groups of units.
 - Modify settings as needed.
- (6) Add and change groups:
 - Go to: [Settings] > [Group register] to check modified groups of units.
 - Modify as needed.
- (7) Add and change blocks:
 - Go to: [Settings] > [Block register] to check on modified blocks of units.
 - Modify as needed.
- (8) Add and change tenants:
 - Go to: [Settings] > [Tenant register] to check on modified tenants of units.
 - Modify settings as needed.
- (9) Check control and monitoring settings:
 - Check control and monitoring operation in accordance with the “Test Run” section of another installation and maintenance manual (P5415508).
- (10) Set of operation ratio function:
 - Set or check each unit item in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 2 Checking Unit Connection and Registration
- 4 Unit Data Setting
- 6 Verifying Unit Connection and Registration

- (11) Restart the operation ratio function:
 - Restart the operation ratio function in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 7 Enable Calculation

4 Add, Change, and Delete Tenants

[Procedure]

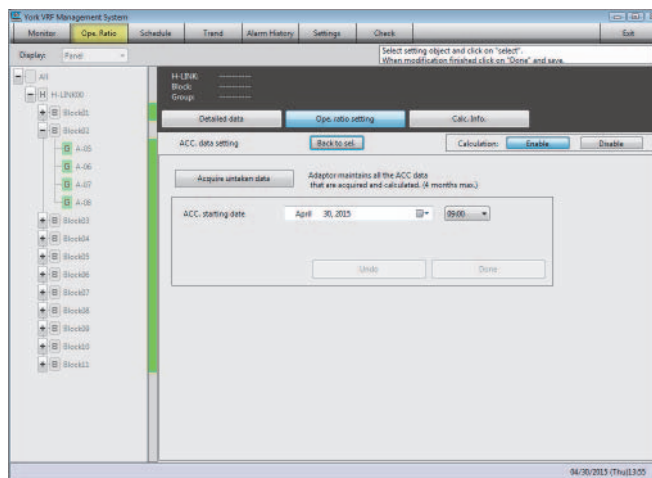
- (1) Current result acquisition in operation ratio function
- (2) Halt the operation ratio function
- (3) Exit the management software
- (4) Backup data
- (5) Add and change tenants
- (6) Set the operation ratio function
- (7) Restart the operation ratio function

- (1) Current result acquisition in the operation ratio function
Calculate current values with current settings in cases where tenants are modified or changed.

NOTICE:

For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour. If the calculation period is set for a 24 hour span, do not perform this procedure within the hours of midnight and 2:00am, local time. If the calculation period is set for a one hour time window, the operation ratio calculation (ope. ratio cal function) will take effect for the following hour of operation.

- (a) Click on [Ope.Ratio] > [Ope. ratio setting] > [Accumulated data setting].
- (b) Click on [Acquire untaken data] to start calculation.

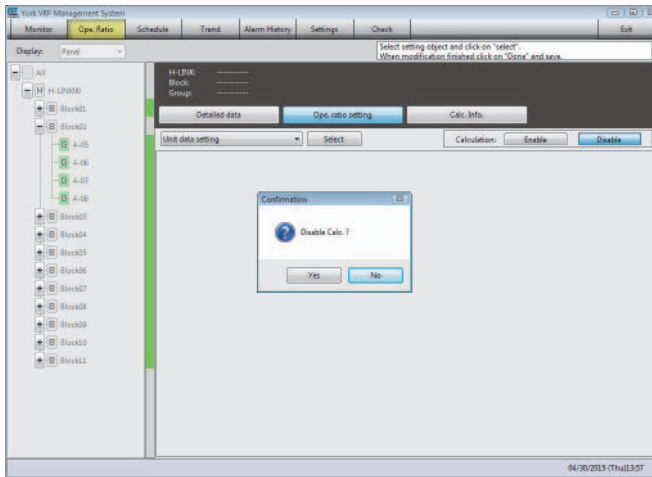


NOTE:

- Calculation can take minutes depending on the amount of data.
- In case of calculation information output, refer to the **Service and Maintenance** [8] Troubleshooting.

INSTALLATION

- (2) Stop operation ratio function:
 - Click on the calculation [Disable] button, YES button, in [Ope. Ratio] > [Ope. Ratio setting] to halt the operation ratio function.



- (3) Exit the management software.
- (4) Backup data:
 - Copy “/centralstation” folder to a USB flash drive or other external memory device.
- (5) Add and change tenants:
 - Go to: [Settings] > [Tenant register] to check modified tenants.
- (6) Set the operation ratio function
 - Set or check each of the unit items in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 2 Checking Unit Connection and Registration
- 4 Unit Data Setting
- 6 Verifying Unit Connection and Registration

- (7) Restart the operation ratio function:
 - Restart the operation ratio function in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 7 Enable Calculation

5 Add, Change, and Delete Layouts

5-1 Edit Layout

[Procedure]

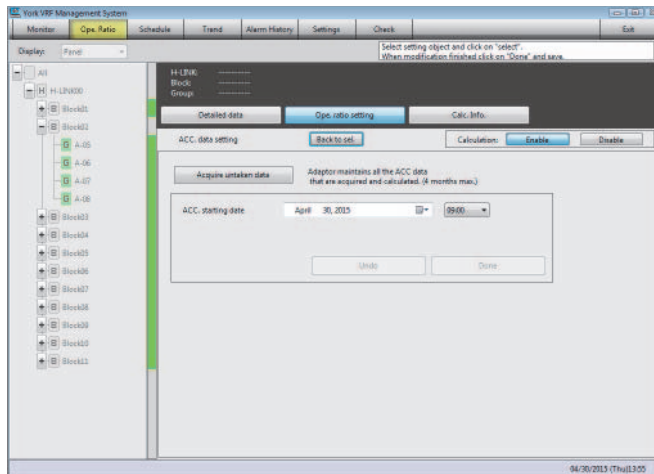
- (1) Current result acquisition in operation ratio function
- (2) Halt the operation ratio function
- (3) Exit the management software
- (4) Backup data
- (5) Edit the layout data
- (6) Restart the management software
- (7) Check controlling and monitoring setting
- (8) Restart the operation ratio function

- (1) Current result acquisition in operation ratio function:
Calculate the current values with current settings in cases where layouts are modified or changed.

NOTICE:

For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour. If the calculation period is set for a 24 hour span, do not perform this procedure within the hours of midnight and 2:00am, local time. If the calculation period is set for a one hour time window, the operation ratio calculation (ope. ratio cal function) will take effect for the following hour of operation.

- (a) Click on [Ope.Ratio] > [Ope. ratio setting] > [Accumulated data setting].
- (b) Click on [Acquire untaken data] to start calculation.

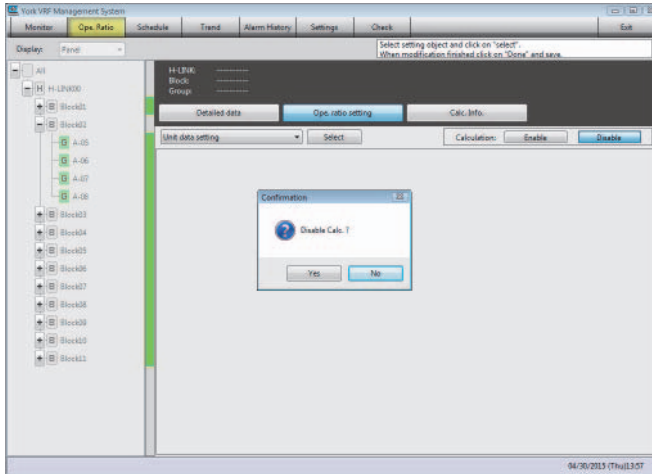


NOTE:

- Calculation can take minutes depending on the amount of data.
- In cases of calculation information output, refer to the **Service and Maintenance** 8 Troubleshooting.

INSTALLATION

- (2) Halt the operation ratio function:
 - Click on calculation [Disable] button in [Ope. Ratio] > [Ope. Ratio setting] to halt the operation ratio function.



- (3) Exit the management software.
- (4) Backup data:
 - Copy the file folder “/centralstation” to a USB flash drive or other external memory device.
- (5) Edit the layout data:
 - Go to: [Settings] > [Layout register] to edit layout data.
- (6) Reboot the management software:
 - Reboot the management software to read the edited layout data.

NOTICE:

Setting or modification of layout data will not be validated until the management software is rebooted; such that it differs with group and block.

- (7) Check control and monitoring setting:
 - Check control and monitoring operation in accordance with the “Test Run” section in another installation and maintenance manual (P5415508).
- (8) Restart the ratio function operation:
 - Restart the operation ratio function in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 7 Enable Calculation

5 -2 Delete Layout

[Procedure]

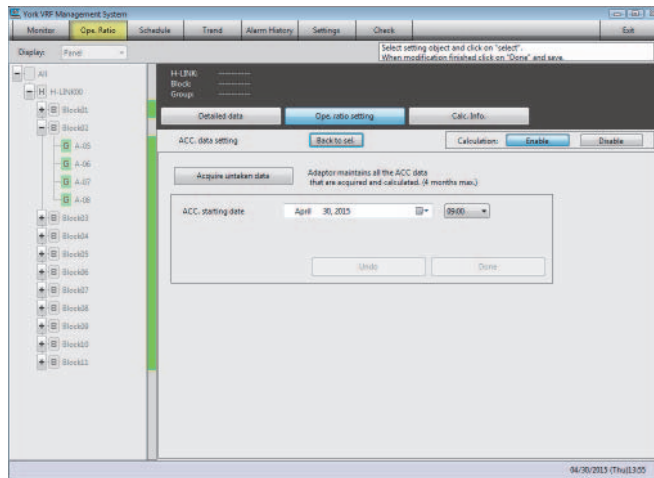
- (1) Current result acquisition in operation ratio function
- (2) Halt the operation ratio function
- (3) Exit the management software
- (4) Backup data
- (5) Delete the layout data
- (6) Edit the layout data
- (7) Restart the management software
- (8) Check controlling and monitoring setting
- (9) Restart the operation ratio function

- (1) Current result acquisition in the operation ratio function
Calculate current values with the current settings in cases where layouts are deleted.

NOTICE:

For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour. If the calculation period is set for a 24 hour span, do not perform this procedure within the hours of midnight and 2:00am, local time. If the calculation period is set for a one hour time window, the operation ratio calculation (ope. ratio cal function) will take effect for the following hour of operation.

- (a) Click on [Ope.Ratio] > [Ope. ratio setting] > [Accumulated data setting].
- (b) Click on [Acquire untaken data] to start calculation.

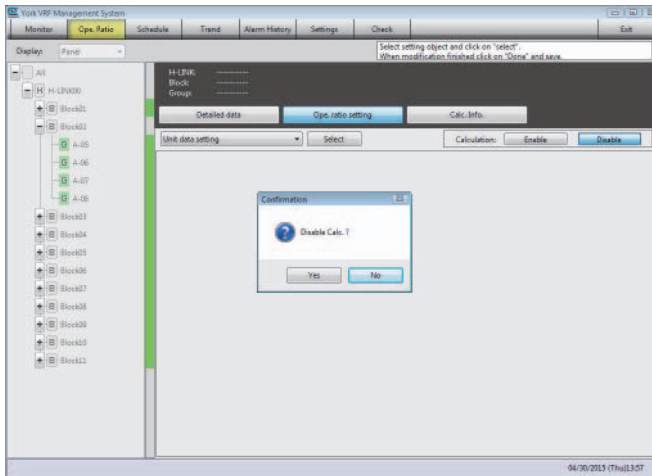


NOTE:

- Calculation can take minutes depending on the amount of data.
- In cases of calculation information output, refer to the **Service and Maintenance** 8 Troubleshooting.

INSTALLATION

- (2) Halt the operation ratio function
 - Click on calculation [Disable] button in [Ope. Ratio] > [Ope. Ratio setting] to halt the operation ratio function.



- (3) Exit the management software.
- (4) Backup data:
 - Copy the file folder “/centralstation” to a USB flash drive or other external memory device.
- (5) Delete the layout data:
 - Open the folder [/centralstation/layout].
 - Delete the layout data folder desired.
 - Boot the management software.

NOTICE:

Only individual layouts can be deleted.

- (6) Edit the layout data
 - Go to [Settings] > [Layout register] to edit layout data.
- (7) Restart the management software:
 - Reboot the management software to read the edited layout data.

NOTICE:

Setting or modification of layout data will not be validated until the management software is rebooted; such that it differs with group and block.

- (8) Check the control and monitoring setting
 - Check control and monitoring operation in accordance with the “Test Run” section of another installation and maintenance manual (P5415508).
- (9) Restart the operation ratio function:
 - Restart the operation ratio function in accordance with the **Operation Ratio Setting** in the **How to Setup** section.

Operation Ratio Setting

[7] Enable Calculation

6 Add Adapters

[Procedure]

- (1) Installation of adapter
- (2) Current result acquisition in operation ratio function
- (3) Halt the operation ratio function
- (4) Exit the management software
- (5) Backup data
- (6) Change IP address of the adapter and establish connection
- (7) Confirm connection information
- (8) Add and change remote controller groups
- (9) Add groups
- (10) Add blocks
- (11) Check controlling and monitoring setting
- (12) Set the operation ratio function
- (13) Restart the operation ratio function

NOTICE:

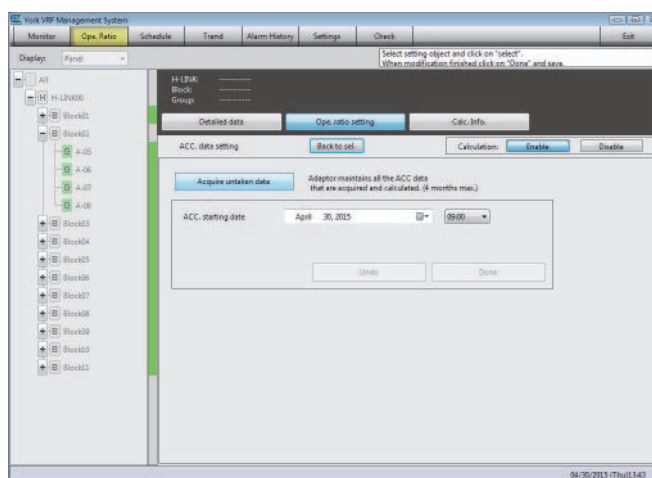
For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour. If the calculation period is set for a 24 hour span, do not perform this procedure within the hours of midnight and 2:00am, local time. If the calculation period is set for a one hour time window, the operation ratio calculation (ope. ratio cal function) will take effect for the following hour of operation.

- (1) Installation of adapter:
Install the adapter according to the installation manual for the adapter.
- (2) Current result acquisition in ratio function
Calculate the ratio with current settings in cases where units are modified or changed.

NOTICE:

Avoid conducting this procedure between 0:00-1:00 or in 10 minutes from :55 every hour.

- (a) Click on [Ope.Ratio] > [Ope. ratio setting] > [Accumulated data setting].
- (b) Click on [Acquire untaken data] to start calculation.

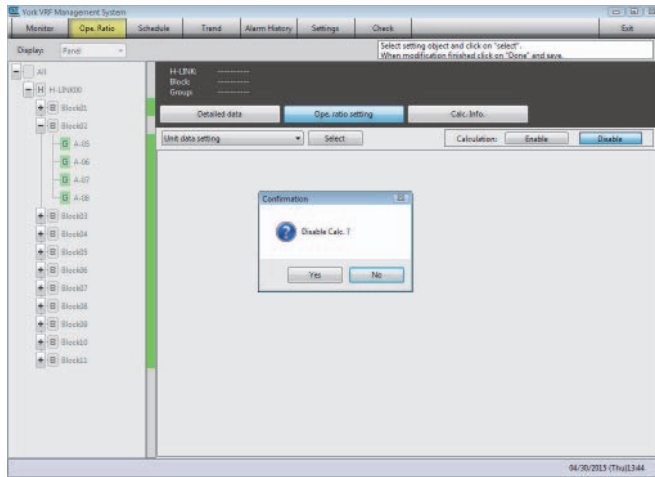


NOTE:

- Calculation can take minutes depending on the amount of data.
- In cases of calculation information output, refer to the **Service and Maintenance** 8 Troubleshooting.

INSTALLATION

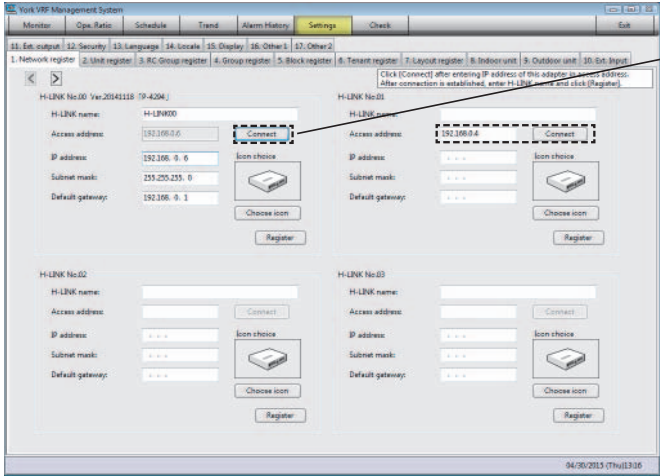
- (3) Halt the operation ratio function
Click the calculation [Disable] in [Ope. Ratio] > [Ope. ratio setting] to disable or halt the ratio function operation.



- (4) Exit the management software.
- (5) Backup data:
Copy the file folder "/centralstation" to a USB flash drive or external memory device.

- (6) Change the adapter IP address and establish connection:
 - Change the adapter IP address so that it will assume its own unique system identification, and eliminate duplication across the system.

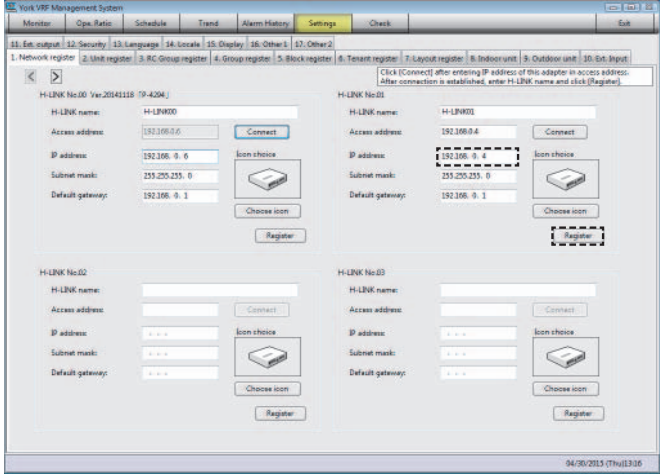
(a) Select [Settings] > [Network register] to enter the IP address for the adapter in the empty Access Address box for whose H-LINK No. is the earliest, and click on the [Connect] button.



Whenever an IP address temporarily overlaps with another, click on the [Connect] button to disconnect the overlapping adapter. This action physically disconnects the LAN connection.

* The Convex [Connect] button indicates that the adapter is disconnected.

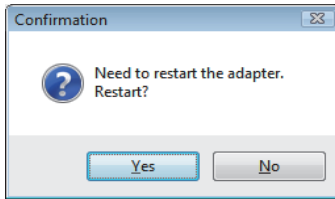
(b) Wait until the window that reads: "Connecting to the adapter. Please wait" closes. Enter H-LINK Name and modify the current IP address to the desired address (for example: 192.168.0.4). Modify the subnet mask and default gateway if necessary.



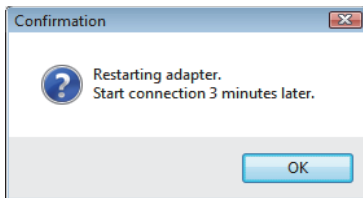
(c) Click on the [Register] button.

INSTALLATION

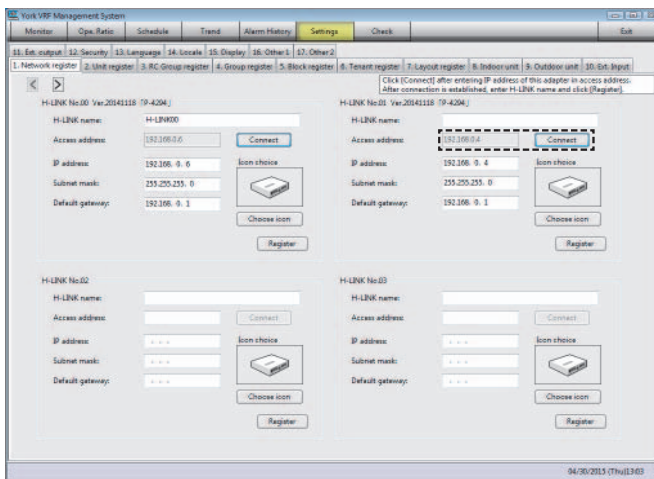
- (d) Click on [Yes] on the pop-up window.



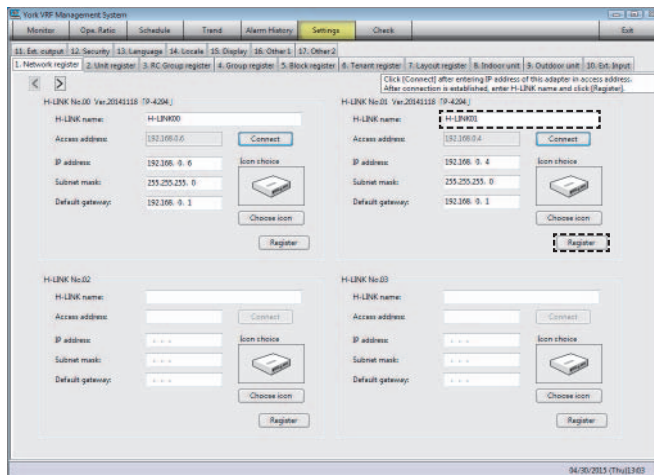
- (e) The adapter will restart. Wait three minutes for the adapter to complete the restart process.



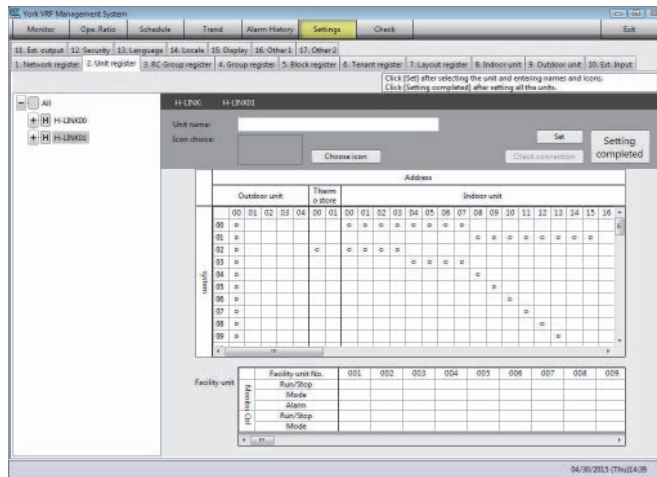
- (f) Click on the [Connect] button to temporarily disconnect the adapter. Wait for three minutes to enter the desired IP address (for example: 192.168.0.4) into the access address box and click on the [Connect] button.



- (g) Enter the H-LINK name and click on the [Register] button.



- (7) Confirm connection information:
 - Select [Settings] > [Unit register].
 - Select newly added H-LINK from the tree.
 - Check the refrigerant system and the address of the air conditioners.



- (8) Add and change remote controller groups:
 - Select [Settings] > [RC Group register] to check on the modified remote controller groups of units.
 - Modify settings when needed.
- (9) Add groups:
 - Select [Settings] > [Group register] to register current groups of units in the H-LINK.
- (10) Add blocks:
 - Select [Settings] > [Block register] to register current blocks of units in the H-LINK.
- (11) Check controlling and monitoring setting:
 - Check controlling and monitoring operation in accordance with the “Test Run” phase in the installation manual for management software.
- (12) Set the operation ratio function
 - Set and check each of the unit items in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 2 Checking Unit Connection and Registration
- 4 Unit Data Setting
- 6 Verifying Unit Connection and Registration

- (13) Restart the operation ratio function:
 - Restart the operation ratio function in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 7 Enable Calculation

7 Delete Adapters

[Procedure]

- (1) Current result acquisition in operation ratio function
- (2) Stop operation ratio function
- (3) Exit the management software
- (4) Backup data
- (5) Delete adapter
- (6) Reboot the management software
- (7) Check control and monitoring setting
- (8) Set the operation ratio function
- (9) Restart the operation ratio function

NOTICE:

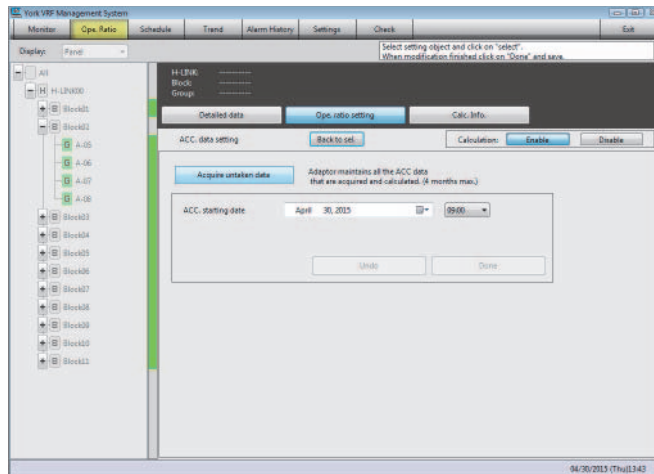
For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour. If the calculation period is set for a 24 hour span, do not perform this procedure within the hours of midnight and 2:00am, local time. If the calculation period is set for a one hour time window, the operation ratio calculation (ope. ratio cal function) will take effect for the following hour of operation.

- (1) Current result acquisition in the operation ratio function:
Calculate the operation ratio with current settings in cases where units are modified or changed.

NOTICE:

Do not perform this procedure between the hours of midnight and 1:00am. For all other hours of the day, do not attempt to start this procedure within 15 minutes prior to the stroke of the next hour.

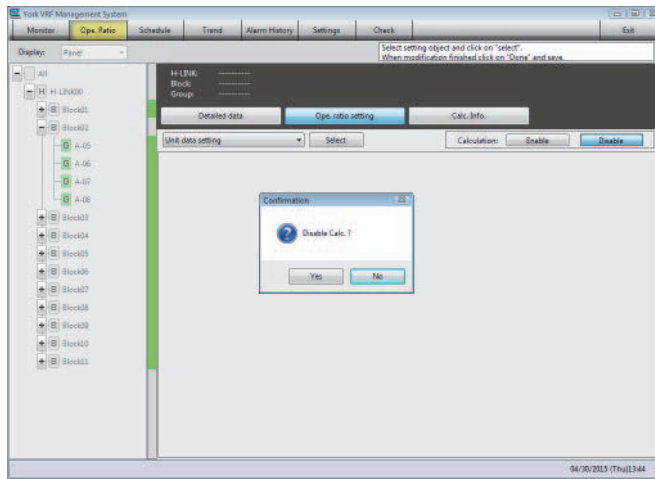
- (a) Click on [Ope.Ratio] > [Ope. ratio setting] > [Accumulated data setting].
- (b) Click on [Acquire untaken data] to start calculation.



NOTE:

- Calculation can take minutes depending on the amount of data.
- In cases of calculation information output, refer to the **Service and Maintenance** 8 Troubleshooting.

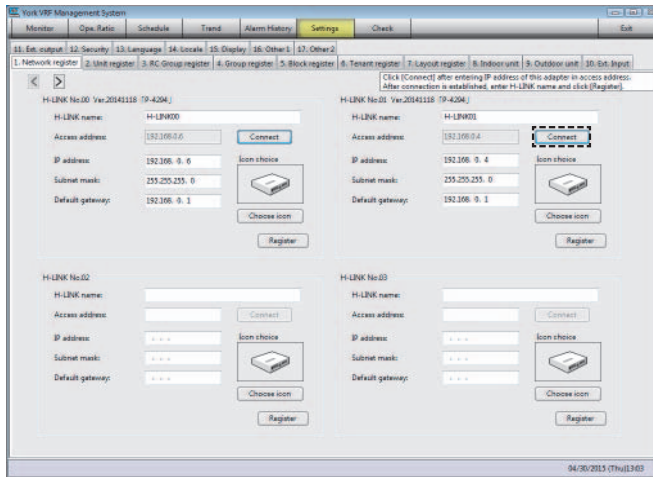
- (2) Halt the operation ratio function:
Click on the calculation [Disable] button in [Ope. Ratio] > [Ope. ratio setting] to disable or halt the operation ratio function.



- (3) Exit the management software.
- (4) Backup data:
Copy the file folder: "/centralstation" folder to a USB flash drive or USB memory device.

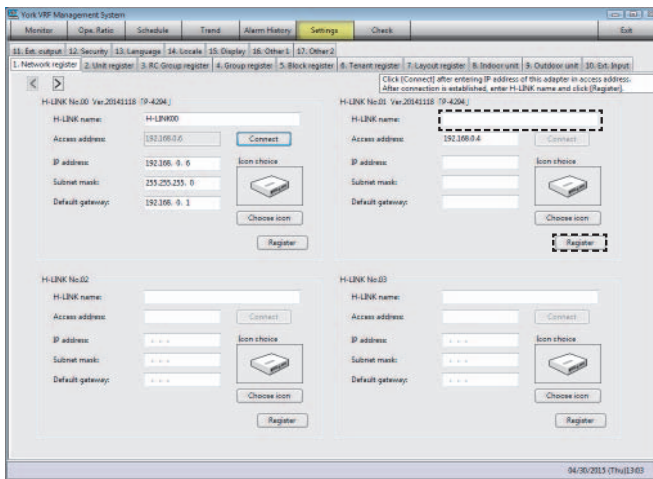
INSTALLATION

- (5) Delete adapter:
 - Click on [Settings] > [Network register].
 - Disconnect the adapter to delete it if connected (*), click on the [Connect] button.



* When the adapter is connected to the system, clicking on the [Connect] button disconnects the adapter.

- Delete the H-LINK Name and click on the [Register] button. (All the boxes except for Access Address will go blank.)



- (6) Reboot the management software.
- (7) Check controlling and monitoring setting:
 - Check the control and monitoring operation in accordance with the “Test Run” section of another installation and maintenance manual (P5415508).

- (8) Set the operation ratio function:
 - Set and check each of the unit items in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 2 Checking Unit Connection and Registration
- 4 Unit Data Settings
- 6 Verifying Unit Connection and Registration

- (9) Restart the operation ratio function:
 - Restart the operation ratio function in accordance with the **Operation Ratio Setting** in the **How to Set Up** section.

Operation Ratio Setting

- 7 Enable Calculation

8 Troubleshooting

The following table identifies possible troubleshooting solutions for abnormal conditions.

No.	Condition	Items to be Checked	Action
1	Communication information is displayed.	Are all the adapters turned ON?	Turn all adapters ON.
		Is the Test Run phase in the management software completed?	Please verify connections and register groups and names.
		Is LAN wiring, connections to computers and adapters indicating normal status? Is the hub turned ON?	Check the wiring and hub to ensure that everything is turned ON.
		Did the adapter shut down for any period of time due to power failure or other circumstances?	Data acquisition cannot occur while the adapter is OFF, disconnected, or down. This software application continues to collect communication data over the period for which the adapter was OFF, disconnected, deleted, or for any reason-not functioning.
		Is there a 1GB margin of free memory space available on the management computer?	Clear the hard drive to ensure a margin of 1GB of free space or substitute with another computer with larger memory space.
		Isn't the management computer set to standby or hibernation state?	Go to the [Start] > [Control Panel] > [Power Options]. Go to the [Change plan settings] > [Change advanced power settings] of the Power Plan selected. • Check that all the items [Sleep] > [Sleep after] > [Hibernate after] are set as [Never]. Check the following setting when using a laptop: • Click [Power buttons and lid]. Check that the [Lid close action] is [Do nothing].
		Have all the settings been performed?	Check the setting content following the [Ope. ratio setting] for this manual.
2	The operation ratio calculation results file was not generated.	Is the current date displayed before the set accumulation start date?	Check the captured start date in [Ope. ratio setting] > [Accumulated data setting] > [Accumulation starting date].
		Is accumulated data present?	Check if captured data is present in [/anbun/Data/H-LINKxx/OneHour] folder in the installation folder. NOTE: xx indicates H-LINK No. +1.
		Is calculation enabled?	Click calculation: [Enable] in [Ope. ratio setting].
3	Pop-up reading "Ope. ratio software cannot start. Restart management software after checking on the condition of the adapter connection" is shown.	Is the adapter connected?	Check the connection and restart for the management software. Also check all setting items in [Ope. ratio setting].

No.	Condition	Items to be Checked	Action
4	Pop-up reading "Error occurred when calculating. Reset the Ope. ratio setting after checking connection with adapter and restarting the management software." is displayed.	Is the adapter connected? Are settings for ratio function correct?	Check connection and restart the management software. Also check all settings in [Ope. ratio setting].
5	Pop-up reading "An error has occurred on the PC. Management software restarted. Check PC status. Click on [Acquire untaken data] (to capture and analyze untaken free data). Avoid specifying data capture within the first 03 minutes of the hour.	Did an error occur on the computer?	Check the computer system. Click [Acquire untaken data] (to capture and analyze untaken free data). Avoid specifying data capture within the first 03 minutes of the hour.
		Did the PC restart schedule initiate when the pop-up screen was displayed?	Management software cannot close down properly when a pop-up screen is displayed. Do not allow pop-up screens to remain open during normal operation.
6	[No Response] is displayed on management software title bar.	Does the software continue to behave normally?	A temporary message reading: [No Response] will display when there is a delayed response. This is normal behavior. Do not attempt to hurry the process along. The [No Response] message will vanish.

9 Periodic Checks

Periodically inspect the following to maintain sound operation and system integrity.

- (1) Environment
 - During normal operation, frequently check the management computer to see that it does not overheat.
 - Ensure that sensitive electronics and monitoring devices are not installed in a hot or inhospitable environment.
 - Inspect the computer to see it is free of wire fragments, dust, and airborne debris.
- (2) Display
 - Ensure that high quality resolution technical data is displayed consistently and that the monitor is working normally.
- (3) Installing
 - Ensure that all system adapters and electronic devices are connected and wired properly.

/// Addenda: Data Sheet (1/4) //

Operation Ratio Mode Setting

*Select after data input.

Operation Ratio Mode		Check
Calculation for air conditioner operation ratio	Mode	

/// **Addenda: Data Sheet (2/4)** //

Unit Data Setting Outdoor unit data

*Select after data input.

*Make copies for each outdoor unit.

	Check																
H-LINK number																	
System																	
Address																	
Outdoor unit type																	

/// Addenda: Data Sheet (3/4) //

Unit Data Setting Indoor unit data

*Select after data input.

*Make copies for each Indoor unit.

	Check											
H-LINK number												
System												
Address												
Ope. ratio object												
Expansion valve coefficient												
Capacity												
Total heat exchanger usage												

/// Addenda: Data Sheet (4/4) //

Unit Data Setting Facility unit data

*Select after data input.

*Make copies for each facility unit.

	Check																
H-LINK number																	
Facility unit number																	
Ope. ratio object																	
Capacity																	

1.4.12 Computerized Central Controller Adapter**- Table of Contents -**

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Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, Caution, and Warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

1. Safety Summary



IMPORTANT:

READ AND UNDERSTAND THIS MANUAL BEFORE USING THIS COMPUTERIZED CENTRAL CONTROLLER ADAPTER.
KEEP THIS MANUAL FOR FUTURE REFERENCE.


IMPORTANT NOTICE:

- No part of this manual may be reproduced without the expressed written permission of Hitachi or Johnson Controls, Inc.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system, including this controller, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake.
If the unit is not installed correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units.
Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

- If there is a source of electromagnetic interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35° to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- If the remote sensors are not used with this controller, then do not install this controller...
 - In a room where there is no thermostat.
 - Where the unit is exposed to direct sunshine or direct light.
 - Where the unit will be in close proximity to a heat source.
 - Where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - In areas with poor air circulation and ventilation.
- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Only use electrical protection equipment and tools suited for this installation.
- Insulate the wired controller against moisture and temperature extremes.
- Use specified cables between units and the controller.
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.

INSTALLATION

- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If there are frequent occurrences with blown fuses or flipped circuit breakers, shut down the system immediately and contact your service contractor.

2. System Configuration

Figure 2.1 below shows a sample configuration with a CCCA01 adapter module. This installation manual only addresses the CCCA01 module. Refer to the management software manual (CCCS01) when used in combination with CCCA01. Refer to the respective operation manuals for each other component in the system.

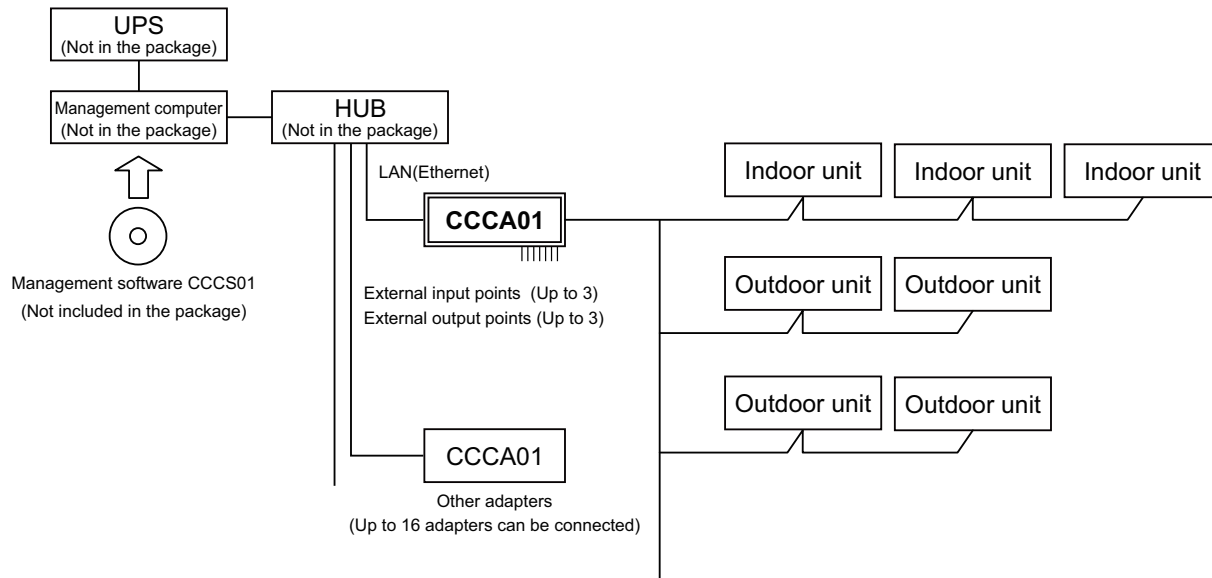


Figure 2.1: Sample of System Configuration

- The management computer upon which is stored the CCCS01 software is solely dedicated to this system and is assumed to be in operation at all times. It should also be connected to the UPS (Uninterruptible Power Supply).
- The CCCS01 management software is not included in this package.
- Up to 16 adapters can be connected to this system.
- External CCCA01 input connections numbered (4-8) cannot be used.
- The management computer, UPS, HUB and associated types of wiring are not included in this package.
- UPS (including its configuration), and RS-232C Interface or Wake on LAN function (including its configuration) for the management computer will be required if automatic shut down of the management computer upon power failure is required.
- UPS (including its configuration), and Wake on LAN function (including its configuration) for the management computer will be required if automatic restart of the management computer upon recovery from power failure is required.
- "Ethernet" is a trademark registered by the Xerox Corporation in the United States of America.

3. Outer Dimensions

(Unit: inch (mm))

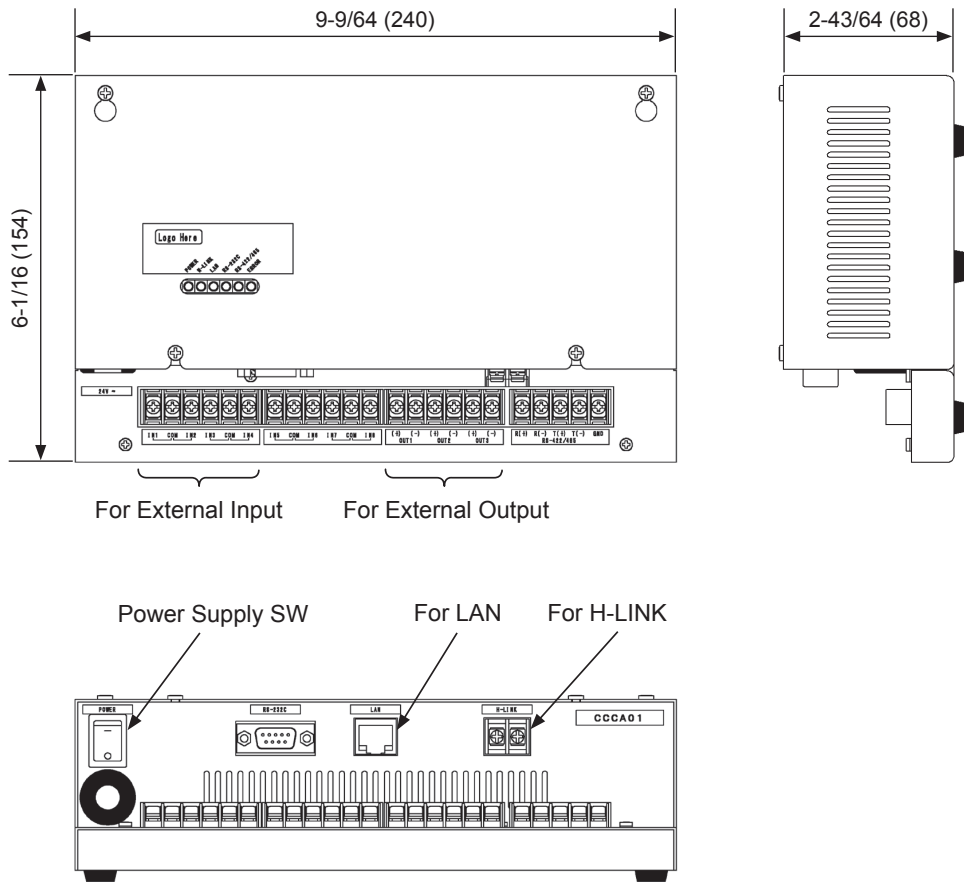


Figure 3.1: Outer Dimensions

4. Brand Label

Select the accessory brand label according to the production order. (HITACHI or YORK)
 Attach the accessory brand logo label to this area.

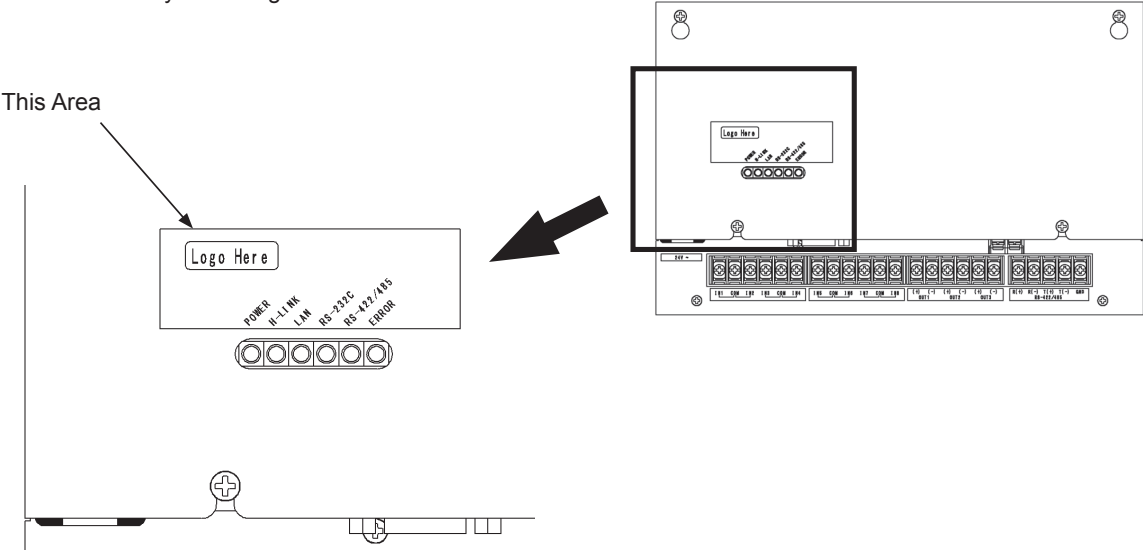


Figure 4.1: Brand Label Area

5. Part Name and Functions

The name of each part for this adapter is shown in Figure 5.1 and Figure 5.2.

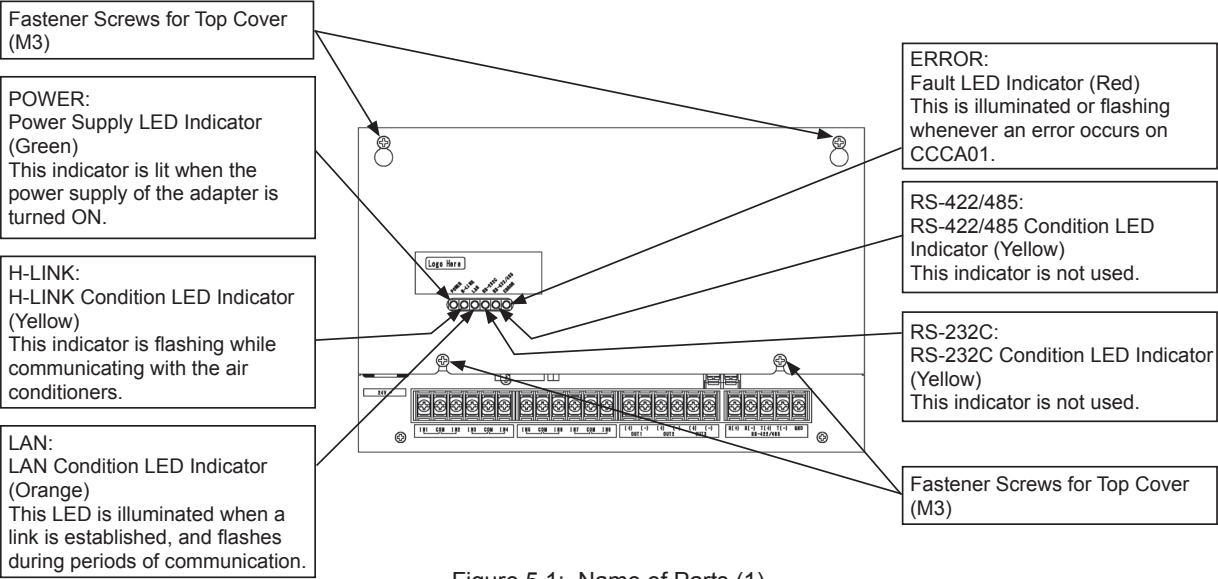
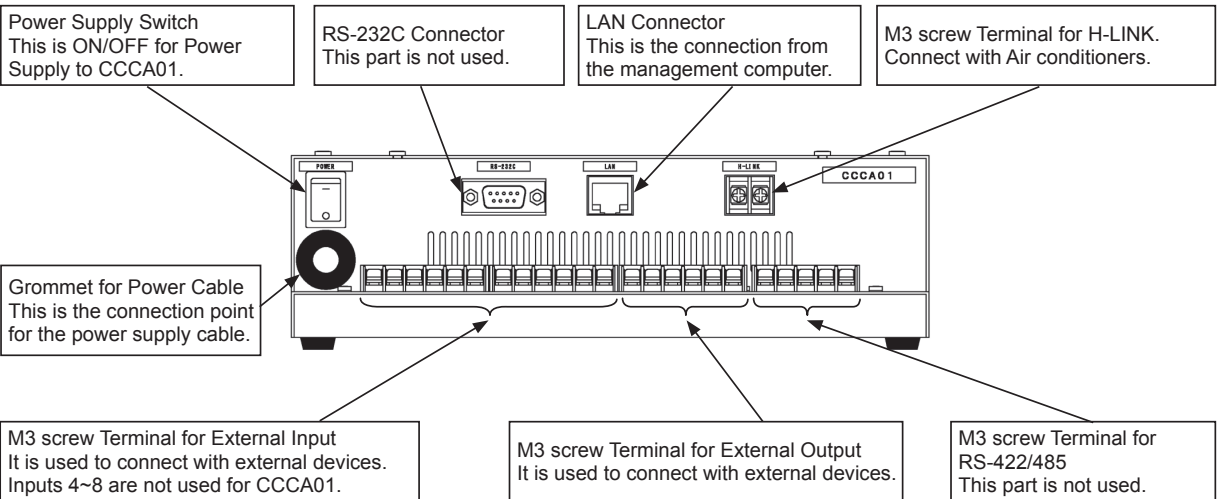


Figure 5.1: Name of Parts (1)



* When turning ON the power supply switch, push “-” mark (upper side). And when turning OFF the power supply switch, push “o” mark (lower side). Please note that as long as power is supplied, CCCA01 is electrically ON even if it is turned OFF.

Figure 5.2: Name of Parts (2)

Table 5.1: LED Indicator for System Condition

Mark	Specification
POWER	Power Supply Indicator (Green)
H-LINK	Indicator flashing when H-LINK Communication (Yellow)
LAN	Indicator lit when LAN link Confirmation and Indicator is flashing during LAN link Communication (Orange).
RS-232C	This indicator is not used.
RS-422/485	This indicator is not used.
ERROR	Indicator lit/flashing when a System Error occurs (Red)

Table 5.2: LED Indicator for LAN Connector

Name	Specification
Indication of Communication Condition	Indicator is lit when LAN link Confirmation and flashing when Communication (Green).
Indication of Communication Speed	Indication is lit when Communication Speed is 100M and is turned OFF when 10M (Yellow).

INSTALLATION

Figure 5.3 shows a CCA01 with the top cover removed. The name of each part is shown below. For connecting method, refer to [7.3 Electric Wiring Connection], and for setting DSW refer to [7.4 Switch Setting Procedure].

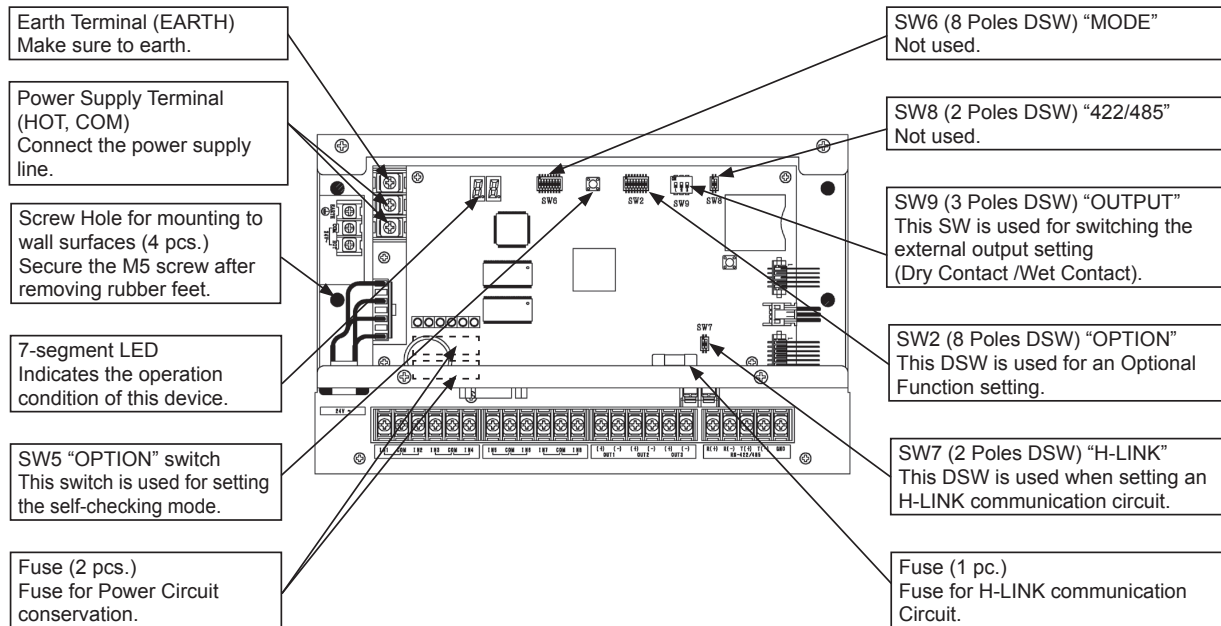


Figure 5.3: Name of Inner Parts

Table 5.3: SW2 "OPTION" Setting upon Startup and 7-segment LED for Condition Display

No.	Setting for SW2 "OPTION"	Condition of Setting	7-Segment LED	Contents of Setting	Application
1	<p>ON 1 2 3 4 5 6 7 8</p>	Pins 1-8 All OFF		Self-Checking Mode	When turning ON the power supply with the setting shown at left, the self-checking will initiate. By setting pins 1-8 and pressing on the SW5 "OPTION" switch, an operation check on each communication port and DSW will be performed.
2	<p>ON 1 2 3 4 5 6 7 8</p>	Only Pin 1 ON		Normal Mode	Only the number 1 pin has been set to ON at the factory. Perform test run with this setting. It will read: "00" after completion of the initialization setting (connection confirmation).

6. Specifications

The hardware specification for CCCA01 is shown in Table 6.1, and the communication specification for H-LINK and for LAN are shown in Tables 6.2 and 6.3.

Table 6.1: Hardware Specification for CCCA01

Item	Specification
Outer Dimension (W x D x H)	9-29/64 x 6-1/16 x 2-43/64 inch (240 x 154 x 68 mm)
Net Weight	3.1lb (1.4kg)
Installation Condition	For Indoor Installation Only Applicable for Horizontal (Stationary) and Vertical (Attached to Wall) Installation.
Rated Power Supply	24VAC \pm 10%, 60Hz
Electrical Power Consumption	10W (Max.)
Ambient Temperature	32-104°F (0-40°C)
Ambient Humidity	20-85% (No Condensation)

Table 6.2: Communication Specification for H-LINK

Item	Specification
Communication Unit	Indoor Unit, Outdoor Unit
Communication Line	Two wires, non polar
Communication Speed	9600 bps
Total Length of Connecting Cable	Total 3281 feet (1000m) (Max.)
Connected Units (Qty.)	Indoor Unit: Max. 160 Units, Outdoor Unit: Max. 64 Units. * Max. 200 Units in total on the single H-LINK.

Table 6.3: Communication specification for LAN (Ethernet)

Item	Specification
Communication Unit	Management Computer
Communication Line	LAN (Ethernet)
Communication Method	IEEE 802.3 (10BASE-T/100BASE-TX)
Total Length of Connecting Cable	328.1 feet (100m) (Max.)

7. Installation Work

In this manual, the installation procedure beginning with CCCA01 installation to start up is described. The installation procedure is shown in Table 7.1. Select on the after checking the item.

Table 7.1: Installation Steps

Step	Item	Check
1	Selection for Installation Place	Note for Installation Place Selection
2	Installation Procedure	Installation Procedure and Note
3	Electrical Wiring Connection	Connection Procedure for Wiring Each Cable
4	Switch Setting Procedure	Each Switch and Setting Procedure
5	Test Run	Check-off

7.1 Selection for Installation Place

Select a compatible location for CCCA01 in the following conditions:

- (1) Refer to the clause “1. Safety Summary” of this installation manual.
- (2) If installing horizontally, it must be on a stable location such as a table/desk.
On the firm wall where CCCA01 can be stably fixed with M5 screws (if installing on the wall, vertically.)

7.2 Installation Procedure

- (1) Create the necessary clearance for the CCCA01 module as shown in Figure 7.1.

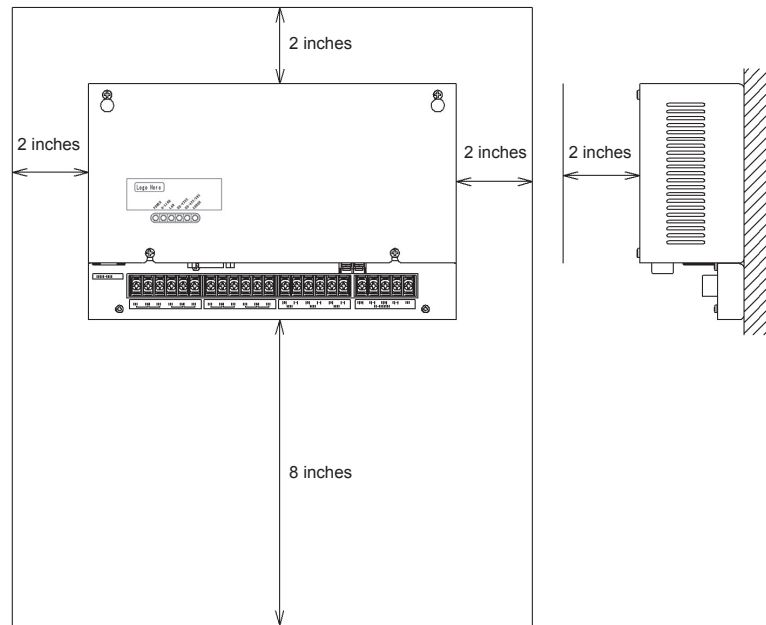


Figure 7.1: Installation Space

□ (2) Vertical Wall Installation

- (a) When installing vertically, install with the terminal block toward the bottom.

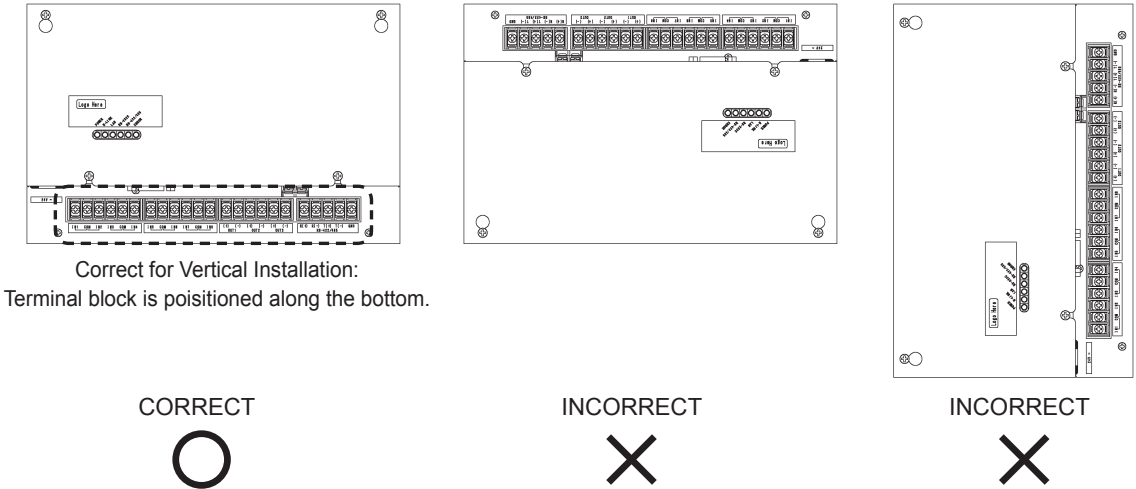


Figure 7.2: Direction for Installing the CCCA01

- (b) Remove all six rubber feet.
- (c) If the heads of the upper cover fastening screws are loosened to about 1/4 inch, you'll be able to remove the top cover.
- (d) Firmly secure the CCCA01 to the wall with four M5 screws (Field-Supplied) from inside the CCCA01.
- (e) Reattach the top cover removed in step three.

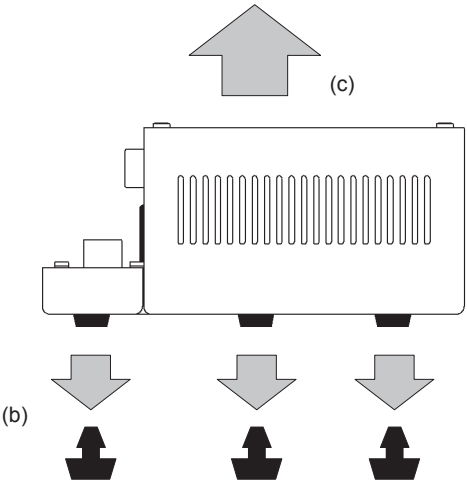


Figure 7.3: Removing Rubber Feet and Top Cover

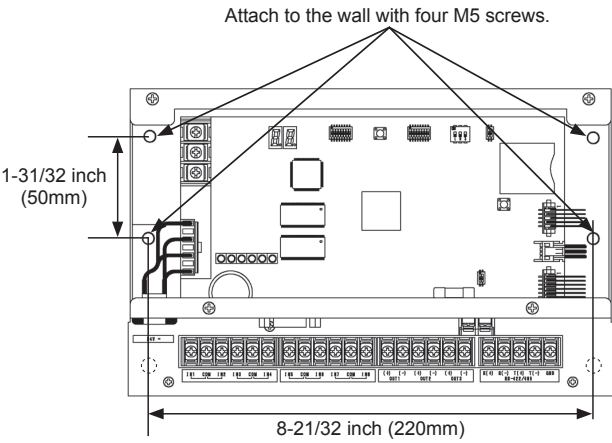
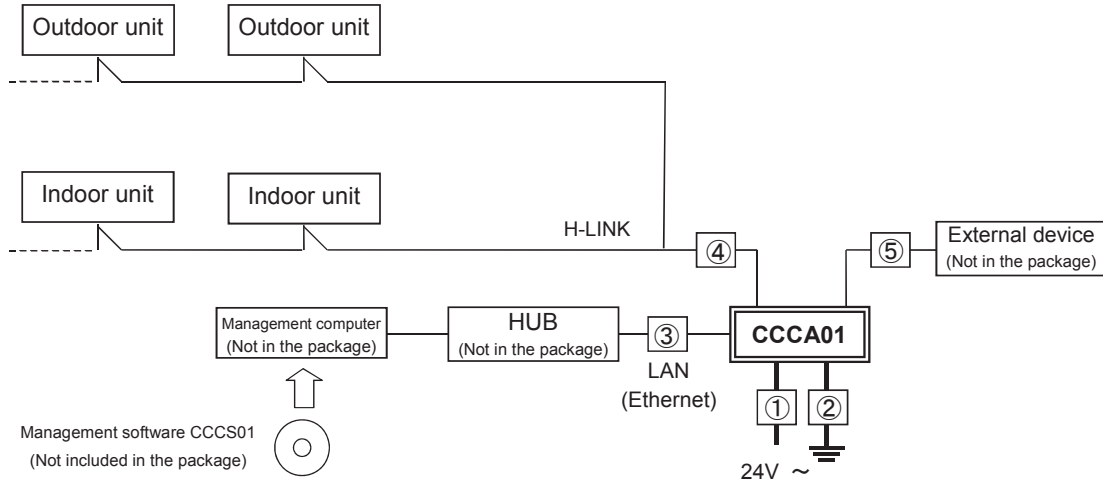


Figure 7.4: Dimensions for M5 Screw Position

7.3 Electrical Wiring Connections

- (1) The following wiring connections are required for this adapter: power wiring, control wiring (H-LINK) to air conditioners, and control wiring (LAN) to the management computer. Wiring for such as the control cables (External Input/Output) to external device is necessary when connecting external devices. Always ensure that the power supply is OFF before attempting this operation.
- (2) Wiring Method



* Management computer, HUB, wires and cables are not in the package. They need to be purchased separately.

Figure 7.5: Wiring Method

Table 7.2: Electrical Wiring Connection Specifications

No.	Type of Wiring	Specification	Length of Wiring	Cable Specification	Recommended Cable Model
①	Power Supply Cable	24VAC	—	AGW 16 (1.25mm ²) to AGW 14 (2mm ²)	CVV, CEV, CCV
②	Earth Wiring	—			
③	LAN Cable	IEEE802.3 Compliance	328.1 feet (100m) ≥	LAN Cable Category 5 or more	
④	H-LINK	5VDC	3281 feet (1000m) ≥	AGW 18 (0.75mm ²) to AGW 16 (1.25mm ²)	JKPEV-S, JKEV-S, CVV-S, CVV 600V VCT
⑤	External I/O	Input :DC24V 5mA Output :DC24V 40mA ≥	1640.5 feet (500m) ≥	AGW 20 (0.5mm ²) to AGW 16 (1.25mm ²)	

- (3) Before making any electrical wiring connections, turn OFF the power supply of the UPS and all other controlling devices.
- (4) To remove the top cover, loosen the four screws securing the cover. If the heads of the upper cover fastening screws are loosened to about 1/4 inch until they float, it will be possible to remove the top cover.

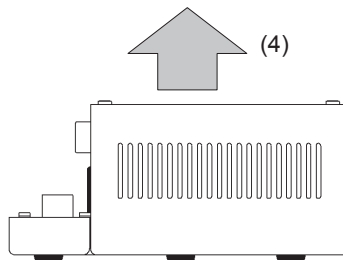
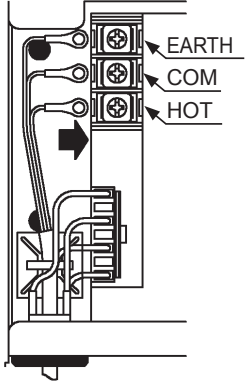
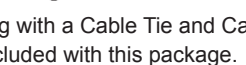


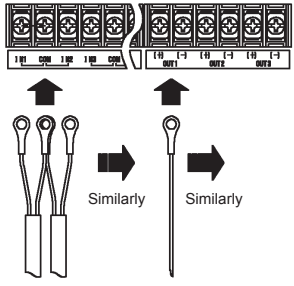


Figure 7.6: Removing Top Cover

- (5) Connect all wiring according to Table 7.3.
The screw sizes for all terminals are M3 and the tightening torque is 0.4lbf-ft. In addition, the item number (shown as No.) in Table 7.3 corresponds to the number in Table 7.2 from the previous page.

Table 7.3: Electrical Wiring Connection Procedures

Type	Other End for connection	No.	Electrical Wiring Connection Procedure	Remarks
Power Line	Power Supply (24V ~)	①	<p>Screw tightening Torque: 0.4lbf-ft</p> 	Connect the power source cable to HOT and COM terminals.
	Earthing	②	 <p>Secure Wiring with a Cable Tie and Cable Tie Mount included with this package.</p>	Connect the earth cable to EARTH terminal.
Communication Cable	Management computer (LAN)	③	 <p>Insert cable until the fitting locks.</p>	Use a straight cable and connect to the management computer by way of a HUB.
	Air conditioners (H-LINK)	④	<p>Non-Polar</p>  <p>Screw tightening Torque: 0.4lbf-ft</p>	Connect the H-LINK communication cable to the H-LINK terminals for the air conditioners.
	External I/O (IN1~3/OUT1~3)	⑤	 <p>Screw tightening Torque: 0.4lbf-ft</p>	<ul style="list-style-type: none"> ● Connect to External Device. ● Terminals IN4~IN8 are not used in this device.

INSTALLATION

NOTICE

Wire the H-LINK cable as short as possible, keep a distance of 6 inches or more with a Power Supply cable and do not wire them in parallel (However in cross line is possible).
If the cables have to run in parallel, insert one of them into a metal conduit tube (with one end earthed) or, perform a procedure to prevent noise such as using shielded cable for H-LINK (with one end earthed).

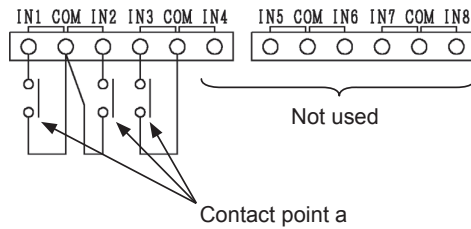
NOTE

Connection with External Device

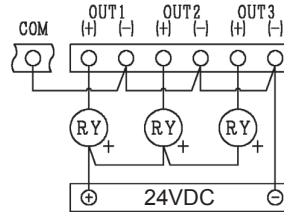
- *1) External input circuit is 24VDC applicable by using the pull-up resistor in CCCA01. The maximum allowable amount of current from the CCCA01 is 5mA. Pulse duration and pulse interval need to be set to 500ms or longer when using external input with pulse input.
- *2) When connecting to external output, apply relay with following specifications.
 - Rated voltage: 24VDC
 - Rated current: 40mA or less
- *3) Turn ON SW9 "OUTPUT" setting when using external output using a wet contact setting (item 3).
- *4) Terminals IN4-IN8 will not be used in this product.

<Sample diagram>

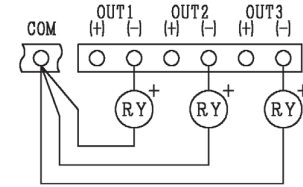
① External Input



② External Output (dry contact setting)



③ External Output (wet contact setting)



Recommended Relay for External Output connection.

- (1) OMRON Corporation Terminal Relay G6D-F4B (24VDC)
- (2) Fuji Electric Terminal Relay RS4N-DE

- (6) Attach the top cover after completing the wiring connection. When attaching the top cover, ensure that the direction of the top cover is correct as shown in Figure 7.7.

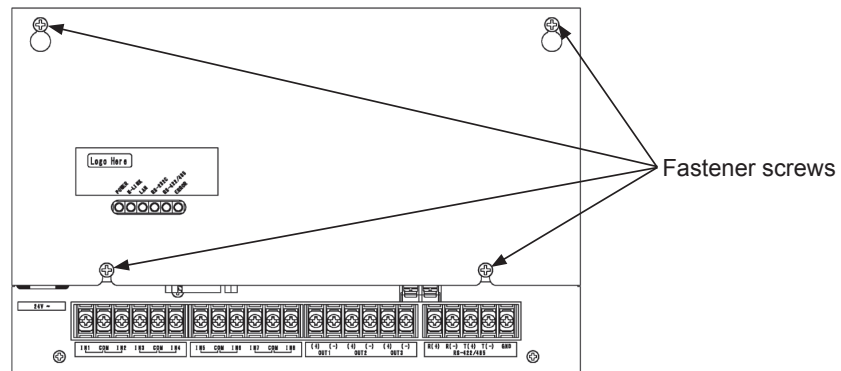


Figure 7.7: Attaching Top Cover

7.4 Switch Setting Procedure

- (1) Set modification of switch before turning ON CCCA01.
 The switch setting is described in the Table 7.4. Some of the switches may require modification as per on si requirement (external output with wet contact setting) arises.

Table 7.4: Switch Setting

Switch		Usage	Factory Setting	Remarks
SW2 (8 poles DSW) "OPTION"	1	ON: Normal Operation Mode OFF: Self-Checking Mode (With all the other Pins OFF)	ON	Refer to [8.2 Self-Checking Mode] for more details.
	2	OFF Fixed	OFF	Do not change it.
	3	OFF Fixed	OFF	Do not change it.
	4	OFF Fixed	OFF	Do not change it.
	5	OFF Fixed	OFF	Do not change it.
	6	OFF Fixed	OFF	Do not change it.
	7	OFF Fixed	OFF	Do not change it.
	8	ON: IP Address Initialization	OFF	Refer to [8.3 Initialization of IP Address Setting].
SW6 (8 poles DSW) "MODE"	1	ON Fixed	ON	Do not change it.
	2	OFF Fixed	OFF	Do not change it.
	3	OFF Fixed	OFF	Do not change it.
	4	OFF Fixed	OFF	Do not change it.
	5	OFF Fixed	OFF	Do not change it.
	6	OFF Fixed	OFF	Do not change it.
	7	OFF Fixed	OFF	Do not change it.
	8	OFF Fixed	OFF	Do not change it.
SW7 (2 poles DSW) "H-LINK"	1	ON: Terminating resistance on H-LINK circuit: Active OFF: Terminating resistance on H-LINK circuit: Inactive	OFF	When activating terminal resistance on this adapter, ensure no other terminal resistance exists on the same H-LINK.
	2	ON: Protection Fuse for H-LINK transmission is available (Short-Circuit) OFF: Protection Fuse for H-LINK transmission is unavailable (Normal)	OFF	Refer to the notice described below.
SW8 (2 poles DSW) "RS-422/485"	1	OFF Fixed	OFF	Do not change it.
	2	OFF Fixed	OFF	Do not change it.
SW9 (3 poles DSW) "External Output"	1	ON: External output 1 Wet Contact (24VDC ON) Setting OFF: External output 1 Dry Contact (24VDC OFF) Setting	OFF	Set ON when applying wet contact setting.
	2	ON: External output 2 Wet Contact (24VDC ON) Setting OFF: External output 2 Dry Contact (24VDC OFF) Setting	OFF	Set ON when applying wet contact setting.
	3	ON: External output 3 Wet Contact (24VDC ON) Setting OFF: External output 3 Dry Contact (24VDC OFF) Setting	OFF	Set ON when applying wet contact setting.
SW5 (PSW) switch "OPTION"		This switch is used for self-checking mode.	--	--

The procedure for setting each switch is as follows:

- (a) Turn OFF the power switch of CCCA01, and remove the top cover after checking that the LED is turned OFF.
- (b) Modify the Switch setting.
- (c) Reinstall the top cover and turn ON the power to CCCA01.

NOTE

In the case that an H-LINK fuse blows, a connection among an H-LINK fuse will be possible by turning ON the pin 2 of SW7.

7.5 Test Run

Turn ON the CCCA01 after the installation of electrical wiring operation, and the switch settings are completed. The CCCA01 will complete startup within approximately one minute to start checking connections.

- (1) Turn all the air conditioners ON. Check that Test Run for each unit is completed to ensure proper operation.
- (2) Turn ON the Power Supply.
- (3) Turn ON the CCCA01.
POWER LED indicator will illuminate.
The CCCA01 will complete start up within approximately one minute to start checking connections. While checking connections, the 7-segment LED will indicate "C0" and ERROR LED will flash every five seconds.
- (4) Wait for completing connection check.
This step will take approximately 20 minutes, the 7-segment LED will indicate "00" and the ERROR LED will be OFF.

Concerning further operations, refer to the installation and operation manual for the management software (CCCS01).

NOTICE

- Before turning the adapter ON, make sure that the insulation resistance between the power terminal and the earth is 1MΩ or more on DC500V. If less than 1MΩ, because there may be an insulation failure, DO NOT turn the power ON.
- Turn the power OFF immediately if you see fire or smoke.

8. Service and Maintenance
















8.1 LED Indicator

In this chapter are described how each of the LED indicators are shown to indicate normal/abnormal conditions.

Table 8.1: Conditions for each LED indicator

LED	Conditions	Condition for LED ON	Condition for LED OFF	Remarks
POWER	Power	- Power ON - In Process of data back up	- Power OFF - After data back up process completion	
H-LINK	H-LINK Communication	- When data is being received on H-LINK - When data is being transmitted on H-LINK	- When data is not being received on H-LINK - When data is not being transmitted on H-LINK	
RS-422/485	RS-422/485 Communication	- When data is being received on RS-422/485 - When data is being transmitted on RS-422/485	- When data is not being received on RS-422/485 - When data is not being transmitted on RS-422/485	Not used
RS-232C	RS-232C Communication	- When data is being received on RS-232C - When data is being transmitted on RS-232C	- When data is not being received on RS-232C - When data is not being transmitted on RS-232C	Not used
LAN	LAN Communication	- Upon establishment of communication on LAN - When data is being received/transmitted on LAN	- When data is not being received/transmitted on LAN	
ERROR	Software in Process	Refer to Table 8.2.		

Table 8.2: Contents and Indication of ERROR LED and 7-segment LED

Condition	Condition for LED ON and its contents	Condition for indicator OFF	ERROR LED	7-Segment LED	Priority for indication
Software Start up Error	Error is detected on the software	No error is detected on the software.	ON		1
Memory Check Error (FlashROM)	Error is detected during FlashROM check	FlashROM Check is properly completed.	ON		2
Checking Memory (FlashROM)	While FlashROM checking	FlashROM Check is completed.	OFF		3
Memory Check Error (SDRAM)	Error is detected during SDRAM check	SDRAM Check is properly completed.	ON		4
Checking Memory (SDRAM)	While SDRAM checking	SDRAM Check is completed.	OFF		5
Memory Check Error (EEPROM)	Error is detected during EEPROM check	EEPROM Check is properly completed.	ON		6
File System Error	Error is detected during file system check	File System Check is properly completed.	ON		7
Application Startup	Immediately after startup of the application by turning the power ON with self check mode or normal mode.	1 second after the condition on the left occurred.	ON for 1 second		8
H-LINK Initialization Error	Error is detected while H-LINK communication port initialization after application startup by turning the power ON.	Initialization of H-LINK Communication port is properly completed.	ON		9
Inner Database Error	Error is detected during inner database check while system initialization after application startup by turning power ON.	Inner data base checking is properly completed.	Repeated ON/OFF for 1 second each		10
System Initialization	While system initialization process after application startup by turning the power ON.	System initialization is completed.	OFF		11
Air Conditioners Connection Check Error	Communication check cannot be completed within 20 minutes after application start up by turning power ON with normal mode setting.	Connection check with air conditioners is completed.	1 time flashing after OFF for 1 second		12
Checking Connection with Air Conditioners	While checking connection with Air Conditioners after application startup by turning power ON with normal mode setting.	Connection check with air conditioners is completed.	1 time flashing after OFF for 5 seconds		13
Air Conditioners Connection Error	Error is detected in communication with one or more air conditioners after connection checking.	Communication with all detected air conditioners is in a stable state.	1 time flashing after OFF for 3 seconds		14
In Proper Operation*	None of the above meets the condition of the adapter after application startup by turning power ON with normal/self-checking mode setting.	Condition of this adapter meets one or more conditions above.	OFF		15

Refer to Table 8.5: Troubleshooting.





















* After indicating “C0” for checking connection, the 7-segment LED will display “00” upon entering the normal operation state. If one or more air conditioners identified on previous connection verification are not detected in the current status check (upon recovery from power failure), “0E” will be displayed on the 7-segment LED indicating a connection error after displaying “00” for three minutes.

8.2 Self-Checking Mode

In this section is described the procedure for checking each function item in self-checking mode.

- (1) Turn OFF the power to the CCCA01.
- (2) Remove all cables and wiring connected to the CCCA01, air conditioners, management computer and other external devices.
- (3) Set all pins for SW2 "OPTION" OFF, and turn the power ON. (Refer to Item number one in Table 5.3)
- (4) Self-checking will be initiated. (Check if the 7-segment LED is indicating self-checking mode in Table 5.3)
- (5) Check each function by switching pin settings for SW2 "OPTION" as shown in Table 8.3.
- (6) Each check procedure will start upon pressing down the SW5 "OPTION" switch after setting the SW2 "OPTION".
- (7) Upon completing self-checking, turn the power to the CCCA01 OFF, and set the SW2 "OPTION" as set before self-checking, and turn ON CCCA01.

Table 8.3: DSW Setting and Checking Contents in Self-Checking Mode

No.	SW2 "OPTION" DSW Setting	Setting Condition	7-Segment LED Display			Checking Item	Description
			Beginning	Normal	Error detected		
1		Pin 1 and 2 ON				H-LINK Communication	Check the communication status on H-LINK
2		Only Pin 3 ON				Ethernet Communication	Check the communication status on Ethernet. Select the IP Address of this device 192.168.0.3 then check.
3		Pin 1, 2 and 3 ON				SW2 "OPTION" Read	Check if SW2 "OPTION" is read correctly. After starting diagnosis, turn all Pins OFF, then turn them ON one after another (1 Pin ON→1 Pin OFF→2 Pin ON→2 Pin OFF...8 Pin ON→8 Pin OFF). If 30 seconds after starting diagnosis, all Pins don't illuminate, 7E will be displayed.
4		Only Pin 4 ON				SW5 "MODE" Read	Check if SW5 "MODE" is read correctly. After starting diagnosis, turn all Pins OFF, then turn them ON one after another (1 Pin ON→1 Pin OFF→2 Pin ON→2 Pin OFF...8 Pin ON→8 Pin OFF). If 30 seconds after starting diagnosis, all Pins don't illuminate, 8E will be displayed.
5		Pin 2 and 4 ON				LED light Check	Check if the LED and 7-segment LED are illuminating correctly.

*1: When performing the Read check for DSW, take note of the setting condition to be able to return to the original condition.

*2: Do not perform any self-checking with any setting other than specified above.

8.3 Initialization of IP Address Setting

In case you forget the IP Address which has been changed, in [Settings] > [Network register] from the management software in normal mode, it is possible to restore it to the factory setting (default setting).

Factory-Setting (Default value)

IP address : 192.168.0.3
 Subnet mask : 255.255.255.0
 Default gateway : 192.168.0.1

<Procedure>

- (1) Remove the top cover of the adapter and set Pin 8 of the SW2 "OPTION" as shown in the figure below.
 * In normal operation mode, Pin 1 is already ON. Set Pin 8 to ON.



- (2) Wait for the 7-segment LED to display the indication below.



- (3) Turn the Power OFF and check that all the LED indicators are turned OFF. Switch SW2 "OPTION" Pin 8 to OFF, then turn the Power ON again and reinstall the top cover of the CCCA01.
- (4) Set IP address from [Settings] > [Network register] in the management software (CCCS01) again.

8.4 Periodic Check

To maintain the healthy operation of the air conditioning control system, periodically check the following items:

- (1) Environment
 - Ensure that the temperature of the CCCA01 is not abnormally or extremely high.
 - Ensure that the ambient temperature, where the CCCA01 is located, is not abnormally high.
 - Ensure that the CCCA01 is kept free of dust, debris and wire clippings.
- (2) Display
 - Ensure that the POWER LED is ON.
 - Ensure that the ERROR LED display indicates normal operation.
 - Ensure that the H-LINK LED and the LAN LED indications are normal.
 - Ensure that the 7-segment LED is indicating "00".
- (3) Installing
 - Ensure that the screws are properly tightened and fastened.
 - Ensure that all wires are correctly connected.

NOTICE

- Because this adapter is equipped with the POWER Back-up function, even if the Power to the device is turned OFF, the POWER LED light may continue to illuminate for a moment. Check that POWER LED light is OFF before performing any more work.
- In the case that a fault has occurred accompanied by flames or smoke, turn the Power OFF immediately.
- DO NOT perform any modifications to the inner electronics of the adapter. It will cause a malfunction.

8.5 Troubleshooting

This chapter describes methods for troubleshooting. Do not proceed unless the power is turned OFF.

Table 8.4: Troubleshooting

No.	Condition	Check Items	Action						
1	The CCCA01 does not operate even after turning the power ON.	Is the power line connected to the CCCA01?	Connect power line to the CCCA01. Ensure that the power supply to the UPS is OFF before doing any wiring.						
		Is the power supply for the UPS ON?	Turn the power of UPS back ON.						
		Is the power to the CCCA01 turned ON?	Turn the power of the CCCA01 back ON.						
		Is the supplied voltage adequate?	Measure the power voltage. If the value is out of the range of 24VAC±10%, check the writing and wiring method.						
		Are both power fuses in proper condition?	Replace with new fuses if they are blown.						
		Is POWER LED illuminated?	There can be a defect in the CCCA01 if the POWER LED is not illuminated without meeting conditions described above. Contact your distributor or dealer.						
		Does ERROR LED and/or 7-Segment LED show one of the following?	The CCCA01 module could be defective. Contact your distributor or dealer.						
		<table border="1"> <tr> <td>ERROR LED</td> <td>7-Segment LED</td> </tr> <tr> <td>ON</td> <td>E0/E1/E2/E5/E6/HE</td> </tr> <tr> <td>Repeated ON/OFF for 1 second each</td> <td>tE</td> </tr> </table>	ERROR LED	7-Segment LED	ON	E0/E1/E2/E5/E6/HE	Repeated ON/OFF for 1 second each	tE	
ERROR LED	7-Segment LED								
ON	E0/E1/E2/E5/E6/HE								
Repeated ON/OFF for 1 second each	tE								
2	The CCCA01 does not complete connection check.	Is H-LINK wiring connected to the CCCA01?	Connect H-LINK wiring to the CCCA01.						
		Is the setting for terminal resistance on the H-LINK wiring adequate?	Use single terminal resistance on H-LINK wiring.						
		Is the address setting for the air conditioners consistent?	Modify the address setting according to the installation and operation manual of air conditioner.						
		Is H-LINK wiring connected properly?	Ensure that all wiring is properly completed.						
		Are all air conditioners connected to the CCCA01 turned ON?	Turn ON all the air conditioners connected to the CCCA01.						
		Is the specified cable (refer to Table 7.2) in use?	Use the following cable: - Recommended Size: AGW18~16 - Total length: 3281 feet (Max)						
		Does ERROR LED and/or 7-Segment LED show one of the following?	Wait for completing connection checks. If the 7-segment LED shows "CE", which indicates a communication error, then check the wiring and address setting to perform the connection check again.						
				<table border="1"> <tr> <td>ERROR LED</td> <td>7-Segment LED</td> </tr> <tr> <td>One flashing per 5 seconds</td> <td>CO</td> </tr> </table>	ERROR LED	7-Segment LED	One flashing per 5 seconds	CO	
ERROR LED	7-Segment LED								
One flashing per 5 seconds	CO								
		Is the H-LINK LED remained ON/OFF?	<ul style="list-style-type: none"> - Check if the H-LINK wiring is correctly connected. - If the H-LINK circuit protection fuse is blown, after clearing the fault, set Pin 2 ON SW7 "H-LINK". - If the condition does not meet the conditions described above, there can be a defect in the adapter. Contact your distributor or dealer. 						

Table 8.4 Troubleshooting (Continuous)

No.	Condition	Check Items	Action			
3	The CCCA01 does not connect with the management computer.	Is the LAN cable connected to CCCA01?	Connect LAN cable to CCCA01. Check the connector fit.			
		Is the LAN cable connected to the management computer?	Connect LAN cable to the management computer. Check the connector fit.			
		Is the IP address of CCCA01 specified in CCCS01 in the management computer?	The default IP address is 192.168.0.3. Adapt the default address by following Clause 8.3 when the modified address is lost.			
		Is the power of HUB ON?	Turn the HUB ON.			
		Is LAN wiring using the specified method (refer to Table 7.2) ?	Use the following cable. - Category 5 or more - Total length: 328.1 feet or less Use the straight cable and connect to the management computer via HUB.			
		Does the LAN wiring appear to be in normal condition? (This is to mean, is there any unusual wear or damage?)	Replace with new Cable.			
		Is the management computer in normal condition?	Replace with new computer.			
		Does the LAN cables run in close proximately to the power cable?	Maintain a distance of at least 6 inches between the LAN cable and the power source cables.			
		Is the LAN LED OFF?	If the management computer and LAN wiring appear in the normal condition, there could be a defect in CCCA01. Contact your distributor or dealer.			
		Is there an incorrect DSW (DIP Switch) setting?	If DSW setting was modified, check again by referring to Table 7.4.			
4	Air conditioners cannot be controlled by management computer (CCCS01).	Does the ERROR LED and/or 7-Segment LED show one of the following ?	Communication is not properly established. Check the wiring connection for air conditioners and H-LINK.			
		<table border="1" style="width: 100%;"> <tr> <td style="width: 50%;">ERROR LED</td> <td style="width: 50%;">7-Segment LED</td> </tr> <tr> <td>One flashing per 3 seconds</td> <td>OE</td> </tr> </table>		ERROR LED	7-Segment LED	One flashing per 3 seconds
		ERROR LED	7-Segment LED			
		One flashing per 3 seconds	OE			
		Are all of air conditioners connected to CCCA01 turned ON?	Turn ON all of air conditioners connected to CCCA01.			
		Is the setting for terminal resistance on H-LINK wiring adequate?	Use single terminal resistance on H-LINK wiring.			
		Is the address setting of the air conditioners consistent?	Modify address setting according to the installation and operation manual of air conditioner.			
		Is H-LINK wiring connected properly?	Check H-LINK wiring connection.			
		Is H-LINK wiring running along the power line?	Maintain a distance of at least 6 inches between the H-LINK wiring and the power cable from the main power source.			
		Is the specified cable (refer to Table 7.2) in use?	Use the following cable: - Recommended Size: AWG 18~16 - Total length: 3281 feet (Max)			
Does the H-LINK LED remain OFF?	Check H-LINK wiring connection.					
Does the H-LINK LED remain ON?	There could be a defect in the CCCA01. Contact your distributor or dealer.					

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1.5 Optional Parts

1.5.1 For Outdoor Unit

- Table of Contents -

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 - Protection Net (Right): PN-TP10R.....1-735
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- 1.5.1.3 Snow Protection Hood.....1-741
 - Snow Protection Hood (Upper): ASG-TP20FAS1, ASG-TP20FBS11-741
 - Snow Protection Hood (Rear): ASG-TP20BAS1, ASG-TP20BBS11-749
 - Snow Protection Hood (Right): ASG-TP20RS2.....1-755
 - Snow Protection Hood (Left): ASG-TP20LS21-761

1.5.1.1 Drain Adaptor: DBS-TP10A

This drain adaptor is for the drain pipe connection in order to enable use of the outdoor unit bottom base as a drain pan.

Install it as follows.

IMPORTANT NOTICE:

- Read and understand this manual before using this drain adaptor.
- Perform the test run after installation to check for abnormalities.
- Forward this information to the building owner and request that they maintain all the equipment manuals.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

CAUTION : Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

1. Applicable Outdoor Unit

Applicable Outdoor Unit	Capacity
Top Flow Type	72,000 to 120,000 Btu/h

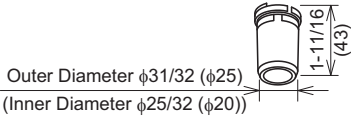


NOTE:

The applicable outdoor unit may be different depending on the product series. Be sure to confirm with the product catalog before installation.

2. Before Installation

Check that all the following accessories are packed with the unit before installation.

Unit: inch (mm)

No.	Accessory	Qty.	Remarks
①	Drain Adaptor (VP20 Equivalent)  Outer Diameter φ31/32 (φ25) Inner Diameter φ25/32 (φ20)	2	Connecting for Drain Piping
②	Rubber Cap 	4	Fixing for ① Adaptor and ③ Cap
③	Drain Cap 	2	Plug for Drain Hole

3. Installation Work

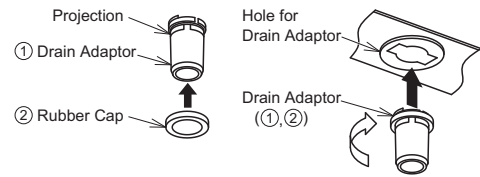
CAUTION

Place the outdoor unit on a flat foundation or block and secure it at least 3-15/16 inch (100mm) higher than the ground. For smooth drainage, install the outdoor unit with a slight incline on the drainage side (rear side).

3.1 Installation of Drain Adaptor

The drain adaptor is for the drain pipe connection so as to use the outdoor unit bottom base as a drain pan.

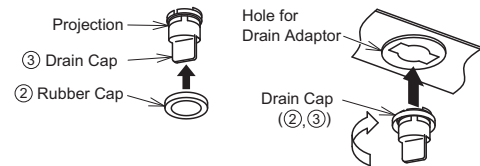
- (1) Put the ② rubber cap in the ① drain adaptor (to the upper part of the drain adaptor projection) in the direction of the arrow.
- (2) Put the drain adaptor in the hole for the drain adaptor of the outdoor unit bottom base until it is securely fixed. (approx. 40°)
(The drain adaptor can be fit into the bottom base until it stops.)



3.2 Installation of Drain Cap

The drain cap is a component to cover a hole.

- (1) Put the ② rubber cap in the ③ drain cap (to the upper part of the drain adaptor projection) in the direction of the arrow.
- (2) Put the drain cap in the hole for the drain adaptor of the outdoor unit bottom base until it is securely fixed. (approx. 40°)
(The drain cap can be fit into the bottom base until it stops.)

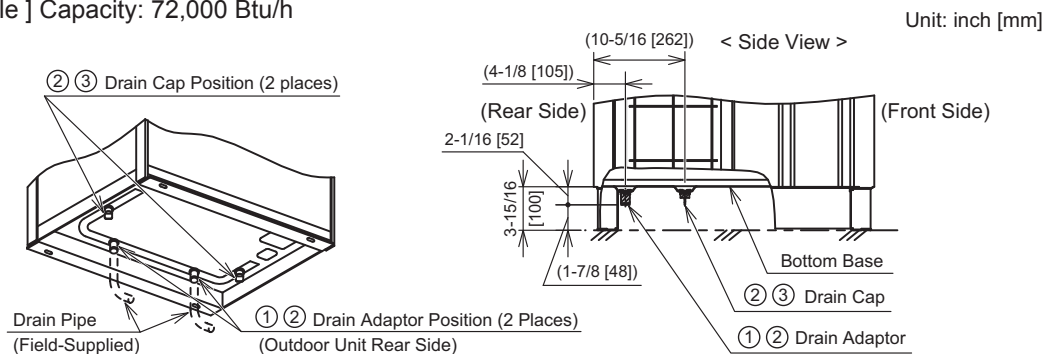


CAUTION

Use a rubber cap when fixing the drain adaptor and drain cap. (No rubber cap may lead to water leakage.) After fixing, ensure that there is no water leakage from the drain cap by pouring water into the bottom base and then draining it from the drain adaptor.

< Installation Position >

[Example] Capacity: 72,000 Btu/h



CAUTION

Securely fix the drain adaptor, rubber cap and drain cap at the bottom base so it doesn't become loose when connecting the drain pipe.

4. Utilization in Cold Area

CAUTION

Do not use the drain adaptor in an area where drain water may be frozen.
(The drain water in the drain pipe may be frozen and then the drain pipe may crack.)

- (1) In a snow area, water from the heat exchanger may be frozen on the surface of the bottom base. This may lead to poor drainage. Therefore, do not use the drain adaptor in this type of area.
- (2) In the drainage method according to this manual, some of the defrost drain water dripped from the inlet protection grille may flow out over the bottom base of the product.
To prevent this, provide a drain pan larger than the bottom surface of the product. Secure the drain pan and the discharge pipe between the bottom part of the product and the foundation prior to discharge.

1.5.1.2 Protection Net

• Protection Net (Rear): PN-TP10BA, PN-TP10BB

This protection net is to protect the outdoor unit heat exchanger from external damages such as being hit by a ball. Install it as instructed in this manual.

IMPORTANT NOTICE:

- Read and understand this manual before using this protection net.
- Perform the test run after installation to check for abnormalities.
- Forward this information to the building owner and request that they maintain all the equipment manuals.
- Signal words are used to identify levels of hazard seriousness.
Definitions for identifying hazard levels are provided below with their respective signal words.



: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

1. Applicable Unit

Name	Protection Net (for Rear Side Installation)	
Model	PN-TP10BA	PN-TP10BB
Required Qty.	1	1
Applicable Outdoor Unit	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h

NOTE:

The applicable outdoor unit may be different depending on the product series. Be sure to confirm with the product catalog before installation.

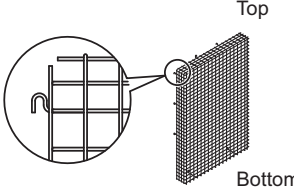

2. Installation Work

- (1) Be sure to securely tighten the protection net with the supplied screws (accessories).
If the screws are not securely tightened, it may cause vibration or abnormal sound.
If they are over-tightened, the screw thread will be broken. When tightening the screws, make sure to follow the tightening torque below.
 - Tightening Torque (M5 Screw): 1.8±0.7 ft•lbs (2.5±1.0 N•m)
- (2) Apply touch-up coating at the screw holes of the outdoor unit in order to prevent rusting (field-supplied).
- (3) Secure enough service space with consideration for attaching/detaching the protection net.
 - Service Space with Protection Net: Service Space for Outdoor Unit + Min. 5-7/8 inch (150mm)
- (4) Do not step on the protection net or the outdoor unit to prevent falls resulting in injury.
- (5) Fallen leaves or some other objects may be caught by the protection net and piled up. Be sure to check for accumulation and clean the protection net periodically.
- (6) The protection net may freeze because of cold weather.
- (7) It is not possible to use the snow protection hood for the rear side inlet and air outlet at the same time.

3. Before Installation

Check that all the following accessories are packed with the unit before installation.

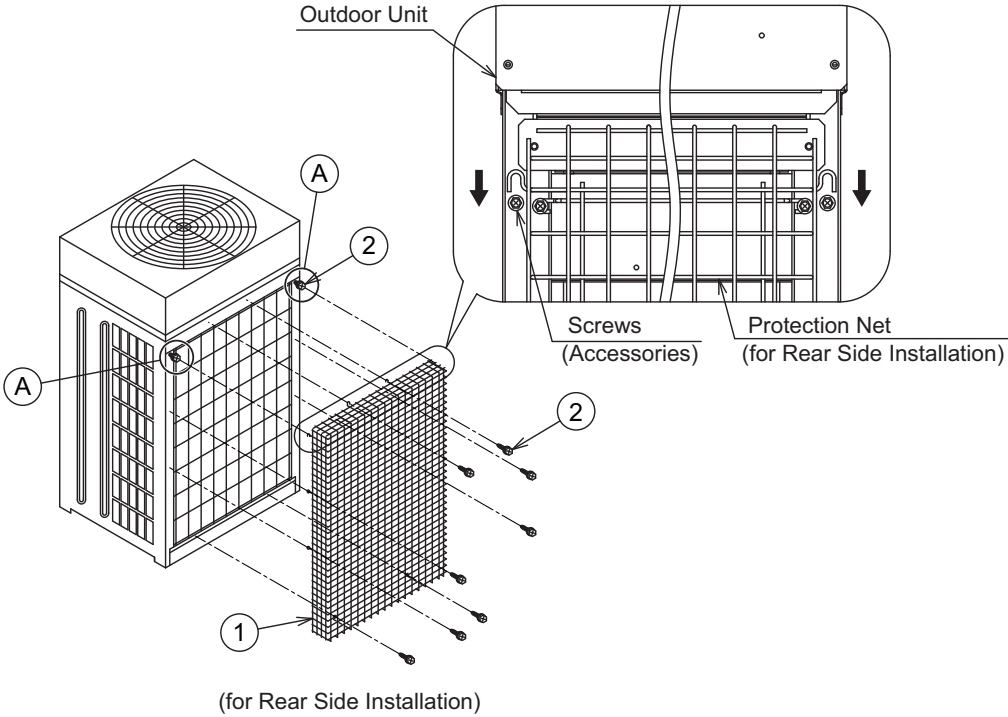
Unit: inch (mm)

No.	Accessory	Qty.		Remarks
		PN-TP10BA	PN-TP10BB	
①	Protection Net (for Rear Side Installation) <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;">  </div>	1	1	
②	Screw <div style="display: flex; align-items: center; justify-content: center; margin-top: 10px;">  <div style="margin-left: 10px;"> M5 x 15/32L (12L) (with Washer) </div> </div>	11 (1)	11 (1)	(1): Spare

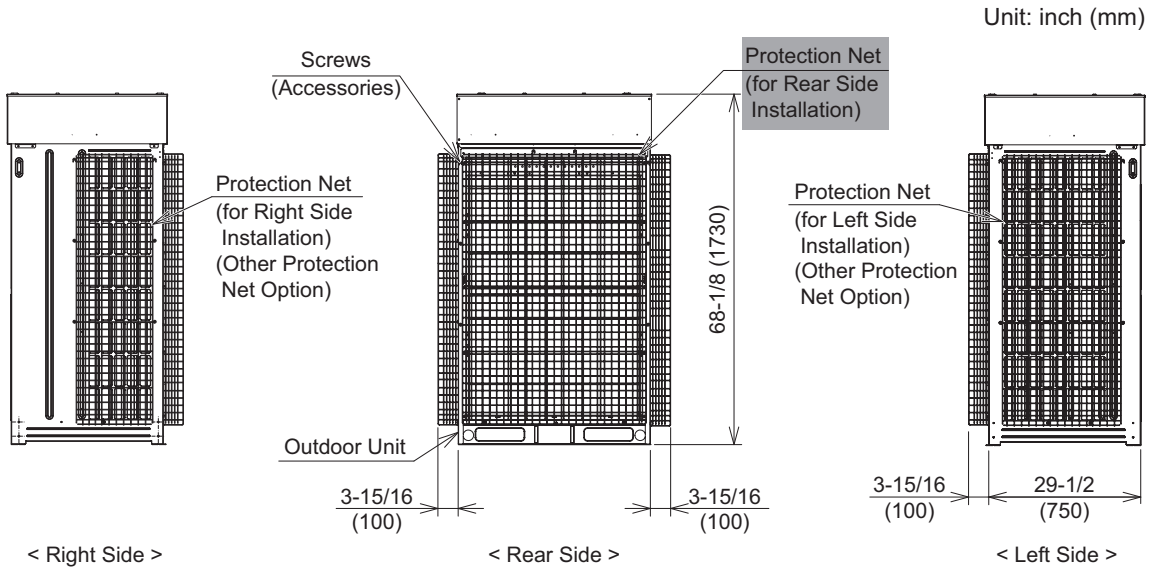
4. Installation Procedures

Before installation, confirm the outdoor unit model. If the protection net is available to install, follow the installation procedures.

- (1) Tighten loosely two screws ② at the top of the outdoor unit rear side (A), and set the protection net (for rear side installation) ① over the top. Securely tighten the other eight screws ② except for the top (A) two screws, and finally, tighten the top (A) two screws securely.



5. Installation Appearance



Available Combinations

Applicable Outdoor Unit	Model	
	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h
Protection Net for Rear Side	PN-TP10BA	PN-TP10BB
Protection Net for Left Side	PN-TP10L	
Protection Net for Right Side	PN-TP10R	

NOTES:


- This installation manual applies only to the combination indicated with . For other protection net options, refer to each installation manual.
- Install the required protection net depending on the installation condition.

● **Protection Net (Right): PN-TP10R**

This protection net is to protect the outdoor unit heat exchanger from external damages such as being hit by a ball. Install it following the instructions below.

IMPORTANT NOTICE:

- Read and understand this manual before using this protection net.
- Perform the test run after installation to check for abnormalities.
- Forward this information to the building owner and request that they maintain all the equipment manuals.
- Signal words are used to identify levels of hazard seriousness.
Definitions for identifying hazard levels are provided below with their respective signal words.

 CAUTION	: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
--	---

1. Applicable Unit

Name	Protection Net (for Right Side Installation)
Model	PN-TP10R
Required Qty.	1
Applicable Outdoor Unit	Top Flow Type 72,000 to 120,000 Btu/h

NOTE:

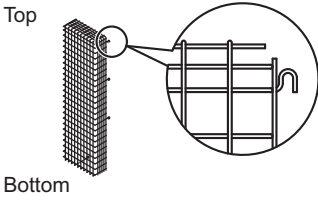

The applicable outdoor unit may be different depending on the product series. Be sure to confirm with the product catalog before installation.

2. Installation Work

- (1) Be sure to securely tighten the protection net with the supplied screws (accessories).
If the screws are not securely tightened, it may cause vibration or abnormal sound.
If they are over-tightened, the screw thread will be broken. When tightening the screws, make sure to follow the tightening torque below.
 - Tightening Torque (M5 Screw): 1.8±0.7 ft•lbs (2.5±1.0 N•m)
- (2) Apply touch-up coating at the screw holes of the outdoor unit in order to prevent rusting (field-supplied).
- (3) Secure enough service space with consideration for attaching/detaching the protection net.
 - Service Space with Protection Net: Service Space for Outdoor Unit + Min. 5-7/8 inch (150mm)
- (4) Do not step on the protection net or the outdoor unit in order to prevent a fall resulting in injury.
- (5) Fallen leaves or some other objects may be caught by the protection net and piled up. Be sure to check for accumulation and clean the protection net periodically.
- (6) The protection net may freeze in cold weather.
- (7) It is not possible to use the snow protection hood along with a right side inlet.

3. Before Installation

Check that all the following accessories are packed with the unit before installation.

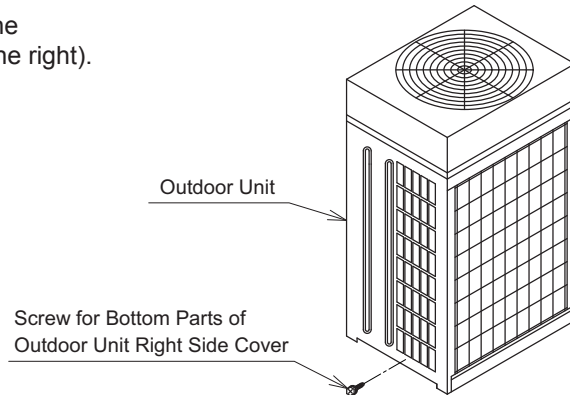
No.	Accessory	Qty.		Remarks
		PN-TP10R		
①	Protection Net (for Right Side Installation)		1	
②	Screw	 M5 x 15/32L (12L) (with Washer)	8 (1)	(1): Spare

Unit: inch (mm)

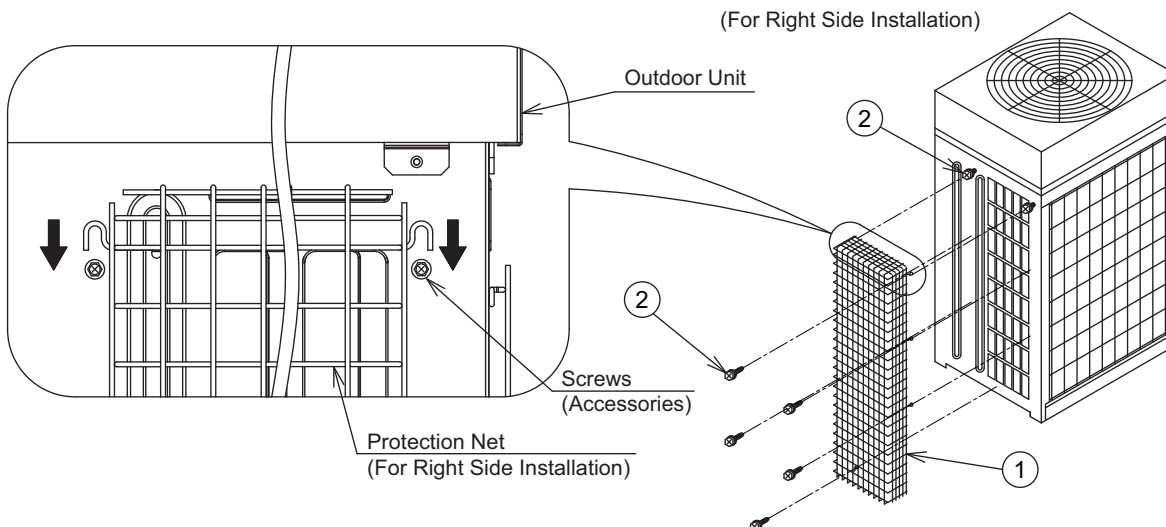
4. Installation Procedures

Before installation, confirm the outdoor unit model. If the protection net is available to install, follow the installation procedures.

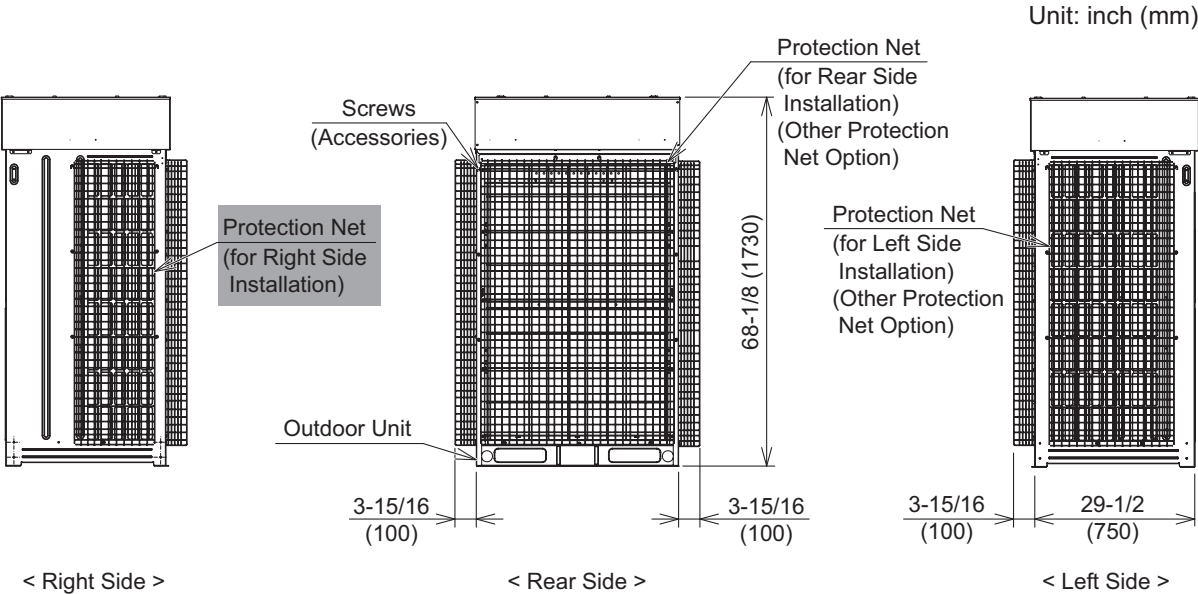
- (1) Remove the one screw for the bottom parts of the outdoor unit right side cover (see the figure on the right).



- (2) Tighten loosely two screws ② at the top of the outdoor unit right side, and set the protection net (for right side installation) ① over the top. Securely tighten the other five screws ② except for the top two screws, and finally, tighten the top two screws securely.



5. Installation Appearance



Available Combinations

Applicable Outdoor Unit	Model	
	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h
Protection Net for Rear Side	PN-TP10BA	PN-TP10BB
Protection Net for Left Side	PN-TP10L	
Protection Net for Right Side	PN-TP10R	

NOTES:

- This installation manual applies only to the combination indicated with .
For other protection net options, refer to each installation manual.
- Install the required protection net depending on the installation condition.

● **Protection Net (Left): PN-TP10L**

This protection net is to protect the outdoor unit heat exchanger from external damages such as being hit by a ball. Install it following the directions below.

IMPORTANT NOTICE:

- Read and understand this manual before using this protection net.
- Perform the test run after installation to check for abnormalities.
- Forward this information to the building owner and request that they maintain all the equipment manuals.
- Signal words are used to identify levels of hazard seriousness.
Definitions for identifying hazard levels are provided below with their respective signal words.

CAUTION : Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

1. Applicable Unit

Name	Protection Net (for Left Side Installation)
Model	PN-TP10L
Required Qty.	1
Applicable Outdoor Unit	Top Flow Type 72,000 to 120,000 Btu/h

NOTE:

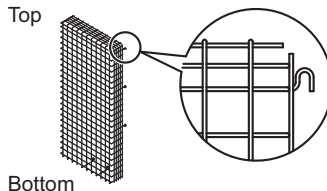

The applicable outdoor unit may be different depending on the product series. Be sure to confirm with the product catalog before installation.

2. Installation Work

- (1) Be sure to securely tighten the protection net with the supplied screws (accessories).
If the screws are not securely tightened, it may cause vibration or abnormal sound.
If they are over-tightened, the screw thread will be broken. When tightening the screws, make sure to follow the tightening torque below.
 - Tightening Torque (M5 Screw): 1.8±0.7 ft•lbs (2.5±1.0 N•m)
- (2) Apply touch-up coating at the screw holes of the outdoor unit in order to prevent rusting (field-supplied).
- (3) Secure enough service space with consideration for attaching/detaching the protection net.
 - Service Space with Protection Net: Service Space for Outdoor Unit + Min. 5-7/8 inch (150mm)
- (4) Do not step on the protection net or the outdoor unit in order to prevent falls resulting in injury.
- (5) Fallen leaves or some other objects may be caught by the protection net and piled up. Be sure to check for accumulation and clean the protection net periodically.
- (6) The protection net may freeze in cold weather.
- (7) It is not possible to use the snow protection hood along with the left side inlet.

3. Before Installation

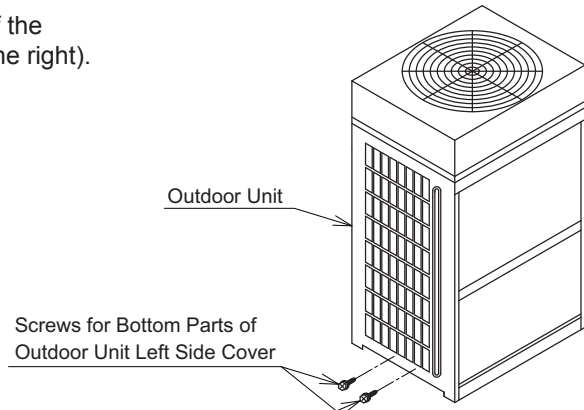
Check that all the following accessories are packed with the unit before installation.

No.	Accessory	Unit: inch (mm)	
		Qty.	Remarks
①	Protection Net (for Left Side Installation) <div style="text-align: center; margin-top: 10px;">  </div>	1	
②	Screw <div style="text-align: center; margin-top: 10px;">  </div> M5 x 15/32L (12L) (with Washer)	9 (1)	(1): Spare

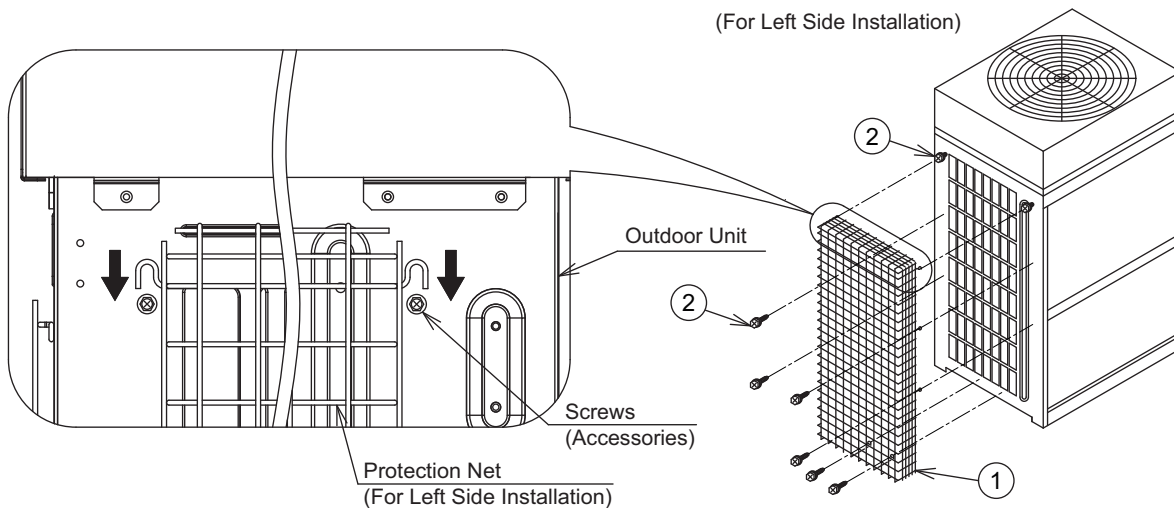
4. Installation Procedures

Before installation, confirm the outdoor unit model. If the protection net is available to install, follow the installation procedures.

- (1) Remove the two screws for the bottom parts of the outdoor unit left side cover (see the figure on the right).

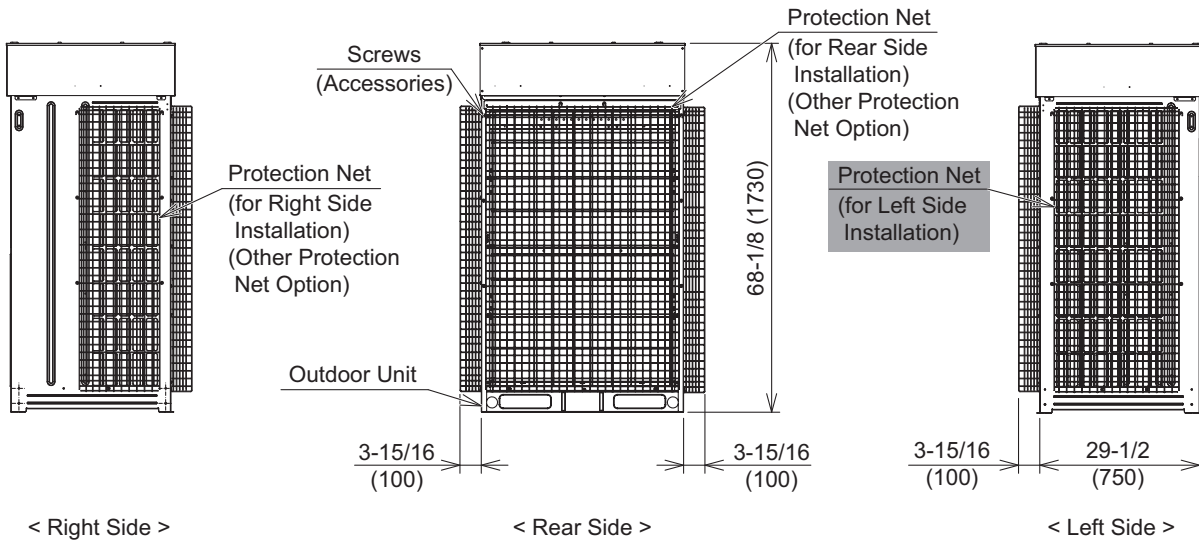


- (2) Tighten loosely two screws ② at the top of the outdoor unit left side, and set the protection net (for left side installation) ① over the top. Securely tighten the other six screws ② except for the top two screws, and finally, tighten the top two screws securely.



5. Installation Appearance

Unit: inch (mm)



Available Combinations

Applicable Outdoor Unit	Model	
	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h
Protection Net for Rear Side	PN-TP10BA	PN-TP10BB
Protection Net for Left Side	PN-TP10L	
Protection Net for Right Side	PN-TP10R	

NOTES:

- This installation manual applies only to the combination indicated with .
For other protection net options, refer to each installation manual.
- Install the required protection net depending on the installation condition.

1.5.1.3 Snow Protection Hood

• Snow Protection Hood (Upper): ASG-TP20FAS1, ASG-TP20FBS1

This snow protection hood prevents snow from entering the outdoor unit and to prevent strong winds from blowing against the heat exchanger. Be sure to read this manual carefully for correct performance before installation work.

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- Keep this manual for future reference.
- Johnson Controls cannot anticipate every possible circumstance that might involve a potential hazard.
- This kit is designed for a combination of Johnson Control air conditioners. Do not use this kit by itself or in combination with other companies' air conditioners.
- To hold the snow protection hood properly to the outdoor unit against the strong wind or earthquake, stay or safety wire rope shall be used for reinforced installation. Use the field-supplied safety wire rope to prevent outdoor unit from overturning.
- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.



: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

1. Applicable Unit

Name	Hood for Air Outlet	
Model	ASG-TP20FAS1	ASG-TP20FBS1
Applicable Outdoor Unit	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h

NOTE:

The applicable outdoor unit may be different depending on the product series. Be sure to confirm with the product catalogue before installation.

2. Installation Work

- (1) After the snow protection hood is installed, electromagnetic noise at the air outlet side may slightly increase. Therefore, it is necessary to carefully consider the air discharge direction when installed.
- (2) Be sure to tighten the snow protection hood securely to the top panel and side panel of the outdoor unit with the supplied screws (accessories). Not doing so may cause vibration or abnormal noise.
- (3) There must be no obstacles in the air discharge direction of the snow protection hood. If there are, it may cause a short circuit or an insufficient airflow rate.
- (4) Do not install other outdoor units in the direction of air outlet. If the air blown out of the snow protection hood is sucked into the other outdoor unit, it may cause of a malfunction of the unit.
- (5) The wind loads which the outdoor unit receives changes by attaching the snow protection hood. The required installation strength will also change in strong wind. Therefore, recheck the strength of the anchor bolts of the outdoor unit.
- (6) If the snow protection hood is installed, cooling/heating performance may be slightly lowered depending on the usage conditions.

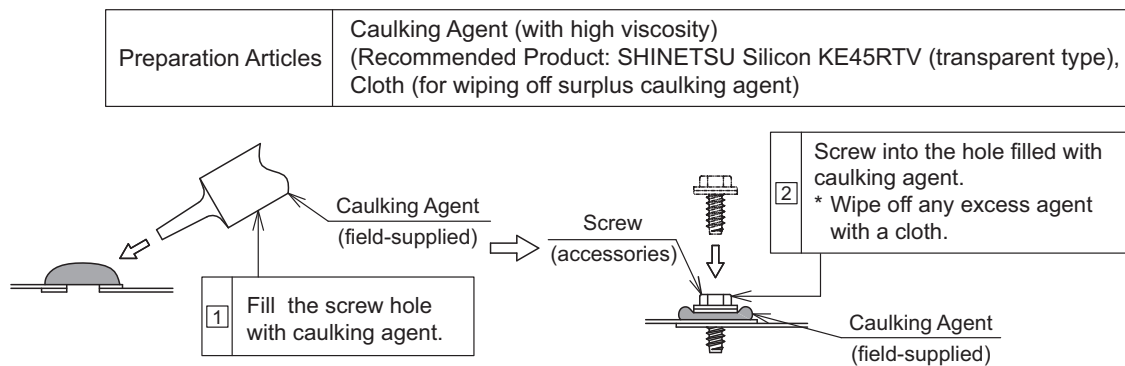
⚠ WARNING

To hold the snow protection hood properly to the outdoor unit against a strong wind or an earthquake, safety wire rope should be used for reinforced installation. Use the field-supplied safety wire rope to prevent the outdoor unit from overturning.

⚠ CAUTION

- Install the snow protection hood so as to avoid facing directly toward seasonal or strong winds.
- Apply touch-up coating or caulking (field-supplied) at the screw holes of the outdoor unit in order to prevent rusting.
- Even though the hood is stainless, salt or iron may cause rust. Be aware of this during installation or maintenance.
- The snow protection hood is heavy-weight. More than two people are required for installation. Be sure to wear protective equipment (such as gloves).
- The screws and the snow protection hood must be protected from scratches or scrapes. If they aren't, it may be the cause of rusting. Handle with care when the snow protection hood is installed and assembled.

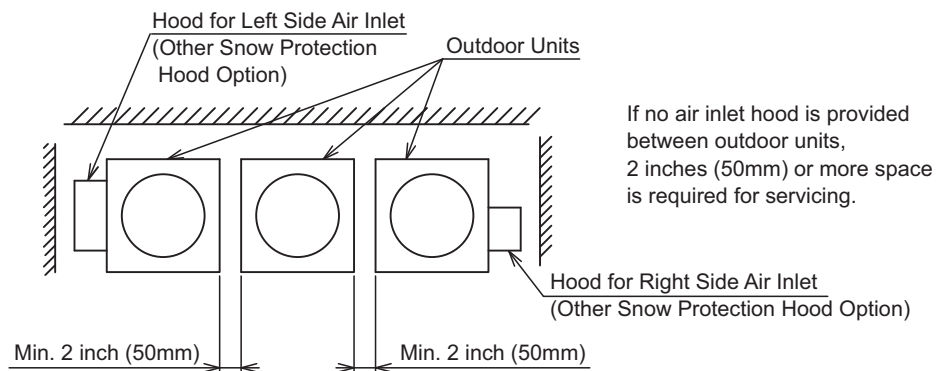
< Caulking Procedures (Example) >



3. Selection of Installation Location

- (1) Install the outdoor unit at the suitable height with consideration for snow accumulation. Increase the base height or additionally provide the frame under the unit (higher than snow accumulation), and fix the outdoor unit securely with anchor bolts.
- (2) Secure enough service space with consideration for snow accumulation height and snow removal operation.
- (3) There must be no obstacles in the air discharge direction.
- (4) Be sure to apply touch-up coating or caulking agent at the screw attaching portions for rustproofing.
- (5) In case of multiple outdoor units installation, provide the service space as shown below.



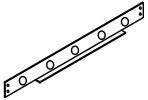
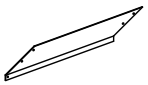
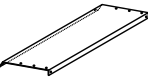
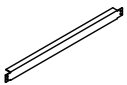







< Service Space for Multiple Outdoor Units Installation >



4. Before Installation

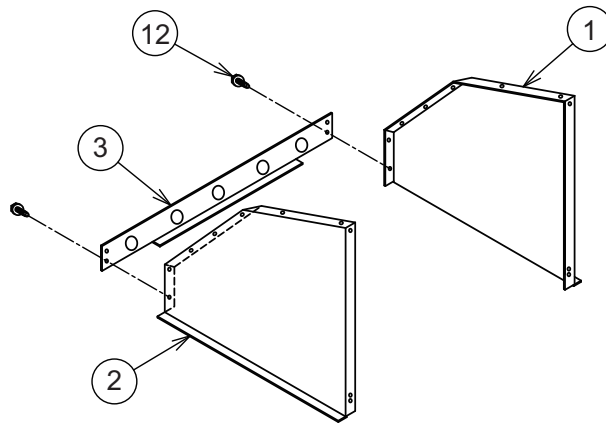
Check that all the following accessories are packed with the unit before installation.

Unit: inch (mm)

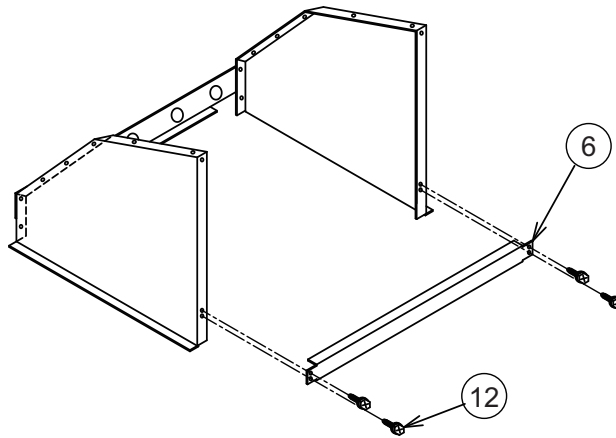
No.	Accessory	Qty.		Remarks
		ASG-TP20FAS1	ASG-TP20FBS1	
①	Right Side Plate 	1	1	
②	Left Side Plate 	1	1	
③	Faceplate (1) 	1	1	
④	Faceplate (2) 	1	1	
⑤	Faceplate (3) 	1	1	
⑥	Horizontal Plate 	1	1	
⑦	Fixing Plate for Left Side (Front Side) 	1	1	
⑧	Fixing Plate for Left Side (Rear Side) 	1	1	
⑨	Fixing Plate for Right Side (Front Side) 	1	1	
⑩	Fixing Plate for Right Side (Rear Side) 	1	1	
⑪	Screw (for Installation)  M5 x 15/32L (12L) (tapping screw type B)	10 (2)	10 (2)	For installation: accepting burring TP hole (2): Spare
⑫	Screw (for Assembling)  M5 x 9/16L (14L) (tapping screw type C)	34 (2)	36 (2)	For installation: accepting weld nut (2): Spare
⑬	Drill Screw  M4 x 1/2L (13L)	2	2	For prepared hole

5. Installation Procedures

- (1) Set the faceplate (1) (3) with its protruding part on the inside, and fix it with the right side plate (1) and left side plate (2) together (two places) by using screws for assembling (12).



- (2) Tighten the horizontal plate (6) (in four places) by using screws for assembling (12).

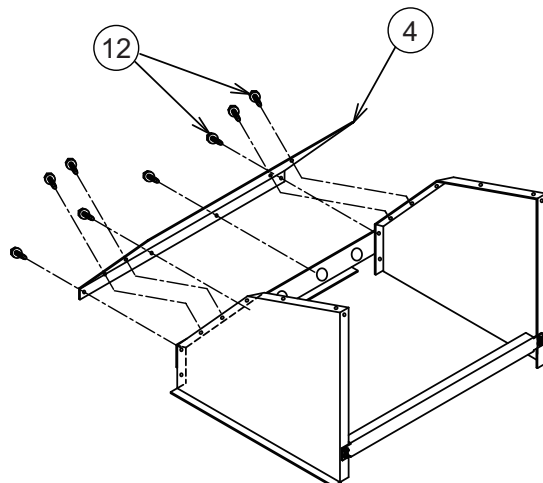


- (3) Tighten the faceplate (three pieces) (4) by using screws for assembling (12).

[Screws for Assembling (12)]

ASG-TP20FAS1: 7 places

ASG-TP20FBS1: 8 places

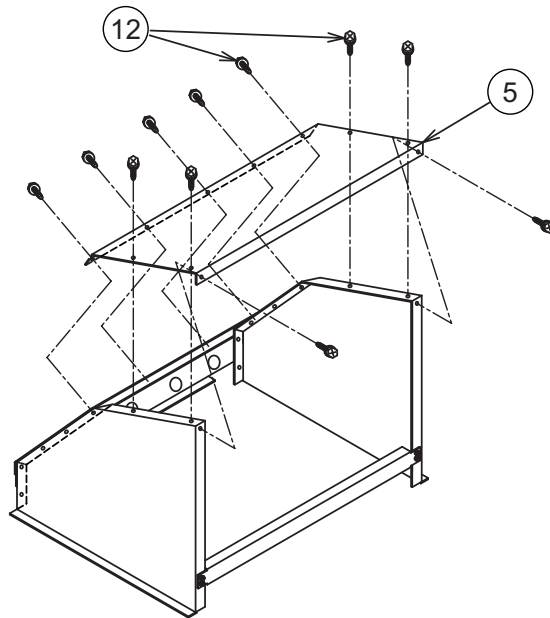


(4) Tighten the faceplate (3) (5) by using screws for assembling (12).

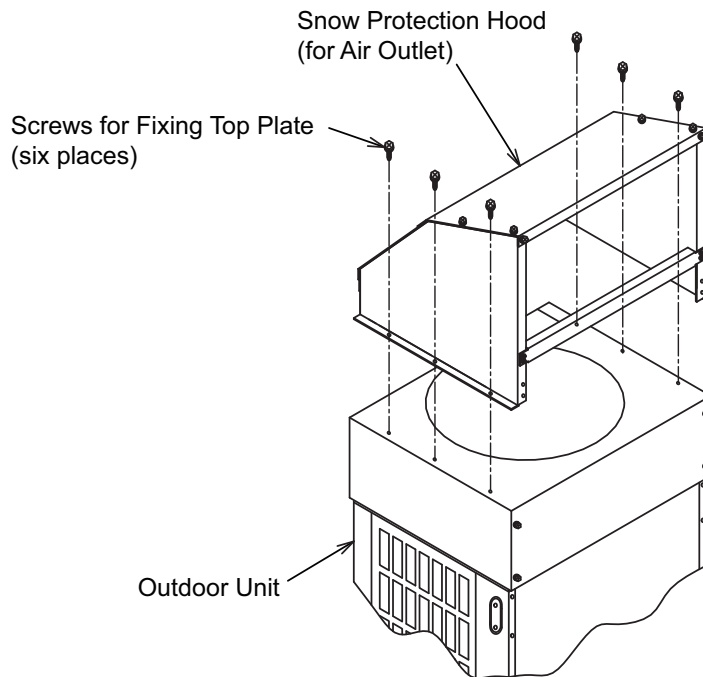
[Screws for Assembling (12)]

ASG-TP20FAS1: 11 places

ASG-TP20FBS1: 12 places

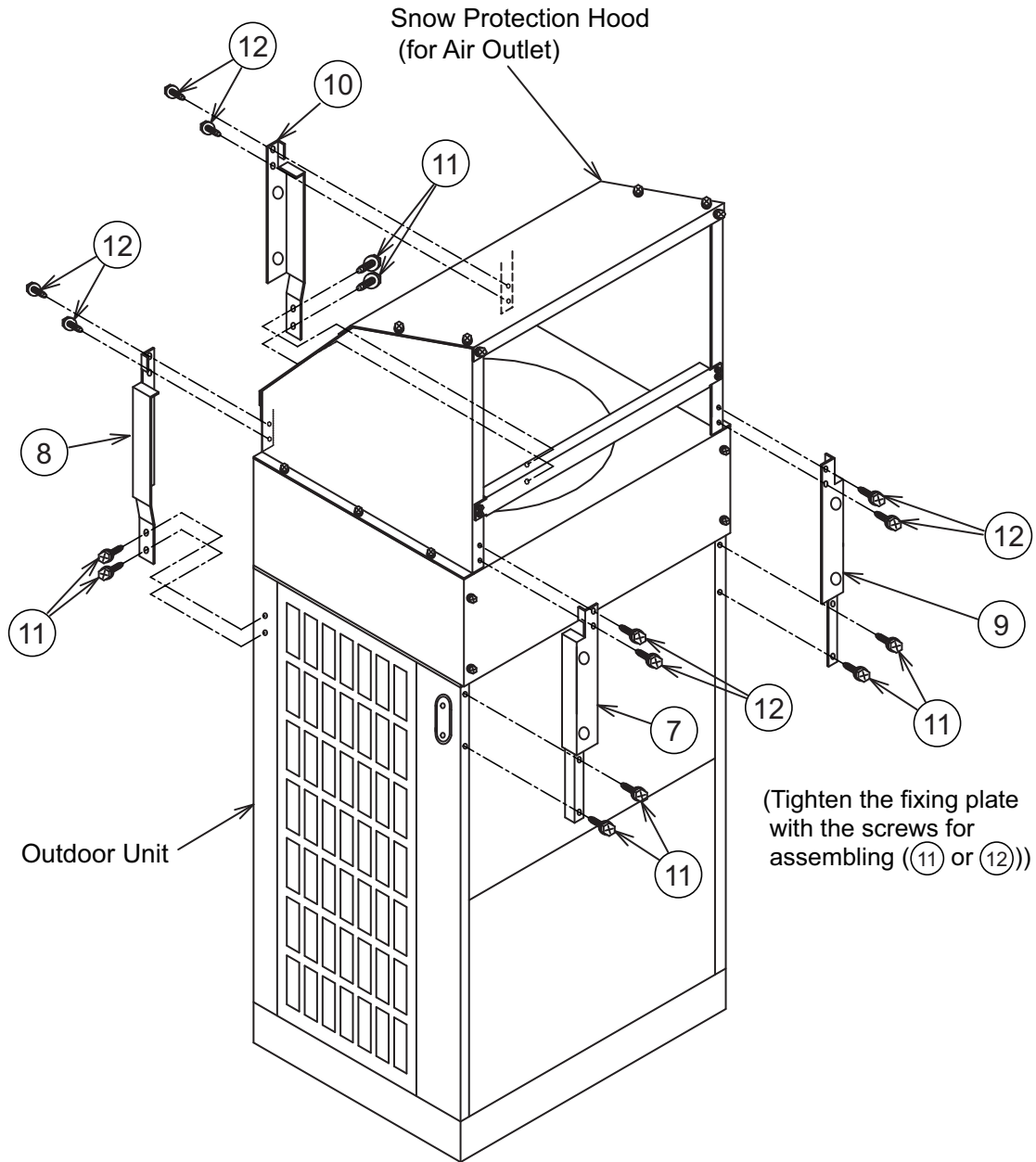


(5) Remove the screws for securing the outdoor unit top plate (six places), then secure the snow protection hood (for the air outlet) with those removed screws.



INSTALLATION

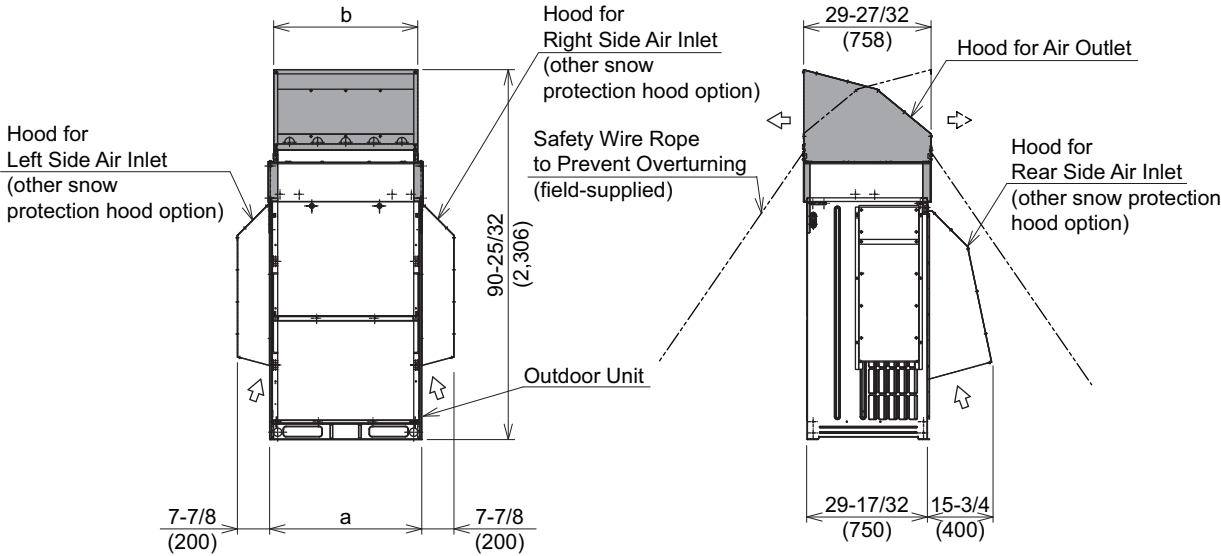
- (6) Tighten the fixing plate for the left side (front side) (7), fixing plate for the left side (rear side) (8), fixing plate for the right side (front side) (9), fixing plate for the right side (rear side) (10) with the screws for assembling (16 places) (11) or (12). Use the screws in specified positions as shown in the figure.



6. Installation Appearance

Unit: inch (mm)

Dimension	a	b
Applicable Outdoor Unit		
Top Flow Type 72,000 Btu/h	37-5/16 (948)	35-11/32 (898)
Top Flow Type 96,000 and 120,000 Btu/h	47-5/8 (1,210)	45-19/32 (1,158)



Available Combinations

Applicable Outdoor Unit	Model	
	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h
Hood for Air Outlet	ASG-TP20FAS1	ASG-TP20FBS1
Hood for Rear Side Air Inlet	ASG-TP20BAS1	ASG-TP20BBS1
Hood for Left Side Air Inlet	ASG-TP20LS2	
Hood for Right Side Air Inlet	ASG-TP20RS2	

NOTE:
 This installation manual applies only to the combination indicated with .
 For other snow protection hood options, refer to each installation manual.

7. Maintenance and Servicing

Even if during the warranty period, the snow protection hood becomes rusted under conditions that are caused by alkaline or corrosive moisture, recommendations are to provide salt damage resistance products to prevent such damage. In order to prolong the product life, perform periodical maintenance to prevent significant aging due to deterioration. Carry out the following periodical inspection and maintenance works in conjunction with air conditioners' inspection.

(1) Red Rust Generation and Coating Film Check

If red rust is generated, or coating film is peeled/cracked, scour the rust off or apply touch-up coating. When recoating such parts, be sure to grind the coating using sandpaper (#180 to 230) before re-applying coating agent. Wear protective equipment such as vinyl gloves when handling the coating agent to prevent contact with skin.

(2) Retightening Screws for Installation and Assembly

Check for loose screws and retighten when inspection and maintenance is performed. In order to prevent screw breakage, be sure to tighten with the following torques:

* M5 Tapping Screw Type C for Assembling ⑫: 2.6 ± 0.7 [lbf-ft] (3.5 ± 1.0 [N•m])

* M5 Tapping Screw Type B for Installation ⑪: 1.8 ± 0.7 [lbf-ft] (2.5 ± 1.0 [N•m])

● **Snow Protection Hood (Rear): ASG-TP20BAS1, ASG-TP20BBS1**

This snow protection hood prevents snow from entering the outdoor unit and prevents strong winds from blowing against the heat exchanger. Be sure to read this manual carefully for correct performance before installation work.

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- Johnson Controls cannot anticipate every possible circumstance that might involve a potential hazard.
- This kit is designed for a combination of Johnson Control air conditioners. Do not use this kit by itself or in combination with other companies' air conditioners.
- To hold the snow protection hood properly to the outdoor unit against the strong wind or earthquake, stay or safety wire rope shall be used for reinforced installation. Use the field-supplied safety wire rope to prevent outdoor unit from overturning.
- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.



WARNING

: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



CAUTION

: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

1. Applicable Unit

Name	Hood for Rear Side Air Inlet	
Model	ASG-TP20BAS1	ASG-TP20BBS1
Applicable Outdoor Unit	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h

NOTE:

The applicable outdoor unit may be different depending on the product series. Be sure to confirm with the product catalogue before installation.

2. Installation Work

- (1) After the snow protection hood is installed, electromagnetic noise at the air outlet side may slightly increase. Therefore, it is necessary to carefully consider the air discharge direction when installed.
- (2) Be sure to tighten the snow protection hood securely to the top panel and side panel of the outdoor unit with the supplied screws (accessories). Not doing so may cause vibration or abnormal noise.
- (3) There must be no obstacles in the air discharge direction of the snow protection hood. If there are, it may cause a short circuit or an insufficient airflow rate.
- (4) Do not install other outdoor units in the direction of the air outlet. If the air blown out of the snow protection hood is sucked into the other outdoor unit, it may cause a malfunction of the unit.
- (5) The wind loads which the outdoor unit receives changes by attaching the snow protection hood. The required installation strength will also change in strong wind. Therefore, recheck the strength of the anchor bolts of the outdoor unit.
- (6) If the snow protection hood is installed, cooling/heating performance may be slightly lowered depending on the usage conditions.

INSTALLATION

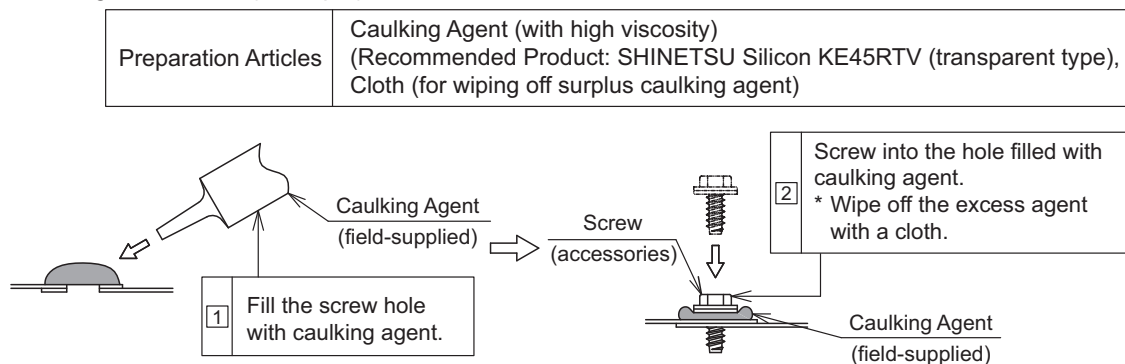
⚠ WARNING

To hold the snow protection hood properly to the outdoor unit against a strong wind or an earthquake, safety wire rope should be used for reinforced installation. Use the field-supplied safety wire rope to prevent the outdoor unit from overturning.

⚠ CAUTION

- Install the snow protection hood so as to avoid facing directly toward seasonal or strong winds.
- Apply touch-up coating or caulking (field-supplied) at the screw holes of the outdoor unit in order to prevent rusting.
- Even though the hood is stainless, salt or iron may cause rust. Be aware of this during installation or maintenance.
- The snow protection hood is heavy-weight. More than two people are required for installation. Be sure to wear protective equipment (such as gloves).
- The screws and the snow protection hood must be protected from scratches or scrapes. If they aren't, it may be the cause of rusting. Handle with care when the snow protection hood is installed and assembled.

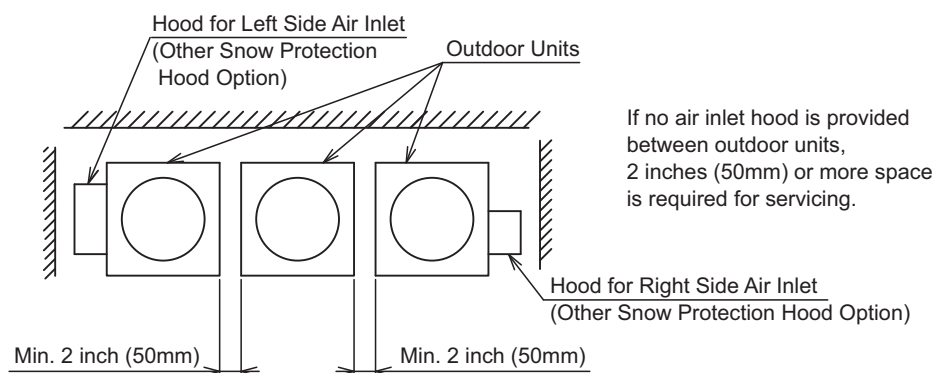
< Caulking Procedures (Example) >



3. Selection of Installation Location

- (1) Install the outdoor unit at a suitable height with consideration for snow accumulation. Increase the base height or additionally provide the frame under the unit (higher than snow accumulation), and fix the outdoor unit securely with anchor bolts.
- (2) Secure enough service space with consideration for snow accumulation height and snow removal operation.
- (3) There must be no obstacles in the air discharge direction.
- (4) Be sure to apply touch-up coating or caulking agent at the screw attaching portions for rustproofing.
- (5) In an instance of multiple outdoor units being installed, provide service space as shown below.



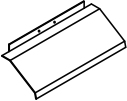



< Service Space for Multiple Outdoor Units Installation >



4. Before Installation

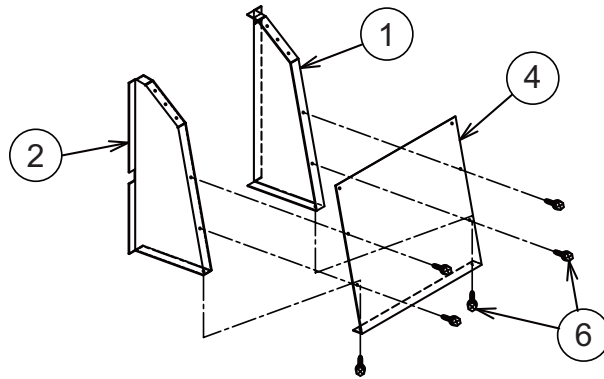
Check that all the following accessories are packed with the unit before installation.

Unit: inch (mm)

No.	Accessory		Qty.		Remarks
			ASG-TP20BAS1	ASG-TP20BBS1	
①	Right Side Plate		1	1	
②	Left Side Plate		1	1	
③	Faceplate (Top Side)		1	1	
④	Faceplate (Back Side)		1	1	
⑤	Screw (for Installation)	 M5 x 15/32L (12L) (tapping screw type B)	8 (2)	8 (2)	For installation: accepting burring TP hole (2): Spare
⑥	Screw (for Assembling)	 M5 x 9/16L (14L) (tapping screw type C)	17 (2)	18 (2)	For installation: accepting weld nut (2): Spare

5. Installation Procedures

- (1) Assemble the faceplate for the back side (④) with the right side plate (①) and left side plate (②), and tighten by using six screws for assembling (⑥).

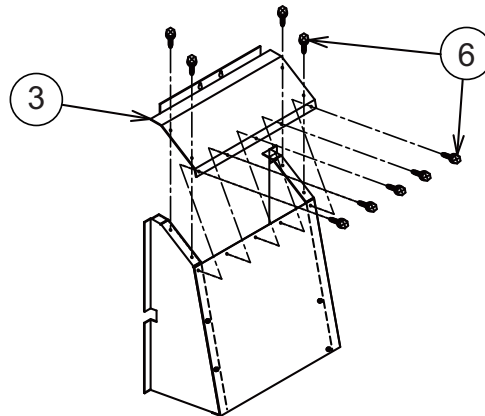


- (2) Fix the faceplate for the top side by tightening with screws for assembling.

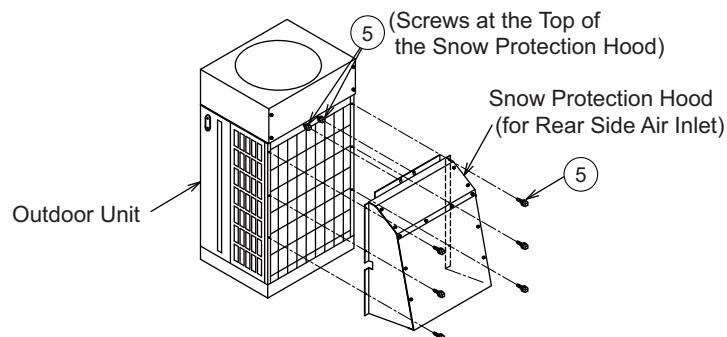
[Screws for Assembling (⑥)]

ASG-TP20BAS1: 9 places

ASG-TP20BBS1: 10 places



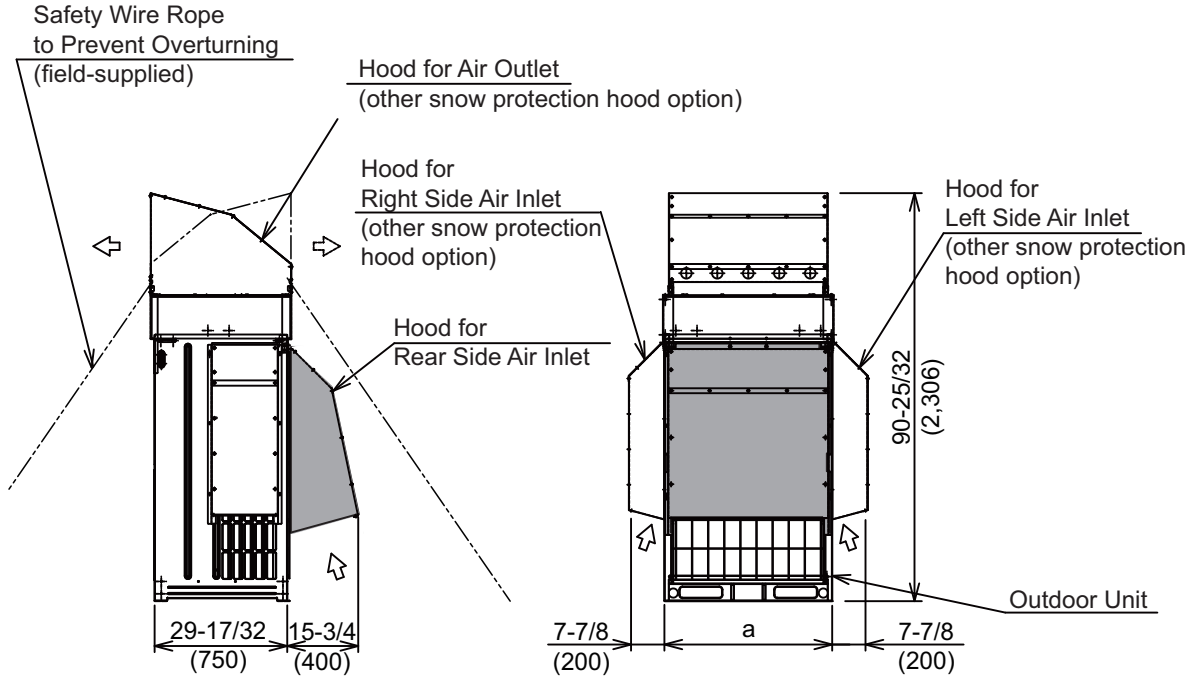
- (3) Tighten loosely two screws (for installation) at the top of the snow protection hood (⑤) to the outdoor unit, and set the snow protection hood (for rear side air inlet) to the outdoor unit. Tighten the other six screws (⑤) except for the top two screws, and finally tighten the top two screws securely.



6. Installation Appearance

Unit: inch (mm)

Dimension	a
Applicable Outdoor Unit	
Top Flow Type 72,000 Btu/h	37-5/16 (948)
Top Flow Type 96,000 and 120,000 Btu/h	47-5/8 (1,210)



Available Combinations

Applicable Outdoor Unit	Model	
	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h
Hood for Air Outlet	ASG-TP20FAS1	ASG-TP20FBS1
Hood for Rear Side Air Inlet	ASG-TP20BAS1	ASG-TP20BBS1
Hood for Left Side Air Inlet	ASG-TP20LS2	
Hood for Right Side Air Inlet	ASG-TP20RS2	

NOTE:

This installation manual applies only to the combination indicated with . For other snow protection hood options, refer to each installation manual.

7. Maintenance and Servicing

Even if during the warranty period, the snow protection hood becomes rusted under conditions that are caused by alkaline or corrosive moisture, recommendations are to provide salt damage resistance products to prevent such damage.

In order to prolong product life, perform periodical maintenance to prevent significant aging due to deterioration. Carry out the following periodical inspection and maintenance works in conjunction with air conditioners' inspection.

(1) Red Rust Generation and Coating Film Check

If red rust is generated, or coating film is peeled/cracked, scour the rust off or apply touch-up coating. When recoating such parts, be sure to grind the coating using sandpaper (#180 to 230) before re-applying coating agent. Wear protective equipment such as vinyl gloves when handling the coating agent to prevent contact with skin.

(2) Retightening Screws for Installation and Assembly

Check for loose screws and retighten when inspection and maintenance is performed. In order to prevent screw breakage, be sure to tighten with the following torques:

* M5 Tapping Screw Type C for Assembling ⑥: 2.6 ± 0.7 [lbf-ft] (3.5 ± 1.0 [N•m])

* M5 Tapping Screw Type B for Installation ⑤: 1.8 ± 0.7 [lbf-ft] (2.5 ± 1.0 [N•m])

● **Snow Protection Hood (Right): ASG-TP20RS2**

This snow protection hood prevents snow from entering the outdoor unit and prevents strong winds from blowing against the heat exchanger. Be sure to read this manual carefully for correct performance before installation work.

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- Keep this manual for future reference.
- Johnson Controls cannot anticipate every possible circumstance that might involve a potential hazard.
- This kit is designed for a combination of Johnson Control air conditioners. Do not use this kit by itself or in combination with other companies' air conditioners.
- To hold the snow protection hood properly to the outdoor unit against the strong wind or earthquake, stay or safety wire rope shall be used for reinforced installation. Use the field-supplied safety wire rope to prevent outdoor unit from overturning.
- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

⚠ WARNING : Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

⚠ CAUTION : Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

1. Applicable Unit

Name	Hood for Right Side Air Inlet
Model	ASG-TP20RS2
Required Qty.	x 1
Applicable Outdoor Unit	Top Flow Type 72,000, 96,000, and 120,000 Btu/h

NOTE:

Applicable outdoor unit may be different depending on the product series. Be sure to confirm with the product catalogue before installation.

2. Installation Work

- (1) After the snow protection hood is installed, electromagnetic noise at the air outlet side may slightly increase. Therefore, it is necessary to carefully consider the air discharge direction when installed.
- (2) Be sure to tighten the snow protection hood securely to the top panel and side panel of the outdoor unit with the supplied screws (accessories). Not doing so may cause vibration or abnormal noise.
- (3) There must be no obstacles in the air discharge direction of the snow protection hood. If there are, it may cause a short circuit or an insufficient airflow rate.
- (4) Do not install other outdoor units in the direction of the air outlet. If the air blown out of the snow protection hood is sucked into the other outdoor unit, it may cause a malfunction of the unit.
- (5) The wind loads which the outdoor unit receives changes by attaching the snow protection hood. The required installation strength will also change in strong wind. Therefore, recheck the strength of the anchor bolts of the outdoor unit.
- (6) If the snow protection hood is installed, cooling/heating performance may be slightly lowered depending on the usage conditions.

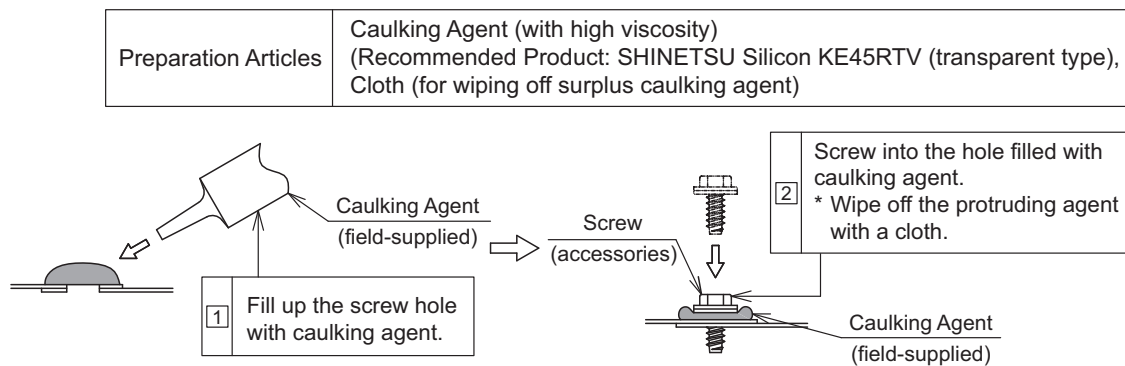
⚠ WARNING

To hold the snow protection hood properly to the outdoor unit against the strong wind or earthquake, stay or safety wire rope shall be used for reinforced installation. Use the field-supplied safety wire rope to prevent outdoor unit from overturning.

⚠ CAUTION

- Install the snow protection hood to avoid direct facing to the seasonal or strong wind.
- Apply touch-up coating or caulking at the screw holes of the outdoor unit in order to prevent rusting. (field-supplied)
- Even though the stainless, it may rust by contacting with salt or iron. Pay good attention when installation or maintenance.
- The snow protection hood is heavy-weight. More than two personnel are required for installation and be sure to wear the protective equipment (such as gloves).
- The screws and the snow protection hood must be protected from scratch or scrape. If not, it may cause of rusting. Handle with care when the snow protection hood is installed and assembled.

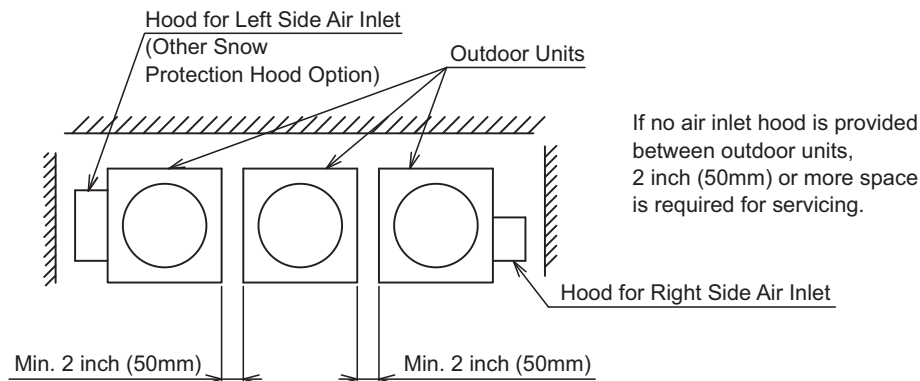
< Caulking Procedures (Example) >



3. Selection of Installation Place

- (1) Install the outdoor unit at the suitable height with consideration for snow accumulation. Increase the base height or additionally provide the frame under the unit (higher than snow accumulation), and fix the outdoor unit securely with anchor bolts.
- (2) Secure enough service space with consideration for snow accumulation height and snow removal operation.
- (3) There must be no obstacles in the air discharge direction.
- (4) Be sure to apply touch-up coating or caulking agent at the screw attaching portions for rustproofing.
- (5) In case of multiple outdoor units installation, provide the service space as shown below.



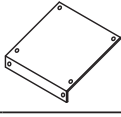



< Service Space for Multiple Outdoor Units Installation >



4. Before Installation

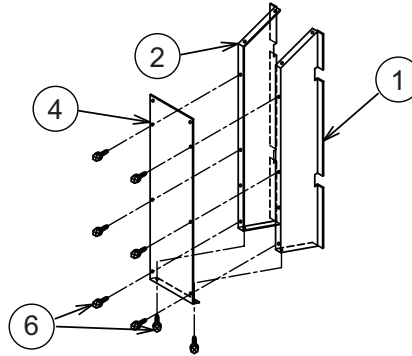
Check that all the following accessories are packed with the unit before installation.

Unit: inch (mm)

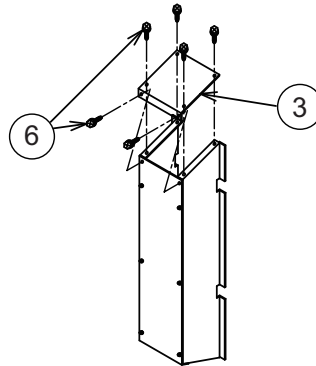
No.	Accessory		Qty.	Remarks
			ASG-TP20RS2	
①	Right Side Plate		1	
②	Left Side Plate		1	
③	Faceplate (Top Side)		1	
④	Faceplate (Back Side)		1	
⑤	Screw (for Installation)	 M5 x 15/32L (12L) (tapping screw type B)	8 (2)	For installation: accepting burring TP hole (2): Spare
⑥	Screw (for Assembling)	 M5 x 9/16L (14L) (tapping screw type C)	16 (2)	For installation: accepting weld nut (2): Spare

5. Installation Procedures

- (1) Tighten the faceplate (back side) (④) with the right side plate (①) and left side plate (②) together (8 places) by using screws for assembling (⑥).



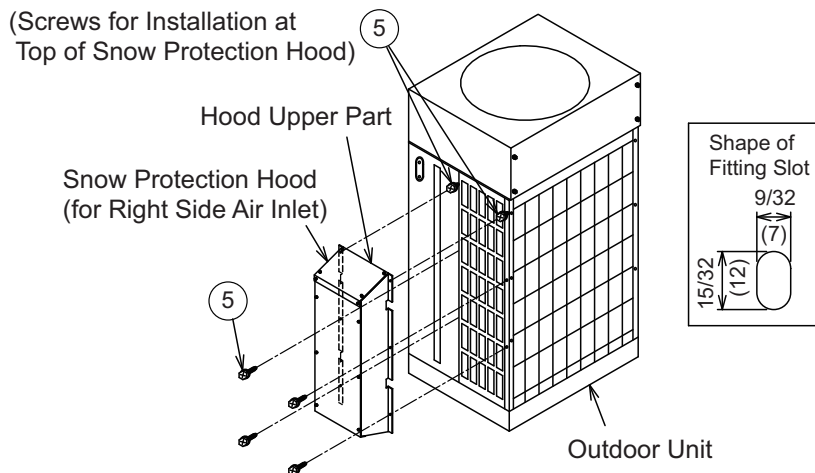
- (2) Tighten the faceplate (top side) (③) (6 places) by using screws for assembling (⑥).



- (3) Tighten loosely two screws (for installation) at the top of the snow protection hood (⑤) to the outdoor unit, and set the snow protection hood (for right side air inlet) to the outdoor unit. Tighten the other four screws (⑤) except for the top two screws, and finally tighten the top two screws securely.

NOTE:

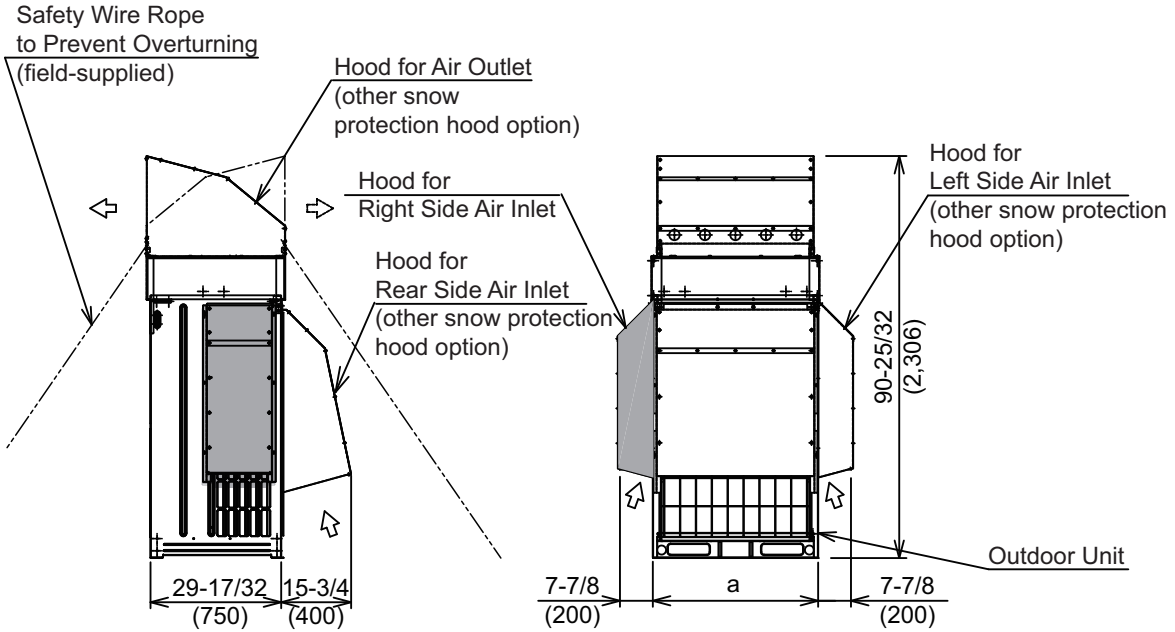
The fitting slots for the hood are adjustable with the securing positions within $\pm 1/8$ inch (± 3 mm). For hood installation, there must be no gap between the outdoor unit top plate and the hood upper part. If there is a gap, ice may form inside the hood.



6. Installation Appearance

Unit: inch (mm)

Dimension	a
Applicable Outdoor Unit	
Top Flow Type 72,000 Btu/h	37-5/16 (948)
Top Flow Type 96,000 and 120,000 Btu/h	47-5/8 (1,210)



Available Combinations

Applicable Outdoor Unit	Model	
	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h
Hood for Air Outlet	ASG-TP20FAS1	ASG-TP20FBS1
Hood for Rear Side Air Inlet	ASG-TP20BAS1	ASG-TP20BBS1
Hood for Left Side Air Inlet	ASG-TP20LS2	
Hood for Right Side Air Inlet	ASG-TP20RS2	

NOTE:

This installation manual applies only to the combination indicated with . For other snow protection hood options, refer to each installation manual.

7. Maintenance and Servicing

Even if during the warranty period, the snow protection hood may be rust under the salt damage or rusty conditions (such a place that acid-, alkaline- or corrosive moisture is always filled with). It is recommended to provide the salt damage-resistance/serious salt damage-resistance products (made-to-order) if the snow protection hood is used under such condition.

In order to prolong the product life, perform the periodical maintenance to prevent significant aging due to the deterioration. Carry out the following periodical inspection and maintenance works in conjunction with air conditioners' inspection.

(1) Red Rust Generation and Coating Film Check

If red rust is generated, or coating film is peeled/cracked, scour the rust off or apply touch-up coating. When re-coat such portions afterwards, be sure to grind the coating by sandpapers (#180 – 230) before applying coating agent. The coating agent may give bad effects to your skin. Wear the protective equipment such as vinyl gloves when handling coating agent to prevent contacting with skin.

(2) Retightening Screws for Installation and Assembly

Check for loose screws and retighten when inspection and maintenance is performed. In order to prevent screw breakage, be sure to tighten with the following torques:

* M5 Tapping Screw Type C for Assembling ⑥: 2.6 ± 0.7 [lbf-ft] (3.5 ± 1.0 [N•m])

* M5 Tapping Screw Type B for Installation ⑤: 1.8 ± 0.7 [lbf-ft] (2.5 ± 1.0 [N•m])

● **Snow Protection Hood (Left): ASG-TP20LS2**

This snow protection hood prevents snow from entering the outdoor unit and prevents a strong wind from blowing against the heat exchanger. Be sure to read this manual carefully for correct performance before installation work.

IMPORTANT NOTICE:

- Johnson Controls pursues a policy of continuous improvement in design and performance of products. We reserve the right to vary specifications without notice.
- No part of this manual may be reproduced without Johnson Controls' written permission.
- Keep this manual for future reference.
- Johnson Controls cannot anticipate every possible circumstance that might involve a potential hazard.
- This kit is designed for a combination of Johnson Control air conditioners. Do not use this kit by itself or in combination with other companies' air conditioners.
- To hold the snow protection hood properly to the outdoor unit against the strong wind or earthquake, stay or safety wire rope shall be used for reinforced installation. Use the field-supplied safety wire rope to prevent outdoor unit from overturning.
- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

- | | |
|------------------|---|
| ⚠ WARNING | : Indicates a hazardous situation that, if not avoided, could result in death or serious injury. |
| ⚠ CAUTION | : Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury. |

1. Applicable Unit

Name	Hood for Left Side Air Inlet
Model	ASG-TP20LS2
Required Qty.	x 1
Applicable Outdoor Unit	Top Flow Type 72,000, 96,000, and 120,000 Btu/h

NOTE:

The applicable outdoor unit may be different depending on the product series. Be sure to confirm with the product catalogue before installation.

2. Installation Work

- (1) After the snow protection hood is installed, electromagnetic noise at the air outlet side may slightly increase. Therefore, it is necessary to carefully consider the air discharge direction when installed.
- (2) Be sure to tighten the snow protection hood securely to the top panel and side panel of the outdoor unit with the supplied screws (accessories). Not doing so may cause vibration or abnormal noise.
- (3) There must be no obstacles in the air discharge direction of the snow protection hood. If there are, it may cause a short circuit or an insufficient airflow rate.
- (4) Do not install other outdoor units in the direction of the air outlet. If the air blown out of the snow protection hood is sucked into the other outdoor unit, it may cause a malfunction of the unit.
- (5) The wind loads which the outdoor unit receives changes by attaching the snow protection hood. The required installation strength will also change in strong wind. Therefore, recheck the strength of the anchor bolts of the outdoor unit.
- (6) If the snow protection hood is installed, cooling/heating performance may be slightly lowered depending on the usage conditions.

INSTALLATION

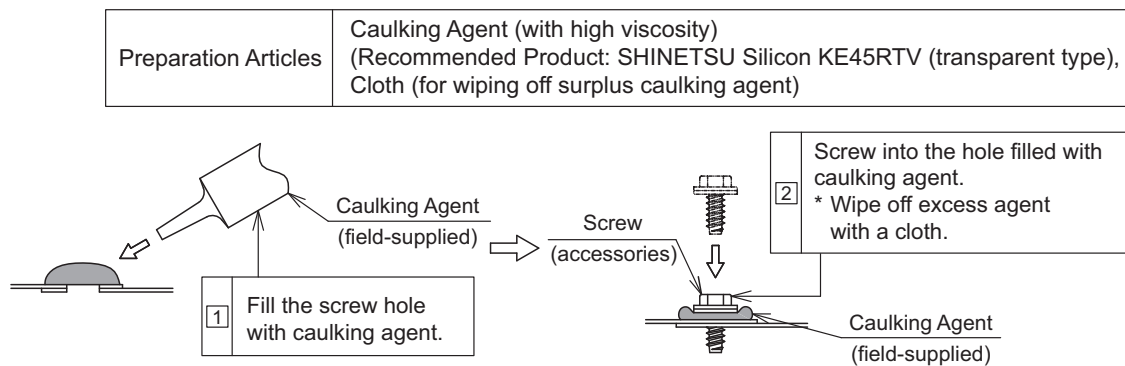
⚠ WARNING

To hold the snow protection hood properly to the outdoor unit against a strong wind or an earthquake, safety wire rope should be used for reinforced installation. Use the field-supplied safety wire rope to prevent the outdoor unit from overturning.

⚠ CAUTION

- Install the snow protection hood so as to avoid facing directly toward seasonal or strong winds.
- Apply touch-up coating or caulking (field-supplied) at the screw holes of the outdoor unit in order to prevent rusting.
- Even though the hood is stainless, salt or iron may cause rust. Be aware of this during installation or maintenance.
- The snow protection hood is heavy-weight. More than two people are required for installation. Be sure to wear protective equipment (such as gloves).
- The screws and the snow protection hood must be protected from scratches or scrapes. If they aren't, it may be the cause of rusting. Handle with care when the snow protection hood is installed and assembled.

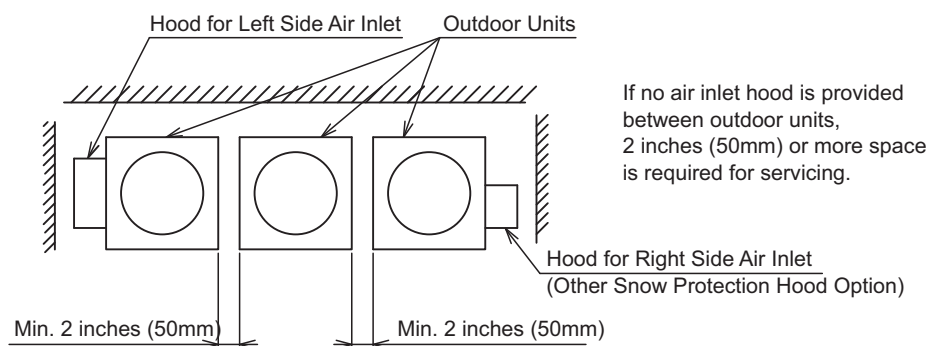
< Caulking Procedures (Example) >



3. Selection of Installation Location

- (1) Install the outdoor unit at a suitable height with consideration for snow accumulation. Increase the base height or additionally provide the frame under the unit (higher than snow accumulation), and fix the outdoor unit securely with anchor bolts.
- (2) Secure enough service space with consideration for snow accumulation height and snow removal operation.
- (3) There must be no obstacles in the air discharge direction.
- (4) Be sure to apply touch-up coating or caulking agent at the screw attaching portions for rustproofing.
- (5) In an instance of multiple outdoor units being installed, provide service space as shown below.



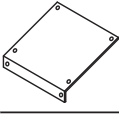



< Service Space for Multiple Outdoor Units Installation >



4. Before Installation

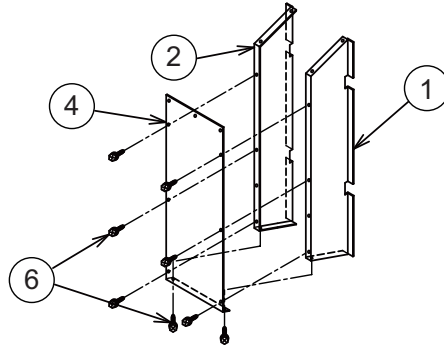
Check that all the following accessories are packed with the unit before installation.

Unit: inch (mm)

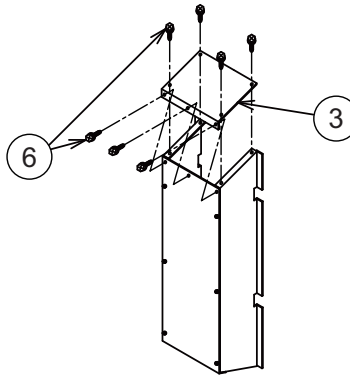
No.	Accessory		Qty.	Remarks
			ASG-TP20LS2	
①	Right Side Plate		1	
②	Left Side Plate		1	
③	Faceplate (Top Side)		1	
④	Faceplate (Back Side)		1	
⑤	Screw (for Installation)	 M5 x 15/32L (12L) (tapping screw type B)	8 (2)	For installation: accepting burring TP hole (2): Spare
⑥	Screw (for Assembling)	 M5 x 9/16L (14L) (tapping screw type C)	17 (2)	For installation: accepting weld nut (2): Spare

5. Installation Procedures

- (1) Tighten the faceplate (back side) (④) with the right side plate (①) and left side plate (②) together (8 places) by using screws for assembling (⑥).



- (2) Tighten the faceplate (top side) (③) (7 places) by using screws for assembling (⑥).

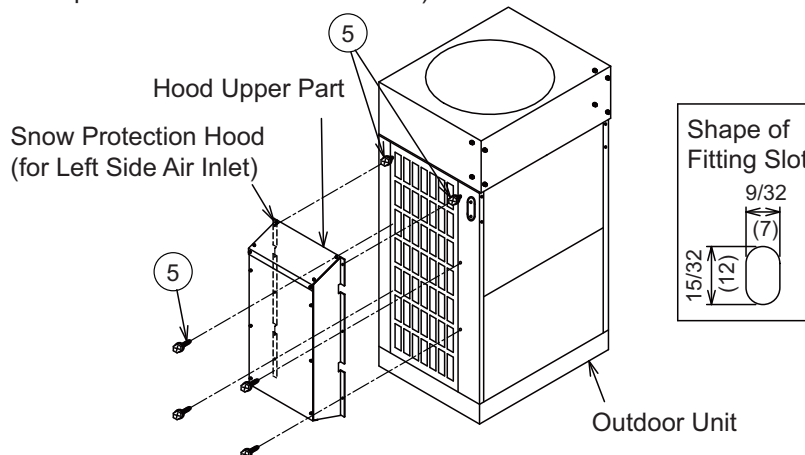


- (3) Tighten loosely two screws (for installation) at the top of the snow protection hood (⑤) to the outdoor unit, and set the snow protection hood (for left side air inlet) to the outdoor unit. Tighten the other four screws (⑤) except for the top two screws, and finally tighten the top two screws securely.

NOTE:

The fitting slots for the hood are adjustable in its fixing position within $\pm 1/8$ inch (± 3 mm). For hood installation, there must be no gap between the outdoor unit top plate and the hood upper part. If there is a gap, ice may form inside the hood.

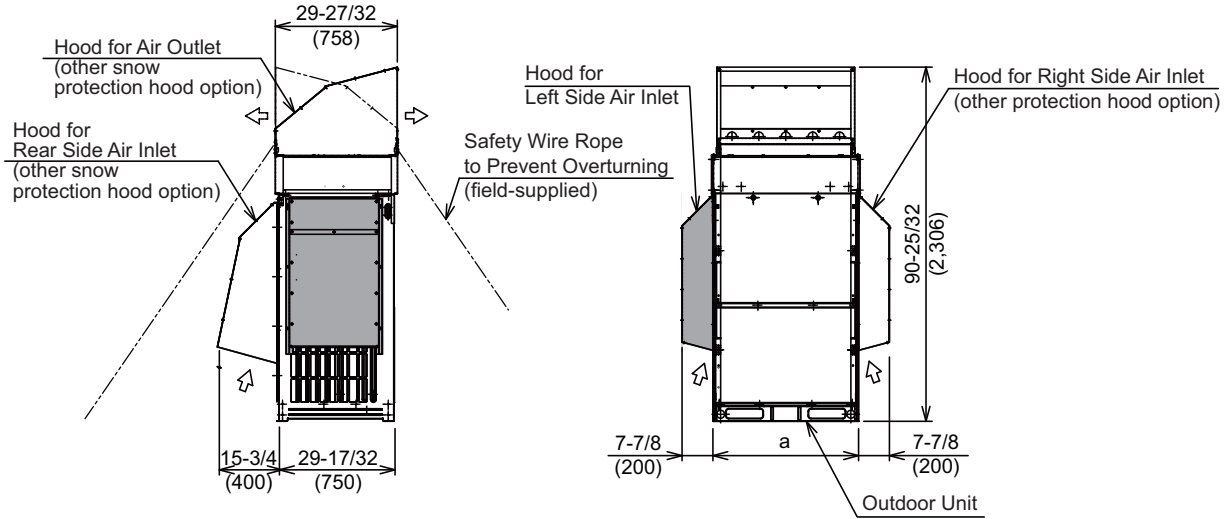
(Screws for Installation at the Top of the Snow Protection Hood)



6. Installation Appearance

Unit: inch (mm)

Dimension	a
Applicable Outdoor Unit	
Top Flow Type 72,000 Btu/h	37-5/16 (948)
Top Flow Type 96,000 and 120,000 Btu/h	47-5/8 (1,210)



Available Combinations

Applicable Outdoor Unit	Model	
	Top Flow Type 72,000 Btu/h	Top Flow Type 96,000 and 120,000 Btu/h
Hood for Air Outlet	ASG-TP20FAS1	ASG-TP20FBS1
Hood for Rear Side Air Inlet	ASG-TP20BAS1	ASG-TP20BBS1
Hood for Left Side Air Inlet	ASG-TP20LS2	
Hood for Right Side Air Inlet	ASG-TP20RS2	

NOTE:
 This installation manual applies only to the combination indicated with .
 For other snow protection hood options, refer to each installation manual.

7. Maintenance and Servicing

Even if during the warranty period, the snow protection hood becomes rusted under conditions that are caused by alkaline or corrosive moisture, recommendations are to provide salt damage resistance products to prevent such damage.

In order to prolong product life, perform periodical maintenance to prevent significant aging due to deterioration. Carry out the following periodical inspection and maintenance works in conjunction with air conditioners' inspection.

(1) Red Rust Generation and Coating Film Check

If red rust is generated, or coating film is peeled/cracked, scour the rust off or apply touch-up coating. When recoating such parts, be sure to grind the coating using sandpaper (#180 to 230) before re-applying coating agent. Wear protective equipment such as vinyl gloves when handling the coating agent to prevent contact with skin.

(2) Retightening Screws for Installation and Assembly

Check for loose screws and retighten when inspection and maintenance is performed. In order to prevent screw breakage, be sure to tighten with the following torques:

* M5 Tapping Screw Type C for Assembling ⑥: 2.6 ± 0.7 [lbf-ft] (3.5 ± 1.0 [N•m])

* M5 Tapping Screw Type B for Installation ⑤: 1.8 ± 0.7 [lbf-ft] (2.5 ± 1.0 [N•m])

1.5.2 For Ducted Type

- Table of Contents -

1.5.2.1 Air Filter: KW-PP3Q, KW-PP4Q	1-768
1.5.2.2 Air Filter: KW-PP7Q, KW-PP8Q, KW-PP9Q, KW-PP10Q	1-769
1.5.2.3 Air Filter: KW-PP5Q, KW-PP6Q	1-770

● Ducted High Static Type

Model	Applicable Model
KW-PP8Q	(H,Y)IDH018B21S
KW-PP3Q	(H,Y)IDH024 ~ 030B21S
KW-PP4Q	(H,Y)IDH036 ~ 048B21S

● Ducted Medium Static Type

Model	Applicable Model
KW-PP7Q	(H,Y)IDM006 ~ 012B21S
KW-PP8Q	(H,Y)IDM015 ~ 018B21S
KW-PP9Q	(H,Y)IDM024 ~ 030B21S
KW-PP10Q	(H,Y)IDM036 ~ 048B21S

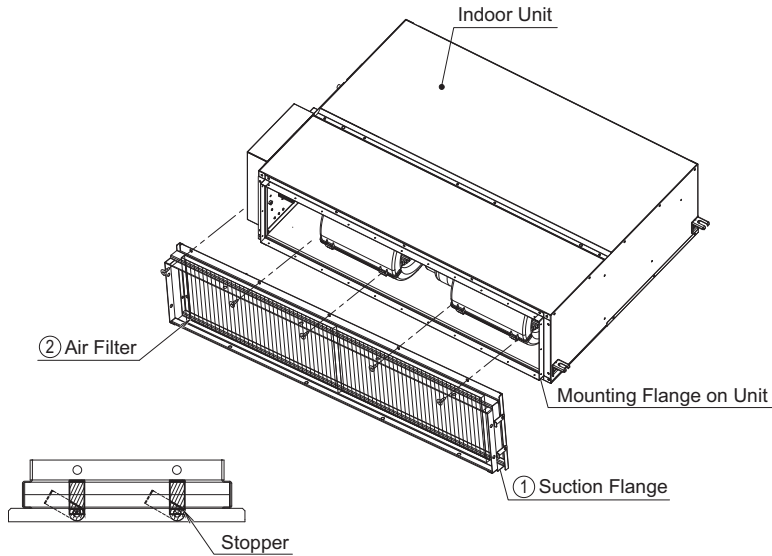
● Ducted Slim Type

Model	Applicable Model
KW-PP5Q	(H,Y)IDM006 ~ 012B21S
KW-PP6Q	(H,Y)IDM015 ~ 018B21S

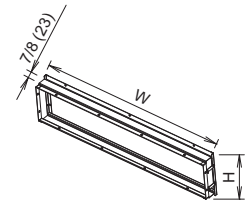
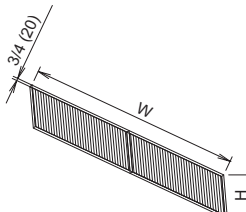
1.5.2.1 Air Filter: KW-PP3Q, KW-PP4Q

1. Procedure

- (1) Remove the mounting flange on the unit.
- (2) Install the suction flange with the air filter.
- (3) In an instance for service or maintenance, remove the stoppers and take the air filter out.
After the maintenance, reassemble the air filter.



Unit: inch (mm)

No.	Name	Illustration	Model	Dimensions	
				W	H
①	Suction Flange		KW- PP1Q	24-3/8 (620)	10-3/8 (262)
			KW- PP2Q	34-1/4 (870)	10-3/8 (262)
			KW- PP3Q	34-1/4 (870)	13-1/2 (342)
			KW- PP4Q	50 (1270)	13-1/2 (342)
②	Air Filter		KW- PP1Q	22-7/8 (582)	9-1/4 (236)
			KW- PP2Q	32-3/4 (832)	9-1/4 (236)
			KW- PP3Q	32-3/4 (832)	12-1/2 (316)
			KW- PP4Q	48-1/2 (1232)	12-1/2 (316)

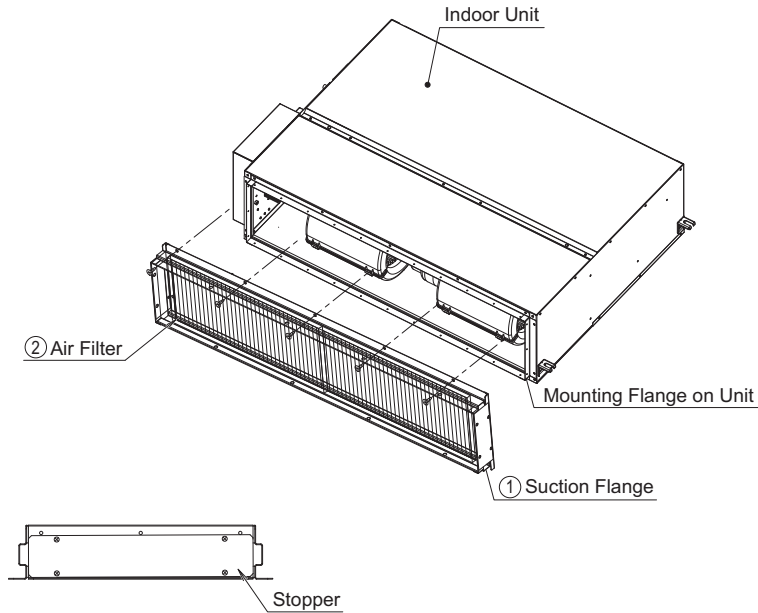
2. Service and Maintenance

Remove the air filter from the flange. Clean the air filter to vacuum dust with a cleaner, or wash the air filter with water or neutral detergent. Dry the air filter in the shade.

1.5.2.2 Air Filter: KW-PP7Q, KW-PP8Q, KW-PP9Q, KW-PP10Q

1. Procedure

- (1) Remove the mounting flange on the unit.
- (2) Install the suction flange with the air filter.
- (3) In an instance for service or maintenance, remove the stoppers and take the air filter out.
After the maintenance, reassemble the air filter.



Unit: inch (mm)

No.	Name	Illustration	Model	Dimensions	
				W	H
①	Suction Flange		KW- PP7Q	25-3/8 (646)	10-3/8 (265)
			KW- PP8Q	35-1/4 (896)	10-3/8 (265)
			KW- PP9Q	43-1/4 (1099)	11-5/8 (296)
			KW- PP10Q	55-1/8 (1399)	11-5/8 (296)
②	Air Filter		KW- PP7Q	24 (610)	9-1/2 (242)
			KW- PP8Q	31-7/8 (810)	9-1/2 (242)
			KW- PP9Q	41-7/8 (1063)	10-3/4 (272)
			KW- PP10Q	53-5/8 (1362)	10-3/4 (272)

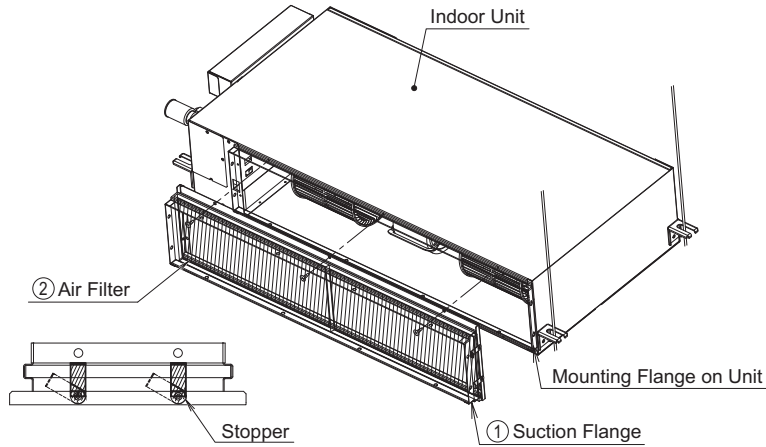
2. Service and Maintenance

Remove the air filter from the flange. Clean the air filter to vacuum dust with a cleaner, or wash the air filter with water or neutral detergent. Dry the air filter in the shade.

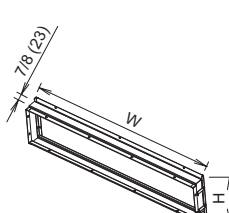
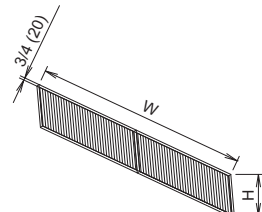
1.5.2.3 Air Filter: KW-PP5Q, KW-PP6Q

1. Procedure

- (1) Remove the mounting flange on the unit.
- (2) Install the suction flange with the air filter.
- (3) In an instance for service or maintenance, remove the stoppers and take the air filter out.
After the maintenance, reassemble the air filter.



Unit: inch (mm)

No.	Name	Illustration	Model	Dimensions	
				W	H
①	Suction Flange		KW- PP5Q	30-7/8 (784)	7-1/2 (191)
			KW- PP6Q	41-1/2 (1054)	7-1/2 (191)
②	Air Filter		KW- PP5Q	30-3/4 (782)	6-3/8 (162)
			KW- PP6Q	41-3/8 (1050)	6-3/8 (162)

2. Service and Maintenance

Remove the air filter from the flange. Clean the air filter to vacuum dust with a cleaner, or wash the air filter with water or neutral detergent. Dry the air filter in the shade.

1.5.3 For 4-Way Cassette Type

- Table of Contents -

1.5.3.1 Anti-bacterial Air Filter: F-71M-K2, F-160M-K2	1-772
1.5.3.2 Filter Box: B-160H3	1-774
1.5.3.3 Air Outlet Shutter Plate: PI-160LS2.....	1-778
1.5.3.4 Fresh Air Intake Kit: OACI-160K3.....	1-782
1.5.3.5 T-Tube Connecting Kit: TKCI-160K.....	1-789
1.5.3.6 Duct Adaptor: PD-75A.....	1-793

1.5.3.1 Anti-bacterial Air Filter: F-71M-K2, F-160M-K2

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

IMPORTANT NOTICE:

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- No part of this manual may be reproduced without Johnson Controls' written permission.
- Keep this manual for future reference.
- Johnson Controls cannot anticipate every possible circumstance that might involve a potential hazard.
- This kit is designed for a combination of Johnson Control air conditioners. Do not use this kit by itself or in combination with other companies' air conditioners.
- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

▲ DANGER

: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

▲ WARNING

: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

▲ CAUTION

: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

NOTE

: Indicates an useful information for operation and/or maintenance.

- It is assumed that this filter will be installed and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or contractor.
- This manual gives a common description and information for this filter, as well as for other models, which you may operate.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment. Forward this information to the building owner and request that they maintain all the equipment manuals.
- The filter box is required for this antibacterial air filter.
(The height inside the ceiling required for the indoor unit and the filter box is 2-3/16 inches (55mm).)
- This antibacterial air filter can be used along with the long life air filter.

▲ CAUTION

Install the antibacterial air filter according to this installation manual. Otherwise, the filter may fall, causing injury or damage to the antibacterial air filter.

NOTE

1. The life period for the antibacterial air filter is approximately 2,500 hours. Replace it when passing the life period.
2. The life period may differ depending on the environment.

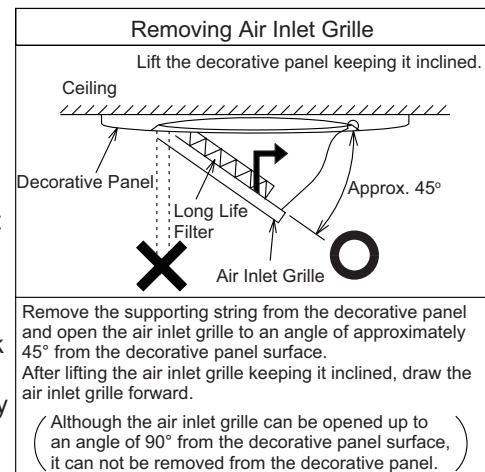
1. Setting of Fan Speed

- Select the function selection mode from the wired controller and set the high speed mode to “High Speed 1” before attaching the antibacterial air filter.
- When using this antibacterial air filter, the air flow volume of “High 2” will be equal to “High”.
- The standard airflow volume will be valid during the heating Thermo-OFF. If the high speed mode is required, set “Hi Speed at Heating Thermo-OFF” from the wired controller.
- The setting details of the wired controller should be referred to the “Installation Manual” for the wired controller.

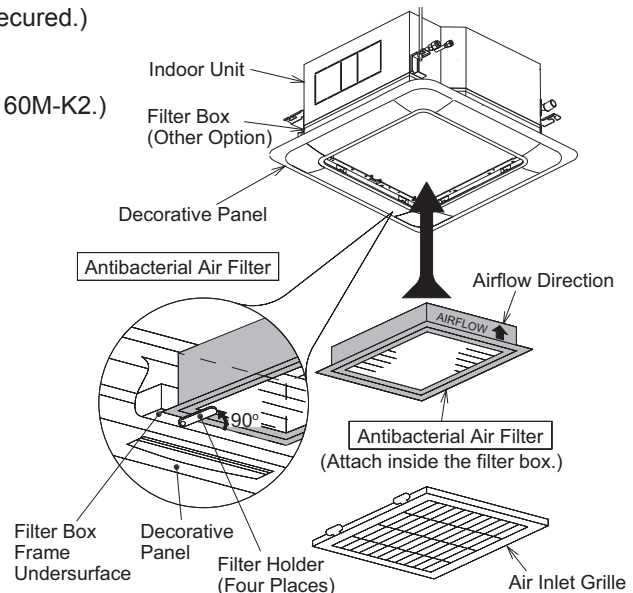
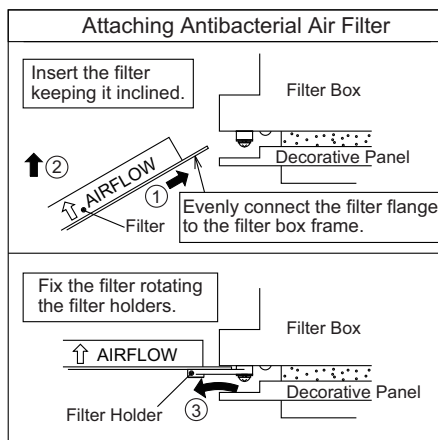
Liquid Crystal Display (LCD) of Wired Controller (CIW01)	Setting of “High Speed 1”	Setting of “Hi Speed at Heating Thermo-OFF”

2. Attaching Antibacterial Air Filter to Indoor Unit

- 1 Remove the air inlet grille according to “Removing Air Inlet Grille” in the figure at the right.
- 2 Insert the antibacterial air filter into the filter box while paying attention to the air flow direction of the antibacterial air filter. When inserting, the filter flange touches the air inlet frame at the decorative panel. Insert the antibacterial air filter keeping it inclined according to procedures ① to ③ below.
- 3 Secure the antibacterial air filter by pushing the filter flange to the filter box frame and rotating the four filter holders 90°. If the filter holders are hard to reach with your fingers, pull back the filter holders using a Phillips screwdriver. (If the filter flange is not set evenly to the filter box frame, it may cause air leakage.)
- 4 Attach the air inlet grille using reverse procedures when removing. (Close the air inlet grille after checking whether the air inlet grille and the decorative panel are tightly secured.)



(NOTE: The figure represents Model F-160M-K2.)



1.5.3.2 Filter Box: B-160H3

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

IMPORTANT NOTICE:

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- Keep this manual for future reference.
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- This kit is designed for a combination of Johnson Control air conditioners. Do not use this kit by itself or in combination with other companies' air conditioners.
- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

▲ DANGER

: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

▲ WARNING

: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

▲ CAUTION

: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

NOTE

: Indicates an useful information for operation and/or maintenance.

- It is assumed that this kit will be installed and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or contractor.
- This manual gives a common description and information for this filter box, as well as for other models, which you may operate.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment. Forward this information to the building owner and request that they maintain all the equipment manuals.
- Do not use this kit under the following conditions:
 - * Where there is oil vapor and the oil is dispersed (such as machine shops or kitchens).
 - * Where there is generation, flowing or remnants of flammable gas and corrosive gas may occur.

▲ WARNING

- Turn OFF the power source before the installation work. Not doing so may cause a fire or an electric shock.
- The installation work should be performed according to this installation manual. If the installation is not completed correctly, air leakage may cause condensation. If the filter box or decorative panel falls, the result may be an injury.

▲ CAUTION

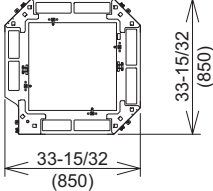
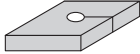
Do not push or pull the filter box. If excessive force is applied to the filter box, it may be deformed and the filters can not be attached.

< Transportation and Handling >

1. Transport the filter box with packing as it is to the installation location.
2. Do not put any materials on the filter box.
3. Do not stand the filter box after unpacking. It may be damaged. Place it on a flat surface.

1. Factory-Supplied Accessories

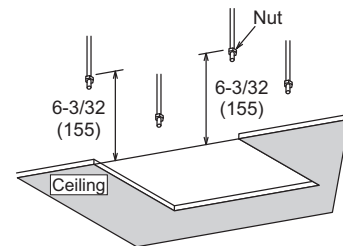
Unit: inch (mm)

No.	Accessory	Qty.
①	Filter Box 	1
②	Insulation  3/16t (5t)	1

2. Installing Indoor Unit

Unit: inch (mm)

- (1) Provide a distance as shown in the figure at the right.
- (2) Install the indoor unit by referring to the "Installation Manual" for the indoor unit.

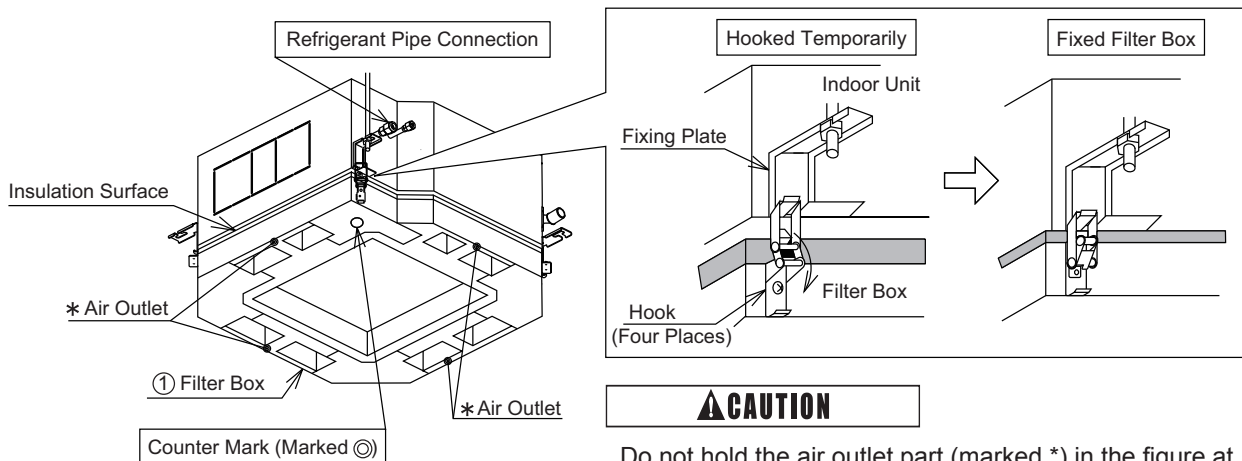


CAUTION

When installing the indoor unit, check to ensure that the filter box (①) is not damaged. Any damage can cause air leakage or condensation.

3. Installing Filter Box (①) to Indoor Unit

- ① Fit the corner position of the refrigerant pipe connection at the indoor unit and the position stamped with the counter mark (marked ⊙) at the filter box.
- ② After temporarily hooking the hooks in four places at the filter box and the fixing plate of the indoor unit, secure the filter box by pulling down each hook as shown in the figure below.

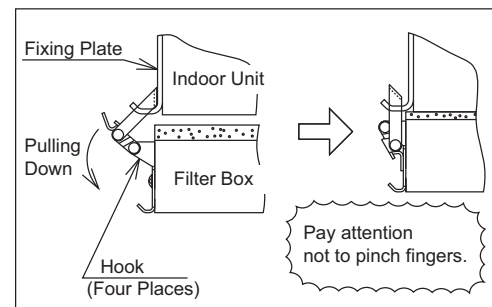


CAUTION

Do not hold the air outlet part (marked *) in the figure at the left when attaching the filter box. If held, deformation may occur.

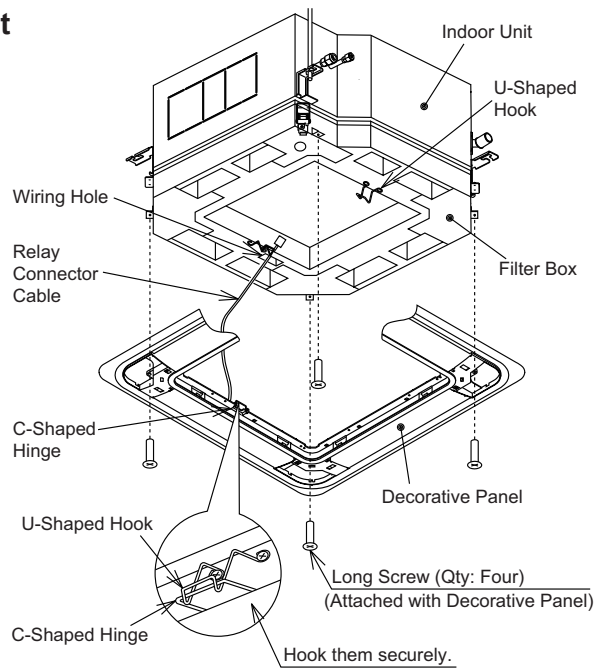
CAUTION

- Check the attaching direction of the filter box (①) of the indoor unit. If the direction is wrong, it may cause the indoor unit to fall and break, or cause air leakage and condensation.
- When pulling down hooks, the upper part of a hook may come down swiftly. Pay attention not to pinch fingers.
- When removing the filter box from the indoor unit after pulling down the hooks, refer to the "Removing Hook" diagram below.



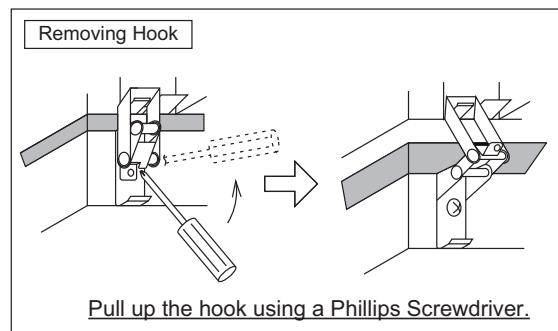
4. Installing Decorative Panel on Indoor Unit

- 1 Check to ensure that the corner position of the refrigerant pipe connection of the indoor unit and the position stamped as "Ref. Pipe 冷媒配管" of the decorative panel are the same.
- 2 Remove the filament tape securing the connector cable for relay and lift the decorative panel. Temporarily hook the decorative panel to catch the C-shaped hinges onto the U-shaped hooks.
- 3 Run the decorative panel wiring from the bottom side through the long hole at the filter box.
- 4 Secure the decorative panel to the indoor unit with long screws (accessory for the decorative panel, Qty. four). Tighten the long screws until touching the stopper to the fixing plate. (Refer to the "Installation Manual" for the decorative panel for installation details.)



CAUTION

- Temporarily secure hooks before installing the decorative panel to the filter box. If the decorative panel is not hooked temporarily, it may fall.
- Be aware that air leakage or condensation may occur if there is gap between the air outlet and the filter box.
- Tighten long screws according to the specified torque when installing the decorative panel to the indoor unit.
- Use a Phillips screwdriver or a wrench (3/8 inch (10mm)) to tighten long screws.



5. Electrical Wiring Connection

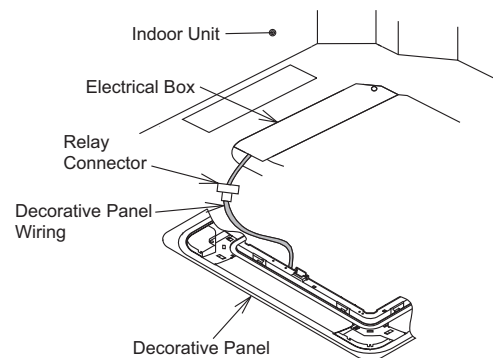
CAUTION

- Perform correctly the electrical wiring connection. If not completed correctly, heat generation at the connection, a fire or an electric shock may occur.
- Make sure that the wires are securely fixed in order not to apply an external force to the terminal connections of the wirings. If fixing is not completed correctly, heat generation or a fire will occur.

- (1) Check to ensure that the power source is turned OFF.
- (2) Connect the decorative panel wiring running it through the long hole at the filter box to the relay connector for the decorative panel. Fix the extra length of the decorative panel wiring using the plastic band (field-supplied). The connection position should be referred to the "Installation Manual" for the decorative panel.

CAUTION

- Before connecting the decorative panel wiring with the relay connector for the decorative panel, turn OFF the power source. If the wirings are connected without turning OFF the power source, the unit can not activate normally.
- Be careful when handling the electrical wiring. If the electrical wiring is caught in the indoor fan and disconnected, it may cause damage to the air conditioner.

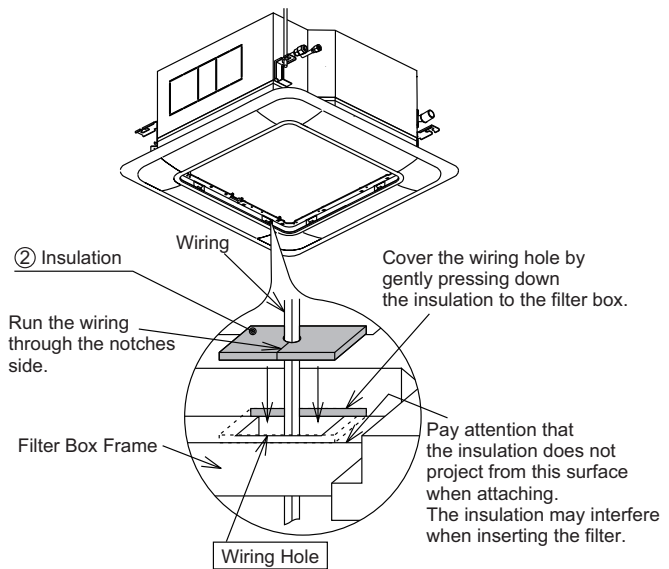


6. Installing Insulation

- (1) Run the wiring through the notch side of the insulation (②).
- (2) Remove the paper from the adhesive surface of the insulation (②). Then, attach the insulation by gently pressing it down to the filter box.

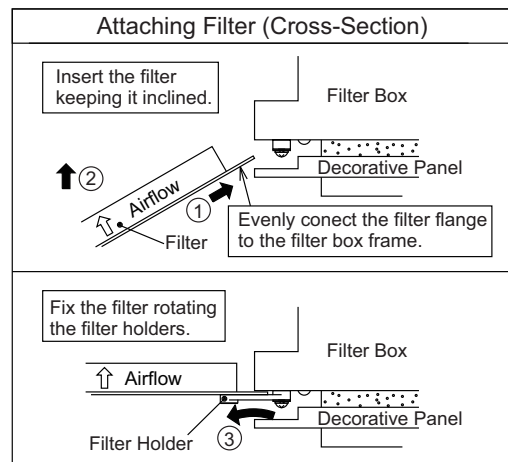
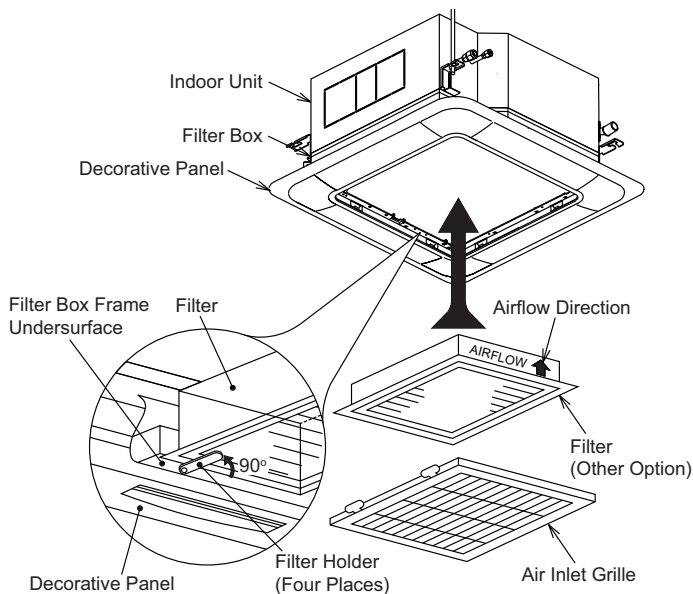
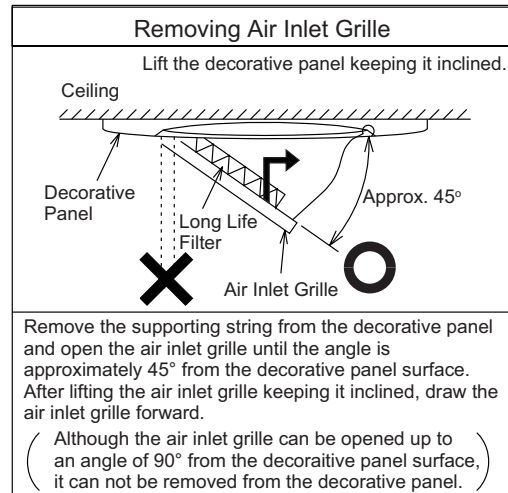
CAUTION

- Attach the insulation so as to cover the gap of the wiring hole. If there is a gap, it may cause air leakage from the wiring hole.
- Do not apply excessive force to the filter box when running the wiring connector through the wiring hole and attaching the insulation. It may become deformed and damaged.



7. Attaching Antibacterial Air Filter (Other Option)

- (1) Remove the air inlet grille according to "Removing Air Inlet Grille" in the figure at the right.
- (2) Insert the filter into the filter box while paying attention to the air flow direction of the filter. When inserting, the filter flange touches the air inlet frame at the decorative panel. Insert the filter keeping it inclined according to procedures ① to ③ at the right.
- (3) Secure the filter by pushing the filter flange to the filter box frame and rotating the four filter holders 90°.
- (4) Attach the air inlet grille using reverse procedures when removing. (Close the air inlet grille after checking whether the air inlet grille and the decorative panel are tightly secured.)



1.5.3.3 Air Outlet Shutter Plate: PI-160LS2

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

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▲ WARNING

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NOTICE

: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

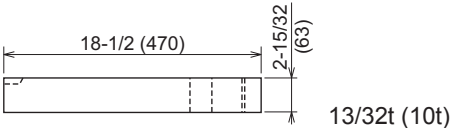
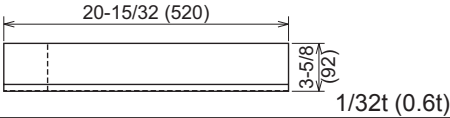
NOTE

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- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment. Forward this information to the building owner and request that they maintain all the equipment manuals.

1. Factory-Supplied Accessories

Unit: inch (mm)

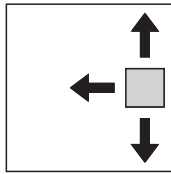
No.	Accessory	Qty.
①	Shutter Plate 	2
②	Sheet 	2

2. Blocking Part and Components

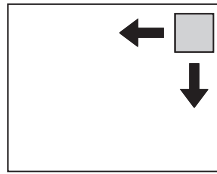
Select the blocking part. Then follow 2.1 and 2.2 below.
Cut the shutter plate using a plastic cutter as shown below.

< Example >

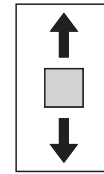
• Near the Wall: 3-Way Outlet



• In a Corner: 2-Way Outlet



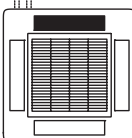
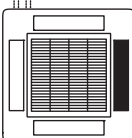
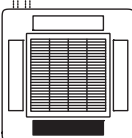
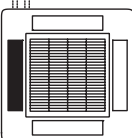
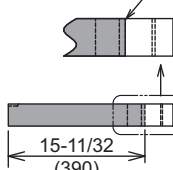
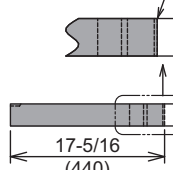
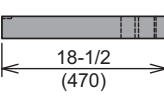
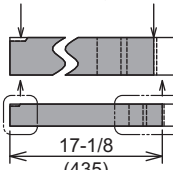
• In Rectangular Room: 2-Way Outlet



2.1 3-Way Outlet

■ : Blocking Part (Use ■ Part of Shutter Plate)

Unit: inch (mm)

Installation Example	Example 1 (*1)	Example 2	Example 3	Example 4 (*2)
Indoor Unit Capacity (MBH)	(Piping Side) 	(Piping Side) 	(Piping Side) 	(Piping Side) 
12 to 36	Cut off here along the cutting line. 	Cut off here along the cutting line. 	No need to cut off. 	Cut off the corner and cut off the cutting line. 

(*1): Change the position of the outlet temperature thermistor (refer to Section 2.4).
Otherwise, a room temperature adjustment may not be possible.

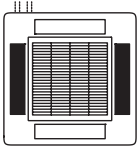
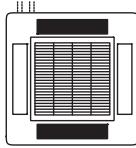
(*2): In the case of Example 4, use the shutter plate cutting off the corner along the cutting line after cutting off the shutter plate according to the dimension shown above.

INSTALLATION

2.2 2-Way Outlet

The air outlet directions can not be selected other than those in the figure below.
(If other air outlet directions are selected, condensation may occur.)

■ : Blocking Part

Installation Example	Example 1	Example 2 (*1)	Example 3 (*2)
	Indoor Unit Capacity (MBH)	(Piping Side) 	(Piping Side) 
12 to 36	The size of Shutter Plate for each model is detailed in Section 2.1		

(*1): Change the position of the outlet temperature thermistor (refer to Section 2.4 below).
Otherwise, a room temperature adjustment may not be possible.

(*2): In the case of Example 3, the airflow volume will decrease compared with other cases.
Set the high speed setting according to the following table as needed.

< Setting from Controller and Airflow Volume during Setting High Speed Mode >

Airflow Volume Setting from Wired Controller		High 2	High	Med	Low
High Speed Mode	Standard	HH2	Hi	Me	Lo
	High Speed 1	HH2	HH1	Hi	Me
	High Speed 2	HH2	HH2	HH1	Hi

“High 2” does not change the airflow volume even if the high speed mode is set.

NOTES:

- 1 “High 2” does not change the airflow volume even if the high speed mode is set.
2. When setting “High Speed 1”, the airflow volume is increased one level compared with the airflow volume of the standard mode. In the case of “High Speed 2”, the airflow volume is increased two levels.
3. When setting “High Speed 2”, the airflow volume of “High 2” and “High” will be equal.
4. When the high speed mode or “High 2” is set, the sound level may increase during the indoor unit operation.

2.3 Setting of Fan Speed

The airflow volume setting function “High 2” is adopted to existing airflow volumes of “High”, “Med” and “Low”. The air conditioning can be supported in the instance of a high ceiling without the high speed setting by the wired controller. Set the ceiling height according to the table below.

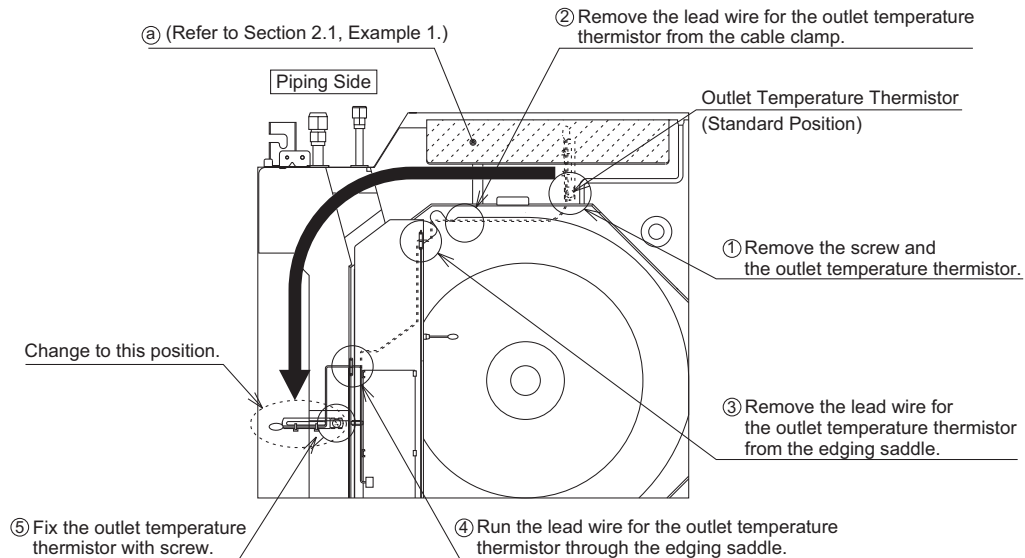
Standard Limit of Ceiling Height (Standard Combination)

MBH	Airflow Mode	Item	Ceiling Height: feet (m)		
			4-Way Outlet	3-Way Outlet	2-Way Outlet
12 - 15	High		8 ft. 11 in. (2.7)	9 ft. 10 in. (3.0)	10 ft. 10 in. (3.3)
	High 2		11 ft. 6 in. (3.5)	11 ft. 10 in. (3.6)	11 ft. 10 in. (3.6)
18 - 24	High		8 ft. 11 in. (2.7)	9 ft. 10 in. (3.0)	10 ft. 10 in. (3.3)
	High 2		11 ft. 6 in. (3.5)	11 ft. 10 in. (3.6)	11 ft. 10 in. (3.6)
30 - 36	High		10 ft. 6 in. (3.2)	11 ft. 10 in. (3.6)	13 ft. 1-1/4 in. (4.0)
	High2		13 ft. 10 in. (4.2)	14 ft. 1-1/4 in. (4.3)	14 ft. 1-1/4 in. (4.3)

2.4 Changing of Outlet Temperature Thermistor (when only blocking ① below)

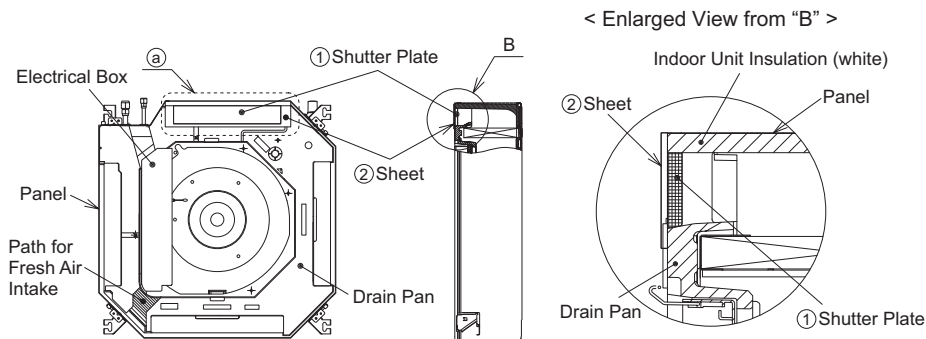
Change the position of the outlet temperature thermistor as shown in the following figure.

* When the position of outlet temperature thermistor is changed, clamp the surplus lead wires.



3. Installing Shutter Plate

This figure is shown referencing Section 2.1, Example 1 of 3-Way Outlet.



* If that shutter plate is used at ① in the figure, cut it off at the cutting line. (For other outlets, the cutting is not required.)

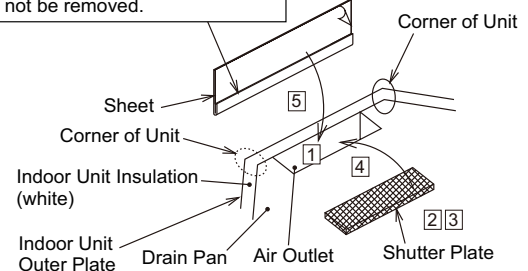
② Detail for Cutting Sheet

17-5/16 inch (440mm)

< Procedures >

- 1 Determine the air outlet to block. (Refer to Section 2.1 or 2.2.)
- 2 Check the length of the shutter plate.
- 3 Cut off the shutter plate. (Refer to Section 2.1.)
- 4 Attach the shutter plate to the air outlet.
- 5 Attach the sheet to the drain pan. (Refer to * part in the figure above.)

Attach the sheet to match the corner of unit. Do not attach the adhesive surface to the indoor unit insulation (white). If adhered, the drain pan can not be removed.



NOTE:

Cut off the sheet using adequate dimensions so as not to attach it to wirings and the path for the fresh air intake. **If adhered, the drain pan can not be removed.**

1.5.3.4 Fresh Air Intake Kit: OACI-160K3

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

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- Johnson Controls cannot anticipate every possible circumstance that might involve a potential hazard.
- This kit is designed for a combination of Johnson Control air conditioners. Do not use this kit by itself or in combination with other companies' air conditioners.
- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.



: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.



: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.



: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

NOTE

: Indicates an useful information for operation and/or maintenance.

- It is assumed that this kit will be installed and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or contractor.
- This manual gives a common description and information for this fresh air intake kit, as well as for other models, which you may operate.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment. Forward this information to the building owner and request that they maintain all the equipment manuals.
- Do not use this kit under the following conditions:
 - * Where there is oil vapor and the oil is dispersed (such as machine shops or kitchens).
 - * Where there is generation, flowing or remnants of flammable gas and corrosive gas.

Installation Restriction

- This kit cannot supply fresh air by itself. Therefore, connect a duct and supply fresh air from the dedicated outside air system or the duct fan.
- When using this kit with the dedicated outside air system, the maximum fresh air intake volume should be within 20% of the rated airflow volume of the indoor unit. In addition, when using this kit without the dedicated outside air system, pay attention not to cause condensation inside this kit, the duct and the indoor unit.

⚠ WARNING





- Turn OFF the power supply before the installation work. Otherwise, there may be a fire or an electric shock.
- The installation work should be performed according to this installation manual. If the installation is not completed correctly, condensation may result from air leakage. An injury may result from the fresh air intake kit or decorative panel falling.

< Transportation and Handling >

1. Transport the fresh air intake kit with packing as it is to the installation location.
2. Do not put any materials on the fresh air intake kit.
3. Do not stand the fresh air intake kit after unpacking. It may be damaged. Place it on flat surface.

1. Factory-Supplied Accessories

Unit: inch (mm)

No.	Accessory		Qty.
①	Intake Box		1
②	Connecting Box	Right Part 	1
		Left Part 	1
③	Truss Head Screw  [M4 x 13/32L (10L)]		4
④	Insulation for Duct Adaptor  19/32t (15t)		4

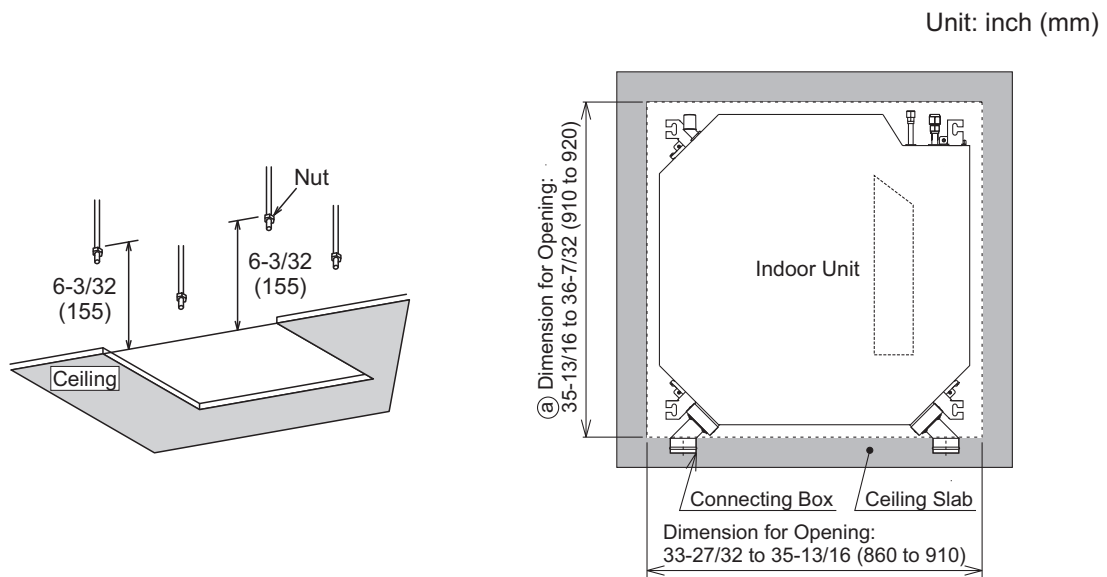
2. Installing Indoor Unit

Installation work should be performed by two or more people.

- (1) Provide a distance as shown in the figure below.
- (2) Suspend the indoor unit.
(Refer to the "Installation Manual" for the 4-Way Cassette Type for details.)

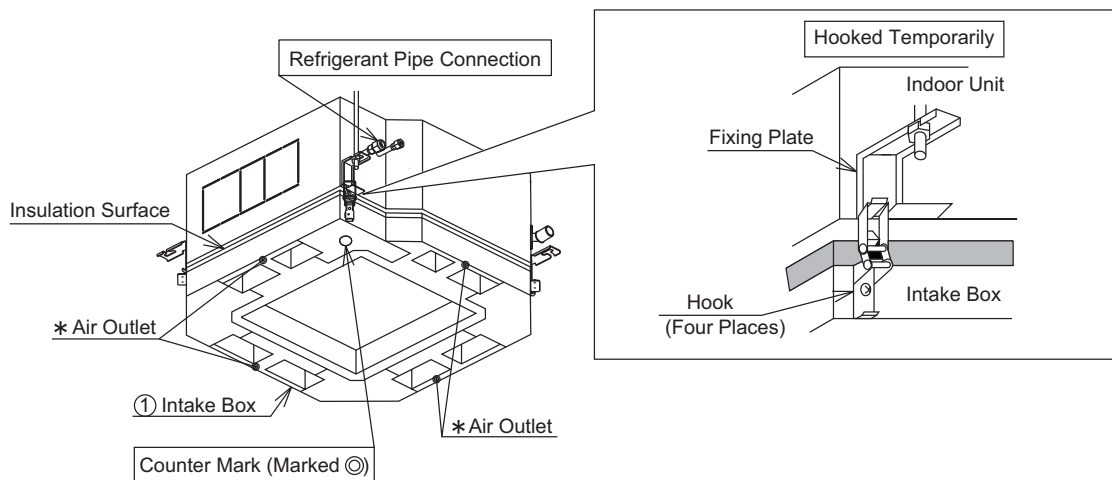
CAUTION

The dimensions for opening are shown in the figure below.
If the dimension ① is 35-7/16 inch (900mm) or less, the ceiling slab will interfere with the connecting box.



3. Installing Intake Box (①) to Indoor Unit

- ① Fit the corner position of the refrigerant pipe connection at the indoor unit and the position stamped with the counter mark (marked ②) at the intake box (①).
- ② Temporarily hook the hooks (four places) at the intake box (①) to the fixing plate at the indoor unit.



CAUTION

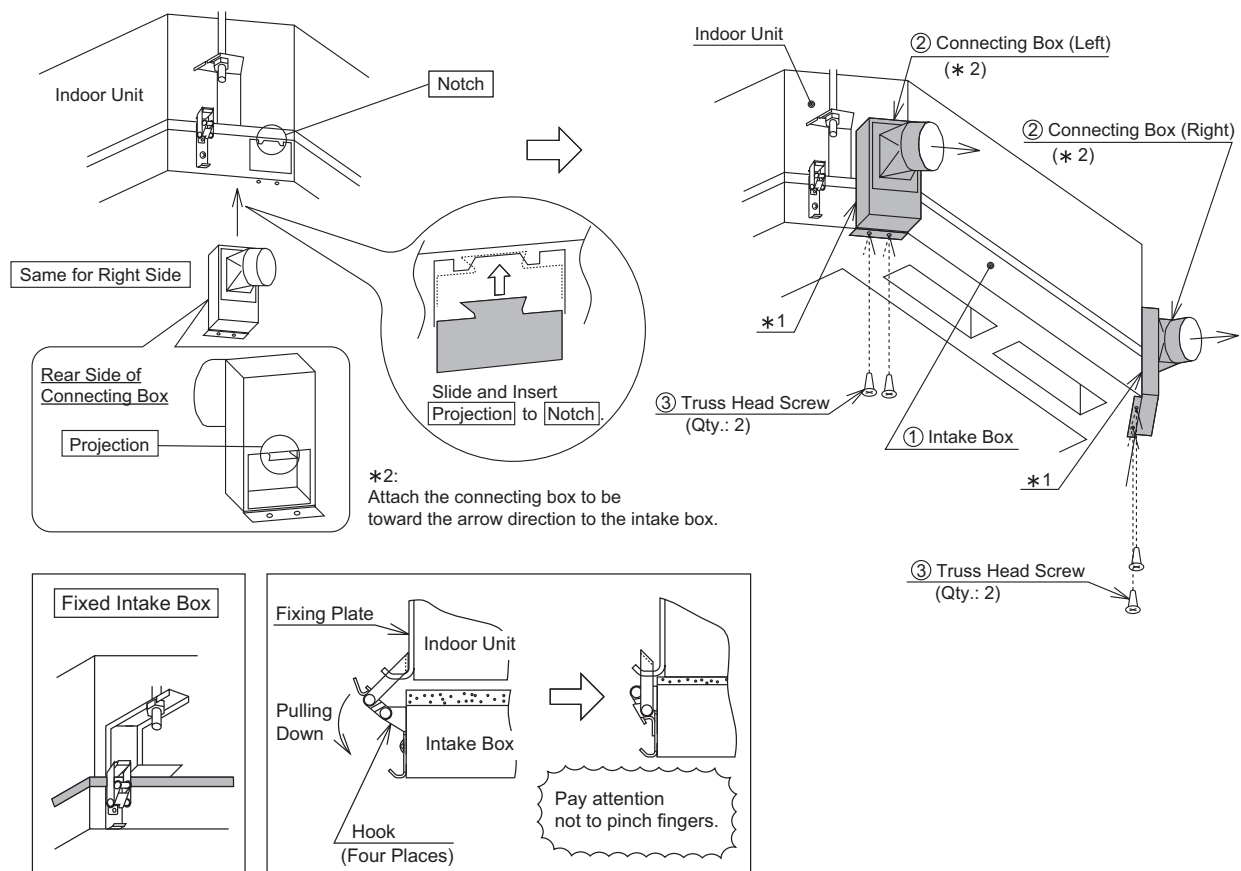
- Do not hold the air outlet part (marked *) in the above figure when installing the intake box. If held, deformation may occur.
- Make sure that the installation direction of the intake box (①) to the indoor unit is correct. If the direction is wrong, it may cause the indoor unit to fall and break or there may be air leakage and condensation.

4. Installing Connecting Box (2)

- 1 Slide and insert the projection at the connecting box (2) to the notch at the intake box (1).
(Perform the same work for the other side.)
- 2 Secure the connecting boxes (2) using two truss head screws (3) on each side.
After securing the connecting boxes (2), secure the intake box pulling down on each hook.

CAUTION

- Installation will be easier if the connecting box (2) is attached to the intake box (1) before installing the ceiling slab.
- The connecting box (2) should be attached to the intake box (1) with no gaps at the connection part (marked *1).
If there is a gap, air leakage may occur.
- The intake box (1) is still hooked temporarily after securing the connecting box.
Secure the intake box (1) pulling down on the hooks.



CAUTION

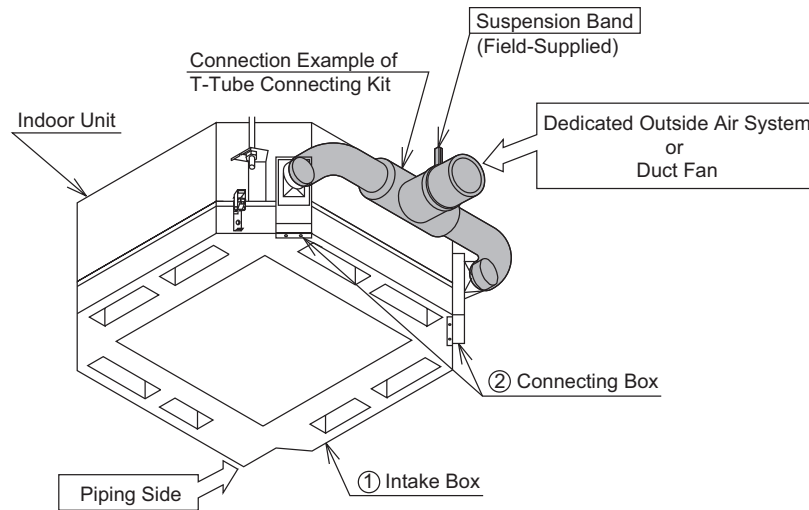
- When pulling down hooks, the upper part of the hook may come down swiftly.
Pay attention not to pinch fingers.
- When removing the intake box from the indoor unit after pulling down the hooks, refer to the figure at the right, "Removing Hook".

5. Connecting to Duct (Field-Supplied)

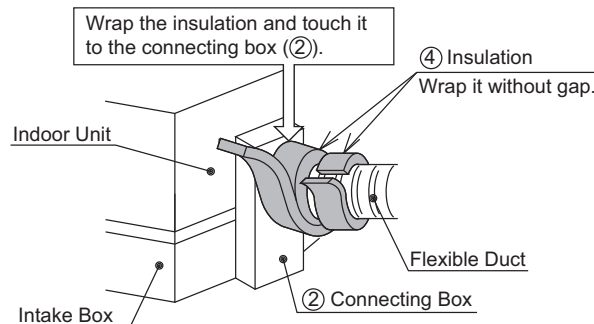
Connect the duct to the connecting boxes (②) with $\phi 2-15/16$ inch ($\phi 75\text{mm}$) flanges using the T-tube connecting kit (optional) or a duct. (For installation details, refer to the "Installation Manual" for the T-tube connecting kit.)

CAUTION

- Install the T-tube connecting kit and duct in a compartment handling air for circulation through a duct supplying only one room.
- Before installing the decorative panel, securely connect the duct to the connecting box and connect the dedicated outside air system or the duct fan according to the installation limit.
- When installing the T-tube connecting kit or a duct, securely attach the suspension band without applying excessive force to the connecting box. If excessive force is applied, air leakage and condensation may occur caused by a gap between the connecting box and the duct adapter.



6. Installing Insulation (④) after Installing Duct

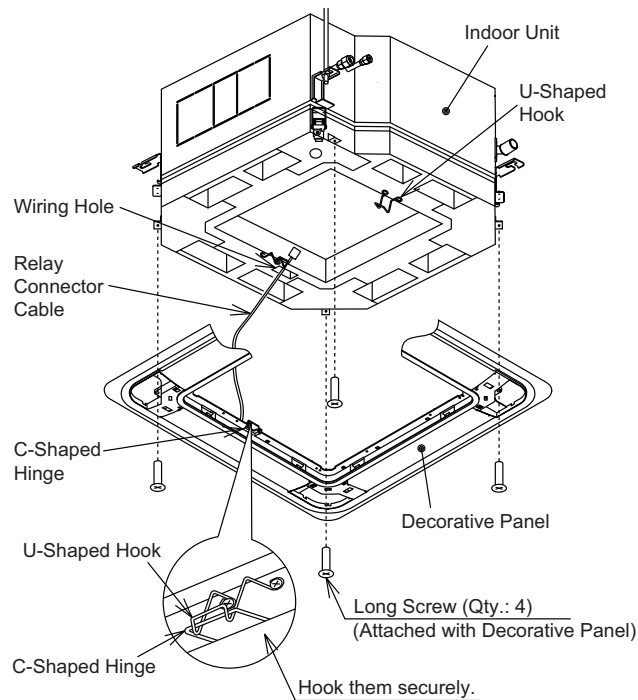


7. Installing Decorative Panel to Indoor Unit

- 1 Check to ensure that the corner position of the refrigerant pipe connection of the indoor unit and the position stamped as “Ref. Pipe 冷媒配管” at the decorative panel are the same.
- 2 Temporarily hook the decorative panel to catch the C-shaped hinges onto the U-shaped hooks.
- 3 Secure the decorative panel to the indoor unit using long screws (accessory for the decorative panel, Qty. 4). Tighten the long screws until touching the stopper to the fixing plate. (Refer to the “Installation Manual” for the decorative panel for installation details.)

CAUTION

- Temporarily secure hooks before installing the decorative panel to the intake box. If the decorative panel is not hooked temporarily, it may fall.
- Be aware that air leakage or condensation may occur if there is a gap between the air outlet and the intake box.
- Tighten long screws according to the specified torque when installing the decorative panel to the indoor unit.
- Use a Phillips screwdriver or a wrench (3/8 inch (10mm)) to tighten long screws.



8. Electrical Wiring Connection

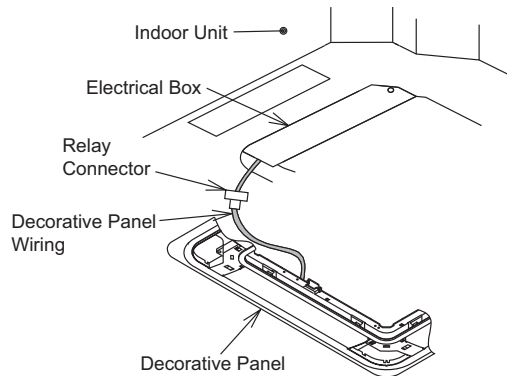
CAUTION

- Perform correctly the electrical wiring connection.
If not completed correctly, heat generation at the connection, a fire or an electric shock may occur.
- Make sure that the wires are securely fixed in order not to apply an external force to the terminal connections of the wirings. If fixing is not completed correctly, heat generation or a fire will occur.

- 1 Check to ensure that the power supply is turned OFF.
- 2 Connect the decorative panel wiring to the relay connector for the decorative panel. Secure the extra length of the decorative panel wiring using a plastic band (field-supplied).
The connection position should be detailed in the "Installation Manual" for the decorative panel.

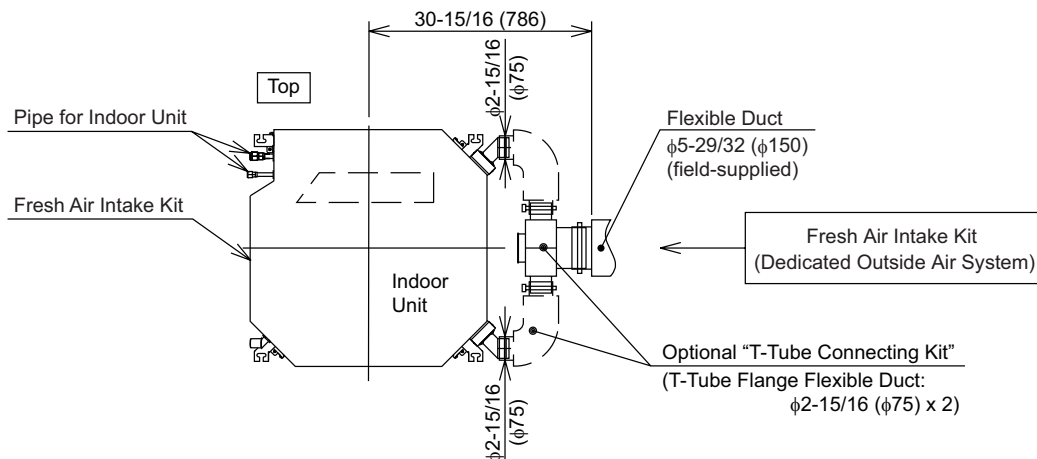
CAUTION

- Before connecting the decorative panel wiring with the relay connector for the decorative panel, turn OFF the power supply.
If the wirings are connected without turning OFF the power supply, the unit can not activate normally.
- Be careful when handling the electrical wiring.
If the electrical wiring is caught in the indoor fan and disconnected, it may cause damage to the air conditioner.



9. Optional "T-Tube Connection Kit" Connecting Example

Unit: inch (mm)



1.5.3.5 T-Tube Connecting Kit: TKCI-160K

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

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- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

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▲ WARNING

: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

▲ CAUTION

: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

NOTE

: Indicates an useful information for operation and/or maintenance.

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- If you have any questions, contact your distributor or contractor.

Installation Restriction

- This kit must be used with a Fresh Air Intake Kit.
- This kit cannot supply fresh air by itself. Therefore, connect a duct and supply fresh air from the dedicated outside air system or the duct fan.
- When using this kit with the dedicated outside air system, the maximum fresh air intake volume should be within 20% of the rated airflow volume of the indoor unit. In addition, when using this kit without the dedicated outside air system, pay attention not to cause condensation inside this kit, the duct and the indoor unit.

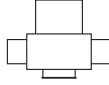
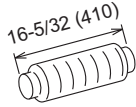
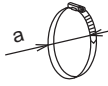
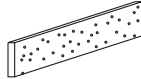
INSTALLATION

⚠ CAUTION

- Install the T-tube flange and flexible duct in a compartment handling air for circulation through a duct supplying only one room.

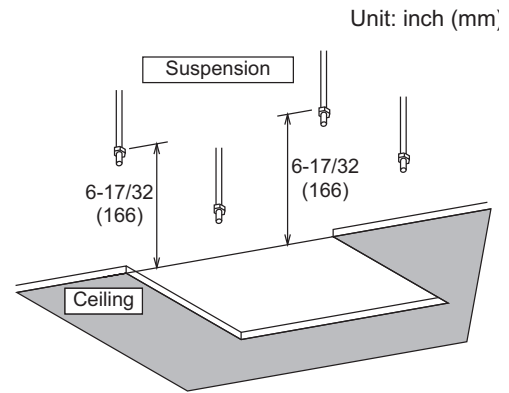
1. Factory-Supplied Accessories

Unit: inch (mm)

No.	Accessory		Qty.	
①	T-Tube Flange		1	
②	Flexible Duct		2	
③	Plate Band		$\phi 2-15/16$ ($\phi 75$)	4
			$\phi 5-29/32$ ($\phi 150$)	1
④	Insulation		1	

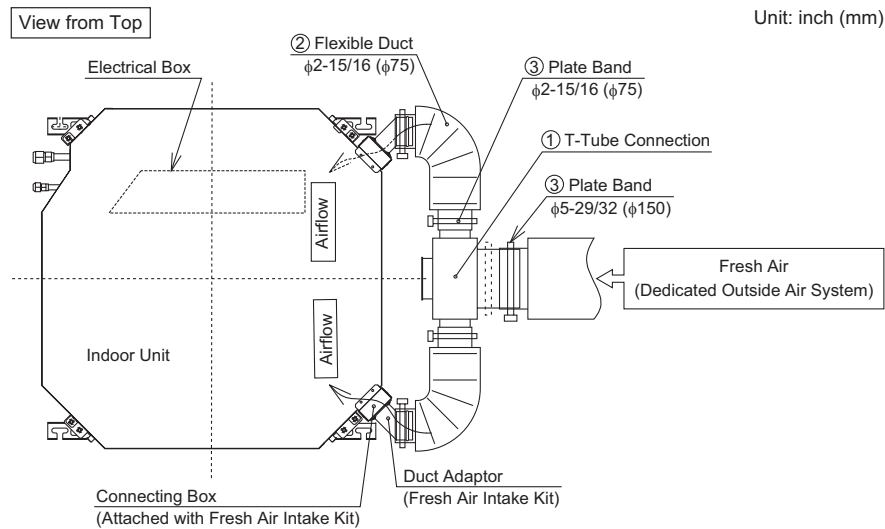
2. Mounting Indoor Unit

- (1) Provide a distance as shown in the figure at the right.
- (2) Suspend the indoor unit with a suspension bolt and attach the intake box of the fresh air intake kit to the indoor unit by referring to the "Installation Manual" for the indoor unit and the fresh air intake kit.
- (3) Attach the connecting box of the fresh air intake kit to the intake box by referring to the "Installation Manual" for the fresh air intake kit.



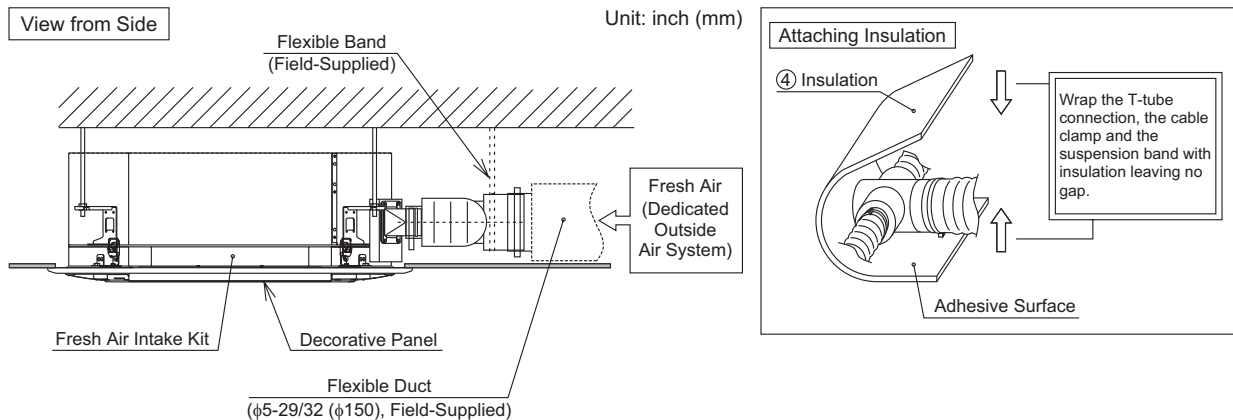
3. Attaching T-Tube Connecting Kit

- 1 Connect the flexible ducts ($\phi 2-15/16$ inch ($\phi 75$ mm)) to the duct adapters ($\phi 2-15/16$ inch ($\phi 75$ mm)) by tightening the plate bands (for $\phi 2-15/16$ inch ($\phi 75$ mm)).
- 2 Connect both joints of T-tube connection to the flexible ducts ($\phi 2-15/16$ inch ($\phi 75$ mm)) by tightening the plate bands (for $\phi 2-15/16$ inch ($\phi 75$ mm)).
- 3 Attach the suspension band (field-supplied) and connect the flexible duct for the dedicated outside air system ($\phi 5-29/32$ inch ($\phi 150$ mm), field-supplied) by tightening the plate band ($\phi 5-29/32$ inch ($\phi 150$ mm)).
- 4 Attach the insulation according to the figure at the lower right. When attaching, wrap the T-tube connection, the plate band and the suspension band (field-supplied) with insulation to cover without leaving a gap.



CAUTION

- If there is not a service access door for the T-tube connecting kit, attach it before installing the decorative panel. The T-Tube Connecting Kit cannot be attached after installing the decorative panel.
- Condensation may occur if the insulation is attached, leaving a gap.
- Securely attach the suspension band (field-supplied) making sure not to apply excessive force to the connecting box. If excessive force is applied to the connecting box, air leakage and condensation may occur because of a gap between the connecting box and the duct adapter.
- Wind aluminum tape (field-supplied) around the duct connection to prevent air leakage.



INSTALLATION

⚠ CAUTION

< Duct Connecting >

- Do not perform the ducting work as shown below.

Sharp Bend



Incorrect

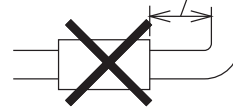
Repeated Bend



Incorrect

Bend near the outlet of dedicated outside air system.

Shorter than 5-29/32inch (150mm)
(for ϕ 5-29/32inch (ϕ 150mm) flexible duct)



Incorrect

- Insulate the duct to prevent condensation.
- If the duct is passed through a fire retarding section such as fireproof construction, a damper shall be installed or the structure will be without fire protection.
- If the metal duct is run through a wall made of wood, insulate between the duct and the wall.

1.5.3.6 Duct Adaptor: PD-75A

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

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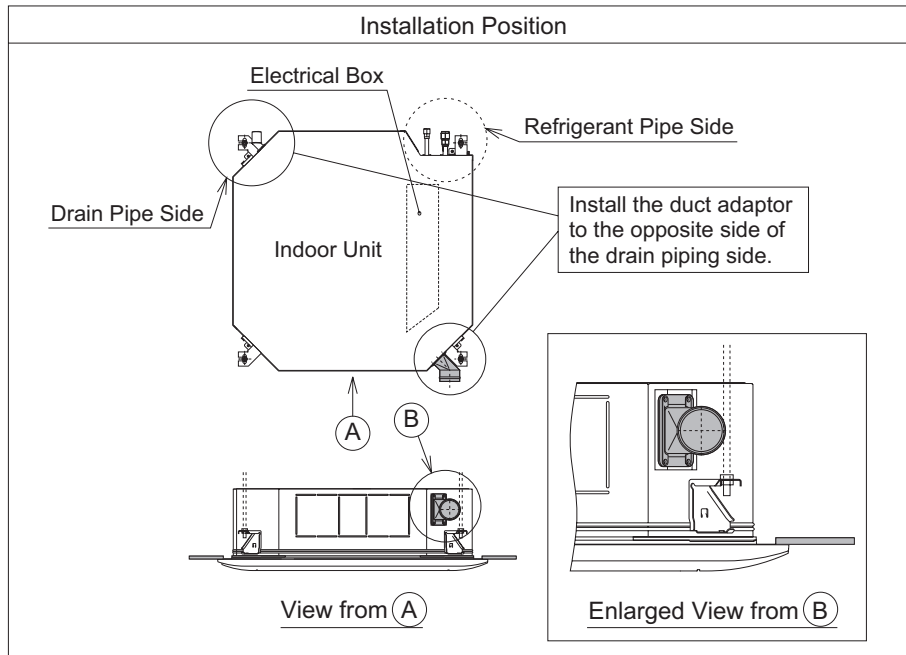
NOTE

: Indicates an useful information for operation and/or maintenance.

- It is assumed that this kit will be installed and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or contractor.
- This manual gives a common description and information for this kit, as well as for other model you may operate.
- This manual should be considered a permanent part of the air conditioning equipment and should remain with the air conditioning equipment. Forward this information to the building owner and request that they maintain all the equipment manuals.

INSTALLATION

This duct adaptor is used as the connection flange to install the fresh air intake duct.



1. Factory-Supplied Accessories

Unit: inch (mm)

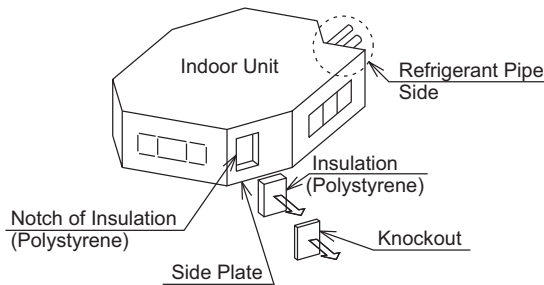
Accessory	Qty.	Purpose
Duct Adaptor	1	-
Insulation A	2	For Covering Gap between Insulation and Side Plate
Insulation B	2	
Insulation	1	For Prevention of Condensation
Screw (M4 x 13/32 (10) Truss)	4	For Installation

2. Installation

(1) Attach the duct adaptor to the indoor unit according to the following procedures.

< Procedures >

- 1 Cut off the knockouts from the side plate using shears.
- 2 Cut off the insulation (Polystyrene) along the notch using a knife or something similar.
- 3 Remove burr after the cutting work. (Be careful not to let swarf enter inside of the indoor unit.)
- 4 Remove swarf after cutting off the insulation (Polystyrene).



CAUTION

- Do not insert the knife more than 1-3/16inch (30mm) into the insulation (Polystyrene) when cutting off the insulation. Do not cut off the (A) part in Fig. 2.
- Do not use any tools which produce a lot of swarf such as a saw for the opening work. The drain pipe can become clogged and cause water leakage.

(2) Place the insulation A and B to cover the entire gap between the side plate and the insulation (Polystyrene). Attach the insulation A to the left and right of the opening and the insulation B to the top and bottom of the opening. Be careful not to cover the screw hole at the indoor unit side during placement.

CAUTION

Perform this work correctly. Otherwise, condensation may occur when cold air enters any gap left between the side plate and the insulation (Polystyrene).

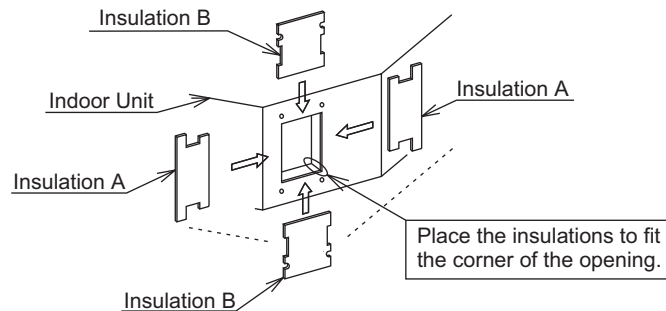
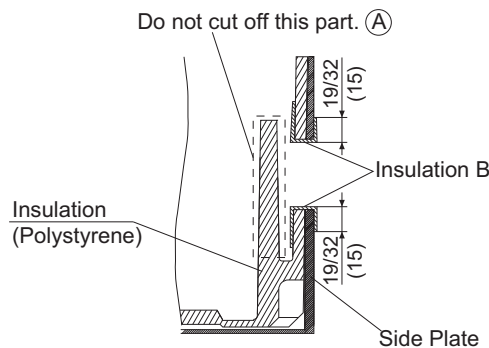
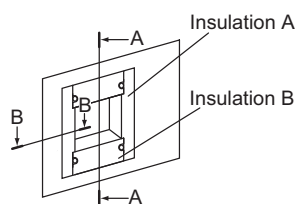
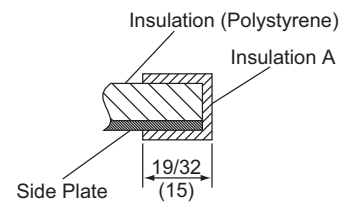


Fig. 1 Position of Insulation Placement



A - A

Unit: inch (mm)



B - B

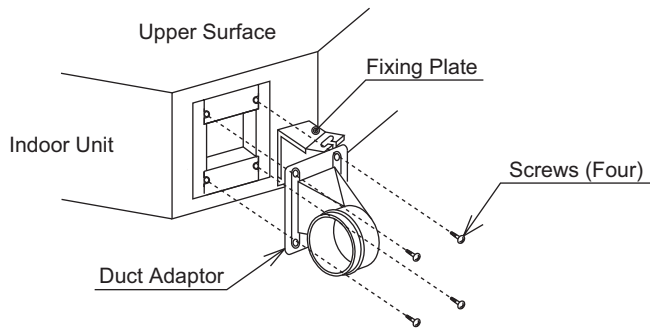
CAUTION

Place the insulations to cover the entire gap between the side plate and the insulation (Polystyrene).

Fig. 2 Cross Section of Insulation Placement

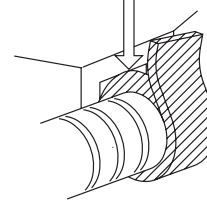
INSTALLATION

(3) Secure the duct adaptor using four screws.



(4) Wrap whole parts from the band for the flexible duct to the resin part of the duct adaptor with the insulation.

Wrap the flexible duct with the insulation so it touches the indoor unit.



CAUTION

Tighten the band to secure the flexible duct. (Field-Supplied, Tightening Torque: 108 ft·lbs. (147 N·cm))

1.5.4 For 1-Way Cassette Type

- Table of Contents -

1.5.4.1 Anti-bacterial Air Filter: F-56MS-PK2.....1-798

1.5.4.2 Duct Adaptor: PD-1001-800

1.5.4.3 Grille for Front Discharge: DG-56SW1.....1-802

1.5.4.4 Air Outlet Shutter Plate: PIS-56LS1-808

1.5.4.1 Anti-bacterial Air Filter: F-56MS-PK2

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

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NOTICE

: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

NOTE

: Indicates an useful information for operation and/or maintenance.

- It is assumed that this filter will be installed and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or contractor.
- This manual gives a common description and information for this filter which you operate as well as for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.
- This antibacterial air filter can not be used along with the long life air filter.

▲ CAUTION

Install the antibacterial air filter according to this installation manual. Otherwise, the filter may fall, causing injury or damage to the antibacterial air filter.

NOTE

1. The life period for the antibacterial air filter is approximately 1,800 hours. Replace it when passing the life period.
2. The life period may differ depending on the environment.

1. Setting of Fan Speed

- Select the function selection mode from the wired controller and set the high speed mode to “High Speed 1” before attaching the antibacterial air filter.
- The standard airflow volume will be valid during the heating Thermo-OFF. If the high speed mode is required, set “Hi Speed at Heating Thermo-OFF” from the wired controller.
- The setting detail of the wired controller should be referred to the “Installation Manual” for the wired controller.

Liquid Crystal Display (LCD) of Wired Controller (CIW01)	Setting of “High Speed 1”	Setting of “Hi Speed at Heating Thermo-OFF”

2. Attaching Antibacterial Air Filter to Indoor Unit

Description of Installation

< Factory-Supplied Accessories >

No.	Accessory	Qty.
①	Latch Plate	2
②	Screw	4

The latch plate should stay inside the inlet grille.

- 1 Open the air inlet grille. Remove the standard air filter (factory-supplied).
- 2 Attach the latch plate to the center rib located on the air inlet grille.
- 3 Install the antibacterial air filter on the air inlet grille by inserting the tab to the square hole of the filter.
- 4 Position the antibacterial air filter on the center of the air inlet grille.
- 5 Close the air inlet grille.

NOTICE

Periodical maintenance is required for the Polypropylene (PP) net of the antibacterial air filter. When the filter is covered with dust, clean up the air filter to avoid a lack of air volume. (Vacuum the dust using a cleaner. Water-wash is not allowed.)

1.5.4.2 Duct Adaptor: PD-100

This duct adaptor can be installed when connecting the flexible duct ($\phi 3\text{-}15/16\text{inch}$ ($\phi 100\text{mm}$)) to the indoor unit.

NOTE:

The applicable indoor units may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

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: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

NOTE

: Indicates an useful information for operation and/or maintenance.

- It is assumed that this duct adaptor will be installed and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or contractor.
- This manual gives a common description and information for this duct adaptor, as well as for other models, which you may operate.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment. Forward this information to the building owner and request that they maintain all the equipment manuals.
- As for this duct adaptor, a maximum quantity of fresh air intake by itself is approximately 18cfm (0.5m³/min) (for $\phi 3.3\text{ft}$ ($\phi 1\text{m}$) duct). When the requirement is to take in fresh air, be sure to install Energy Recovery Ventilation (ERV) which is field-supplied. In this instance, do not utilize the duct fan.
- When utilizing ERV (field-supplied), an abnormal noise level may be increased.
- When installing ERV, be sure to confirm a maximum quantity of fresh air intake by referring to the dimensional drawing of the duct adaptor and adjust airflow volume with a damper.
- As for installation work for the duct adaptor, refer to the "Installation Manual" for the indoor unit.
- When taking outside air into the indoor unit, install the field-supplied air filter on the duct side as the indoor unit has no air filter to pass through.

1. Factory-Supplied Accessories

Unit: inch (mm)

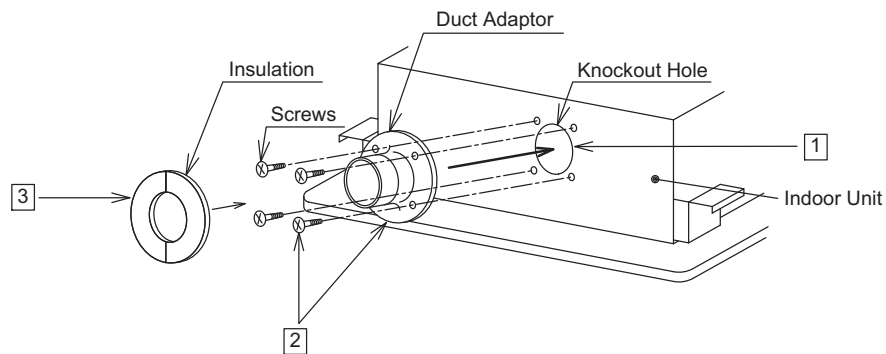
Accessory	Qty.	Purpose	
Duct Adaptor	1	-	
Insulation	1	For Prevention of Condensation	
Screws	4 (M4 x 13/32L (10L))	For 1-Way Cassette and Ceiling Suspended.	For Fixing
	4 (M4 x 15/32L (12L))	-	

2. Installing Duct Adaptor (Example for 1-Way Cassette Type)

(1) Attach the duct adaptor to the indoor unit according to the following procedures.

< Procedures >

- 1 Remove the knockout hole of the unit. After doing so, be sure to scour off any rough parts using sandpaper.
- 2 Fix the adaptor using four screws.
- 3 Attach the insulation.
- 4 Install the field-supplied flexible duct $\phi 3-15/16$ ($\phi 100$)



NOTE:

Tightening torque of the band for the flexible duct (field-supplied) is 1.1 ft·lbs (1.5 N·m).
If fixed excessively, plastic parts may be broken.

1.5.4.3 Grille for Front Discharge: DG-56SW1

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

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- Perform a test run after installation to check for abnormalities.
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: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.



: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

NOTE

: Indicates an useful information for operation and/or maintenance.

- It is assumed that this grille will be installed and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or contractor.
- Perform a test run whether there is an abnormality or not after the installation work is completed. The usage and the maintenance should be explained to a user according to the "Installation and Maintenance Manual" for the indoor unit. Forward this information to the building owner and request that they maintain all the equipment manuals.
- This manual gives a common description and information for this grille for front discharge, as well as for other models, which you may operate.
- DO NOT install the unit in the following places. It causes failure to the unit in many cases.
 - * Places where oil (including machinery oil) mist and steam drifts.
 - * Places where sulfide gas coalesces, such as hot springs.
 - * Places where inflammable gas can generate or flow.
 - * Places where air contains high salt contents, such as coastal regions.
 - * Regions where the air quality is of high acidity or alkalinity.

⚠ WARNING

Perform correctly installation work as instructed in this installation manual.
If the installation is not completed correctly, there can be air leakage resulting in condensation, damage or even injury if the grille for front discharge falls.

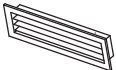
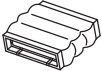


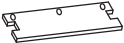

⚠ CAUTION

- Install the grille for front discharge and flexible duct in a compartment handling air for circulation through a duct supplying only one room.
- Do not apply an excessive force to the grille for front discharge. Otherwise, the louver mechanism will be damaged.
- Pay careful attention not to scratch the coating on the surface of the grille for front discharge when transporting and handling. (Especially, pay careful attention to the flocking parts such as a frame of the grille for front discharge and side of the louver.)

1. Before Installation

(1) Check that all the following accessories are packed with the unit before installation.

Unit: inch (mm)

No.	Name	Sketch	Qty.	Location and Purpose
			DG-56SW1	
①	Grille for Front Discharge		1	For Front Discharge
②	Flexible Duct		1	Connecting to Indoor Unit
③	Screw (M4)		6	Fixing Duct to Indoor Unit
④	Adjustment Equipment		1	To Adjust Louver Angle
⑤	Insulation	A  $3/32T \times 2-3/4 \times 25-23/32$ (2T x 70 x 653)	2	Seal Material for Flexible Duct
		C  $3/32T \times 2-3/4 \times 3-1/32$ (2T x 70 x 77)	2	

NOTE:

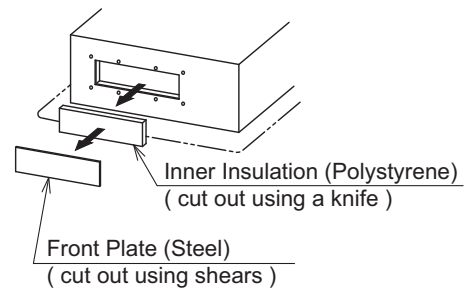
In an instance of dedicated front flow (1-way), an optional part, the “Air Outlet Shutter Plate” (PIS-56LS) is required.

INSTALLATION

- (2) Cut out the front plate and insulation from the side plate of the indoor unit.

< Procedure >

- 1 Cut out the front plate (Steel) of the indoor unit along with the score lines using shears.
- 2 Cut out the inner insulation (Polystyrene) along with the square hole using a knife.



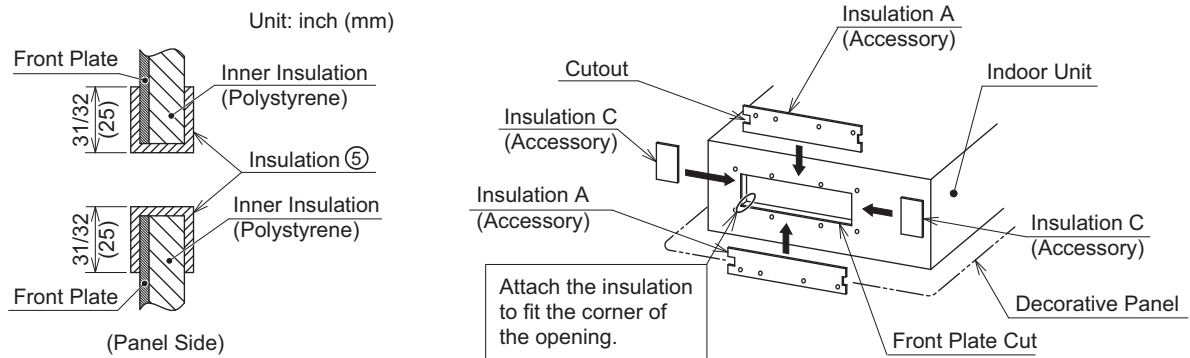
NOTES:

1. Remove burr after the cutting work. (Do not let swarf enter inside the indoor unit.)
2. Remove swarf after cutting off the insulation (Polystyrene).
3. Do not insert the knife more than 1-1/2 in. (30mm) into the insulation (Polystyrene). Otherwise, the drain pan and the heat exchanger may be damaged.

- (3) Attach the insulation A and C to cover the entire gap between the side plate and the insulation (Polystyrene). Attach the insulation A to the upper and lower part of the opening, and the insulation C to the left and right of the opening. Be careful not to cover the screw hole at the indoor unit side when attaching.

CAUTION

Perform this work correctly. Otherwise, condensation may occur when cold air enters a gap between the side plate and the insulation (Polystyrene).



CAUTION

Attach insulations to seal a clearance between the front plane and the inner insulation (Polystyrene).

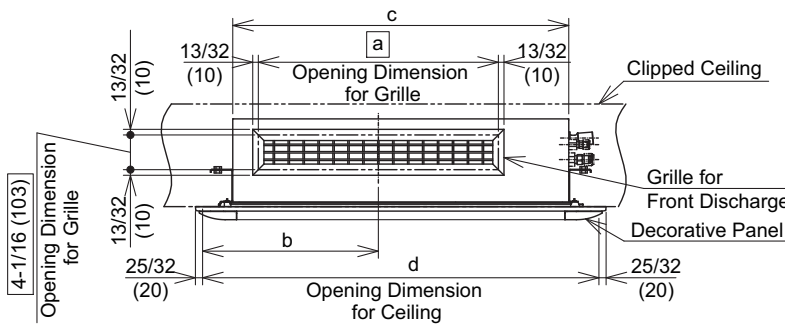
2. Installation

(1) Install the grille for front discharge according to the figure below.

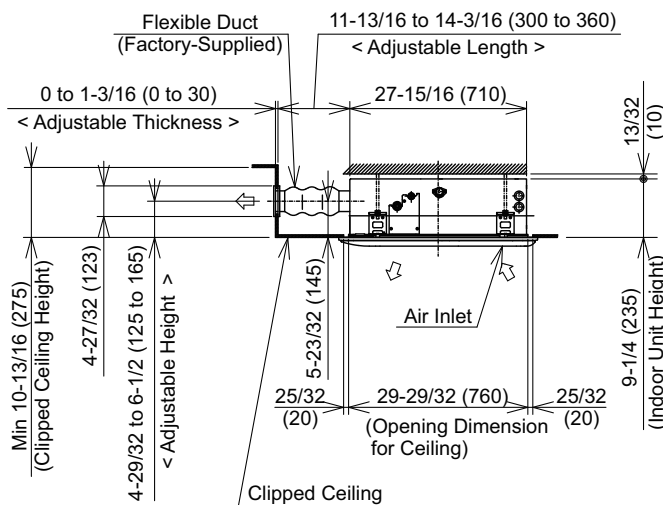
Unit: inch (mm)

Dimension \ Model	a	b	c	d
DG-56SW1	25-23/32 (653)	18-1/2 (470)	35-7/16 (900)	41-23/32 (1060)

Front View



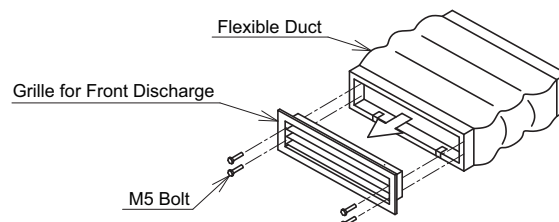
Right Side View



NOTES:

1. When installing the grille for front discharge to the unit, be careful it doesn't touch the metallic equipment which is for the ceiling installation.
2. Refer to the "Installation Manual" for the decorative panel for the installation details.
3. Be certain to use the factory-supplied duct. A field-supplied duct is not available.
4. Pay attention not to scratch the panel surface when installing and removing the grille for front discharge.
(Especially pay careful attention not to scratch frame of the grille for front discharge and the side louver with insulation.)

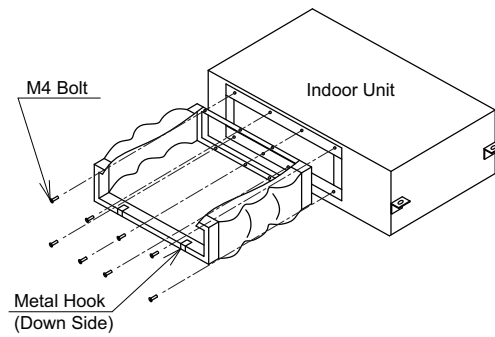
(2) Remove four M5 bolts and separate the grille for front discharge and the flexible duct.



INSTALLATION

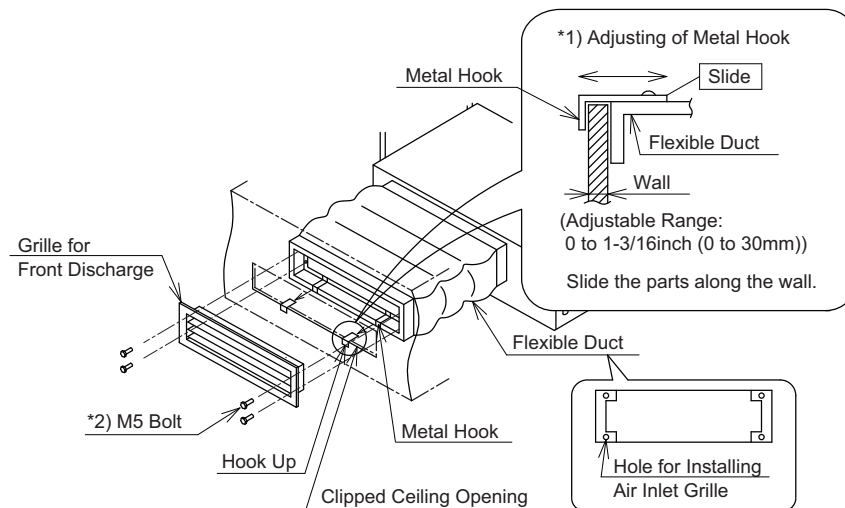
(3) Mount the grille for front discharge and the flexible duct according to the following procedures.

- 1 Mount the flexible duct to the indoor unit with M4 screws (DG-56SW1: 6).



2 Hook the metal hook of the flexible duct to the under surface of the clipped ceiling opening.

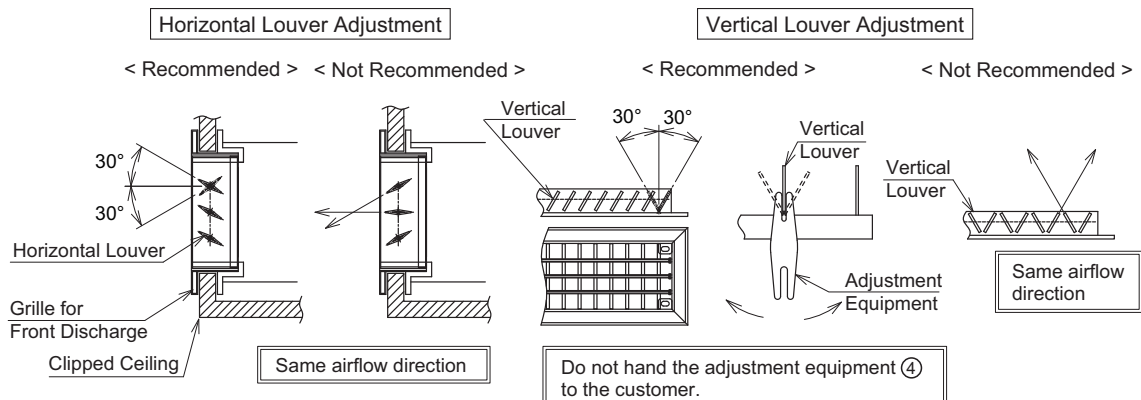
- 1 Adjust the size according to the wall thickness.
- 2 Attach the grille for front discharge to the flexible duct.
- 3 Secure the flexible duct with four M5 bolts. (As for details of adjusting the metal hook, refer to *1) in the figure below.)



*2) No gap should exist between the clipped ceiling opening and the grille for front discharge. Otherwise, air leakage can cause condensation. If there is still a gap after attaching the grille for front discharge to the flexible duct, tighten firmly with four M5 bolts until no gap exists.

(4) Adjustment of four airflow directions as shown in the figure below.

- 1 Adjust the horizontal louver using your hands and make the louver angle within $\pm 30^\circ$ from the initial position. Otherwise, it will allow condensation to drip from the air outlet grille.
- 2 When adjusting the vertical louver, use the factory-supplied adjustment (4) and make the louver angle within $\pm 30^\circ$ from the initial position.



3. Optional Setting

It is possible to discharge air from both front and down airflow by combining with the grille for front discharge.

Item Type	Figure	Function	Caution
1-Way (Front Flow)		Standard	Be certain to use the air outlet shutter plate to close the air outlet of the indoor unit.
2-Way (Front Flow + Down Flow)		High 1	Air Volume Ratio: Front Flow 5, Down Flow 5 (Fixed)

CAUTION

- When the requirement is to increase the airflow volume for a down flow depending on the installing conditions or environment of the room, close the openings of the grille for front discharge using the vertical louvers to let more airflow for the down flow.
- When an antibacterial air filter is used with the grille for front discharge, select “Speed-up 1” for 1-way, “Speed-up 2” for 2-way. The specified flow volume is secured.

* Refer to the “Installation Manual” for the wired controller for details.

Liquid Crystal Display (LCD) of Wired Controller (CIW01)

Setting of “High Speed 1”

Function Selection:01-03

Item	Setting
C2	-- 04
C3	00 /
C4	00
C5	← 01 → 23
C6	00

Sel. Adj. OK Entr Back Rtrn

“High Speed Mode” High Speed 1: 01
High Speed 2: 02

< Setting from Controller and Airflow Volume during Setting High Speed Mode >

Airflow Volume Setting from Wired Controller	High 2	High	Med	Low	
High Speed Mode	Standard	HH2	Hi	Me	Lo
	High Speed 1	HH2	HH1	Hi	Me
	High Speed 2	HH2	HH2	HH1	Hi

“High 2” does not change the airflow volume even if the high speed mode is set.

NOTES:

1. “High 2” does not change the airflow volume even if the high speed mode is set.
2. When setting “High Speed 1”, the airflow volume is increased one level compared with the airflow volume of the standard mode. In an instance of “High Speed 2”, the airflow volume is increased two levels.
3. When setting “High Speed 2”, the airflow volume of “High 2” and “High” will be equal.
4. When the high speed mode or “High 2” is set, the sound level may increase during the indoor unit’s operation.

1.5.4.4 Air Outlet Shutter Plate: PIS-56LS

NOTE:

The applicable indoor unit may be different depending on the product series. Refer to the product catalog for applicable indoor unit models.

IMPORTANT NOTICE:

- Johnson Controls pursues a policy of continuous improvement in design and performance of products. We reserve the right to vary specifications without notice.
- No part of this manual may be reproduced without Johnson Controls' written permission.
- Keep this manual for future reference.
- Johnson Controls cannot anticipate every possible circumstance that might involve a potential hazard.
- This kit is designed for a combination of Johnson Control air conditioners. Do not use this kit by itself or in combination with other companies' air conditioners.
- Perform a test run after installation to check for abnormalities.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

▲ DANGER

: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

▲ WARNING

: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

▲ CAUTION

: Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.

NOTICE

: Indicates information considered important, but not hazard-related (e.g. messages relating to property damage).

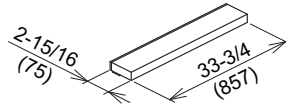
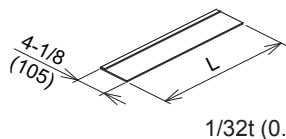
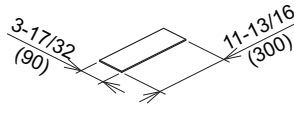
NOTE

: Indicates an useful information for operation and/or maintenance.

- It is assumed that this shutter plate will be installed and serviced by English speaking people. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your distributor or contractor.
- This manual gives a common description and information for this shutter plate, as well as for other models, which you may operate.
- This manual should be considered a permanent part of the air conditioning equipment and should remain with the air conditioning equipment. Forward this information to the building owner and request that they maintain all the equipment manuals.

1. Factory-Supplied Accessories

Unit: inch (mm)

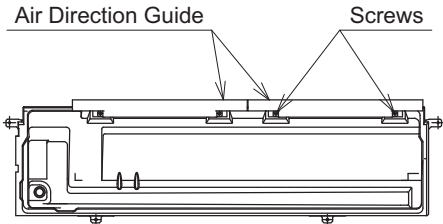
No.	Accessory	Accessory			Qty.
					PIS-56LS
①	Shutter Plate				1
②	Sheet		L	34-21/32 (880)	1
③	Patch Sheet				1

2. Before Installation

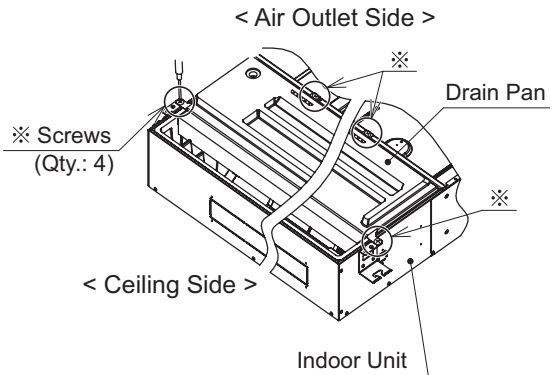
Remove the air direction guide from the drain pan.

- (1) Remove the drain pan from the indoor unit.
- (2) Remove the air direction guide from the drain pan.
- (3) Reassemble the drain pan.

NOTE:
Keep the air direction guide.



< View from Drain Pan Side >



3. Installation

< Procedures >

Unit: inch (mm)

1

Peel off the release paper of the sheet ②. Attach the sheet ② to the insulation ① according to the figure below. Full area of the cover should be covered by the sheet. (Refer to the details for the Folded Part.)

- PIS-56LS

※1: Keep the space.

[Details of Folded Part]

< View from P >

2

Attach the shutter plate ① with the sheet ② on the air outlet of the indoor unit.

- PIS-56LS

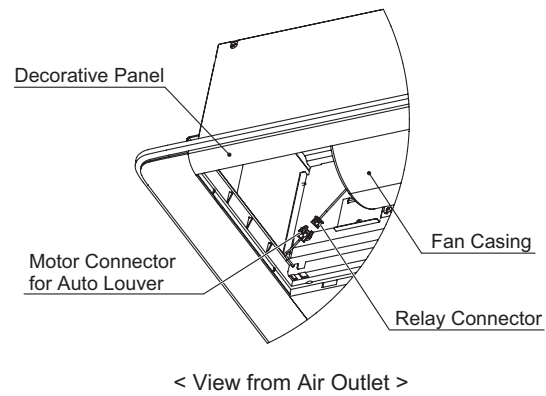
※2: When installing, be sure that the folded part touches the drain pan to make the maintenance easier. (At that time, be sure the adhesive surface doesn't touch the drain pan.)

4. Decorative Panel Installation

- (1) Do not connect the connector and the relay connector.
- (2) Refer to the Installation Manual for the decorative panel.

NOTES:

1. If the sheet ② is peeled off, cut a patch sheet ③ to an appropriate size and repair it.
2. Do not throw away the patch sheet.



1.5.5 For Wall Mount Type

- Table of Contents -

1.5.5.1 Strainer Kit: MSF-NP63A, MSF-NP112A.....1-813

1.5.5.1 Strainer Kit: MSF-NP63A, MSF-NP112A

This manual is for the strainer kit installation. Read this manual together with the “Installation and Maintenance Manual” for the outdoor unit and indoor unit.

Be sure to read this manual carefully for correct performance before installation work.

When connecting the wall mount type indoor unit to the VRF system, make sure to attach the strainer kit to the refrigerant piping close to the wall mount type indoor unit. This prevents solid particles from entering into the electronic expansion valve inside the unit.

NOTE:

Forward this information to the building owner and request that they maintain all the equipment manuals.

IMPORTANT NOTICE:

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- Johnson Controls cannot anticipate every possible circumstance that might involve a potential hazard.
- This kit is designed for a combination of Johnson Controls air conditioners. Do not use this kit itself or in combination with other companies’ air conditioners.
- No part of this manual may be reproduced without Johnson Controls’ written permission.
- Signal words are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.



: Indicates a hazardous situation that, if not avoided, will result in death or serious injury.



: Indicates a hazardous situation that, if not avoided, could result in death or serious injury.



: Indicates a hazardous situation that, if not avoided could result in minor or moderate injury.



: Indicates information considered important, but not hazard-related (such as messages relating to property damage).

NOTE

: Indicates useful information for operation and/or maintenance.

- Do not install the unit in the following places. Doing so may cause ignition, fire, deformation, corrosion, or damage.
 - * Places where oil (including machinery oil) may be present
 - * Places where sulfide gas can generate, such as hot springs
- Do not install the unit in the following places. It may cause corrosion.
 - * Places with dense, salt-laden airflow such as coastal regions
 - * Regions where the air quality is of high acidity

INSTALLATION

WARNING

- Utilize this manual when performing installation work. If the installation is not performed correctly and completely, there may be water leakage, electric shock, fire or even injury as a result of the indoor unit falling.
- Select an appropriate place to support the strainer kit weight for installation. If not, it may cause injury if the strainer kit falls.
- When this strainer kit is installed in a small room, make sure to take proactive measures to prevent the refrigerant from exceeding the maximum allowable concentration should a refrigerant gas leakage should occur. If refrigerant gas leakage occurs in a small room, refrigerant concentration exceeds the allowable limit and may lead to asphyxiation. Contact your distributor or contractor for countermeasures (ventilation system and so forth) in such a case.
- Do not install the strainer kit in a location where flammable gas generation or inflow may occur. It may lead to fire.
- Do not step on the strainer kit or put any materials on it. It may lead to an injury because of a fall.
- Be sure to wear leather gloves for handling refrigerant gas. If refrigerant gas directly contacts skin, it may cause frostbite.
- Be sure to check for refrigerant leakage. Noncombustible, nontoxic, odorless fluorocarbon is used for this unit, but if fluorocarbon is leaked and ignites, toxic gas may generate. Also, since specific gravity of fluorocarbon is heavier than that of air, gas will spread over the floor surface and may lead to oxygen deficiency.
- Use the specified non-flammable refrigerant (R410A) to the refrigerant cycle. Do not mix other substances with R410A at installation, maintenance or relocation. If combustible substances such as different refrigerant, air, oxygen, propane or alcohol are mixed, it may lead to explosion, fire or injury.
- Refrigerant oil is sensitive to the influence of moisture, oxide film or grease and oil. Take good care to prevent moisture, dirt and dust, or remaining refrigerant/refrigerant oil used before from entering into the refrigeration cycle when installing. If not, such impurities accumulate at other parts, such as the expansion valve, and may lead to operational malfunction.
- Install the refrigerant piping securely before starting compressor operation. For maintenance, relocation or disposal, be sure to stop compressor operation before removing the refrigerant piping. If the compressor is operated without refrigerant piping and the stop valve is opened, abnormal high pressure is generated in the refrigerating cycle because of suctioned air, and it may lead to explosion, fire or injury.
- Existing Refrigerant Pipe Cleaning
 - (1) A noncombustible and nontoxic cleaning agent should be used. If a combustible cleaning agent is used, it may lead to explosion or fire.
 - (2) Enough ventilation is required for cleaning in a close space to avoid suffocation. Toxic gas may generate when the cleaning agent is under a high temperature condition.
 - (3) Be sure to collect and clean up the cleaning agent after cleaning. It is against the law to emit CFCs in the atmosphere intentionally.
- Do not install the unit where oil, steam/organic solvent/corrosive gas (such as ammonia, sulfur compound, acid), or acid/alkali atmosphere is present. It may lead to refrigerant leakage due to corrosion, electric shock, or malfunction.

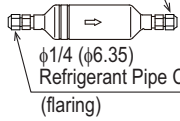
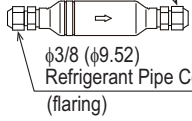
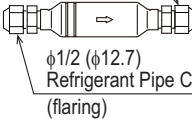
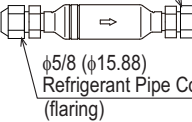
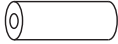
CAUTION

- Do not apply excessive force to the flare nut when tightening. If excessive force is applied, the flare nut may crack refrigerant leakage may occur. Tighten with the specified torque.

1. Factory-Supplied Accessories

Check to ensure the correct number of the following accessories are packed with the unit.

Unit: inch (mm)

No.	Accessory	Figure	Qty.		Remarks
			MSF-NP63A	MSF-NP112A	
1	$\phi 1/4$ ($\phi 6.35$) Strainer	$\phi 1/4$ ($\phi 6.35$) Refrigerant Pipe Connection (flaring)  $\phi 1/4$ ($\phi 6.35$) Refrigerant Pipe Connection (flaring)	1	-	Attach the strainer close to the indoor unit at the liquid side refrigerant piping to facilitate any replacement work.
2	$\phi 3/8$ ($\phi 9.52$) Strainer	$\phi 3/8$ ($\phi 9.52$) Refrigerant Pipe Connection (flaring)  $\phi 3/8$ ($\phi 9.52$) Refrigerant Pipe Connection (flaring)	-	1	
3	$\phi 1/2$ ($\phi 12.7$) Strainer	$\phi 1/2$ ($\phi 12.7$) Refrigerant Pipe Connection (flaring)  $\phi 1/2$ ($\phi 12.7$) Refrigerant Pipe Connection (flaring)	1	-	Attach the strainer close to the indoor unit at the gas side refrigerant piping to facilitate any replacement work.
4	$\phi 5/8$ ($\phi 15.88$) Strainer	$\phi 5/8$ ($\phi 15.88$) Refrigerant Pipe Connection (flaring)  $\phi 5/8$ ($\phi 15.88$) Refrigerant Pipe Connection (flaring)	-	1	
5	Piping Insulation	 (common use for liquid and gas piping)	2	2	For strainer insulation

2. Installation

- (1) Attach the strainer close to the indoor unit to facilitate replacement work.
- (2) When the strainer is attached to an inside wall or roof space, provide a service access door for maintenance.
- (3) When on-site piping with a joint such as an elbow socket is buried, provide a service access door to facilitate the check for connecting parts.

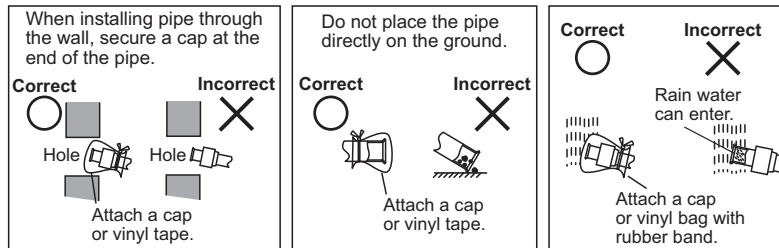
3. Refrigerant Piping Work

Refer to the "Installation and Maintenance Manual" attached with the outdoor unit for details on refrigerant piping, vacuuming and refrigerant charging work.

3.1 Piping

- (1) Prepare field-supplied copper pipes.
- (2) Select clean copper pipes. Make sure there is no dust or moisture inside
- (3) The refrigerant oil for the refrigerant R410A is susceptible to moisture, an oxide film, oil and grease. Take special care during the installation so that moisture, contaminants or old refrigerant oil will not enter the refrigerant cycle. Otherwise, impurities may adhere to the expansion valve and it may prevent proper operation.
- (4) When cutting the pipes, use a pipe cutter to avoid a grind swarf generation for the pipe cutting work. Blow the inside of the pipes with nitrogen or dry air to remove any dust or foreign materials before connecting pipes. Do not use any tools which produce a lot of swarf such as a saw or a grinder.

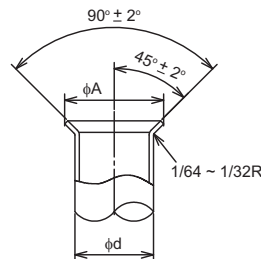
< Caution for Refrigerant Piping >



3.2 Piping Connection

3.2.1 Flare Nut and Flaring Work

- (1) Perform the flaring work as shown on the right.



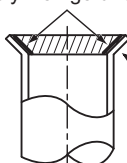
Diameter (ϕd)	inch (mm)
	ϕA^0 -1/64 (-0.4)
1/4 (6.35)	11/32 (9.1)
3/8 (9.52)	17/32 (13.2)
1/2 (12.7)	21/32 (16.6)
5/8 (15.88)	25/32 (19.7)

- (2) Use specific flare nuts attached with the unit. (The flare nut is based on JIS B 8607.)
- (3) Check that there are no scratches, adhered grinding swarf, deformation or surface unevenness at the flaring part.
- (4) Before tightening the flare nut, apply refrigerant oil (field-supplied) in a thin layer over the flaring part. (Do not apply the oil on other parts.) Tighten the flare nut for the liquid pipe to the specified torque with two wrenches. Then, tighten the flare nut for the gas pipe in the same way. After the tightening work has been completed, check that no refrigerant leakage occurs.

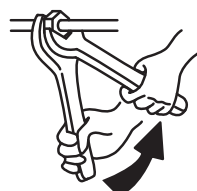
NOTES:

1. Refrigerant oil is field-supplied.
[Polyvinyl ether Oil FVC68D (Idemitsu Lubricants America)]
2. If the refrigerant oil attaches to the decorative panel, it may cause a crack.
Be careful not to let that happen.

Apply Refrigerant Oil.



Do not apply the refrigerant oil to the outside of the flaring part.



Use two wrenches for tightening the flare nut.

Required Tightening Torque

(JIS B 8607)

Pipe Size	Tightening Torque
ϕ1/4 inch (6.35 mm)	10.3 - 13.3 lbf-ft (14 - 18 N-m)
ϕ3/8 inch (9.52 mm)	25.1 - 31.0 lbf-ft (34 - 42 N-m)
ϕ1/2 inch (12.7 mm)	36.1 - 45.0 lbf-ft (49 - 61 N-m)
ϕ5/8 inch (15.88 mm)	50.2 - 60.5 lbf-ft (68 - 82 N-m)

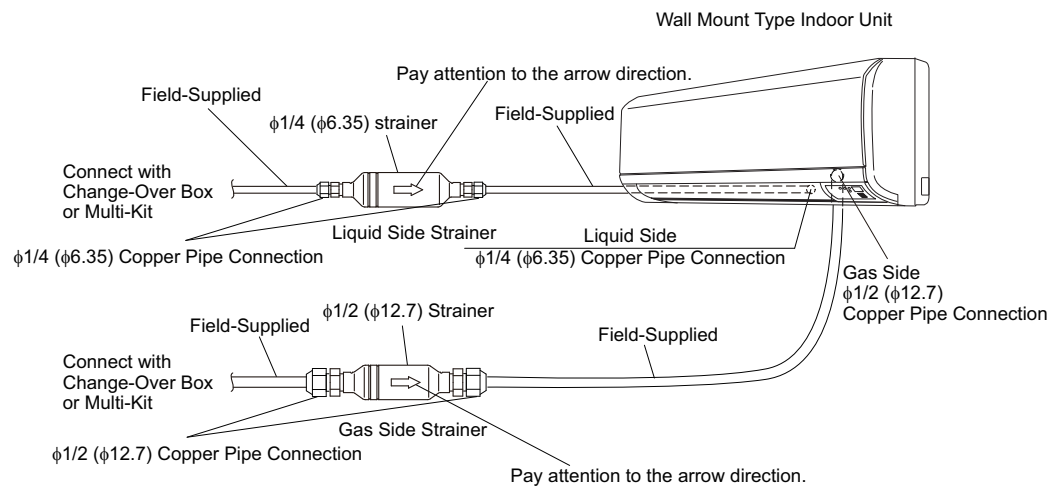
3.2.2 Strainer Kit Installation

- (1) Attach the strainer kit with the point of the arrow directing toward the indoor unit side. If it is installed in the opposite direction, foreign material is not collected.
- (2) Provide anti-vibration support with piping to avoid damages by an external force such as earthquake.
- (3) Piping (gas/liquid) will stretch because of refrigerant temperature changes. Provide clearance in an axial direction to prevent thermal stress.
- (4) When installing piping, fix the pipes and prevent the pipes from contacting areas such as walls or ceilings. Otherwise, abnormal sounds may be heard due to vibrating pipes.

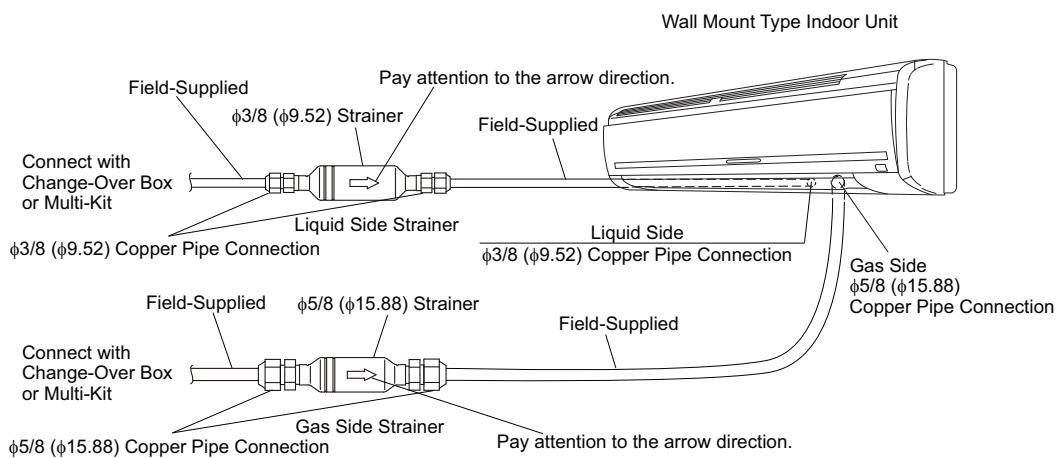
Example

< MSF-NP63A >

Unit: inch (mm)



< MSF-NP112A >



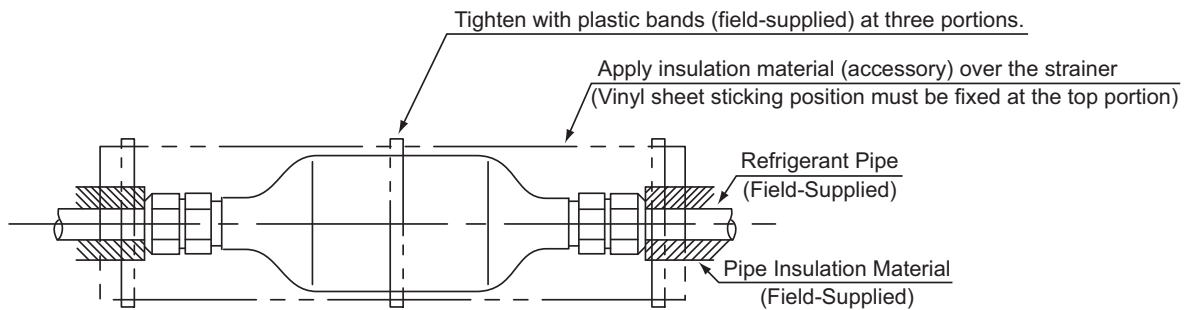
- Insulate all the refrigerant piping to prevent condensation. If piping is exposed to the ambient atmosphere, dew condenses over the piping surface and water drips.
- In an instance where the piping size does not correspond with the strainer kit, use a reducer (field-supplied).

INSTALLATION

- (5) Perform airtight test according to the "Installation and Maintenance Manual" attached with the outdoor unit.
- (6) Be sure to apply the insulation material (accessory) around the gas side strainer and the liquid side strainer.
If atmospheric conditions seem to exceed approx. 80.6°F (27°C), 80%RH, condensation may generate over the insulation material surface which is applied to the strainer. Additionally apply the insulation material (7/32 to 13/32 in. (5 to 10 mm thickness)) over the strainer insulation material to prevent condensation.
- (7) Apply tapes over the insulation material surface to prevent water splash.

CAUTION

- Do not apply excessive force to the flare nut when tightening. If excessive force is applied, the flare nut may crack because of aged deterioration and refrigerant leakage may occur. Tighten with the specified torque.



In order to prevent condensation, apply tapes over the insulation material (accessory) and secure them with plastic bands.

Forward this information to the building owner and request that they maintain all the equipment manuals.

1.5.6 Piping Kit

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1.5.6.1 Piping Connection Kit between Outdoor Units for 2 Piping System

● MC-NP21A1, MC-NP30A1

NOTE

After installation, it is recommended to give this manual to customer for future reference.

1. Applicable Outdoor Units

These multiple piping connecting kits can be applied to the R410A VRF systems.

2. Transportation




Transport this product as close to the installation site as is practical before unpacking. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete

Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection Upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).
General Precautions	
 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic “Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

INSTALLATION

- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions



To reduce the risk of serious injury or death, the following installation precautions must be followed:

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.

INSTALLATION

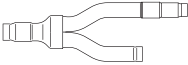
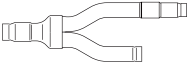
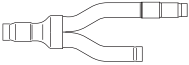
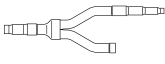
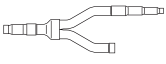
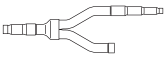














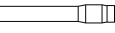











- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor

⚠ CAUTION

Do not place any material on this product

3. Before Installation

IMPORTANT! Confirm the number of the following parts kit by referencing the model number printed on the package before opening. Do NOT intermix any foreign objects within this kit. Verify that no foreign objects are present inside any kit components prior to installation.

Name of Parts	MC-NP21A1		MC-NP30A1				
	Qty.		Piping Connection Kit 1		Piping Connection Kit 2		
			Qty.		Qty.		
Branch Pipe for High/Low Pressure Gas Line		1		1		1	
Branch Pipe for Liquid Line		1		1		1	
Accessory	Insulation for High/Low Pressure Gas Line		1 set		1 set		1 set
	Insulation for Liquid Line		1 set		1 set		1 set
	Reducer for High/Low Pressure Gas Line Connection (For Connecting Pipe (Field-Supplied))		1		1		1
			1		1		1
			1		1		1
			1	 2	 1	 1	 2
Reducer for Liquid Line Connection (For Connecting Pipe (Field-Supplied))		1		1		1	
Tape		2		2		2	

NOTE : If any of these parts are missing, please contact your distributor. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

4. Installation Work

4.1 Piping Connection Size

The ends of the multi-kits are finished as shown in the following figures. Cut the end of the pipe to correspond with the pipe size.

CAUTION

Allow adequate space for elbow, angled, and irregular piping arrangements to compensate for expansion and contraction brought on by temperature change.

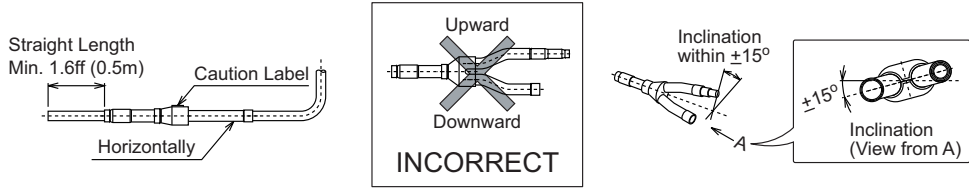
Model	Branch Pipe for High/Low Pressure Gas Line	Branch Pipe for Liquid Line	Reducer for High/Low Pressure Gas Line	Reducer for Liquid Line
MC-NP21A1				
MC-NP30A1	Piping Connection Kit 1 			
	Piping Connection Kit 2 			

Unit: inch, ID: Inner Diameter, OD: Outer Diameter

(※): When installing the “Branch Pipe for High/Low Pressure Gas Line” for “Piping Connection Kit 2”, install “Long Reducer” at “To Piping Connection Kit 1” side of “Piping Connection Kit 2”. Otherwise, it could result in abnormal oil distribution between each of the outdoor units.

4.2 Installation Position

- Horizontal Installation
 Locate the branch pipes to become the “Y” union pipe section with the affixed caution label.
 (Inclination within $\pm 15^\circ$)
 Make the straight section a minimum of 1.6ft (0.5m) after the vertical bend.
 Incorrect installation can result in the failure of the outdoor unit.

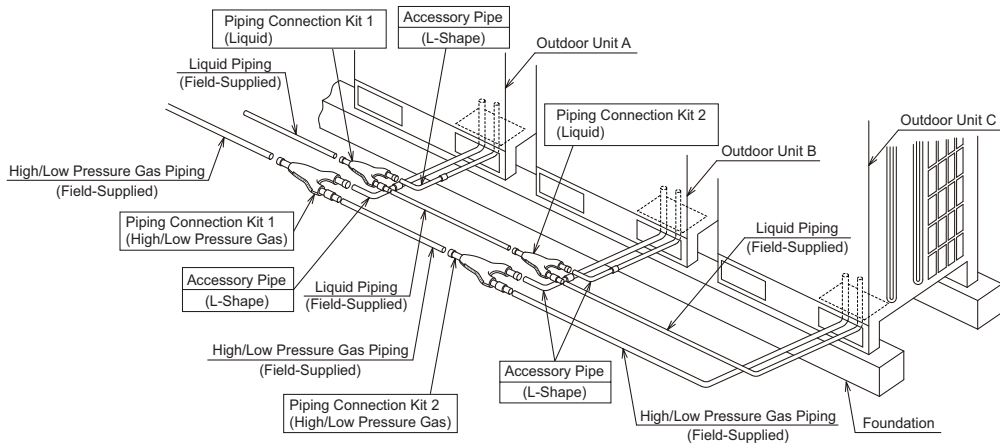


4.3 Piping Connection

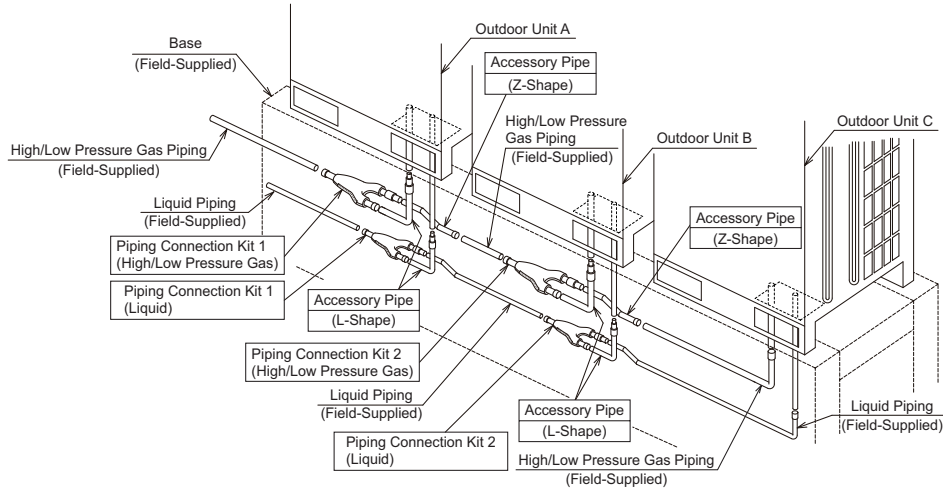
Perform piping connections work by referring to the figure below.
 Refer to the installation and maintenance manual for outdoor units for piping length between outdoor units and between piping connection kits.

Example: Combination of three Outdoor Units

Front Side or Rear Side Piping Connection



Downward Piping Connection



NOTE:
 Use the field-supplied connecting pipe in accordance with the installation and maintenance manual for the outdoor units. If necessary, use a reducer (accessory).

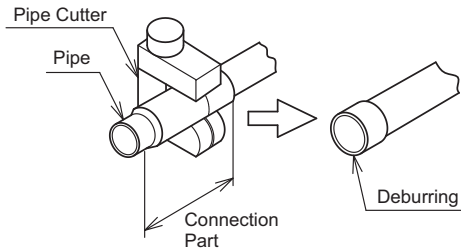
INSTALLATION

4.4 Piping Work

- When the branched pipe size is 7/8 inch (22.2mm) or less in inner diameter, a field-supplied mini-pipe cutter is required.

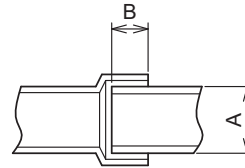
Recommended Mini-Pipe Cutter	Available Cut Size	Rotating Radius
	<p>3/16 - 1-1/8 (5 - 29)</p>	<p>2 inches (51)</p>

- Use clean copper piping with no dust or moisture on internal surfaces present. When connecting refrigerant piping, cut copper pipes with a pipe cutter as shown below. Blow-out the pipes with nitrogen or compressed air to remove any dust or metal filings. Do not use a saw or a grindstone which can leave behind large amounts of filings and cutting residue.

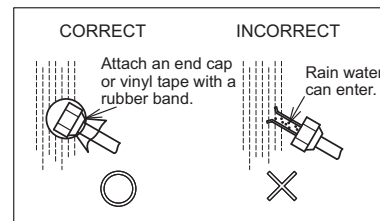
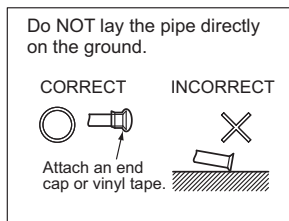
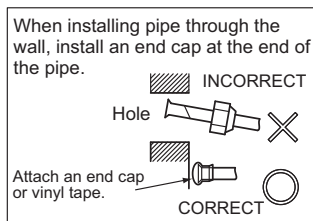


- When cutting the pipe, allow for an adequate depth for brazing as shown in the following table.

Diameter (A)	Min. Insertion Depth (B)
$3/16 \leq A < 5/16$ ($5 \leq A < 8$)	1/4 (6)
$5/16 \leq A < 15/32$ ($8 \leq A < 12$)	9/32 (7)
$15/32 \leq A < 5/8$ ($12 \leq A < 16$)	5/16 (8)
$5/8 \leq A < 31/32$ ($16 \leq A < 25$)	13/32 (10)
$31/32 \leq A < 1-3/8$ ($25 \leq A < 35$)	15/32 (12)
$1-3/8 \leq A < 1-25/32$ ($35 \leq A < 45$)	9/16 (14)



• Caution for Refrigerant Piping



4. Make sure that all stop valves of the outdoor unit are closed completely.
5. Bleed nitrogen gas through refrigerant lines when brazing. Pressure should not exceed 2.9psi (0.02MPa).

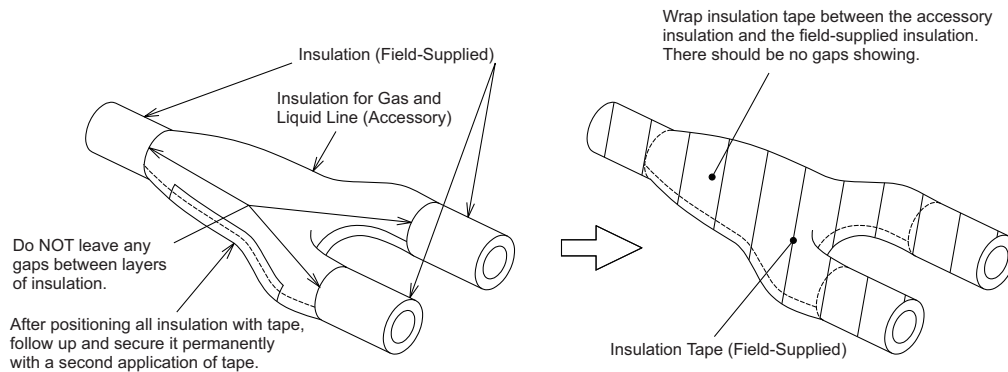
⚠ DANGER

Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which could cause suffocation.

6. The air-tight test pressure for this product is 601psi (4.15MPa).
7. Install the field-supplied insulation with these multi-kits to each branch (liquid side and gaseous side), with tape. Also, apply the field-supplied insulation for these units.

NOTE

When polyethylene foam is applied, a thickness of 13/32 inch (10mm) for liquid piping and 19/32 to 25/32 inch (15 to 20mm) for gas piping is recommended. (Use a grade of insulation with heat resistance value of 212°F (100°C) for gas piping.)



⚠ CAUTION

- Perform insulation work only when the surface temperature of the pipe material has cooled to room temperature. Anything done immediately after brazing can cause the insulation to melt.
- During piping work, always cover over or plug the open end to keep the inside free of dust and moisture.

After installation, it is recommended that the customer retain this manual for future reference.

• MC-NP40A1

NOTE

After installation, it is recommended to give this manual to customer for future reference.

1. Applicable Outdoor Units

These multiple piping connecting kits can be applied to the R410A VRF systems.

2. Transportation

Transport this product as close to the installation site as practical before unpacking. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

 CAUTION




Do not place any material on this product.

Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).
General Precautions	
 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic “Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

INSTALLATION

- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions



To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution

⚠ WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

⚠ WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

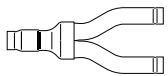
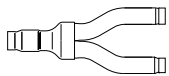
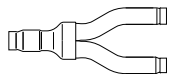
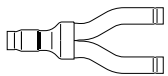
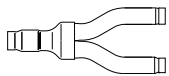
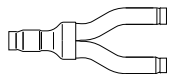
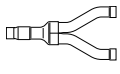
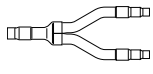
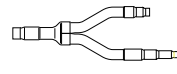
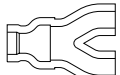
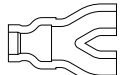
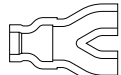
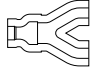
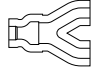
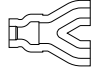







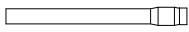
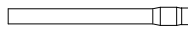







- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.

INSTALLATION

- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor

3. Before Installation

IMPORTANT! Confirm the number of the following parts kit by referencing the model number printed on the package before opening. Do NOT intermix any foreign objects within these kits. Verify that no foreign objects are present inside any kit components prior to installation.

Name of Parts	Piping Connection Kit 1		Piping Connection Kit 2		Piping Connection Kit 3		
		Qty.		Qty.		Qty.	
Branch Pipe for High/Low Pressure Gas Line		1		1		1	
Branch Pipe for Liquid Line		1		1		1	
Accessory	Insulation for High/Low Pressure Gas Line			1 set		1 set	
	Insulation for Liquid Line			1 set		1 set	
	Reducer for High/Low Pressure Gas Line Connection (For Connecting Pipe (Field-Supplied))		1		1		1
			2		1		1
			1		1		1
		—	None		1		2
Reducer for Liquid Line Connection (For Connecting Pipe (Field-Supplied))	—	None		1		1	
Tape		2		2		2	

NOTE : If any of these parts are missing, please contact your distributor. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

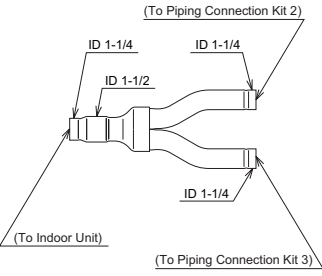
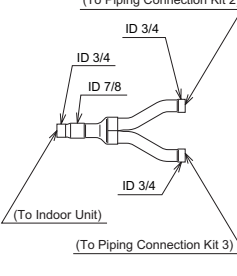
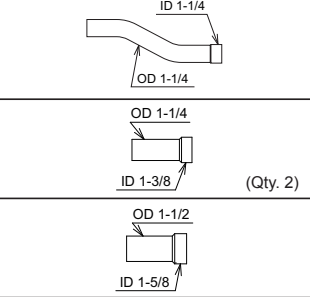
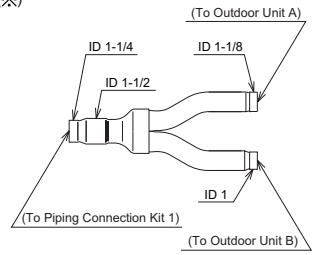
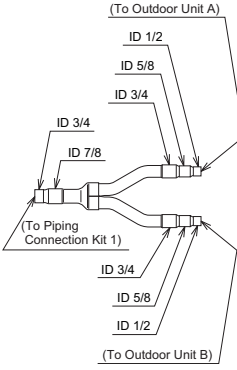
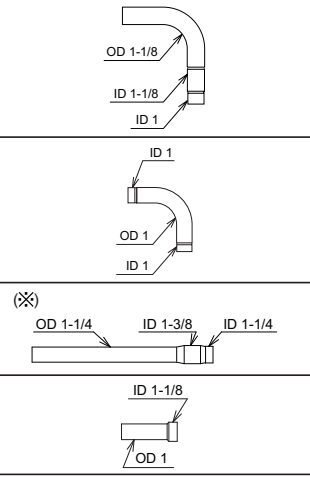
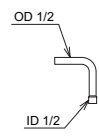
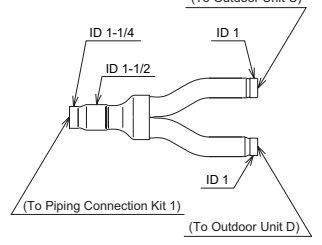
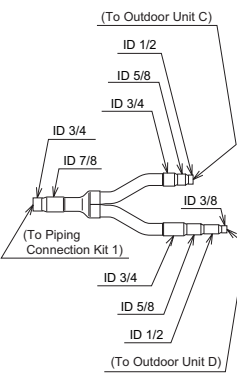
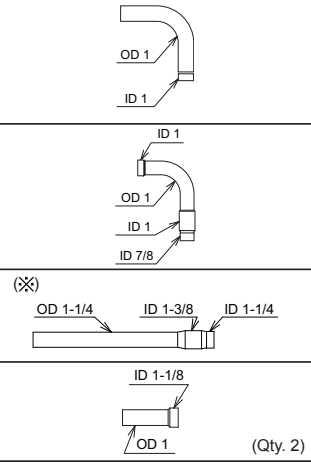
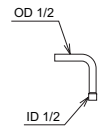
4. Installation Work

4.1 Piping Connection Size

The ends of the multi-kits are finished as shown in the following figures. Cut the end of the pipe to correspond with the pipe size.

⚠ CAUTION

Allow adequate space for elbow, angled, and irregular piping arrangements to compensate for expansion and contraction brought on by temperature change.

	Branch Pipe for High/Low Pressure Gas Line	Branch Pipe for Liquid Line	Reducer for High/Low Pressure Gas Line	Reducer for Liquid Line
Piping Connection Kit 1				—
Piping Connection Kit 2	<p>(※)</p> 			
Piping Connection Kit 3	<p>(※)</p> 			

Unit: inch, ID: Inner Diameter, OD: Outer Diameter

(※): When installing "Branch Pipe for High/Low Pressure Gas Line" of "Piping Connection Kit 2" and "Piping Connection Kit 3", install "Long Reducer" at "To Piping Connection Kit 1" side of "Piping Connection Kit 2" and "Piping Connection Kit 3". Otherwise, it will cause oil distribution problems between each of the outdoor units.

INSTALLATION

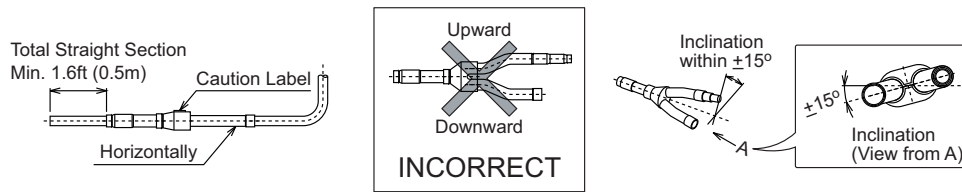
4.2 Installation Position

- Horizontal Installation

Locate the "Y" union pipe section with the affixed caution label. The caution label uppermost on the same horizontal plane. (Inclination within $\pm 15^\circ$)

Make the straight length a minimum of 1.6ft (0.5m) after the vertical bend.

Incorrect installation can lead to a failure of the outdoor unit.



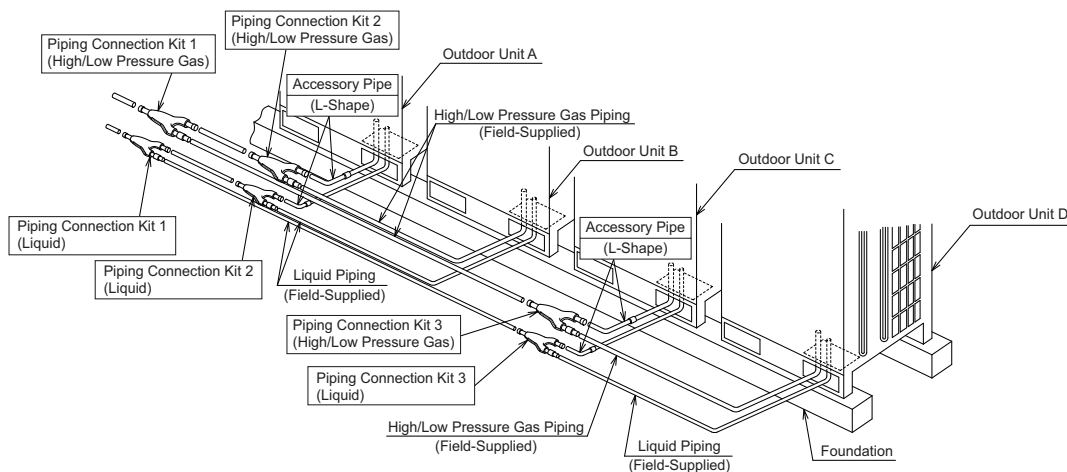
4.3 Piping Connection

Perform the piping connection work by referring to the figure below.

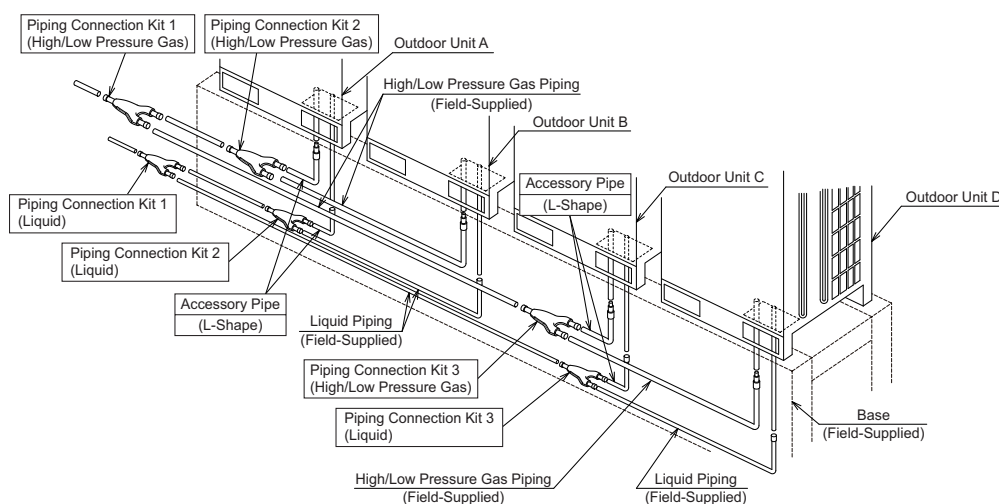
Refer to Installation and Maintenance Manual for Outdoor Unit for the piping length between outdoor units and between piping connection kits.

Example: Combination of for Outdoor Units)

Front Side or Rear Side Piping Connection



Downward Piping Connection



NOTE:

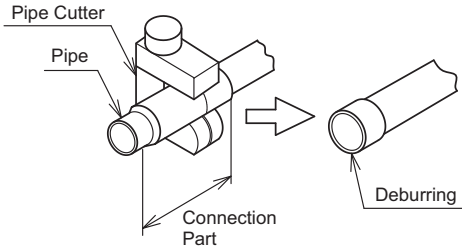
Use field-supplied connecting pipe in accordance with the installation and maintenance manual for the outdoor units. If necessary, use a reducer (accessory).

4.4 Piping Work

- When the branched pipe size is smaller than 7/8 inch (22 mm) of inner diameter, a field-supplied mini-pipe cutter is required.

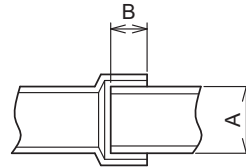
	inch (mm)	
Recommended Mini Pipe Cutter	Available Cut Size	Rotating Radius
	<p>3/16 - 1-3/32 (5 - 28)</p>	<p>2 inches (51)</p>

- Use clean copper piping with no dirt or moisture on internal surfaces present. When connecting refrigerant piping, cut the copper pipes with a pipe cutter as shown below. Blow-out the pipes with nitrogen or compressed air to remove any dust or metal filings. Do NOT use a saw, a grindstone, which leave behind large amounts of filings and cutting residue.

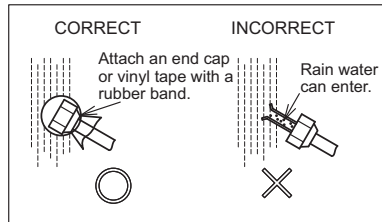
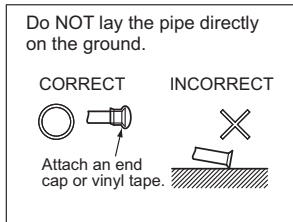
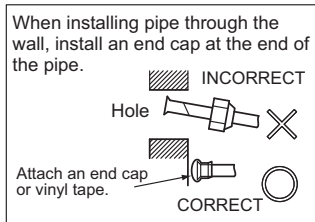


- When cutting the pipe, allow for an adequate depth for brazing as shown in the following table.

inch (mm)	
Diameter (A)	Min. Insertion Depth (B)
$3/16 \leq A < 5/16$ (5 ≤ A < 8)	1/4 (6)
$5/16 \leq A < 15/32$ (8 ≤ A < 12)	9/32 (7)
$15/32 \leq A < 5/8$ (12 ≤ A < 16)	5/16 (8)
$5/8 \leq A < 31/32$ (16 ≤ A < 25)	13/32 (10)
$31/32 \leq A < 1-3/8$ (25 ≤ A < 35)	15/32 (12)
$1-3/8 \leq A < 1-25/32$ (35 ≤ A < 45)	9/16 (14)



• Caution for Refrigerant Piping



INSTALLATION

4. Make sure that all stop valves for the outdoor unit are closed completely.
5. Bleed nitrogen gas through piping during brazing. Pressure not to exceed 2.9psi (0.2MPa).

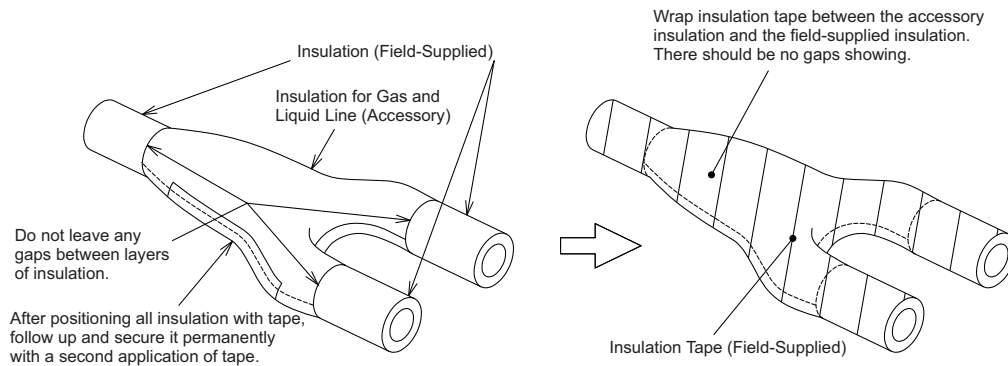
⚠ DANGER

Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which could cause suffocation.

6. The airtight test pressure for this product is 601psi (4.15MPa).
7. Install the supplied insulation with these multi-kits to each branch (liquid side and gas side), with tape. Also, apply the field-supplied insulation to field-supplied pipes.

NOTE

When polyethylene foam is applied, a thickness of 13/32 inch (10mm) for liquid piping and 19/32 to 25/32 inch (15 to 20mm) for gas piping is recommended. (Use a grade of insulation with a heat resistance of 212°F (100°C) for gas piping.)



⚠ CAUTION

- Perform insulation work only when the surface temperature of the pipe material has cooled to room temperature. Anything done immediately after brazing can cause insulation to melt.
- During piping work, always cover over or plug the open end to keep the inside free of dust and moisture.

After installation, it is recommended that the customer retain this manual for future reference.

1.5.6.2 Piping Connection Kit between Outdoor Units for 3 Piping System

● MC-NP21X1, MC-NP30X1

NOTE

After installation, it is recommended to give this manual to customer for future reference.

1. Applicable Outdoor Units

These multiple piping connecting kits can be applied to the R410A VRF systems.

2. Transportation

Transport the product as close to the installation site as is practical before unpacking. Do not discard foam packing. It is used to insulate fitting after leak check is complete.




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- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection Upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

INSTALLATION

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).
General Precautions	
 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions



To reduce the risk of serious injury or death, the following installation precautions must be followed:

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution

⚠ WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

⚠ WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.

- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor

CAUTION

Do not place objects on top of this unit.

3. Before Installation

Confirm the number of the following parts by referring to the model printed on the package before unpacking. Do NOT put any foreign material into the parts. Check to confirm that no foreign materials are inside the parts before installation.

Name of Parts	MC-NP21X1		MC-NP30X1				
		Qty.	Piping Connection Kit 1		Piping Connection Kit 2		
Branch Pipe for Low Pressure Gas Line		1		1		1	
Branch Pipe for High/Low Pressure Gas Line		1		1		1	
Branch Pipe for Liquid Line		1		1		1	
Accessory	Insulation for Low Pressure Gas Line	1 set		1 set		1 set	
	Insulation for High/Low Pressure Gas Line	1 set		1 set		1 set	
	Insulation for Liquid Line	1 set		1 set		1 set	
	Reducer for Low Pressure Gas Line Connection (For Connecting Pipe (Field-Supplied))		1		1		1
			1		1		1
			1		1		2
			1		2		1
	Reducer for High/Low Pressure Gas Line Connection (For Connecting Pipe (Field-Supplied))		1		1		1
			1		1		1
			2		1		2
			1		1		2
			None		1		None
	Reducer for Liquid Line Connection (For Connecting Pipe (Field-Supplied))		1		1		1
	Tape		3		3		3

NOTE : If any of these parts are missing, please contact your distributor. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

4. Installation Work

4.1 Piping Connection Size

The ends of the multi-kits are finished as shown in the following figures. Cut the end of the pipe to correspond with the pipe size.

⚠ CAUTION

Allow adequate space for elbow, angled, and irregular piping arrangements to compensate for expansion and contraction brought on by temperature change.

Model	Branch Pipe for Low Pressure Gas Line	Branch Pipe for High/Low Pressure Gas Line	Branch Pipe for Liquid Line	Reducer for Low Pressure Gas Line	Reducer for High/Low Pressure Gas Line	Reducer for Liquid Line
MC-NP21X1						
MC-NP30X1	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Piping Connection Kit 1</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Piping Connection Kit 2</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Piping Connection Kit 2</p>			
MC-NP30X1	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Piping Connection Kit 2</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Piping Connection Kit 1</p>	<p style="writing-mode: vertical-rl; transform: rotate(180deg);">Piping Connection Kit 1</p>			

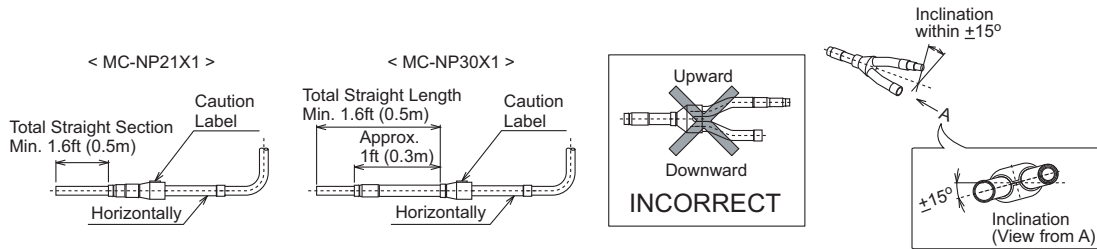
Unit: inch, ID: Inner Diameter, OD: Outer Diameter

(⊗): When installing "Branch Pipe for Low Pressure Gas Line", install a "Long Reducer" at the "To Indoor Unit" side. Otherwise, it could result in abnormal oil distribution between each the outdoor units.

INSTALLATION

4.2 Installation Position

- Horizontal Installation
 Locate the branch pipes to become the “Y” union pipe section with the affixed caution label.
 (Inclination within $\pm 15^\circ$)
 Make the straight length a minimum of 1.6ft (0.5m) after the vertical bend.
 Incorrect installation can result in the failure of the outdoor unit.

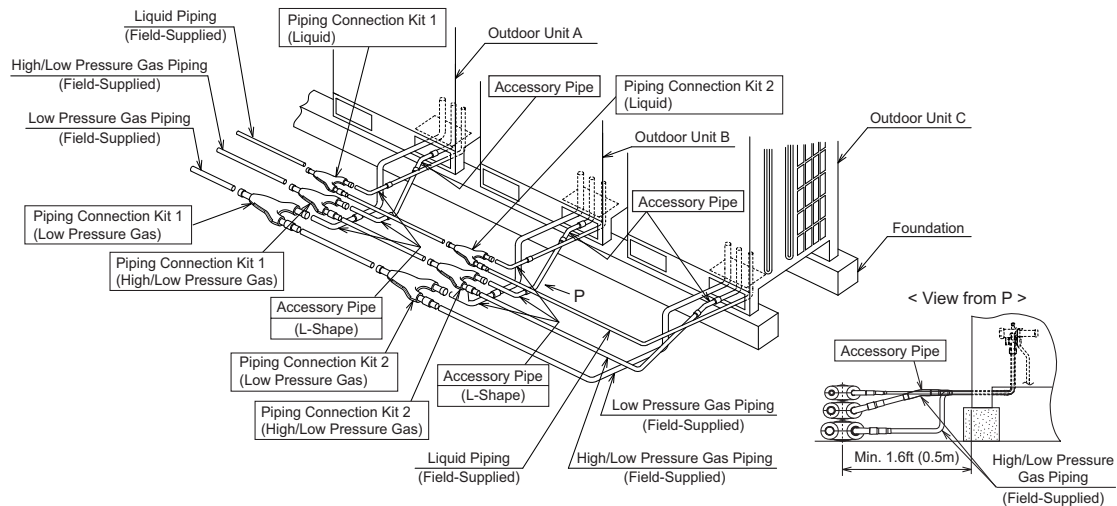


4.3 Piping Connection

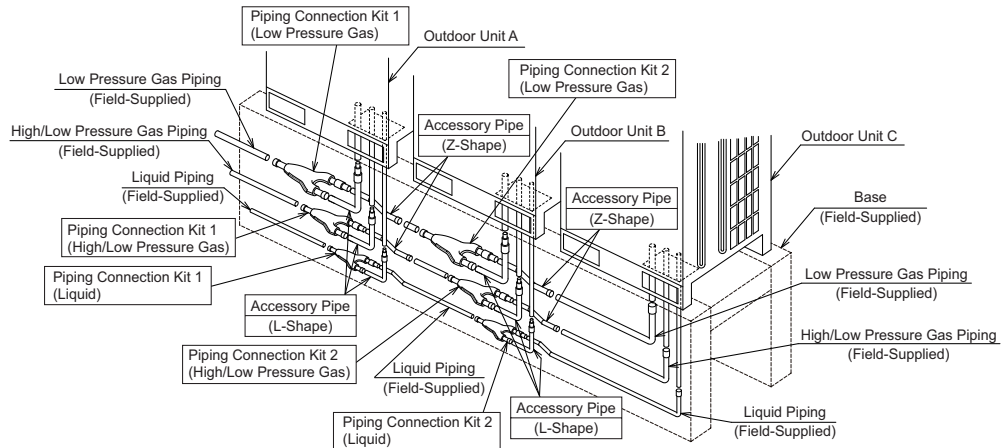
Perform the piping connection work by referring to the figure below.
 Refer to Installation and Maintenance Manual for Outdoor Unit for the piping length between outdoor units and between piping connection kits.

Example: Combination of 3 Outdoor Units

Front Side or Rear Side Piping Connection



Downward Piping Connection



NOTE:

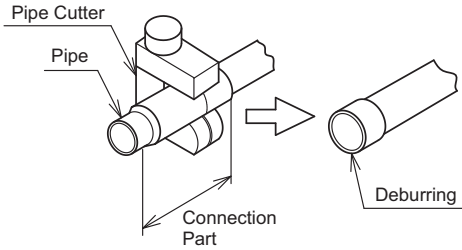
Use field-supplied connecting pipe in accordance with the installation and maintenance manual for the outdoor units. If necessary, use a reducer (accessory).

4.4 Piping Work

- When the branched pipe size is 7/8 inch (22.2mm) or less of inner diameter, a field-supplied mini-pipe cutter is required.

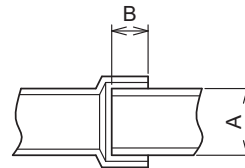
	inch (mm)	
Recommended Mini Pipe Cutter	Cleavable Size	Rotating Radius
	$\phi 3/16 - 1-3/32$ ($\phi 5 - 28$)	2 inches (51)

- Use clean copper piping with no dirt or moisture on internal surfaces present. When connecting refrigerant piping, cut the copper pipes with a pipe cutter as shown below. Blow-out the pipes with nitrogen or compressed air to remove any dust or metal filings. Do NOT use a saw, a grindstone, which leave behind large amounts of filings and cutting residue.

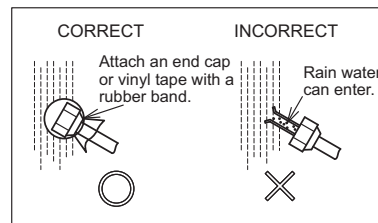
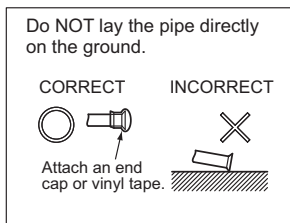
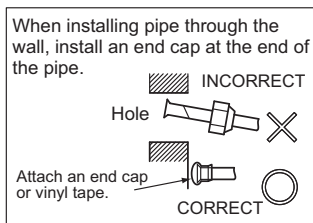


- When cutting the pipe, allow for an adequate depth for brazing as shown in the following table.

inch (mm)	
Diameter (A)	Min. Insertion Depth (B)
$3/16 \leq A < 5/16$ ($5 \leq A < 8$)	1/4 (6)
$5/16 \leq A < 15/32$ ($8 \leq A < 12$)	9/32 (7)
$15/32 \leq A < 5/8$ ($12 \leq A < 16$)	5/16 (8)
$5/8 \leq A < 31/32$ ($16 \leq A < 25$)	13/32 (10)
$31/32 \leq A < 1-3/8$ ($25 \leq A < 35$)	15/32 (12)
$1-3/8 \leq A < 1-25/32$ ($35 \leq A < 45$)	9/16 (14)



• Caution for Refrigerant Piping



INSTALLATION

- 4 Make sure that all stop valves for the outdoor unit are closed completely.
- 5 Bleed nitrogen gas through piping during brazing. Pressure not to exceed 2.9psi (0.2MPa).

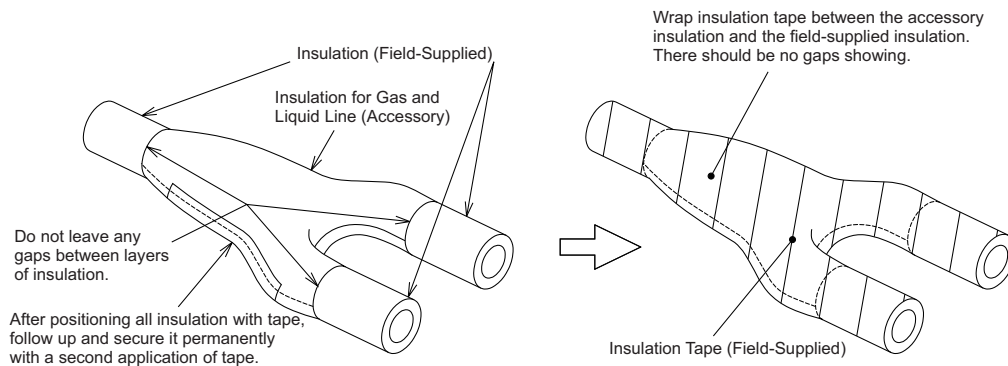
▲ DANGER

Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which could cause suffocation.

6. The airtight test pressure for this product is 601psi (4.15MPa).
7. Install the supplied insulation with these multi-kits to each branch (liquid side and gas side), with tape. Also, apply the field-supplied insulation to field-supplied pipes.

NOTE

When polyethylene foam is applied, a thickness of 12/32 inch (10mm) for liquid piping and 19/32 to 25/32 inch (15 to 20mm) for gas piping is recommended. (Use a grade of insulation with a heat resistance of 212°F (100°C) for gas piping.)



▲ CAUTION

- Perform insulation work only when the surface temperature of the pipe material has cooled to room temperature. Anything done immediately after brazing can cause insulation to melt.
- During piping work, always cover over or plug the open end to keep the inside free of dust and moisture.

After installation, it is recommended that the customer retain this manual for future reference.

- MC-NP40X1

NOTE

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1. Applicable Outdoor Units

These multiple piping connecting kits can be applied to R410A VRF systems.

2. Transportation

Transport this product as close to the installation site as practical before unpacking. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.




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Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

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General Precautions	
 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
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- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated

from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions



To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution



WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit’s intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit’s faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country’s requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions



WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit’s rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.


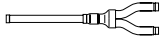
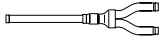
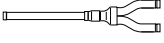






































- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor

CAUTION

Do not place any material on this product.

3. Before Installation

IMPORTANT! Confirm the number of the following parts kit by referencing the model number printed on the package before opening. Do NOT intermix any foreign objects within this kit. Verify that no foreign objects are present inside any kit components prior to installation.

Name of Parts		Piping Connection Qty. Kit 1	Piping Connection Qty. Kit 2	Piping Connection Qty. Kit 3
Branch Pipe for Low Pressure Gas Line		 1	 1	 1
Branch Pipe for High/Low Pressure Gas Line		 1	 1	 1
Branch Pipe for Liquid Line		 1	 1	 1
Accessory	Insulation for Low Pressure Gas Line	 1 set	 1 set	 1 set
	Insulation for High/Low Pressure Gas Line	 1 set	 1 set	 1 set
	Insulation for Liquid Line	 1 set	 1 set	 1 set
	Reducer for Low Pressure Gas Line Connection (For Connecting Pipe (Field-Supplied))	 1	 1	 1
		 2	 1	 1
		 1	 1	 2
		— None	 1	 1
	Reducer for High/Low Pressure Gas Line Connection (For Connecting Pipe (Field-Supplied))	 1	 2	 2
		 1	 1	 1
		— None	 1	 1
	Reducer for Liquid Line Connection (For Connecting Pipe (Field-Supplied))	— None	 1	 1
	Tape	 3	 3	 3

NOTE: If any of these parts is are missing, please contact your distributor. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

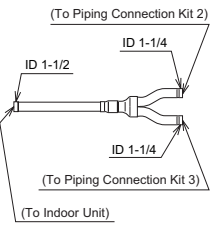
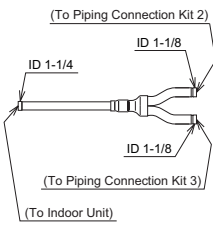
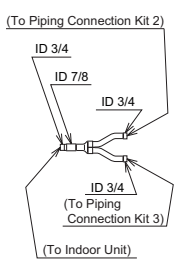
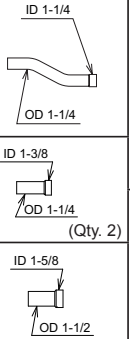
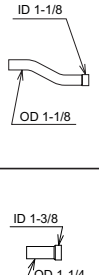
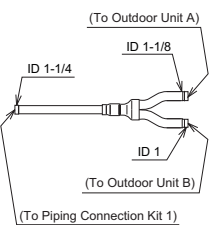
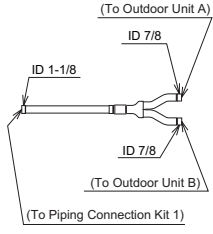
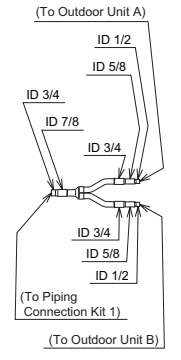
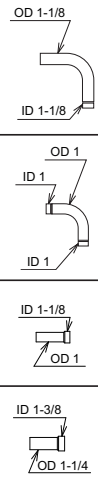
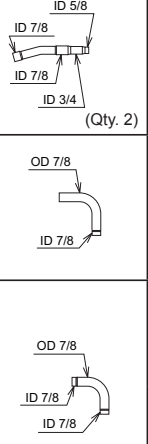
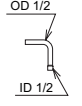
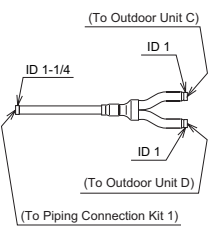
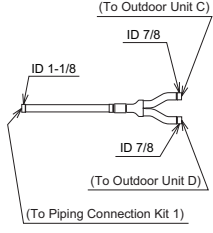
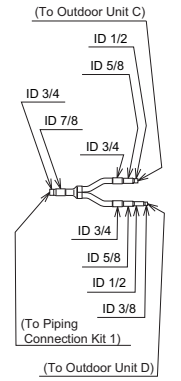
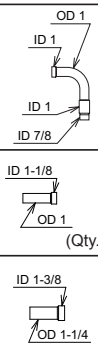
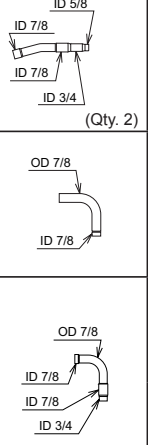
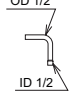
4. Installation Work

4.1 Piping Connection Size

The ends of the multi-kits are finished as shown in the following figures. Cut the end of the pipe to correspond with the pipe size.

⚠ CAUTION

Allow adequate room for elbow, angled, and irregular piping arrangements to compensate for expansion and contraction brought on by temperature change.

Model	Branch Pipe for Low Pressure Gas Line	Branch Pipe for High/Low Pressure Gas Line	Branch Pipe for Liquid Line	Reducer for Low Pressure Gas Line	Reducer for High/Low Pressure Gas Line	Reducer for Liquid Line
Piping Connection Kit 1						—
Piping Connection Kit 2						
Piping Connection Kit 3						

Unit: inch, ID: Inner Diameter, OD: Outer Diameter

INSTALLATION

4.2 Installation Position

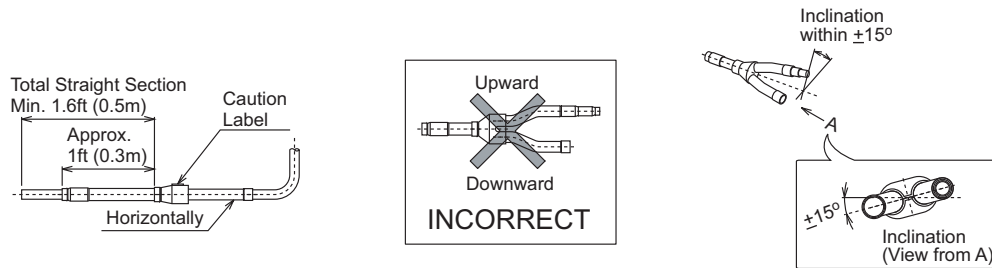
- Horizontal Installation

Locate the "Y" union pipe section with the affixed caution label.

(Inclination within $\pm 15^\circ$)

Make the straight section a minimum of 1.6ft (0.5m) after the vertical bend.

Incorrect installation can result in the failure of the outdoor unit.



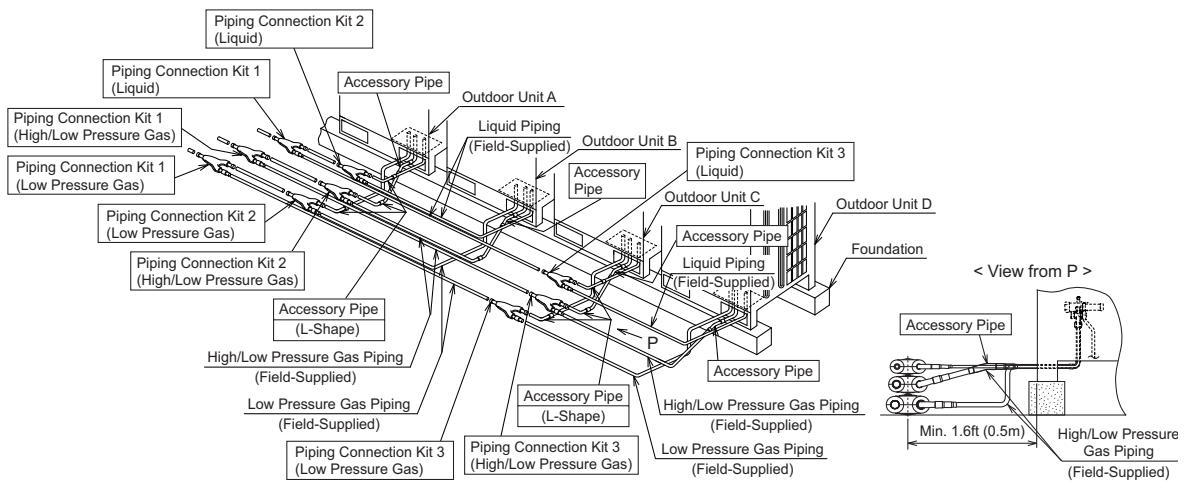
4.3 Piping Connection

Perform the piping connection work by referring to the figure below.

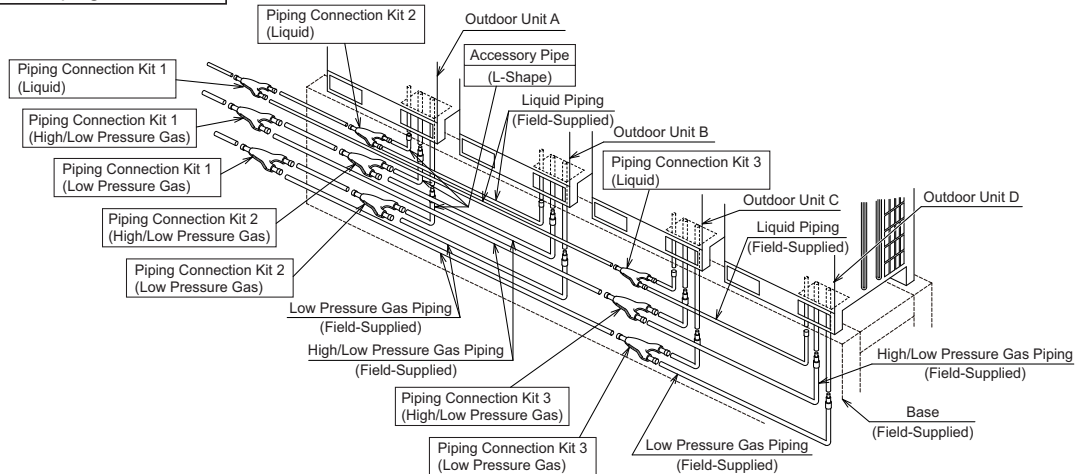
Refer to the installation and maintenance manual for outdoor units, for piping length between outdoor units and between piping connection kits.

Example: Combination of four Outdoor Units

Front Side or Rear Side Piping Connection



Downward Piping Connection



NOTE:

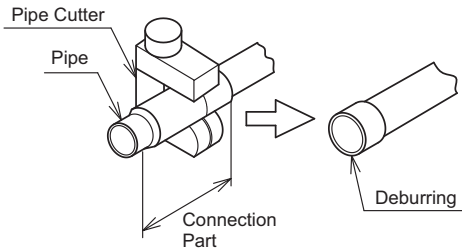
Use the field-supplied connecting pipe in accordance with the installation and maintenance manual for the outdoor unit. If necessary, use a reducer (accessory).

4.4 Piping Work

- When the branched pipe size is 7/8 inch (22mm) or less of inner diameter, a field-supplied mini-pipe cutter is required.

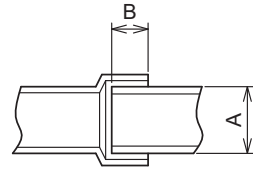
	inch (mm)	
Recommended Mini Pipe Cutter	Available Cut Size	Rotating Radius
	<p>3/16 - 1-1/8 (5 - 29)</p>	<p>2 inches (51)</p>

- Use clean copper piping with no dirt or moisture on internal surfaces present. When connecting refrigerant piping, cut copper pipes with a pipe cutter as shown below. Blow-out the pipes with nitrogen or compressed air to remove any dust or metal filings. Do not use a saw or a grindstone which can leave large amounts of filings and cutting residue.
Do NOT use a saw, a grindstone or others which causes a large amount of cutting powder.

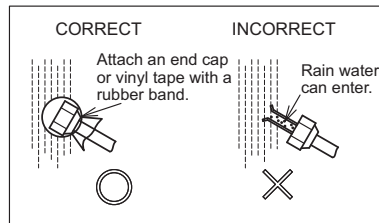
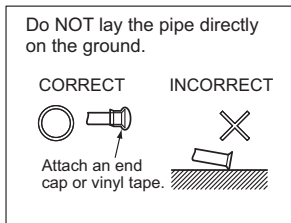
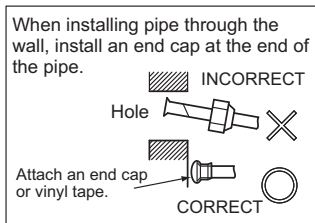


- When cutting the pipe, allow an adequate depth for brazing as shown in the following table.

inch (mm)	
A: Outer Diameter	B: Minimum Depth
$3/16 \leq A < 5/16$ (5 ≤ A < 8)	1/4 (6)
$5/16 \leq A < 1/2$ (8 ≤ A < 13)	5/16 (8)
$1/2 \leq A < 5/8$ (13 ≤ A < 16)	5/16 (8)
$5/8 \leq A < 1$ inch (16 ≤ A < 25)	7/16 (11)
$1 \text{ inch} \leq A < 1-3/8$ (25 ≤ A < 35)	1/2 (13)
$1-3/8 \leq A < 1-13/16$ (35 ≤ A < 46)	9/16 (14)



• Caution for Refrigerant Piping



INSTALLATION

4. Make sure that all stop valves on the outdoor unit are closed completely.
5. Blow-out the inside of the pipes with nitrogen gas before brazing. Bleed nitrogen gas through refrigerant lines when brazing. Pressure should not exceed 2.9psi (0.02MPa).

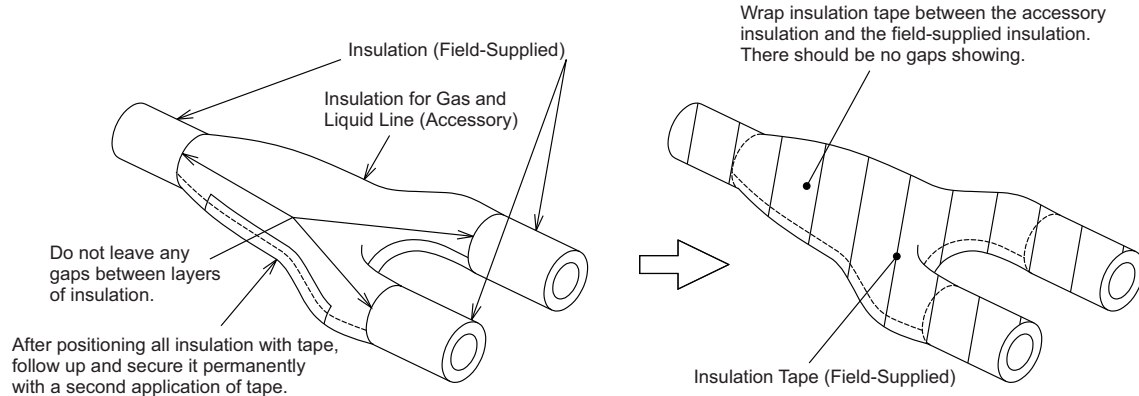
⚠ DANGER

Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which could cause suffocation.

6. The airtight test pressure for this product is 601psi (4.15MPa).
7. Use the supplied insulation to insulate the multi kits. Use insulating tape to connected the two halves of the insulation, field supplied. Also apply insulation to all the refrigerant pipes, field supplied.

NOTE

When polyethylene foam is applied, a thickness of 13/32 inch (10mm) for liquid piping and 19/32 to 25/32 inch (15 to 20mm) for gas piping is recommended. (Use the insulation with heat resistance of 212°F (100°C) for gas piping.)



⚠ CAUTION

- Perform insulation work only when the surface temperature of the pipe material has cooled to room temperature. Anything done immediately after brazing can cause insulation to melt.
- During piping work, always cover over or plug the open end to keep the inside free of dust and moisture.

After installation, it is recommended that the customer retain this manual for future reference.

1.5.6.3 Multi-Kit between Indoor Units for 2 Piping System (Branch Type)

- MW-NP282A2, MW-NP452A2, MW-NP692A2, MW-NP902A2

NOTE

After installation, it is recommended to give this manual to customer for future reference.

1. Applicable Outdoor Units

These multiple line branches can be applied to the R410A VRF systems.

2. Transportation

Transport this product as close to the installation site as practical before unpacking. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

CAUTION

Do not place any material on this product.




Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

INSTALLATION

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).
General Precautions	
 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>


- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions

 <p>WARNING</p>	<p>To reduce the risk of serious injury or death, the following installation precautions must be followed.</p>
---	--

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit’s weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent “sweating” that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the “Safety Precautions,” use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution



To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions



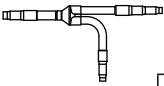
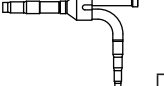
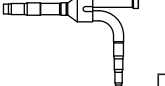
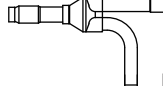


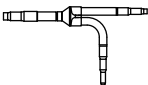
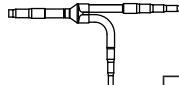








































Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.

- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

3. Before Installation

IMPORTANT! Confirm the number of the following parts kit by referencing the model number printed on the package before opening. Do NOT intermix any foreign objects within this kit. Verify that no foreign objects are present inside any kit components prior to installation.

Name of Parts		MW-NP282A2	MW-NP452A2	MW-NP692A2	MW-NP902A2
		Qty.	Qty.	Qty.	Qty.
Branch Pipe for High/Low Pressure Gas Line		 1	 1	 1	 1
Branch Pipe for Liquid Line		 1	 1	 1	 1
Accessory	Insulation for High/Low Pressure Gas Line	 1 set	 1 set	 1 set	 1 set
	Insulation for Liquid Line	 1 set	 1 set	 1 set	 1 set
	Reducer for High/Low Pressure Gas Line Connection (For Connecting Pipe (Field-Supplied))	 None	 1	 1	 1
		 None	 None	 1	 1
		 None	 None	 2	 1
		 None	 None	 None	 1
		 None	 None	 None	 2
	Reducer for Liquid Line Connection (For Connecting Pipe (Field-Supplied))	 2	 1	 1	 1
		 None	 2	 None	 1
	Tape	 2	 2	 2	 2

NOTE: If any of these parts are missing, please contact your distributor. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

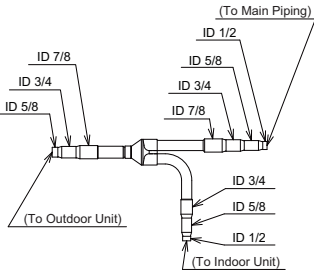
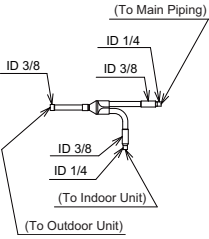

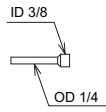
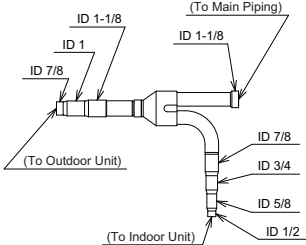
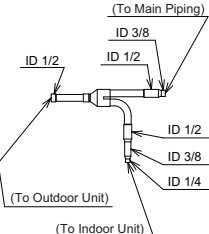
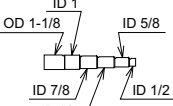
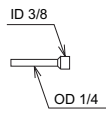
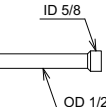
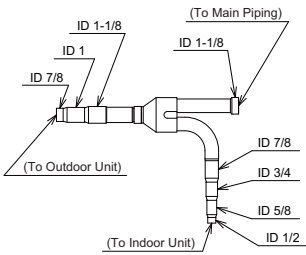
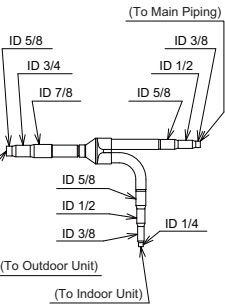
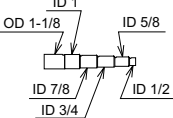
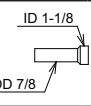
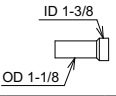
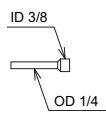
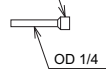
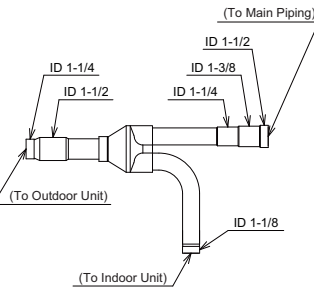
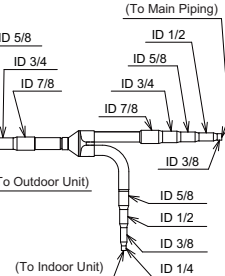
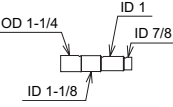
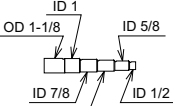



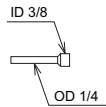
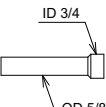
4. Installation Work

4.1 Piping Connection Size

The ends of the multi-kits are finished as shown in the following figures. Cut the end of the pipe to correspond with the pipe size.

⚠ CAUTION

Allow adequate space for elbow, angled, and irregular piping arrangements to compensate for expansion and contraction brought on by temperature change.

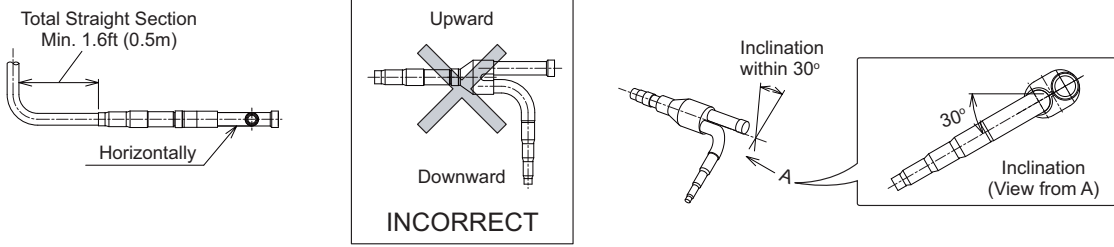
Model	Branch Pipe for High/Low Pressure Gas Line	Branch Pipe for Liquid Line	Reducer for High/Low Pressure Gas Line	Reducer for Liquid Line
MW-NP282A2				 (Qty. 2)
MW-NP452A2				  (Qty. 2)
MW-NP692A2			   (Qty. 2)	 
MW-NP902A2			     (Qty. 2)	 

Unit: inch, ID: Inner Diameter, OD: Outer Diameter

4.2 Installation Position

1. Horizontal Installation

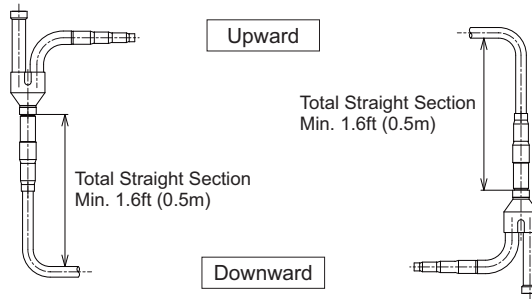
Locate the "Y" union pipe section on the same horizontal plane. (Inclination within 30°)
 Make the straight section a minimum of 1.6ft (0.5m).



2. Vertical Installation

Straight section of the pipe connection on the outdoor unit side is made as follows:

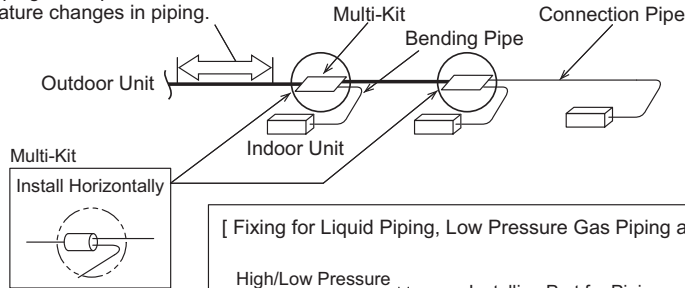
- a) The collective pipe connection part is installed upward, the straight section must be a minimum of 1.6ft (0.5m).
- b) The collective pipe connection part is installed downward, the straight section must be a minimum of 1.6ft (0.5m).



3. Piping Form from Multi-Kit to Indoor Unit

Example: Recommended From each Indoor Unit to Multi-Kit have bending pipes and they will not tend to be deformed.

Copper Piping will expand and contract due to temperature changes in piping.

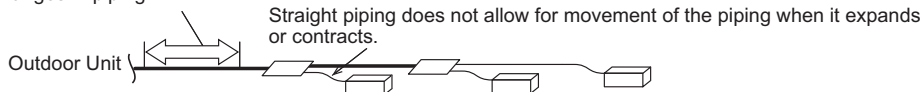


[Fixing for Liquid Piping, Low Pressure Gas Piping and High/Low Pressure Gas Piping]

NOTE:
 Due to the properties of copper piping material, expansion and contraction take place during seasons of heat and cold. Do not strap gas refrigerant and piping containing liquids together as deformation and cracks can result.

Example: Recommended

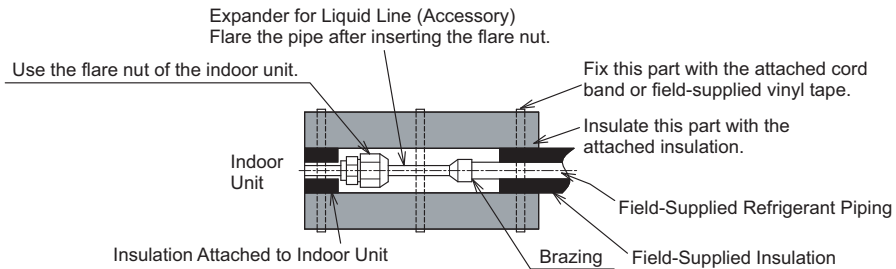
Copper Piping will expand and contract due to temperature changes in piping.



INSTALLATION

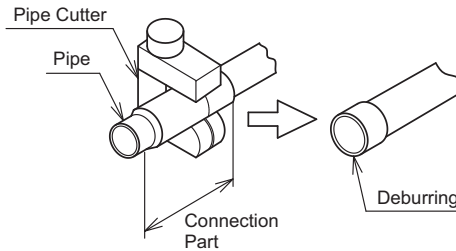
4.3 Connection Procedure for Piping Joint

When connecting liquid piping for the unit with a capacity 15 MBH or smaller, and when the length of piping is 49.2ft (15m) or longer, use a piping diameter size of 3/8 inch (9.52mm). Secure the connecting pipe as shown below. Use the insulation attached to the indoor unit.



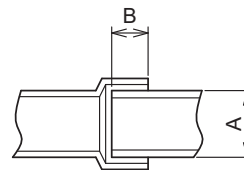
4.4 Piping Work

- Use clean copper pipes without any moisture or foreign materials on inner surface of pipes. When connecting refrigerant pipe, cut the copper pipes with a pipe cutter as shown below. Also blow-out the pipes with nitrogen or compressed air to ensure that no dust remains inside the pipe. Do NOT use a saw, a grindstone or others which causes a large amount of cutting powder.

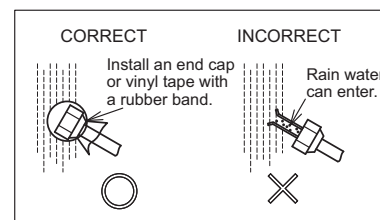
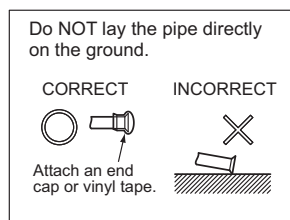
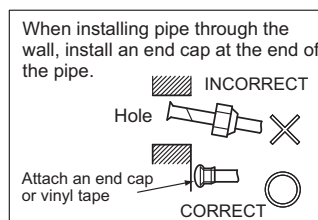


- When cutting the pipe, allow for an adequate depth for brazing as shown in the following table.

inch (mm)	
Diameter (A)	Min. Insertion Depth (B)
$3/16 \leq A < 5/16$ (5 ≤ A < 8)	1/4 (6)
$5/16 \leq A < 15/32$ (8 ≤ A < 12)	9/32 (7)
$15/32 \leq A < 5/8$ (12 ≤ A < 16)	5/16 (8)
$5/8 \leq A < 31/32$ (16 ≤ A < 25)	13/32 (10)
$31/32 \leq A < 1-3/8$ (25 ≤ A < 35)	15/32 (12)
$1-3/8 \leq A < 1-25/32$ (35 ≤ A < 45)	9/16 (14)



• Caution for Refrigerant Piping



3. Make sure that all stop valves on the outdoor unit are closed completely.
4. Blow-out the inside of the pipes with nitrogen gas before brazing. Bleed nitrogen gas through refrigerant lines when brazing. Pressure should not exceed 2.9psi (0.02MPa).

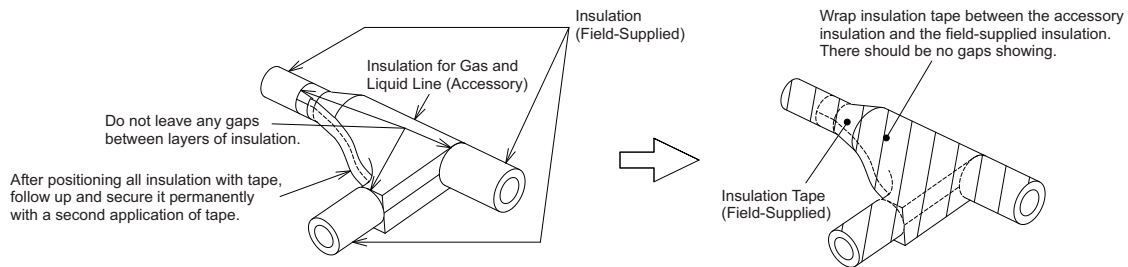
⚠ DANGER

Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which could cause suffocation.

NOTE

When polyethylene foam is applied, a thickness of 13/32 inch (10mm) for liquid piping and 19/32 to 25/32 inch (15 to 20mm) for gas piping is recommended. (Use a grade of insulation with a heat resistance of 212°F (100°C) for gas piping.)

5. The airtight test pressure of this product is 601psi (4.15MPa).
6. Install the field-supplied insulation with these multi-kits to each branch (liquid side and gaseous side), with tape. Also, apply the field-supplied insulation for these units.



⚠ CAUTION

- Perform insulation work only when the surface temperature of the pipe material has cooled to room temperature. Anything done immediately after brazing can cause the insulation to melt.
- During piping work, always cover over or plug the open end to keep the inside free of dust and moisture.

After installation, it is recommended that the customer retain this manual for future reference.

1.5.6.4 Multi-Kit between Indoor Units for 3 Piping System (Branch Type)

- **MW-NP142X2, MW-NP282X2, MW-NP452X2, MW-NP562X2, MW-NP692X2, MW-NP902X2**

NOTE

After installation, it is recommended to give this manual to customer for future reference.

1. Applicable Outdoor Units

These multiple line branches can be applied to the R410A VRF systems.

2. Transportation

Transport this product as close to the installation site as practical before unpacking. Do not discard any of the foam packing it will be used to insulate the fitting after it has been leak checked.



CAUTION




Do not place any material on this product.

Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).
General Precautions	
 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic "Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
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- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

INSTALLATION

- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions



WARNING

To reduce the risk of serious injury or death, the following installation precautions must be followed.

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the run test, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

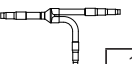
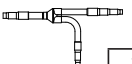
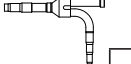
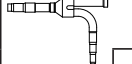
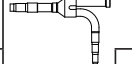
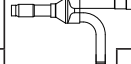
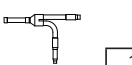
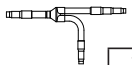
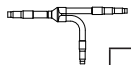
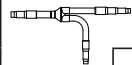
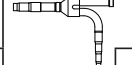
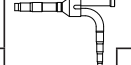


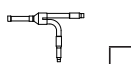
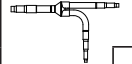
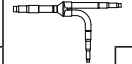
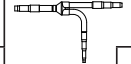
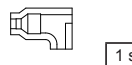
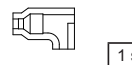
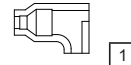
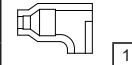
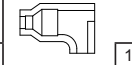
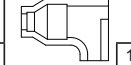
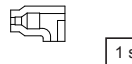
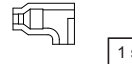
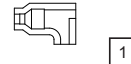
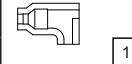



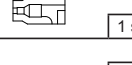
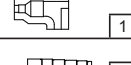
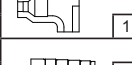
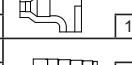
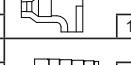
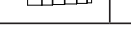
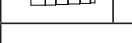
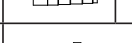
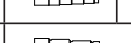




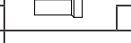

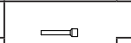
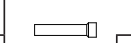
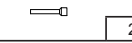
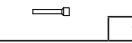
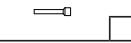
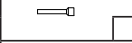
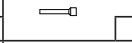
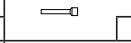
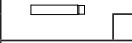
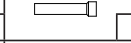

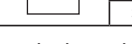
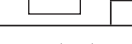
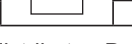
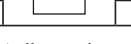
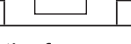
- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.

INSTALLATION

- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor.

3. Before Installation

IMPORTANT! Confirm the number of the following parts kit by referencing the model number printed on the package before opening. Do NOT intermix any foreign objects within this kit. Verify that no foreign objects are present inside any kit components prior to installation.

Name of Parts	MW-NP142X2	MW-NP282X2	MW-NP452X2	MW-NP562X2	MW-NP692X2	MW-NP902X2
	Qty.	Qty.	Qty.	Qty.	Qty.	Qty.
Branch Pipe for Low Pressure Gas Line	 1	 1	 1	 1	 1	 1
Branch Pipe for High/Low Pressure Gas Line	 1	 1	 1	 1	 1	 1
Branch Pipe for Liquid Line	 1	 1	 1	 1	 1	 1
Insulation	 1 set	 1 set	 1 set	 1 set	 1 set	 1 set
	 1 set	 1 set	 1 set	 1 set	 1 set	 1 set
	 1 set	 1 set	 1 set	 1 set	 1 set	 1 set
Accessory	— None	— None	 1	 1	 2	 2
	— None	— None	— None	— None	 1	 1
	— None	— None	— None	— None	 2	 2
	— None	— None	— None	— None	— None	 1
	— None	— None	— None	— None	— None	 3
	— None	— None	— None	— None	— None	 1
	— None	— None	— None	— None	— None	 2
Reducer for Liquid Line Connection (For Connecting Pipe (Field-Supplied))	 2	 1	 1	 1	 1	 1
	— None	— None	— None	 1	— None	 1
Tape	 3	 3	 3	 3	 3	 3

NOTE: If any of these parts are missing, please contact your distributor. Do not discard any of the foam packing it will be used to insulate the fitting after it has been leak checked.

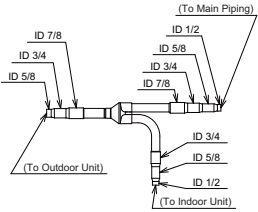
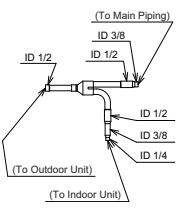
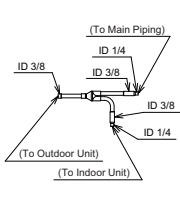
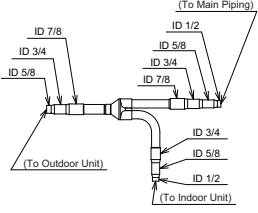
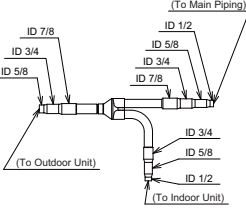
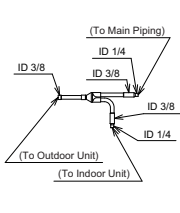
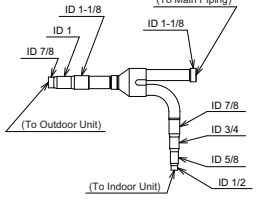
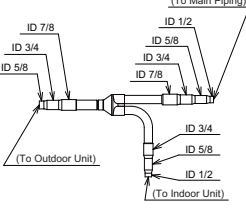
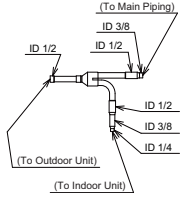
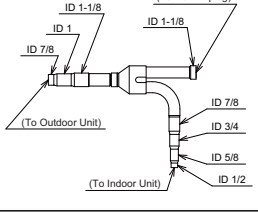
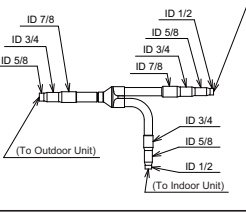
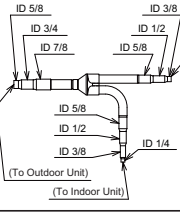
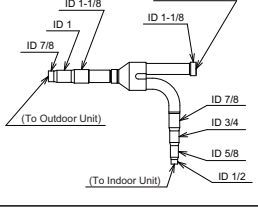
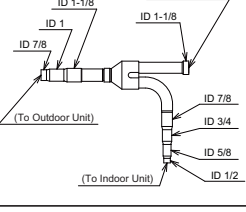
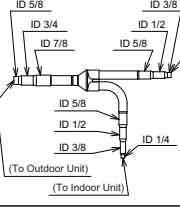
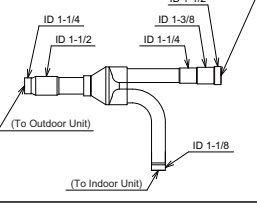
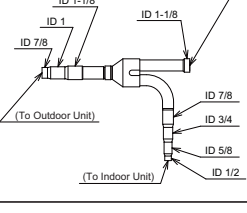
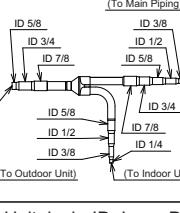
4. Installation Work

4.1 Piping Connection Size

The ends of the multi-kits are finished as shown in the following figures. Cut the end of the pipe to correspond to the pipe size.



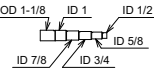

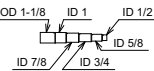


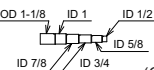
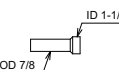
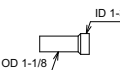

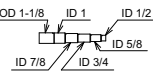
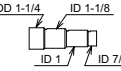
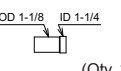
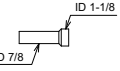

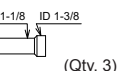
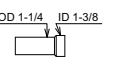
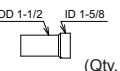
⚠ CAUTION

Allow adequate space for elbow, angled, and irregular piping arrangements to compensate for expansion and contraction brought on by temperature change.

Model	Branch Pipe for Low Pressure Gas Line	Branch Pipe for High/Low Pressure Gas Line	Branch Pipe for Liquid Line
MW-NP142X2			
MW-NP282X2			
MW-NP452X2			
MW-NP562X2			
MW-NP692X2			
MW-NP902X2			

Unit: inch, ID: Inner Diameter

INSTALLATION

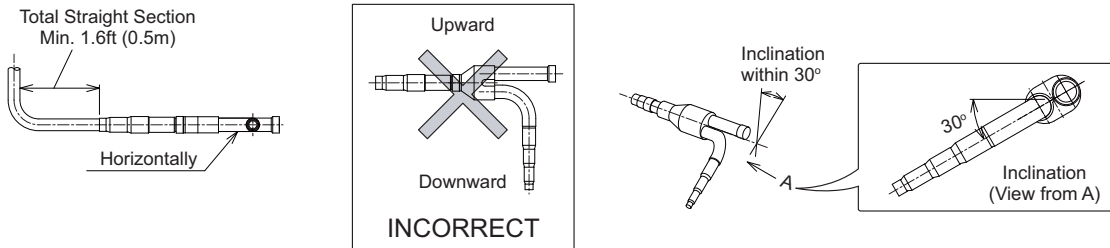
Model	Reducer for Gas Line			Reducer for Liquid Line	
MW-NP142X2	—	—	—	 (Qty. 2)	
MW-NP282X2	—	—	—		
MW-NP452X2		—	—		
MW-NP562X2		—	—		
MW-NP692X2	 (Qty. 2)		 (Qty. 2)		
MW-NP902X2	 (Qty. 2)		 (Qty. 2)		
		 (Qty. 3)		 (Qty. 2)	

Unit: inch, ID: Inner Diameter, OD: Outer Diameter

4.2 Installation Position

1. Horizontal Installation

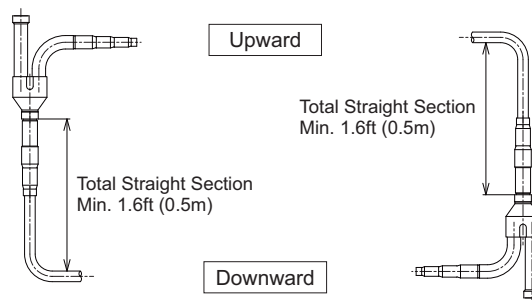
Locate the "Y" union pipe section on the same horizontal plane. (Inclination within 30°)
Make the straight length a minimum of 1.6ft (0.5m) after the vertical bend.



2. Vertical Installation

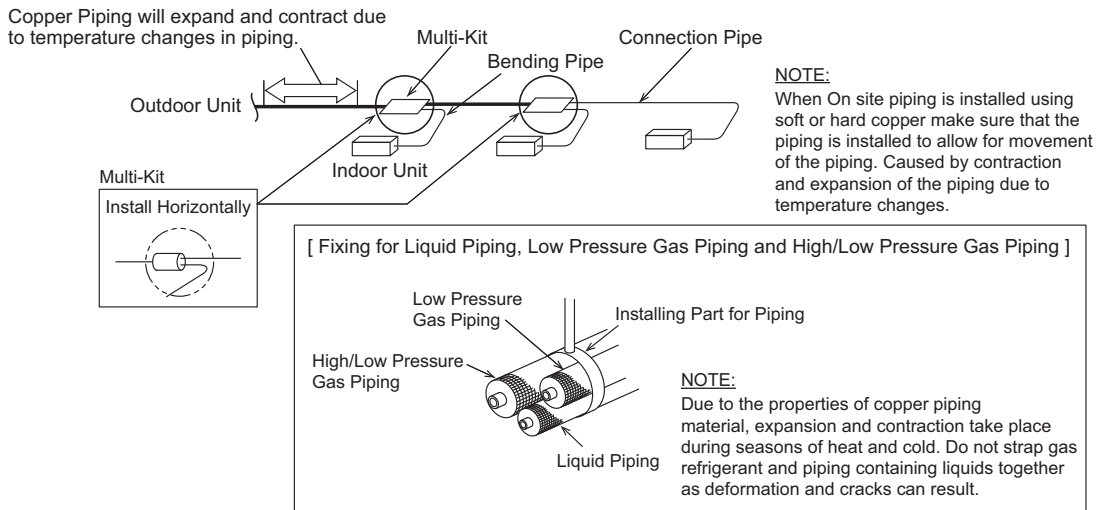
The straight section of pipe connection on the outdoor unit side is made as follows:

- For the collective pipe connection part that is installed upward, the straight length must be a minimum of 1.6ft (0.5m).
- The collective pipe connection part is installed downward, the straight length must be min.1.6ft (0.5m).

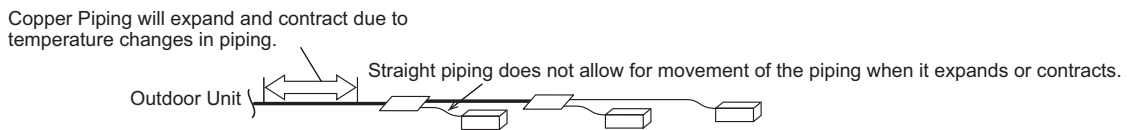


3. Piping Form from Multi-Kit to Indoor Unit

Example: Recommended From each Indoor Unit to Multi-Kit have bending pipes and they will not tend to be deformed.

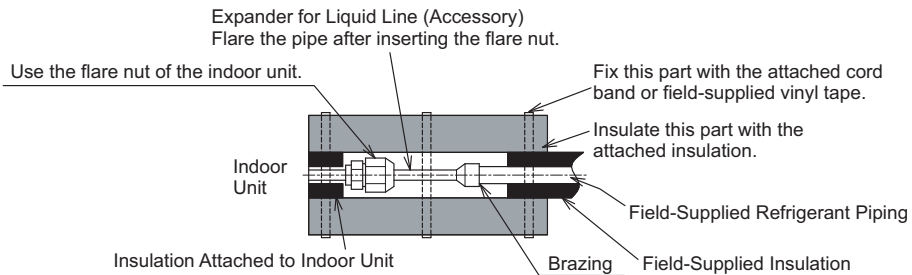


Example: Not Recommended



4.3 Connection Procedure for Piping Joint

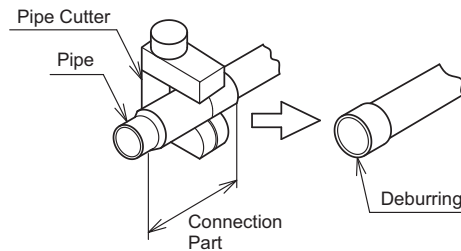
When connecting liquid piping for the unit with a capacity 15 MBH or smaller, and when the length of piping is 49.2ft (15m) or longer, use a piping diameter size of 3/8 inch (9.52mm). Secure the connecting pipe as shown below. Use the insulation attached to the indoor unit.



INSTALLATION

4.4 Piping Work

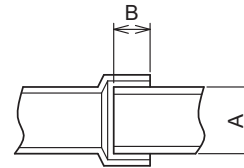
1. Use clean copper pipes without any moisture or foreign materials on inner surface of pipes. When connecting refrigerant pipe, cut the copper pipes with a pipe cutter as shown below. Also blow-out the pipes with nitrogen or compressed air to ensure that no dust remains inside the pipe. Do NOT use a saw, a grindstone or others which causes a large amount of cutting powder residue.



2. When cutting the pipe, allow for an adequate depth for brazing as shown in the following table.

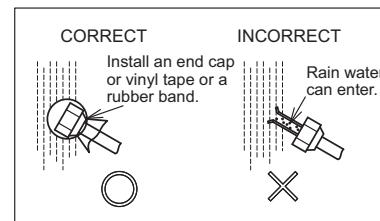
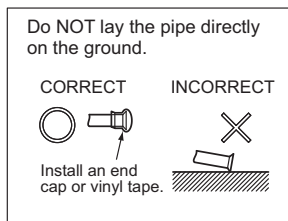
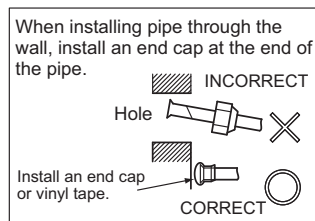
inch (mm)

Diameter (A)	Min. Insertion Depth (B)
$3/16 \leq A < 5/16$ ($5 \leq A < 8$)	1/4 (6)
$5/16 \leq A < 15/32$ ($8 \leq A < 12$)	9/32 (7)
$15/32 \leq A < 5/8$ ($12 \leq A < 16$)	5/16 (8)
$5/8 \leq A < 31/32$ ($16 \leq A < 25$)	13/32 (10)
$31/32 \leq A < 1-3/8$ ($25 \leq A < 35$)	15/32 (12)
$1-3/8 \leq A < 1-25/32$ ($35 \leq A < 45$)	9/16 (14)



Total Straight Section
Min. 1.6ft (0.5m)

• Caution for Refrigerant Piping



3. Make sure that all stop valves for the outdoor unit are closed completely.
4. Blow-out the inside of the pipes with nitrogen gas before brazing. Bleed nitrogen gas through piping during brazing. Pressure not to exceed 2.9psi (0.02MPa).

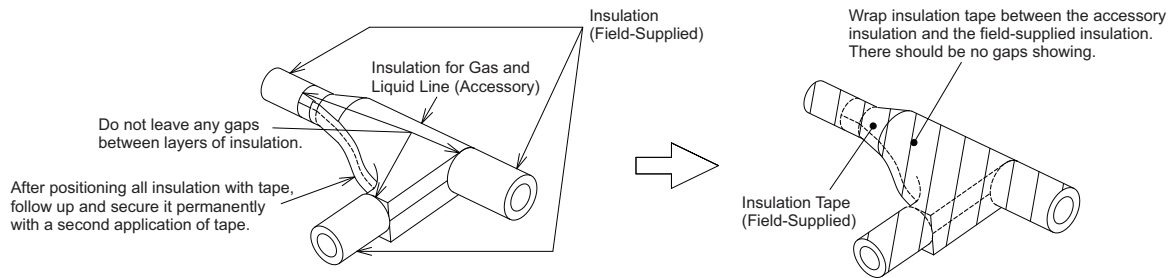
⚠ DANGER

Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which could cause suffocation.

5. The airtight test pressure for this product is 601psi (4.15MPa).
6. Install the field-supplied insulation with these multi-kits to each branch (liquid side and gaseous side), with tape. Also, apply the field-supplied insulation for these units.

NOTE

When polyethylene foam is applied, a thickness of 13/32 inch (10mm) for liquid piping and 19/32 to 25/32 inch (15 to 20mm) for gas piping is recommended. (Use a grade of insulation with a heat resistance of 212°F (100°C) for gas piping.)



CAUTION

- Perform insulation work only when the surface temperature of the pipe material has cooled to room temperature. Anything done immediately after brazing can cause insulation to melt.
- During piping work, always cover over or plug the open end to keep the inside free of dust and moisture.

After installation, it is recommended that the customer retain this manual for future reference.

1.5.6.5 Multi-Kit between Indoor Units for 2 Piping System (Multi Type)

- **MH-NP224A, MH-NP288A**

NOTE

After installation, it is recommended to give this manual to customer for future reference.

1. Applicable Outdoor Units

These multiple header branches can be applied to the R410A VRF systems.

2. Transportation




Transport this product as close to the installation site as practical before unpacking. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection Upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).
General Precautions	
 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic “Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
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- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

INSTALLATION

- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions



To reduce the risk of serious injury or death, the following installation precautions must be followed:

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.

INSTALLATION

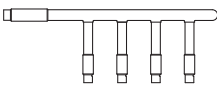
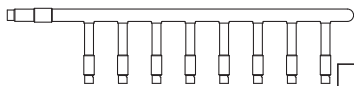
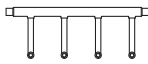
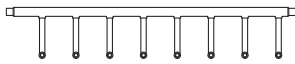










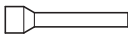




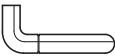



- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor

⚠ CAUTION

Do not lay any material on this product.

3. Before Installation

IMPORTANT! Confirm the number of the following parts kit by referencing the model number printed on the package before opening. Do NOT intermix any foreign objects within this kit. Verify that no foreign objects are present inside any kit components prior to installation.

Name of Parts	MH-NP224A			MH-NP288A			
	Qty.			Qty.			
Branch Pipe for Gas Line							
Branch Pipe for Liquid Line							
Accessories	Insulation for Gas Line						
	Insulation for Liquid Line						
	Closing Pipe	For Gas Line φ1/2  2	For Liquid Line φ1/4  2	For Liquid Header φ3/8  1	For Gas Line φ1/2  6	For Liquid Line φ1/4  6	For Liquid Header φ3/8  1
	Expander for Gas Line	—			 2		
	Expander for Liquid Line	 4			 8		
	Insulation for Closing Pipe	 2 sets			 6 sets		
	Insulation for Liquid Line	 4 sets			 8 sets		
Tape	 24			 48			

Unit: inch

NOTE : If any of these parts are missing, please contact your distributor. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

4. Installation Work

4.1 Piping Connection Size

The ends of the multi-kits are finished as shown in the following figures. Cut the end of the pipe to correspond with the pipe size.

⚠ CAUTION

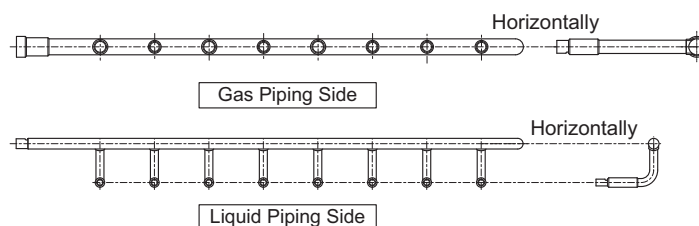
Allow adequate room for elbow, angled, and irregular piping arrangements to compensate for expansion and contraction brought on by temperature change.

Models	Gas Line	Liquid Line	Expander	Closing Pipe
MH-NP224A				<p>Qty.: 2</p>
			<p>Qty.: 4</p>	<p>Qty.: 2</p>
MH-NP288A			<p>Qty.: 2</p>	<p>Qty.: 6</p>
			<p>Qty.: 8</p>	<p>Qty.: 6</p>

Unit: inch, ID: Inner Diameter, OD: Outer Diameter

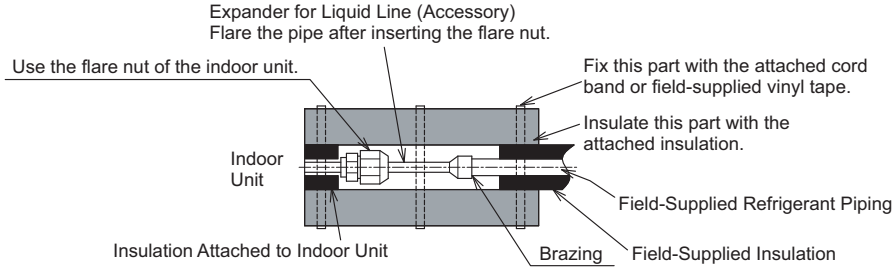
4.2 Installation Position

Perform to install horizontally always.
(Example: Model MH-NP288A)



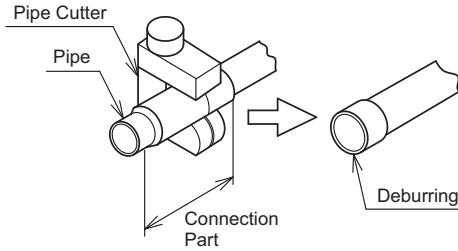
4.3 Connection Procedure for Piping Joint

When connecting liquid piping for a unit with a capacity of 15 MBH or smaller, and with a length of piping 49.2ft (15m) or longer, apply a piping size of 3/8 inch (9.52mm). Secure the connecting pipe as shown in the figure below. Use the insulation attached to the indoor unit.



4.4 Piping Work

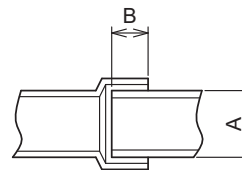
- Use clean copper pipes without any moisture or foreign materials on inner surface of pipes. When connecting refrigerant pipe, cut the copper pipes with a pipe cutter as shown below. Also blow-out the pipes with nitrogen or compressed air to ensure that no dust remains inside the pipe. Do NOT use a saw, a grindstone or others which causes a large amount of cutting powder.



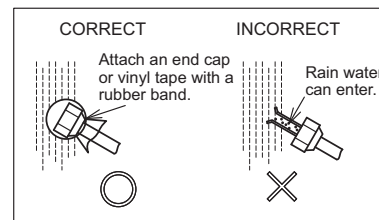
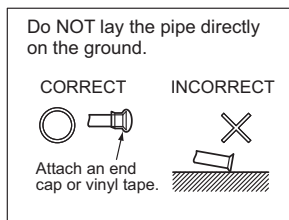
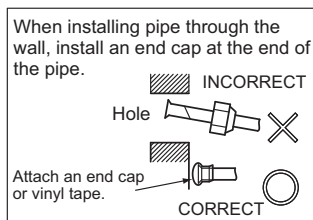
- When cutting piping, secure the adequate depth for brazing as shown in the following table.

inch (mm)

Diameter (A)	Min. Insertion Depth (B)
$3/16 \leq A < 5/16$ ($5 \leq A < 8$)	1/4 (6)
$5/16 \leq A < 15/32$ ($8 \leq A < 12$)	9/32 (7)
$15/32 \leq A < 5/8$ ($12 \leq A < 16$)	5/16 (8)
$5/8 \leq A < 31/32$ ($16 \leq A < 25$)	13/32 (10)
$31/32 \leq A < 1-3/8$ ($25 \leq A < 35$)	15/32 (12)
$1-3/8 \leq A < 1-25/32$ ($35 \leq A < 45$)	9/16 (14)



• Caution for Refrigerant Piping



INSTALLATION

- (3) Make sure that all stop valves for the outdoor unit are closed completely.
- (4) Bleed nitrogen gas through refrigerant lines when brazing. Pressure should not exceed 2.9psi (0.02MPa).

⚠ DANGER

Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which could cause suffocation.

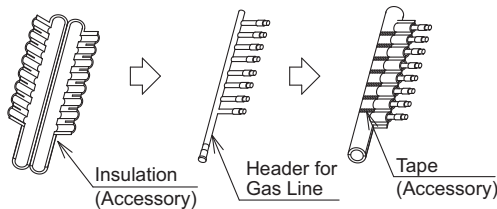
- (5) The air-tight test pressure of this product is 601psi (4.15MPa).
- (6) Install the field-supplied insulation with these multi-kits to each branch (liquid side and gaseous side), with tape. Also, apply the field-supplied insulation for these units.

NOTE

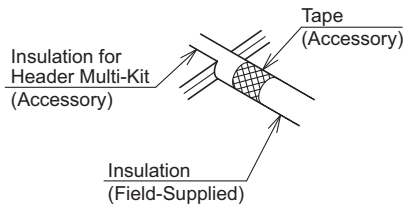
When polyethylene foam is applied, a thickness of 13/32 inch (10mm) for liquid piping and 19/32 to 25/32 inch (15 to 20mm) for gas piping is recommended. (Use a grade of insulation with a heat resistance value of 212°F (100°C) for gas piping.)

For Gas Side

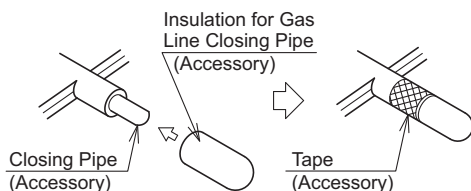
- a) Cover the gas header with the insulation as shown below.



- b) Seal the joint portion of insulation with tape (accessory).

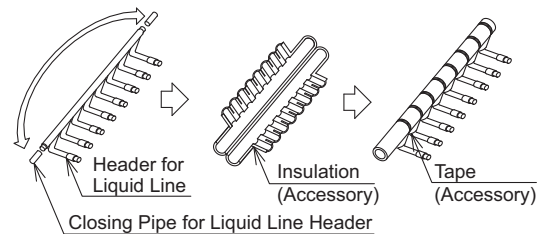


- c) Attach the insulation (accessory) to the closed-off end of pipe. Then seal the joint portion with tape (accessory).

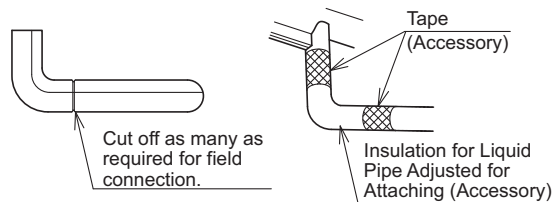


For Liquid Side

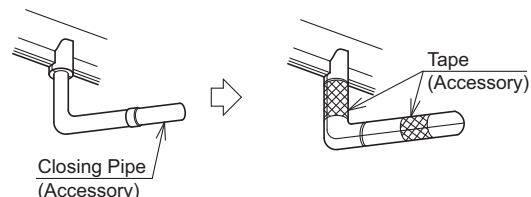
- a) Braze the pipe cap to the open end of the liquid header, opposite the liquid line connection. Cover the liquid line header with the insulation after pipe temperature decreases to room temperature.



- b) Cut the sections of insulation for liquid piping as often as required.



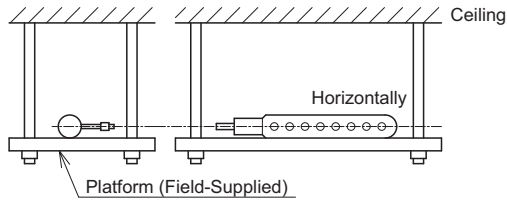
- c) Seal the joint for the closed-off end of pipe with tape (accessory) after attaching the liquid pipe insulation.



• **Caution for Installation**

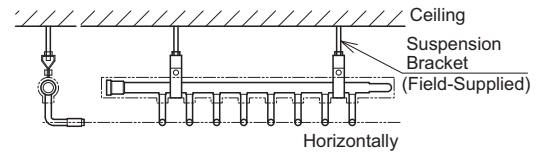
Branch Pipe for Gas Line

Install the branch pipe horizontally by placing it on the platform.



Branch Pipe for Liquid Line

Suspend the branch pipe from the ceiling so that the branch pipe port openings are horizontal.



CAUTION

- **Perform insulation work only when the surface temperature of the pipe material has cooled to room temperature. Anything done immediately after brazing can cause insulation to melt.**
- **During piping work, always cover over or plug the open end to keep the inside free of dust and moisture.**

After installation, it is recommended that the customer retain this manual for future reference.

1.5.6.6 Multi-Kit between Indoor Units for 3 Piping System (Multi Type)

- **MH-NP288X**

NOTE

Forward this installation manual to the next installation team. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

1. Applicable Outdoor Units

These multiple header branches can be applied to the R410A VRF systems.

2. Transportation




Transport this product as close to the installation site as practical before unpacking.

Important Notice

- Johnson Controls Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls Inc. reserves the right to make changes at any time without prior notice.
- Johnson Controls Inc. cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioning unit is designed for standard air conditioning applications only. Do not use this unit for anything other than the purposes for which it was intended for.
- The installer and system specialist shall safeguard against leakage in accordance with local pipefitter and electrical codes. The following standards may be applicable, if local regulations are not available. International Organization for Standardization: (ISO 5149 or European Standard, EN 378). No part of this manual may be reproduced in any way without the expressed written consent of Johnson Controls Inc.
- This heat pump air conditioning unit will be operated and serviced in the United States of America and comes with a full complement of the appropriate Safety, Danger, and Caution, warnings.
- If you have questions, please contact your distributor or dealer.
- This manual provides common descriptions, basic and advanced information to maintain and service this heat pump air conditioning unit which you operate as well for other models.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.

Product Inspection Upon Arrival

1. Upon receiving this product, inspect it for any damages incurred in transit. Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
2. Check the model number, electrical characteristics (power supply, voltage, and frequency rating), and any accessories to determine if they agree with the purchase order.
3. The standard utilization for this unit is explained in these instructions. Use of this equipment for purposes other than what it designed for is not recommended.
4. Please contact your local agent or contractor as any issues involving installation, performance, or maintenance arise. Liability does not cover defects originating from unauthorized modifications performed by a customer without the written consent of Johnson Controls, Inc. Performing any mechanical alterations on this product without the consent of the manufacturer will render your warranty null and void.

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).
General Precautions	
 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic “Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
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- Be careful that moisture, dust, or variant refrigerant compounds not enter the refrigerant cycle during installation work. Foreign matter could damage internal components or cause blockages.
- If air filters are required on this unit, do not operate the unit without the air filter set in place. If the air filter is not installed, dust may accumulate and breakdown may result.
- Do not install this unit in any place where silicon gases can coalesce. If the silicon gas molecules attach themselves to the surface of the heat exchanger, the finned surfaces will repel water. As a result, any amount of drainage moisture condensate can overflow from the drain condensate pan and could run inside of the electrical box, possibly causing electrical failures.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.

INSTALLATION

- When a wireless controller is used, locate at a distance of at least 3.3 ft. (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may have difficulty receiving operation commands.
- Do not install the unit in any location where animals and plants can come into direct contact with the outlet air stream. Exposure could adversely affect the animals and plants.
- Do not install the unit with any downward slope to the side of the drain adaptor. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the drain hose discharges water properly. If connected incorrectly, it may cause leaks.
- Do not install the unit in any place where oil can seep onto the units, such as table or seating areas in restaurants, and so forth. For these locations or social venues, use specialized units with oil-resistant features built into them. In addition, use a specialized ceiling fan designed for restaurant use. These specialized oil-resistant units can be ordered for such applications. However, in places where large quantities of oil can splash onto the unit, such as a factory, even the specialized units cannot be used. These products should not be installed in such locations.

Installation Precautions



To reduce the risk of serious injury or death, the following installation precautions must be followed:

- When installing the unit into...
 - A wall: Make sure the wall is strong enough to hold the unit's weight. It may be necessary to construct a strong wood or metal frame to provide added support.
 - A room: Properly insulate any refrigerant tubing run inside a room to prevent "sweating" that can cause dripping and water damage to wall and floors.
 - Moist or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
 - An area with high winds: Securely anchor the outdoor unit down with bolts and a metal frame. Provide a suitable air baffle.
 - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow vents.
- Do not install the unit in the following places. Doing so can result in an explosion, fire, deformation, corrosion, or product failure.
 - Explosive or flammable atmosphere
 - Where a fire, oil, steam or powder can directly enter the unit, such as nearby or above a kitchen stove.
 - Where oil (including machinery oil) may be present.
 - Where corrosive gases such as chlorine, bromine or sulfide can accumulate, such as near a hot tub or hot spring.
 - Where dense, salt-laden airflow is heavy, such as in coastal regions.
 - Where the air quality is of high acidity.
 - Where harmful gases can be generated from decomposition.
- Do not position the drain pipe for the indoor unit near any sanitary sewers where corrosive gases may be present. If you do, toxic gases can seep into breathable air spaces and can cause respiratory injuries. If the drainpipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate piping becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage or uneven locations: Use a raised concrete pad or concrete blocks to provide a solid, level foundation for the unit to prevent water damage and abnormal vibration.
- Before performing any brazing work, be sure that there are no flammable materials or open flames nearby.
- Perform a test run to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.
- Clean up the site when finished, remembering to check that no metal scraps or bits of wiring have been left inside the unit being installed.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Refrigerant Precaution

WARNING

To reduce the risk of serious injury or death, the following refrigerant precautions must be followed.

- As originally manufactured, this unit contains refrigerant installed by Johnson Controls. Johnson Controls uses only refrigerants that have been approved for use in the unit's intended home country or market. Johnson Controls distributors similarly are only authorized to provide refrigerants that have been approved for use in the countries or markets they serve. The refrigerant used in this unit is identified on the unit's faceplate and/or in the associated manuals. Any additions of refrigerant into this unit must comply with the country's requirements with regard to refrigerant use and should be obtained from Johnson Controls distributors. Use of any non-approved refrigerant substitutes will void the warranty and will increase the potential risk of injury or death.
- If installed in a small room, take measures to prevent the refrigerant from exceeding the maximum allowable concentration in the event that refrigerant gases should escape. Refrigerant gases can cause asphyxiation (0.026lbs/ft³ (0.42 kg/m³) based on ISO 5149 for R410A). Consult with your distributor for countermeasures (ventilation system and so on). If refrigerant gas has leaked during the installation work, ventilate the room immediately.
- Before installation is complete, make sure that the refrigerant leak test has been performed. If refrigerant gases escape into the air, turn OFF the main switch, extinguish any open flames and contact your service contractor. Refrigerant (Fluorocarbon) for this unit is odorless. If the refrigerant should leak and come into contact with open flames, toxic gas could be generated. Also, because the fluorocarbons are heavier than air, they settle to the floor, which could cause asphyxiation.
- When installing the unit, and connecting refrigerant piping, keep all piping runs as short as possible, and make sure to securely connect the refrigerant piping before the compressor starts operating. If the refrigerant piping is not connected and the compressor activates with the stop valve opened, the refrigerant cycle will become subjected to extremely high pressure, which can cause an explosion or fire.
- Tighten the flare nut with a torque wrench in the specified manner. Do not apply excessive force to the flare nut when tightening. If you do, the flare nut can crack and refrigerant leakage may occur.
- A compressor/unit comprises a pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- When maintaining, relocating, and disposing of the unit, dismantle the refrigerant piping after the compressor stops.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death.

- Highly dangerous electrical voltages are used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- Use an exclusive power supply for the air conditioner at the unit's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker and so on), with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.

INSTALLATION

- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Turn OFF and disconnect the unit from the power source when handling the service connector. Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply.
- After stopping operation, be sure to wait at least five minutes before turning off the main power switch. Otherwise, water leakage or electrical breakdown may result. Disconnect the power source completely before attempting any maintenance for electrical parts. Check to ensure that no residual voltage is present after disconnecting the power source.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.
- If a circuit breaker or fuse is frequently activated, shut down the system and contact your service contractor

⚠ CAUTION

Do not lay any material on the product.

3. Before Installation

IMPORTANT! Confirm the number of the following parts kit by referencing the model number printed on the package before opening. Do NOT intermix any foreign objects within this kit. Verify that no foreign objects are present inside any kit components prior to installation.

Name of Parts		MH-NP288X			Qty.					
Branch Pipe for Low Pressure Gas Line					1					
Branch Pipe for High/Low Pressure Gas Line					1					
Branch Pipe for Liquid Line					1					
Accessory	Insulation for Low Pressure Gas Line				1					
	Insulation for High/Low Pressure Gas Line				1					
	Insulation for Liquid Line				1					
	Closing Pipe	For Gas Line 1/2		12	For Liquid Line 1/4		6	For Liquid Header 3/8		1
		Expander for Low Pressure Gas Line				2				
		Expander for High/Low Pressure Gas Line		1		8				
	Expander for Liquid Line				10					
	Insulation for Closing Pipe				12					
	Insulation for Liquid Pipe				8					
	Tape				62					

Unit: inch

NOTE : If any of these parts are missing, please contact your distributor. Do not discard any foam packaging as it is used as insulation for the joint kits after pressure testing is complete.

4. Installation Work

4.1 Piping Connection Size

The ends of the multi-kits are finished as shown in the following figures. Cut the end of the pipe to correspond with the pipe size.

⚠ CAUTION

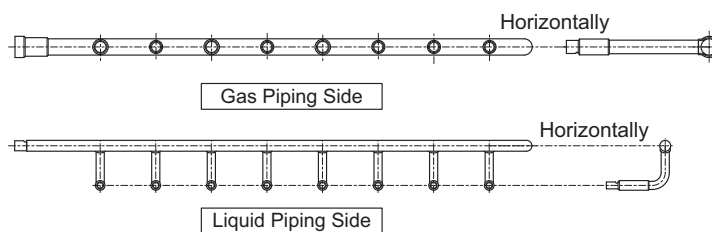
Allow adequate room for elbow, angled, and irregular piping arrangements to compensate for expansion and contraction brought on by temperature change.

Name of Parts	MH-NP288X		
Low Pressure Gas Line			
High/Low Pressure Gas Line			
Liquid Line			
Expander	<p>(For Low Pressure Gas Line)</p> <p>Qty: 2 (For End of Multi-Kit Connection)</p>	<p>(For High/Low Pressure Gas Line)</p> <p>Qty: 8 (For End of Multi-Kit Connection)</p> <p>Qty: 1 (For End of Multi-Kit Connection)</p>	<p>(For Liquid Line)</p> <p>Qty: 10 (2: For End of Multi-Kit Connection) 8: For Unit Piping Connection)</p>
Closing Pipe	<p>(For Low Pressure Gas Line)</p> <p>Qty: 6</p>	<p>(For High/Low Pressure Gas Line)</p> <p>Qty: 6</p>	<p>(For Liquid Line)</p> <p>Qty: 6</p>

Unit: inch, ID: Inner Diameter, OD: Outer Diameter

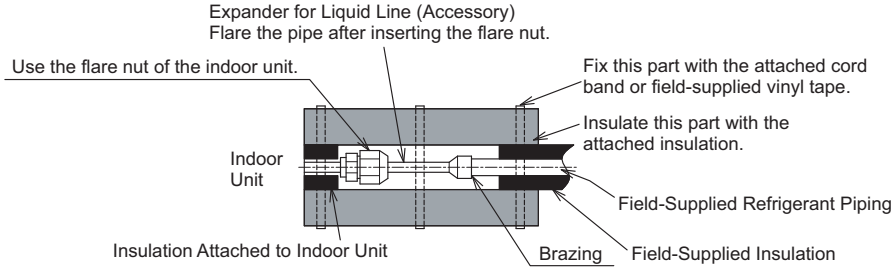
4.2 Installation Position

Always install horizontally.



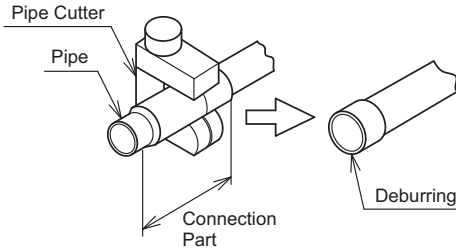
4.3 Connection Procedure for Piping Joint

When connecting liquid piping for the unit with a capacity of 15 MBH or smaller, and when the length of piping is 49.2ft (15m) or longer, go with a pipe size of 3/8 inch (φ9.52mm). Secure the connecting pipe as shown below. Use the insulation attached to the indoor unit.



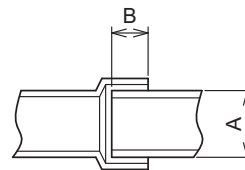
4.4 Piping Work

- Use clean copper pipes without any moisture or foreign materials on inner surface of pipes. When connecting refrigerant pipe, cut the copper pipes with a pipe cutter as shown below. Also blow-out the pipes with nitrogen or compressed air to ensure that no dust remains inside the pipe. Do NOT use a saw, a grindstone or others which causes a large amount of cutting powder.

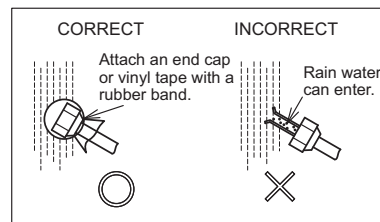
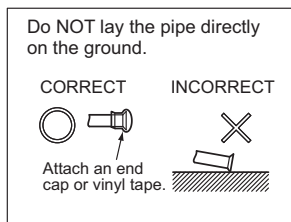
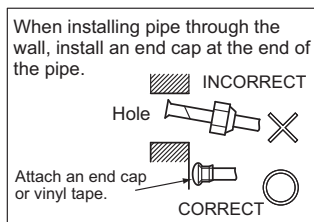


- When cutting the pipe, secure the adequate depth for brazing as shown in the following table.

Diameter (A)	Min. Insertion Depth (B)
$3/16 \leq A < 5/16$ ($5 \leq A < 8$)	1/4 (6)
$5/16 \leq A < 15/32$ ($8 \leq A < 12$)	9/32 (7)
$15/32 \leq A < 5/8$ ($12 \leq A < 16$)	5/16 (8)
$5/8 \leq A < 31/32$ ($16 \leq A < 25$)	13/32 (10)
$31/32 \leq A < 1-3/8$ ($25 \leq A < 35$)	15/32 (12)
$1-3/8 \leq A < 1-25/32$ ($35 \leq A < 45$)	9/16 (14)



• Caution for Refrigerant Piping



INSTALLATION

- (3) Make sure that all stop valves of the outdoor unit are closed completely.
- (4) Bleed nitrogen gas through refrigerant lines when brazing. Pressure should not exceed 2.9psi (0.02MPa).

⚠ DANGER

Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which could cause suffocation.

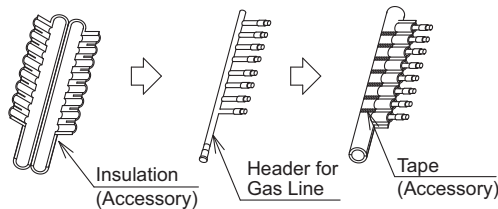
- (5) The air-tight test pressure for this product is 601psi (4.15MPa).
- (6) Install the field-supplied insulation with these multi-kits to each branch (liquid side and gaseous side), with tape. Also, apply the field-supplied insulation for these units.

NOTE

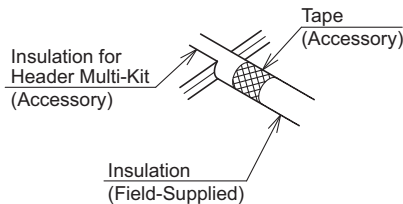
When polyethylene foam is applied, a thickness of 13/32 inch (10mm) for liquid piping and 19/32 to 25/32 inch (15 to 20mm) for gas piping is recommended. (Use a grade of insulation with a heat resistance value of 212°F (100°C) for gas piping.)

For Gas Side

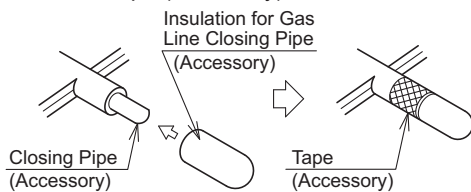
- a) Cover the gas header with the insulation as shown below.



- b) Seal the joint portion of insulation with tape (accessory).

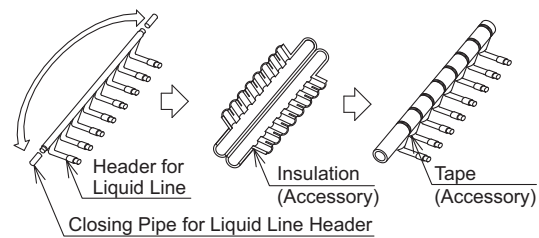


- c) Attach the insulation (accessory) to the closed-off end of pipe. Attach the insulated end cap and seal as shown using the tape provided. Then seal the joint portion with tape (accessory).

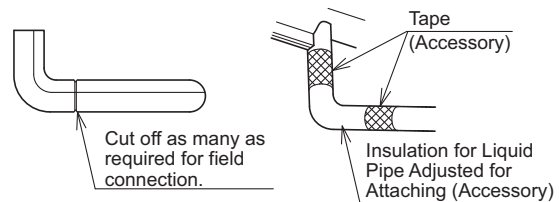


For Liquid Side

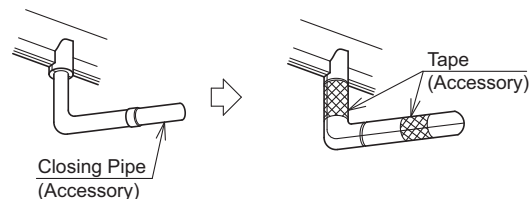
- a) Braze the pipe cap on the open end of the liquid header after the liquid line connection is made. Cover the liquid header with the insulation after the piping cools to room temperature



- b) Cut sections of insulation for liquid piping as often as required.



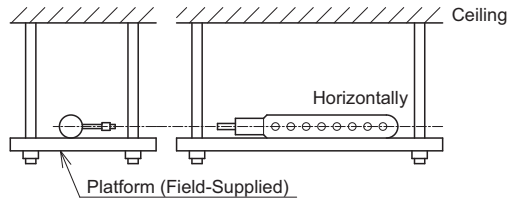
- c) Seal the joint for the closed-off end with tape (accessory) after attaching the liquid pipe insulation.



• **Caution for Installation**

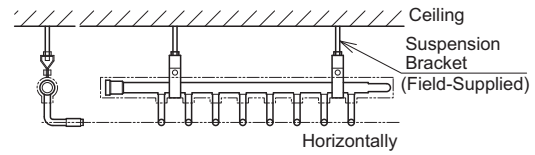
Branch Pipe for Gas Line

Install the branch pipe horizontally by placing it on the platform.



Branch Pipe for Liquid Line

Suspend the branch pipe from the ceiling so that the branch pipe port openings are horizontal.



CAUTION

- **Perform insulation work only when the surface temperature of the pipe material has cooled to room temperature. Anything done immediately after brazing can cause insulation to melt.**
- **During piping work, always cover over or plug the open end to keep the inside free of dust and moisture.**

After installation, it is recommended that the customer retain this manual for future reference.

1.5.7 Control

- Table of Contents -

1.5.7.1 3 Pin Connector Cable: PCC-1A	1-899
1.5.7.2 Remote Sensor: THM-R2A	1-900
1.5.7.3 Relay and 3 Pin Connector Kit: PSC-5RA	1-902

1.5.7.1 3 Pin Connector Cable: PCC-1A

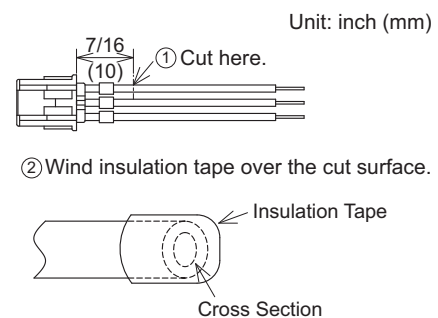
1. Contents of 3P Connector Cable

XARP-03V is the model number of the housing used for 3P Connector Cable.
 Please check the connection port of PCB by referring to the service manual before use.
 The maximum cable length is 164ft (50m) with a diameter of 0.3~0.5mm² (AWG22).

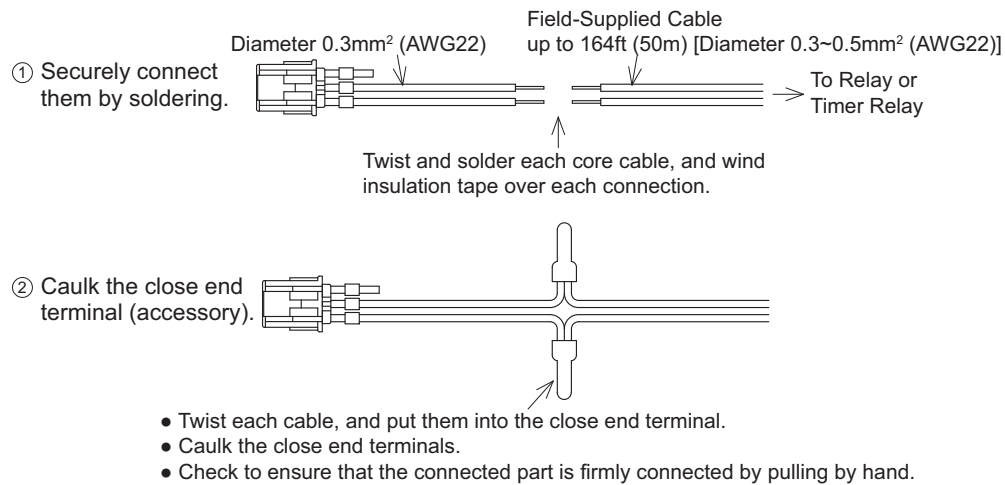
No.	Name	Qty.
1	3P Connector Cable	5 sets
2	Close End Terminal (JST CE-100)	15
3	Securing Band	5
4	Insulation Tape	1

2. How to Use

(1) There are three cables. If one of the three is not used depending on the purpose, check the connector numbers and cut the cable. Then cover the cut surface with insulation tape.



(2) In an instance where a relay or timer relay is connected with field-supplied cable (use method ① or ②).



(3) Caution when Wiring

Make sure that the field-supplied cable runs more than 6 in. (150mm) away from a power cable higher than 100V. (Crossing cables is okay.)
 If the cable runs along the power cable, use shielded cable and connect one end to earth ground.

1.5.7.2 Remote Sensor: HM-R2, THM-R2A

1. Applicable Models

This remote sensor is applicable to indoor units for air conditioners.

2. Contents

Check to ensure that the following parts are included in the box.

No.	Name	Qty.
1	Remote Sensor	1
2	Fixing Screw	2
3	Cord Fixer	3

3. Installation

(1) Selection of Installation Location

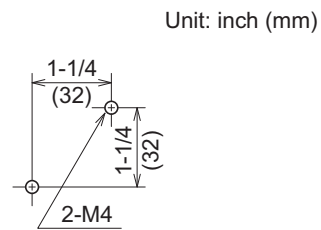
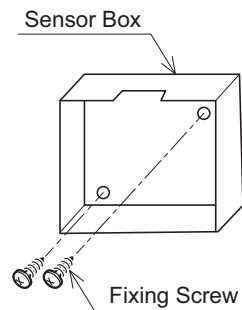
The thermistor for detecting room temperature is installed inside the remote sensor. Installation location should be determined according to the following conditions.

Install the remote sensor where:

- * the average room temperature can be detected.
- * it is not exposed to the sun.
- * there is no heat source around.
- * discharge air from the air conditioner does not blow directly against it.
- * it is not affected by the outdoor air when opening or closing doors or windows.

(2) Installation

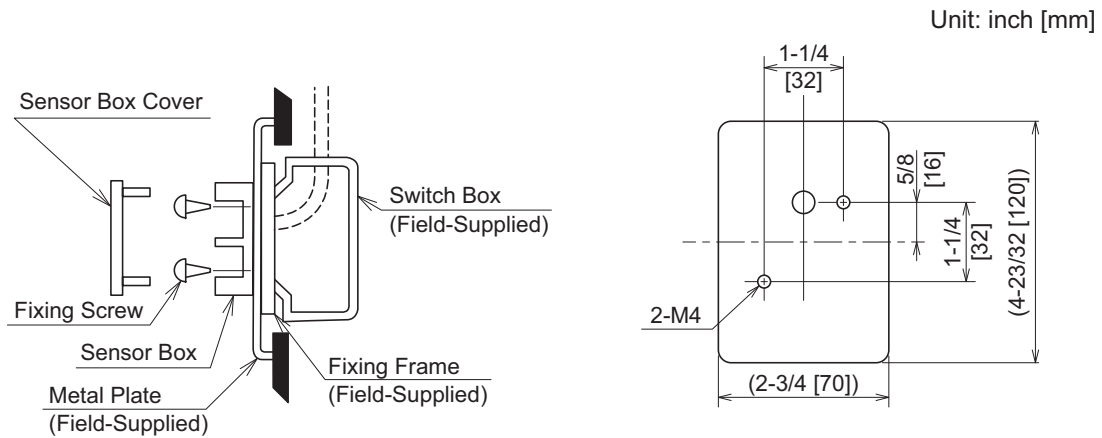
(a) Installing Remote Sensor on Wall



Dimension for Fixing Remote Sensor on Wall

- Cut out the wiring holes in the sensor box and lead the wires for the sensor through the holes.
- Secure the sensor box on the wall with the two screws.
- If the sensor box cannot be secured on the wall with the screws, use double-sided tapes.

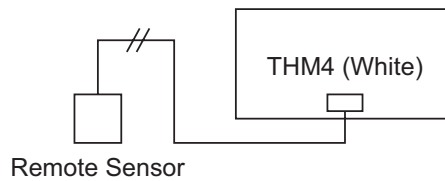
(b) Concealing Wires inside Wall



- Make the holes for securing the sensor box on the metal plate (field-supplied) as shown in the figure on the right, and secure the sensor box to the plate with screws.
- Make sure that the hole for air intake on the sensor box remains unobstructed.

4. Wiring Procedures

(1) Connect the cord (26ft (8m)) for the remote sensor to connector “THM4” of the indoor unit PCB.



(2) Extending Cord

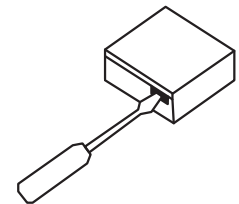
If there is a requirement that the cord be extended, cut the cord in the middle and connect it to the extension cord (wire size: 0.3mm² (AWG22), field-supplied).

When using the extension cord, connect it by soldering and the soldering part should be isolated electrically so that contact failure may not occur.

The total length of the cord (including the extension cord) should be within 98ft (30m).

5. Remarks

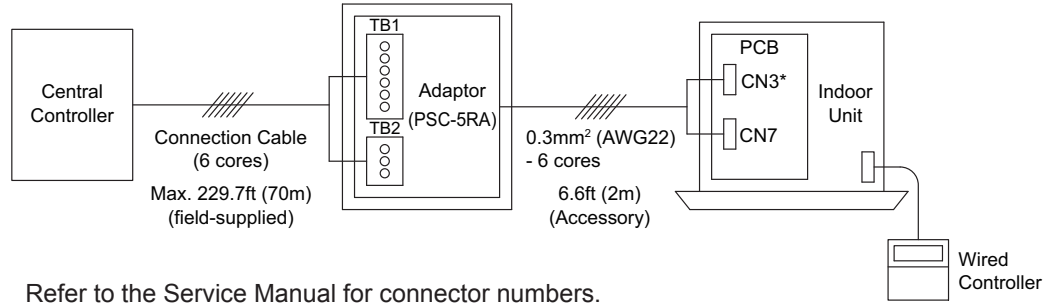
- (1) When removing the cover of the sensor box, insert the tip of the flat head screwdriver between the upper recess part of the sensor box and the cover, and remove it.
- (2) Run the sensor cord where the power line or electromagnetic interference (EMI) will not cause any abnormal operation.
- (3) Check to ensure that the wiring is correctly performed. Contact failure may cause incorrect temperature sensing and an abnormal operation.



1.5.7.3 Relay and 3 Pin Connector Kit: PSC-5RA

1. System

This kit is used for input/output signals (ON/OFF, mode, alarm) between the central controller and the indoor unit.



Refer to the Service Manual for connector numbers.

Item	Signal	Description	Specifications
Input from Central Controller	Input 1	Input level signal or pulse signal for voltage from the central controller	Voltage: 12VDC, 10mA Voltage: 24VDC, 10mA Pulse Range: 500ms or more
	Input 2		
Output to Central Controller	Output 1	Output the signal from the wired controller	24VDC From 10mA to 1A
	Output 2		

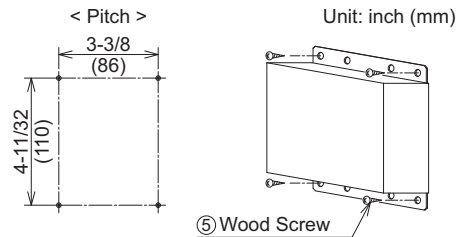
Refer to the Indoor Unit Manual for Input/Output mode settings by the wired controller.

2. Installation

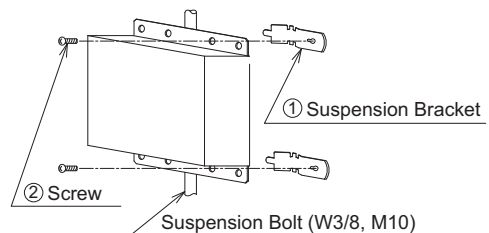
- (1) Avoid a humid environment. Install it near the indoor unit.
- (2) Check to ensure that the following parts are included in the box.

.No.	Name	Qty.	No.	Name	Qty.
①	Suspension Bracket	2	④	Wood Screw for Clamp	3
②	Screw	2	⑤	Wood Screw	4
③	Cable Clamp	3			

- (3) Use the wood screws ⑤ when the adaptor is installed on the wall/post.

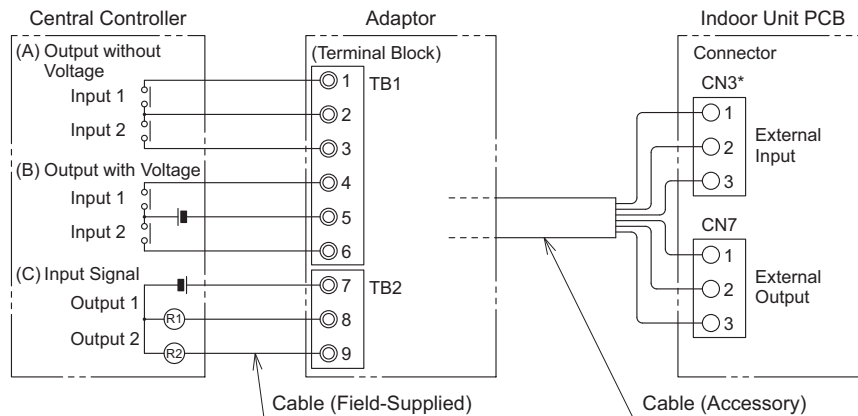


- (4) When the adaptor is installed with the suspension bolts (field-supplied), use the suspension brackets ①. Hang it on the bracket's hook and tighten two screws.



3. Electrical Wiring

Connect the central controller, the adaptor and the indoor unit PCB according to the following procedures.



Refer to the Service Manual for connector numbers.

- (1) Connect the accessory cables for the indoor unit.
Confirm the mark tubes on the connector. Insert them into the applicable PCB.
- (2) Connect the field-supplied cables for the central controller.
Use crimped terminals equivalent to J.S.T. 1.25-4, 0.3 - 0.75mm² (AWG22 - AWG18) in size of field-supplied cables.
- (3) Use terminal No.1 - No.3 for (A), output without voltage, No.4 - No.6 for (B), output with voltage.
- (4) Output with voltage from the central controller: 24VDC, 10mA
Input signals to the central controller: 24VDC, From 10mA to 1A

4. Precaution

- (1) Make the cables between the central controller and the adaptor as short as possible.
Do not run the cable along with 208/230V lines. Separate the cable 11-13/16 inch (300mm) or more from the 208/230V lines. Otherwise, actions will be required to prevent electromagnetic interference (EMI) using conduit tubes or shielded cables.
- (2) In an instance of an automatic operation by the remote switch, install a breaker or a smoke sensor near the indoor unit for safety in addition to monitoring by "Alarm Signal Output".
- (3) Refer to the Service Manual for details as to level signals and pulse signals from the central controller.

2. Operation

2.1 Indoor Unit

2.1.1 Duct Type

Ducted (High Static) Model:	(H,Y)IDH018B21S, (H,Y)IDH024B21S, (H,Y)IDH030B21S (H,Y)IDH036B21S, (H,Y)IDH048B21S
Ducted (Medium Static) Model:	(H,Y)IDM006B21S, (H,Y)IDM008B21S, (H,Y)IDM012B21S (H,Y)IDM015B21S, (H,Y)IDM018B21S, (H,Y)IDM024B21S (H,Y)IDM030B21S, (H,Y)IDM036B21S, (H,Y)IDM048B21S
Ducted (Slim) Model:	(H,Y)IDS006B21S, (H,Y)IDS008B21S, (H,Y)IDS012B21S (H,Y)IDS015B21S, (H,Y)IDS018B21S



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1. Introduction

This is operation manual for the indoor unit.
 Read this operation manual carefully before operating this product.
 Keep this operation manual with this product.

2. Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
---	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.

OPERATION

- Before servicing, turn-OFF current at the power source and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

Operation

⚠ WARNING

- Do not insert fingers or objects into air inlet/outlet. Injury can result from rotating fan blades or energized electrical components.
- Do not touch the wired controller with wet hands. It can result in failure of the wired controller or an electrical shock.
- Hair spray, insecticides, lacquers, and other pressurized substances should not be used within 3.3ft (1m) of any air conditioning unit. It can react with energized electrical components and cause fire.
- Do not install the indoor unit anywhere discharge airflow can pass directly toward nearby heating appliances (space heaters). It may interfere with the combustion process in these units.
- Air circulation should be optimized so as to achieve the best distribution pattern and not settle into isolated pockets that can make people uncomfortable.
- When the indoor unit is operated with heating appliances, ventilate a room sufficiently. Any leaked refrigerant gases that happen to come into contact with any heat source can become toxic on contact which can cause suffocation in the immediate area.
- Shut down at the main power source if the GFCI (Ground Fault Circuit Interrupter) activates frequently. Contact your distributor or contractor immediately. Failure to act accordingly can result in serious injury and damage to the unit.
- CAUTION! If you smell anything burning, shut down the unit and turn OFF the power at the main power source. Contact the fire department and your installer or electrical contractor.
- Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which can cause suffocation.
- If fluorocarbon gas should leak, turn OFF all heating appliances and ventilate the room immediately. Mop down or vacuum floor areas of residual toxic particulate.
- CAUTION! Do not operate indoor units with the electrical box and switch panel open and exposed. Incidental contact with energized components can prove fatal.

OPERATION

Repair / Relocation

WARNING

- When the air conditioner is to be repaired or transported to a new location, contact your distributor or contractor. If the repair and the installation are not completed, it may cause an electric shock or fire.

Others

WARNING

- Turn OFF all power at the main power source before performing maintenance work. Failure to do so can result in damage to internal components with severe or fatal electrical shock.
- Insulate all electrical components and connections from exposure to moisture. Failure to do so can result in an electrical short, fire.
- Do not tamper with or attempt to "repair" electrical wiring or connections. Call your installer or electrical contractor. Serious or fatal injury can occur.
- Perform all maintenance work on a firm and stable platform to minimize the risk of injury.
- Do not attempt to "clean" indoor unit components with liquid or powdered cleaning agents during maintenance. Electric shock, sparks, flame, and serious or fatal injury can occur.
- Inside piping is charged with refrigerant and highly pressurized.

CAUTION

- Hold the air filter and the air inlet grille securely when attaching or removing it. Carelessness can result in accident or injury.

3. Before Operation

NOTICE

Power is turned on. Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil. Make sure that the outdoor unit is not covered with snow or ice. If it is, remove it by using hot water that is approximately 122°F (50°C). If the water temperature is higher than 122°F (50°C), it will cause damage to plastic parts.

- Turn OFF the main power switch when the system is stopped for a long period of time. If the main switch is not turned OFF, electricity is consumed because the oil heater is always energized during compressor stopping.
- When the system is started after a shutdown longer than approximately three months, it is recommended that the system be checked by your service contractor.

3.1 Working Range

This heat pump air conditioner has been designed for the following temperatures. Operate the heat pump air conditioner within this range.

Temperature

		Maximum	Minimum
Cooling Operation	Indoor	89°F DB/73°F WB (32°C DB/23°C WB)	69°F DB/59°F WB (21°C DB/15°C WB)
	Outdoor	118°F DB (48°C DB) *	14°F DB (-10°C DB) *
Heating Operation	Indoor	80°F DB (27°C DB)	59°F DB (15°C DB)
	Outdoor	59°F WB (15°C WB) *	-4°F WB (-20°C WB) *

DB: Dry Bulb, WB: Wet Bulb

* The temperature may change depending on the outdoor unit.

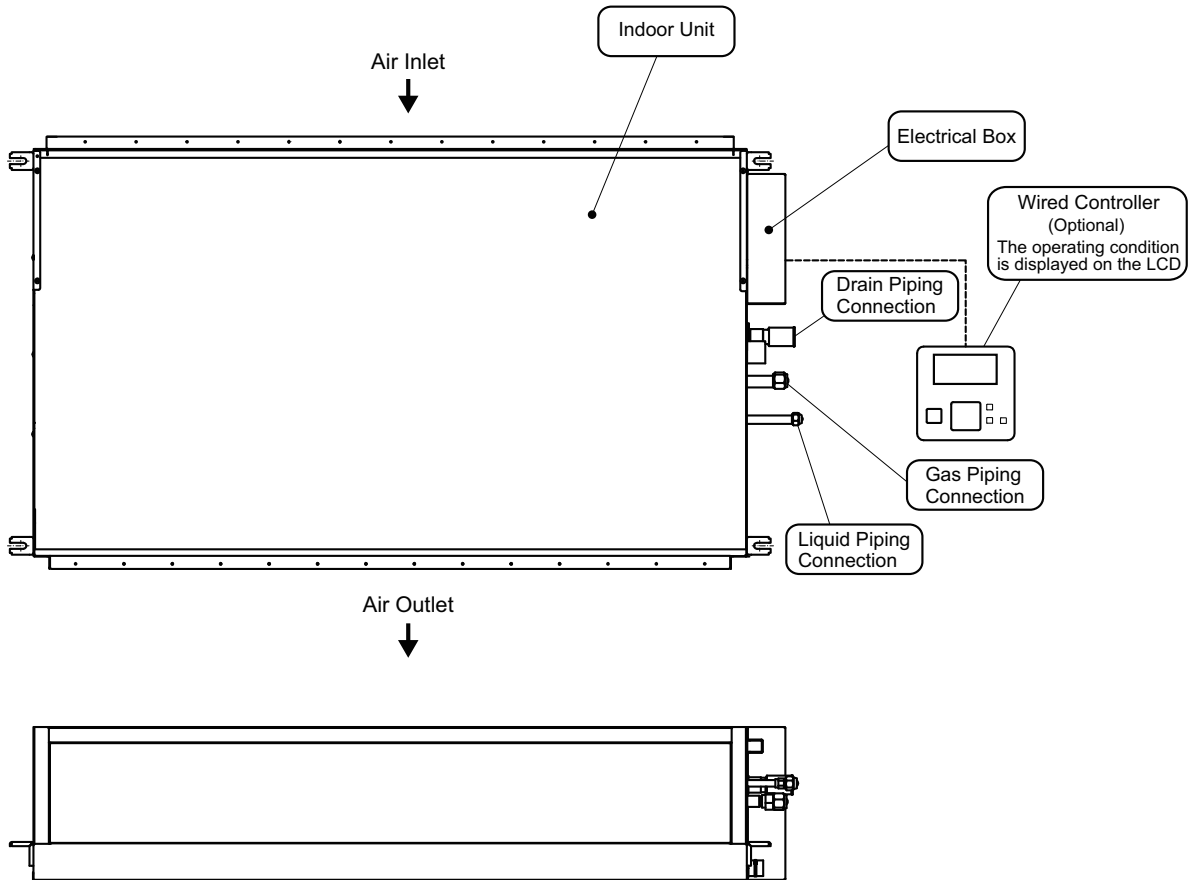
3.2 Efficient Use of Indoor Unit

- **Do not leave a window or a door open.**
The operating efficiency will be decreased.
It may cause condensation of the indoor unit. Ventilate a room sufficiently.
- **Attach a curtain or a blind to a window.**
Blocking direct sunlight into a room will increase efficiency.
- **Use a circulator if warm air stays around the ceiling.**
Comfort will be increased. Contact your distributor for details for using a circulator.
- **Change the air flow direction downward if the ceiling surface gets dirty.**
It is recommended to change the air flow direction by approx. 30° downward.
- **Turn OFF the main power source if the indoor unit is not to be used for a long period.**
The standby electricity charges will have to be paid even if the indoor unit is unused.

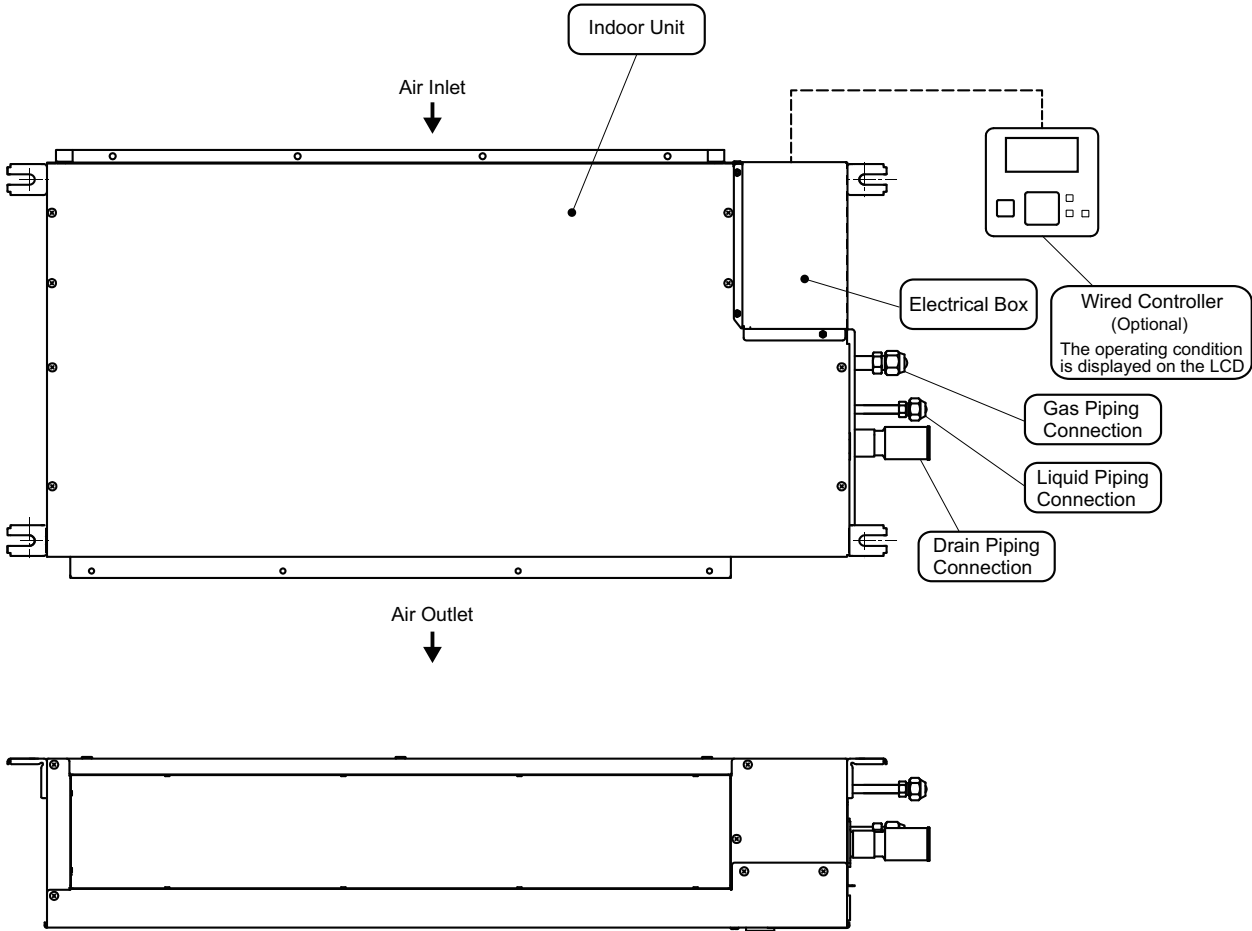
4. Names of Parts

4.1 Ducted Type

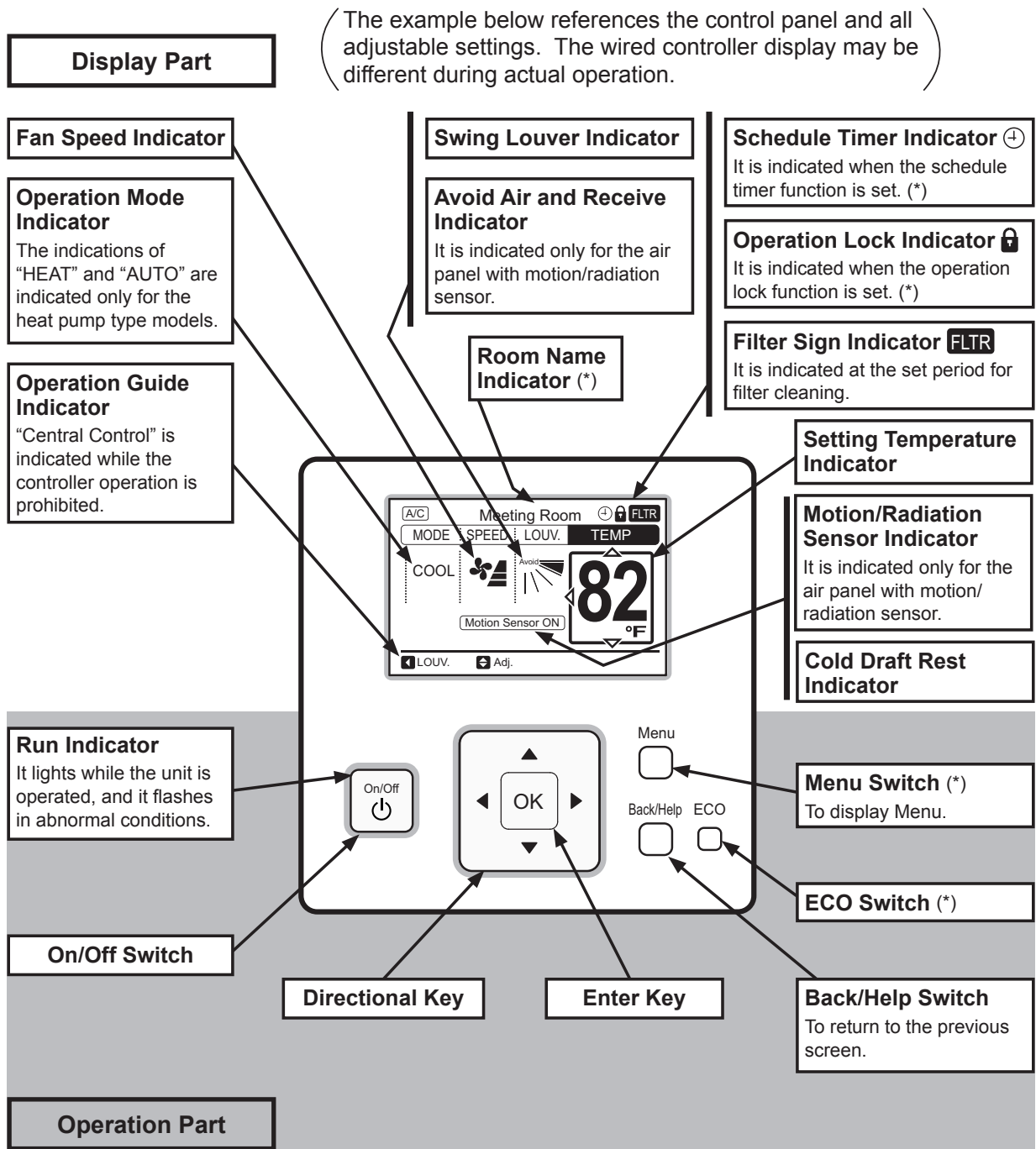
- High Static Type
(H,Y)IDH018B21S, 024B21S, 030B21S, 036B21S and 048B21S
- Medium Static Type
(H,Y)IDM006B21S, 008B21S, 012B21S, 015B21S, 018B21S, 024B21S, 030B21S, 036B21S and 048B21S



- Slim Type
(H,Y)IDS006B21S, 008B21S, 012B21S, 015B21S and 018B21S



4.2 Wired Controller (CIW01)

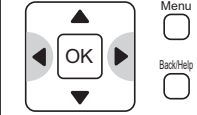
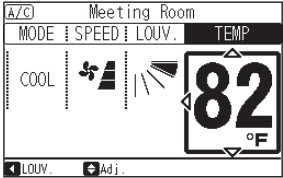
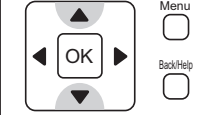
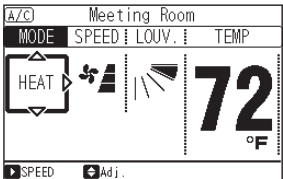


NOTE

- This manual shows example CIW01 is utilized. If other models of the controller are utilized, operate the unit according to the manual for that controller.
- Press the switches lightly to control the wired controller. Do not press the wired controller with a sharp object such as a pen. It may cause damage to the control part.
- (*) : For details description, refer to the operation manual for the wired controller.

5. Operation Method

5.1 Basic Operation

Item Selection	<p>By pressing “<” or “>”, the icon “” will move between “MODE”, “SPEED”, “LOUV.” and “TEMP”.</p>		
Change of Settings	<p>With (“MODE”, “SPEED”, “LOUV.” or “TEMP”) selected, press “Δ” or “∇”. The setting will be changed.</p>		

- For the ducted unit, “LOUV.” is not displayed on Liquid Crystal Display (LCD).

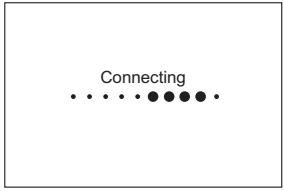
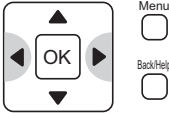
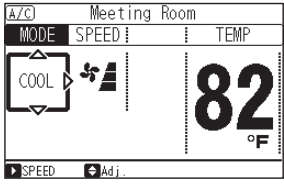

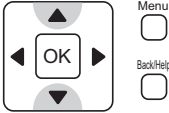
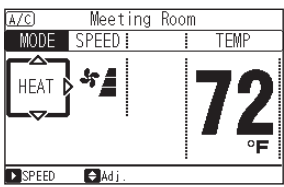
5.2 Cooling / Heating / Fan Operation

Heating Operation is for VRF system only and is not available for other systems.

<Function>


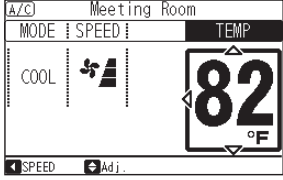
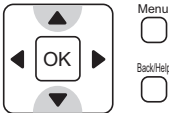
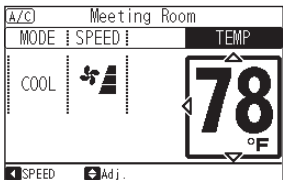
- * Cooling Operation: To decrease the room temperature.
- * Heating Operation: To increase the room temperature.
- * Dry Operation: To decrease the humidity in the room.
- * Fan Operation: To circulate the air in the room.

- Dry operation may not be performed properly if there are other heat sources which exceed the capacity of the unit.
- The control of humidity is unavailable with this unit. If you require dehumidification and the control of humidity, choose specialized equipments.
- In case where the individual setting is operated, decreasing of the humidity during dry operation might be unavailable.

<p>Before Operation</p>	<p>Turn ON the power supply. Turn ON the main power approximately 12 hours before operation in order to preheat the compressor.</p> <p>Do not turn OFF the main power of the indoor unit during season of heating or cooling.</p>		
<p>1</p>	<p>Press “<” or “>” to select “MODE”.</p>		
<p>2</p>	<p>By pressing “Δ” or “∇”, the mode will be changed as follows.</p> 		

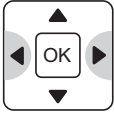
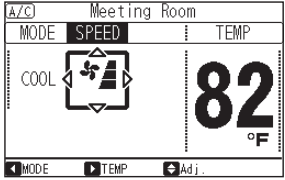


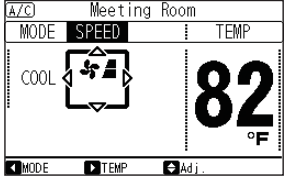
- Automatic cooling/heating operation requires an extra setting. Contact your distributor or contactor for details.

5.3 Temperature Setting

<p>1</p>	<p>Press “<” or “>” and select “TEMP”.</p>		
<p>2</p>	<p>By pressing “Δ”, the temperature is increased by 1°F (0.5°C). (Max. 86°F (30°C)) By pressing “∇”, the temperature is decreased by 1°F (0.5°C). COOL, FAN operation: Min. 66°F (19°C) HEAT operation: Min. 62°F (17°C)</p>		

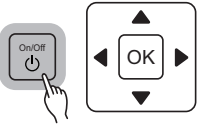
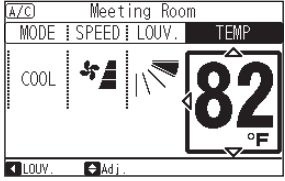
- In case the optional function “Automatic Reset of Setting Temperature” is set:
 Even if changing the setting temperature on the wired controller, it automatically returns to the temperature set by “Automatic Reset Temperature” after a set time.
- Minimum and maximum temperature setpoint limits can be configured by selecting a cooling lower limit and heating upper limit in the “Function Selection” mode of the wired controller's Test Run Menu.
- Contact your distributor or dealer for details on optional functions “Automatic Reset of Setting Temperature,” “Cooling Lower Limit for Setting Temperature” and “Heating Upper Limit for Setting Temperature.”

5.4 Fan Speed

<p>1</p>	<p>Press “◀” or “▶” and select “SPEED”.</p>	 <p>Menu Back/Help</p>	
<p>2</p>	<p>By pressing “△” or “▽”, the fan speed will be changed as follows.</p> 	 <p>Menu Back/Help</p>	

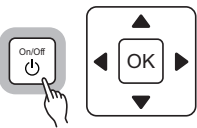
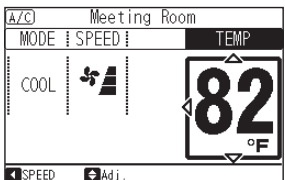
- During the dry operation, the fan speed is automatically changed to “LOW” and cannot be changed to any other fan speed. (“LOW” will NOT be displayed on Liquid Crystal Display (LCD) at this time. The present setting condition will be displayed on the LCD.)
- The fan speed setting “HIGH 2” may not be available depending on the indoor unit type.

5.5 Operation

<p>Operation Start</p>	<p>Press “⏻” (On/Off). The RUN indicator will be turned ON and the operation will start.</p>		
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< Temperature/Air Flow Setting >

- The setting condition will be memorized. Therefore, no daily setting is required. Temperature setpoint and airflow settings will be retained after the indoor unit is turned OFF at the controller. In a case where the setting change is required, refer to Sections 5.2 to 5.4.

<p>Operation Stop</p>	<p>Press “⏻” (On/Off) again. The RUN indicator will be turned OFF and the operation will stop.</p>		
------------------------------	--	--	---

- The indoor unit fan may continue to operate for up to two minutes following the heating cycle to dissipate residual heat from the indoor unit.

6. Automatic Control

This air conditioner automatically starts the following operations according to the indoor conditions.

The system is equipped with the following functions.

Three-Minute Guard		<ul style="list-style-type: none"> ▪ Enforced Stoppage: The compressor remains off for at least three minutes once it has stopped. If the system is started within approximately three minutes after it has stopped, the RUN indicator is activated. However, the cooling operation or the heating operation remains off and does not start until after three minutes has elapsed. ▪ Enforced Operation: If all indoor units of the system are Thermo-OFF within approximately three minutes after the compressor has started, the compressor is operated during three minutes continuously. However, if all indoor units of the system are stopped by a controller, compressor has stopped.
Cooling and Dry	Frost Prevention	When the indoor unit is operated at a low discharge air temperature, the cooling operation may be changed to fan operation for a while to avoid frost formation on the indoor heat exchanger.
	Self-Cleaning of Expansion Valve	The expansion valve self-cleaning when the cooling operation has stopped. The sound of which the refrigerant flows may be heard from the indoor unit during the self-cleaning. This is not abnormal.
Heating	Hot Start	To prevent cold air discharge in the room, the fan speed is controlled from the slow position and the low position and then to the set position according to the discharge air temperature. At this time the louver is fixed horizontally and "HOT-START" is displayed on the LCD of the wired controller.
	Defrost Operation	The indoor unit fan operation is stopped to prevent cold air discharge during the defrost operation. At this time, the indication "HOT-START" is displayed on the LCD of the wired controller and the indoor unit fan louver angle is fixed horizontally.
	Residual Heat Removal	When the heating operation is stopped, the indoor fan operation may be kept at the slow position for a maximum of two minutes to lower temperature of the inside of the indoor unit.
	Prevention of Overload Operation	When the outdoor temperature is high (approx. 70°F (21°C) or more) during the heating operation, the operation is stopped by activation of the outdoor thermistor.

NOTE

- This air conditioner adopts a hot air circulation system for the heating operation. If the space is large or the room temperature is excessively low, it takes time to heat the entire room. If the room has been heated enough and discharged air reaches a required temperature, the indication "HOT-START" will be turned OFF after heating the room.
- The indication "HOT-START" may be displayed during, or right after, the defrosting operation. "HOT-START" is activated during defrost to ensure comfort by reducing the delivery of cold air in the heating cycle. This is NOT abnormal.

7. Maintenance

⚠ WARNING

- Turn OFF the power source before the maintenance work. If the power source is not turned OFF, the result may be an electric shock or fire.
- Perform the maintenance work with a stable foothold or foundation. This may prevent falling or injury.

⚠ CAUTION

- Hold the air filter and the air inlet grille securely by hand when attaching or removing it. If not, it may cause the product to fall, resulting in an injury.

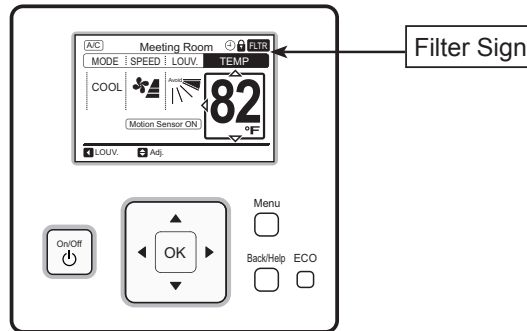
7.1 Daily Maintenance

< Cleaning Air Filter >

Clean the air filter when the filter sign is turned ON.

(1) Air filter is an optional parts.

The filter cleaning method is followed by manual attached by filter.



NOTICE

- Do not operate the system without the air filter to protect the indoor unit heat exchanger from being clogged.

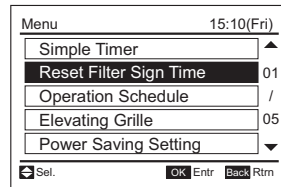
(2) The indication "FLTR" is shown on the LCD of wired controller after the time is set on the wired controller. (Default filter time for the ducted units is 1200 hours.)

- (3) Reset the filter sign.

NOTE

If the accumulated operation time is shorter than the filter sign setting, the indication "☒" is turned ON and "Setting Disabled" will be displayed.

- Press "Menu".
Select "Reset Filter Sign Time" from the menu and press "OK".
The confirmation screen will be displayed.



- Select "Yes" by pressing "<" or ">" and press "OK".
The indication of "FLTR" will be turned OFF and the screen will return to the normal mode.



7.2 Maintenance

Beginning of Start Up

- Remove obstacles around the air inlet and the air outlet of the indoor unit and outdoor unit.
- Check that the air filter is not clogged with dust and dirt.

Regular Maintenance

- Clean on regular basis the air filter, the air inlet grille to maintain the system's peak performance and efficiency.

8. Troubleshooting

8.1 This is Not Abnormal

Phenomenon		Cause and Action
Operation Stopped	All indication lamps on the wired controller are turned OFF.	The micro-computer is activated to protect the device from electromagnetic waves. Restart the operation.
	After Power Failure	Restart the operation. If the instantaneous power failure is within two seconds, the operation restarts automatically.
White Steam from Indoor Unit	During Heating Operation	This might occur during the defrosting operation in the heating operation.
White Smoke from Indoor Unit	At Beginning of Heating Operation Season	This might occur when dust attached to the heat exchanger has been dried.
Mist from Indoor Unit	In Restaurant or Kitchen	This might occur when oil attached to the fins might decrease the heat exchange efficiency.
	During Dry Operation	This might occur when the air outlet temperature becomes lower. Change the operation mode.
	During Cooling Operation in Humid Environment	This might occur when the air outlet temperature becomes lower. Raise the set temperature and the air flow volume.
Odor from Indoor Unit	Odor Discharged from Indoor Unit	This might occur when the smell of cigarette smoke infiltrated the inside of the indoor unit. Ventilate the unit well in the fan mode and clean the air filter, the air outlet and the air inlet grille.
Sound from Indoor Unit	Grate is heard when starting or stopping the operation.	This is the sound made when the components are rubbing against each other due to the extension and contraction of the resin parts caused by the temperature change.
	Sound of water flowing or bubbling during the operation.	This is the sound made when the refrigerant flows or the drain-up mechanism drains water. The sound may be heard especially when starting the operation or stopping the compressor (for approx. three minutes).
	Growling sound may be heard temporarily right after the air flow volume is changed.	It is generated because the fan motor makes temporary sound by change of fan speed.
Temperature Irregularity	The air flow volume and temperature of each air outlet are irregular.	This might occur for structural reasons, such as the size of air outlet and the location of heat exchanger.
“HOT-START” on LCD Turned ON		This might occur according to the operation mode or operation conditions.
Operation Mode on LCD Flashing		

8.2 Before Contacting a Contractor

Refer to the information below before contacting a contractor.

Trouble		Check Point	Action
Operation Unavailable		Check that the main power source is turned ON.	Turn ON the main power source for the air conditioner.
		Check that the fuse is not blown out or the circuit breaker of the main power source tripped.	Replace the fuse or reset the circuit breaker. If the trouble recurs, contact your contractor or distributor.
Immediate Shutdown after Start-up	Cooling	Check that the air inlet and outlet of the outdoor unit are not covered with paper, vinyl or other objects.	Remove objects covering the air inlet and outlet.
	Heating	Check for any obstacles preventing the air flow near the air inlet and outlet of the outdoor unit.	Remove the obstacles preventing the air flow.
		Check that the outlet air is not short-circuited to the air inlet.	
Insufficient Cooling or Heating		Check that the operation mode is correct.	If the fan mode is selected, switch the operation mode to cooling or heating.
		Check that the set temperature is correct.	If not, change the set temperature by pressing “Δ” or “▽” by the wired controller.
		Check that the air flow direction is correct.	If not, change the air flow direction. In the case that the footing is not heated well during the heating operation, change the louver downward.
		Check that the air filter is not clogged.	Clean the air filter.
		Check that a window or a door is not opened.	Close the window or the door.
		Check for any obstacles preventing the air flow near the air inlet and outlet of the indoor and outdoor units.	Remove the obstacles.

8.4 Alarm Code

Code	Category	Content of Abnormality	Code	Category	Content of Abnormality
01	Indoor Unit	Activation of Protection Device	35	System	Incorrect Setting of Indoor Unit No.
02	Outdoor Unit	Activation of Protection Device (High Pressure Cut)	36		Incorrect Indoor Unit Combination
03	Communication	Operational Irregularities between Indoor and Outdoor	38		Problem with Protective Pickup Circuit in Outdoor Unit
04		Problem between Inverter PCB and Outdoor PCB	39	Compressor	Problem with Running Current at Constant Speed Compressor
05	Supply Phase	Problem of Power Source Phases	41	Pressure	Overload Cooling
06	Voltage	Abnormal Voltage Drop in Outdoor Unit	42		Overload Heating
07	Cycle	Decrease in Superheated Discharge Gas	43	Protection Device	Activation of Pressure Ratio Decrease Protection Device
08		Increase in Discharge Gas Temperature	44		Activation of Low Pressure Decrease Protection Device
09	Outdoor Unit	Activation of Protection Device for Outdoor Fan	45		Activation of Low Pressure Increase Protection Device
11	Sensor on Indoor Unit	Inlet Air Thermistor Failure	46		Activation of High Pressure Increase Protection Device
12		Outlet Air Thermistor Failure	47	Activation of High Pressure Decrease Protection Device	
13		Freeze Protection Thermistor Failure	48	Activation of Overcurrent Protection Device	
14		Gas Piping Thermistor Failure	51	Inverter	Problem with Inverter Current Sensor
19	Fan Motor	Activation of Protection Device for Indoor Fan	52		Activation of Inverter Overcurrent Protection
20	Sensor on Outdoor Unit	Compressor Thermistor Failure	53		Activation of Transistor Module Protection
21		High Pressure Sensor Failure	54		Abnormality of Inverter Fin Temperature
22		Outdoor Air Thermistor Failure	56	Outdoor Fan	Abnormality of Detection for Fan Motor Position
23		Discharge Gas Thermistor Failure	57		Activation of Fan Controller Protection
24		Evaporating Thermistor Failure	58	Abnormality of Fan Controller	
29	Low Pressure Sensor Failure	b0	System	Incorrect Setting of Unit Capacity	
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit		b1	Incorrect Setting of Unit and Refrigerant Cycle No.
32		Incorrect Setting of Other Indoor Unit Number	EE	Compressor	Compressor Protection Alarm

2.1.2 4-Way Cassette Type

Model: (H,Y)TIC4012B21S, (H,Y)TIC4015B21S, (H,Y)TIC4018B21S,
(H,Y)TIC4024B21S, (H,Y)TIC4030B21S, (H,Y)TIC4036B21S

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1. Introduction



Read this installation and maintenance manual carefully before installing this product.

This is installation and maintenance manual for the indoor unit. Read over the installation and maintenance manual for the outdoor unit as well.


Hand over this installation and maintenance manual and the warranty to the next team of installers and then users. Ask them to keep this installation and maintenance manual with the air conditioning unit.
 (Refrigerant Piping Work) → (Electrical Wiring Work) → (Ref. Charge Work) → (Test Run) → (User)

- For details on wiring between the indoor unit and the outdoor unit, refer to the installation and maintenance manual” for the outdoor unit.
- For details on the optional decorative panel, refer to the installation and maintenance manual for the optional decorative panel.
- For details on the optional controller, refer to the installation and maintenance manual for that optional controller module.
- For details on each optional part, refer to the installation and maintenance manual for each optional part.
- For central station, refer to the installation and maintenance manual for the central station.

2. Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic “Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.

OPERATION

- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.
- Before servicing, turn-OFF current at the power source and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

Operation

⚠ WARNING

- Do not insert fingers or objects into air inlet/outlet. Injury can result from rotating fan blades or energized electrical components.
- Do not touch the wired controller with wet hands. It can result in failure of the wired controller or an electrical shock.
- Hair spray, insecticides, lacquers, and other pressurized substances should not be used within 3.3ft (1m) of any air conditioning unit. It can react with energized electrical components and cause fire.
- Do not install the indoor unit anywhere discharge airflow can pass directly toward nearby heating appliances (space heaters). It may interfere with the combustion process in these units.
- When the indoor unit is operated with heating appliances, ventilate a room sufficiently. Any leaked refrigerant gases that happen to come into contact with any heat source can become toxic on contact which can cause suffocation in the immediate area.
- Shut down at the main power source if the GFCI (Ground Fault Circuit Interrupter) activates frequently. Contact your distributor or contractor immediately. Failure to act accordingly can result in serious injury and damage to the unit.
- CAUTION! If you smell anything burning, shut down the unit and turn OFF the power at the main power source. Contact the fire department and your installer or electrical contractor.
- Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which can cause suffocation.
- If fluorocarbon gas should leak, turn OFF all heating appliances and ventilate the room immediately. Mop down or vacuum floor areas of residual toxic particulate.
- CAUTION! Do not operate indoor units with the electrical box and switch panel open and exposed. Incidental contact with energized components can prove fatal.

NOTICE

- Air circulation should be optimized so as to achieve the best distribution pattern and not settle into isolated pockets that can make people uncomfortable.

OPERATION

Repair / Relocation

WARNING

- When the air conditioner is to be repaired or transported to a new location, contact your distributor or contractor. If the repair and the installation are not completed, it may cause an electric shock or fire.

Others

WARNING

- Turn OFF all power at the main power source before performing maintenance work. Failure to do so can result in damage to internal components with severe or fatal electrical shock.
- Insulate all electrical components and connections from exposure to moisture. Failure to do so can result in an electrical short, fire.
- Do not tamper with or attempt to "repair" electrical wiring or connections. Call your installer or electrical contractor. Serious or fatal injury can occur.
- Perform all maintenance work on a firm and stable platform to minimize the risk of injury.
- Do not attempt to "clean" indoor unit components with liquid or powdered cleaning agents during maintenance. Electric shock, sparks, flame, and serious or fatal injury can occur.
- Inside piping is charged with refrigerant and highly pressurized.

CAUTION

- Hold the air filter and the air inlet grille securely when attaching or removing it. Carelessness can result in accident or injury.

NOTICE

- When cleaning the lens surface of the motion sensor, do not make unnecessary contact as it can be easily scratched.

3. Before Operation

NOTICE

Apply power to the outdoor unit(s) at least 12 hours prior to system operation to allow for preheating of the compressor oil. Do not start the system immediately without preheating the compressor. Otherwise, the compressor can be damaged. Check that the outdoor unit is free of ice and snow cover. If snow covered, remove with hot water at (122°F or 50°C). If hot water temperature is higher than 122°F (50°C), it can cause damage to plastic parts.

- When the system is restarted after a shutdown longer than approximately three months, it is recommended that the system be checked over by your service contractor.
- Turn OFF at the main switch when the system has been off for a long period of time.
If the main switch is not turned OFF, electricity is consumed, because the oil heater is always energized during periods of compressor stoppage.

3.1 Working Range

This heat pump air conditioner has been designed for the following temperatures. Operate the heat pump air conditioner within this range.

Temperature

		Maximum	Minimum
Cooling Operation	Indoor	89°F DB/73°F WB (32°C DB/23°C WB)	69°F DB/59°F WB (21°C DB/15°C WB)
	Outdoor	118°F DB (48°C DB) *	14°F DB (-10°C DB) *
Heating Operation	Indoor	80°F DB (27°C DB)	59°F DB (15°C DB)
	Outdoor	59°F WB (15°C WB) *	-4°F WB (-20°C WB) *

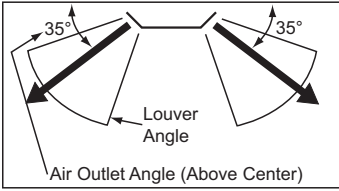
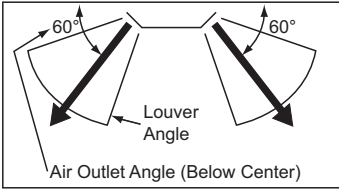
DB: Dry Bulb, WB: Wet Bulb

* The temperature may change depending on the outdoor unit.

3.2 Efficient Use of Indoor Unit

- **Do not leave windows or doors open.**
Operating efficiency will be degraded.
Condensation and problems relating to it can result. (Ventilate a room sufficiently too.)
- **Attach a curtain or a blind to a window.**
Direct sunlight is blocked, the cooling efficiency is enhanced.
- **Avoid using heating appliances during the cooling operation as much as possible.**
Cooling efficiency will be decreased. It may cause dew condensation and dropping dew.
- **Use the built-in circulating fan if warm air tends to remain around the ceiling.**
Comfort will be increased. Contact your distributor for the details.
- **Redirect airflow downward if ceiling surface areas become discolored due to airborne particulate.**
It is recommended that airflow be redirected 30° downward.
- **Turn OFF power at the main power source if the indoor unit is not being used over a prolonged period of time.**
You will be billed for excess electrical consumption while the unit rests in standby mode.

3.3 Efficient Use of Cooling and Heating

COOLING	HEATING
<p>(1) Airflow Direction The appropriate air outlet angle is approximately 35°. If cooling is not sufficient, change the airflow direction. The louver angle can be changed each approximately 5° per step by the wired controller.</p> <div style="text-align: center; margin: 10px 0;">  </div> <p>(2) Airflow Volume "AUTO" should be usually used. If the airflow volume is set as "HIGH" or "Low", freeze protection operation will be activated and cooling and fan operation will be performed in turn.</p>	<p>(1) Airflow Direction The appropriate air outlet angle is approximately 60°. If heating is not sufficient, change the airflow direction. The louver angle can be changed each approximately 5° per step by the wired controller.</p> <div style="text-align: center; margin: 10px 0;">  </div> <p>(2) Airflow Volume "AUTO" should be usually used.</p>

NOTE

< For Multi-Split Systems >

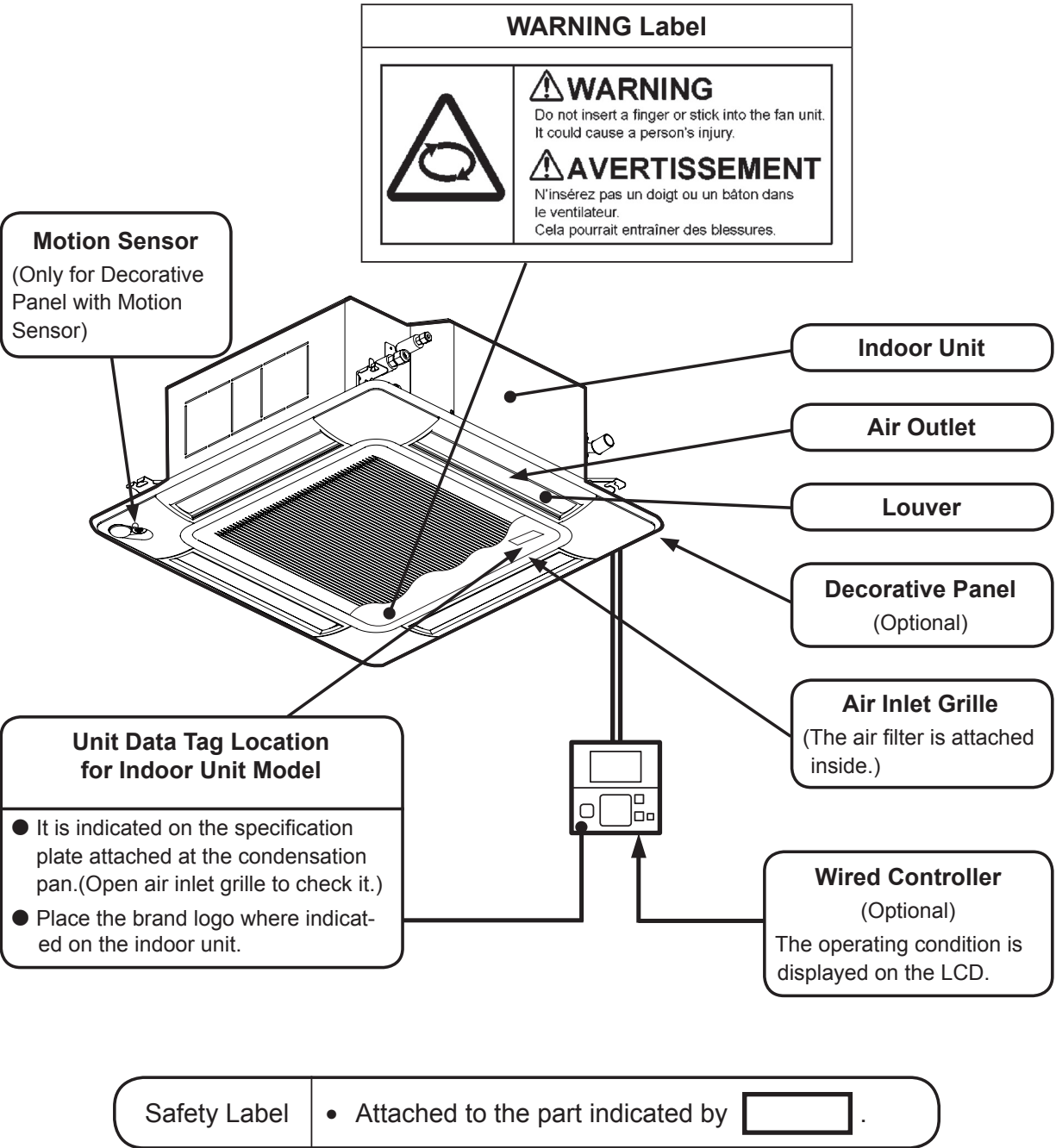
When the number of the indoor units in operation or the operating mode is changed, the change in air outlet temperature can cause the indoor temperature to change. In this case, adjust the settings as follows.

- During Cooling Operation: Lower the setting temperature slightly.
 - During Heating Operation: Raise the setting temperature slightly.
-

4. Name of Parts and Indication of Safety Consideration

Safety labels are affixed to the indoor unit in order to ensure safe use.
Read and understand this manual before using the indoor unit.

4.1 Indoor Unit

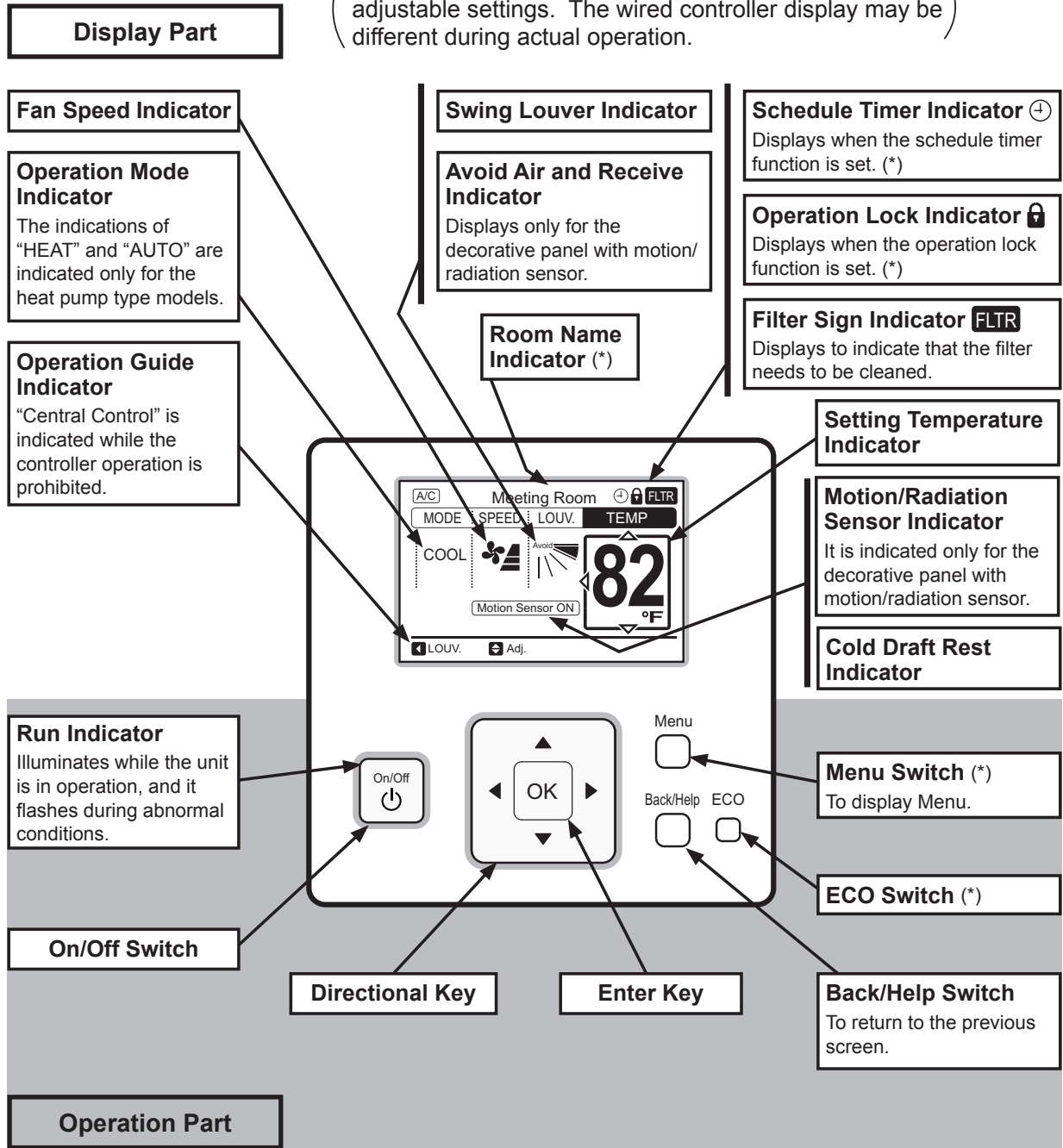


NOTE

- Wired Controller keyboard: avoid damage to the keyboard by using light pressure keystrokes when changing settings.
- Review the installation and maintenance manual for the optional Wireless Controller and Receiver Kit.

4.2 Wired Controller (CIW01)

(The example below references the control panel and all adjustable settings. The wired controller display may be different during actual operation.)


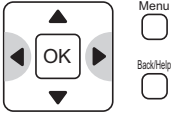
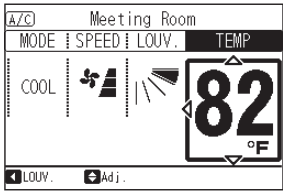
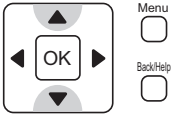
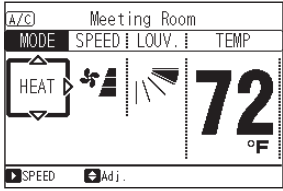


NOTE

- This manual shows an example where CIW01 is utilized. If other models of the controller are utilized, operate the unit according to the manual for that controller.
- (*) : For detailed descriptions, refer to the wired controller operator's manual.

5. Operation Method

5.1 Basic Operation

<p style="text-align: center;">Item Selection</p>	<p>By pressing “<” or “>”, the icon “  </p>		
<p style="text-align: center;">Change of Settings</p>	<p>With the item (“MODE”, “SPEED”, “LOUV.” or “TEMP”) selected, press “Δ” or “∇”. The setting will be changed.</p>		

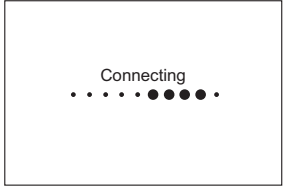
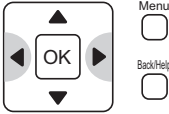
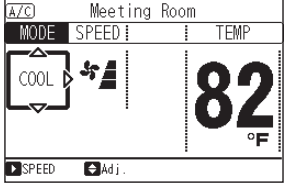

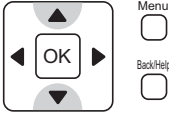
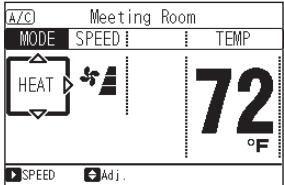
5.2 Cooling / Heating / Fan Operation

Heating Operation is for VRF system only and is not available for other systems.

<Function>

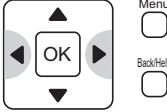
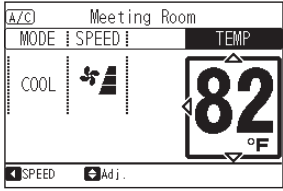
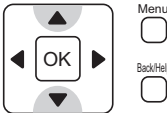
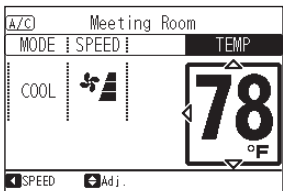
- * Cooling Operation: To decrease room temperature.
- * Heating Operation: To increase room temperature.
- * Dry Operation: To decrease humidity in the room.
- * Fan Operation: To increase air circulation in the room.

- Dry operation may not run properly if there are other heat sources which exceed the capacity of the unit.
- The humidity control device is not installed on this unit. If dehumidification and the control humidity are required, please purchase and install the humidity control device.
- In cases where individual settings are used, the ability to reduce humidity levels during the Dry Operation function might not be available.

<p>Before Operation</p>	<p>Turn ON the power supply. Turn ON the main power for approximately 12 hours before operation in order to preheat the compressor.</p> <p>Do not turn OFF the main power to the indoor unit during active heating and cooling seasons.</p>		
<p>1</p>	<p>Press “<” or “>” to select “MODE”.</p>		
<p>2</p>	<p>By pressing “Δ” or “∇”, the mode will be changed as follows.</p> 		


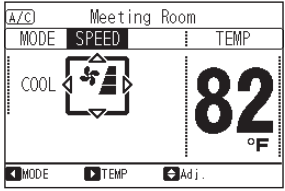


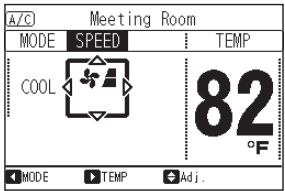
- Automatic heating/cooling operation requires extra settings. Contact your distributor or contractor for details.

5.3 Temperature Setting

1	Press “<” or “>” and select “TEMP”.		
2	<p>By pressing “Δ”, temperature is increased by 1°F (0.5°C). (Max. 86°F (30°C))</p> <p>By pressing “∇”, temperature is decreased by 1°F (0.5°C).</p> <p>COOL, FAN operation: Min. 66°F (19°C)</p> <p>HEAT operation: Min. 62°F (17°C)</p>		

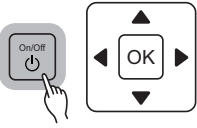
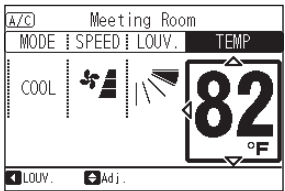
- In case that the optional function “Automatic Reset of Setting Temperature” is set:
Even if changing the setting temperature on the wired controller, it automatically returns to the set temperature by “Automatic Reset Temperature” after a set time.
- The minimum/maximum temperature settings can be changed by adjusting the lower limit for set temperature for cooling (or the upper limit for setting temperature for heating) from the function selection.
- Contact your distributor or dealer for details on optional functions “Automatic Reset for Setting Temperature,” “Cooling Lower Limit for Set Temperature” and “Heating Upper Limit for Set Temperature.”

5.4 Fan Speed

<p>1</p>	<p>Press “<” or “>” and select “SPEED”.</p>	 <p>Menu Back/Help</p>	
<p>2</p>	<p>By pressing “Δ” or “∇”, fan speed will be changed as follows.</p> 	 <p>Menu Back/Help</p>	

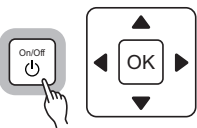
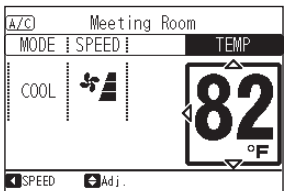
- During dry operation, fan speed is automatically adjusted to “LOW” and cannot be changed to any other fan speed. (“LOW” will NOT be displayed on the LCD (Liquid Crystal Display) at this time. The present setting condition will be displayed on the LCD.)
- The fan speed setting “HIGH 2” may not be available depending on the type of indoor model.

5.5 Operation

<p>Operation Start</p>	<p>Press “On/Off”.</p> <p>The RUN indicator will be turned ON and the operation will start.</p>		
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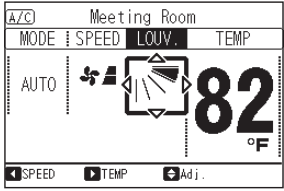
< Temperature/Airflow Setting >

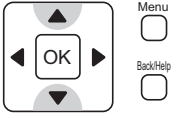
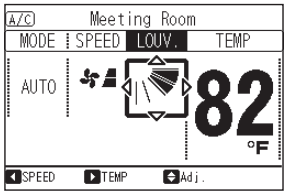

























- The setting condition will be entered into memory once after the setting is confirmed, so repeated daytime re-settings are not required. In the case a setting change is required, refer to items 5.2 to 5.4.

<p>Operation Stop</p>	<p>Press “On/Off” again.</p> <p>The RUN indicator will be turned OFF and the operation will stop.</p>		
------------------------------	---	--	---

- After the heating operation stops, the fan will continue to run for approximately two minutes.

5.6 Louver Swing Direction

1	Press "On/Off". Make sure that the operation is started. Press "<" or ">" and select "LOUV.".		
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2	By pressing "Δ" or "∇", the louver direction will be changed as follows.																																																																							
<table border="1" style="width: 100%; border-collapse: collapse; font-size: 10pt;"> <thead> <tr> <th style="width: 10%;">Step</th> <th style="width: 10%;">1</th> <th style="width: 10%;">2</th> <th style="width: 10%;">3</th> <th style="width: 10%;">4</th> <th style="width: 10%;">5</th> <th style="width: 10%;">6</th> <th style="width: 10%;">7</th> <th style="width: 10%;">-</th> </tr> </thead> <tbody> <tr> <td>LCD Indication</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Air Louver Angle</td> <td>Approx. 25°</td> <td>Approx. 35°</td> <td>Approx. 42°</td> <td>Approx. 49°</td> <td>Approx. 55°</td> <td>Approx. 60°</td> <td>Approx. 65°</td> <td rowspan="4" style="text-align: center; vertical-align: middle;">Auto Swing</td> </tr> <tr> <td>FAN</td> <td></td> <td style="text-align: center;">Recommended Angle</td> <td colspan="2" style="text-align: center;">Angle Range</td> <td colspan="3" style="text-align: center;">Auto-Swing Range</td> </tr> <tr> <td>Air Louver Angle</td> <td>Approx. 25°</td> <td>Approx. 35°</td> <td>Approx. 42°</td> <td>Approx. 49°</td> <td>Approx. 55°</td> <td>Approx. 60°</td> <td>Approx. 65°</td> </tr> <tr> <td>COOL and DRY</td> <td></td> <td style="text-align: center;">Recommended Angle</td> <td colspan="2" style="text-align: center;">Angle Range</td> <td style="text-align: center;">(※)</td> <td style="text-align: center;">(※)</td> <td></td> </tr> <tr> <td>Air Louver Angle</td> <td>Approx. 30°</td> <td>Approx. 35°</td> <td>Approx. 41°</td> <td>Approx. 47°</td> <td>Approx. 53°</td> <td>Approx. 60°</td> <td>Approx. 66°</td> <td></td> </tr> <tr> <td>HEAT</td> <td></td> <td></td> <td colspan="2" style="text-align: center;">Angle Range</td> <td colspan="3" style="text-align: center;">Auto-Swing Range</td> <td></td> </tr> </tbody> </table>				Step	1	2	3	4	5	6	7	-	LCD Indication									Air Louver Angle	Approx. 25°	Approx. 35°	Approx. 42°	Approx. 49°	Approx. 55°	Approx. 60°	Approx. 65°	Auto Swing	FAN		Recommended Angle	Angle Range		Auto-Swing Range			Air Louver Angle	Approx. 25°	Approx. 35°	Approx. 42°	Approx. 49°	Approx. 55°	Approx. 60°	Approx. 65°	COOL and DRY		Recommended Angle	Angle Range		(※)	(※)		Air Louver Angle	Approx. 30°	Approx. 35°	Approx. 41°	Approx. 47°	Approx. 53°	Approx. 60°	Approx. 66°		HEAT			Angle Range		Auto-Swing Range			
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HEAT			Angle Range		Auto-Swing Range																																																																			
<p>NOTE: Even if 60° or 65° is selected during cooling and drying operations, the louver angle will remain automatically fixed at 55°. (※) If "Individual Louver Setting" mode is used, a louver setting of 60° or 65° can be corrected.</p> <p> : Auto-swing operation will be activated. At this time, animated louver graphic on the LCD will appear to swing.</p>																																																																								

- The louver angle indicated on the LCD and the actual louver angle do not correspond precisely with each other during auto-swing mode operation. When the louver angle is established, set the louver angle according to the louver position as indicated on the LCD.
- Louver movement may NOT stop immediately after the switch is pressed.

5.7 Individual Louver Setting

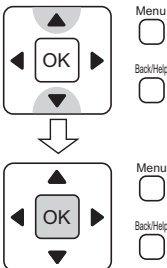
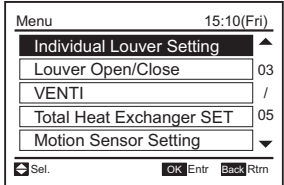
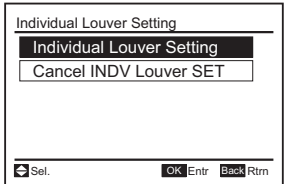
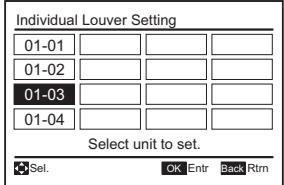
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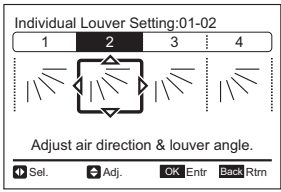
- This setting is available only for indoor models equipped with the individual louver.
 - Each louver angle can be set individually.
- < Example >
Units equipped with Auto-Swing have a set of options to allow for airflow adjustment from vertical to horizontal.

NOTICE


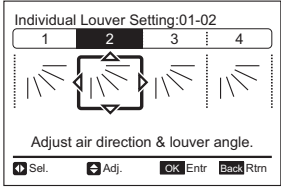
- This function cannot be set while the unit is not in operation.
- After the individual louver setting is set during the heating operation, the louver angles can be adjusted automatically to 25°. Louver angles will assume this setting after a short period of time.
- Fan speed will slow down to “LOW” while this function is being set. (After the setting process is completed, the unit operation will return to normal speed.)
- As for “Start-up of Heating Operation”, “During Defrost Operation” and “Activation of Thermistors”, all louver angles will become fixed at 25° automatically, even when this function is set.
- This function will not be displayed if 2 (two) controllers (including wired controller + wireless controller) are used.
- Less than 16 units can be set to Individual Louver Setting per wired controller.

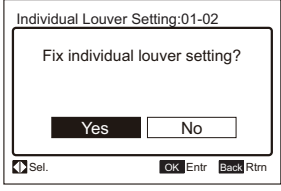
5.7.1 Individual Louver Settings

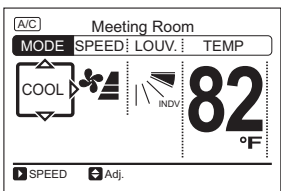
<p>1</p>	<p>Press “Menu”. Select “Individual Louver Setting” from the menu by pressing “Δ” or “∇” and press “OK”. The individual louver settings menu will be displayed.</p>		
<p>2</p>	<p>Select “Individual Louver Setting” from the individual louver setting menu and press “OK”. The connected indoor units selection for the individual louver setting will be displayed.</p> <p><u>NOTE:</u> If the connected indoor unit is one (1) in the system, the louver setting display at the procedure “4” is displayed.</p>		
<p>3</p>	<p>Select the indoor unit to change the louver direction by pressing “Δ”, “∇”, “◀” or “▶”. Press “OK”. The louver direction setting will be displayed.</p> <p><u>NOTE:</u> The indoor unit displayed on the screen flashes if the individual louver is set.</p>		

4	<p>Press “◀” or “▶” and select the louver direction from one to four. The selected louver is opened and the other louvers are located in horizontally.</p>	
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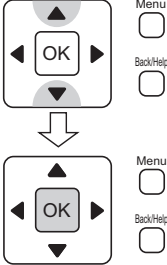
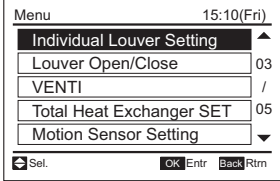
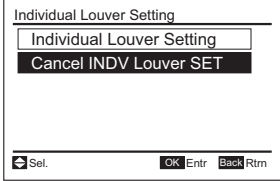
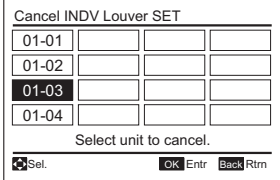
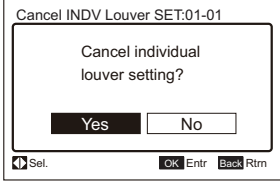
- If the louver position is hard to distinguish, press “△” or “▽” to set the position .
- In the default setting, the louver on the side where the electrical box position is located as the number one louver. Looking up from underneath the unit, the louver numbers run in a clockwise direction: numbered "one," "two," "three" and "four." The louver number can also be changed. Contact your distributor or dealer for details.

5	<p>Select the louver angle by pressing “△” or “▽” and press “OK”. The confirmation screen will be displayed. The louver angle will be changed as shown below.</p>  <p>NOTE: The louver direction without “INDV” will comply with the setting of the normal mode.</p>	
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6	<p>Select “Yes” by pressing “◀” or “▶” and press “OK”. The setting is confirmed and the screen will return to the normal mode.</p>	
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7	<p>Verify that “INDV” is turned on at the airflow section on the normal mode.</p>	
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5.7.2 Cancellation of Louver Setting

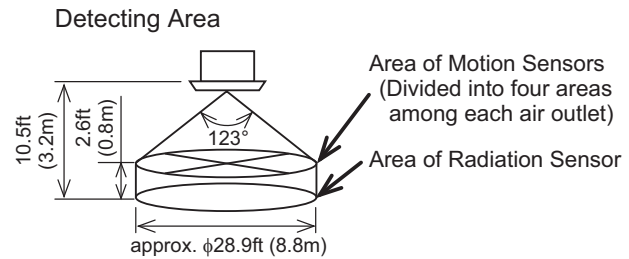
<p>1</p>	<p>Press "Menu". Select "Individual Louver Setting" from the menu by pressing "Δ" or "∇" and press "OK". The individual louver setting menu will be displayed.</p>		
<p>2</p>	<p>Select "Cancel INDV Louver SET" from the individual louver setting menu and press "OK". The connected indoor units selection of the cancelled louver setting will be displayed. <u>NOTE:</u> If the connected indoor unit is one (1) in the system, the cancel individual louver setting display at the procedure "4" is displayed.</p>		
<p>3</p>	<p>Select the indoor unit to cancel by pressing "Δ", "∇", "◁" or "▷". Press "OK". <u>NOTE:</u> The indoor unit displayed on the screen flashes if and when the individual louver is set.</p>		
<p>4</p>	<p>Select "Yes" by pressing "◁" or "▷" and press "OK". The individual louver setting will be canceled and the screen will return to the normal mode. <u>NOTE:</u> All the individual louver settings will be canceled.</p>		

5.8 Motion Sensor

5.8.1 Function

The decorative panel (P-AP160NAE1) is equipped with four motion sensors and one radiation sensor.

- **Motion Sensor**
These sensors can detect human activity by measuring the level of change in infrared light emitted by humans or objects.
- **Radiation Sensor**
These sensors can detect the radiation temperature of humans or objects by measuring the level of infrared light emitted by humans or objects.



< Function 1 > Automatic Capacity Save Operation

This function can automatically perform the capacity save operation by a human activity in the air-conditioned area. If there is insufficient human activity or absence in the air-conditioned area, the motion sensors detect it and save the air conditioning capacity. In addition, after the motion sensors detect as absence for the period, the operation mode will be changed to "If absent".

- **During Capacity Save Operation**
 - * **Setting Temperature:** The temperature is adjusted 2° or 3°F (1° or 2°C) for saving capacity.
 - * **Airflow Volume:** The airflow volume is lowered to one step or to "Slow". (except during "dry" operation).
 - * **Airflow Direction:** The louver angle of controlling airflow direction is adjusted horizontally or downward depending on the operation conditions.
- **If absent**
The unit performs the operation set by the controller. Refer to "Descriptions for Setting Items".

NOTICE

- Do not use the motion sensor function in situations where there is single people who is disabled or infant. The motion sensor may detect as absence and the operation may be stopped in the case staying for long time with a bit motion.
- The motion sensor detects the human activity. However, if someone is in a room with a bit motion, the motion sensor may detect as absence.
- The motion sensor may detect as human activity if the indoor unit with the motion sensor is installed near a moving object (ex. swing operation of a heating appliance) which is difference in temperature against atmosphere.
- The indoor unit operation can be stopped by the motion sensor control.

NOTE:

Indoor units with and without motion sensors can be integrated together into a system installation.

In this case, when the operation is stopped by the motion sensor control, the indoor unit without the motion sensor will also stop the operation.

When the total heat exchanger is interlocked with the indoor unit motion sensor, the total heat exchanger can be stopped with the indoor unit under the following conditions:

- * The operation mode of the total heat exchanger: A/C + VENTI and the "If absent" setting: Stop. However, the total heat exchanger operation mode is "VENTI", it cannot be stopped even if the "If Absent" setting is set to "Stop". This is so because the "VENTI" operation of the total heat exchanger, the indoor unit is not activated (because the motion sensor is not active).
- While air conditioning capacity is saved or operation is stopped by the motion sensor control, "Motion sensor is activated" is displayed on the LCD.
- If the function: "Prohibiting operation by controller", is activated from the centralized controller, select the command: "Running" or "Standby" inside "If absent" condition at the motion sensor controls setting. If the command "Stop" is selected, motion sensor control is lost and cannot be performed correctly as follows:
 - * In the case that "If absent: Stop" of motion sensor setting is set by the controller and "Prohibiting operation by controller" (for all items) is set by the centralized controller, the operation will not be stopped even if in the indoor unit operation stoppage condition of "If absent: Stop".
 - * In the case that "If absent: Stop" of motion sensor setting is set and "Prohibiting operation by controller" (for part of items) is set by the centralized controller, the indoor unit operation will be stopped by the motion sensor control. However, the indoor unit operation cannot be restarted from the centralized controller.

< Function 2 > Adjusting Capacity by Increase or Decrease in the Number of People

- (1) In instances where people are gathered within or are beyond the range of the motion sensor. The air conditioning capacity is adjusted by the automatic setting temperature correction depending on a human activity and movement of heat source in the detecting area of the motion sensor .

Cooling or Dry Operation	Increase in the number of people	The setting temperature will be adjusted from -2°F to -3°F (-1°C to -2°C).
	Decrease in the number of people	The setting temperature will be adjusted from +2°F to +3°F (+1°C to +2°C).
Heating Operation	Increase in the number of people	The setting temperature will be adjusted from -2°F to -3°F (-1°C to -2°C).
	Decrease in the number of people	The function is invalidated.

- (2) The adjusted setting temperature will return after 10 to 30 minutes, depending on the conditions.

NOTICE

- If the human activity and movement of heat source are small, the motion sensor cannot detect them.
- If room temperature is high and there is little difference between the radiation temperature of walls, floor space, and humans, the motion sensor may not detect increase and decrease of number of human. (For example: The cooling operation is performed with a setting at 86°F (30°C) in the summer season.)
- During the “Capacity Save” and “If absent” phase of operation of Function 1, this Function 2 is unavailable.

5.8.2 Descriptions for Setting Items

● Motion Sensor Setting

The operation mode for activations for functions 1 and 2 can be selected as follows:

- * “ALL MODES” : Functions 1 and 2 are available when the operation mode is “COOL”, “DRY”, “HEAT”, or “FAN”.
- * “COOL + DRY” : Functions 1 and 2 are available when the operation mode is “COOL”, “DRY”, or “FAN”.
- * “HEAT” : Functions 1 and 2 are available when the operation mode is “HEAT”.
- * “OFF” : Functions 1 and 2 are not available.

(The default setting is “ALL MODES”.)

● If absent

The operation mode for activations during the automatic capacity save operation for Function 1 can be selected from “Running”, “Stand-by”, or “Stop” on the wired controller. It is set for the indoor unit operation after the motion sensor detects an absence for set time in “Check Interval”.

* Running:

The operation is continued with saving the capacity after detected as an absence.

If human activity is detected over a period of time, the normal operation will be performed again.

* Stand-by:

The operation mode is the fan operating at “Slow” speed. If the human activity is detected for a period of time, the normal operation will be performed again.

* Stop:

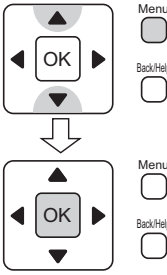
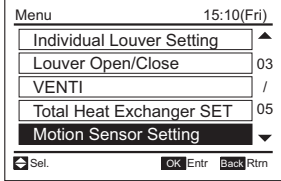
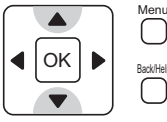
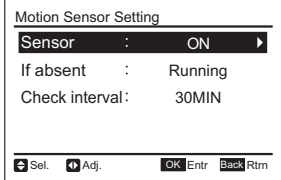
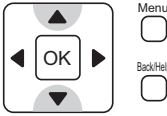
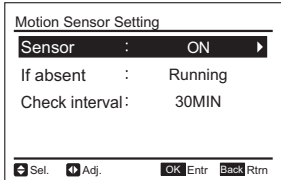
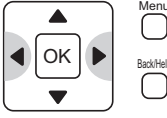
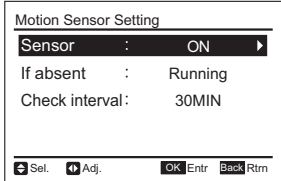
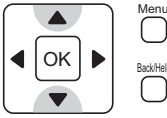
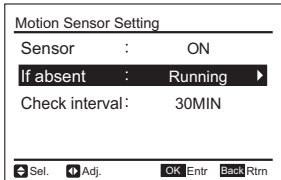

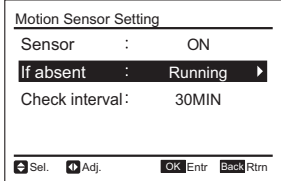
The operation is stopped by the wired controller when all the indoor units with motion sensor detect an absence which is connected with same wired controller. If the human activity is detected for a period of time by the stoppage, the normal operation will be performed again.

● Check Interval

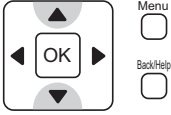
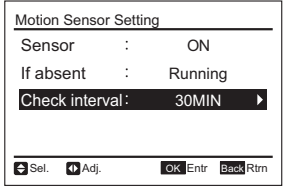

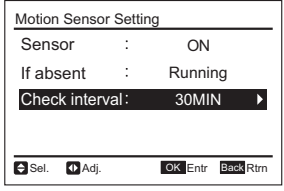
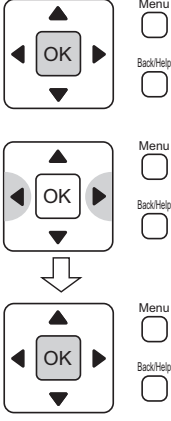
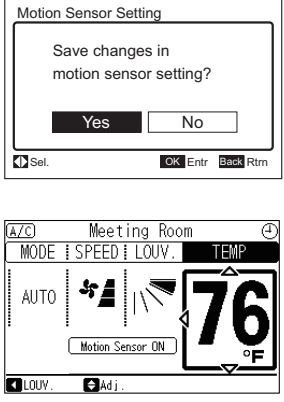
When the motion sensor detects an absence at selected check time interval, the function “If absent” (Function 1) will be executed. The interval can be selected from choices ranging from: 30, 60, 90, 120, or 180 minutes.

(The default setting is 30 minutes.)

5.8.3 Setting the Motion Sensor

1	<p>Press "Menu". Select "Motion Sensor Setting" from the menu by pressing "Δ" or "∇" and press "OK".</p>		
2	<p>"Motion Sensor Setting" is displayed. The highlighted item changes to "Sensor", "If absent", and "Check interval" by pressing "Δ" or "∇".</p> <ul style="list-style-type: none"> • To set "Sensor", go to procedure (3). • To set "If absent", go to procedure (5). • To set "Check interval", go to procedure (7). 		
3	<p>Press "Δ" or "∇" and select "Sensor".</p>		
4	<p>The display is switched "ON" and "OFF" in order by pressing "◀" or "▶" and change the setting. If other settings are not required, go to procedure (9).</p>		
5	<p>Press "Δ" or "∇" and select "If absent".</p>		
6	<p>The display changes to "Running", "Stand-by" and "Stop" in order by pressing "◀" or "▶" and change the setting. If other settings are not required, go to procedure (9).</p>		

OPERATION

<p>7</p>	<p>Press “△” or “▽” and select “Check interval”.</p>		
<p>8</p>	<p>The display will display: “30MIN”, “60MIN”, “90MIN”, “120MIN”, and “180MIN” in order by pressing “<” or “>” to change the setting. If other settings are not required, go to procedure (9).</p>		
<p>9</p>	<p>Press “OK” after the setting is made. The confirmation screen will be displayed. Select “Yes” by pressing “<” or “>” and press “OK”. The motion sensor setting will be confirmed and the screen will return to the normal mode (operation mode indicator).</p>		

NOTICE

If more than two controllers are utilized, setting of the motion sensor is available by simply using the main controller only.

5.9 Comfort Setting

5.9.1 Setting of "Control Cool Air" (Cold Draft Control during Cooling Operation)

(1) Function

This function controls the overcooling airflow to prevent of cold draft.

(2) Setting Items

- * OFF : This function is not available.
- * LOW : The over-cooling airflow temperature is controlled low degree.
- * MID : The over-cooling airflow temperature is controlled medium degree.
- * HIGH : The over-cooling airflow temperature is controlled high degree.

(The default setting is "OFF")

(3) Supplement of Function

- The discharge air temperature is elevated higher in "HIGH" > "MID" > "LOW" order.
- The recommended discharge air temperature setting is "LOW". (When feeling cold at "LOW", change the setting to "MID" or "HIGH".)
- This function also reduces the formation of dew condensation on the decorative panel when the discharge air temperature is lower than the inlet air temperature in a very humid room. (The recommended discharge air temperature setting is "LOW".)

NOTICE

- The "Control Cool Air" function may not have much effect depending on the operating conditions of the outdoor unit.
- In case that one outdoor unit is connected to multiple indoor units and the rate of these indoor units which are equipped with the "Control Cool Air" function is low, this function may not have much of an effect.
- When this function is set, it may takes a few minutes to get cooling the whole room.
- While this function is activated, "Cold draft rest." is displayed on the LCD control panel of the wired controller.

5.9.2 Setting of Avoid Air and Receive

(1) Function

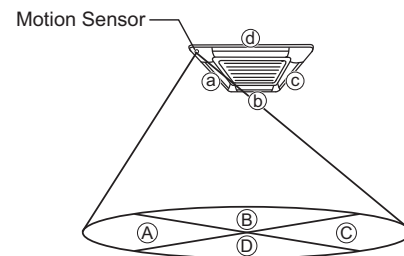
This function automatically activates the louver under the setting of "Avoid Air" or "Receive" when the motion sensor detects human activity.

(The "Avoid Air" setting is the reduction of airflow set by the wired controller.

(The "Receive" setting allows airflow set by the wired controller.

Each Detection Area: (A) to (D), corresponds to each area (a) to (d) as is shown at right.

■ Detecting Area of Motion Sensor



(2) Descriptions for Setting Items

Louver in COOL (Louver Activation at Cooling Operation)

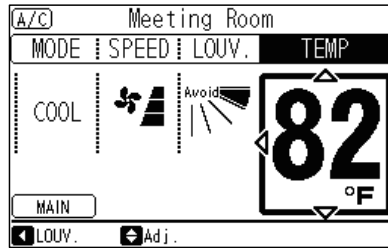
Louver in HEAT (Louver Activation at Heating Operation)

- NORMAL: The function is not activated. (The louvers are situated in the setting directions on the main menu.)
- AVOID AIR: The louver angle is automatically adjusted to the highest angle if there is a human activity detected by the motion sensor.
- RECEIVE: The louver operation is automatically changed to "AUTO" (Auto-Swing) mode if human activity is detected by the motion sensor.

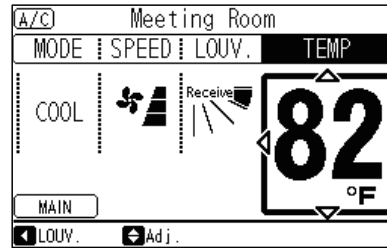
(The default setting is "NORMAL".)

(3) Supplement of Function

- The louver angle is adjusted by the motion sensor to compensate for the presence or absence of human activity and can be set for manual override at the wired controller.
- Each of the four louvers can move independently of the others.
- When the motion sensor detects continuous human activity, louver operation will remain at: “Avoid Air” or the “Receive” setting.
- If the motion sensor detects an absence of human activity for 15 minutes or longer, louver angles can be adjusted to the “Avoid Air” or “Receive” settings to save on energy consumption or manually overridden from the wired controller.
- The commands: “Avoid Air” and “Receive” are shown on the LCD display as variations of angular louver positioning. See below:



Avoid Air



Receive

NOTICE

- The function diminishes to (sleep mode) in times of sparse human activity. To reactivate, stand up and begin walking.
- Objects with higher temperature signatures can be mistaken for humans and can activate this system function.
- Louver settings: “Avoid Air” or “Receive” in FAN or DRY operations are the equivalent settings for the “Louver in COOL”.

5.9.3 Setting of "Floor HEAT Control" (Radiation Sensor during Heating Operation)

(1) Function

If a steep temperature difference is detected between the radiation temperature and the setting temperature, this function will heat the entire room efficiently by adjusting airflow direction and airflow volume.

(2) Descriptions for Setting Items:

The setting of "Floor HEAT Control"

- OFF: This function is unavailable.
- ON: This function is available.

(The default setting is OFF.)

(3) Supplement of Function

- When this function is activated, airflow direction is directed downwards and the airflow volume will change to "AUTO".
- This function will be continued active for between 20 to 60 minutes, depending on the difference between the ambient air temperature and the set temperature.
- This function will repeat, depending on the temperature difference between a radiation temperature and the setting temperature.

NOTICE

- If the radiation temperature (Floor Temperature) in detecting area is low, this function may be activated frequently.
- This louver direction is downward during this function, if avoiding cold draft by direct airflow, set the function "Individual Louver Setting" or "Avoid Air".
- During the activation of this function, "Floor HEAT control" is indicated on the LCD.

5.9.4 Useful Tips on Setting of Swing Louver Direction

The swing louver direction can be varied according to each set function. If the set airflow direction is not comfort, refer to the following descriptions and adjust the airflow direction.

Order of Priority for Set Swing Louver Direction

HIGH



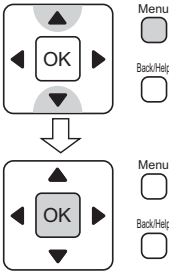
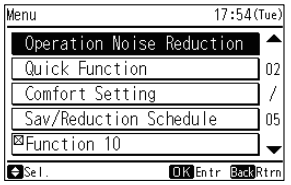
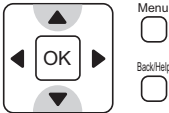
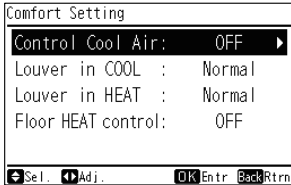
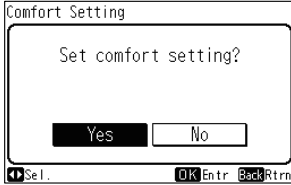
LOW

- Capacity save operation (Function 1) set as "Motion Sensor Setting".
- Setting of "Individual Louver Setting"
- Swing louver direction at detecting human activity side by "Avoid Air" and "Receive" function.
- Setting of "Floor HEAT Control"
- Louver direction set on the main menu of a wired controller.

NOTICE

- If 2 wired controllers are utilized, the comfort setting is available by using the wired controller 1 only.

5.9.5 Creating Comfort Settings

<p>1</p>	<p>Press "Menu". Select "Comfort Setting" from the menu by pressing "Δ" or "∇" and press "OK".</p>		
<p>2</p>	<p>"Motion Sensor Setting" is displayed. The highlighted item is changed to "Control Cool Air", "Louver in COOL", "Louver in HEAT" and "Floor HEAT control" by pressing "Δ" or "∇". After selecting set item, set function by pressing "◀" or "▶". Setting details are as shown below.</p> <ul style="list-style-type: none"> • Control Cool Air: "OFF" ↔ "LOW" ↔ "MED" ↔ "HI" • Louver in COOL: "Normal" ↔ "Avoid Air" ↔ "Receive" • Louver in HEAT: "Normal" ↔ "Avoid Air" ↔ "Receive" • Floor HEAT Control: OFF ↔ ON 		
<p>3</p>	<p>Press "OK". The confirmation screen will be displayed and select "Yes" by pressing "◀" or "▶" and press "OK". The "Comfort Setting" is completed and the LCD indication will return to the normal mode.</p>		

6. Automatic Control

This air conditioner automatically starts the following operations according to the conditions.

The system is equipped with the following functions:

3-Minute Guard		<p>Enforced Stoppage: The compressor remains OFF for at least three minutes once it has stopped. If the system is restarted within approximately three minutes after it has stopped, the RUN indicator is activated. However, the cooling operation or the heating operation remains OFF and does not start until after three minutes has elapsed.</p> <p>Enforced Operation: If all indoor units of a system are Thermo-OFF within approximately three minutes after the compressor has started, compressor is operated during three minutes continuously. However, if all indoor units of a system are stopped by a controller, compressor is stopped.</p>
Cooling and Dry	Frost Prevention	When the indoor unit is operated at a low discharge air temperature, the cooling operation may be changed to a fan operation for a while to avoid frost formation on the indoor heat exchanger.
	Self-Cleaning of Expansion Valve	It is for self-cleaning the expansion valve when the operation is stopped at cooling. The sound which the refrigerant flows may be heard from the indoor unit during the self-cleaning. However, it is not abnormal.
Heating	Hot Start	To prevent cold air discharge into a heated space, the fan speed is controlled from the SLOW / LOW setting and then to a set position based on discharge air temperature. At this time, the louver is in a fixed horizontal position and "HOT START" is displayed on the LCD of the wired controller.
	Defrosting Operation	The indoor unit fan operation is stopped to prevent cold air discharge during the defrosting operation. At this time, the message "HOT-START" is displayed on the LCD of the wired controller and the indoor unit fan louver angle is fixed horizontally.
	Residual Heat Removal	When the heating operation is stopped, indoor fan operation may remain at the slow position for the maximum of two minutes to cool down the internal temperature inside the indoor unit.
	Prevention of Overload Operation	When the outdoor temperature is high (approximately 70°F (21°C) or more), during heating operation, the operation is stopped by activation of the outdoor thermistor.

NOTE

- This air conditioner adopts hot air circulation system for the heating operation.
- Any oversized room with a low ambient air temperature will require an extended amount of time to warm up. Once the air temperature gets to the required setting temperature, the display "HOT START" will be turned OFF.
- The indication "HOT-START" may be displayed during or right after the defrosting operation. It is activated the hot start operation to prevent the perception of cold draft. It is NOT abnormal.

7. Maintenance

CAUTION

- Hold the air filter and the air inlet grille securely by hand when attaching or removing it. If not, it may cause the unit to fall, resulting in serious injury.

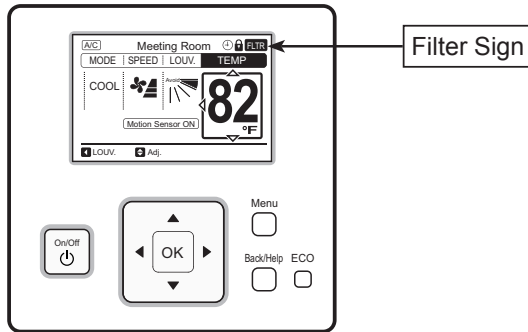
NOTICE

- Use light pressure with a clean soft cloth when cleaning the lens of the motion sensor. The surface material of the lens is easily scratched, blemished, and can result in degraded performance of the sensor.

7.1 Daily Maintenance

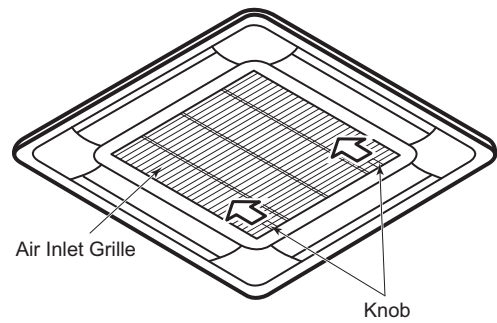
7.1.1 Cleaning Air Filter

Clean the air filter when the [FLTR] sign is turned ON.



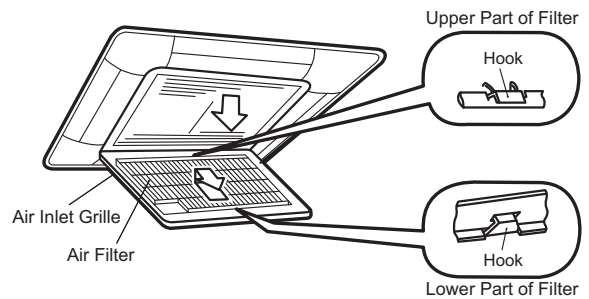
(1) Open the air inlet grille.

Slide the knobs on both sides of the air inlet grille in the direction of the arrows as shown and open the inlet.



(2) Remove the air filter.

Support the underside of the air inlet grille as shown. Unhook the filter from the air inlet grille and remove the air filter.



(3) Clean the air filter.

- Vacuum dust off with hand-held vacuum cleaner, or wash the air filter with water or a neutral detergent.
- Dry the air filter in a shaded area.

NOTE

- Do not use water warmer than 122°F (50°C). Filter elements can be damage by heat.
 - Do not dry the air filter by holding it over open flame, with a hair dryer, or any type of heating device. Filter elements can be damaged by heat.
-

(4) Attach the air filter.

After the air filter is dried, attach it in the reverse order from what is shown item(2).

(5) Close the air inlet grille.

NOTE

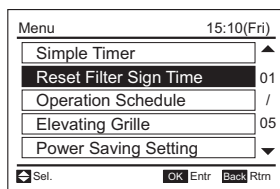
- Be sure to attach the air filter.
Operating the indoor unit without a filter installed will cause serious damage and breakdown.
 - Make sure that the air inlet grille is securely locked with the knobs. If not properly secured, it could swing open and strike someone below and cause minor injuries.
-

(6) Reset the filter sign.

NOTE

If the accumulated operation time is shorter than that indicated by the filter sign setting, the icon displaying "☒" activates and "Setting Disabled" will be displayed.

- Press "Menu".
Select "Reset Filter Sign Time" from the menu and press "OK".
The confirmation screen will be displayed.



- Select "Yes" by pressing "<" or ">" and press "OK".
The indication of "FLTR" will be turned OFF and the screen will return to the normal mode.



OPERATION

7.1.2 Removing, Attaching and Cleaning Air Inlet Grille

Wipe down the decorative panel with a soft cloth soaked in lukewarm water and wrung out.

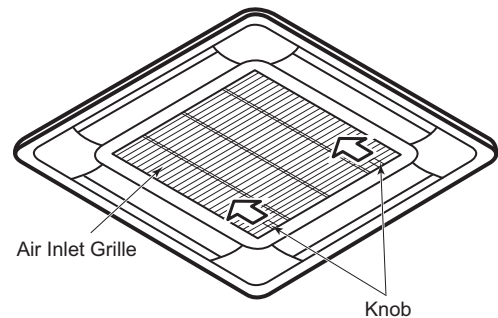
NOTICE

- Wipe down the grille air inlet with a soft cloth soaked in lukewarm water and wrung-out.
- Gently wipe down using only a clean soft cloth. Avoid the use of Benzene type thinners or chemical detergents and abrasives as cleaning agents which will damage the finish of outer plastic surfaces and louvers. Avoid using excessive force when cleaning these surfaces as they can be easily damaged.
- When cleaning the lens of the motion sensor, the surface material of the lens is easily scratched, and can result in degraded performance of the sensor.

The air inlet grille can be removed and cleaned.

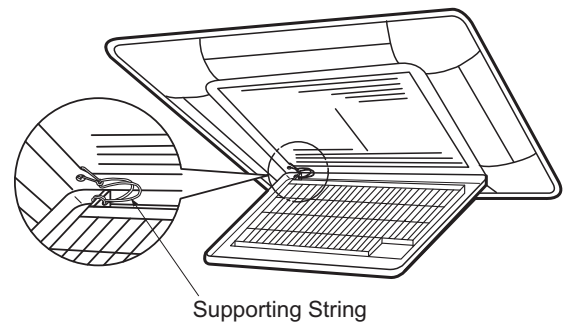
(1) Open the air inlet grille.

While sliding the knobs on both sides of the air inlet grille in the direction of the arrows, open the air inlet grille.



(2) Remove the air inlet grille.

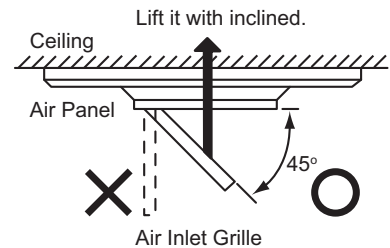
- Unhook the string tether from the decorative panel.



- Open the air inlet grille at an approximately 45° angle from the decorative panel surface.
- Tilting the air inlet grille, lift it up to remove it.

NOTE:

Although the air inlet grille can be opened up to 90°, it cannot be removed from the decorative panel at that angle. Tilt it to a 45° angle when removing it.



(3) Clean the air inlet grille.

(4) Reattach the air inlet grille.
Reattach in reverse order.

7.2 Maintenance Prior to and After Use

Prior to Use

- Remove any obstacles around the air inlet grilles and the air outlet of both the indoor and outdoor units.
- Check that the air filter is not clogged with dust and dirt.

After Use

- Clean the air filter, the air inlet grille, and the decorative panel.

8. Troubleshooting

8.1 This is Not Abnormal

Phenomenon		Cause and Action
Operation Stopped	All indicator LEDs on the wired controller are turned OFF.	The micro-computer is activated to protect the device from electromagnetic interference. Restart the operation.
	“Motion Sensor ON” is turned ON the wired controller.	The operation has stopped automatically because the motion sensor is set as “If absent: Stop” and it detects an absence of motion for a period of time. (All indoor units connected to the same controller are stopped.)
	After Power Failure	Restart the operation. If the instantaneous power failure is within 2 seconds, the operation restarts automatically.
White Steam from Indoor Unit	During Heating Operation	A dust attached to the heat exchanger has been dried.
White Smoke from Indoor Unit	At Beginning of Heating Season	This might occur when dust attached to the heat exchanger has been dried.
Mist from Indoor Unit	In Restaurant or Kitchen	This can occur when oily residue coats the fins and heat exchanger efficiency is degraded.
	During Dry Operation	This might occur due to the air outlet temperature decreasing. Change the operation mode.
	During Cooling Operation in Humid Environment	This might occur due to the air outlet temperature decreasing. Raise the set temperature and airflow volume.
Odor from Indoor Unit	Odors Emanating from Indoor Unit Air Discharge	The intake of cigarette smoke is the likely reason, with nicotine deposits coating or clogging the cells and surfaces of the air filter. Ventilate the unit well in fan mode and clean the air filter, the air outlet and air inlet grill.
Sound from Indoor Unit	A grating sound is heard when starting or stopping the operation.	This is the sound made when the components are rubbing up against one another due to the expansion and contraction of plastic formed parts brought on by temperature change.
	Sound of water flowing or bubbling is heard during the operation.	This is the sound made when the refrigerant flows or the drain-up mechanism drains water. The sound may be heard especially when starting the operation or stopping the compressor (for approximately 3 minutes).
	A growling sound may be heard temporarily right after the airflow volume is changed.	It is generated because the fan motor makes temporary sound by change of fan speed.
Dew Condensation on Air Panel	Dew condensation on Decorative Panel or Cabinet or Dew Drops	This might occur when the operation is performed in a humid environment over a prolonged period of time (relative humidity around 80%).
Temperature Irregularity	Airflow volume and temperature irregularities exist for each outlet.	This might occur for structural reasons, such as the size of an air outlet and the location of heat exchanger.
“HOT-START” on LCD Illuminated (ON)		This might occur according to the operation mode or operational conditions.
Operation Mode on LCD Flashing		

8.2 Before Contact

Check these items over before contacting a contractor.

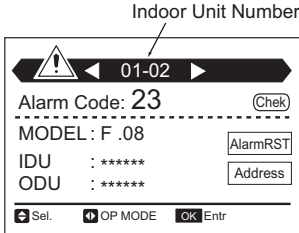
Trouble		Checking Point	Action
Operation Unavailable		Check that the main power source is turned ON.	Turn ON the power at the main power source for the air conditioner.
		Check that the fuse is not blown or the circuit breaker from the main power source is not tripped.	Replace the fuse or reset the circuit breaker. If trouble recurs, contact your contractor or distributor.
Immediate shutdown after start-up	Cooling	Check if the air inlet and outlet for the outdoor unit are not obstructed.	Remove objects obstructing the air inlet and outlet.
	Heating	Check if there are any obstacles impeding the airflow near the air inlet and outlet of the outdoor unit.	Remove any obstacles obstructing airflow.
		Check that the outlet air is not redirected into the air inlet.	
Insufficient Cooling or Heating		Check that the operation mode is appropriate.	If the fan mode is selected, switch the operation mode to cooling/heating.
		Check that the set temperature is appropriate.	If not, change the setting temperature by pressing “Δ” or “▽” by the wired controller.
		Check that the airflow direction is appropriate.	If not, change the airflow direction. In the case that the footing is not heated well during the heating operation, change the louver downward.
		Check that the air filter is not clogged.	Clean the air filter.
		Verify that there are no open windows and doorways.	Close windows and doors.
		Check that there are no obstacles impeding airflow near the air inlet and outlet for both indoor and outdoor units.	Remove the obstacles.

8.3 Contact Distributor

If trouble still persists, even after checking off previously listed items or detecting problems not mentioned in the previous pages, stop using this product and call your distributor or contractor immediately.

! WARNING

If there is any perceived abnormality present (noises or odors associated with electrical short, fire, or burning elements), shut down immediately and shut OFF at the main power source. Contact your distributor or contractor without delay.

Trouble	Action before Contact
Protection devices (fuses, breakers, and GFCI's) activate frequently or the operation switch does not work.	Turn OFF the power source.
Water leakage from the indoor unit.	Stop the operation.
"Motion Sensor ON" or "Radiation Sensor" is flashing.	There is a possibility of the failure of motion sensor or radiation sensor. Make the setting of motion sensor and "Floor HEAT Control" invalid and contact your distributor. In that case, after the LCD of wired controller display is disappeared and until service is finished, the operation of this unit is available.
<ul style="list-style-type: none"> ● The RUN indicator (red) is flashing. ● The indoor unit number, alarm code, unit model code, and the number of connected indoor units are displayed on LCD. ● In the case that the multiple indoor units are connected to one controller, the above abnormality informations for each indoor unit are displayed individually. <p>Check the details on LCD and contact your distributor.</p> <div style="text-align: center;">  <p style="margin-left: 100px;">Indoor Unit Number</p> </div>	<p>Refer to the alarm code table. Contact your distributor and inform them of the alarm code indicated on the LCD of the wired controller.</p>

Provide the following information when contacting your distributor.

- 1) Unit model
- 2) Symptoms and nature of the problem.
- 3) Number of the alarm code or any flashing indicator on the LCD.

8.4 Alarm Codes

Code	Category	Content of Abnormality	Code	Category	Content of Abnormality
01	Indoor Unit	Activation of Protection Device	35	System	Incorrect Setting of Indoor Unit No.
02	Outdoor Unit	Activation of Protection Device (High Pressure Cut)	36		Incorrect Indoor Unit Combination
03	Communication	Operational Irregularities between Indoor and Outdoor	38		Problem with Protective Pickup Circuit in Outdoor Unit
04		Problem between Inverter PCB and Outdoor PCB	39	Compressor	Problem with Running Current at Constant Speed Compressor
05	Supply Phase	Problem of Power Source Phases	41	Pressure	Overload Cooling
06	Voltage	Abnormal Voltage Drop in Outdoor Unit	42		Overload Heating
07	Cycle	Decrease in Superheated Discharge Gas	43	Protection Device	Activation of Pressure Ratio Decrease Protection Device
08		Increase in Discharge Gas Temperature	44		Activation of Low Pressure Decrease Protection Device
09	Outdoor Unit	Activation of Protection Device for Outdoor Fan	45		Activation of Low Pressure Increase Protection Device
11	Sensor on Indoor Unit	Inlet Air Thermistor Failure	46		Activation of High Pressure Increase Protection Device
12		Outlet Air Thermistor Failure	47		Activation of High Pressure Decrease Protection Device
13		Freeze Protection Thermistor Failure	48	Activation of Overcurrent Protection Device	
14		Gas Piping Thermistor Failure	51	Inverter	Problem with Inverter Current Sensor
19	Fan Motor	Activation of Protection Device for Indoor Fan	52		Activation of Inverter Overcurrent Protection
20	Sensor on Outdoor Unit	Compressor Thermistor Failure	53		Activation of Transistor Module Protection
21		High Pressure Sensor Failure	54	Abnormality of Inverter Fin Temperature	
22		Outdoor Air Thermistor Failure	56	Outdoor Fan	Abnormality of Detection for Fan Motor Position
23		Discharge Gas Thermistor Failure	57		Activation of Fan Controller Protection
24		Evaporating Thermistor Failure	58	Abnormality of Fan Controller	
29		Low Pressure Sensor Failure	b0	System	Incorrect Setting of Unit Capacity
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit	b1		Incorrect Setting of Unit and Refrigerant Cycle No.
32		Incorrect Setting of Other Indoor Unit Number	EE	Compressor	Compressor Protection Alarm

2.1.3 1-Way Cassette Type

Model: TIC1006B21S, TIC1008B21S, TIC1012B21S, TIC1015B21S



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1. Introduction

This is operation manual for the indoor unit.
 Read this operation manual carefully before operating this product.
 Keep this operation manual with this product.

2. Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
---	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.

- Before servicing, turn-OFF current at the power source and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

⚠ WARNING

- Do not insert fingers or objects into air inlet/outlet. Injury can result from rotating fan blades or energized electrical components.
- Do not touch the wired controller with wet hands. It can result in failure of the wired controller or an electrical shock.
- Hair spray, insecticides, lacquers, and other pressurized substances should not be used within 3.3ft (1m) of any air conditioning unit. It can react with energized electrical components and cause fire.
- Do not install the indoor unit anywhere discharge airflow can pass directly toward nearby heating appliances (space heaters). It may interfere with the combustion process in these units.
- Air circulation should be optimized so as to achieve the best distribution pattern and not settle into isolated pockets that can make people uncomfortable.
- When the indoor unit is operated with heating appliances, ventilate a room sufficiently. Any leaked refrigerant gases that happen to come into contact with any heat source can become toxic on contact which can cause suffocation in the immediate area.
- Shut down at the main power source if the GFCI (Ground Fault Circuit Interrupter) activates frequently. Contact your distributor or contractor immediately. Failure to act accordingly can result in serious injury and damage to the unit.
- CAUTION! If you smell anything burning, shut down the unit and turn OFF the power at the main power source. Contact the fire department and your installer or electrical contractor.
- Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which can cause suffocation.
- If fluorocarbon gas should leak, turn OFF all heating appliances and ventilate the room immediately. Mop down or vacuum floor areas of residual toxic particulate.
- CAUTION! Do not operate indoor units with the electrical box and switch panel open and exposed. Incidental contact with energized components can prove fatal.

Repair / Relocation

⚠ WARNING

- When the air conditioner is to be repaired or transported to a new location, contact your distributor or contractor. If the repair and the installation are not completed, it may cause an electric shock or fire.

Others

⚠ WARNING

- Turn OFF all power at the main power source before performing maintenance work. Failure to do so can result in damage to internal components with severe or fatal electrical shock.
- Insulate all electrical components and connections from exposure to moisture. Failure to do so can result in an electrical short, fire.
- Do not tamper with or attempt to "repair" electrical wiring or connections. Call your installer or electrical contractor. Serious or fatal injury can occur.
- Perform all maintenance work on a firm and stable platform to minimize the risk of injury.
- Do not attempt to "clean" indoor unit components with liquid or powdered cleaning agents during maintenance. Electric shock, sparks, flame, and serious or fatal injury can occur.
- Inside piping is charged with refrigerant and highly pressurized.

⚠ CAUTION

- Hold the air filter and the air inlet grille securely when attaching or removing it. Carelessness can result in accident or injury.

3. Before Operation

NOTICE

Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil. Make sure that the outdoor unit is not covered with snow or ice. If it is covered with snow or ice, remove it by using hot water approximately 122°F (50°C). If the water temperature is higher than 122°F (50°C), it will cause damage to plastic parts.

- Turn OFF the main switch when the system is stopped for a long period of time.
If the main switch is not turned OFF, electricity is consumed because the oil heater is always energized during compressor stoppage.
- When the system is started after a shutdown longer than approximately three months, it is recommended that the system be checked by your service contractor.

3.1 Working Range

This heat pump air conditioner has been designed for the following temperatures. Operate the heat pump air conditioner within this range.

Temperature

		Maximum	Minimum
Cooling Operation	Indoor	89°F DB/73°F WB (32°C DB/23°C WB)	69°F DB/59°F WB (21°C DB/15°C WB)
	Outdoor	118°F DB (48°C DB) *	14°F DB (-10°C DB) *
Heating Operation	Indoor	80°F DB (27°C DB)	59°F DB (15°C DB)
	Outdoor	59°F WB (15°C WB) *	-4°F WB (-20°C WB) *

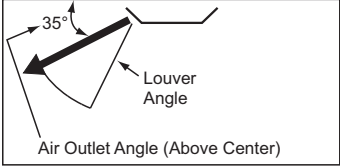
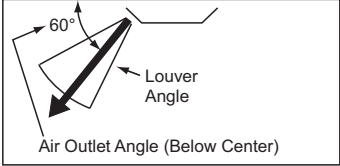
DB: Dry Bulb, WB: Wet Bulb

* The temperature may change depending on the outdoor unit.

3.2 Efficient Use of Indoor Unit

- **Do not leave a window or a door open.**
The operating efficiency will be decreased.
It may cause condensation of the indoor unit.
- **Attach a curtain or a blind to a window.**
Blocking direct sunlight into a room will increase efficiency.
- **Do not use heating appliances as much as possible during the cooling operation.**
Cooling efficiency will be decreased. It may cause condensation.
- **Use a circulator if warm air stays around the ceiling.**
Comfort will be increased. Contact your distributor for details for using a circulator.
- **Change the air flow direction downward if the ceiling surface gets dirty.**
It is recommended to change the air flow direction by approx. 35° downward.
- **Turn OFF the main power source if the indoor unit is not used for a long period.**
The unit will continue to draw power even if the indoor unit is unused.

3.3 Efficient Use of Cooling and Heating

COOLING	HEATING
<p>(1) Airflow Direction The appropriate air outlet angle is approximately 35°. If cooling is not sufficient, change the airflow direction. The louver angle can be changed approximately 5° per step by the wired controller.</p>  <p>(2) Airflow Volume Medium, "MED", airflow volume should be used as first choice, then adjusted as needed.</p>	<p>(1) Airflow Direction The appropriate air outlet angle is approximately 60°. If heating is not sufficient, change the airflow direction. The louver angle can be changed approximately 5° per step by the wired controller.</p>  <p>(2) Airflow Volume Medium, "MED", airflow volume should be used as first choice, then adjusted as needed.</p>

NOTE

< For Multi-Split System >

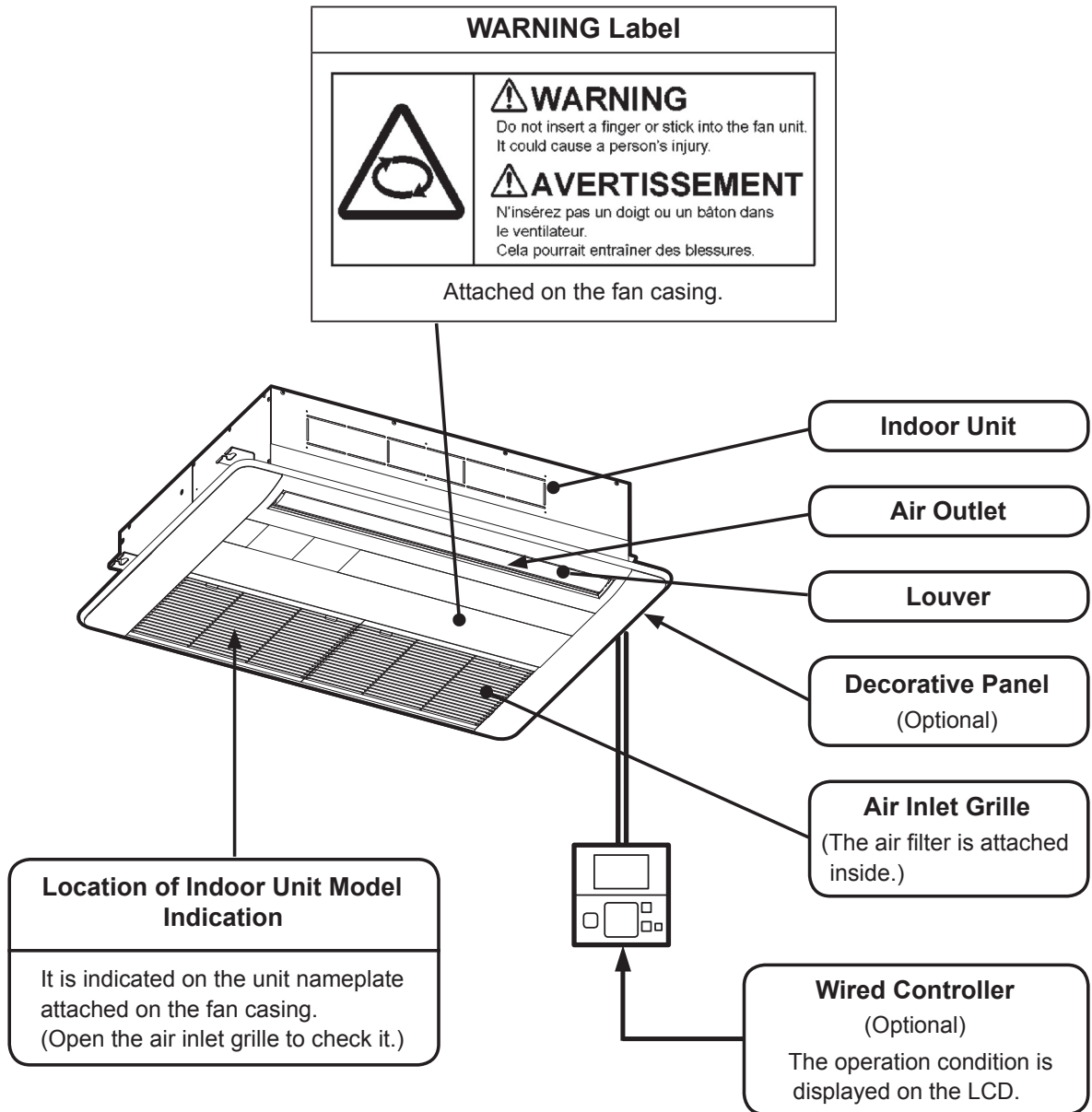
When the number of the indoor units in operation or the operating mode is changed, the change in air outlet temperature can cause the indoor temperature to change. In this situation, change the settings as follows.

- During Cooling Operation: Lower the temperature setting slightly.
- During Heating Operation: Raise the temperature setting slightly.

4. Name of Parts

Safety considerations are indicated on the indoor unit in order to ensure safe use. Read and understand this manual before using the indoor unit.

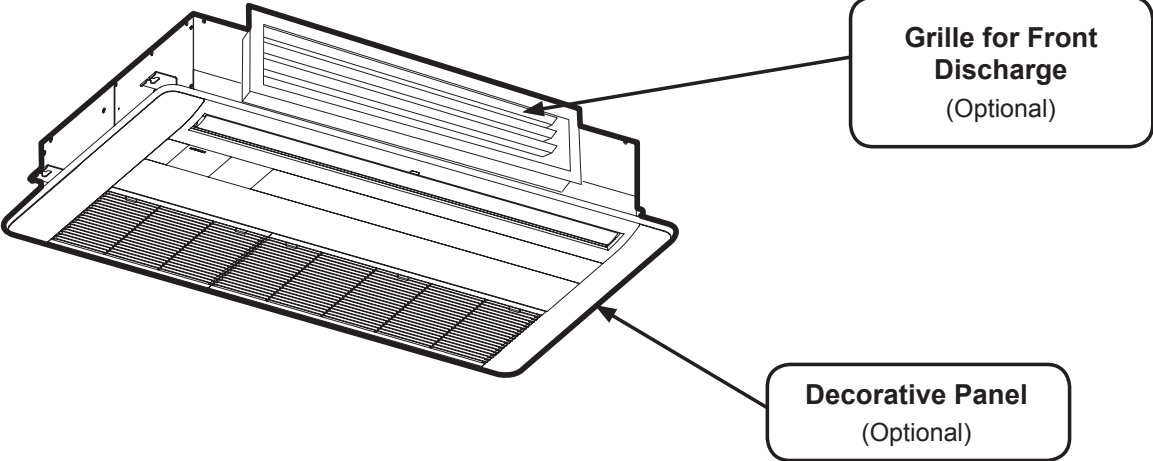
4.1 1-Way Cassette Type



NOTE

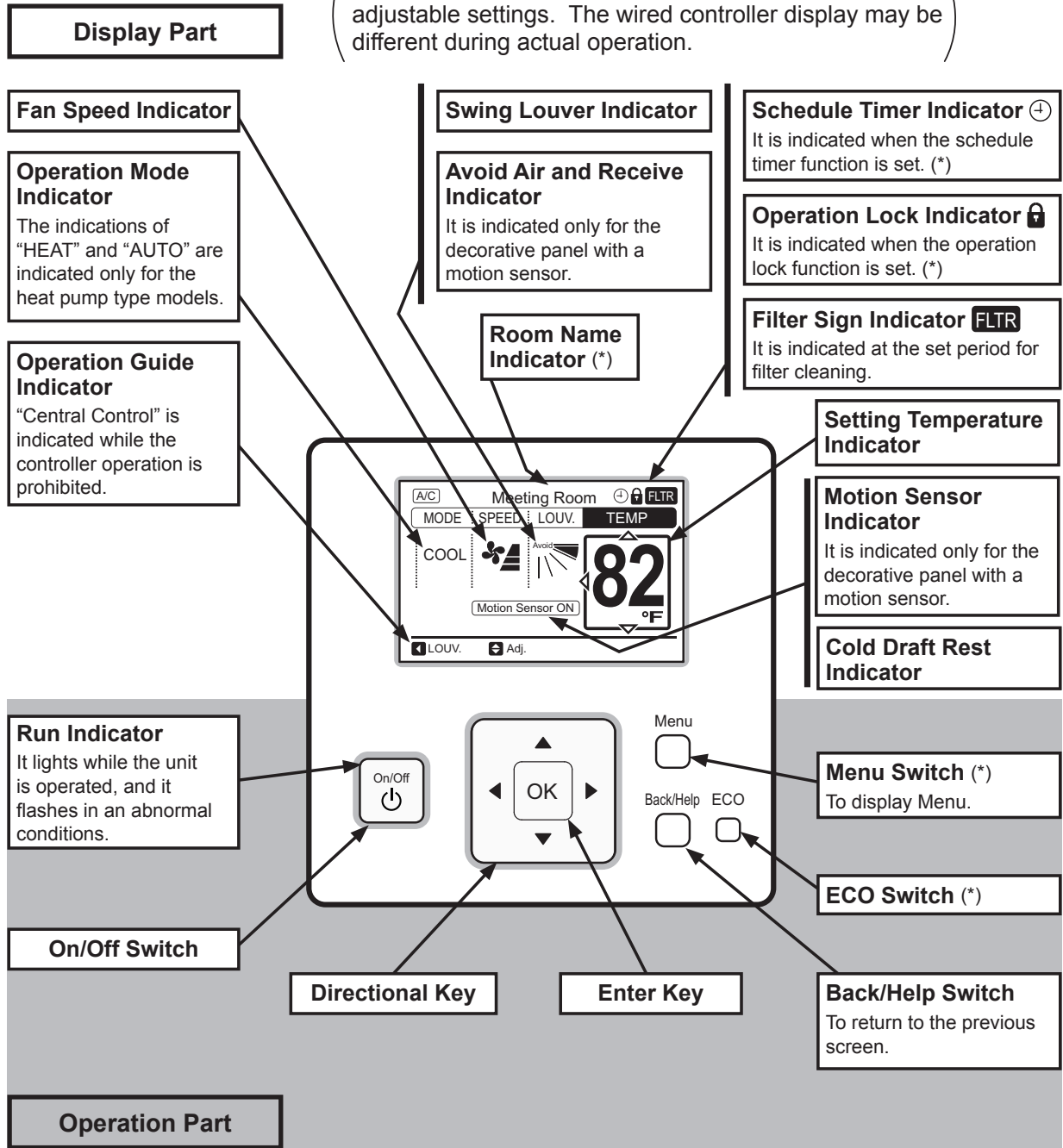
- Press switches lightly to control the wired controller. Do not press them with a sharp object such as a pen, as it could cause damage to the controller.
- The optional wireless controller and receiver kit shall be controlled according to each installation manual attached to them.

< Clipped Ceiling Type >



4.2 Wired Controller (CIW01)

(The example below references the control panel and all adjustable settings. The wired controller display may be different during actual operation.)


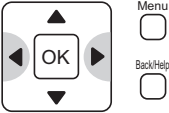
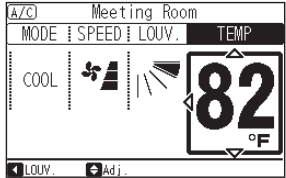
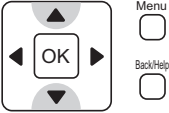
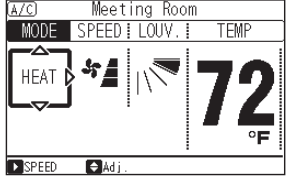


NOTE

- This manual shows a situation where CIW01 is utilized. If other models of the controller are utilized, operate the unit according to the manual for that controller.
- Press the switches lightly to control the wired controller. Do not press the wired controller with a sharp object such as a pen as it could cause damage to the controller.
- (*): For detailed description, refer to the "Operation Manual" for the wired controller.

5. Operation Method

5.1 Basic Operation

Item Selection	<p>By pressing “◀” or “▶”, the icon “  </p>		
Change of Settings	<p>With (“MODE”, “SPEED”, “LOUV.” or “TEMP”) selected, press “Δ” or “∇”. The setting will be changed.</p>		

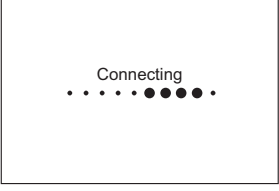

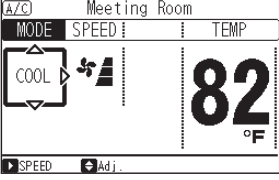


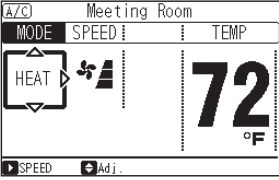
5.2 Cooling / Heating / Fan Operation

Heating operation is for a VRF system only and is not available for other systems.

<Function>

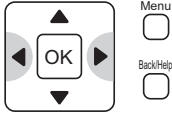
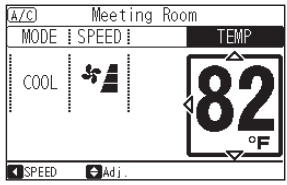
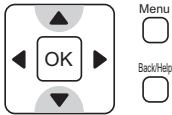
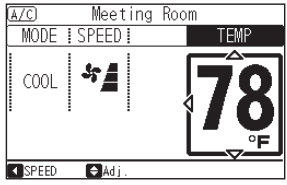
- * Cooling Operation: To decrease the room temperature.
- * Heating Operation: To increase the room temperature.
- * Dry Operation: To decrease the humidity in the room.
- * Fan Operation: To circulate the air in the room.

- Dry operation may not be performed properly if there are other heat sources which exceed the capacity of the unit.
- The control of humidity is unavailable for this unit. If you require dehumidification and the control of humidity, choose specialized equipments.
- In case where the individual setting is operated, decreasing of the humidity during dry operation might be unavailable.

<p>Before Operation</p>	<p>Turn ON the power supply. Turn ON the main power approximately 12 hours before operation in order to preheat the compressor.</p> <p>Do not turn OFF the main power of the indoor unit during season of heating and cooling.</p>		
<p>1</p>	<p>Press “◀” or “▶” to select “MODE”.</p>		
<p>2</p>	<p>By pressing “Δ” or “∇”, the mode will be changed as follows.</p> 		


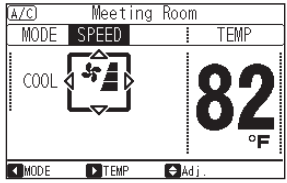


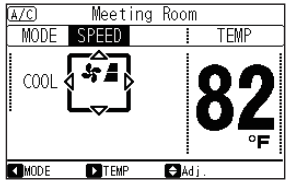
- Automatic cooling/heating operation (AUTO) requires an extra setting. Contact your distributor or contractor for details.

5.3 Temperature Setting

1	Press "◀" or "▶" and select "TEMP".		
2	<p>By pressing "▲", the temperature is increased by 1°F (0.5°C). (Max. 86°F (30°C))</p> <p>By pressing "▼", the temperature is decreased by 1°F (0.5°C). COOL, FAN operation: Min. 66°F (19°C) HEAT operation: Min. 62°F (17°C)</p>		

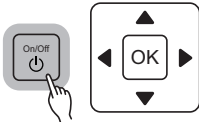
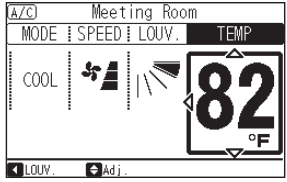
- In case the optional function "Automatic Reset of Setting Temperature" is set:
Even if changing the setting temperature on the wired controller, it automatically returns to the temperature set by "Automatic Reset Temperature" after a set time.
- Minimum and maximum temperature setpoint limits can be configured by selecting a cooling lower limit and heating upper limit in the "Function Selection" mode of the wired controller's Test Run Menu.
- Contact your distributor or dealer for details on optional functions "Automatic Reset of Setting Temperature," "Cooling Lower Limit for Setting Temperature" and "Heating Upper Limit for Setting Temperature."

5.4 Fan Speed

<p>1</p>	<p>Press “◀” or “▶” and select “SPEED”.</p>		
<p>2</p>	<p>By pressing “△” or “▽”, the fan speed will be changed as follows.</p> 		

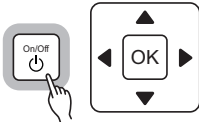
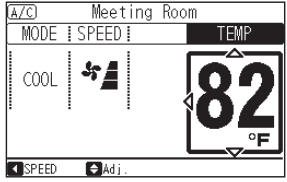
- During the dry operation, the fan speed is automatically changed to “LOW” and cannot be changed to any other fan speed. (“LOW” will NOT be displayed on the Liquid Crystal Display (LCD) at this time. The present setting condition will be displayed on LCD.)
- The fan speed setting “HIGH 2” may not be available depending on the indoor unit type.

5.5 Operation

<p>Operation Start</p>	<p>Press “⏻” (On/Off). The RUN indicator will be turned ON and the operation will start.</p>		
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< Temperature/Airflow Setting >

- The setting condition will be memorized. Therefore, no daily setting is required. Temperature setpoint and airflow settings will be retained after the indoor unit is turned OFF at the controller. In a case where the setting change is required, refer to Sections 5.2 to 5.4.

<p>Operation Stop</p>	<p>Press “⏻” (On/Off) again. The RUN indicator will be turned OFF and the operation will stop.</p>		
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- The indoor unit fan may continue to operate for up to two minutes following the heating cycle to dissipate residual heat from the indoor unit.

5.6 Swing Louver Direction

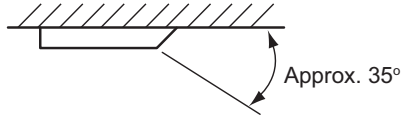
1	Press “” (On/Off). Make sure the operation is started. Press “” or “” and select “LOUV.”.		
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2	By pressing “” or “”, the louver direction will be changed as follows.																																																																																																																																
<table border="1" style="width: 100%; border-collapse: collapse; font-size: 10pt;"> <thead> <tr> <th style="width: 10%;">Step</th> <th style="width: 10%;">1</th> <th style="width: 10%;">2</th> <th style="width: 10%;">3</th> <th style="width: 10%;">4</th> <th style="width: 10%;">5</th> <th style="width: 10%;">6</th> <th style="width: 10%;">7</th> <th style="width: 10%;">-</th> </tr> </thead> <tbody> <tr> <td>LCD Indication</td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Air Louver Angle</td> <td>Approx. 35°</td> <td>Approx. 40°</td> <td>Approx. 45°</td> <td>Approx. 50°</td> <td>Approx. 55°</td> <td>Approx. 60°</td> <td>Approx. 65°</td> <td></td> </tr> <tr> <td>FAN</td> <td></td> <td style="text-align: center;">Recommended Angle</td> <td></td> <td colspan="2" style="text-align: center;">Angle Range</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">→</td> <td colspan="2" style="text-align: center;">→</td> </tr> <tr> <td></td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">→</td> <td colspan="2" style="text-align: center;">→</td> </tr> <tr> <td>Air Louver Angle</td> <td>Approx. 35°</td> <td>Approx. 40°</td> <td>Approx. 45°</td> <td>Approx. 50°</td> <td>Approx. 55°</td> <td>Approx. 60°</td> <td>Approx. 65°</td> <td></td> </tr> <tr> <td>COOL and DRY</td> <td></td> <td style="text-align: center;">Recommended Angle</td> <td></td> <td colspan="2" style="text-align: center;">Angle Range</td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">→</td> <td colspan="2" style="text-align: center;">→</td> </tr> <tr> <td></td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">→</td> <td colspan="2" style="text-align: center;">→</td> </tr> <tr> <td>Air Louver Angle</td> <td>Approx. 35°</td> <td>Approx. 40°</td> <td>Approx. 45°</td> <td>Approx. 50°</td> <td>Approx. 55°</td> <td>Approx. 60°</td> <td>Approx. 65°</td> <td></td> </tr> <tr> <td>HEAT</td> <td></td> <td></td> <td></td> <td colspan="2" style="text-align: center;">Angle Range</td> <td style="text-align: center;">Recommended Angle</td> <td></td> <td></td> </tr> <tr> <td></td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">→</td> <td colspan="2" style="text-align: center;">→</td> </tr> <tr> <td></td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">←</td> <td colspan="2" style="text-align: center;">→</td> <td colspan="2" style="text-align: center;">→</td> </tr> </tbody> </table>				Step	1	2	3	4	5	6	7	-	LCD Indication									Air Louver Angle	Approx. 35°	Approx. 40°	Approx. 45°	Approx. 50°	Approx. 55°	Approx. 60°	Approx. 65°		FAN		Recommended Angle		Angle Range						←		←		→		→			←		←		→		→		Air Louver Angle	Approx. 35°	Approx. 40°	Approx. 45°	Approx. 50°	Approx. 55°	Approx. 60°	Approx. 65°		COOL and DRY		Recommended Angle		Angle Range						←		←		→		→			←		←		→		→		Air Louver Angle	Approx. 35°	Approx. 40°	Approx. 45°	Approx. 50°	Approx. 55°	Approx. 60°	Approx. 65°		HEAT				Angle Range		Recommended Angle				←		←		→		→			←		←		→		→	
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<p>NOTE: Even if 60° or 65° is selected during cooling operation and dry operation, the louver angle will be automatically fixed at 55°.</p> <p> : Auto swing operation will be activated. At this time, animated louver icon will swing repeatedly on the LCD.</p>																																																																																																																																	

- The louver angle indicated on the LCD and the actual louver angle do not correspond precisely with each other during auto-swing mode operation. When the louver angle is established, set the louver angle according to the louver position indicated on the LCD.
- Louver movement may NOT stop immediately after the switch is pressed.
- As for the indoor unit for a clipped ceiling, the auto-swing function is not available. It cannot select “LOUV.”.

During heating operation the swing louver direction will automatically changed.

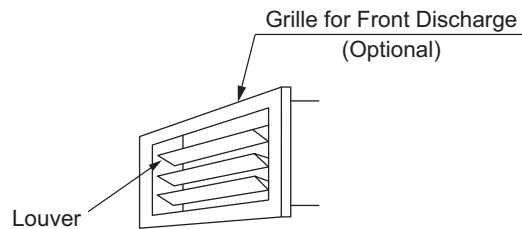
- Regarding to "Start-up of Heating Operation", "During Defrost Operation" and "Activation of Thermistor", all the louver angles will be fixed at 35° automatically even when this function is activated.



- When the air outlet temperature rises to 86°F (30°C) or more, the temperature setting condition will be back to the former temperature setting condition.
At this time, the LCD setting condition is not changed to other displays. The present setting condition will be displayed on the LCD.

< Clipped Ceiling Type >

- The optional "Grille for Front Discharge" is equipped with the louvers for air flow direction adjustment. The louvers can be adjusted by hand.
- The recommended louver direction are as follows.
Heating Operation: Upward
Cooling Operation: Downward
- For details of the louver angle adjustment, refer to the "Installation and Maintenance Manual" for the optional "Grille for Front Discharge".



6. Automatic Control

This air conditioner automatically starts the following operations according to the conditions.

The system is equipped with the following functions.

Three-Minute Guard		<ul style="list-style-type: none"> ▪ Enforced Stoppage: The compressor remains off for at least three minutes once it has stopped. If the system is started within approximately three minutes after it has stopped, the RUN indicator is activated. However, the cooling operation or the heating operation remains off and does not start until after three minutes has elapsed. ▪ Enforced Operation: If all indoor units of the system are Thermo-OFF within approximately three minutes after the compressor has started, the compressor is operated during three minutes continuously. However, if all indoor units of the system are stopped by a controller, compressor has stopped.
Cooling and Dry	Frost Prevention	When the indoor unit is operated at a low discharge air temperature, the cooling operation may be changed to fan operation for a while to avoid frost formation on the indoor heat exchanger.
	Self-Cleaning of Expansion Valve	The expansion valve self-cleaning when the cooling operation has stopped. The sound of which the refrigerant flows may be heard from the indoor unit during the self-cleaning. This is not abnormal.
Heating	Hot Start	To prevent cold air discharge in the room, the fan speed is controlled from the slow position and the low position and then to the set position according to the discharge air temperature. At this time the louver is fixed horizontally and "HOT-START" is displayed on the LCD of the wired controller.
	Defrost Operation	The indoor unit fan operation is stopped to prevent cold air discharge during the defrost operation. At this time, the indication "HOT-START" is displayed on the LCD of the wired controller and the indoor unit fan louver angle is fixed horizontally.
	Residual Heat Removal	When the heating operation is stopped, the indoor fan operation may be kept at the slow position for a maximum of two minutes to lower temperature of the inside of the indoor unit.
	Prevention of Overload Operation	When the outdoor temperature is high (approx. 70°F (21°C) or more) during the heating operation, the operation is stopped by activation of the outdoor thermistor.

The auto-swing function is not available for an indoor unit for a clipped ceiling. The swing louver direction cannot be set automatically by the power saving function during the operation control of the indoor unit. At this time, the present setting of the swing louver direction is fixed.

NOTE

- This air conditioner adopts a hot air circulation system for the heating operation. If the space is large or the room temperature is excessively low, it takes time to heat the entire room. If the room has been heated enough and discharged air reaches a required temperature, the indication "HOT-START" will be turned OFF after heating the room.
- The indication "HOT-START" may be displayed during, or right after, the defrosting operation. "HOT-START" is activated during defrost to ensure comfort by reducing the delivery of cold air in the heating cycle. This is NOT abnormal.

7. Maintenance

⚠ WARNING

- Turn OFF the power source before maintenance work. If the power source is not turned off, it may cause a fire or an electric shock.
- Perform the maintenance work with a stable foothold or foundation. This may prevent falling or injury.

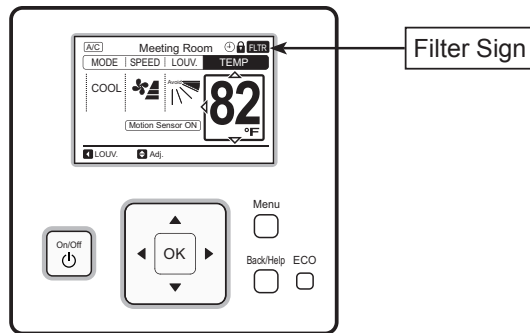
⚠ CAUTION

- Hold the air filter and the air inlet grille securely by hand when attaching or removing it. If not, it may cause the product to fall, resulting in an injury.

7.1 Daily Maintenance

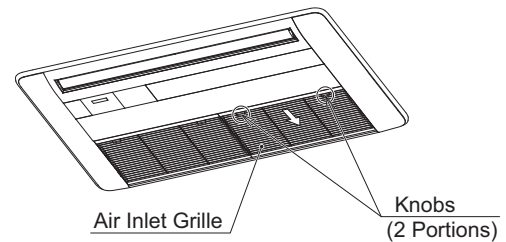
7.1.1 Cleaning Air Filter

Clean the air filter when the filter sign is turned ON.



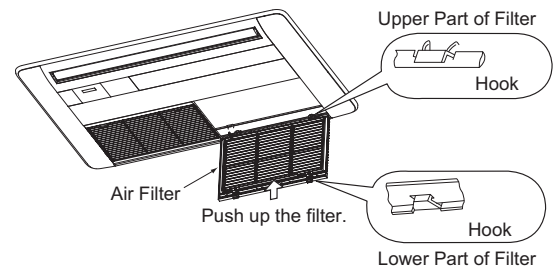
(1) Open the air inlet grille.

While sliding the knobs on both sides of the air inlet grille in the direction of the arrow, as shown, open the air inlet grille.



(2) Remove the air filter.

- Push up the air filter to create a slight bow on the top edge.
- Remove the air filter from the hooks at the lower part of the air inlet grille.
- Pull out the air filter to remove it.



(3) Clean the air filter.

- Vacuum dust off with a cleaner, or wash the air filter with water or a mild, non-caustic detergent.
- Dry the air filter in a shaded area.

NOTE

- Do not use water warmer than 122°F (50°C). Filter elements can be damaged.
 - Do not dry the air filter by holding it over open flame, with a hair dryer, or any type of heating device. Filter elements can be damaged by heat.
-

(4) Attach the air filter.

After the air filter is dried, attach it in the reverse order from what is shown on item (2).

(5) Close the air inlet grille.

NOTE

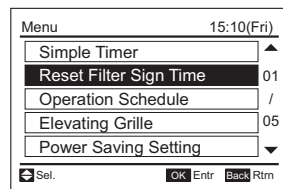
- Be sure to attach the air filter. Operating the indoor unit without a filter installed will cause serious damage and breakdown.
 - Make sure that the air inlet grille is securely locked with the knobs. If not properly secured, it could swing open and strike someone below and cause minor injuries.
-

(6) Reset the filter sign.

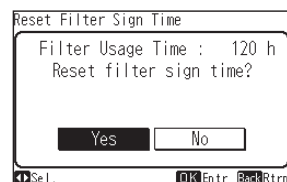
NOTE

If the accumulated operation time is shorter than the filter sign setting, the indication "☒" is turned ON and "Setting Disabled" will be displayed.

- Press "Menu".
Select "Reset Filter Sign Time" from the menu and press "OK".
The confirmation screen will be displayed.



- Select "Yes" by pressing "<" or ">" and press "OK".
The indication of "FLTR" will be turned OFF and the screen will return to the normal mode.



OPERATION

7.1.2 Removing, Attaching and Cleaning Air Inlet Grille

Wipe down the decorative panel with a soft cloth soaked in lukewarm water and wrung out.

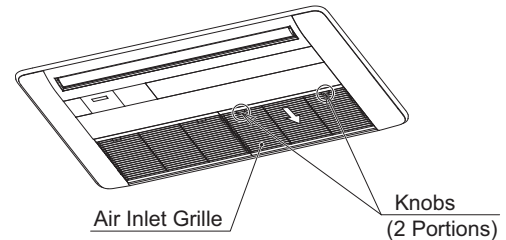
NOTICE

- Wipe down the air inlet grille with a soft cloth soaked in lukewarm water and wrung-out.
- Gently wipe down using only a clean soft cloth. Avoid the use of Benzene type thinners or chemical detergents and abrasives as cleaning agents which will damage the finish of outer plastic surfaces and louver. Avoid using excessive force when cleaning these surfaces as they can be easily damaged.

The air inlet grille can be removed and cleaned.

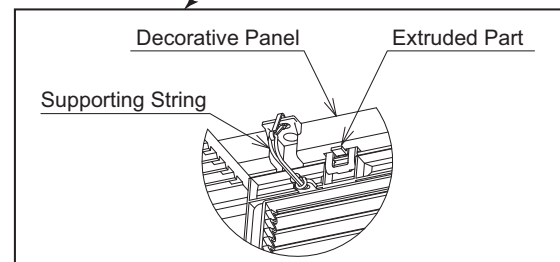
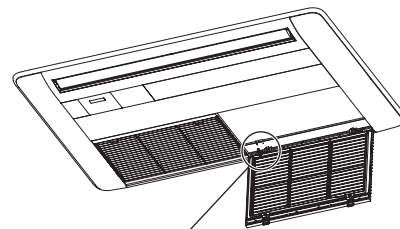
(1) Open the air inlet grille.

While sliding the knobs on both sides of the air inlet grille in the arrow direction, open the air inlet grille.



(2) Remove the air inlet grille.

- Unhook the supporting string from the decorative panel.
- While opening the air inlet grille, push the extruded part of the hinge, then pull the air inlet grille downward to remove it.



(3) Clean the air inlet grille.

(4) Reattach the air inlet grille.

Reattach the air inlet grille in the reverse procedure to removing it.

7.2 Maintenance Prior to and After Use

Prior to Use

- Remove any obstacles around the air inlet grilles and the air outlet of the indoor unit and outdoor unit.
- Check that the air filter is not clogged with dust and dirt.

After Use

- Clean the air filter, the air inlet grille and the decorative panel.

8. Troubleshooting

8.1 This is Not Abnormal

Phenomenon		Cause and Action
Operation Stopped	All indication lamps on the wired controller are turned OFF.	The micro-computer is activated to protect the device from electromagnetic waves. Restart the operation.
	After Power Failure	Restart the operation. If the instantaneous power failure is within two seconds, the operation restarts automatically.
White Steam from Indoor Unit	During Heating Operation	This might occur during the defrosting operation in the heating operation.
White Smoke from Indoor Unit	At Beginning of Heating Operation Season	This might occur when dust attached to the heat exchanger has been dried.
Mist from Indoor Unit	In Restaurant or Kitchen	This might occur when oil attached to the fins might decrease the heat exchange efficiency.
	During Dry Operation	This might occur when the air outlet temperature becomes lower. Change the operation mode.
	During Cooling Operation in Humid Environment	This might occur when the air outlet temperature becomes lower. Raise the set temperature and the air flow volume.
Odor from Indoor Unit	Odor Discharged from Indoor Unit	This might occur when the smell of cigarette smoke infiltrated the inside of the indoor unit. Ventilate the unit well in the fan mode and clean the air filter, the air outlet and the air inlet grille.
Sound from Indoor Unit	Grate is heard when starting or stopping the operation.	This is the sound made when the components are rubbing against each other due to the extension and contraction of the resin parts caused by the temperature change.
	Sound of water flowing or bubbling during the operation.	This is the sound made when the refrigerant flows or the drain-up mechanism drains water. The sound may be heard especially when starting the operation or stopping the compressor (for approx. three minutes).
	Growling sound may be heard temporarily right after the air flow volume is changed.	It is generated because the fan motor makes temporary sound by change of fan speed.
Condensation on Decorative Panel	Condensation on Decorative Panel or Cabinet, or condensation drops.	This might occur when the operation is performed in a humid environment (relative humidity around 80%) over a prolonged period of time. Change the louver angle to ensure the cold air does not build up around the air outlet or increase the air volume so temperature increases around the air outlet.
Temperature Irregularity	The air flow volume and temperature of each air outlet are irregular.	This might occur for structural reasons, such as the size of air outlet and the location of heat exchanger.
“HOT-START” on LCD Turned ON		This might occur according to the operation mode or operation conditions.
Operation Mode on LCD Flashing		

8.2 Before Contacting a Contractor

Refer to the information below before contacting a contractor.

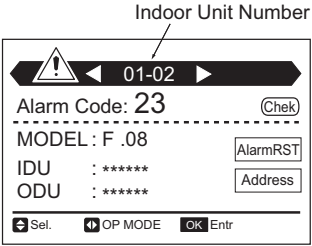
Trouble		Check Point	Action
Operation Unavailable		Check that the main power source is turned ON.	Turn ON the main power source for the air conditioner.
		Check that the fuse is not blown out or the circuit breaker of the main power source tripped.	Replace the fuse or reset the circuit breaker. If the trouble recurs, contact your contractor or distributor.
Immediate Shutdown after Start-Up	Cooling	Check that the air inlet and outlet of the outdoor unit are not covered with paper, vinyl or other objects.	Remove objects covering the air inlet and outlet.
	Heating	Check for any obstacles preventing the air flow near the air inlet and outlet of the outdoor unit.	Remove the obstacles preventing the air flow.
		Check that the outlet air is not short-circuited to the air inlet.	
Insufficient Cooling or Heating		Check that the operation mode is correct.	If the fan mode is selected, switch the operation mode to cooling or heating.
		Check that the set temperature is correct.	If not, change the set temperature by pressing “Δ” or “▽” by the wired controller.
		Check that the air flow direction is correct.	If not, change the airflow direction. In the case that the footing is not heated well during the heating operation, change the louver downward.
		Check that the air filter is not clogged.	Clean the air filter.
		Check that a window and a door are not opened.	Close the window or the door.
		Check for any obstacles preventing the air flow near the air inlet and outlet of the indoor and outdoor units.	Remove the obstacles.

8.3 Contact Distributor

If problem still remains even after checking previous issues or other problems not mentioned in the previous issues occur, stop using the product and contact your distributor or contractor.

! WARNING

If an abnormality such as a burnt odor or something similar occurs, stop the operation and turn OFF the main power source immediately. If the power source is not turned OFF, there may be damage of the product, an electric shock or a fire. Contact your distributor or contractor.

Trouble	Action before Contacting Contractor or Distributor
The protection devices (fuse, breaker, GFCI, and so forth) are frequently activated or the operation switch does not work.	Turn OFF the power source.
Water Leakage from the Indoor Unit.	Stop the operation.
<ul style="list-style-type: none"> • The RUN indicator (red) is flashing. • The indoor unit number, the alarm code, the unit model code and the number of connected indoor units are displayed on the LCD. • In a case where the plural indoor units are connected to one controller, the above abnormality informations for each indoor unit is displayed individually. <p>Check the details on the LCD and contact your distributor.</p> <div style="text-align: center;">  </div>	<p>Refer to the alarm code table. Contact your distributor and advise the indication detail on the wired controller.</p>

Provide the following information when contacting your distributor.

- 1) Unit Model
- 2) Explain the Trouble or Problem
- 3) Alarm Code No. on the LCD or Details of a Flashing Indicator

8.4 Alarm Code

Code	Category	Content of Abnormality	Code	Category	Content of Abnormality
01	Indoor Unit	Activation of Protection Device	35	System	Incorrect Setting of Indoor Unit No.
02	Outdoor Unit	Activation of Protection Device (High Pressure Cut)	36		Incorrect Indoor Unit Combination
03	Communication	Operational Irregularities between Indoor and Outdoor	38		Problem with Protective Pickup Circuit in Outdoor Unit
04		Problem between Inverter PCB and Outdoor PCB	39	Compressor	Problem with Running Current at Constant Speed Compressor
05	Supply Phase	Problem of Power Source Phases	41	Pressure	Overload Cooling
06	Voltage	Abnormal Voltage Drop in Outdoor Unit	42		Overload Heating
07	Cycle	Decrease in Superheated Discharge Gas	43	Protection Device	Activation of Pressure Ratio Decrease Protection Device
08		Increase in Discharge Gas Temperature	44		Activation of Low Pressure Decrease Protection Device
09	Outdoor Unit	Activation of Protection Device for Outdoor Fan	45		Activation of Low Pressure Increase Protection Device
11	Sensor on Indoor Unit	Inlet Air Thermistor Failure	46		Activation of High Pressure Increase Protection Device
12		Outlet Air Thermistor Failure	47		Activation of High Pressure Decrease Protection Device
13		Freeze Protection Thermistor Failure	48	Activation of Overcurrent Protection Device	
14		Gas Piping Thermistor Failure	51	Inverter	Problem with Inverter Current Sensor
19	Fan Motor	Activation of Protection Device for Indoor Fan	52		Activation of Inverter Overcurrent Protection
20	Sensor on Outdoor Unit	Compressor Thermistor Failure	53		Activation of Transistor Module Protection
21		High Pressure Sensor Failure	54		Abnormality of Inverter Fin Temperature
22		Outdoor Air Thermistor Failure	56	Outdoor Fan	Abnormality of Detection for Fan Motor Position
23		Discharge Gas Thermistor Failure	57		Activation of Fan Controller Protection
24		Evaporating Thermistor Failure	58	Abnormality of Fan Controller	
29	Low Pressure Sensor Failure	b0	System	Incorrect Setting of Unit Capacity	
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit		b1	Incorrect Setting of Unit and Refrigerant Cycle No.
32		Incorrect Setting of Other Indoor Unit Number	EE	Compressor	Compressor Protection Alarm

2.1.4 Wall Mount Type

**Model: TIWM006B21S, TIWM008B21S, TIWM012B21S
TIWM015B21S, TIWM018B21S, TIWM024B21S**



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1. Introduction

This is operation manual for the indoor unit.
 Read this operation manual carefully before operating this product.
 Keep this operation manual with this product.

2. Safety Instructions

Signal Words	
 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
---	--

- This system should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake if the unit is not installed correctly, injuries may occur due to a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves and protective goggles and, where appropriate, have a gas mask nearby. Also use electrical protection equipment and tools suited for electrical operation purposes. Keep a quenching cloth and a fire extinguisher nearby during brazing. Use care in handling, rigging, and setting of bulky equipment.
- When transporting, be careful when picking up, moving and mounting these units. Although the unit may be packed using plastic straps, do not use them for transporting the unit from one location to another. Do not stand on or put any material on the unit. Get a partner to help, and bend with your knees when lifting to reduce strain on your back. Sharp edges or thin aluminum fins on the air conditioner can cut fingers, so wear protective gloves.
- Do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass or jump-out any safety device or switch.

- Before servicing, turn-OFF current at the power source and use accepted lockout and tag out procedures at all main switches.
- This unit is the pressurized system. Never loosen threaded joints while the system is under pressure and never open pressurized system parts.
- Johnson Controls will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

⚠ WARNING

- Do not insert fingers or objects into air inlet/outlet. Injury can result from rotating fan blades or energized electrical components.
- Do not touch the wired controller with wet hands. It can result in failure of the wired controller or an electrical shock.
- Hair spray, insecticides, lacquers, and other pressurized substances should not be used within 3.3ft (1m) of any air conditioning unit. It can react with energized electrical components and cause fire.
- Do not install the indoor unit anywhere discharge airflow can pass directly toward nearby heating appliances (space heaters). It may interfere with the combustion process in these units.
- Air circulation should be optimized so as to achieve the best distribution pattern and not settle into isolated pockets that can make people uncomfortable.
- When the indoor unit is operated with heating appliances, ventilate a room sufficiently. Any leaked refrigerant gases that happen to come into contact with any heat source can become toxic on contact which can cause suffocation in the immediate area.
- Shut down at the main power source if the GFCI (Ground Fault Circuit Interrupter) activates frequently. Contact your distributor or contractor immediately. Failure to act accordingly can result in serious injury and damage to the unit.
- If you smell anything burning, shut down the unit and turn OFF the power at the main power source. Contact the fire department and your installer or electrical contractor.
- Make sure that a test for leakage of refrigerant gases has been performed. The refrigerant used for this unit (HFC R410A), is a non-flammable, non-toxic, and odorless gas. However if refrigerant should leak and make contact with sparks, fire; toxic gas will be generated. Also, because the fluorocarbon is heavier than air, the floor surface will be filled with it, which can cause suffocation.
- If fluorocarbon gas should leak, turn OFF all heating appliances and ventilate the room immediately. Mop down or vacuum floor areas of residual toxic particulate.
- Do not operate indoor units with the electrical box and switch panel open and exposed. Incidental contact with energized components can prove fatal.
- When a wireless controller is used, put a distance of at least 3.3ft (1m) between the indoor unit and electric lighting. If not, the receiver part of the unit may be difficult to receive operation commands due to effect of the electric lighting.

Repair / Relocation

! WARNING

- When the air conditioner is to be repaired or transported to a new location, contact your distributor or contractor. If the repair and the installation are not completed, it may cause an electric shock or fire.

Others

! WARNING

- Turn OFF all power at the main power source before performing maintenance work. Failure to do so can result in damage to internal components with severe or fatal electrical shock.
- Insulate all electrical components and connections from exposure to moisture. Failure to do so can result in an electrical short, fire.
- Do not tamper with or attempt to "repair" electrical wiring or connections. Call your installer or electrical contractor. Serious or fatal injury can occur.
- Perform all maintenance work on a firm and stable platform to minimize the risk of injury.
- Do not attempt to "clean" indoor unit components with liquid or powdered cleaning agents during maintenance. Electric shock, sparks, flame, and serious or fatal injury can occur.
- Inside piping is charged with refrigerant and highly pressurized.

! CAUTION

- When the flat panel is opened (closed) or the air filter is attached (removed), hold them firmly. If not, it may cause falling or injury.
- < About Wireless Controller >
- Pay attention to the following to use the batteries correctly. If not, it may cause liquid spill or burst.
 1. Never use new and used batteries together.
 2. Never use the different types of batteries (for example manganese battery and alkaline battery) together.
 3. When the wireless controller is not used over a prolonged period of time (more than 2 or 3 months), remove the batteries from the wireless controller.
 - After removing the old batteries, wait five or more seconds before inserting the new ones.

3. Before Operation

NOTICE

Power is turned on. Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil. Make sure that the outdoor unit is not covered with snow or ice. If it is, remove it by using hot water that is approximately 122°F (50°C). If the water temperature is higher than 122°F (50°C), it will cause damage to plastic parts.

- Turn OFF the main power switch when the system is stopped for a long period of time.
If the main switch is not turned OFF, electricity is consumed because the oil heater is always energized during compressor stopping.
- When the system is started after a shutdown longer than approximately three months, it is recommended that the system be checked by your service contractor.

3.1 Working Range

This heat pump air conditioner has been designed for the following temperatures. Operate the heat pump air conditioner within this range.

Temperature

		Maximum	Minimum
Cooling Operation	Indoor	89°F DB/73°F WB (32°C DB/23°C WB)	69°F DB/59°F WB (21°C DB/15°C WB)
	Outdoor	118°F DB (48°C DB) *	14°F DB (-10°C DB) *
Heating Operation	Indoor	80°F DB (27°C DB)	59°F DB (15°C DB)
	Outdoor	59°F WB (15°C WB) *	-4°F WB (-20°C WB) *

DB: Dry Bulb, WB: Wet Bulb

* The temperature may change depending on the outdoor unit.

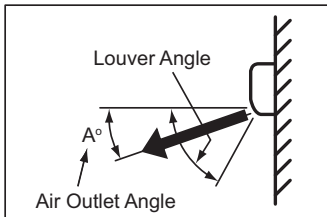
3.2 Efficient Use of Indoor Unit

- **Do not leave a window or a door open.**
The operating efficiency will be decreased.
It may cause condensation of the indoor unit. Ventilate a room sufficiently.
- **Attach a curtain or a blind to a window.**
Blocking direct sunlight into a room will increase efficiency.
- **Do not use heat appliances during the cooling operation as much as possible.**
The cooling efficiency will be decreased. It may cause condensation and dew drop.
- **Use a circulator if warm air stays around the ceiling.**
Comfort will be increased. Contact your distributor for details for using a circulator.
- **Turn OFF the main power source if the indoor unit is not to be used for a long period.**
The standby electricity charges will have to be paid even if the indoor unit is unused.

3.3 Efficient Use of Cooling and Heating

COOLING

(1) **Airflow Direction**
 The appropriate air outlet angle is approx. A° as shown in the table. If the cooling is not sufficient, change the airflow direction. Pay attention to condensation, which may occur due to a prolonged cooling operation with low louver angle.



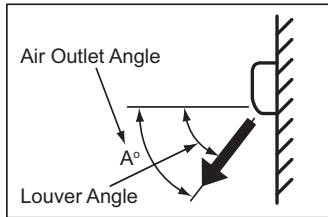
Unit Type	A
TIWM006B21S ~ 012B21S	30
TIWM015B21S ~ 024B21S	33

(Refer to the item 5.1.6 and 5.2.5 for details.)

(2) **Airflow Volume**
 The normal setting is "MED." If the airflow volume is set as "HIGH 2" or "HIGH," the airflow will be spread wider than "MED".

HEATING

(1) **Airflow Direction**
 The appropriate air outlet angle is approx. A° as shown in the table. If the heating is not sufficient, change the airflow direction.



Unit Type	A
TIWM006B21S ~ 012B21S	55
TIWM015B21S ~ 024B21S	60

(Refer to the item 5.1.6 and 5.2.5 for details.)

(2) **Airflow Volume**
 The normal setting is "MED." If the airflow volume is set as "HIGH 2" or "HIGH," the airflow will be spread wider than "MED".

NOTE

< About Multi-Split System >

When the number of indoor unit or the operating mode is changed, the air outlet temperature may be changed and the indoor temperature is changed. In this case, set as follows.

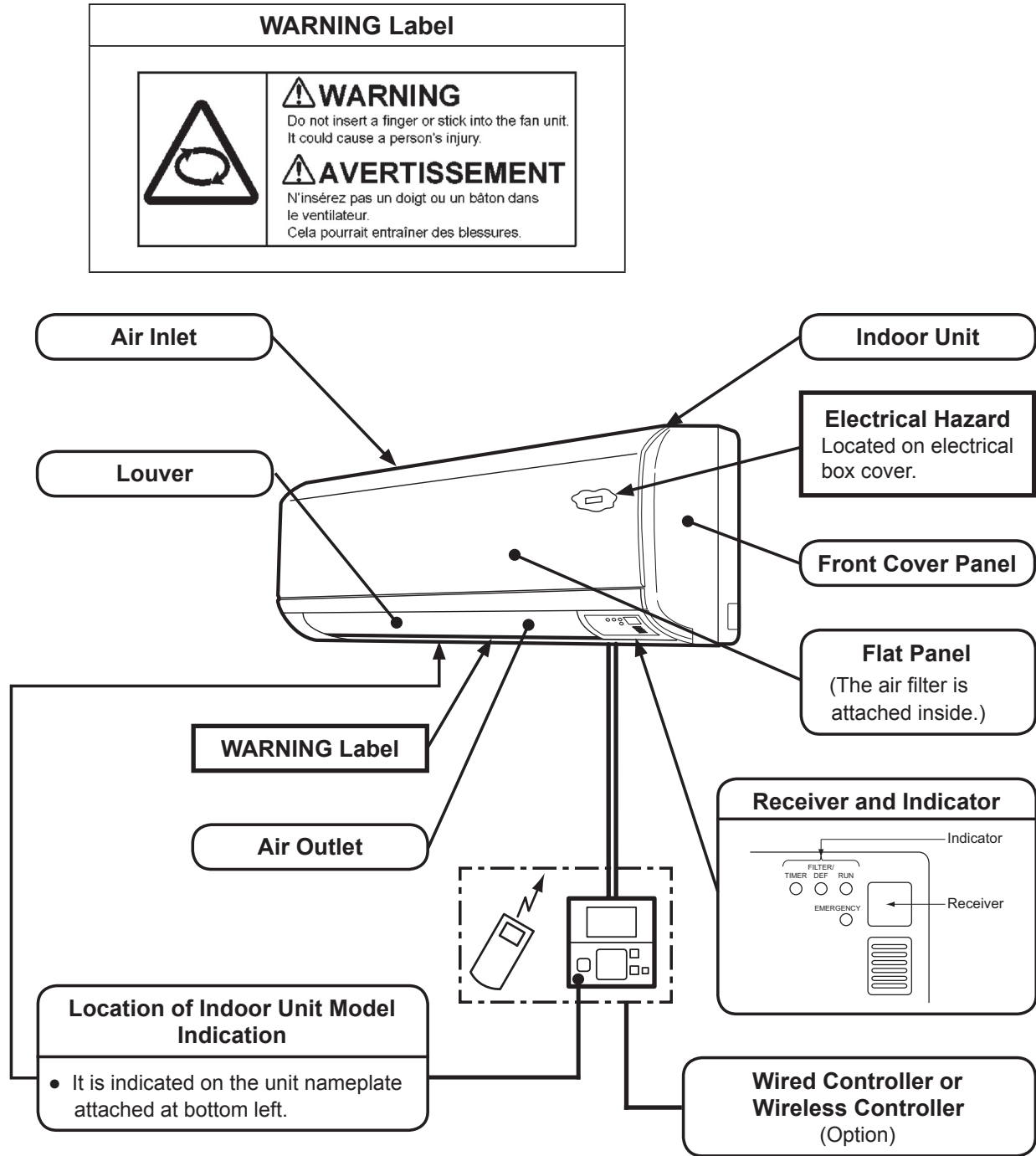
- During Cooling: Lower slightly the temperature setting.
- During Heating: Raise slightly the temperature setting.

4. Name of Parts

The safety considerations are indicated on the indoor unit in order to ensure safe use. Read and understand this manual before using the indoor unit.

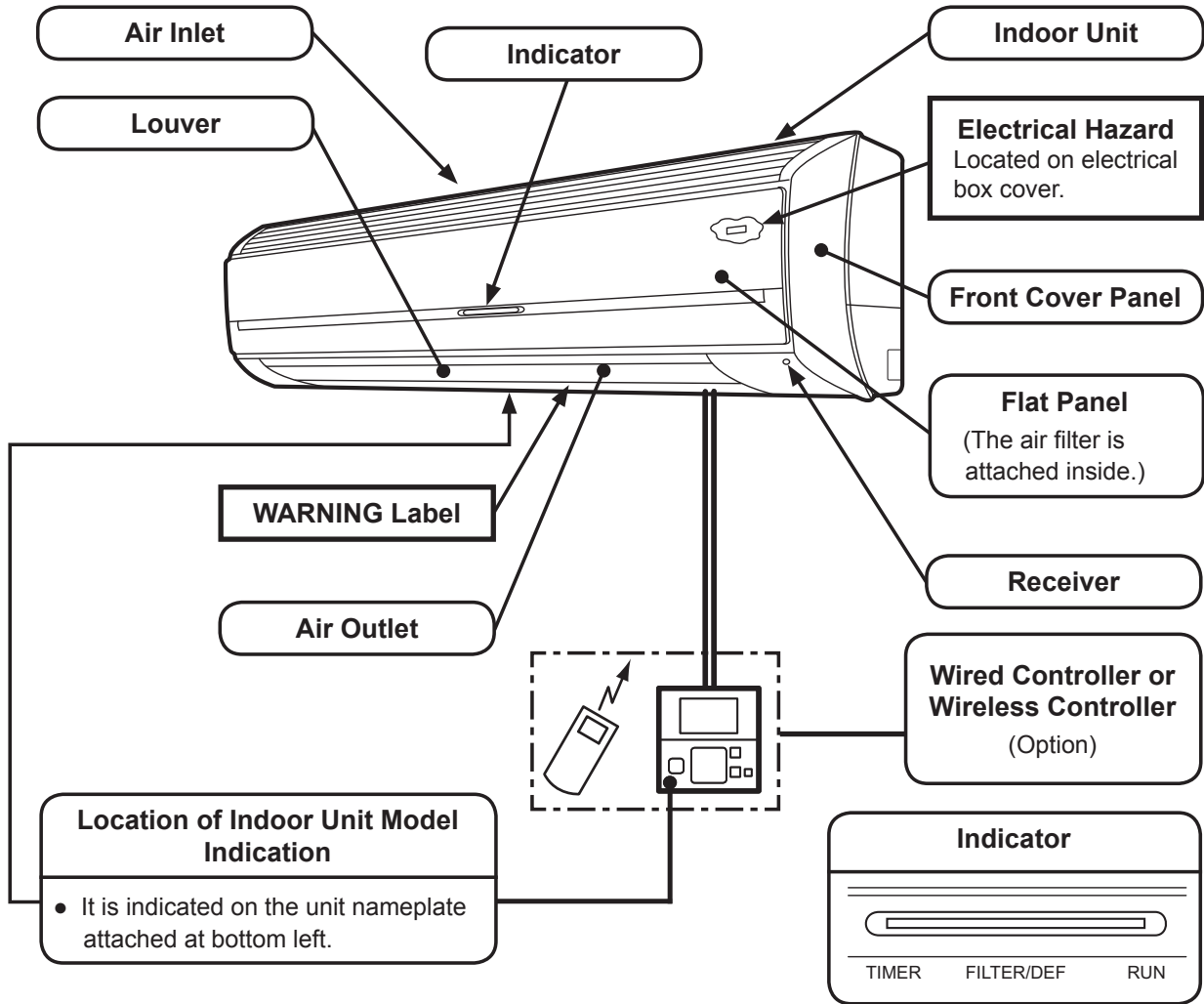
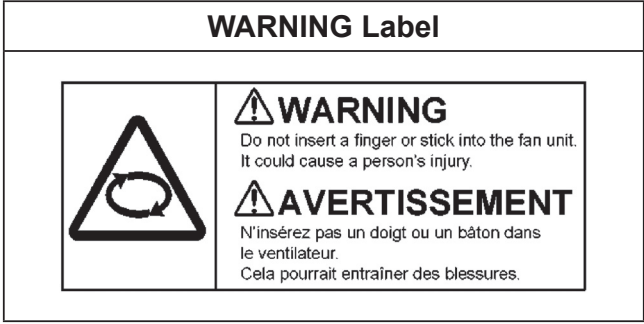
4.1 Wall Mount Type


4.1.1 TIWM006B21S, TIWM008B21S and TIWM012B21S



Safety Label • Attached to the part indicated by .

4.1.2 TIWM015B21S, TIWM018B21S and TIWM024B21S

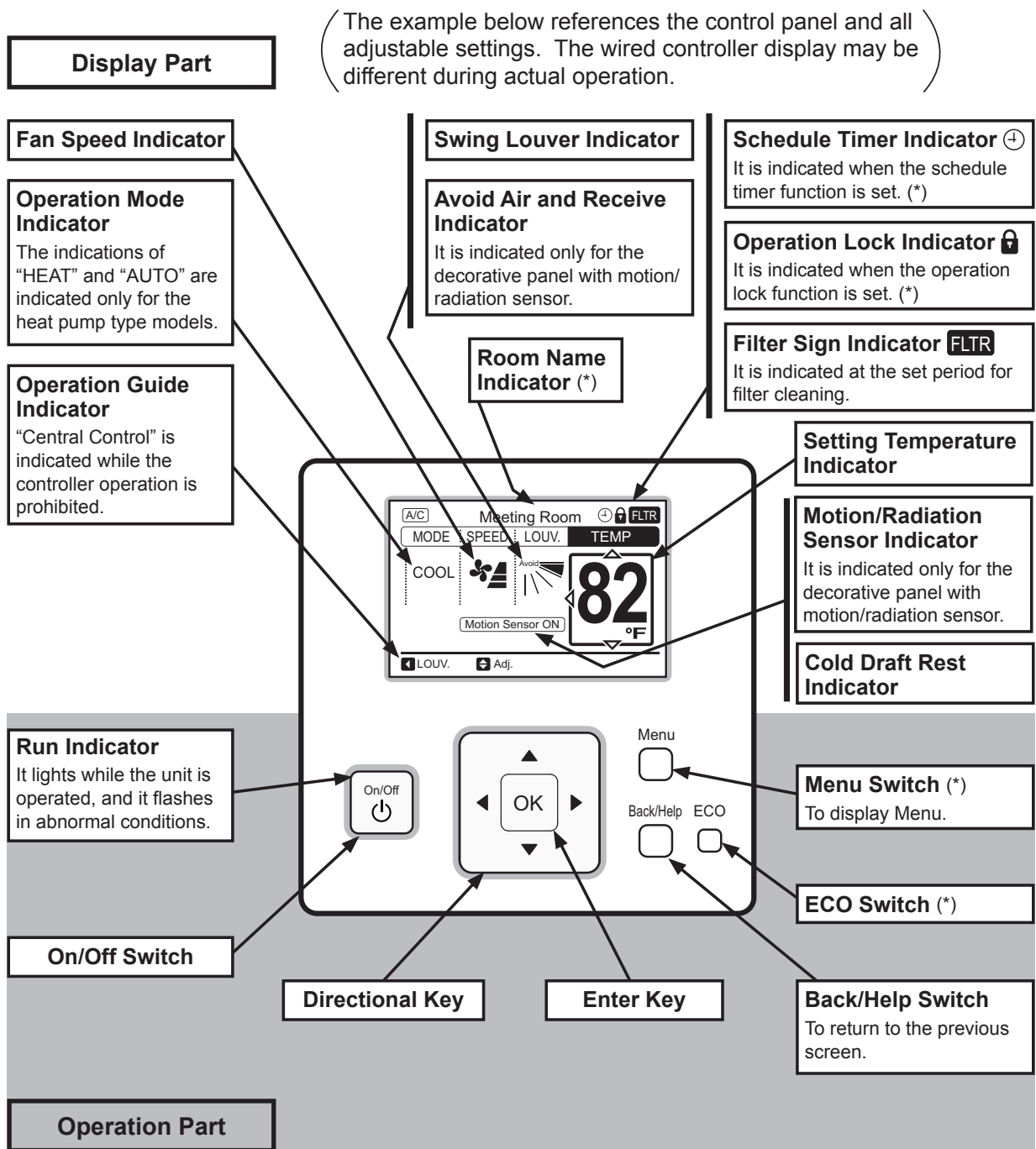


Safety Label • Attached to the part indicated by  .

NOTICE

- Wall mount models: either a wired or a wireless controller is available. When a centralized controller is connected, restrictions are in place limiting operation of indoor units with a single wireless controller or utilize wired and wireless controllers together. Contact your distributor or contractor for details.
 - The RUN indicator of this indoor unit is activated even when the wired controller is used. The indication for timer settings is indicated on the wired controller only.
 - To utilize the wired and wireless controller together, an optional receiver kit is required.
-

4.2 Wired Controller (CIW01)

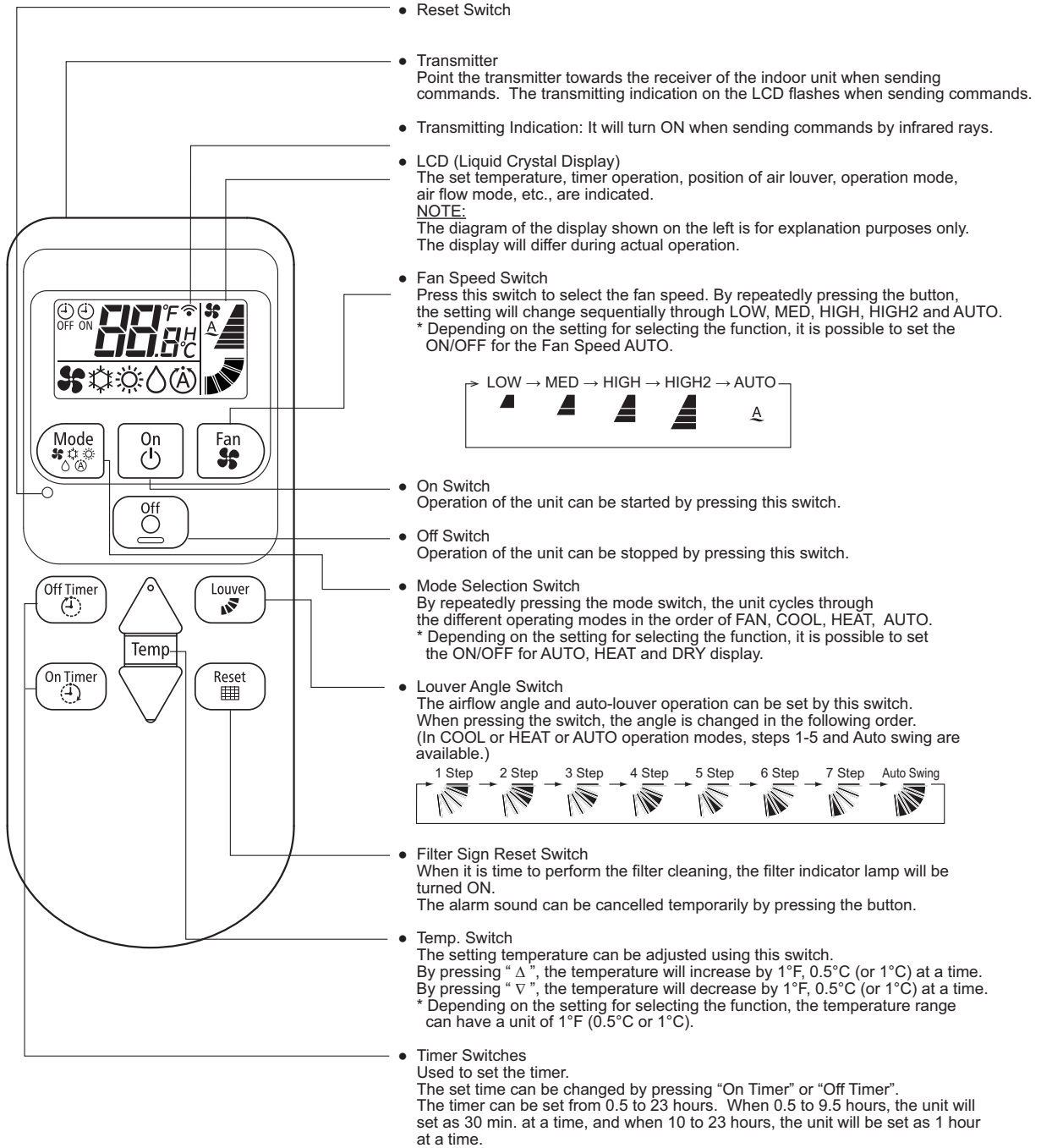


NOTE

- This manual shows example CIW01 is utilized. If other models of the controller are utilized, operate the unit according to the manual for that controller.
- Press the switches lightly to control the wired controller. Do not press the wired controller with a sharp object such as a pen. It may cause damage to the control part.
- (*) : For details description, refer to the operation manual for the wired controller.

4.3 Wireless Controller (CIR01)

- This controller is used to send commands about operation mode timer settings and so on, to the indoor unit. Face the transmitter of the controller toward the receiver of the indoor unit and press the switch to send commands to indoor unit.
- The effective transmission range limit is approximately 19.7ft (6m). The effective distance for transmitting shortens if the transmitter is not perpendicular to the receiver or if there is other electronic interference in the room.
- Use the receiver kit and the indoor unit which are supported by this controller.

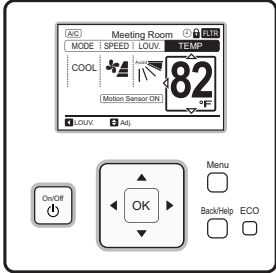



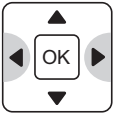
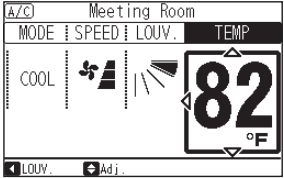

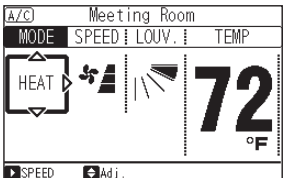
NOTE:
When the wireless controller is prohibited by central controller, this function is disabled even though the indoor unit is set with the wireless controller and the buzzer sounds.

5. Operation Method

5.1 Wired Controller (CIW01)

5.1.1 Basic Operation



<p style="text-align: center;">Item Selection</p>	<p>By pressing “◀” or “▶”, the icon “  <p style="text-align: right;">Menu <input type="checkbox"/> Back/Help <input type="checkbox"/></p> </p>		
<p style="text-align: center;">Change of Settings</p>	<p>With (“MODE”, “SPEED”, “LOUV.” or “TEMP”) selected, press “Δ” or “∇”. The setting will be changed.</p>	 <p style="text-align: right;">Menu <input type="checkbox"/> Back/Help <input type="checkbox"/></p>	

OPERATION

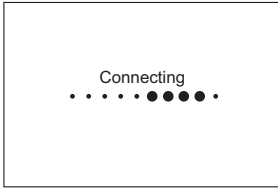
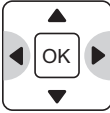
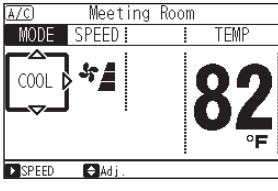


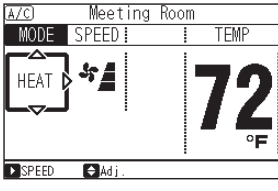
5.1.2 Cooling / Heating / Fan Operation

Heating Operation is for VRF system only and is not available for other systems.

<Function>


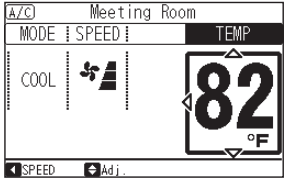

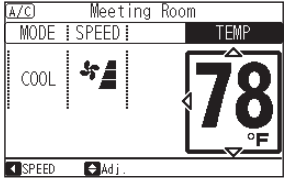
- * Cooling Operation: To decrease the room temperature.
- * Heating Operation: To increase the room temperature.
- * Dry Operation: To decrease the humidity in the room.
- * Fan Operation: To circulate the air in the room.

- Dry operation may not be performed properly if there are other heat sources which exceed the capacity of the unit.
- The control of humidity is unavailable with this unit. If you require dehumidification and the control of humidity, choose specialized equipments.
- In case where the individual setting is operated, decreasing of the humidity during dry operation might be unavailable.

<p>Before Operation</p>	<p>Turn ON the power supply. Turn ON the main power approximately 12 hours before operation in order to preheat the compressor.</p> <p>Do not turn OFF the main power of the indoor unit during season of heating or cooling.</p>		
<p>1</p>	<p>Press “◀” or “▶” to select “MODE”.</p>	 <p>Menu <input type="checkbox"/></p> <p>Back/Help <input type="checkbox"/></p>	
<p>2</p>	<p>By pressing “△” or “▽”, the mode will be changed as follows.</p> 	 <p>Menu <input type="checkbox"/></p> <p>Back/Help <input type="checkbox"/></p>	


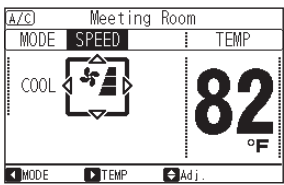


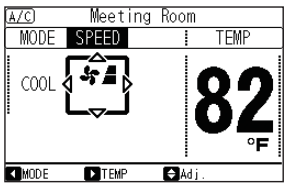
- Automatic cooling/heating operation (AUTO) requires an extra setting. Contact your distributor or contractor for details.

5.1.3 Temperature Setting

<p>1</p>	<p>Press “<” or “>” and select “TEMP”.</p>	 <p>Menu <input type="checkbox"/> Back/Help <input type="checkbox"/></p>	
<p>2</p>	<p>By pressing “Δ”, the temperature is increased by 1°F (0.5°C). (Max. 86°F (30°C)) By pressing “∇”, the temperature is decreased by 1°F (0.5°C). COOL, FAN operation: Min. 66°F (19°C) HEAT operation: Min. 62°F (17°C)</p>	 <p>Menu <input type="checkbox"/> Back/Help <input type="checkbox"/></p>	

- In case the optional function “Automatic Reset of Setting Temperature” is set:
Even if changing the setting temperature on the wired controller, it automatically returns to the temperature set by “Automatic Reset Temperature” after a set time.
- Minimum and maximum temperature setpoint limits can be configured by selecting a cooling lower limit and heating upper limit in the “Function Selection” mode of the wired controller’s Test Run Menu.
- Contact your distributor or dealer for details on optional functions “Automatic Reset of Setting Temperature,” “Cooling Lower Limit for Setting Temperature” and “Heating Upper Limit for Setting Temperature.”


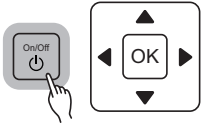
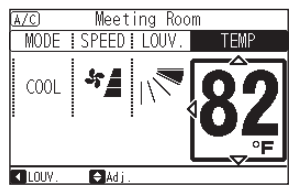
5.1.4 Fan Speed

<p>1</p>	<p>Press “<” or “>” and select “SPEED”.</p>	 <p>Menu <input type="checkbox"/> Back/Help <input type="checkbox"/></p>	
<p>2</p>	<p>By pressing “Δ” or “∇”, the fan speed will be changed as follows.</p> 	 <p>Menu <input type="checkbox"/> Back/Help <input type="checkbox"/></p>	

- During the dry operation, the fan speed is automatically changed to “LOW” and cannot be changed to any other fan speed. (“LOW” will NOT be displayed on Liquid Crystal Display (LCD) at this time. The present setting condition will be displayed on the LCD.)
- The fan speed setting “HIGH 2” may not be available depending on the indoor unit type.


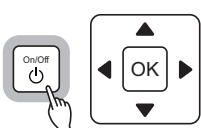
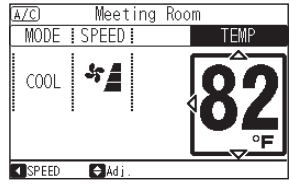
OPERATION

5.1.5 Operation

<p>Operation Start</p>	<p>Press “” (On/Off). The RUN indicator will be turned ON and the operation will start.</p>		
-------------------------------	--	--	---

< Temperature/Air Flow Setting >

- The setting condition will be memorized. Therefore, no daily setting is required. Temperature setpoint and airflow settings will be retained after the indoor unit is turned OFF at the controller. In a case where the setting change is required, refer to Sections 5.1.2 to 5.1.4.

<p>Operation Stop</p>	<p>Press “” (On/Off) again. The RUN indicator will be turned OFF and the operation will stop.</p>		
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- The indoor unit fan may continue to operate for up to two minutes following the heating cycle to dissipate residual heat from the indoor unit.

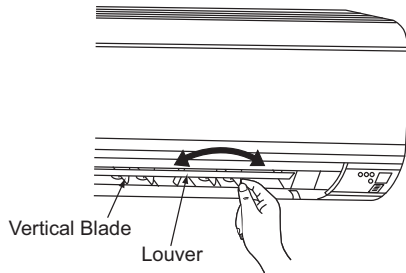
5.1.6 Swing Louver Direction

1	<p>Press “” (On/Off). Make sure that the operation is started. Press “” or “” and select “LOUV.”.</p>		
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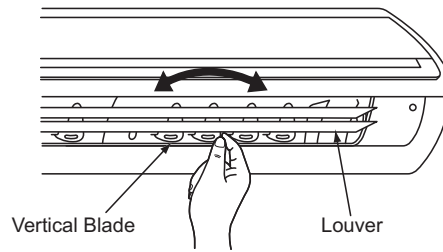
2	<p>By pressing “” or “”, the louver direction will be changed as follows.</p>																																																																																																
<p>< LCD Indication ></p> <table border="1" style="width: 100%; border-collapse: collapse; text-align: center;"> <tr> <td style="font-size: 8px;">Auto Swing</td> <td style="width: 12.5%; font-size: 8px;">1</td> <td style="width: 12.5%; font-size: 8px;">2</td> <td style="width: 12.5%; font-size: 8px;">3</td> <td style="width: 12.5%; font-size: 8px;">4</td> <td style="width: 12.5%; font-size: 8px;">5</td> <td style="width: 12.5%; font-size: 8px;">6</td> <td style="width: 12.5%; font-size: 8px;">7</td> </tr> <tr> <td colspan="8"> </td> </tr> </table> <p style="margin-left: 20px;"> : Auto-swing operation will be started. At this time, the louver animation will swing repeatedly on LCD.</p>				Auto Swing	1	2	3	4	5	6	7																																																																																						
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<ul style="list-style-type: none"> ● The louver angle indicated on the LCD and the actual louver angle do not correspond precisely with each other during the auto-swing mode operation. When the louver is fixed, set the louver angle according to the louver position indicated on the LCD. ● The louver may NOT stop immediately right after the switch is pressed. 																																																																																																	

OPERATION

- Adjusting Vertical Blade
Adjust the vertical blade by hand as shown below.

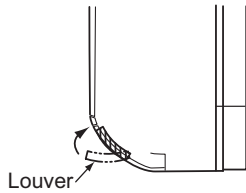


TIWM006B21S ~ TIWM012B21S

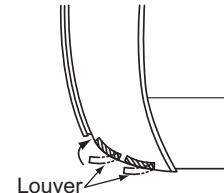


TIWM015B21S ~ TIWM024B21S

- Automatic Louver Setting
The swing louver is stopped and moved by controlling the wired controller.
The louver will automatically close when the unit is stopped from the wired controller.



TIWM006B21S ~ TIWM012B21S

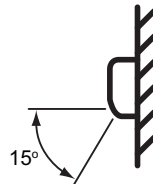


TIWM015B21S ~ TIWM024B21S

- Louver Angle during Cooling and Dry Operation
The louver angle self-adjusts from its default setting during times of cooling and dry conditions to prevent condensation buildup. Louver angle changes are not shown on the LCD of wired controller.
- Louver Angle during Heating Operation
The louver angle self-adjust for heating conditions.

- * When the heating operation starts
 - * When the defrost operation starts
- ➡ The louver angle is fixed to 15°.

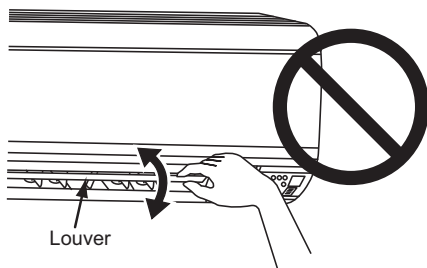
Above louver angle changes are not shown on the LCD of the wired controller.



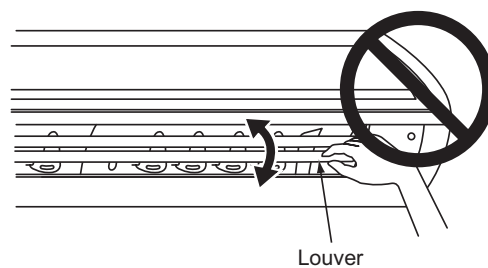
➡ When the discharge temperature is higher than 86°F (30°C), the louver angle automatically returns to the setting condition.

NOTICE

Do not attempt to move the louver by hand as this will damage the automatic louver setting function.



TIWM006B21S ~ TIWM012B21S



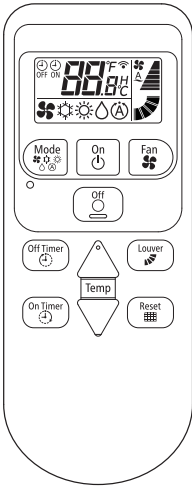
TIWM015B21S ~ TIWM024B21S

5.2 Wireless Controller (CIR01)

5.2.1 Operation Mode (Cooling, Heating, Dry and Fan Operation)

When VRF system is used with wireless controllers, follow the procedure as shown below.


- <Function>**
- * Cooling Mode (COOL): To decrease the room temperature.
 - * Heating Mode (HEAT): To increase the room temperature.
 - * Dry Mode (DRY): To decrease the humidity in the room.
 - * Fan Mode (FAN): To circulate the air in the room.



Before Operation

Turn ON the power supply.
Apply power to unit(s) for approximately 12 hours before operation in order to preheat the compressor.

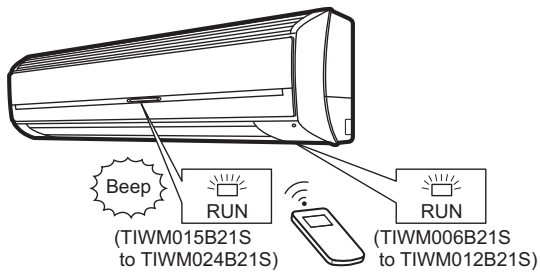
Do not turn OFF the main power of the indoor unit during season of heating or cooling.

1	<p>Press "Mode" switch. By repeatedly pressing "Mode" switch, the operation mode switches in the order of FAN , COOL , HEAT , DRY and AUTO .</p>	<p>LCD indications of setting temperature, fan speed and airflow angle are turned ON.</p> <div style="text-align: center;">  </div> <p>Above indication is for cooling operation.</p> <p>When the unit operation is stopped, LCD indications of setting temperature, fan speed and air flow angle will be turned OFF after 10 seconds without pressing the switches.</p>
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- Refer to the item 5.2.3 "Automatic Cooling/Heating Mode" for automatic cooling/heating operation mode.

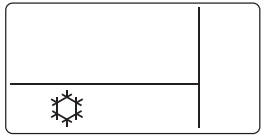
NOTE

The indoor unit emits a beeping sound when the wireless controller is activated.

2	<p>Point the transmitter towards the receiver and press “On  <p>The figure shows for TIWM015B21S to TIWM024B21S.</p> </p>
----------	---

< Temperature, Fan Speed and Airflow Direction Setting >


- The setting condition will be memorized. Therefore, no daily setting is required. Temperature setpoint and airflow settings will be retained after the indoor unit is turned OFF at the controller. In a case where the setting change is required, refer to Section 5.2.2.



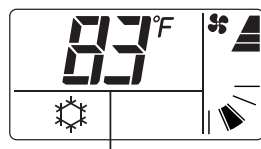
Stop	<p>Point the transmitter towards the receiver and press “Off  <p>The indications of setting temperature, fan speed and airflow angle are turned OFF.</p> </p>
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- The indoor unit fan may continue to operate for up to two minutes following the heating cycle to dissipate residual heat from the indoor unit.







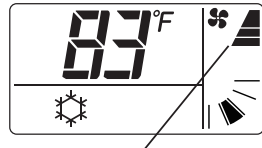
5.2.2 Temperature, Fan Speed and Air Flow Direction Setting

NOTE




When the wireless controller is pressed, the transmitting indicator “” flashes on the LCD display of the wireless controller and the beep sound is heard from the indoor unit.

Temperature	<p>Point the transmitter towards the receiver and press “Temp” switch to set the temperature. By pressing “”, the temperature is increased by 1°F (0.5°C). By pressing “”, the temperature is decreased by 1°F (0.5°C).</p>	<div style="text-align: center;">  </div> <p style="text-align: center;">The set temperature is set to 83°F (28°C) in the cooling operation.</p>
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- The available set temperature range is 66°F (19°C) to 86°F (30°C) by the wireless controller.

Fan Speed	<p>Point the transmitter towards the receiver and press “Fan ” switch to set the fan speed. By repeatedly pressing the switch, the setting will change sequentially as shown below. “MED” should be normally used.</p> <div style="border: 1px solid black; padding: 5px; margin: 5px 0;"> <p style="text-align: center;">→ LOW → MED → HIGH → HIGH2 → AUTO</p> <div style="display: flex; justify-content: space-around; align-items: center;">      </div> </div>	<div style="text-align: center;">  </div> <p style="text-align: center;">The fan speed is set to “HIGH” in the cooling operation.</p>
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- The fan speed can be set for each operating mode except Dry mode which forces fan operation at “LOW” speed only.

Air Flow Direction	<p>Point the transmitter towards the receiver and press “Louver ” switch to set the louver angle. By pressing “Louver ” switch, the louver angle will be changed as follows.</p> <div style="text-align: center; margin: 10px 0;"> <p><u>LCD Indication</u></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">1 Step</div> <div style="text-align: center;">2 Step</div> <div style="text-align: center;">3 Step</div> <div style="text-align: center;">4 Step</div> <div style="text-align: center;">5 Step</div> <div style="text-align: center;">6 Step</div> <div style="text-align: center;">7 Step</div> <div style="text-align: center;">Auto Swing</div> </div>  </div> <p>NOTE: Auto-swing and 1 step to 5 step louver settings are only available for the cooling and dry modes.</p>
---------------------------	---

- Louver settings are automatically changed during heating, cooling, or dry operation.

OPERATION

5.2.3 Automatic Cooling/Heating Mode

Automatic Cooling/Heating Mode is for VRF system only and is not available for other systems. Also note that there is quite temperature difference between cooling and heating operation when using this function.

The automatic cooling/heating operation is set by the function selection. Contact your distributor and contractor for details.

< Function >

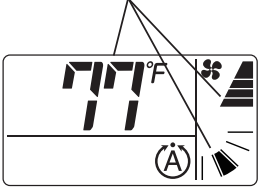
Automatic Cooling/Heating Mode automatically switches cooling and heating based on the set temperature.

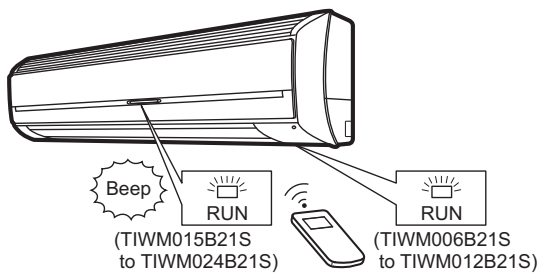
The cooling operation is performed when the inlet air temperature is approximately 37.4°F (3°C) higher than set temperature.

The heating operation is performed when the inlet air temperature is approximately 37.4°F (3°C) lower than set temperature.

NOTE

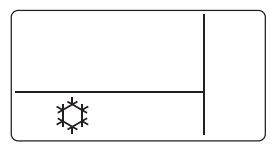
- If the fan speed is set to “LOW” during the heating operation, the operation tends to be stopped by activation of the protection devices, etc. In this case, set the fan speed to “MED”, “HIGH” or “HIGH 2”.
- The heating operation is not available when the ambient temperature is higher than approximately 70°F (21°C).

<p>Before Operation</p>	<p>Turn ON the power supply. Apply power to unit(s) for approximately 12 hours before operation in order to preheat the compressor.</p> <p>Do not turn OFF the main power of the indoor unit during season of heating or cooling.</p>	
<p>1</p>	<p>Press and hold “Mode” switch for more than 3 seconds. The indication “Ⓐ” (automatic cooling/heating operation) will appear.</p> <p>When “Mode” switch is pressed at “Ⓐ”, the fan operation is started.</p>	<p>Indicators for temperature setting, fans speed, and airflow angle are displayed.</p>  <p>Displayed settings remain illuminated for 10 seconds after the unit operation is stopped before going dark.</p>

2	<p>Point the transmitter portion of wireless controller towards the receiver and press “On ” switch.</p> <p>When the transmitting indicator “” flashes, the RUN indicator (orange) on indoor unit is turned ON and the beep sound is heard. The operation is started.</p> <p>NOTE: Do not press “On ” and “Off ” switches repeatedly (within 3 seconds). If the switch is pressed frequently, the wireless controller may not work correctly.</p>	 <p style="text-align: center; font-size: small;">The figure shows for TIWM015B21S to TIWM024B21S.</p>
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< Temperature, Fan Speed and Airflow Direction Setting >

- To set the temperature, fan speed and airflow direction, refer to Section 5.2.2 “Temperature, Fan Speed and Airflow Direction Setting”.

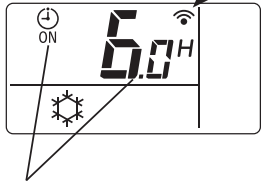
Stop	<p>Point the transmitter towards the receiver and press “Off ” switch.</p> <p>The RUN indicator (orange) on the indoor unit is turned OFF and the beep sound is heard. The indications of setting temperature, fan speed, and airflow angle are turned OFF. The operation is stopped.</p>	 <p style="text-align: center; font-size: small;">The indications of setting temperature, fan speed, and airflow angle are turned OFF.</p>
-------------	---	---

- The indoor unit fan may continue to operate for up to two minutes following the heating cycle to dissipate residual heat from the indoor unit.

5.2.4 Timer Setting

< Function >

- This function is used to start or stop unit operation at a pre-set time.
- The timer setting is available for ON TIME and OFF TIME.
 On Timer ☺: The operation is started beyond the set time.
 Off Timer ☺: The operation is stopped beyond the set time.


<p>1</p>	<p>Press “On Timer ☺” or “Off Timer ☺” switch. By repeatedly pressing “On Timer ☺” or “Off Timer ☺”, the indication of setting time is changed. When the transmitting indicator “☺” flashes, the TIMER indicator (green) (indoor units) is turned ON and a beeping sound is heard. Timer setup is complete.</p> <p>Timer setup functions can be set at half hour intervals up to 10 hours and at one-hour intervals up to 23 hours after 10 hours.</p>	<p style="text-align: center;">Transmitting Indication</p>  <p>The setting time for “ON TIMER” is set to 6 hours.</p>
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5.2.5 Swing Louver Direction

< Function >

- This function is used to change the louver angle to the required angle.
- Fixed:
The louver can be set at the required angle.
- Auto-swing:
The louvers can be set to continuously oscillate.


NOTE

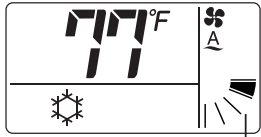
- When the wireless controllers are pressed, the transmitting indicator “” flashes on the LCD of wireless controller and a beeping sound is heard from the indoor unit.

1

Point the transmitter towards the receiver and press “LOUVER” switch to set the louver angle.
By pressing “LOUVER” switch, the louver angle will be changed as follows.

LCD Indication (Ex. Heating Mode)





The louver angle is set to 1 step at “HIGH” in the cooling mode.

By pressing the “LOUVER” switch, the louver direction will be changed as follows.

< TIWM006B21S to TIWM012B21S >

Step	1	2	3	4	5	6	7	-
LCD Indication								
Air Louver Angle	Approx. 15°	Approx. 22°	Approx. 28°	Approx. 35°	Approx. 42°	Approx. 48°	Approx. 55°	
FAN			Recommended Angle	Angle Range				
				Auto-Swing Range				
Air Louver Angle	Approx. 15°	Approx. 23°	Approx. 30°	Approx. 38°	Approx. 45°			
COOL and DRY			Recommended Angle	Angle Range				
				Auto-Swing Range				
Air Louver Angle	Approx. 25°	Approx. 30°	Approx. 35°	Approx. 40°	Approx. 45°	Approx. 50°	Approx. 55°	
HEAT				Angle Range			Recommended Angle	
				Auto-Swing Range				

Auto Swing

2

< TIWM015B21S to TIWM024B21S >

Step	1	2	3	4	5	6	7	-
LCD Indication								
Air Louver Angle	Approx. 15°	Approx. 23°	Approx. 30°	Approx. 38°	Approx. 45°	Approx. 53°	Approx. 60°	
FAN			Recommended Angle	Angle Range				
				Auto-Swing Range				
Air Louver Angle	Approx. 15°	Approx. 24°	Approx. 33°	Approx. 41°	Approx. 50°			
COOL and DRY			Recommended Angle	Angle Range				
				Auto-Swing Range				
Air Louver Angle	Approx. 30°	Approx. 35°	Approx. 40°	Approx. 45°	Approx. 50°	Approx. 55°	Approx. 60°	
HEAT				Angle Range			Recommended Angle	
				Auto-Swing Range				

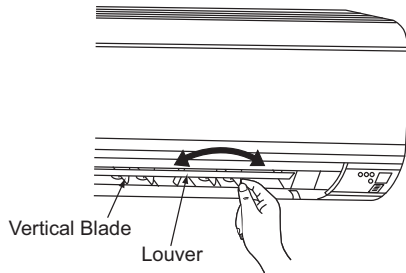
Auto Swing

NOTE:
The louver settings are only available from 1 through 5 steps and auto swing is only available in the cooling and dry modes. (Steps 6 and 7 are unavailable.)

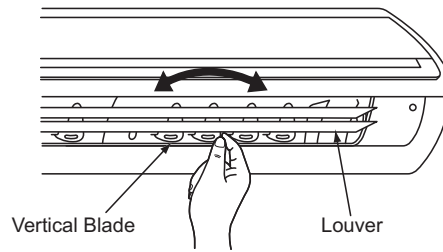
- The louver angle indicated on the LCD and the actual louver angle do not correspond precisely with each other during the auto-swing mode operation. Individual angled louver settings are displayed on the LCD display.
- The louver may NOT stop immediately right after the switch is pressed.

OPERATION

- **Adjusting Vertical Blade**
Adjust the vertical blade by hand as shown below.

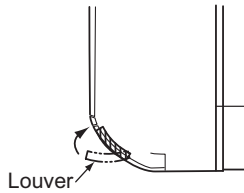


TIWM006B21S ~ TIWM012B21S

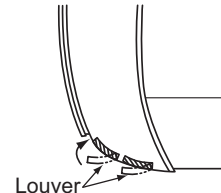


TIWM015B21S ~ TIWM024B21S

- **Automatic Louver Setting**
The swing louver is stopped and moved by controlling the wireless controller.
The louver will automatically close when the unit is stopped from the wireless controller.



TIWM006B21S ~ TIWM012B21S

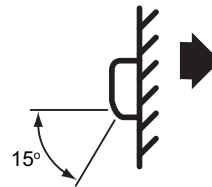


TIWM015B21S ~ TIWM024B21S

- **Louver Angle during Cooling and Dry Operation**
The louver angle self-adjusts from its default setting during times of cooling and dry conditions to prevent condensation buildup. Louver angle changes are not shown on the LCD of wireless controller.
- **Louver Angle during Heating Operation**
The louver angle self-adjust for the heating conditions.

- * When the heating operation starts
 - * When the defrost operation starts
- ➡ The louver angle is fixed to 15°.

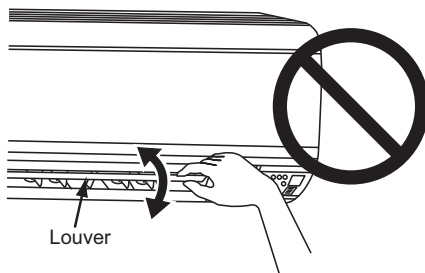
Above louver angle changes are not shown on the LCD of the wireless controller.



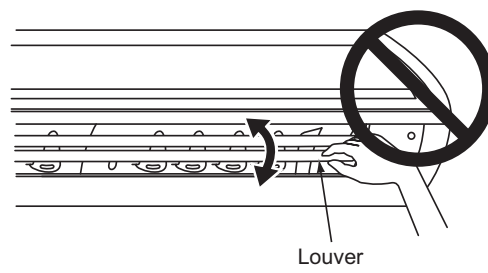
➡ When the discharge temperature is higher than 86°F (30°C), the louver angle automatically returns to the setting condition.

NOTICE

Do not attempt to move the louver by hand as this will damage the automatic louver setting function.



TIWM006B21S ~ TIWM012B21S



TIWM015B21S ~ TIWM024B21S

5.2.6 Emergency Operation

< Function >

When the wireless controller battery power dies, the emergency operation switch on the unit is used.

NOTE

The operation is as follows.

< Automatic Cooling/Heating Operation >

Setpoint Temperature: 77°F (25°C)

Fan Speed: HIGH

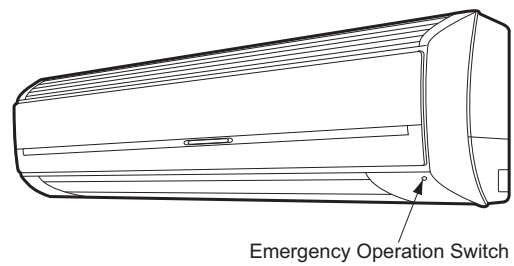
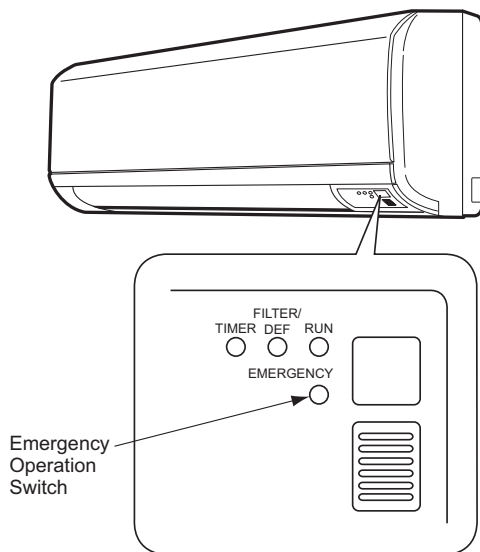
Louver Angle: Horizontal

< TIWM006B21S ~ TIWM012B21S >

Press the emergency operation switch.

< TIWM015B21S ~ TIWM024B21S >

Press the emergency operation switch with a non-metallic tool, etc.



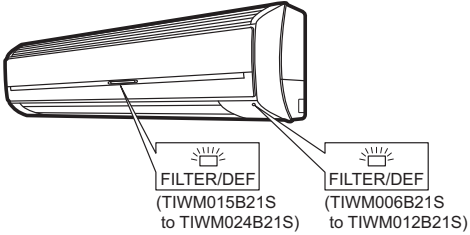
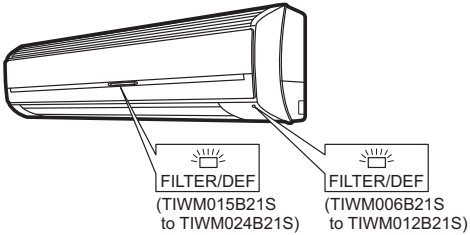
The emergency operation is stopped when the emergency operation switch is pressed again.

NOTE:

Do not use metallic pins, paper clips, or pens to activate the emergency operation switch. A failure could occur.

5.2.7 Other Indications

< In Normal Condition >

<p>Defrost (for Cooling/Heating Unit Only)</p>	<p>< Defrost Operation > The "FILTER/DEF" indicator (yellow) is turned ON during the defrosting. The louver is stationary. The louver indication of LCD continues to be activated.</p> <p>< Operation Stoppage during Defrosting Operation > The RUN indicator (orange) is turned OFF when pressing "Off ○" switch during the defrosting. The operation continues with the "FILTER/DEF" indicator (yellow) turned ON, and the unit will be stopped after finishing defrost operation.</p>	 <p>The figure shows for TIWM015B21S to TIWM024B21S.</p>
<p>Filter</p>	<p>< Filter Sign > The air filter will need to be cleaned when the "FILTER/DEF" light turns yellow. This occurs when the operation time has accumulated 200 hours. After cleaning, point the transmitter towards the receiver and press "Reset" button to turn OFF the "FILTER/DEF" indicator.</p>	 <p>The figure shows for TIWM015B21S to TIWM024B21S.</p>

NOTE:

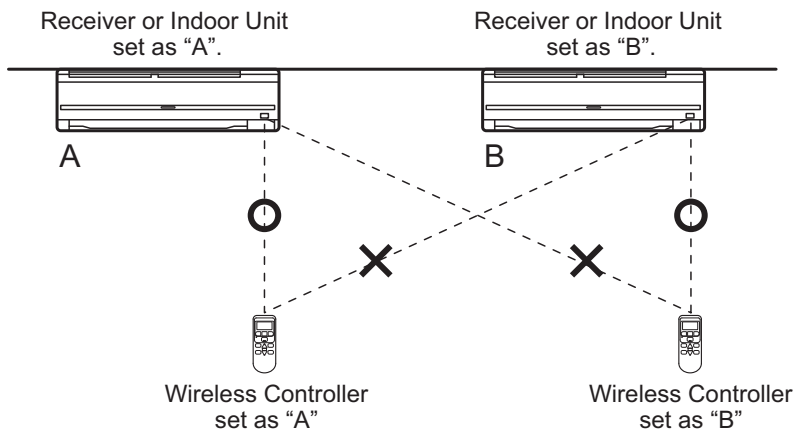
During heating operation, the fan speed may be changed to low due to air inlet thermistor control. However, the indication is not changed.

< In Abnormal Condition >

<p>Abnormal</p>	<ul style="list-style-type: none"> The RUN indicator (orange) will flash (0.5 second ON / 0.5 second OFF) when a fault is generated or a safety device activates during TEST RUN or normal operation. <p>The type of an alarm code is determined by how many times in sequence it flashes.</p>	<p>< Example > Alarm 3 5</p> <p>└─ "TIMER" (green lamp) └─ "FILTER/DEF" (yellow lamp)</p> <p>"TIMER" flashes 3 times (0.5 second ON / 0.5 second OFF)</p> <p>"FILTER/DEF" flashes 5 times (0.5 second ON / 0.5 second OFF)</p> <p>These indications are repeated until the alarm is reset.</p> <table border="1"> <thead> <tr> <th>Item</th> <th>Indicator</th> <th>Indication Color</th> <th>Flashing Times</th> </tr> </thead> <tbody> <tr> <td>Tens Digit</td> <td>TIMER</td> <td>Green</td> <td>Tens digit is indicated by number of flashing times.</td> </tr> <tr> <td>Unit Digit</td> <td rowspan="2">FILTER/DEF</td> <td rowspan="2">Yellow</td> <td>Unit digit is indicated by number of flashing times.</td> </tr> <tr> <td>Alphabet</td> <td>Alphabet is indicated by number of flashing times as follows. A...10 times / B...11 times / C...12 times</td> </tr> </tbody> </table>	Item	Indicator	Indication Color	Flashing Times	Tens Digit	TIMER	Green	Tens digit is indicated by number of flashing times.	Unit Digit	FILTER/DEF	Yellow	Unit digit is indicated by number of flashing times.	Alphabet	Alphabet is indicated by number of flashing times as follows. A...10 times / B...11 times / C...12 times
Item	Indicator	Indication Color	Flashing Times													
Tens Digit	TIMER	Green	Tens digit is indicated by number of flashing times.													
Unit Digit	FILTER/DEF	Yellow	Unit digit is indicated by number of flashing times.													
Alphabet			Alphabet is indicated by number of flashing times as follows. A...10 times / B...11 times / C...12 times													
<p>Power Failure</p>	<ul style="list-style-type: none"> All the indications are OFF. Once a power failure has occurred, the unit will not restart even though power is restored. Repeat the starting procedure. In the case of instantaneous power failure within 2 seconds, the unit will be started again automatically. 															
<p>Electric Interference</p>	<p>A unit shutdown with all indicators OFF is caused by electronic interference (noise). The micro-computer was activated, thus setting the process in motion. Repeat the starting procedure.</p>															

5.2.8 Identifying Indoor Units Installed Side by Side

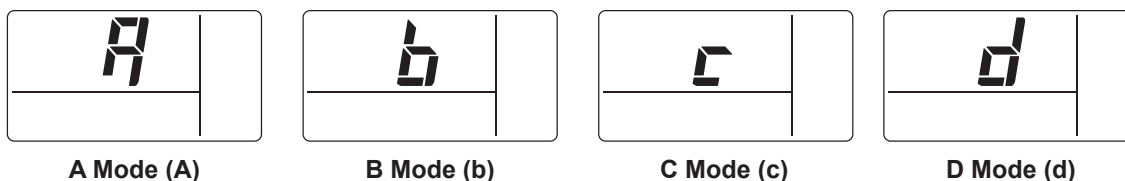
This function is used when operating several receivers or indoor units side by side, to prevent a malfunction because incorrect signals were received from the wireless controllers used in other areas. Only the communication between the paired setting is possible, and four pairs (A, B, C, D) are available. For example, the receiver set as “A” can only receive signals from the wireless controller set as “A”. It cannot receive signals from wireless controller set as B, C or D.



Refer to the “Installation and Maintenance Manual” or the “Operation Manual” for each receiver kit or indoor unit settings. Depending on the type of receiver kit or the indoor unit, only settings A and B are available and not C or D. In that case, set the wireless controller as A or B.

• Procedure for this function

- (1) Press both “On Timer” and “Reset” switches for 3 seconds.
- (2) The current value set for this function will be displayed (A, B, C or D).



- (3) Press “▽” to change the setting in ascending order. ($\Rightarrow A \rightarrow B \rightarrow C \rightarrow D \Leftarrow$)
 Press “△” to change the setting in descending order. ($\Leftarrow A \leftarrow B \leftarrow C \leftarrow D \Leftarrow$)

NOTE:

The setting will be recorded each time “On ⏻” switch is pressed.

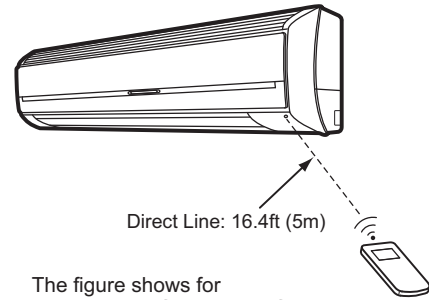
- (4) Press “Off ○” switch to exit this function and reset.

NOTE:

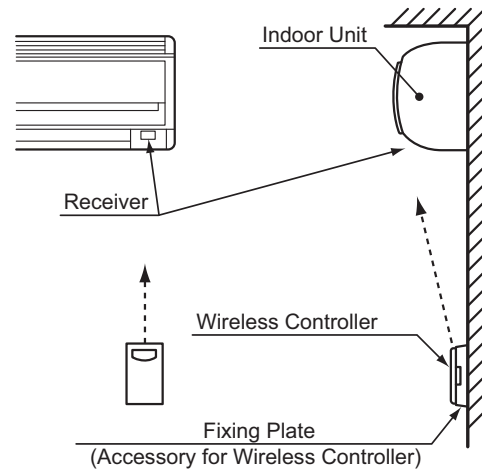
If no operation is performed 30 seconds after this function is displayed, it will automatically end and reset.

5.2.9 Handling Wireless Controller

- Point the transmitter towards the receiver.
The distance for transmitting is approximately 16.4ft (5m) maximum. (The distance for transmitting shortens if the transmitting angle is not vertical to the receiver or if there is other electronic interference in the room.) Maintain a minimum of 3.3ft (1m) distance between the indoor unit and light fixtures.



- Before installation of the indoor unit, ensure that the receiver can correctly receive commands from the wireless controller.
- Handle the wireless controller with care. It is fragile and susceptible to damage by moisture.



6. Automatic Control

This air conditioner automatically starts the following operations according to the indoor conditions.

The system is equipped with the following functions.

Three-Minute Guard		<ul style="list-style-type: none"> ▪ Enforced Stoppage: The compressor remains off for at least three minutes once it has stopped. If the system is started within approximately three minutes after it has stopped, the RUN indicator is activated. However, the cooling operation or the heating operation remains off and does not start until after three minutes has elapsed. ▪ Enforced Operation: If all indoor units of the system are Thermo-OFF within approximately three minutes after the compressor has started, the compressor is operated during three minutes continuously. However, if all indoor units of the system are stopped by a controller, compressor has stopped.
Cooling and Dry	Frost Prevention	When the indoor unit is operated at a low discharge air temperature, the cooling operation may be changed to fan operation for a while to avoid frost formation on the indoor heat exchanger.
	Self-Cleaning of Expansion Valve	The expansion valve self-cleaning when the cooling operation has stopped. The sound of which the refrigerant flows may be heard from the indoor unit during the self-cleaning. This is not abnormal.
	Condensate Prevention	To prevent condensation, the unit operates with its louver at a different angle from the specified setting for a certain period of time. Even in this case, the LCD of the wireless controller indicates the specified louver angle.
	Fan Operation during Power Saving Control	When the power saving operation is performed, the louver control is changed to auto mode or fixed downward angle. The LCD on the wireless controller indicates it has not changed.
Heating	Hot Start	To prevent cold air discharge in the room, the fan speed is controlled from the slow position and the low position and then to the set position according to the discharge air temperature. At this time the louver is fixed horizontally and "HOT-START" is displayed on the LCD of the wired controller.
	Defrost Operation	The indoor unit fan operation is stopped to prevent cold air discharge during the defrost operation. At this time, the indication "HOT-START" is displayed on the LCD of the wired controller and the indoor unit fan louver angle is fixed horizontally.
	Residual Heat Removal	When the heating operation is stopped, the indoor fan operation may be kept at the slow position for a maximum of two minutes to lower temperature of the inside of the indoor unit.
	Prevention of Overload Operation	When the outdoor temperature is high (approx. 70°F (21°C) or more) during the heating operation, the operation is stopped by activation of the outdoor thermistor.

NOTE

- This air conditioner adopts a hot air circulation system for the heating operation. If the space is large or the room temperature is excessively low, it takes time to heat the entire room. If the room has been heated enough and discharged air reaches a required temperature, the indication "HOT-START" will be turned OFF after heating the room.
- The indication "HOT-START" may be displayed during, or right after, the defrosting operation. "HOT-START" is activated during defrost to ensure comfort by reducing the delivery of cold air in the heating cycle. This is NOT abnormal.

7. Maintenance

⚠ WARNING

- Turn OFF the power source before the maintenance work. If the power source is not turned OFF, the result may be an electric shock or fire.
- Perform the maintenance work with a stable foothold or foundation. This may prevent falling or injury.

⚠ CAUTION

- When the flat panel is opened (closed) or the air filter is attached (removed), hold them firmly. If not, it may cause falling or injury.

NOTICE

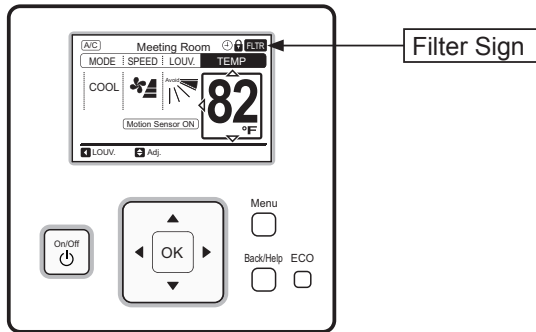
Do not operate the system without the air filter to protect the indoor unit heat exchanger against being clogged.

7.1 Daily Maintenance

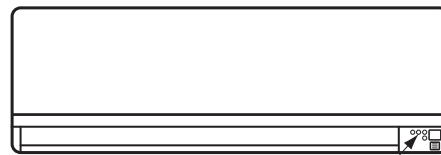
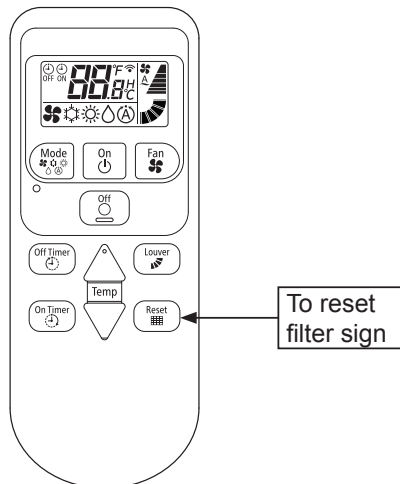
7.1.1 Cleaning Air Filter

Clean the air filter when the filter sign is turned ON.

< CIW01 >

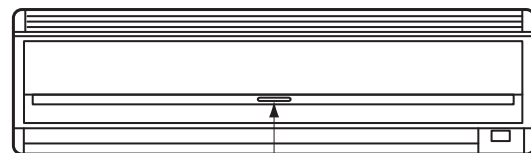


< CIR01 >



Filter Sign
(The yellow lamp
is turned ON.)

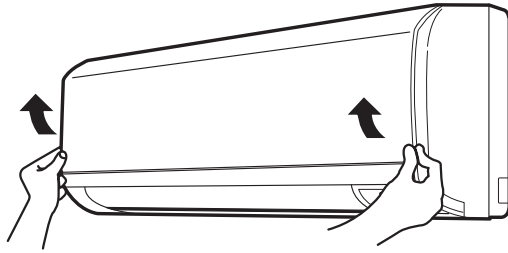
TIWM006B21S to TIWM012B21S



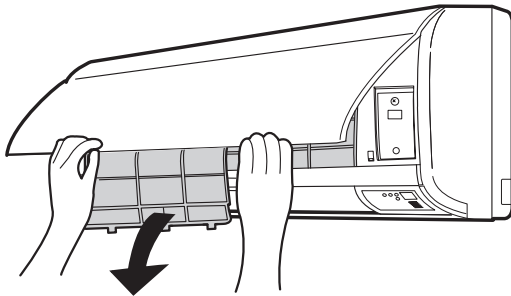
Filter Sign
(The yellow lamp
is turned ON.)

TIWM015B21S to TIWM024B21S

- (1) Open the flat panel.
Hold both sides of the flat panel and lift it up.



- (2) Remove the air filter.
Release the two (2) catches and pull the air filter downward to remove it.



The figure shows for TIWM006B21S to TIWM012B21S

CAUTION

Raise the flat panel until it locks into open position. Otherwise, the flat panel closes and it may cause injury.

- (3) Clean the air filter.
 - Wash the filter with mild soap and warm water or vacuum-clean.
 - Dry the air filter in the shade.

NOTE

- Do not use water warmer than 122°F (50°C). Air filter element can be damaged by heat.
- Do not dry the air filter by holding it over open flame, with a hair dryer, or any type of heating device. Filter elements can be damaged by heat.

- (4) Attach the air filter.
After the air filter has been cleaned with water and dried, reattach with the “FRONT” indicators in the proper position.

NOTICE

Be sure to attach the air filter.
If the indoor unit is operated without the air filter, it may cause malfunction of the indoor unit.

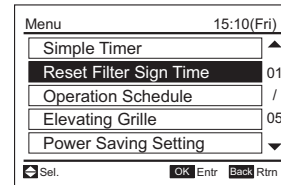
- (5) Reset the filter sign.

< CIW01 >

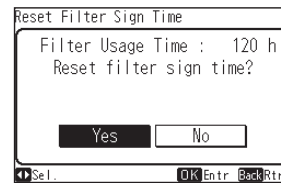
NOTE

If the default time period for filter cleaning has not been set, the indication “☒” appears and “Setting Disabled” will be displayed.

- Press “Menu”.
Select “Reset Filter Sign Time” from the menu and press “OK”.
The confirmation screen will be displayed.



- Select “Yes” by pressing “<” or “>” and press “OK”.
The indication of “FLTR” will be turned OFF and the screen will return to the normal mode.



< CIR01 >

Point the transmitter toward the receiver and press “Reset” switch. The filter sign of unit is turned OFF and the time before the next filter cleaning will be accumulated.

7.1.2 Maintenance for Flat Panel

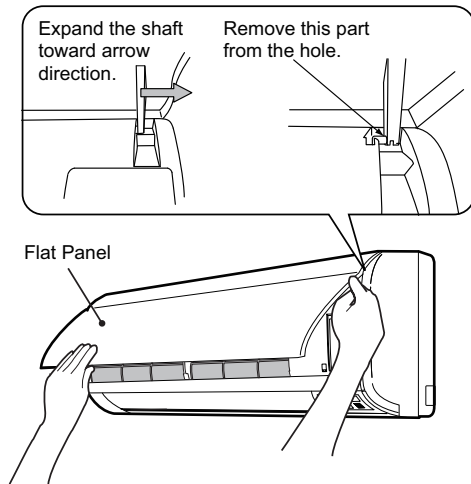
NOTICE

- Gently wipe down using only a clean soft cloth. Using Benzene type thinners or chemical detergents and abrasives as cleaning agents can damage the finish of plastic surfaces and louvers. In addition, pay attention that the parts around the air outlet (louver, guide, etc.) may be damaged if an excessive force is applied.
- The flat panel can be removed using both hands and cleaned.

< TIWM006B21S to TIWM012B21S >

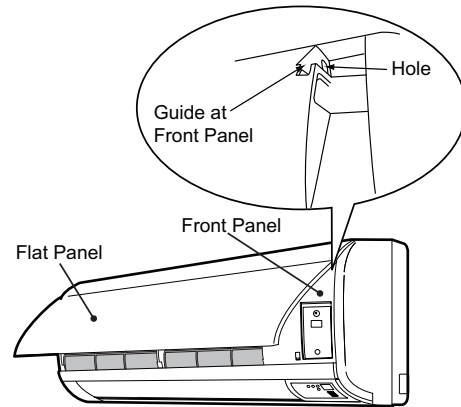
(1) Removing Flat Panel

Hold both ends of flat panel and open it fully. After the right arm shaft is expanded outward and shafts are removed from the front panel, pull the flat panel forward while the right arm shaft is expanded outward.



(2) Attaching Flat Panel

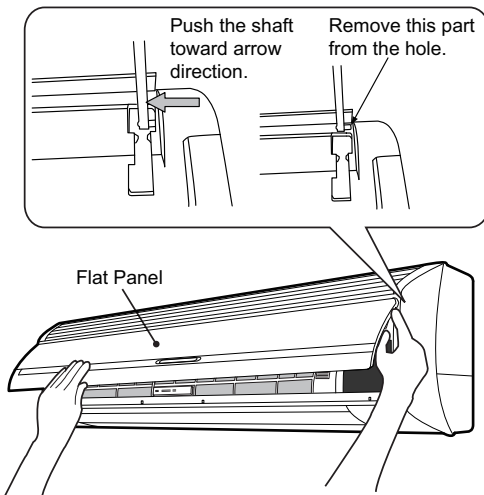
Insert both support arms into the recessed openings and close the lid. Check that the flat panel is attached completely, and close the flat panel.



< TIWM015B21S to TIWM024B21S >

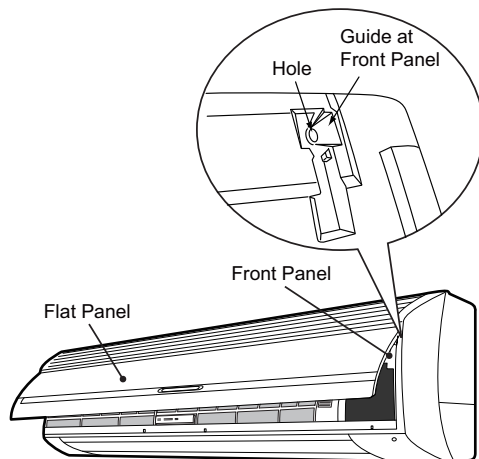
(1) Removing Flat Panel

Hold both sides of flat panel and open it fully. After the right arm shaft is pushed inward and shafts are removed from the front panel, pull the flat panel forward while the right arm shaft is slightly pushed inward.



(2) Attaching Flat Panel

Insert both support arms into the recessed openings and close the lid. Check that the flat panel is attached completely, and close the flat panel.



7.2 Maintenance Prior to and After Use

Prior to Use

- Remove any obstacles around the air inlet grilles and the air outlet of the indoor unit and outdoor unit.
- Check that the air filter is not clogged with dust and dirt.

After Use

- Clean the air filter, the air inlet grille and the flat panel.

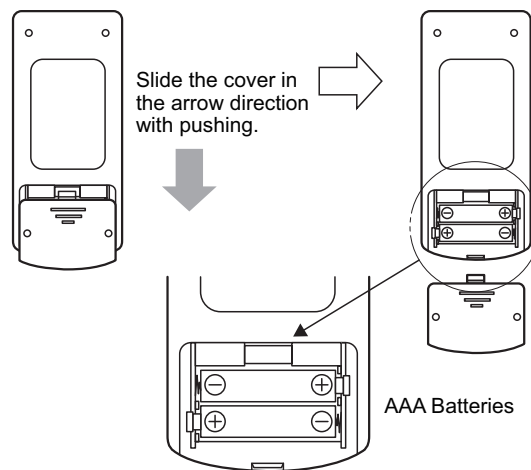
7.3 Replacing Batteries (CIR01)

Under the normal use, battery life should be about 1 year (in the case of alkaline batteries).

Replace the batteries if the following phenomenon occurs:

The transmission distance between the wireless controller and the receiver gets shorter for operation or fan speed adjustment.

- (1) Remove the battery cover by sliding it in the direction of the arrow by pushing the cover apart as shown in the figure below.
- (2) Set the batteries.
(Insert the batteries according to the marks + and - on the case.)



NOTES:

- Follow these precautions for battery use.
 1. Never use the new and used batteries together.
 2. Never use different types of batteries (for example manganese battery and alkaline battery) together.
 3. When the wireless controller is not used for a long time (more than 2 or 3 months), remove the batteries.
- When the batteries are replaced, wait at least 5 seconds before installing new batteries.
- All settings are reset after batteries are replaced. Therefore, when "Identifying Indoor Units Installed Side by Side" is set, this setting is cancelled once the batteries are replaced. After replacing the batteries, set the "Identifying Indoor Units Installed Side by Side" command.
(Press and hold "On Timer ⌚" and "Off Timer ⌚" simultaneously for 3 seconds. The indication "b" will appear. Refer to the item 5.2.8 for details.)

8. Troubleshooting

8.1 This is Not Abnormal

Phenomenon		Cause and Action
Operation Stopped	All indication lamps on the wired controller are turned OFF.	The micro-computer is activated to protect the device from electromagnetic waves. Restart the operation.
	After Power Failure	Restart the operation. If the instantaneous power failure is within two seconds, the operation restarts automatically.
White Steam from Indoor Unit	During Heating Operation	Dust attached to the heat exchanger has been dried.
White Smoke from Indoor Unit	At Beginning of Heating Operation Season	This might occur when dust attached to the heat exchanger has been dried.
Mist from Indoor Unit	In Restaurant or Kitchen	This might occur when oil attached to the fins might decrease the heat exchange efficiency.
	During Dry Operation	This might occur when the air outlet temperature becomes lower. Change the operation mode.
	During Cooling Operation in Humid Environment	This might occur when the air outlet temperature becomes lower. Raise the set temperature and the air flow volume.
Odor from Indoor Unit	Odor Discharged from Indoor Unit	This might occur when the smell of cigarette smoke infiltrated the inside of the indoor unit. Ventilate the unit well in the fan mode and clean the air filter, the air outlet and the air inlet grille.
Sound from Indoor Unit	Grate is heard when starting or stopping the operation.	This is the sound made when the components are rubbing against each other due to the extension and contraction of the resin parts caused by the temperature change.
	Sound of water flowing or bubbling during the operation.	This is the sound made when the refrigerant flows or the drain-up mechanism drains water. The sound may be heard especially when starting the operation or stopping the compressor (for approx. three minutes).
	Growling sound may be heard temporarily right after the air flow volume is changed.	It is generated because the fan motor makes temporary sound by change of fan speed.
Condensation on Front Panel	Condensation on front panel or cabinet or condensation drips	This might occur when the operation is performed in humid location (relative humidity is approximately 80%) over a prolonged period of time.
Temperature Irregularity	The air flow volume and temperature of each air outlet are irregular.	This might occur for structural reasons, such as the size of air outlet and the location of heat exchanger.
“HOT-START” on LCD Turned ON		This might occur according to the operation mode or operation conditions.
Operation Mode on LCD Flashing		

8.2 Before Contacting a Contractor

Refer to the information below before contacting a contractor.

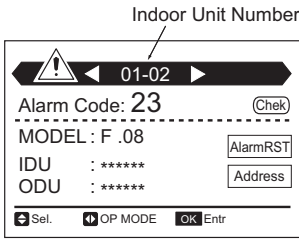
Trouble		Check Point	Action
Operation Unavailable		Check that the main power source is turned ON.	Turn ON the main power source for the air conditioner.
		Check that the fuse is not blown out or the circuit breaker of the main power source tripped.	Replace the fuse or reset the circuit breaker. If the trouble recurs, contact your contractor or distributor.
Immediate Shutdown after Start-up	Cooling	Check that the air inlet and outlet of the outdoor unit are not covered with paper, vinyl or other objects.	Remove objects covering the air inlet and outlet.
	Heating	Check for any obstacles preventing the air flow near the air inlet and outlet of the outdoor unit.	Remove the obstacles preventing the air flow.
		Check that the outlet air is not short-circuited to the air inlet.	
Insufficient Cooling or Heating		Check that the operation mode is correct.	If the fan mode is selected, switch the operation mode to cooling or heating.
		Check that the set temperature is correct.	If not, change the set temperature by pressing “Δ” or “▽” by the wired controller.
		Check that the air flow direction is correct.	If not, change the air flow direction. In the case that the footing is not heated well during the heating operation, change the louver downward.
		Check that the air filter is not clogged.	Clean the air filter.
		Check that a window or a door is not opened.	Close the window or the door.
		Check for any obstacles preventing the air flow near the air inlet and outlet of the indoor and outdoor units.	Remove the obstacles.

8.3 Contact Distributor

If problem still remains even after checking previous issues or other problems not mentioned in the previous issues occur, stop using the product and contact your distributor or contractor.

! WARNING

If an abnormality such as a burnt odor or something similar occurs, stop the operation and turn OFF the main power source immediately. If the power source is not turned OFF, there may be damage of the product, an electric shock or a fire. Contact your distributor or contractor.

Trouble	Action before Contacting Contractor or Distributor
The protection devices (fuse, breaker, GFCI, and so forth) are frequently activated or the operation switch does not work.	Turn OFF the power source.
Water Leakage from the Indoor Unit.	Stop the operation.
<ul style="list-style-type: none"> • The RUN indicator (red) is flashing. • The indoor unit number, the alarm code, the unit model code and the number of connected indoor units are displayed on the LCD. • In a case where the plural indoor units are connected to one controller, the above abnormality informations for each indoor unit is displayed individually. <p>Check the details on the LCD and contact your distributor.</p> <div style="text-align: center;">  </div>	<p>Refer to the alarm code table. Contact your distributor and advise the indication detail on the wired controller.</p>

Provide the following information when contacting your distributor.

- 1) Unit Model**
- 2) Explain the Trouble or Problem**
- 3) Alarm Code No. on the LCD or Details of a Flashing Indicator**

8.4 Alarm Code

Code	Category	Content of Abnormality	Code	Category	Content of Abnormality
01	Indoor Unit	Activation of Protection Device	35	System	Incorrect Setting of Indoor Unit No.
02	Outdoor Unit	Activation of Protection Device (High Pressure Cut)	36		Incorrect Indoor Unit Combination
03	Communication	Operational Irregularities between Indoor and Outdoor	38		Problem with Protective Pickup Circuit in Outdoor Unit
04		Problem between Inverter PCB and Outdoor PCB	39	Compressor	Problem with Running Current at Constant Speed Compressor
05	Supply Phase	Problem of Power Source Phases	41	Pressure	Overload Cooling
06	Voltage	Abnormal Voltage Drop in Outdoor Unit	42		Overload Heating
07	Cycle	Decrease in Superheated Discharge Gas	43	Protection Device	Activation of Pressure Ratio Decrease Protection Device
08		Increase in Discharge Gas Temperature	44		Activation of Low Pressure Decrease Protection Device
09	Outdoor Unit	Activation of Protection Device for Outdoor Fan	45		Activation of Low Pressure Increase Protection Device
11	Sensor on Indoor Unit	Inlet Air Thermistor Failure	46		Activation of High Pressure Increase Protection Device
12		Outlet Air Thermistor Failure	47		Activation of High Pressure Decrease Protection Device
13		Freeze Protection Thermistor Failure	48	Activation of Overcurrent Protection Device	
14		Gas Piping Thermistor Failure	51	Inverter	Problem with Inverter Current Sensor
19	Fan Motor	Activation of Protection Device for Indoor Fan	52		Activation of Inverter Overcurrent Protection
20	Sensor on Outdoor Unit	Compressor Thermistor Failure	53		Activation of Transistor Module Protection
21		High Pressure Sensor Failure	54		Abnormality of Inverter Fin Temperature
22		Outdoor Air Thermistor Failure	56	Outdoor Fan	Abnormality of Detection for Fan Motor Position
23		Discharge Gas Thermistor Failure	57		Activation of Fan Controller Protection
24		Evaporating Thermistor Failure	58		Abnormality of Fan Controller
29		Low Pressure Sensor Failure	b0	System	Incorrect Setting of Unit Capacity
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit	b1		Incorrect Setting of Unit and Refrigerant Cycle No.
32			Incorrect Setting of Other Indoor Unit Number	EE	Compressor

2.2 Control Device

2.2.1 Wired Controller

Model: CIW01



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1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system, including this controller, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least three feet (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.

- If the controller is installed in a location where electromagnetic radiation is generated, make sure that the controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the run test, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35° to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- If the remote sensors are not used with this controller, then do not install this controller...
 - In a room where there is no thermostat.
 - Where the unit is exposed to direct sunshine or direct light.
 - Where the unit will be in close proximity to a heat source.
 - Where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - In areas with poor air circulation and ventilation.
- Perform a run test using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the run test, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

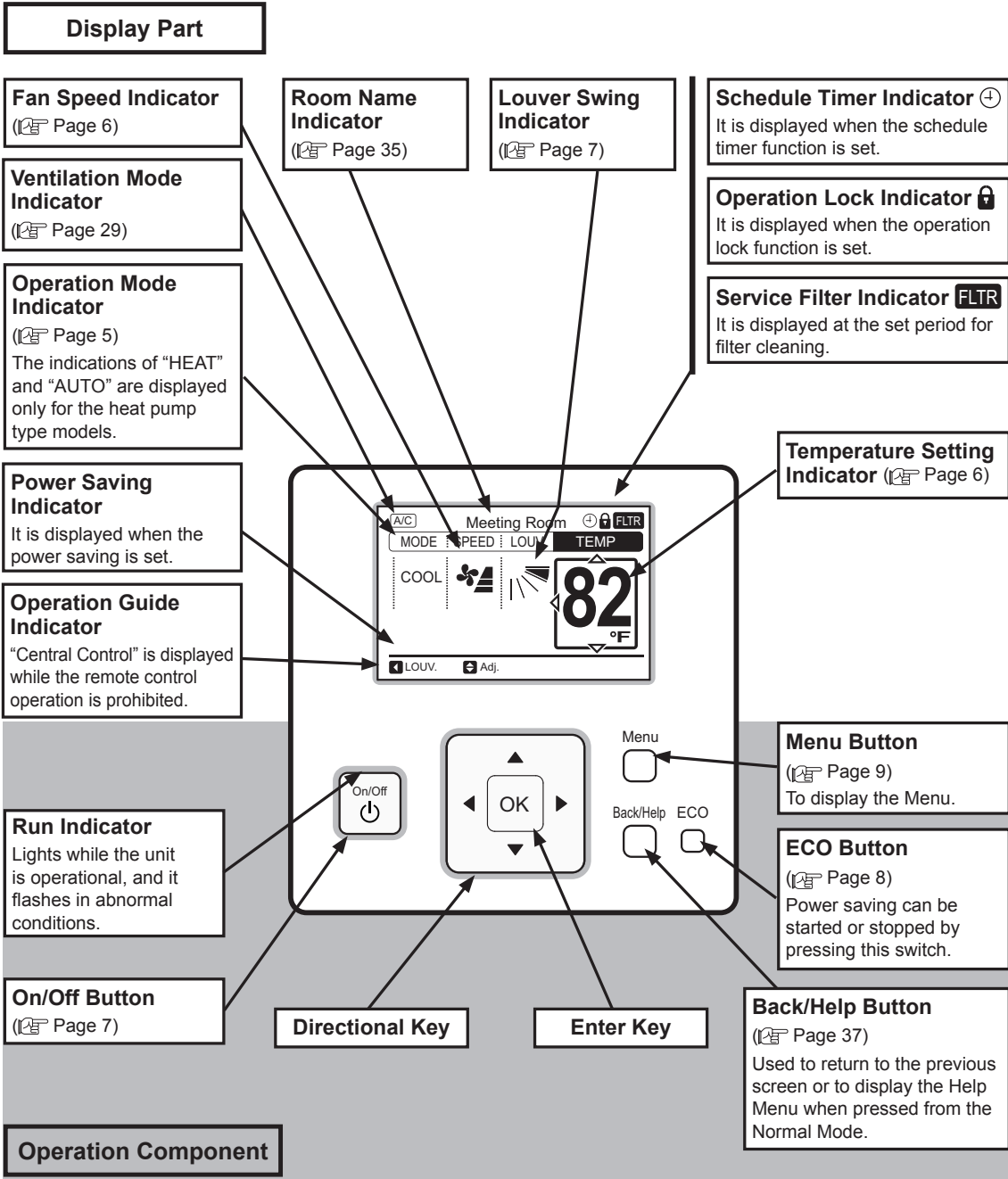
- Only use electrical protection equipment and tools suited for this installation.
- Insulate the controller against moisture and temperature extremes.
- Use specified cables between units and the controller.
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.

OPERATION

- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

2. Switch Names and Functions

The figure below shows all the functions for reference. The actual display during operation is different.



Operation Component


Backlight
Backlight is turned ON by pressing any button. In an instance of using two controllers, only the first operated controller turns ON a backlight; the other does not turn ON backlight.

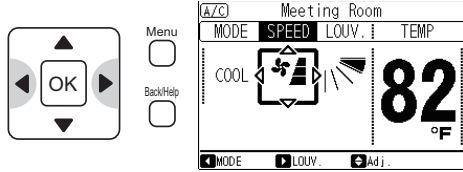
NOTE:
Make sure to press the buttons lightly with your fingertips. Do NOT press the buttons or anything with sharp points, such as a ball point pen. The operational functionality of the controller may become damaged.

3. Operation Method

3.1 Basic Procedures

(1) Function Selection

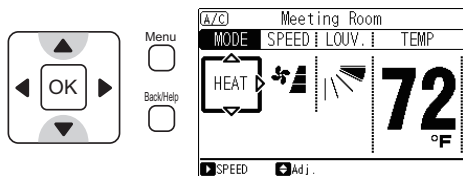
By pressing “◀” or “▶”, the icon “” will move to the next function in order of the functions “MODE”, “SPEED”, “LOUV.” and “TEMP”.



(2) Change of Settings

With the function (“MODE”, “SPEED”, “LOUV.” or “TEMP”) selected, press “Δ” or “∇”.

The setting will be changed.



3.2 Operation Mode

(Cooling, Heating, Dry, Cooling/Heating Automatic and Air Flow Operation)

<Function>

- * Cooling Operation (COOL):
To decrease the room temperature.
- * Heating Operation (HEAT):
To increase the room temperature.
- * Dry Operation (DRY):
To decrease the humidity in the room.
- * Cooling/Heating Automatic Operation (AUTO):
To cool and heat automatic changeover.
- * Air Flow Operation (FAN):
To circulate the air in the room.

ATTENTION

The recommended temperature set-point is as follows:

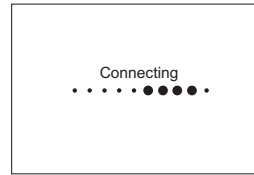
- * Cooling Operation: 80 to 84°F (27 to 29°C)
- * Heating Operation: 64 to 68°F (18 to 20°C)
- * Dry Operation: 74 to 77°F (23 to 25°C)

<Before Operation>

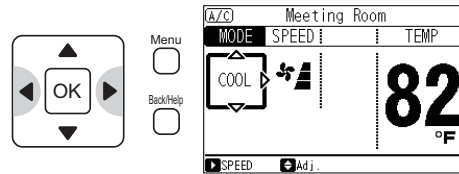
CAUTION

Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.
Do NOT turn OFF the power supply during change of seasons.
Make sure that the outdoor unit is not covered with snow or ice. If covered, remove it by using warm water less than 122°F (50°C).
If the water temperature is higher than 122°F (50°C), it will cause damage to plastic parts.

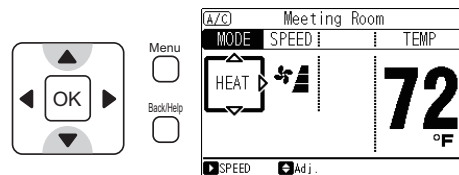
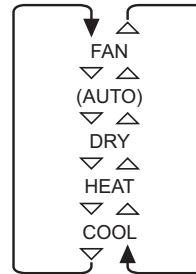
(1) Turn ON the power supply.



(2) Press “◀” or “▶” and select “MODE”.



(3) By pressing “Δ” or “∇”, the operation mode will be changed as follows.



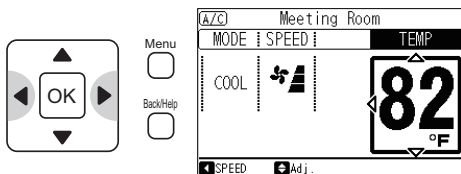
NOTE:

The advanced setting is required for the “AUTO” operation. Contact your distributor for detailed information.

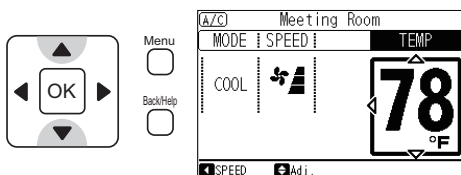
4. Setting Method

4.1 Temperature Setting

- (1) Press “<” or “>” and select “TEMP”.



- (2) By pressing “Δ”, the temperature is increased by 1°F (0.5°C) to a maximum of 86°F (30°C).
By pressing “∇”, the temperature is decreased by 1°F (0.5°C).
Cooling, Dry, Air Flow operation:
A minimum of 66°F (19°C)
Heating operation: A minimum of 62°F (17°C)

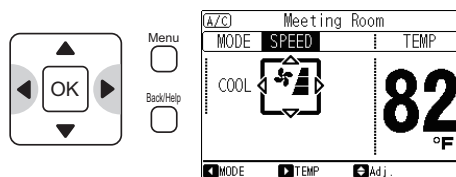


NOTE:

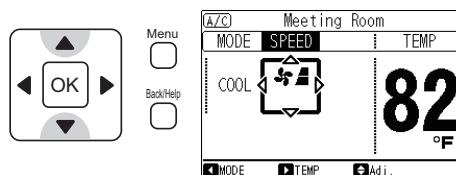
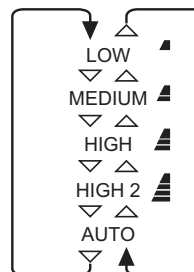
- Depending on the type and setting of the indoor unit, it may not be possible to set the temperature by 1°F (0.5°C).
- The max./min. temperature may differ depending on the type of indoor unit.
- Minimum and maximum temperature set-point limits can be configured by selecting a cooling lower limit and heating upper limit in the “Function Selection” mode of the wired controller’s Test Run Menu.
- When the “Automatic Reset of Setting Temperature” function is selected, the temperature is automatically returned to the preset temperature after the temperature set-point change.
- Contact your distributor for detailed information about “Automatic Reset of Setting Temperature” and “Cooling Lower Limit Value and Heating Upper Limit Value for Setting Temperature” functions.

4.2 Fan Speed

- (1) Press “<” or “>” and select “SPEED”.



- (2) By pressing “Δ” or “∇”, the fan speed will be changed as follows.

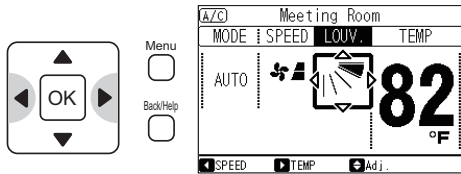


NOTE:

- During dry operation, the fan speed is automatically changed to “LOW” and cannot be changed to another fan speed. (“LOW” will NOT be displayed on the liquid crystal display (LCD) at this time. The present setting condition will be displayed on the LCD.)
- The fan speed settings “HIGH 2” and “AUTO” may not be available depending on the indoor unit type.

4.3 Louver Swing Direction

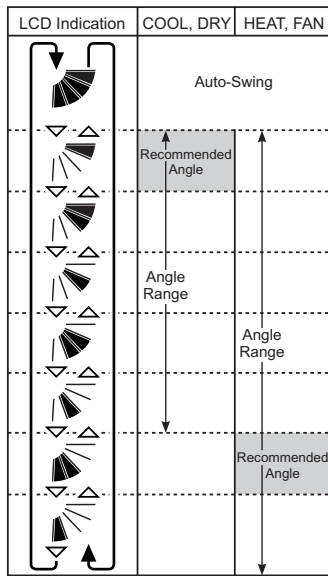
- Press "⏻" (On/Off).
Make sure that the power is ON. Press "◀" or "▶" and select "LOUV."



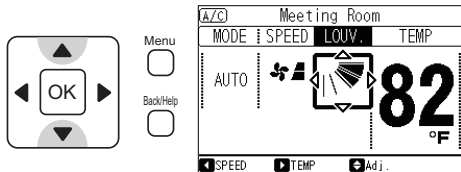
NOTE:

For the indoor unit without the auto louver mechanism, the indication of "LOUV." will NOT be displayed on the LCD.

- By pressing "▲" or "▼", the louver direction will be changed as follows.



: Auto swing operation will be started. At this time, the louver will swing repeatedly on the LCD.



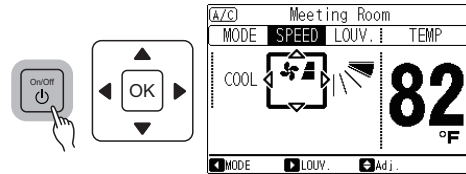
NOTE:

- The air flow angle is different for each indoor unit type. Check for detailed information in the Installation and Maintenance Manual for the indoor unit to be used.
- The louver position on the LCD and the actual louver position may not match during the auto swing operation.
To set the louver positions, set the angle after checking the position on the LCD.
- The louver may NOT stop immediately after the switch is pressed.

5. Operation

5.1 Operation Start

Press "⏻" (On/Off).
The run indicator will be turned on and the operation will be started.



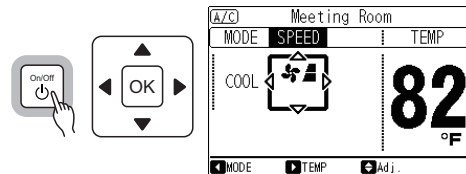
NOTE:

< Temperature/Air Flow Setting >

Temperature set-point and airflow settings will be retained after the indoor unit is turned off at the controller. If a setting change is required, refer to Sections 3.1 to 4.3.

5.2 Operation Stop

Press "⏻" (On/Off) again.
The run indicator will be turned off and the operation will be stopped.



NOTE:


The indoor unit fan may continue to operate for up to two minutes following the heating cycle to dissipate residual heat from the indoor unit.

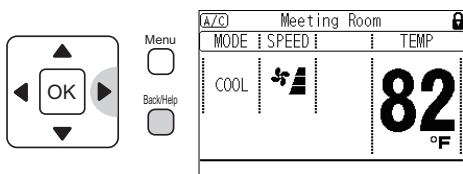
6. Operation Lock


- This function is used to lock a setting.
- The following functions are applicable.
 - Operation Mode (MODE)
 - Temperature Setting (TEMP)
 - Fan Speed (SPEED)
 - Louver Swing Direction (LOUV.)

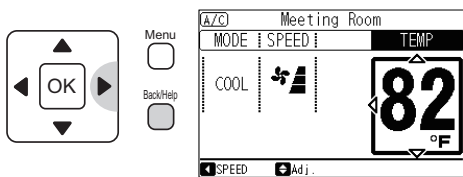
NOTE:

When "Lock function for operation mode selection" is selected, the operation lock performs the following procedures

- (1) To set the operation lock, press “▷” and “Back/Help” simultaneously for three seconds. The icon “” will appear to show the lock is turned ON. When pressing “◁” or “▷”, locked setting items will be skipped.



- (2) To cancel the operation lock, press “▷” and “Back/Help” simultaneously for three seconds. “” will be turned OFF, and the operation lock will be canceled.





NOTE:

- Each time when pressing “▷” and “Back/Help” simultaneously for three seconds, the operation lock state will be switched alternately between locked and unlocked.
- Select what is to be locked at the function selection setting. Contact your distributor for detailed information.

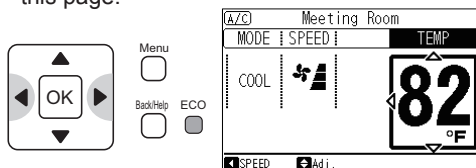
7. Power Saving Guidance

- This function easily sets the power-saving feature.

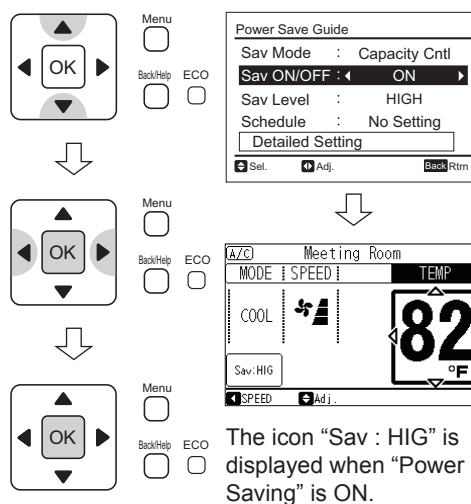
NOTE:

: Unable to set:
If a function displaying “” is selected from the menu, “No Function” will be displayed on the lower screen.

- (1) Press “ECO”:
The Power Saving Guide will be displayed as shown in the image near the bottom of this page.



- (2) The current setting status is displayed for “Power Saving Mode”, “Power Saving ON/OFF”, “Power Saving Level” and the schedule. It is possible to change the “Sav ON/OFF” and “Sav Level” settings. (*1)
 - Power Saving ON/OFF Setting:
Press “△” or “▽” and select “SAV ON/OFF”. By pressing “△” or “▽”, the setting will change between “ON” ↔ “OFF”. (*2)
 - Power Saving Level:
Press “△” or “▽” and select “Sav Level”. By pressing “△” or “▽” the setting will change between “LOW” ↔ “MED” ↔ “HIGH”. (*2) (*3)
 - Detailed Setting:
Press “△” or “▽” and select “Detailed Setting”. By pressing “OK”, the Detailed Setting screen will be displayed.

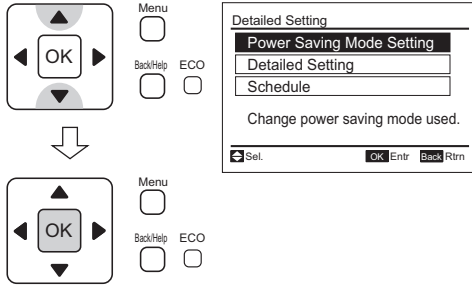


NOTE:

- *1: When the Power Saving Mode is “Rotation Control”, the “Power Saving Level” and schedule are not displayed. When the Power Saving Mode is “No Setting”, the “Power Saving ON/OFF”, “Power Saving Level” and schedule are not displayed.
- *2: When the Power Saving Mode is “Capacity Control” and “Main/Sub-Remote” from Section 9. “Help Menu”, “Current Setting” is displayed as SUB. It is not possible to change the settings for “Power Saving ON/OFF” and “Power Saving Level”.
- *3: When Power Saving is OFF, the “Power Saving Level” cannot be changed.

- (3) Press “Δ” or “∇” and select the setting function. By pressing “OK”, each type of setting will be displayed.
Refer to the following concerning each setting.

- Power Saving Mode Setting (Section 8.6 “Power Saving”)
- Power Saving Detailed Setting (Section 8.6 “Power Saving”)
- Power Saving Schedule Setting (Section 8.10 “Power Saving/Operation Noise Reduction Schedule”)



8. Menu Operation

8.1 Menu

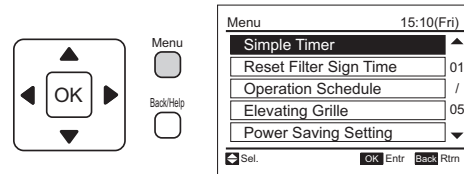
- Every function setting is displayed in the “Menu”.
- Refer to Sections 8.2 to 8.19 for each function.

NOTE:

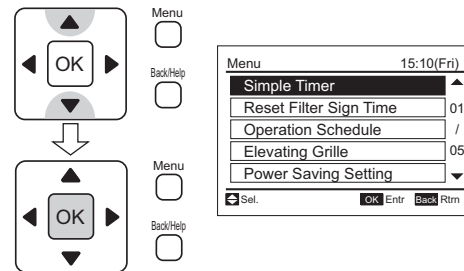
☒: Unable to set:

If a function with “☒” is selected from the “Menu”, “No Function” or “Setting Disabled” will be displayed on the lower screen.

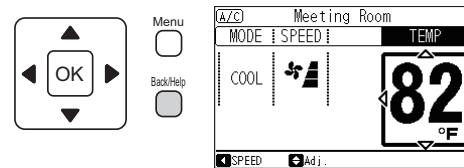
- (1) Press “Menu”.
The menu will be displayed.



- (2) Select a function by pressing “Δ” or “∇” and press “OK”.
(“☒” will be displayed if the function is not available.)



- (3) Press “Back/Help” to return to Normal Mode (Operation Mode Indication).



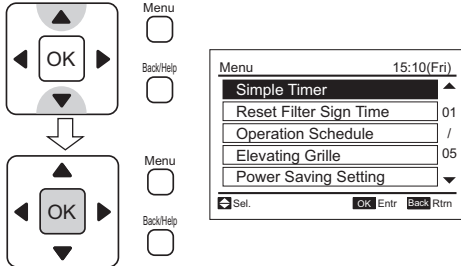
NOTE:

If the menu screen remains unchanged for approximately 10 minutes, the screen will automatically return to normal mode.

8.2 Simple Timer Operation

- This function is used to start or stop the unit operation at the set time.
- The timer operation contents can be set from “Not Used”, “Once” or “Everyday”.

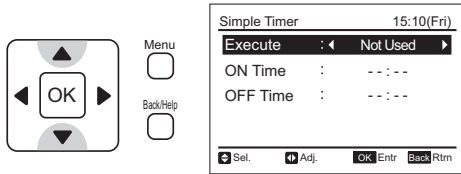
(1) Select “Simple Timer” from the menu and press “OK”.
The “Simple Timer” setting will be displayed.



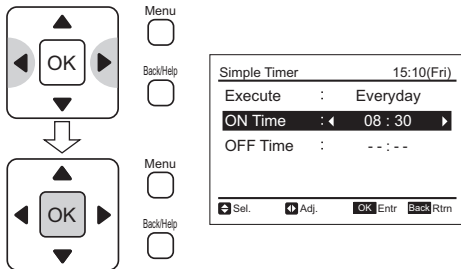
NOTE:

If the present time has not been set yet, “Set Date/Time” will automatically be displayed. Refer Section item 8.15 “Adjusting Date/Time”.

(2) Press “Δ” or “∇” to select the setting data. The setting data are displayed “Timer Ope.”, “ON Time” and “OFF Time”.



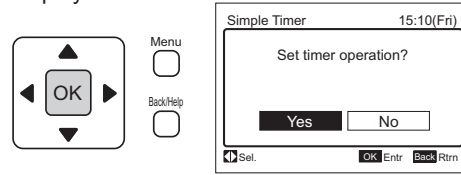
(3) Press “◀” or “▶” to set each setting data for the selected details. When “Timer Ope.” is selected, the setting contents are switched between “Not Used” ↔ “Once” ↔ “Everyday” by repeatedly pressing “◀” or “▶”. When “ON Time” or “OFF Time” is selected, the setting time can be adjusted by 30-minute increments by pressing “◀” or “▶”. By pressing and holding “◀” or “▶”, the setting time can be changed continuously.



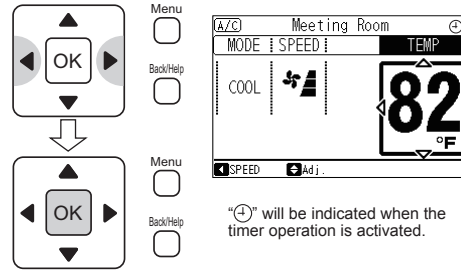
NOTE:

- If “Once” on the timer operation setting is selected, the setting content will be automatically changed to “Not Used” after one timer operation.
- Do not set the same hour for both ON/OFF timers.

(4) Press “OK” to finish the “Simple Timer” setting. The confirmation screen will be displayed.



(5) Select “Yes” by pressing “◀” or “▶” and press “OK”. The setting will be confirmed and the screen will return to the normal mode.



NOTE:

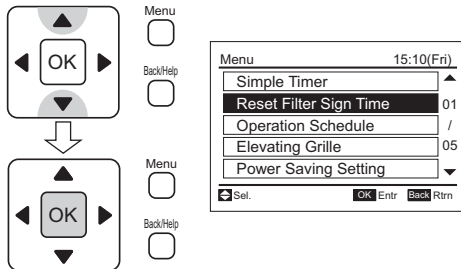
If the following happens, the “Simple Timer” operation is NOT available:

- * When the operation is prohibited by the controller and set from the central controller.
- * When “⊗” is indicated on the LCD, the timer operation cannot function. Set the date and time according to Section 8.15 “Adjusting Date/Time”.

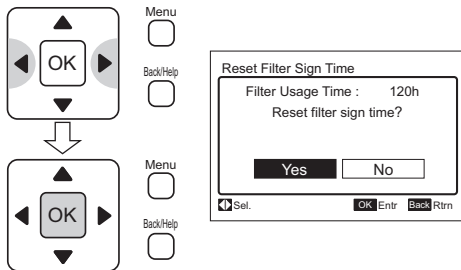
8.3 Reset Filter Sign Time

This function is used to turn off the filter sign indication and to reset the time of use for the filter.

- (1) Select “Reset Filter Sign Time” from the “Menu” and press “OK”.
The “Reset Filter Sign Time” screen will display.

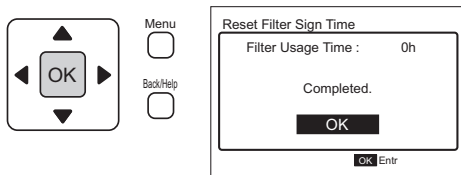


- (2) Select “Yes” by pressing “◀” or “▶” and press “OK”.
After resetting, the confirmation screen of “Reset Filter Sign Time” will display. Depending on the type of the indoor unit, the screen will return to the normal mode.



The “Filter Usage Time” may not display depending on the type of the indoor unit.

- (3) Press “OK” to return to the normal mode.

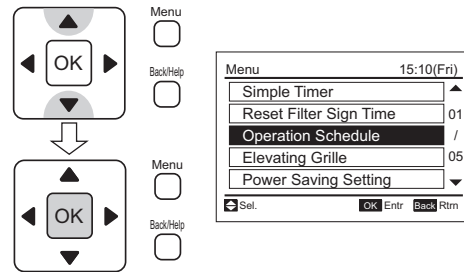


8.4 Scheduled Operation

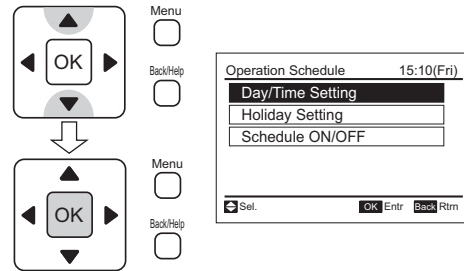
8.4.1 Schedule Setting

- This function is used to start or stop the unit operation at a set time.
- Temperature can be also set with “Schedule Timer” operation.
- Five different schedule timers (maximum) can be set for each day of the week.

- (1) Select “Operation Schedule” from the “Menu” and press “OK”.



- (2) Select “Day/Time Setting” by pressing “Δ” or “▽” and press “OK”.



NOTE:

If the present time has not been set yet, “Set Date/Time” will automatically display. Refer to Section 8.15 “Adjusting Date/Time”.

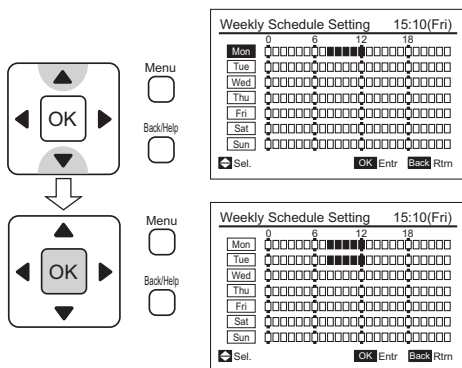
(3) Select the day of the week (from Mon. to Sun.) by pressing “△” or “▽”. Press “OK”.

- “■” (run) and “□” (stop) will be displayed on the LCD.
- To copy the setting contents of the previous day, press “◀” and “OK” simultaneously.

< Example >

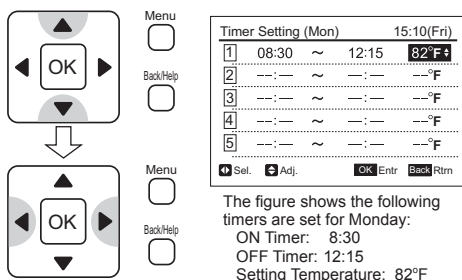
The setting contents of Monday are copied in Tuesday.

- Select “Tue”.
- Press “◀” and “OK” simultaneously.
- The setting contents of Monday are copied in Tuesday.

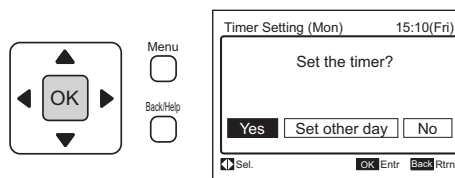


(4) Select the schedule No. (from 1 to 5 as seen below) by pressing “△” or “▽”. Select “ON Time”, “OFF Time” or “Setting Temperature” by pressing “◀” or “▶”. Set the ON/OFF timer and temperature by pressing “△” or “▽”.

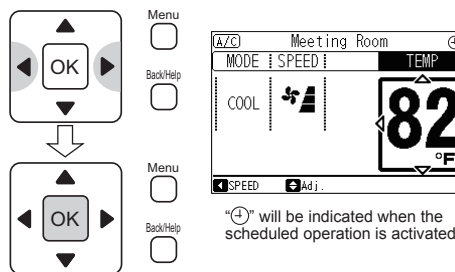
- Press or keep pressing “△” or “▽” to adjust numbers.
- Five different schedule timers (maximum) can be set for each day of the week.
- When setting other days of the week, press “Menu”. The schedule setting screen of the next day will display.



(5) Press “OK”. The confirmation screen will be displayed.



(6) Select “Yes” by pressing “◀” or “▶” and press “OK”. The setting will be confirmed and the screen will return to normal mode. To set other days of the week, select “Set other day” and press “OK”.



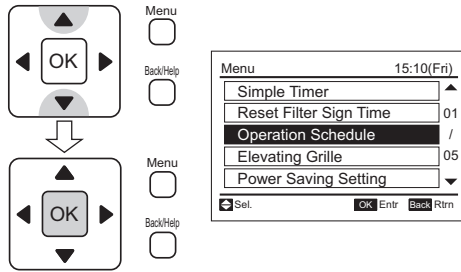
NOTE:

- In the following instances, the schedule operation is NOT available;
- * When the operation is prohibited by the controller and is set from the central controller.
 - * When “⊗” is indicated on the LCD, the schedule operation cannot function. Set the date and time according to Section 8.15 “Adjusting Date/Time”.

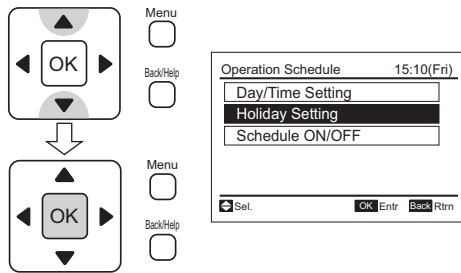
8.4.2 Holiday Setting

- This function is used to deactivate the schedule operation temporarily for just one day. After that, the schedule operation will recover automatically.
- This function is used to set irregular schedules such as national holidays.

- (1) Select "Operation Schedule" from the menu and press "OK".
The "Schedule Timer" setting will be displayed.

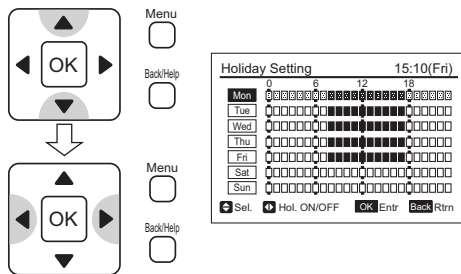


- (2) Select "Holiday Setting" by pressing "Δ" or "∇" and press "OK".

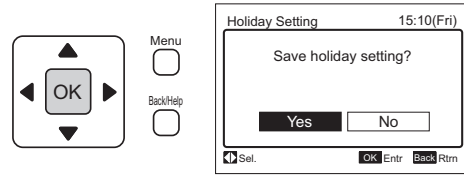


- (3) Select the day of the week to stop the operation by pressing "Δ" or "∇".
Select "Hol. ON/OFF" by pressing "◀" or "▶".

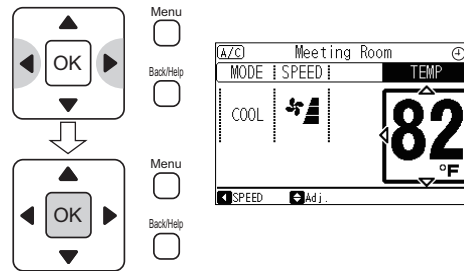
- "■" and "□" will be changed to "■" and "□" on the LCD.



- (4) Press "OK" after the setting is completed.
The confirmation screen will be displayed.



- (5) Select "Yes" by pressing "◀" or "▶" and press "OK". The holiday setting will be confirmed and the screen will return to normal mode.



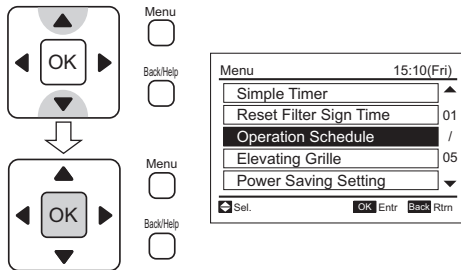
NOTE:

"⊕" will be turned off when the holiday setting is activated.

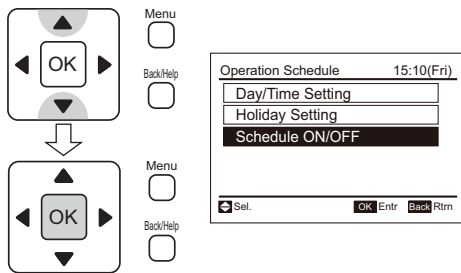
8.4.3 Schedule ON/OFF Setting

- This function is used to deactivate the scheduled operation temporarily.
- The scheduled operation will not be carried out when “OFF” is set in this function.
- This function is used for long periods of time.

- (1) Select “Operation Schedule” from the menu and press “OK”.

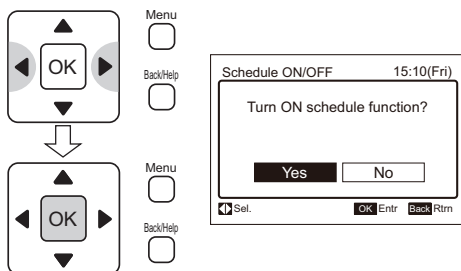


- (2) Select “Schedule ON/OFF” by pressing “Δ” or “∇” and press “OK”. The confirmation screen will be displayed.



- (3) Select “Yes” by pressing “◀” or “▶” and press “OK”. The schedule ON/OFF setting will be confirmed and the screen will return to the normal mode.

- “+” will be turned on when schedule operation is ON.
- “-” will be turned off when schedule operation is OFF.



NOTE:

When the schedule operation is OFF, it will not be activated.

8.5 Elevating Grille

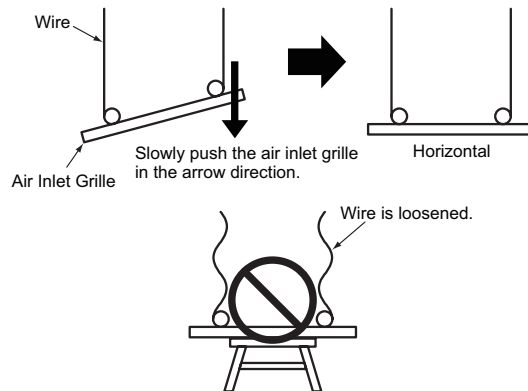
This function is with a decorative panel.

⚠ CAUTION

< Caution for Installation of Grille into Decorative Panel After Cleaning >

When the air inlet grille is set inside the decorative panel, ensure that the air inlet grille is horizontal and the wire is suspended tightly without loosening. After the above is ensured, set the air inlet grille.

If the air inlet grille is slanted and the wire is loosened, they may get caught in the pulley. It may result in damage of the pulley or pulley block. If this happens, it may cause personal injury from a falling the decorative panel.

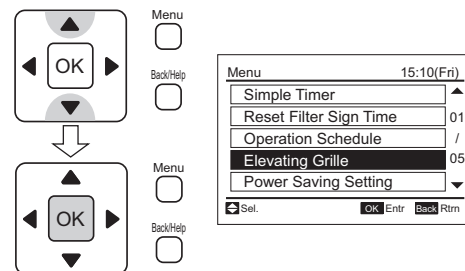


This function allows the air inlet grille to automatically move up and down from the decorative panel for cleaning the air filter and air inlet grille.

NOTE:

- Make sure the unit operation is stopped before using the elevating grille.
- The elevating grille function is not possible if the unit is operating.

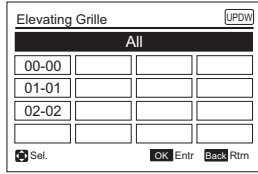
- (1) Press “Menu” and select “Elevating Grille” from the menu. Press “OK”.



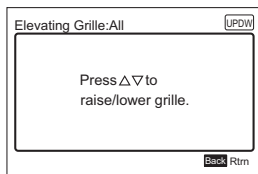
NOTE:

If the number of indoor units connected with the controller is 1 (one), (3) will be displayed after the procedure (1).

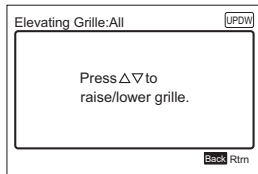
- (2) Select the indoor unit by pressing “Δ”, “∇”, “◀” or “▶”. Press “OK”.



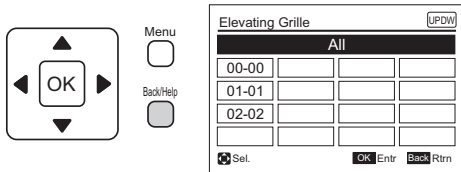
- (3) Press “∇”.
The elevating grille starts lowering.
- Once “∇” is pressed, the elevating grille lowers to the specified height.
 - If “∇” is pressed once again, the elevating grille lowers by 20 inches (50cm) from the present height. (When “∇” is pressed each time, the elevating grille lowers respectively by 20 inches (50cm).)
 - To stop the elevating grille, press “Δ”.



- (4) When the cleaning is finished, press “Δ”.
The elevating grille starts rising. The grille will be set inside the decorative panel and stop moving after 3 seconds.
(If the air inlet grille is slanted at this time, press “Δ” again. A slant can be corrected.)



- (5) Press “Back/Help”.
The screen will return to (2) above.
(If necessary, set the elevating grille for other indoor units.)
To complete the setting, press “Back/Help” again. The screen will return to the “Menu”.
If “Back/Help” is pressed once again, the screen will return to the normal mode.



NOTE:
If there is only one indoor unit connected with the controller, the screen will return to the normal mode after “Back/Help” is pressed.

8.6 Power Saving

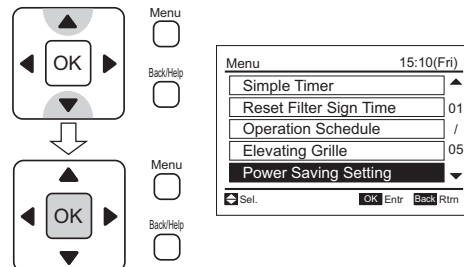
<Function>

- Outdoor Unit Capacity Control:**
Controls the COOL/HEAT capacity of the outdoor unit.
- Indoor Unit Rotation Control:**
Indoor units linked with the same outdoor unit system are switched ON in order, one by one.
- Intermittent Operation Control:**
Cooling/Heating and FAN mode are repeated in fixed intervals.
- No Setting:**
The power saving function will not operate.

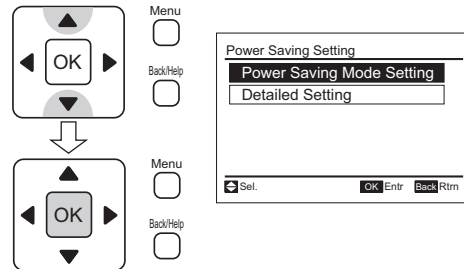
NOTE:

- The power saving mode can be changed and may differ depending on the type of the outdoor unit or indoor unit in use. When “Main/Sub-Remote” from the “Help Menu” “Current Setting” is displayed, the power saving mode can be changed as follows :
 - “Main”: The power saving mode can change functions 1 through 4 above.
 - “Sub”: The power saving mode cannot be changed. It will synchronize with the power saving mode of the main controller from the same outdoor unit cycle.
 - “--”: The power saving mode can be changed between functions 3 and 4 above.
- If the power saving mode is changed, the “Power Saving ON/OFF” will be set as OFF.

- (1) Select “Power Saving Setting” from the “Menu” and press “OK”.
The “Power Saving Setting” screen will be displayed.

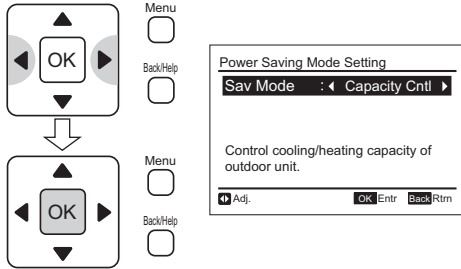


- (2) Select “Power Saving Mode Setting” by pressing “Δ” or “∇” and press “OK”.
The “Power Saving Mode Setting” screen will be displayed.

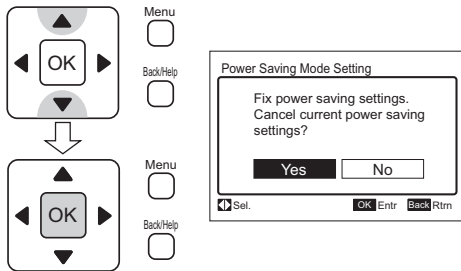


- (3) By pressing “◀” or “▶”, “Power Saving Mode Setting” will change between: Capacity Control ↔ Rotation Control ↔ Intermittent Control ↔ No Setting

Select “Power Saving Mode” and press “OK”. The setting confirmation screen will display.



- (4) Select “Yes” using “◀” or “▶” and press “OK”. The screen will return to normal mode.



8.6.1 Power Saving Detailed Setting (Outdoor Unit Capacity Control)

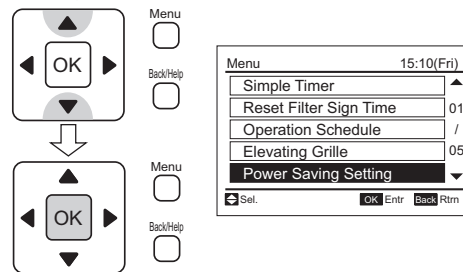
This function is used to set the detail of the outdoor unit capacity control.

- Control Method: The “Peak Cut Control” reduces the power consumption range when it exceeds the value of the power setting. On the basis of the current air conditioning capacity, the “Moderate Control” is used to moderate the air conditioning capacity as well as the peak.
- Power Saving LOW (MED / HIGH): Assign a value corresponding to the capacity control of each level of the power saving LOW / MED / HIGH.
- Change Level: It is possible to change the power saving level from the power saving guidance.

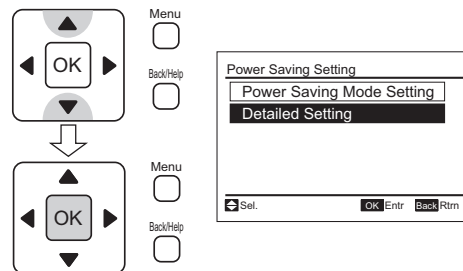
NOTE:

- The “Main/Sub-Remote” display in “Current Setting” of the “Help Menu” cannot be set if the indication is “Sub” or “--”.
- If the power saving mode change the power saving detailed setting in the outdoor unit capacity control, the “Power Saving ON/OFF” will be OFF.
- It is necessary to assign a value of capacity control as follows: “Sav LOW” > “Sav MED” > “Sav HIGH”.
- The cooling/heating capacity can decrease when using the “Power Saving” function.

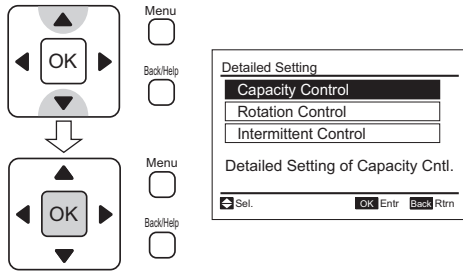
- (1) Select “Power Saving Mode Setting” from the “Menu” screen and press “OK”. The “Power Saving Setting” screen will be displayed.



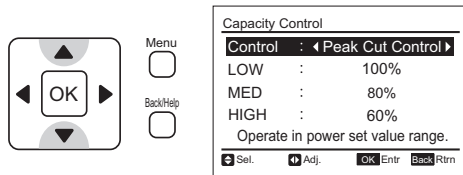
- (2) Select “Detailed Setting” by pressing “Δ” or “▽” and press “OK”. The power saving “Detailed Setting” screen will be displayed.



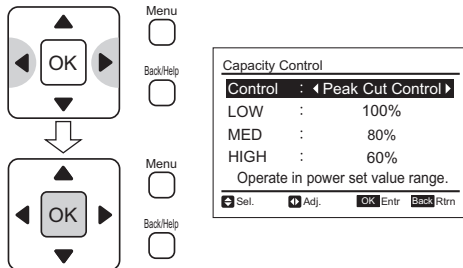
- (3) Select "Capacity Control" using "Δ" or "∇" and press "OK".
The outdoor unit "Capacity Control" screen will be displayed.



- (4) Press "Δ" or "∇" and select the setting function. The setting will change as follows:
"Control Method" ↔ "Sav LOW" ↔
"Sav MED" ↔ "Sav HIGH".

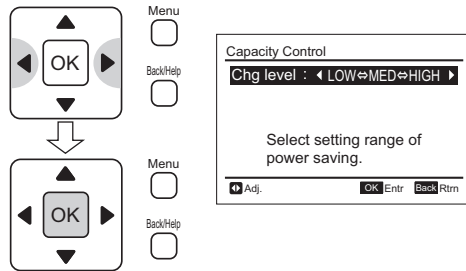


- (5) Press "◀" or "▶" and select setting content.
- If "Control Method" is selected, it will change as follows :
"Peak Cut Control" ↔ "Moderate Control".
 - If "Sav LOW (MED or HIGH)" is selected, it will change as follows :
"100%" ↔ "90%" ↔ "80%" ↔ "70%" ↔
"60%" ↔ "50%" ↔ "40%" ↔ "0%".
- Press "OK" after completing all settings.
The next setting screen will be displayed.

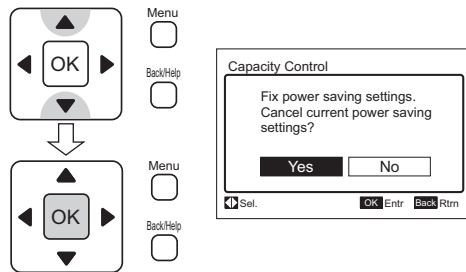


- (6) By pressing "◀" or "▶", the setting function will change as follows
"LOW→MED→HIGH" ↔ "LOW Only" ↔
"MED Only" ↔ "HIGH Only".

Press "OK" after completing the setting.



- (7) The confirmation screen will be displayed. Select "Yes" by pressing "◀" or "▶", and press "OK" to confirm the setting.
The screen will return to the normal mode.
If the power saving setting is available, set it "ON" using the "Power Saving Guidance".



**8.6.2 Power Saving Detailed Setting
(Indoor Unit Rotation Control)**

This function sets the data of the indoor unit rotation control.

• **Control Method**

“Address order”:

The number (address) assigned by the previous indoor unit will change the FAN mode for the indoor unit in ascending order.

“Temperature order”:

The difference between the temperature set-point and the indoor unit intake temperature will change the FAN mode in ascending order for the indoor unit.

“Sensor order:”

If the motion sensor is used, this function will change the FAN mode in order, from the indoor unit in a spacious area with few people.

*: The outdoor unit cannot be set without this indoor function.

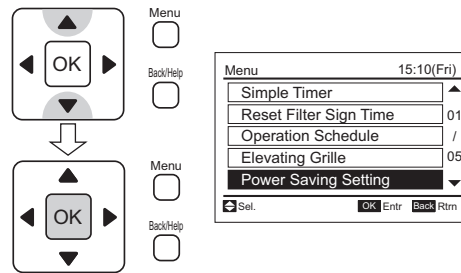
• **FAN Operation Time**

It is possible to change the timing of the FAN operation of the indoor unit.

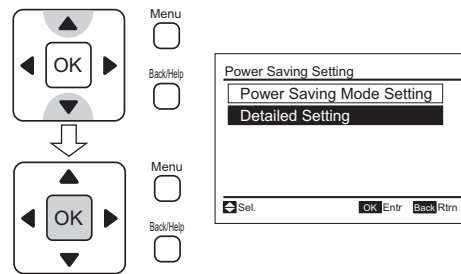
NOTE:

- The “Main/Sub-Remote” display in the “Current Setting” of the “Help Menu” cannot be set if “Sub” or “--” is displayed.
- If the “Power Saving Mode” changes the power saving “Detailed Setting” in the outdoor unit capacity control, “Power Saving ON/OFF” will be OFF.
- This function can only be used when the operation mode is in COOL or HEAT.
- The cooling/heating capacity can decrease when using the “Power Saving” function.

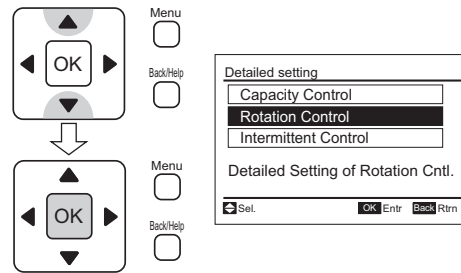
- (1) Select “Power Saving Setting” from the menu screen and press “OK”.



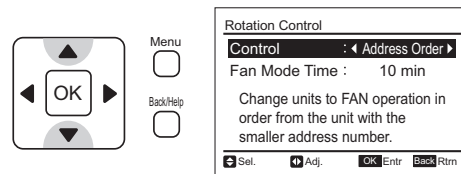
- (2) The “Power Saving Setting” screen will be displayed. Select “Detailed Setting” with “Δ” or “∇” and press “OK”.



- (3) Select “Rotation Control” with “Δ” or “∇” and press “OK”.
The detailed setting screen of the indoor unit “Rotation Control” will be displayed.



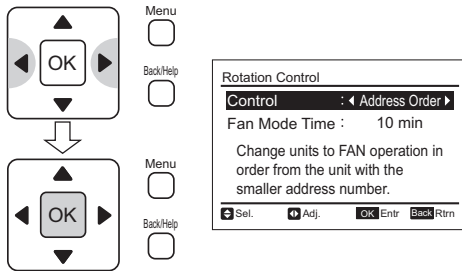
- (4) Press “Δ” or “∇” and select the setting.
The setting will change as follows.
“Control Method” ↔ “FAN Mode Time”



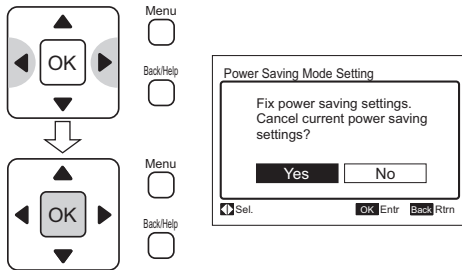
- (5) Press “◀” or “▶” and select the setting content.
- If “Control Method” is selected, it will change as follows:
 “Address Order” ↔ “Temperature Order”
 ↔ “Sensor Order* ”
 - If “FAN Mode Time” is selected, it will change between:
 “10 min.” ↔ “5 min.” ↔ “3 min.”

Press “OK” when all settings have been carried out.

* It is not possible to set the indoor or outdoor unit when the “Sensor Order” is not supported.



- (6) The setting confirmation is displayed. Select “Yes” with “◀” or “▶” and press “OK” to confirm the setting and return to the normal mode. If the “Power Saving Mode” setting is accessible, set “Power Saving ON” from “Power Saving Guidance”.



8.6.3 Power Saving Detailed Setting (Intermittent Operation Control)

This function is used to set details of the Intermittent Operation Control. Change Level It is possible to change the “Power Saving Level” from “Power Saving Guidance”.

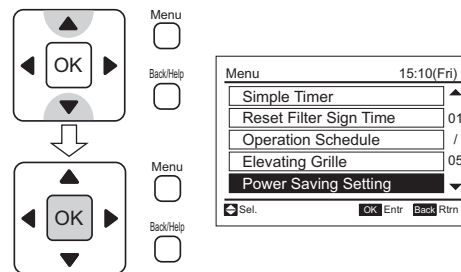
NOTE:

- This function cannot be set if it is connected only to the total heat exchanger.
- Each power saving level will repeat the operation as follows :

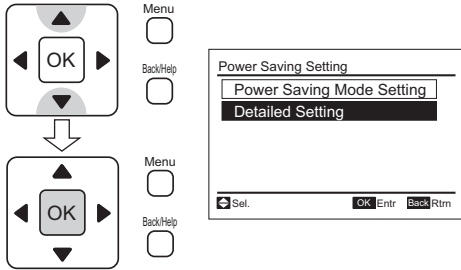
	Cool / Dry Mode	Heat Mode
SAV:LOW	Normal Mode 20min. ↓ Fan Mode 13min.	Normal Mode 25min. ↓ Fan Mode 5min.
SAV:MED	Normal Mode 20min. ↓ Fan Mode 13min.	Normal Mode 25min. ↓ Fan Mode 5min.
SAV:HIGH	Normal Mode 20min. ↓ Fan Mode 13min.	Normal Mode 25min. ↓ Fan Mode 5min.

- If the “Power Saving Mode” changes the “Power Saving Detailed” setting in intermittent operation control, the “Power Saving ON/OFF” will be OFF.
- The cooling/heating capacity can decrease when using the “Power Saving” function.

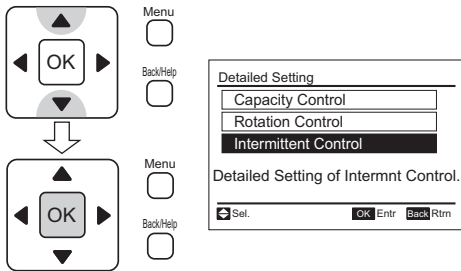
- (1) Select “Power Saving Setting” from the “Menu” screen and press “OK”. The “Power Saving Setting” screen will be displayed.



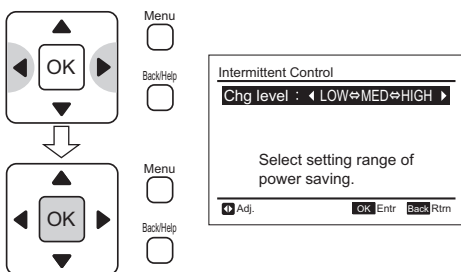
- (2) Select "Detailed Setting" with "Δ" or "∇" and press "OK".
- When using a main controller, the "Power Saving Detailed Setting" screen will be displayed. Refer to (3) below.
 - When using a sub controller or if the indoor unit does not support power saving, the "Detailed Setting" of the "Intermittent Control" will be displayed. Refer to (4) below.



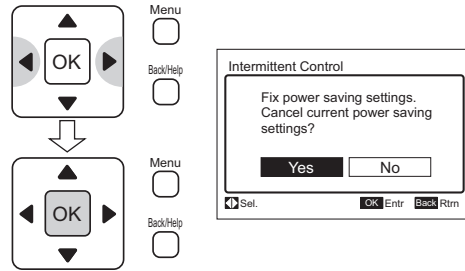
- (3) Select "Intermittent Control" with "Δ" or "∇" and press "OK".
The detailed setting screen of the intermittent control will be displayed.



- (4) By pressing "◀" or "▶", the following indications will be displayed :
"LOW→MED→HIGH" ↔ "LOW Only" ↔
"MED Only" ↔ "HIGH Only".
Press "OK" after selecting a setting.



- (5) The setting confirmation screen will be displayed. Select "Yes" with "◀" or "▶" and press "OK" to confirm the setting. The screen will return to normal mode.
If the "Power Saving Setting" setting is accessible, set it "ON" using "Power Saving Guidance".



8.8 Quick Function

This function operates for 30 minutes once the operation starts.

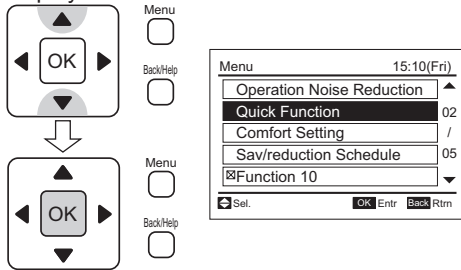
This function is only available when the operation mode is COOL or HEAT.

The unit will start each time in quick mode until the setting is canceled.

NOTE:

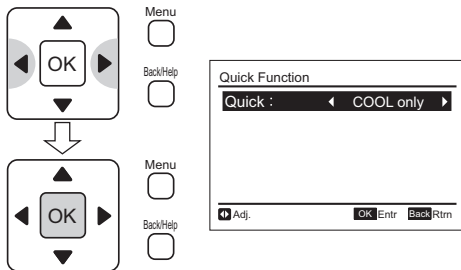
- The outdoor unit cannot be set when the function is not supported.
- The “Main/Sub-Remote” is displayed in the “Current Setting” of the “Help Menu” and cannot be set if “--”.
- It is possible that the automatic fan speed will fall to LOW for a maximum of 30 minutes. The operation will start regardless of the fan speed setting of the controller when in cooling mode.

- (1) Select “Quick Function” from the “Menu” screen and press “OK”.
The “Quick Function” screen will be displayed.

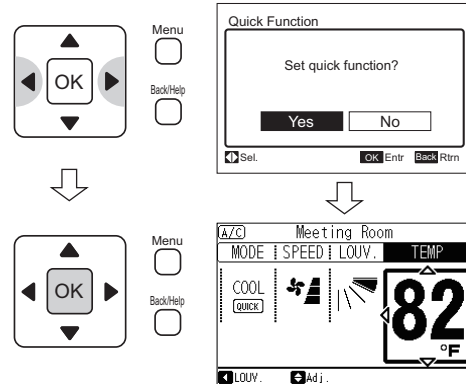


- (2) By pressing “◀” or “▶” the “Quick” mode will change as follows :
OFF ↔ COOL Only ↔ HEAT Only ↔
COOL + HEAT

Select the “Quick” mode and press “OK”.



- (3) The setting confirmation screen will be displayed. Select “Yes” with “◀” or “▶” and press “OK” to confirm the setting. The screen will return to normal mode.



The icon “QUICK” will be displayed when in “Quick” mode.

8.9 Comfort Setting

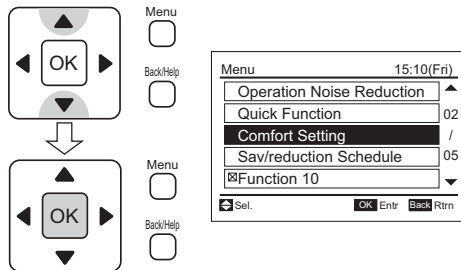
This function is used to control cooling of the discharged air when in the cooling mode.

NOTE:

- The indoor unit cannot be set when the function is not supported.
- The cool air level order is as follows: “HIGH” > “MED” > “LOW” and the temperature of the discharged air is high.
- It is possible the operation may not function if there are more than two units operating.
- When this function is set, it may take time for the entire room to cool down.

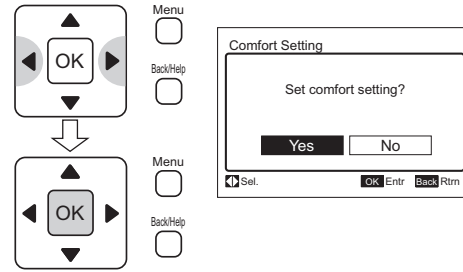
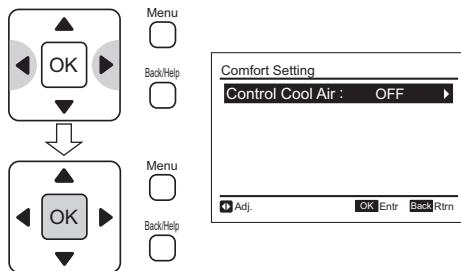
- (3) The setting confirmation screen will be displayed. Select “Yes” with “◀” or “▶” and press “OK” to confirm the setting. The screen will return to normal mode.

- (1) Select “Comfort Setting” from the “Menu” screen and press “OK”. The “Comfort Setting” screen will be displayed.



- (2) By pressing “◀” or “▶” the Comfort Setting Mode will change as follows :
OFF ↔ LOW ↔ MED ↔ HIGH

Select the “Control Cool Air” level and press “OK”.



8.10 Power Saving/Operation Noise Reduction Schedule

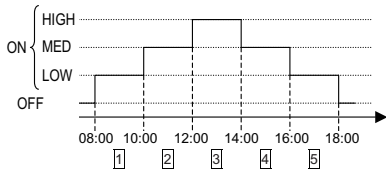
This function is used to start or stop the power saving or the noise reduction at the desired time. It is possible to set the power saving or the operation noise reduction schedule up to five times a day each day.

The "Power Saving Schedule" setting performs the scheduled control of the mode set by the "Power Saving" mode.

NOTE:

- Set time zones so they don't overlap during a day when managing multiple schedule patterns as in Example 1 below. If time zones are overlapped as in Example 2, the first "Time OFF" (14:00 in the example 2) will be cancelled.

<Example of Power Saving Operation and Schedule Setting>



Example of Power Saving Schedule Operation

Example 1

○ CORRECT

Capacity Control (Mon)		15:10(Fri)
1	08:00 ~ 10:00	LOW
2	10:00 ~ 12:00	MED
3	12:00 ~ 14:00	HIGH
4	14:00 ~ 16:00	MED
5	16:00 ~ 18:00	LOW
Sel. Adj. OK Entr Back Rtrn		

Example 2

✗ INCORRECT

Capacity Control (Mon)		15:10(Fri)
1	08:00 ~ 18:00	LOW
2	10:00 ~ 16:00	MED
3	12:00 ~ 14:00	HIGH
4	--:-- ~ --:--	
5	--:-- ~ --:--	
Sel. Adj. OK Entr Back Rtrn		

- Select "Sav/Reduction Schedule" from the "Menu" screen and press "OK".
The power saving/operation noise reduction schedule setting screen will be displayed as "Sav/Reduction Schedule".
When using a Sub controller or if the indoor unit does not support power saving, the power saving schedule setting of the "Intermittent Control" will be displayed.
Refer to (3) below.

- By pressing "Δ" or "∇", select the setting item.
The setting will change as follows:
"Capacity Control" ↔ "Intermittent Control"
↔ "Noise Reduction"



Press "OK".
The power saving schedule setting (or noise reduction schedule) screen will be displayed as "Sav/Reduction Schedule".

- Select the "Day/Time Setting" with "Δ" or "∇" and press "OK".
The weekly schedule setting screen will be displayed.

When the current time is not set, the "Time Adjusting" screen will be displayed automatically.

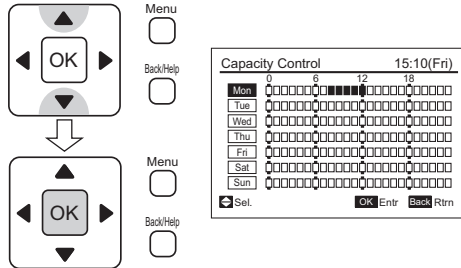
OPERATION

- (4) Select the day set with “ Δ ” or “ ∇ ” and press “OK”. The “Time Setting” screen will be displayed.

- The icon “” indicates the power saving control (or the operation noise reduction control), and the icon “” indicates the canceled time period.

In case of a holiday setting, the icons will appear as follows “” and “”.

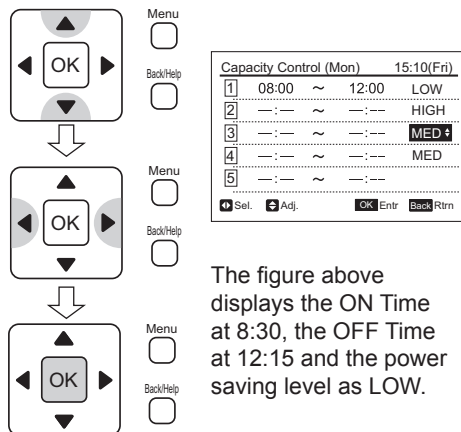
- To copy a setting, press “ \triangleleft ” and “OK” simultaneously for the selected day. The setting data of the previous day will be copied.



- (5) Select the schedule number from 1 to 5 with “ Δ ” or “ ∇ ”. Then select “ON Time” or “OFF Time” or “Power Saving level” (or “Operation Noise Reduction level”) with “ \triangleleft ” or “ \triangleright ”.

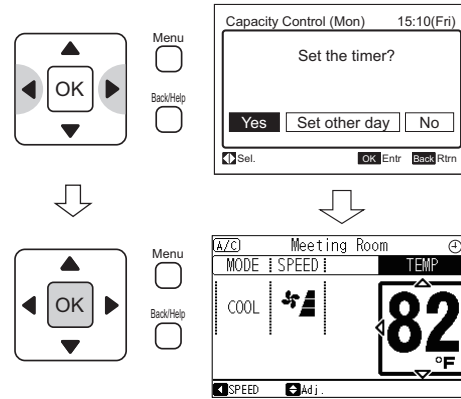
Set the ON/OFF time or the “Power Saving level” (or “Operation Noise Reduction”) with “ Δ ” or “ ∇ ”.


- When pressing continuously “ Δ ” or “ ∇ ”, the level will increase or decrease in a row.
- The setting is possible every day up to five times a day.
- To set another day, press “Menu” to display the time setting of the next day. Press “OK”.




The figure above displays the ON Time at 8:30, the OFF Time at 12:15 and the power saving level as LOW.

- (6) The setting confirmation screen will be displayed. Select “Yes” with “ \triangleleft ” or “ \triangleright ” and press “OK” to confirm schedule setting. The screen will return to normal mode. When another day is set, select “Set other day” and press “OK”.



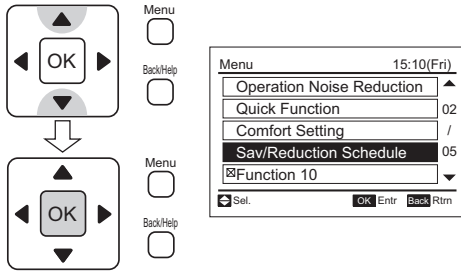
If the schedule control is activated, the icon “” will be displayed.

If the icon “” is displayed, the schedule control cannot be displayed. Refer to “Date/Time Adjusting” and set Date/Time.

■ Schedule ON/OFF Setting

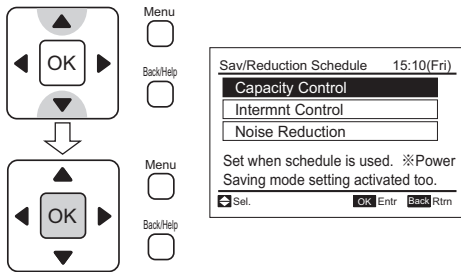
- This function is used to temporarily deactivate the schedule operation.
- Schedule control cannot be performed when the schedule setting is not accessible.
- This function is used for holidays over long periods of time.

- (1) Select "Sav/Reduction Schedule" from the "Menu" screen and press "OK".
The power saving/operation noise reduction schedule setting screen will be displayed as "Sav/Reduction Schedule".



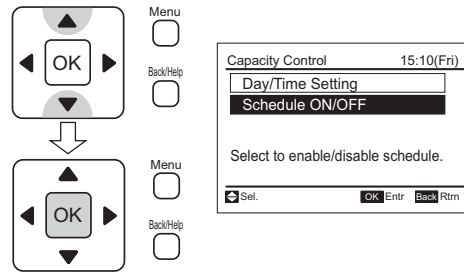
- (2) By pressing "Δ" or "∇", select the setting item. The power saving/operation noise reduction schedule will change as follows:
"Capacity Control" ↔ "Intermittent Control"
↔ "Noise Reduction"

Press "OK".
The power saving schedule setting (or noise reduction schedule) screen will be displayed as "Sav/Reduction Schedule".



- If the display of the "Main/Sub-Remote" Current Setting is displayed as "Sub" or "--", "Capacity Control" and "Intermittent Control" cannot be selected.

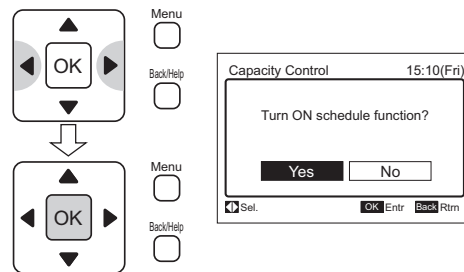
- (3) Select "Schedule ON/OFF" with "Δ" or "∇" and press "OK".



- (4) The "Schedule ON/OFF setting confirmation screen will be displayed.

When schedule is ON, select "Turn OFF schedule function". When schedule is OFF, select "Turn ON schedule function".

Select "Yes" with "◀" or "▶" and press "OK" to confirm the schedule ON/OFF setting.
The screen will return to the normal mode.



8.11 Individual Louver Setting

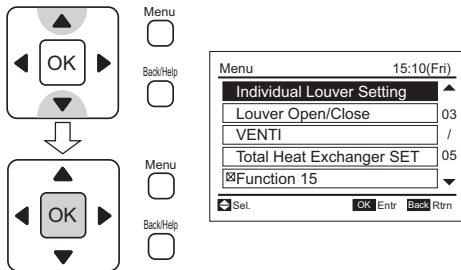
8.11.1 Setting

This setting is available only for indoor units that allow an individual louver control. Each louver angle can be set individually.

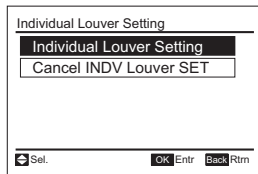
NOTE:

- This function is available only when the indoor unit corresponds to an individual louver.
- This function cannot be set if the unit is stopped.
- The fan speed will be changed to “LOW” while this function is being set. (After the setting is completed, the unit operation will be back to normal.)
- As for “Start-up of Heating Operation”, “During Defrost Operation” and “Activation of Thermo-Controller”, all the louver angles will be secured horizontally automatically when this function is activated.
- This function will not be available if two controllers (including a combination of wired controller + wireless controller) are used.

- (1) Select “Individual Louver Setting” from the “Menu” and press “OK”.
The “Individual Louver Setting” menu will be displayed.



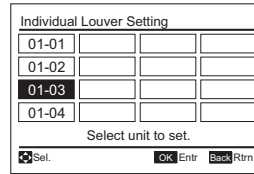
- (2) Select “Individual Louver Setting” from the “Individual Louver Setting” menu and press “OK”.



NOTE:

If there is one indoor unit connected with the controller, four individual louvers will be displayed.

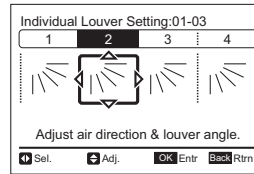
- (3) Select the indoor unit to change the louver direction by pressing “Δ”, “∇”, “◀” or “▶”. Press “OK”.



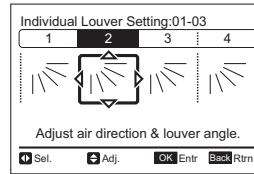
NOTE:

The indoor unit displayed on the screen flashes if an individual louver is set.

- (4) Press “◀” or “▶” and select the louver from 1 to 4. The selected louver is opened and the other louvers are closed.



- (5) Select the louver angle by pressing “Δ” or “∇” and press “OK”.



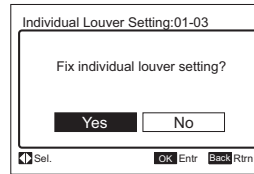
The louver angle will be changed as follows.



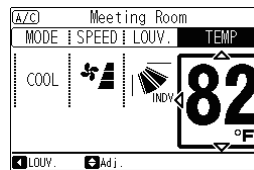
NOTE:

The louver direction without “INDV” will comply with the setting of the normal mode.

- (6) The confirmation screen will be displayed. Select “Yes” by pressing “◀” or “▶” and press “OK”. The setting is confirmed and the screen will return to the normal mode.

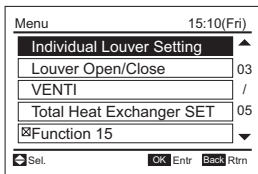


- (7) Ensure that “INDV” is turned on at the air flow section on the normal mode.

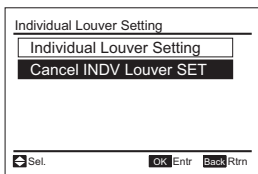


8.11.2 Cancellation of Louver Setting

- (1) Select "Individual Louver Setting" from the "Menu" and press "OK".



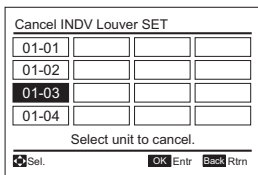
- (2) Select "Cancel INDV Louver SET" from the "Individual Louver Setting" screen and press "OK".



NOTE:

If there is one indoor unit connected with the controller, four individual louvers will be displayed.

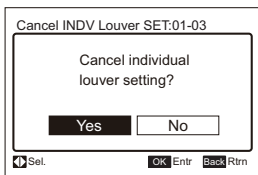
- (3) Select the indoor unit to cancel by pressing "△", "▽", "◀" or "▶". Press "OK".



NOTE:

The indoor unit displayed on the screen flashes if the individual louver is set.

- (4) The confirmation screen will be displayed. Select "Yes" by pressing "◀" or "▶" and press "OK". The individual louver setting will be cancelled and the screen will return to the normal mode.



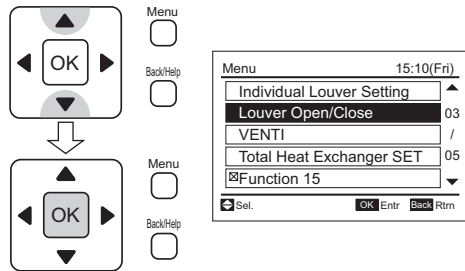
NOTE:

All the individual louver settings will be canceled.

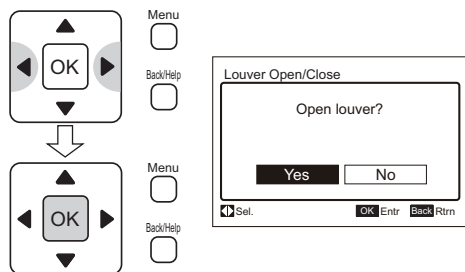
8.12 Louver Open/Close

- This function is used to fully open a louver and adjust the vertical deflector for air flow direction (manually).
- This function cannot be set when the unit is operating.
- This function may not be available depending on the indoor unit type. Refer to the Installation and Maintenance Manual for detailed information.

- (1) Select "Louver Open/Close" from the "Menu" screen and press "OK".



- (2) The confirmation screen will display. Select "Yes" by pressing "◀" or "▶" and press "OK". The louver will be open (closed) and the screen will return to the normal mode.



NOTE:

Refer to the Installation and Maintenance Manual for Indoor Units regarding the adjustment of air flow direction.

8.13 Ventilation

<Function>

A/C (Air Conditioning):

To operate an air conditioner separately.

VENTI (Ventilation):

To operate a total heat exchanger separately.

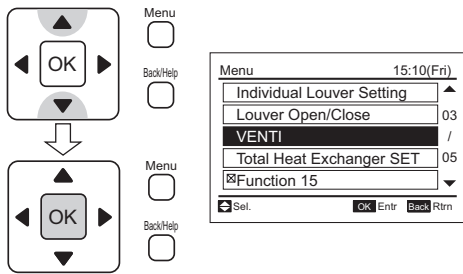
A/C+VENTI:

To operate an air conditioner and total heat exchanger together.

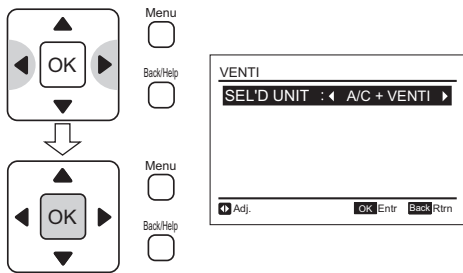
NOTE:

These functions are accessible only when the total heat exchanger is connected.

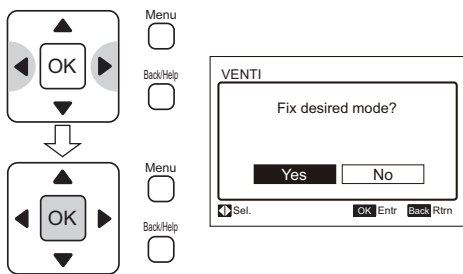
- (1) Select "VENTI" from the "Menu" screen and press "OK".



- (2) By repeatedly pressing "◀" or "▶", the indication is changed between "A/C", "VENTI" and "A/C + VENTI". Select the operation target and press "OK".



- (3) The confirmation screen will be displayed. Select "Yes" by pressing "◀" or "▶" and press "OK". The setting will be confirmed and the screen will return to the normal mode.



The selected unit will be displayed as follows: "A/C + VENTI".

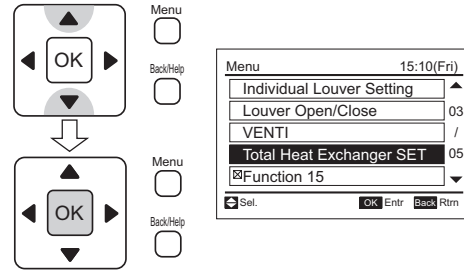
8.14 Setting of Total Heat Exchanger

This function is used to change the ventilation mode of the total heat exchanger.

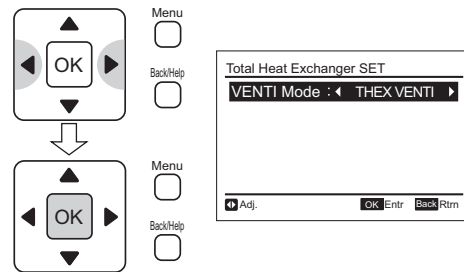
NOTE:

This function is accessible only when the total heat exchanger is connected. This function cannot be set when the unit is operating.

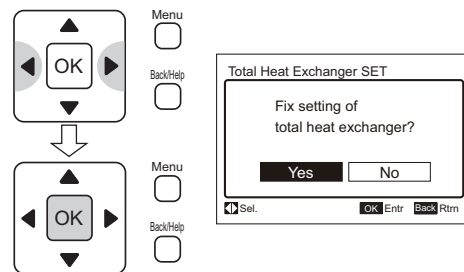
- (1) Select "Total Heat Exchanger SET" from the "Menu" screen and press "OK". The total heat exchanger setting will be displayed.



- (2) By repeatedly pressing "◀" or "▶", the indication is changed between AUTO VENTI ↔ THEX VENTI ↔ Normal VENTI. Select the operation target and press "OK".



- (3) The confirmation screen will be displayed. Select "Yes" by pressing "◀" or "▶" and press "OK". The setting will be confirmed and the screen will return to the normal mode.



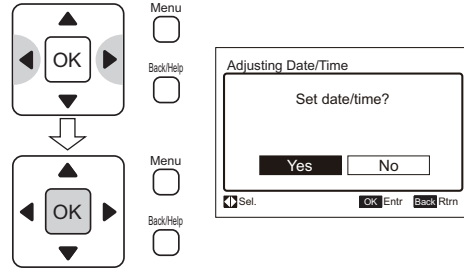
8.15 Adjusting Date/Time

- This function is used to adjust the date and time.
- Periodic time setting is recommended.
(Clock accuracy: difference within ±70 seconds by a month)
- With this controller, the installed electric battery will allow continued operation for 72 hours. Reset the date and time if the controller remains without power for longer than 72 hours or the main power supply is OFF for a long period of time.
- When adjusting time from the main controller, the sub controller of the same refrigerant cycle will be set at the same time.

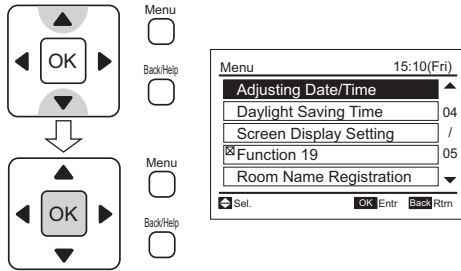
NOTE:

It is possible to adjust time from the sub controller. If more than two minutes' modification is done, the main controller will be set at the same time. (Check Main or Sub at the "Main/ Sub-Remote" from the "Help Menu" "Current Setting").

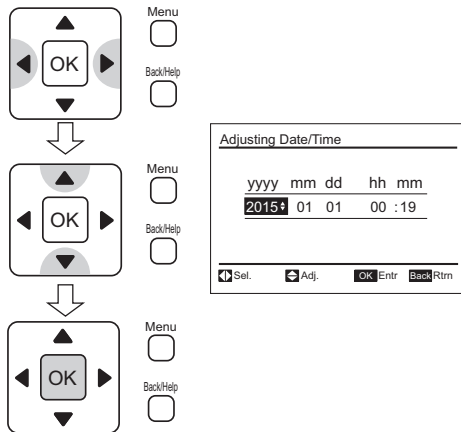
- (5) The confirmation screen is displayed. Select "Yes" by pressing "◀" or "▶" and press "OK". The setting will be confirmed and the screen will return to the normal mode.



- (1) Select "Adjusting Date/Time" from the "Menu" screen and press "OK".



- (2) Press "◀" or "▶" and select "yyyy/mm/dd/hh/mm".

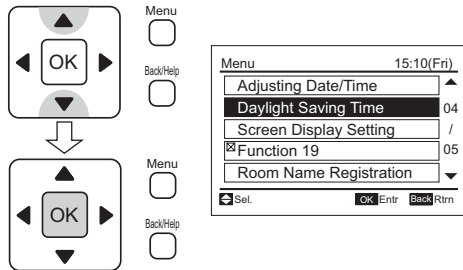


- (3) Press "▲" or "▼" to change the setting. Press or keep pressing "▲" or "▼" to adjust numbers.
- (4) After the setting is completed, press "OK".

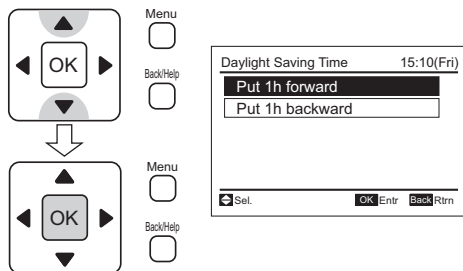
8.16 Daylight Saving Time

This function adjusts time forward or backward an hour when daylight saving time starts or ends.

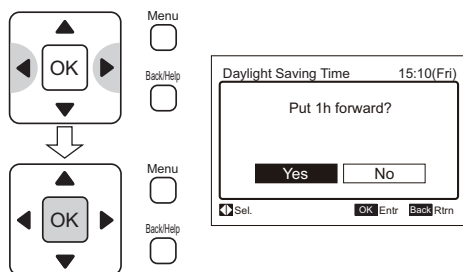
- (1) Select "Daylight Saving Time" from the "Menu" screen and press "OK".



- (2) The "Daylight Saving Time" screen displays. Select "Put 1h forward" with "Δ" or "∇" and press "OK".

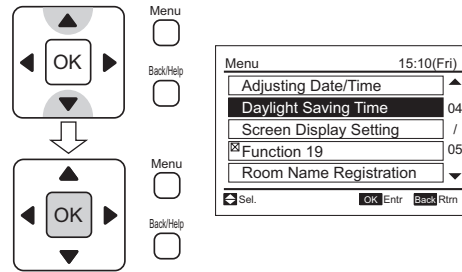


- (3) The daylight saving time confirmation screen will display. Select "Yes" using "◀" or "▶" and press "OK" to confirm the setting. The screen will return to normal mode.

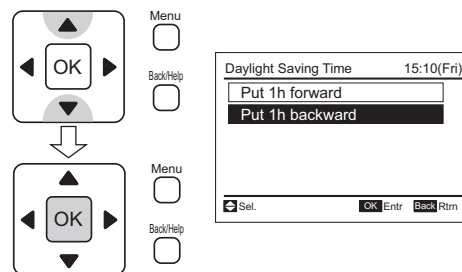


■ Stop Daylight Saving Time

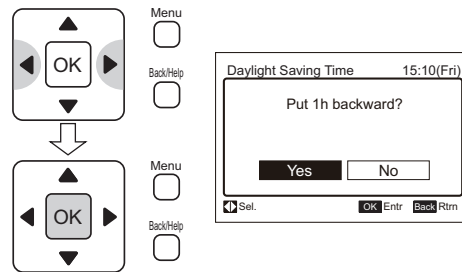
- (1) Select "Daylight Saving Time" from the "Menu" screen and press "OK".



- (2) The "Daylight Saving Time" screen will display. Select "Put 1h backward" using "Δ" or "∇" and press "OK".



- (3) The "Daylight Saving Time" confirmation screen displays. Select "Yes" using "◀" or "▶" and press "OK" to confirm the setting. The screen will return to normal mode.



8.17 Screen Display Setting

8.17.1 Display Adjustment

<Function>

*** Time Format:**

Changes the time form to 12 hour or 24 hour.

*** Brightness:**

Adjusts the brightness of backlight.

*** Backlight:**

Changes the time (5, 15 or 30 seconds) between ON and OFF of backlight.

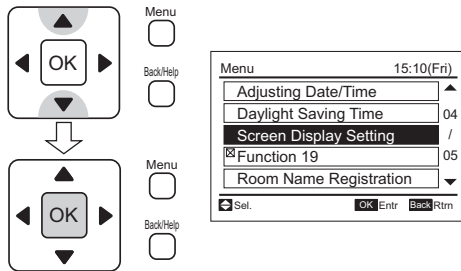
*** Contrast:**

Adjusts the degree of difference between light and dark elements of the LCD display.

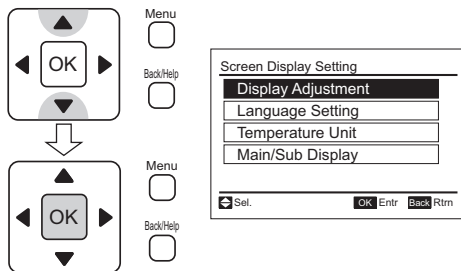
*** On/Off lamp:**

Adjusts the brightness of the run indicator.

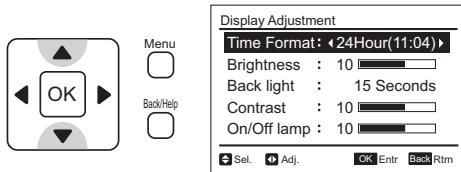
- (1) Select "Screen Display Setting" from the "Menu" screen and press "OK".



- (2) Select "Display Adjustment" by pressing "▲" or "▼" and press "OK".



- (3) Select the setting details by pressing "▲" or "▼".
The features change in order of "Time Format", "Brightness", "Back light", "Contrast" and "On/Off lamp".



- (4) Press "◀" or "▶" and set the display.

Time Format:

The time format changes as follows:
12 Hour ↔ 24 Hour

Brightness:

Press "◀" or "▶" and the brightness of the backlight is changed.

Backlight:

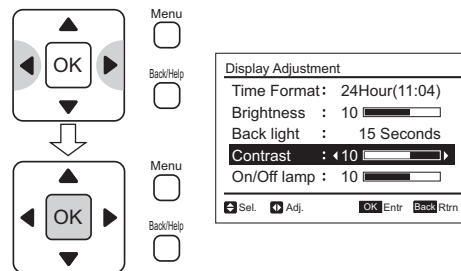
The display backlight is OFF after a specified time of inactivity (no input from touchscreen). The backlight off time interval can be selected as follows:
5 Seconds ↔ 15 Seconds ↔ 30 Seconds

Contrast:

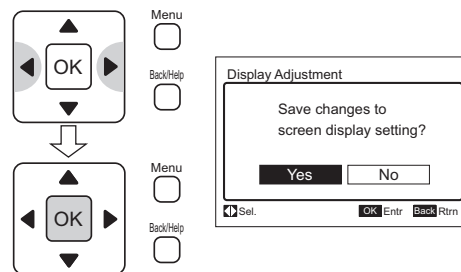
Press "◀" or "▶" and the degree of difference between light and dark elements of the LCD is changed.

On/Off lamp:

Press "◀" or "▶" and the brightness of the run indicator is changed.



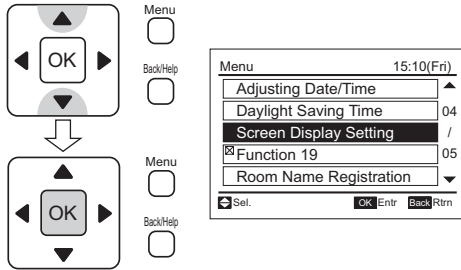
- (5) Select "Yes" by pressing "◀" or "▶" and press "OK". The setting will be confirmed and the screen will return to the normal mode.



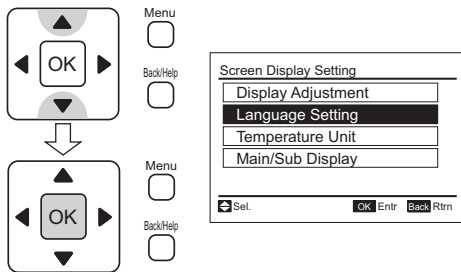
8.17.2 Language Setting

This function changes the displayed language.

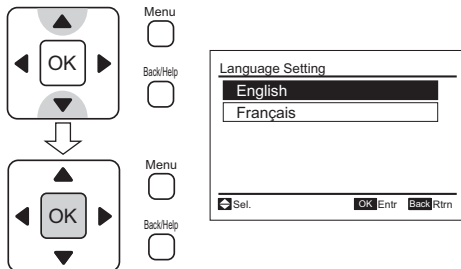
- (1) Select "Screen Display Setting" from the "Menu" screen and press "OK".



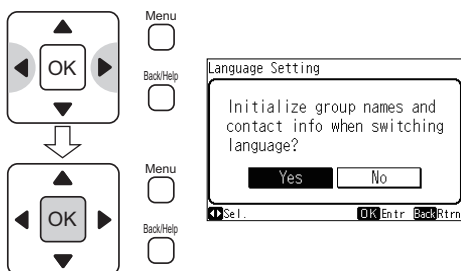
- (2) Select "Language Setting" by pressing "Δ" or "∇" and press "OK". The language setting will be displayed.



- (3) Press "Δ" or "∇" to select the language and press "OK".



- (4) The confirmation screen will display. Select "Yes" by pressing "◀" or "▶" and press "OK". The setting will be confirmed and the screen will return to the normal mode.

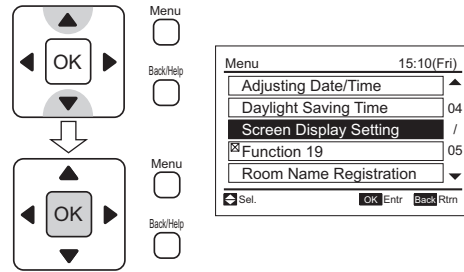


NOTE:

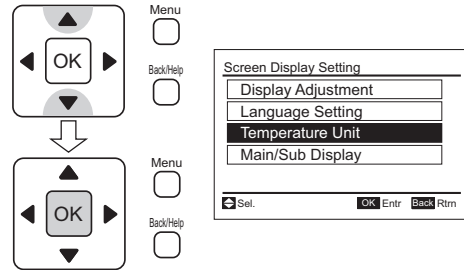
If displayed language is changed, the registered room name and contact information will be deleted.

8.17.3 Temperature Unit

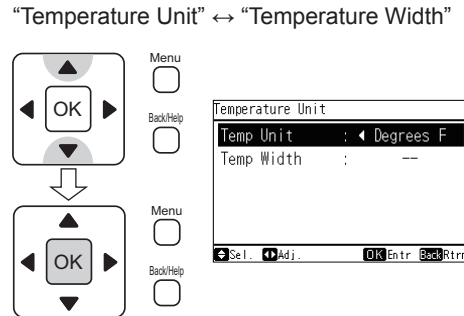
- (1) Select "Screen Display Setting" from the "Menu" screen and press "OK".



- (2) The "Screen Display Setting" screen will display. Select "Temperature Unit" using "Δ" or "∇" and press "OK". The temperature setting screen will be displayed.



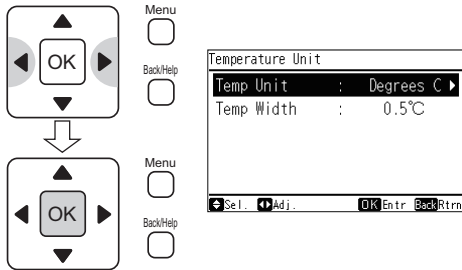
- (3) The temperature setting options display. Press "◀" or "▶" and select the setting item. The temperature setting will change as follows.



(4) Press “◀” or “▶” and select setting data.

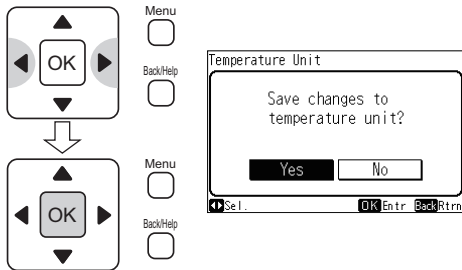
- If “Temperature Unit” is selected it will change as follows :
“Degrees C” ↔ “Degrees F”.
- If “Temperature Width” is selected it will change as follows :
“0.5°C” ↔ “1°C”

Press “OK” when all settings are complete.



When the selected language is English, Fahrenheit temperature degrees can be selected.

(5) The setting confirmation screen will display. Select “Yes” using “◀” or “▶” and press “OK” to confirm the setting. The screen will return to the normal mode.



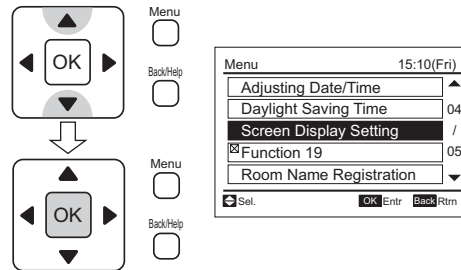
8.17.4 Main/Sub Remote Controller

This function is used to select Display/Non-display for “MAIN” or “SUB” displayed on the normal mode screen.

NOTE:

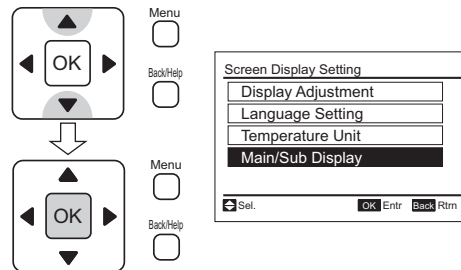
If the unit is set as “Non-display”, it is possible to verify if the controller is Main/Sub in the “Main/Sub-Remote” of the “Help Menu” “Current Setting”.

(1) Select “Screen Display Setting” from the “Menu” screen and press “OK”.



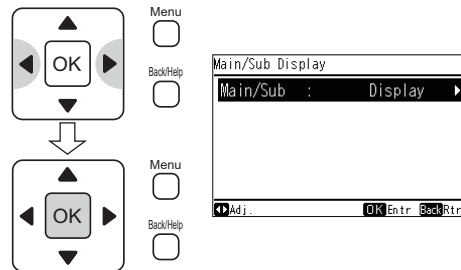
(2) The “Screen Display Setting” screen will display. Select “Main/Sub Display” using “Δ” or “▽” and press “OK”.

It cannot be set if only the main controller is available or when the display for “Main/Sub-Remote” in the “Current Setting” is shown as “--”.



(3) The “Main/Sub Display” screen displays. By pressing “◀” or “▶” the setting will be changed as follows :
“Display” ↔ “Non-display”

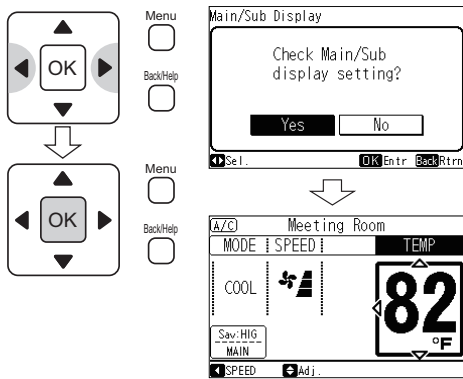
Select the setting and press “OK”.



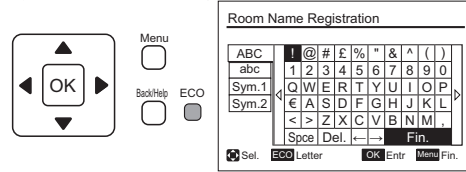
- (4) The setting confirmation screen will display. Select "Yes" with "◀" or "▶" and press "OK" to confirm the setting. The screen will return to normal mode.

Main/Sub	Display	Non-display
SAV		
OFF	<div style="border: 1px solid black; padding: 2px; display: inline-block;">MAIN</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">SUB</div>	Hide
ON	<div style="border: 1px solid black; padding: 2px; display: inline-block;">Sav: HIG MAIN</div> <div style="border: 1px solid black; padding: 2px; display: inline-block;">Sav: HIG SUB</div>	Sav: HIG

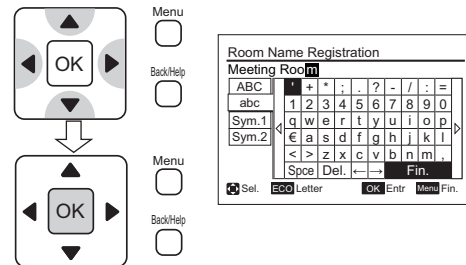
The icon will be displayed as above when set as "Display".



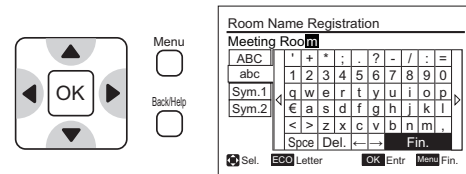
- (2) By pressing "Back/Help", letter and symbol types can be changed.



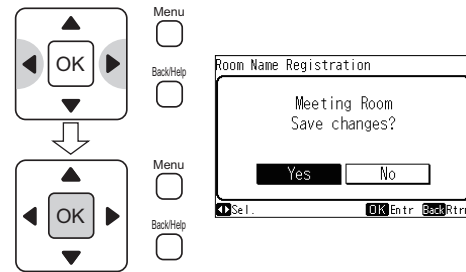
- (3) Press "Δ", "∇", "◀" or "▶" and select the letter or symbol. Press "OK" to confirm the selected letter or symbol (maximum of 12 characters).



- (4) Select "Fin." by pressing "Δ", "∇", "◀" or "▶" and press "OK", or press "Menu".



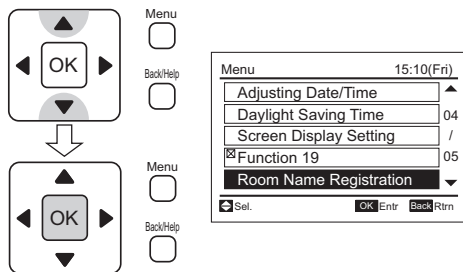
- (5) The confirmation screen displays. Select "Yes" by pressing "◀" or "▶" and press "OK". The setting will be confirmed and the screen will return to the normal mode.



8.18 Room Name Registration

This function registers the name of the room (installation location of controller).

- (1) Select "Room Name Registration" from the "Menu" screen and press "OK". The room name will be displayed.



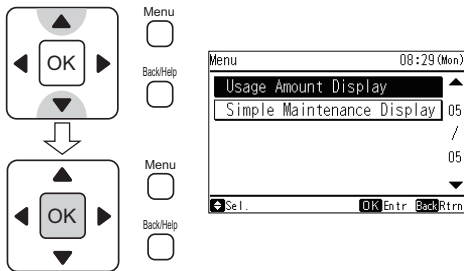
8.19 Power Consumption Display

This function displays the power consumption of the outdoor unit compressor. The value of each displayed in Graph/List format is 1 day (24h (- every 2 hrs.)), 1 week (7 days), and 1 year (12 months).

NOTE:

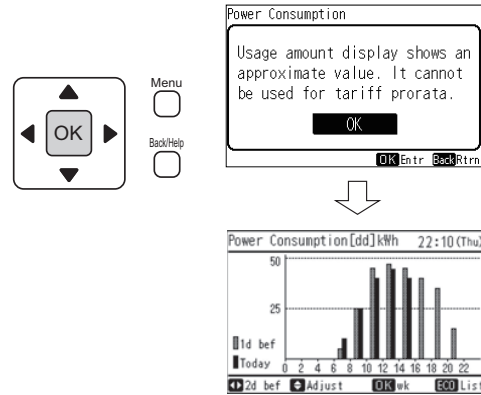
- The numerical value is a reference. Do not use this unit for the following:
Calculation of power rates or examination of the power contract.
- The "Main/Sub-Remote" display in the "Current Setting" of the "Help Menu" cannot be set if "Sub" or "--".
- In the following instances, the calculated value may be a deficit or may be changed.
 - Power Failure (outdoor unit, indoor unit, wired controller)
 - Communication Failure (outdoor unit ↔ indoor unit ↔ wired controller)
 - Modification of time

- (1) Select "Usage Amount Display" from the "Menu" screen and press "OK".



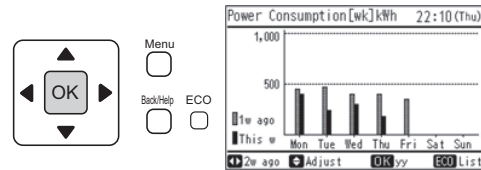
The Usage Amount Display setting screen will be displayed. When the current time is not set, the time adjusting screen will be automatically displayed.

- (2) The confirmation screen will be displayed. Press "OK" to change the screen to "Power Consumption" display.



- (3) Display Period

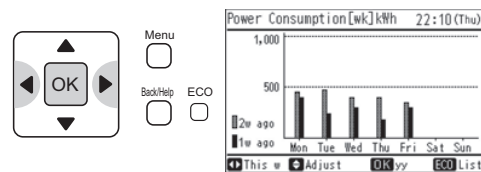
Press "OK" to change the Display Period as follows:
1 day (24h) / 1 Week (7 days) / 1 year (12 months)



Comparison

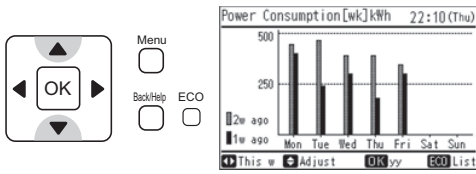
Press "◀" or "▶" to change the periods of comparison as follows:

- "2 days before / 1 day before"
- ↓
- "1 day before / Today"
- ↓
- "2 weeks ago / 1 week ago"
- ↓
- "1 week ago / This week"
- ↓
- "2 years ago / 1 year ago"
- ↓
- "1 year ago / This year"



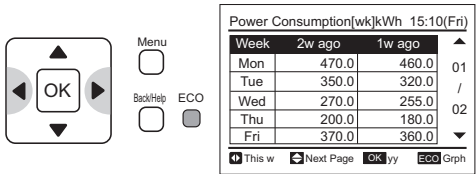
Display Scale

Change the scale using “Δ” or “∇”.

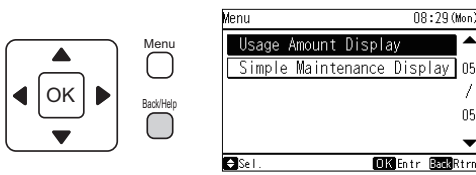


Graph ↔ List Display

Press “ECO” to change the “Power Consumption” display as follows:
“Graph” ↔ “List”



- (5) Press “Back/Help” to return to the “Menu” screen.



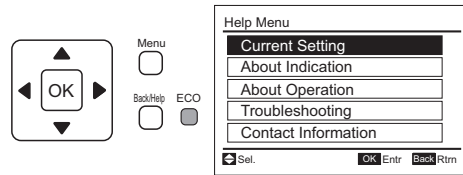
9. Help Menu

9.1 Help Menu

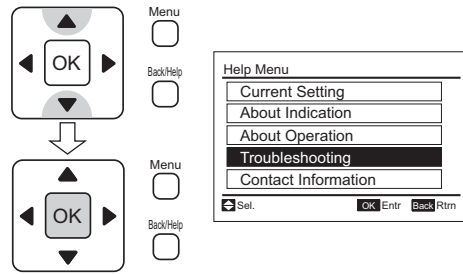
The explanation of indicators on the LCD and operations can be found in the “Help Menu”. The purpose of the “Help” function is to support manual operation.

More details are found below.

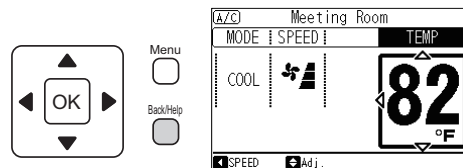
- (1) Press “Back/Help”.
The “Help Menu” will be displayed.



- (2) Select the topic from the “Help Menu” by pressing “Δ” or “∇” and press “OK”.



- (3) To return to the normal mode, press “Back/Help”.



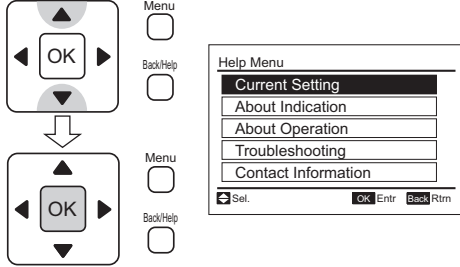
NOTE:

If the “Menu” screen remains unchanged for approximately 10 minutes, the screen will automatically return to the normal mode.

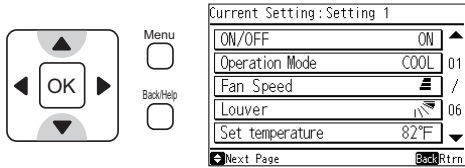
9.2 Current Setting Display

This function displays the setting content of the operating condition of the air conditioning and controller.

- (1) Select "Current Setting" from the "Menu" screen and press "OK".

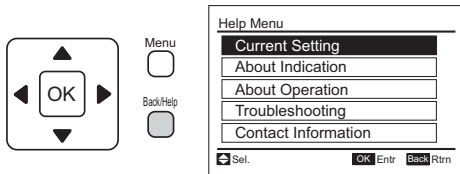


- (2) The "Current Setting" screen displays. Press "Δ" or "∇" to change to the indication "page".



- (3) Press "Back/Help" to return to the "Help Menu".

Press "Back/Help" again to return to the normal mode.



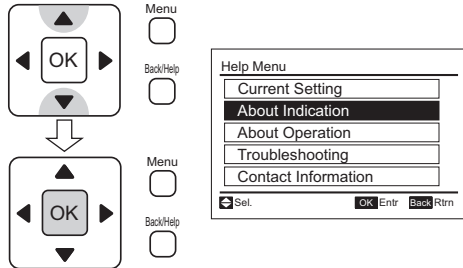
List of indications for the "Current Setting"

Each Type Setting 1	ON/OFF
	Operation Mode
	Fan Speed
	Louver
Each Type Setting 2	Setting Temperature
	Air Conditioning / Ventilation Setting
	Ventilation Mode
	Date
Each Type Setting 3	Room Name
	Main/Sub-Remote
	External Power Saving Control
	Operation Mode / Setting Temperature Priorities
Schedule	Operation Noise Reduction
	Quick Mode
	Simple Schedule
	Operation Schedule
Lock Operation	Outdoor Unit Capacity Control Schedule
	Intermittent Operation Control Schedule
	Noise Reduction Schedule
	Operation Mode
Central Control	Fan Speed
	Louver
	Setting Temperature
	ON/OFF
Central Control	Operation Mode
	Fan Speed
	Louver
	Setting Temperature

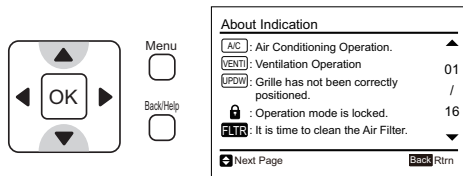
9.3 Indicators on LCD

This function is used for explaining each icon on the LCD.

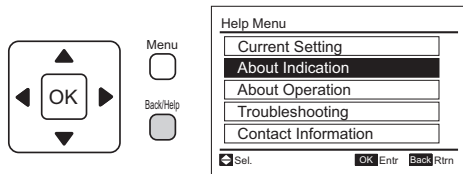
- Select "About Indication" from the "Help Menu" and press "OK". Explanations of indicators on the LCD will be displayed.



- Press "Δ" or "∇" to scroll the information up and down.



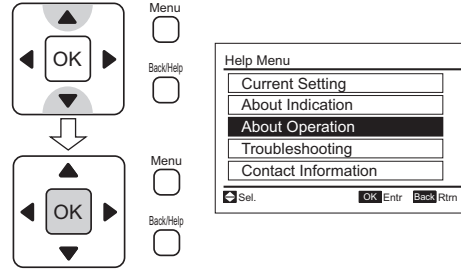
- Press "Back/Help". The screen will return to the "Help Menu".
 - To return to the normal mode, press "Back/Help" again.



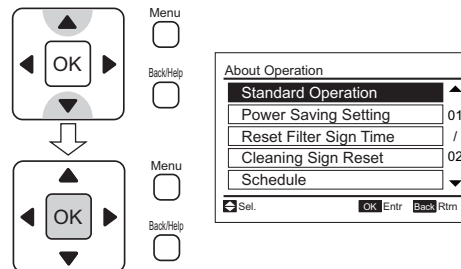
9.4 About Operation

This function is used to explain operations and operation methods.

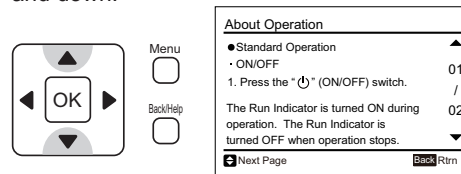
- Select "About Operation" from the "Help Menu" and press "OK". A list of operation functions will be displayed.



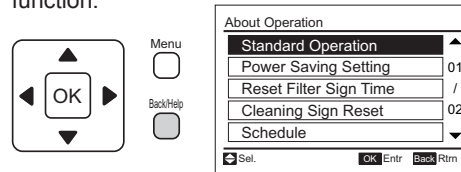
- Select the operation functions from the list by pressing "Δ" or "∇" and press "OK". The explanation of the selected operation will be displayed.



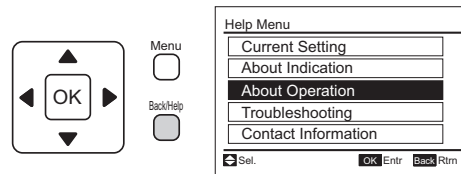
- Press "Δ" or "∇" to scroll the information up and down.



- Press "Back/Help". The screen will return to the operation function.



- Press "Back/Help". The screen will return to the "Help Menu".
 - To return to the normal mode, press "Back/Help" again.

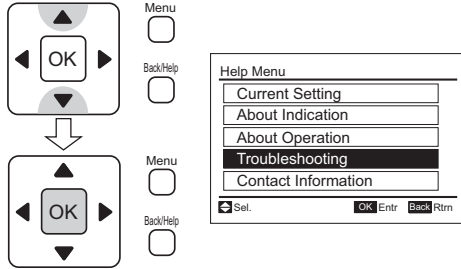


9.5 Troubleshooting

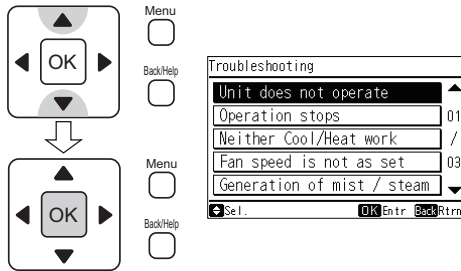
This function is used to troubleshoot operating problems.

Make sure that the troubleshooting section is read carefully before requesting repairs.

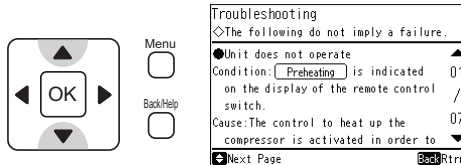
- (1) Select "Troubleshooting" from the "Help Menu" and press "OK".



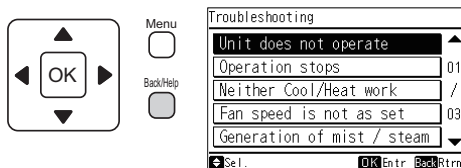
- (2) A list of troubleshooting issues is displayed. Select a problem from the list by pressing "△" or "▽" and press "OK". The details of the selected problem will be displayed.



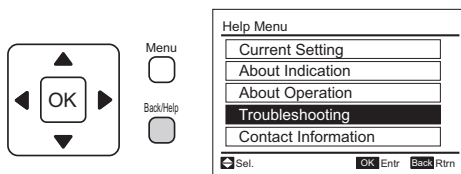
- (3) Press "△" or "▽" to scroll the information up and down.



- (4) Press "Back/Help". The screen will return to the list of "Troubleshooting".



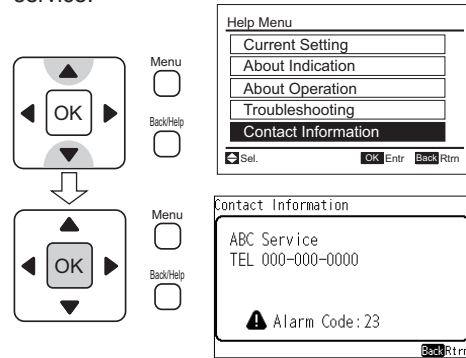
- (5) Press "Back/Help". The screen will return to the "Help Menu".
 - To return to Normal Mode, press "Back/Help" again.



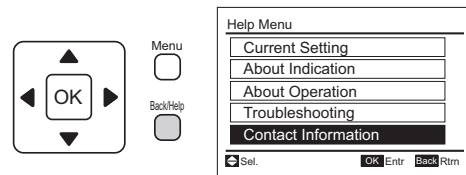
9.6 Contact Information

The screen will display "Contact Information" and the latest alarm code.

- (1) Select "Contact Information" from the "Help Menu" and press "OK". The "Contact Information" and the latest alarm code will be displayed along with contact information for service.



- (2) Press "Back/Help". The screen will return to the "Help Menu".
 - To return to the normal mode, press "Back/Help" again.



10. Other Indications

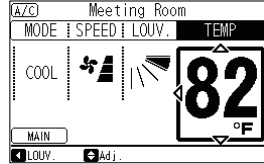
10.1 In Normal Condition

10.1.1 Main / Sub Controller

The icon "MAIN" will be displayed as ON when the controller is set as MAIN.

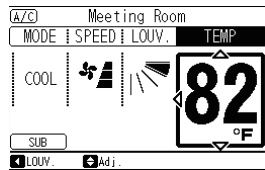
Use the main controller to set principal power saving.

When there is a single controller, the icon "MAIN" will not display as ON.



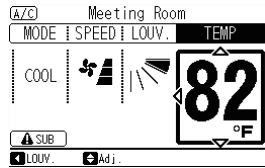
The icon "SUB" will display as ON when the controller is set as Sub.

The sub controller cannot set power saving except for a part of the power saving function.



The icon "▲ SUB" will display as ON when the main controller is absent.

In this instance, it is possible that the control with the power saving and the operation noise reduction functions may not operate normally.

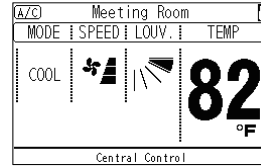


10.1.2 Central Control

When remote control operation is restricted (all functions)

The central control "🔒" will turn ON.

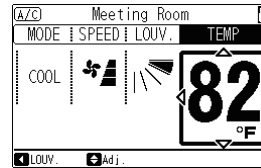
If the remote control restriction is set from the central controller, the settings for "RUN", "Operation Mode", "Temperature Setting", "Fan Speed", and "Louvre" will not be accessible from the controller.



When remote control operation is restricted (some functions)

The icon "🔒" will display as ON.

The function operation which is restricted from the central controller cannot be set.



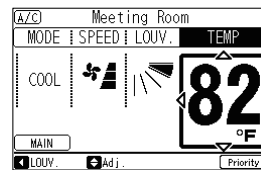
10.1.3 Priorities

When only the Operation Mode or Operation Mode and Temperature Setting have setting priorities (only when using the main controller).

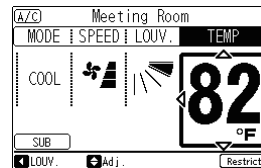
The icon "Priority" will display as ON.

In this instance, the sub controller "Restrict" icon will display as ON and the setting modifications of the Operation Mode and Temperature Setting from the sub controller will be restricted.

Main Controller



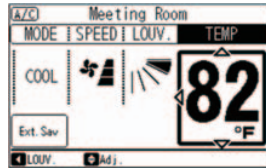
Sub Controller



10.1.4 External Power Saving Control Processing

During Outdoor Capacity Control setting in process of the central controller or outdoor unit The icon “Ext. Sav” will display as ON.

However, if the controller is set for indoor unit rotation or intermittent operation control, the icon will not display as ON.



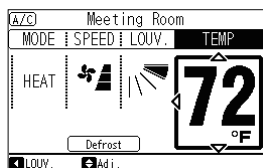
10.1.5 Thermo-Controller

The fan speed is changed to “LOW” at the thermo-controller actuation. However, the indication is not changed. (It changes only in the heating operation mode.)

10.1.6 Defrosting

Only device using both Cooling/Heating (included multi Cooling/Heating device for building)

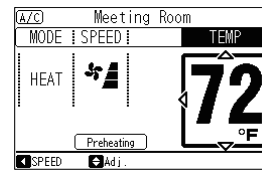
- When in Defrosting Operation
The icon “Defrost” will display as ON and the indoor fan will turn OFF.
The unit will be situated so the air will blow horizontally.
- When Turning OFF Operation During Defrosting.
The operation light will turn OFF but the operation will continue and the defrosting will stop when complete.



10.1.7 Operation Control

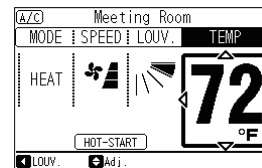
Power Activation

The icon “Preheating” will display as ON.
The compressor is preheating.
Because the unit cannot operate beyond four hours at a maximum, do not turn OFF the power of the outdoor unit in a Cooling/Heating season.
Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.



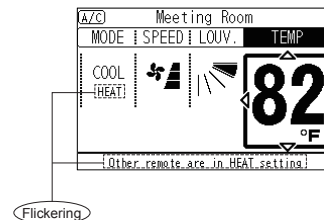
Activating in Hot Start (only for Heating Mode)

The icon “HOT-START” will display as ON.
The icon “HOT-START” will turn OFF when the unit is not operating.



In an instance where the operation mode set by the central station is different from the operation mode of the outdoor unit (when the outdoor unit is operating in a mode other than heat/cool simultaneous operation.)

- The current operation mode and the message “Other remote are in HEAT setting” will be flickering.



10.2 In Abnormal Condition

10.2.1 Abnormality

- The RUN indicator (red) flashes.
- The indoor unit number, the alarm code, the model code and the connected number of indoor units are displayed on the LCD.
- If two or more indoor units are connected, the above functions for each indoor unit are displayed one-by-one.

10.2.2 Power Failure

- All the indications are OFF.
- Once the unit is stopped by power failure, the unit will not be started again although power recovers. Perform the starting procedures again.
- If the power recovers within two seconds, the unit will start again automatically.

10.2.3 Electromagnetic Interference (EMI)

There could be an instance where all the indications are OFF and the unit is stopped. This can occur through activation of the micro computer for the unit protection from the Electromagnetic Interference (EMI). Perform the starting procedures again.

2.2.2 Simplified Wired Controller



Model: CIS01

- Table of Contents -


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1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system, including this controller, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least three feet (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.

- If the controller is installed in a location where electromagnetic radiation is generated, make sure that the controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the run test, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35° to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- If the remote sensors are not used with this controller, then do not install this controller...
 - In a room where there is no thermostat.
 - Where the unit is exposed to direct sunshine or direct light.
 - Where the unit will be in close proximity to a heat source.
 - Where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - In areas with poor air circulation and ventilation.
- Perform a run test using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the run test, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

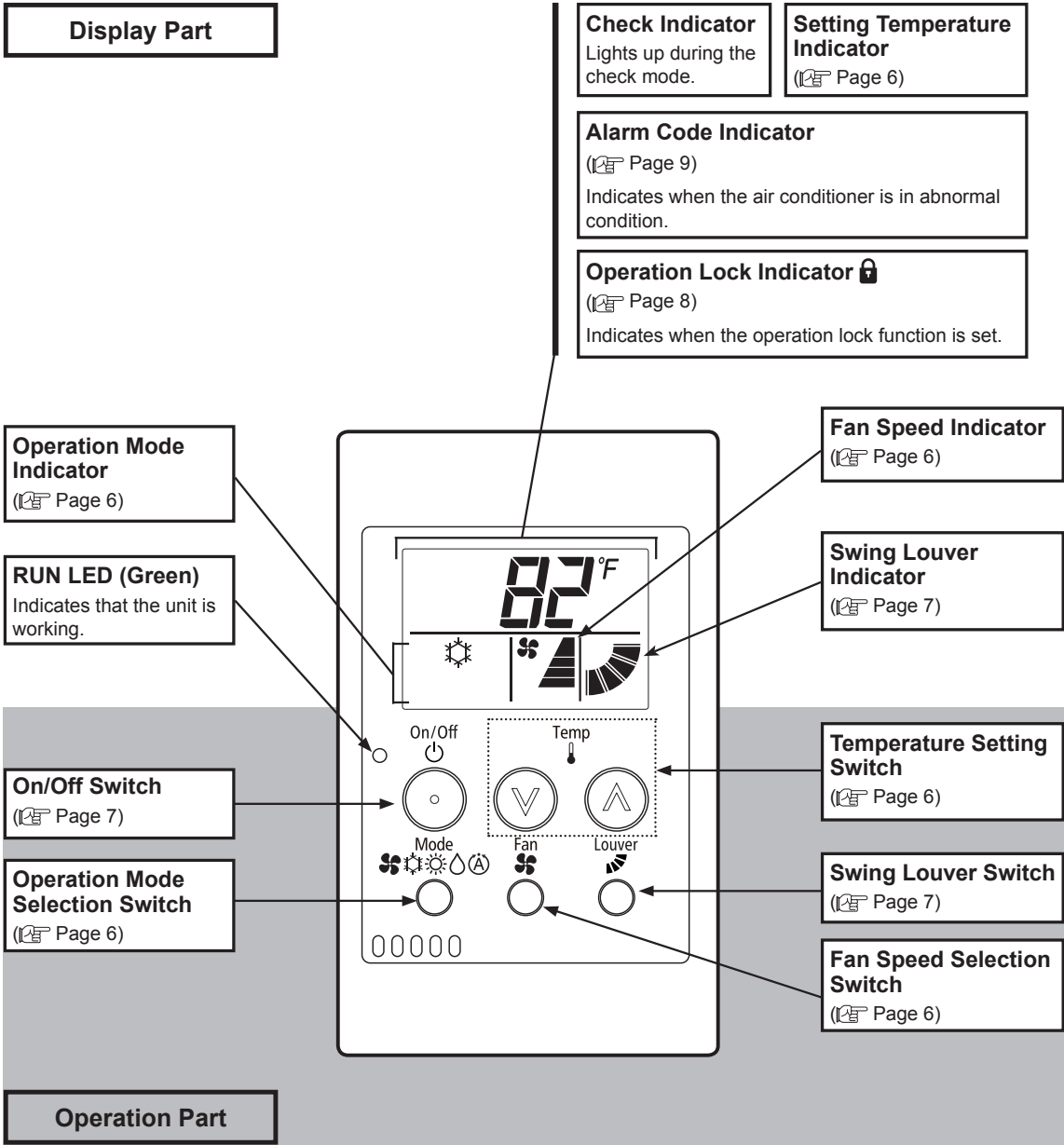
- Only use electrical protection equipment and tools suited for this installation.
- Insulate the controller against moisture and temperature extremes.
- Use specified cables between units and the controller.
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.

OPERATION

- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

2. Switch Names and Functions

The figure below shows all the indications for reference. The actual display during operation is different.



3. Operation Method

3.1 Operation Mode
(Cooling, Heating, Dry, Cooling/Heating Automatic and Airflow Operation)

<Function>

- * Cooling Operation (COOL):
To decrease the room temperature.
- * Heating Operation (HEAT):
To increase the room temperature.
- * Dry Operation (DRY):
To decrease the humidity in the room.
- * Cooling/Heating Automatic Operation (AUTO):
To cooling and heating automatic changeover.
- * Airflow Operation (FAN):
To circulate the air in the room.

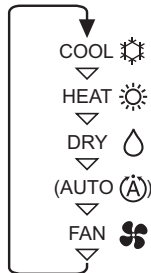
<Before Operation>



CAUTION

Turn ON the power supply for the air conditioner. To protect the compressor unit, the power supply should be energized 12 hours before the startup operation is begun. Do not turn OFF the power supply during in-season heating or cooling operation. Make sure that the outdoor unit is always free of ice and snow. If snow covered, remove it by using hot water (cooler than 122°F (50°C)). If the water temperature is higher than 122°F (50°C), it will damage plastic parts.

By pressing “Mode”, the operation mode will be adjusted as follows.



NOTE:
The advanced setting is required for “AUTO” operation mode. Contact your distributor or dealer for detailed information.

4. Setting Method

4.1 Temperature Setting

By pressing “Temp ^”, the temperature is increased by 1°F (0.5°C). (Max. 86°F (30°C))
By pressing “v Temp”, the temperature is decreased by 1°F (0.5°C).
(Cooling, Dry, Airflow operation: Min. 66°F (19°C))
(Heating operation: Min. 62°F (17°C))

NOTE:
Minimum and maximum temperature levels can be adjusted by setting the lower limit (set temperature for cooling) and the upper limit (set temperature for heating) from the function selection.

4.2 Fan Speed

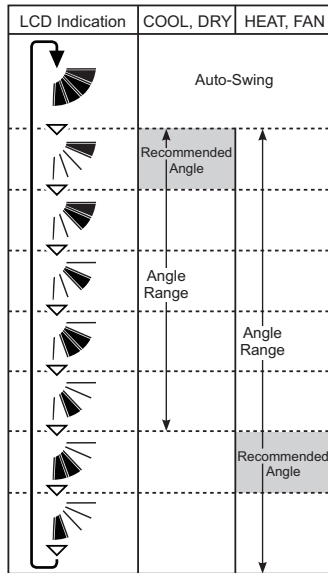
By pressing “Fan”, the fan speed will be adjusted as follows.



- NOTES:**
- During the dry operation, the fan speed is automatically adjusted to “LOW ” and cannot be changed to another fan speed. (“LOW ” will NOT be displayed on the LCD (liquid crystal display) at this time. The present setting condition will be displayed on the LCD.)
 - The fan speed settings “HIGH2” and (or) “AUTO” might not be available depending on the type of indoor unit.

4.3 Swing Louver Direction

By pressing "Louver", the louver direction will be adjusted as follows.



: The Auto-swing operation will start. At this time, the louver graphic will swing repeatedly on the LCD display.

NOTE:

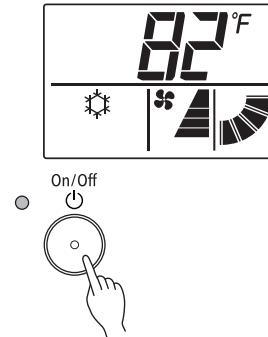
- The airflow angle is different for each indoor unit type. For details, refer to the indoor unit installation and maintenance manual.
- Louver action as depicted on the LCD display might not mimic the actual movement of the louver during the auto-swing operation. To adjust louver position, first set the angle new angle on the LCD display.
- Louver action might not stop immediately after the switch is pressed.

5. Operation

5.1 Operation Start

Press "On/Off".

The run indicator will be turned ON and the operation will initiate.



NOTE:

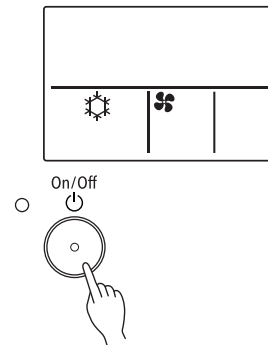
< Temperature/Airflow Setting >

The setting condition will be entered into memory once the setting is confirmed, therefore a daily setting is not required. In cases where a change of setting is required, refer to items 3.1 to 4.3.

5.2 Operation Stop

Press "On/Off" again.

The run indicator will shut OFF and the operation will be halted.




NOTE:

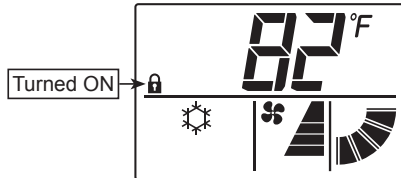
After the heating operation is halted, the airflow operation may be activated for approximately two minutes.

6. Other Indicators

6.1 In Normal Conditions

6.1.1 Central Control

The “” means turned ON. In case that the prohibiting operation by controller is set from the central controller, operation, temperature setting, fan speed and direction setting are not available from the controller.



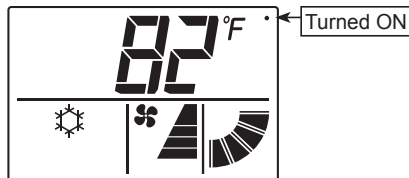
6.1.2 Thermo-controller

The fan speed is changed to “LOW ” at the thermo-controller switch. However, the graphic indication remains unchanged. (Only in the heating operation mode.)

6.1.3 Defrost

• Defrost Operation

The “•” is turned ON during the defrosting. The indoor fan is stopped although the graphic indication is unchanged. The louver is fixed at the horizontal position. The graphic louver symbol on the LCD remains animated.



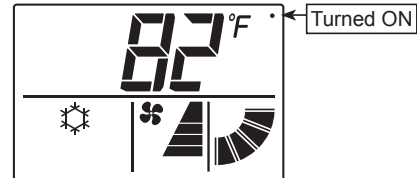
• Operation Stoppage during Defrosting Operation

The RUN LED (Green) goes out when the operation is stopped during defrosting. However, the operation continues with the “•” displayed, and the unit stops after the defrost operation is finished.

6.1.4 Operation Control

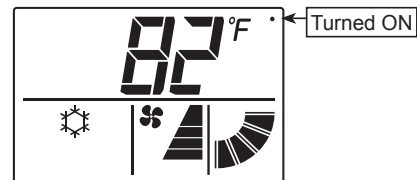
• Supplying Electrical Power

The “•” is activated when electrical power is turned ON. In this case, the compressor is now in the preheat stage. Operation might be delayed by a maximum of four hours. Do not cut power to the outdoor unit during seasonal heating and cooling operation.



• During Hot Start (Heating Operation Only)

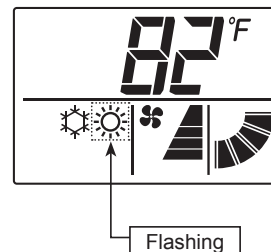
The “•” is turned ON.



• Different Operation Mode

The operation mode set by the controller is different from the outdoor unit operation mode. (Except for the heat recovery system models.)

The operation mode indicator will flash.



This indicator will flash when a command to COOL has been set by way of the controller during a HEATING operation.

6.2 In Abnormal Conditions

6.2.1 Abnormality

- The RUN LED (Red) is flashing.
- The indoor unit number, alarm code, model code, and the connected number of indoor units are displayed on LCD.
- In cases where a number of indoor units are connected, the above items for each indoor unit are displayed one by one.

6.2.2 Power Failure

- All indicators are DARK.
- Once a unit is shut down by a power failure, it cannot be restarted after the power recovers. Repeat starting procedures again.
- In instances where the power failure and recovery are instantaneous, the unit will restart automatically.

6.2.3 Electronic Interference

For instance, if a unit is in a shutdown state and all indicators are OFF, this condition could have been induced by the reaction of the unit's micro-computer fail-safe protections against electronic interference (EMI). If this is the case, perform restart procedures.

2.2.3 Infrared (IR) Receiver Kit (for 4-Way Cassette Type)



Model: C4IRK01

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1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	---

- This system, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least 3 ft. (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.
- If the controller is installed in a location where electromagnetic radiation is generated, make sure that the controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35 to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions**⚠ WARNING**

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions



WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Only use electrical protection equipment and tools suited for this installation.
- Insulate the infrared (IR) receiver kit against moisture and temperature extremes.
- Use specified cables between units and the infrared (IR) receiver kit.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the infrared (IR) receiver kit, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the infrared (IR) receiver kit as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

NOTICE

The wireless controller shall be utilized under the following conditions.

If not, it may cause failure of wireless controller.

Installation Place: Indoor

Ambient Temperature: 41 to 95°F (5 to 35°C)

Ambient Humidity: 35 to 90%

2. Before Operation

Refer to Section 3 of the Operation Manual for the 4-way cassette type indoor unit (P5415455).

2.1 Efficient Use of Indoor Unit

Refer to Section 3.2 of the Operation Manual for the 4-way cassette type indoor unit (P5415455).

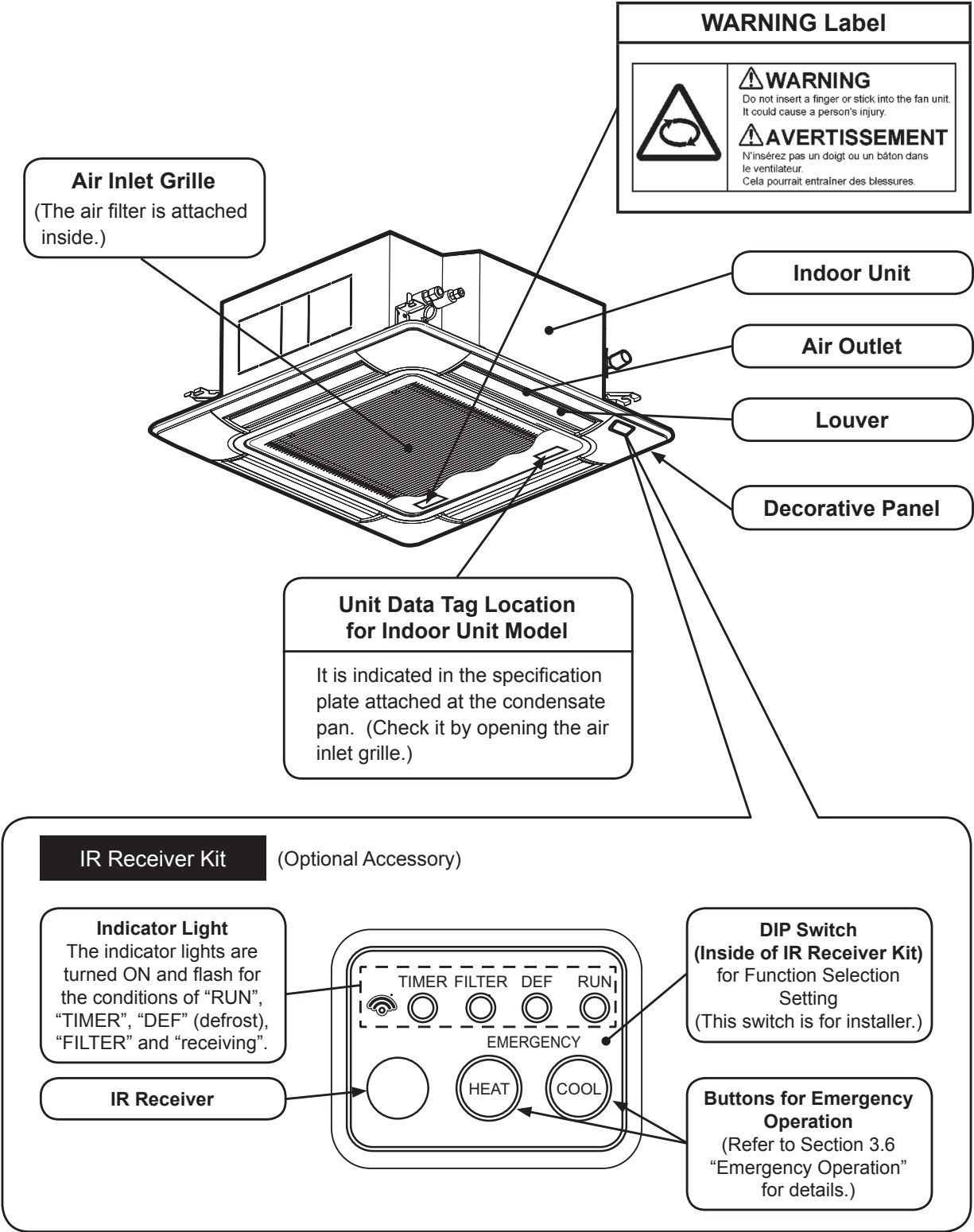
2.2 Efficient Use of Cooling and Heating

Refer to Section 3.3 of the Operation Manual for the 4-way cassette type indoor unit (P5415455).

2.3 Names of Parts and Indications for Safety Considerations

Safety considerations are located on the indoor unit for safety.
 Read and understand this manual before using the IR receiver kit.

2.3.1 Indoor Unit and IR Receiver Kit

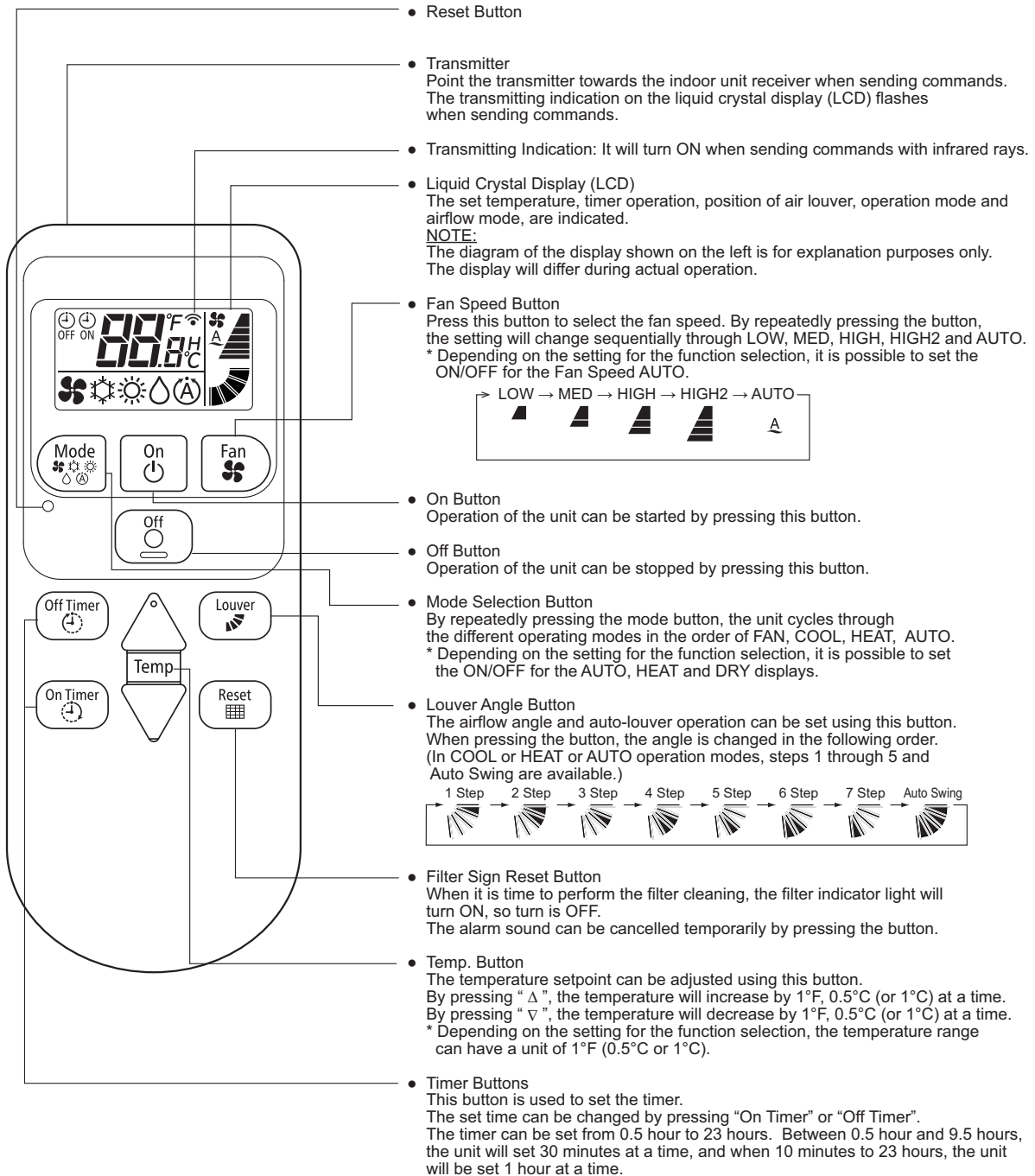


2.3.2 Wireless Controller

Model: CIR01

NOTE

- This wireless controller is used to send commands about operation modes, timer settings, and so forth to the indoor unit. Point the transmitter of the controller toward the receiver of the indoor unit. Press the button for the required operation so that commands (through infrared rays) are sent to the indoor unit.
- The distance for transmitting is approximately 20 feet as a maximum. Refer to Section 2.4.2 “Horizontal Distance Limit for IR Receiver Kit” for details. (A suitable distance for transmission will be shorter if the transmitting angle is not vertical to the receiver or an electronic type light is used in the room.)
- CIR01 is only available paired with the IR receiver kit and the indoor unit which are supported in High2 mode.



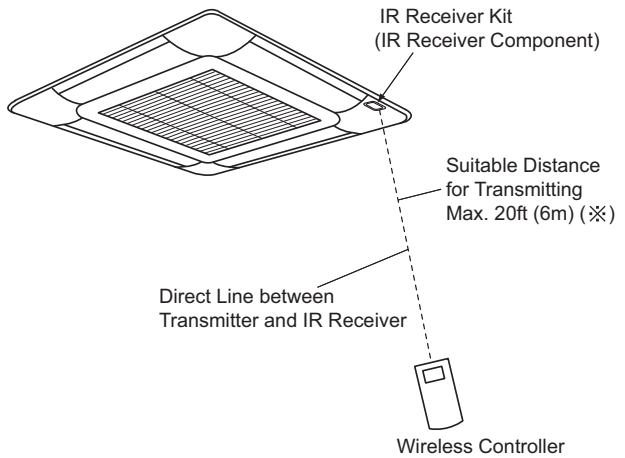
2.4 Handling Wireless Controller

NOTE

- Do not put the wireless controller in the following high-temperature environments. Heat may prevent it from operating correctly.
 - Places of direct light, including sunlight.
 - Places where hot air from a heater, or something similar will affect it
- Handle the wireless controller with care. If it falls or is splashed with water, the wireless controller may fail to operate.

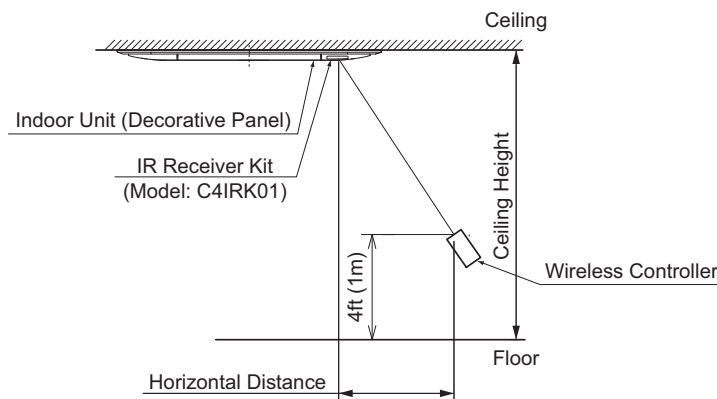
2.4.1 Sending Commands from Wireless Controller

- The operation commands are sent by pressing the operation button by pointing the transmitter of the wireless controller toward the receiver of the indoor unit.
- When commands are sent from the wireless controller, it should face vertically and be as close as possible to the IR receiver kit. The distance for transmitting will reduce when the angle of the controller is not vertical to the receiver or if there is an electric magnetic interference (EMI) in the room.
- The wireless controller has direct contact with the receiver. The distance for transmitting depends on the ceiling height. Refer to the table below for distance limits. The distance may differ depending on the building structure. Control the wireless controller within the distance shown in the table below.
- The distance for transmitting will might be too short because of battery consumption. When this happens, replace the battery.



※ The distance for transmitting differs depending on the ceiling height. Refer to the table below for details.

2.4.2 Horizontal Distance IR Limit for Receiver Kit





Horizontal Distance Limit for Receiver Kit
(If the height of wireless controller from floor is 4 feet)

Unit: ft (m)


Height of Indoor Unit	9 (3)	10 (3)	12 (4)	14 (4)	15 (5)	17 (6)
Horizontal Distance	10 (3)	12 (4)	14 (5)	15 (5)	15 (5)	15 (5)

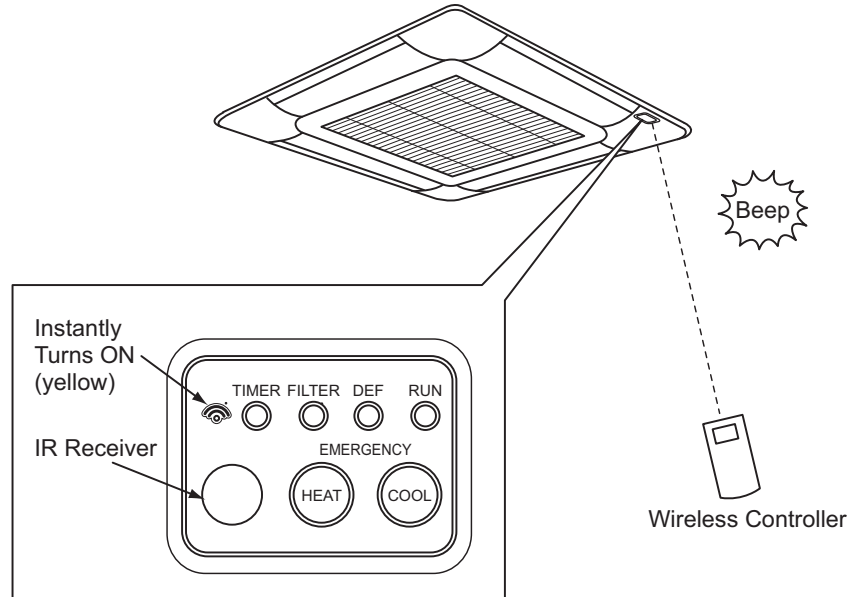
OPERATION

2.4.3 Receipt Confirmation of IR Receiver Kit

The “” light (yellow) on the receiver component of the indoor unit is turned ON for an instant when the IR receiver kit receives the commands from the wireless controller. If the “” light (yellow) is not turned ON, the commands may not have reached the receiver. Send the commands again.

NOTE

- The “” light (yellow) is turned ON with a beeping sound for receipt confirmation.
 - The beep sound may not be heard if there is surrounding noise.
-






3. Operation

NOTICE








Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil. Do not turn OFF the power supply during change of seasons.

NOTE

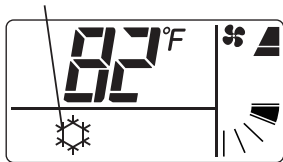
- The “” light (yellow) is turned ON with a beeping sound for receipt confirmation.
- The beep sound may not be heard if there is surrounding noise.
- “” light (yellow) on the receiver of the indoor unit flashes (0.25 seconds ON/0.25 seconds OFF), and then turns OFF. While the “” light is flashing, the unit will not operate because it is initializing.

3.1 Basic Operation

< Start Operation >

- (1) Press the “Mode ” button. By repeatedly pressing the “Mode ” button, the unit cycles through different operating modes in the order of (Fan), (Cool), (Heat), (Dry) and (Auto).




Cooling mode is under operation.



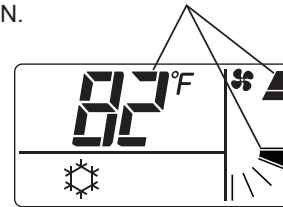
Indications for setting temperature, fan speed, and airflow angle may be turned ON depending on what function is being operated on the control.

NOTE:



For details about the automatic cooling/heating operation mode, refer to Section 3.4 “Automatic Cooling/Heating Operation”.

- (2) Point the transmitter toward the IR receiver kit and press the “On ” button. When the transmitting signal “” appears on the LCD of the wireless controller, the “” light (yellow) on the receiver will turn on briefly. The RUN indicator (red) on the receiver is turned ON when the operation starts.

The functions for setting temperature, fan speed, and airflow angle are turned ON.




NOTE:

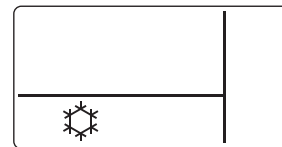
Do not press the “On ” or “Off ” button repeatedly (less than 3 seconds). If the button is pressed repeatedly, the controller may not work correctly.

< Temperature, Fan Speed, and Airflow Direction >

Once the setting is confirmed, it will be stored. A daily setting is not required. When a setting change is required, refer to Section 3.3 “Setting Method”.

< Stop Operation >

Point the transmitter toward the IR receiver kit and press the “Off ” button again. The RUN indicator (red) on the receiver is turned OFF and the operation stops.



The functions for setting temperature, fan speed, and airflow angle are turned OFF.

NOTE:

The indoor unit fan may continue to operate for up to two minutes following the heating cycle to dissipate residual heat from the indoor unit.


3.2 Operation Mode (Cooling, Heating, Dry, Fan and Automatic Cooling/Heating Operation)

<Function>


- Fan Operation (Fan):
Circulates the air in the room.
- Cooling Operation (Cool):
Decreases the room temperature.
- Heating Operation (Heat):
Increases the room temperature.
- Dry Operation (Dry):
Decreases the humidity in the room.
- Automatic Cooling/Heating Operation (Auto):
Cools and heats with automatic change-over.


3.3 Setting Method


NOTE

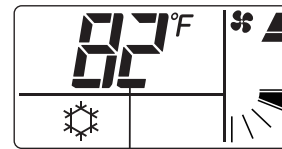
- The “” light (yellow) is turned ON with a beeping sound for receipt confirmation.
 - The beeping sound may not be heard if there is surrounding noise.
 - To adjust the airflow angle, refer to the installation and operation manuals for the indoor unit.
-

3.3.1 Temperature Setting

Point the transmitter toward the IR receiver kit and press the “Temp ” button to set the temperature.

By pressing “”, the temperature is increased by 1°F (0.5°C).

By pressing “”, the temperature is decreased by 1°F (0.5°C).




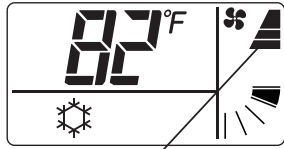
In this example, the temperature is set to 82°F (28°C) in the cooling operation.

NOTES:

- The temperature is not displayed during a shutdown. If the temperature is set during a shutdown, the temperature indication is turned ON only temporarily. It is automatically turned OFF after being set.
- The temperature can be set for each operation mode.
- The temperature set-point can be set from 62°F (17°C) to 86°F (30°C) by the wireless controller.
However, for an indoor unit where the temperature set-point range is 66°F (19°C) ~ to 86°F (30°C), temperature settings of 62°F (17°C) and 64°F (18°C) are not an option.

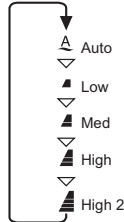
3.3.2 Fan Speed

Point the transmitter toward the IR receiver kit and press the “Fan ” button to set the fan speed.



The fan speed is set on “High” in the cooling operation.


By repeatedly pressing the button, the setting will change sequentially through Auto, Low, Med, High, and High2.

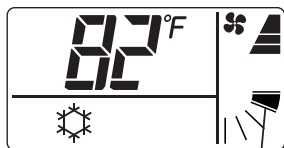


NOTE:


- The fan speed is not displayed during a shutdown. If the fan speed is set during the shutdown, the fan speed indication is turned ON only temporarily. It automatically turns OFF after being set.
- The fan speed can be set for each operating mode except Dry mode, which forces the fan operation at “LOW” speed only.









3.3.3 Airflow Direction


(1) Point the transmitter toward the IR receiver kit and press the “Louver ” button to set the louver angle.



The louver angle is set on 1 step at “High” in the cooling operation.

(2) By pressing the “Louver ” button, the louver angle will change as follows.

Step	LCD Indication	Auto, Cool, Dry	Heat, Fan
-		Auto-Swing	
1		Recommended Angle	↑
2			
3		Angle Range	↑
4			
5		Angle Range	↑
6			
7		Recommended Angle	↓

 : Auto swing operation will be started. At this time, the louver will swing repeatedly on the LCD.

NOTES:

- The louver angle is not displayed during a shutdown.
- The louver settings are only available from 1 step through 5 steps and auto-swing at the cooling, dry, and auto operation modes. Steps 6 and 7 can be used to avoid cold or hot air coming out of the unit blowing directly at someone or something you would rather not. It's a customer's airflow direction preference also. You may want hot air blowing straight down and cold air straight up. Cold air sinks and hot air rises.
- The louver angle may change automatically during the heating operation. (Refer to the installation and operation manuals of the unit for details.)
- The louver may NOT stop immediately after the button is pressed.
- The auto louver mechanism is not available for duct-type units.
- To adjust the louver angle, refer to the installation and operation manuals for the indoor unit.

3.4 Automatic Cooling/Heating Operation

< Function >

Automatic Cooling/Heating Operation automatically switches the cooling and heating operation based on the set temperature for inlet air temperature conditions.



The cooling operation is performed when the inlet air temperature is approximately 5°F (3°C) higher than the set temperature.

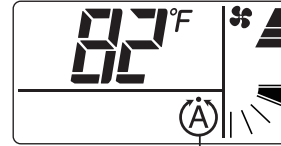
The heating operation is performed when the inlet air temperature is approximately 5°F (3°C) lower than the set temperature.

NOTE

- If the fan speed is set to “Low” during a heating operation, the operation stops by activating the protection devices.
In this instance, set to “Med”, “High”, or “High 2”.
- The heating operation is not possible when the ambient temperature is higher than approximately 70°F (21°C).
- The threshold of switching the temperature against the temperature set-point is $\pm 5^\circ\text{F}$ ($\pm 3^\circ\text{C}$) when using this function. Therefore, this function should not be utilized in a room where accurate temperature and humidity controls are required.

< Start Operation >



- (1) Press the “Mode  ” button several times.
The indication of “Auto  ” (automatic cooling/heating operation) will appear.






“Auto” is set.

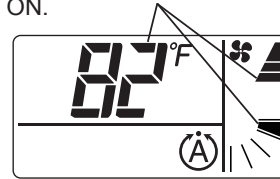
The indications of setting temperature, fan speed, and airflow angle are turned ON depending on what function is being operated on the control.

NOTE:



- The automatic cooling/heating operation requires other settings to be performed. Contact your distributor for details.
- When the “Mode  ” button is pressed at “Auto  ”, the fan operation starts.

- (2) Point the transmitter toward the IR receiver kit and press the “On  ” button.
When the transmitting indication “ ” flashes, the “ ” light (yellow) on the receiver will turn on briefly.
The RUN indicator (red) on the receiver turns ON and the operation is started.

The functions for setting temperature, fan speed, and airflow angle are turned ON.



NOTE:

Do not press the “On  ” or “Off  ” button repeatedly (less than 3 seconds).


If the button is pressed repeatedly, the wireless controller may not work correctly.

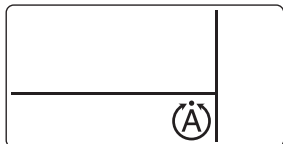
< Temperature, Fan Speed and Airflow Direction >

To set the temperature, fan speed, and airflow direction, refer to Section 3.3 “Setting Method”.

3.5 Timer Setting Method


< Stop Operation >

Point the transmitter toward the IR receiver kit and press the “Off ” button again. The RUN indicator (red) of the receiver is turned OFF and the operation stops.





The functions for setting temperature, fan speed, and airflow angle are turned OFF.

NOTE

- The “” light (yellow) is turned ON along with a beeping sound for receipt confirmation.
- The beeping sound may not be heard if there is surrounding noise.







< Function >

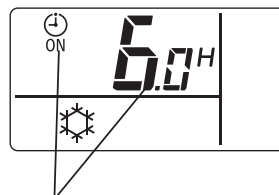
- This function is used to start or stop the unit operation when setting the timer.
- The timer setting can be set with both an “On Timer ” and “Off Timer ”.

On Timer: The operation is started after the set time is passed.

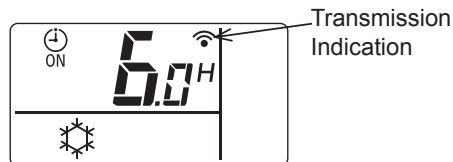
Off Timer: The operation is stopped after the set time is passed.

< Timer Setting >



- Press “On Timer ” or “Off Timer ”. By repeatedly pressing “On Timer ” or “Off Timer ”, the setting time is changed.
- Point the transmitter toward the IR receiver kit and press the “On Timer ” button to set the time and the LCD of the wireless the time controller indicates transmission “”.
- Time can be set for half-hour intervals up to 10 hours and at one-hour intervals up to 23 hours after the 10 hours.

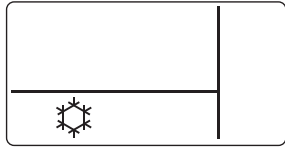


In this example, the “On Timer” is set at 6 hours.




< Cancel Setting >

To cancel the timer setting, point the transmitter towards the IR receiver kit and press “On Timer ” or “Off Timer ” button after proceeding up to 23 hours by repeatedly pressing the button. The TIMER indicator (green) on the receiver is turned OFF.



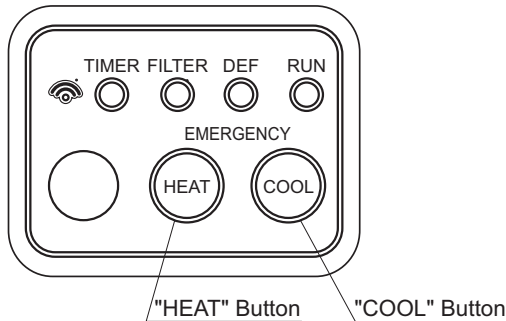
3.6 Emergency Operation

NOTE

- The setting temperature and the fan speed for a cooling/heating operation are the same as before starting an emergency operation.
- During an emergency operation, the “” light (yellow) flashes (0.5 second ON/0.5 second OFF).

< Function >

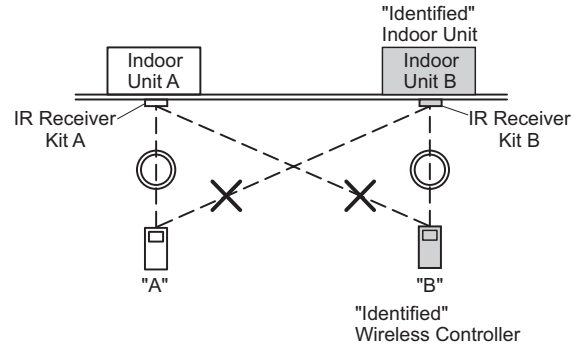
“COOL” and “HEAT” buttons are used for an emergency operation when the batteries for the wireless controller are low.



- “COOL” Button: Press “COOL” to start the cooling operation.
Press “COOL” again to stop the cooling operation.
- “HEAT” Button: Press “HEAT” to start the heating operation.
Press “HEAT” again to stop the heating operation.

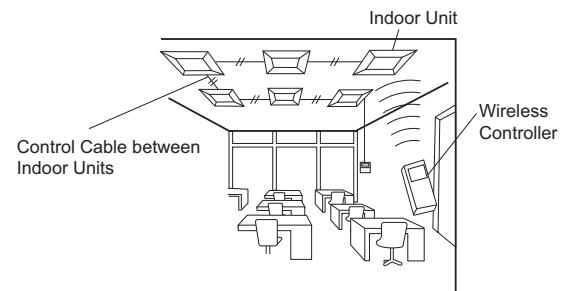
3.7 Identifying Indoor Units Installed Side by Side

When two indoor units are installed side by side, the commands from the wireless controller may be received by both indoor units. The function, “Identifying of Indoor Units Installed Side by Side” enables operation of an individual unit without interfering with the other unit’s operation. As shown in the figure below, the indoor units of A and B are set side by side. In this case, unit B is set as “Identifying Indoor Units Installed Side by Side”. Contact your distributor for details.



3.8 Simultaneous Operation of Multiple Indoor Units

Multiple indoor units (a maximum 16 units) can be started and stopped simultaneously by one wireless controller. For details, contact your distributor.

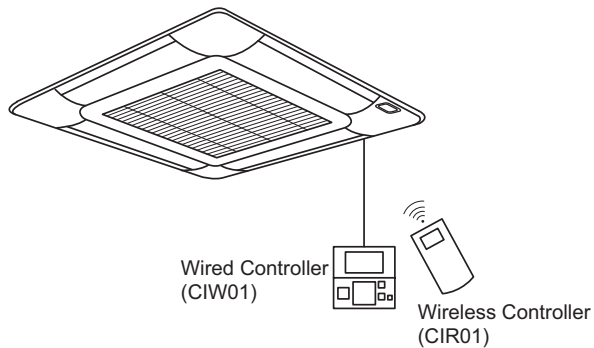


This is an example of Simultaneous Operation of Multiple Units

3.9 Operation with Wired Controller

The indoor unit can be operated by both wired and wireless controllers.

Contact your distributor for details.



3.10 Automatic Operation

Refer to the installation and operation manuals for the indoor unit.

4. Maintenance

Refer to the installation and operation manuals for the indoor unit.

4.1 Cleaning Wireless Controller

- Clean the controller with a soft, dry cloth.
- It is important not to use a wet cloth to clean. It may cause damage to the wireless controller.
- Do not use benzine, thinner, or detergent (Surfactant). If it is used, the wireless controller may be damaged or change color.

4.2 Replacing Batteries

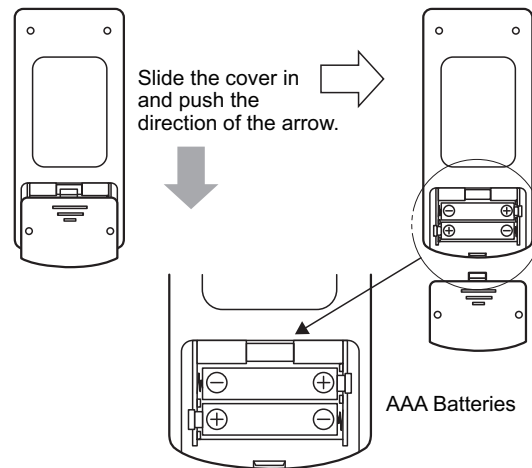
Under normal use, the battery life should be about one year (for alkaline batteries).

Replace the batteries if one of the following circumstances occurs:


The transmission distance between the wireless controller and the IR receiver kit can be too short for operation or fan speed adjustment.

To replace batteries:

- (1) Remove the battery cover by sliding and pushing the cover in the direction of the arrow as shown in the figure below.
- (2) Replace the batteries.
(Insert the batteries according to the + and - marks on the case.)



NOTE:

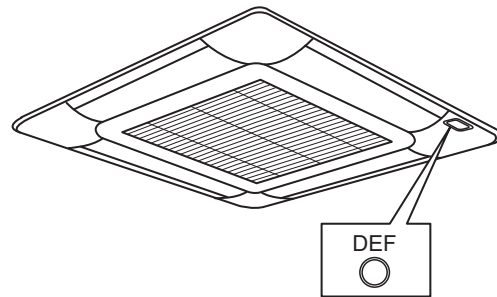
- Review the following to ensure using the batteries correctly. If not, there may be a leak or flare up.
 1. Never use new and used batteries together.
 2. Never use different types of batteries together (for example, manganese and alkaline) together.
 3. When the wireless controller is not used for a length of time (more than two or three months), replace the batteries of the wireless controller.
- The batteries included at the factory are for validation and may be low.
- When replacing batteries, wait for more than 5 seconds after removing the old batteries to replace with new ones.
- All settings are reset after the batteries are replaced. Therefore, when “Identifying of Indoor Units Installed Side by Side” has been set, the setting is canceled once the batteries are replaced. After replacing the batteries, reset “Identifying of Indoor Units Installed Side by Side” again.
(Press and hold the “On Timer” and “Off Timer” buttons simultaneously for 3 seconds. The indication “” will appear. Refer to the installation manual for details.)

5. Indications of IR Receiver Kit

5.1 In Normal Condition

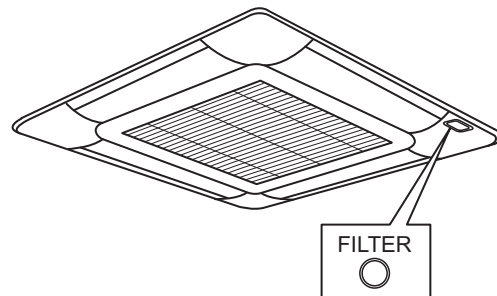
5.1.1 Defrost

- **Defrost Operation**
The DEF indicator (green) is turned ON during defrosting. The indoor fan is stopped. The louver is fixed at the horizontal position. However, the louver indication of the LCD continues to activate.
- **Operation Stoppage during Defrosting Operation**
The RUN indicator (red) is turned OFF when the operation is stopped during defrosting. However, the operation continues when turning on the ON DEF indicator (green), and the unit is stopped after the defrost operation is finished.




5.1.2 Filter Sign

When the filter indication LED turns yellow, the air filter needs to be cleaned or replaced. (Details for the cleaning method and filter cleaning time should be referred to in the installation and operation manuals of the indoor unit.) After cleaning, point the transmitter toward the IR receiver kit and press the “RESET” button to turn OFF the FILTER indicator.



5.1.3 Central Control

When the “” light (yellow) remains ON, the indoor unit is under centralized control. In this instance, “RESET” and “RUN/STOP” buttons are only available for control from the wireless controller.

5.2 In Abnormal Condition

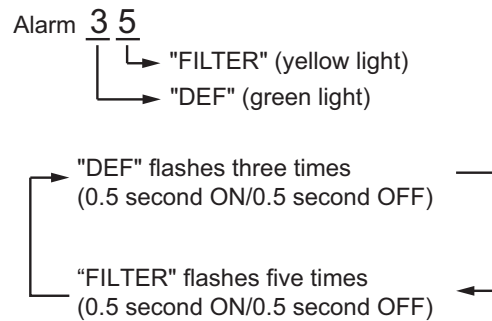
5.2.1 Abnormality

- If a malfunction occurs, such as a safety device actuation, during the test run or the normal operation, the “RUN” (red light) flashes (0.5 second ON/0.5 second OFF).
- The alarm codes are indicated by the flashing of “DEF” (green light) and “FILTER” (yellow light).

The first LED light is green. The number of times this LED flashes (0.5 second ON and OFF) will tell you the “DEF” Alarm Code.

The second LED light is yellow. The number of times this LED flashes (0.5 second ON and OFF) will tell you the “FILTER” Alarm Code.

< Example >



These signals are repeated until the alarm is reset.

5.2.2 Power Failure

- All the indications are OFF.
- Once the unit is stopped by a power failure, it will not start again even if the power recovers. Perform the starting procedures again.
- If there is a temporary instantaneous power failure lasting two seconds, the unit will start again automatically.

5.2.3 Electromagnetic Interference (EMI)

There could be a situation where all the indications are OFF and the unit is stopped. This is a result of the micro computer activating because of the unit, protection from the EMI. Perform the starting procedures again.

6. Troubleshooting

6.1 This is Not Abnormal

Refer to the installation and operation manuals of the indoor unit.

Phenomenon		Cause and Action
Stopped Operation	All indication lights on the IR receiver kit are turned OFF.	The micro-computer is activated to protect the device from electromagnetic waves. The operation can be recovered if it is started from the beginning.
	Power failure occurs.	Start the operation from the beginning.

6.2 Before Contact

Check the issues before contacting a contractor.

Refer to the operation manual of the indoor unit together.

Issue	Checking Point	Action
Not Operated	Is the transmitter of wireless controller pointed towards the IR receiver kit?	Point the transmitter towards the IR receiver kit.
	Check batteries of the wireless controller.	Replace batteries.
	Is the receiver surface covered by dust?	Wipe the receiver with a soft, dry cloth.
	Is the air conditioning controlled by a centralized control?	When the air conditioning is under centralized control, "RESET" and "RUN/STOP" buttons are only available for control from the wireless controller.
Not Cooling or Heating Well	Check that the operation mode is correct.	If the fan mode is selected, switch the operation mode to cooling (heating).
	Check that the set temperature is correct.	If not, change the set temperature by pressing "△" or "▽" with the wireless controller.
	Check that the airflow direction is correct.	If not, change the airflow direction.

6.3 Contact Distributor

If the trouble still remains even after checking the previous issues or other problems not mentioned, stop using the product and contact your distributor.

WARNING

If an abnormality (burnt odor, for example) occurs, stop the operation and turn OFF the main power source immediately. Otherwise, there may be damage to the product, an electric shock or a fire.

Contact your distributor.

Trouble	Action before Contact
The protection devices (such as a fuse, breaker, or Ground Fault Circuit Interrupter (GFCI)) are frequently activated or the main power source does not work.	Turn OFF the power source.
Water Leakage from Indoor Unit.	Stop the operation.
<ul style="list-style-type: none"> ● The RUN indicator (red) is flashing. ● The alarm codes are indicated by the flashing of DEF indicator (green) and FILTER indicator (yellow). Check the details for flashing indicators and contact your distributor. (Refer to Section 5.2.1 “Abnormality”.) 	Refer to the Alarm Code Table of the installation manual for the indoor unit. Inform your distributor of the details for the flashing indicator of the IR receiver kit.

Provide the following information to the distributor.

- 1) **Model Name**
- 2) **Description of Problem**
- 3) **Alarm Code Number or Details of Flashing Indicator (Refer to Section 5.2.1 “Abnormality” for details.)**

2.2.4 Infrared (IR) Receiver Kit (for 1-Way Cassette Type)



Model: C1IRK01

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1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	---

- This system, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least 3 ft. (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.
- If the controller is installed in a location where electromagnetic radiation is generated, make sure that the controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35 to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions**⚠ WARNING**

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions



WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Only use electrical protection equipment and tools suited for this installation.
- Insulate the infrared (IR) receiver kit against moisture and temperature extremes.
- Use specified cables between units and the infrared (IR) receiver kit.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the infrared (IR) receiver kit, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the infrared (IR) receiver kit as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

NOTICE

The wireless controller shall be utilized under the following conditions.

If not, it may cause failure of wireless controller.

Installation Place: Indoor

Ambient Temperature: 41 to 95°F (5 to 35°C)

Ambient Humidity: 35 to 90%

2. Before Operation

Refer to Section 3 of the Operation Manual for the 1-way cassette indoor unit model (P5415457).

2.1 Efficient Use of Indoor Unit

Refer to Section 3.2 of the Operation Manual for the 1-way cassette indoor unit model (P5415457).

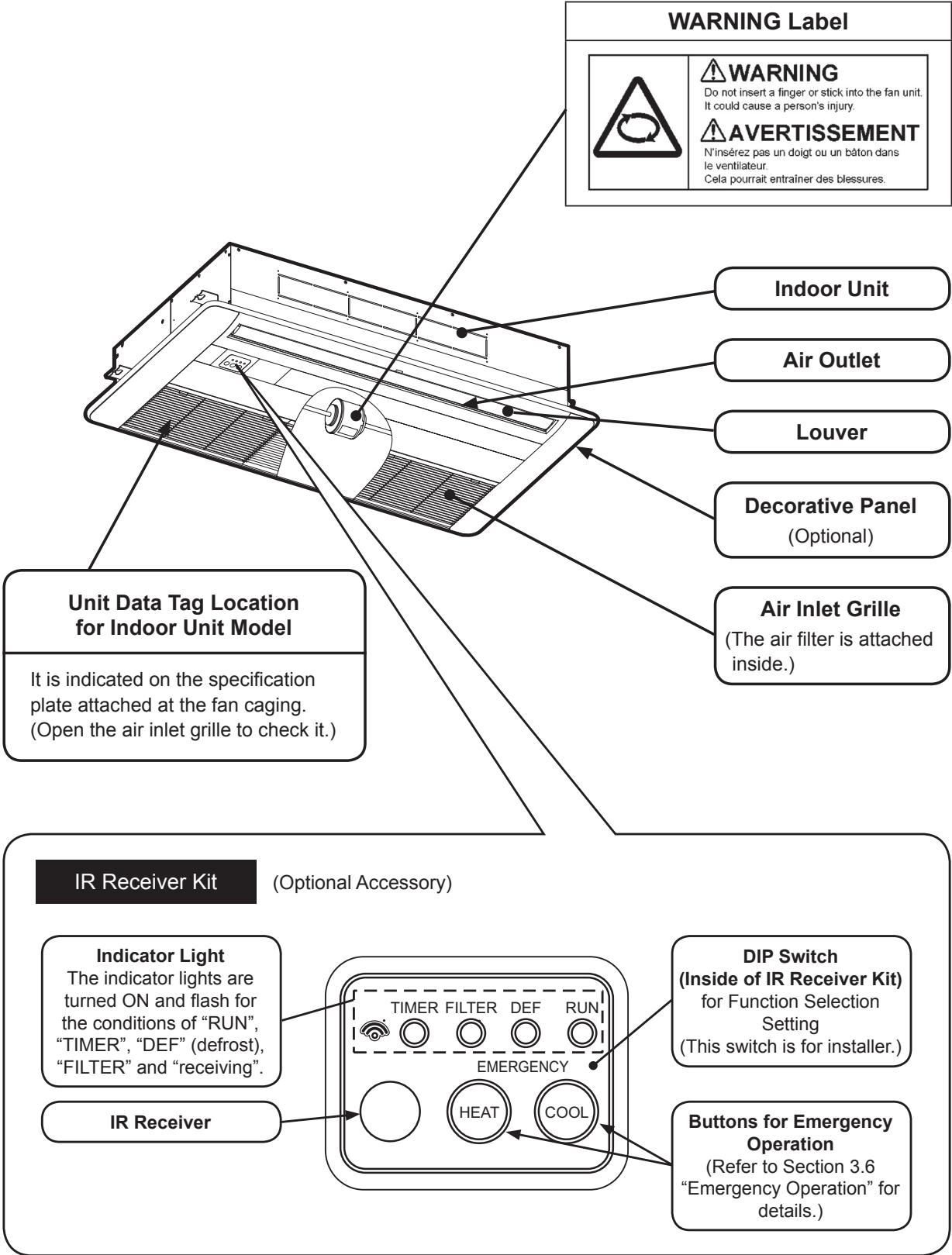
2.2 Efficient Use of Cooling and Heating

Refer to Section 3.3 of the Operation Manual for the 1-way cassette indoor unit model (P5415457).

2.3 Names of Components and Indications for Safety Consideration

The IR receiver kit is attached to the indoor unit as shown in the figure below. As a safety consideration, a warning label is indicated on the indoor unit. Read and understand this manual before using the IR receiver kit.

2.3.1 Indoor Unit and IR Receiver Kit

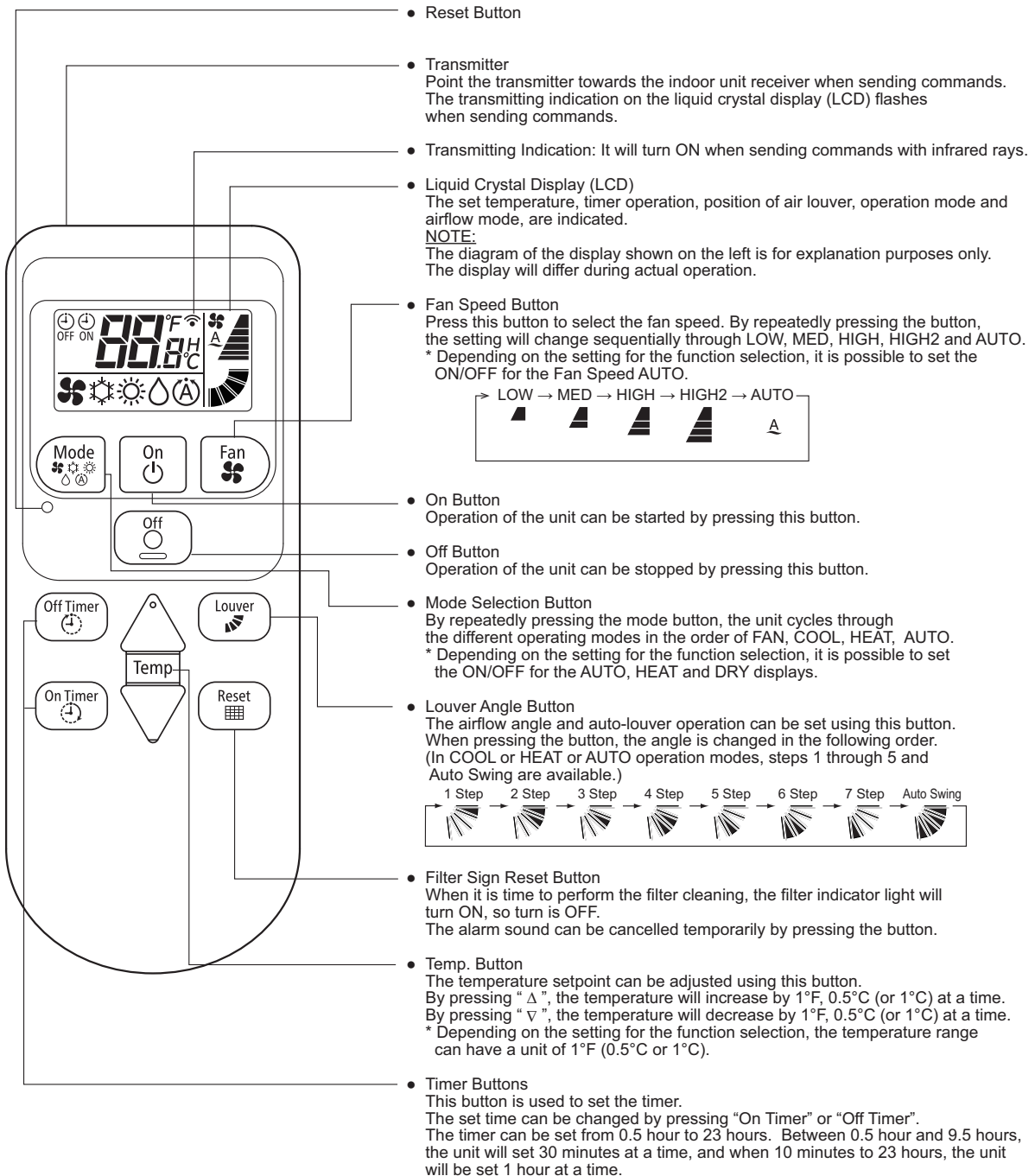


2.3.2 Wireless Controller

Model: CIR01

NOTE

- This wireless controller is used to send commands about operation modes, timer settings, and so forth to the indoor unit. Point the transmitter of the controller toward the receiver of the indoor unit. Press the button for the required operation so that commands (through infrared rays) are sent to the indoor unit.
- The distance for transmitting is approximately 20 feet as a maximum. Refer to Section 2.4.2 “Horizontal Distance Limit for IR Receiver Kit” for details. (A suitable distance for transmission will be shorter if the transmitting angle is not vertical to the receiver or an electronic type light is used in the room.)
- CIR01 is only available paired with the IR receiver kit and the indoor unit which are supported in High2 mode.



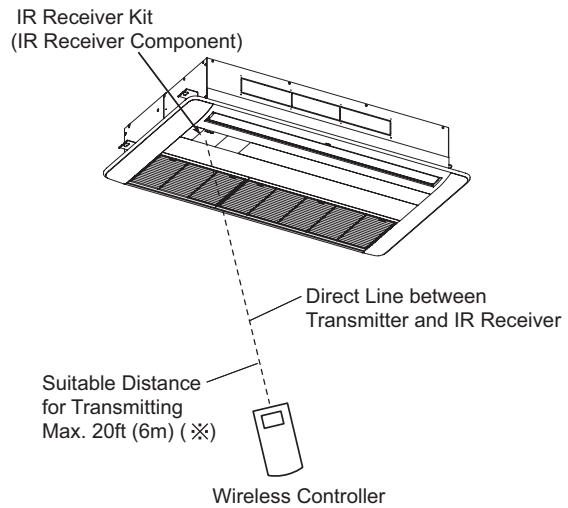
2.4 Handling Wireless Controller

NOTE

- Do not put the wireless controller in the following high-temperature environments. Heat may prevent it from operating.
 - * Places of direct light, including sunlight.
 - * Places where hot air from a heater, or something similar will affect it.
- Handle the wireless controller with care. If it falls or is splashed with water, the wireless controller may fail to operate.

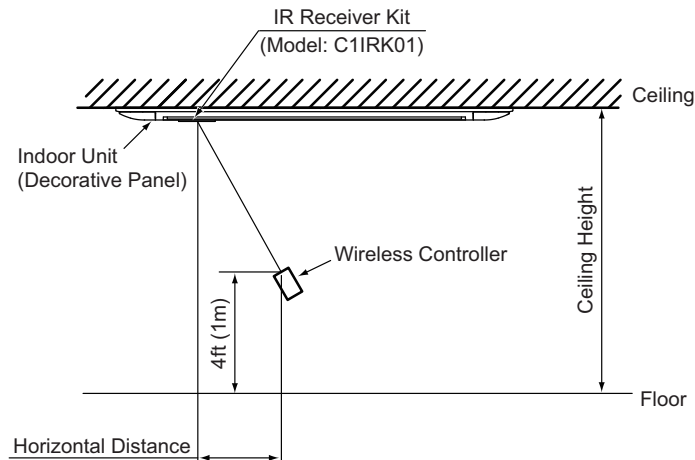
2.4.1 Sending Commands from Wireless Controller

- The operation commands are sent by pressing the required operation button by pointing the wireless controller transmitter toward the receiver of the indoor unit.
- When commands are sent from the wireless controller, it should face vertically and be as close as possible to the IR receiver kit. A suitable distance for transmitting will appear too short if the transmitting angle is not vertical to the receiver or an electronic type light is used in the room.
- The wireless controller needs direct line of sight to the IR Receiver Kit. The distance for transmitting depends on the ceiling height. Refer to the table below for distance limits. The distance may differ depending on the building structure. Control the wireless controller within the distance shown in the table below.
- The distance for transmitting might be too short because of battery consumption. When this happens, replace the battery.



※ The distance for transmitting differs depending on the ceiling height. Refer to the table below for details.

2.4.2 Horizontal Distance IR Limit for IR Receiver Kit





Horizontal Distance Limit for IR Receiver Kit
(If the height of wireless controller from floor is 4 ft)


	Unit: ft (m)			
Height of Indoor Unit	9 (3)	10 (3)	12 (4)	14 (5)
Horizontal Distance	9 (3)	12 (4)	14 (5)	15 (5)

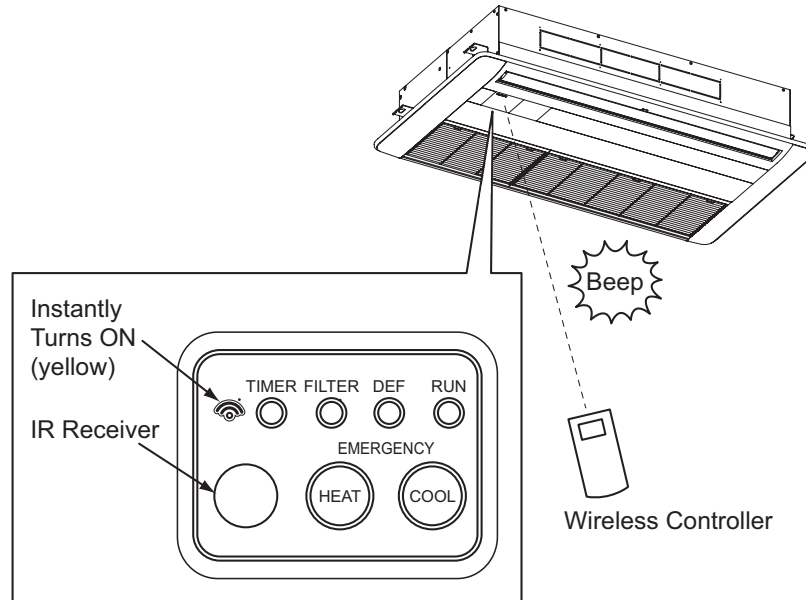
OPERATION

2.4.3 Receipt Confirmation of IR Receiver Kit

The yellow light “” on the IR receiver component of the indoor unit is turned ON for an instant when the IR receiver kit receives the commands from the wireless controller. If the yellow light “” is not turned ON, the commands may not have reached the receiver. Send the commands again.

NOTE

- The yellow light “” turns ON with a beeping sound for receipt confirmation.
 - The beeping sound may not be heard if there is surrounding noise.
-






3. Operation

NOTICE








Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil. Do not turn OFF the power supply during change of seasons.

NOTE

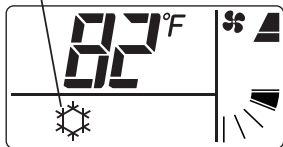
- The yellow light “” is turned ON with a beeping sound for receipt confirmation.
- The beeping sound may not be heard if there is surrounding noise.
- The yellow light “” on the receiver of the indoor unit flashes (0.25 seconds ON/0.25 seconds OFF), and then turns OFF. While the light “” lamp is flashing, the unit will not operate because it is initializing.

3.1 Basic Operation

< Start Operation >

- (1) Press the “Mode ” button. By repeatedly pressing the “Mode ” button, the unit cycles through different operating modes in the order of  (Fan),  (Cool),  (Heat),  (Dry) and  (Auto).




Cooling mode is engaged.



Indications for setting temperature, fan speed, and airflow angle may be turned ON depending on what function is being operated on the control.

NOTE:

For details about the automatic cooling/heating operation mode, refer to Section 3.4 “Automatic Cooling/Heating Operation”.



- (2) Point the transmitter toward the IR receiver kit and press the “On ” button. When the transmitting signal “” appears on the LCD of the wireless controller, the yellow light “” on the receiver will turn on briefly.

The RUN indicator (red) on the receiver is turned ON when the operation starts.

The functions for setting temperature, fan speed, and airflow angle are turned ON.




NOTE:

Do not press the “On ” or “Off ” buttons repeatedly (less than 3 seconds). If the buttons are pressed repeatedly, the controller may not work correctly.

< Temperature, Fan Speed, and Airflow Direction >

Once the setting is confirmed, it will be stored. A daily setting is not required. When a setting change is required, refer to Section 3.3 “Setting Method”.

< Stop Operation >

Point the transmitter toward the IR receiver kit and press the “Off ” button again. The RUN indicator (red) on the receiver is turned OFF and the operation stops.



The functions for setting temperature, fan speed, and airflow angle are turned OFF.

NOTE:

The indoor unit fan may continue to operate for up to two minutes following the heating cycle to dissipate residual heat from the indoor unit.


3.2 Operation Mode (Cooling, Heating, Dry, Automatic Cooling/Heating and Fan Operation)

<Function>


- Fan Operation (Fan):
Circulates the air in the room.
- Cooling Operation (Cool):
Decreases the room temperature.
- Heating Operation (Heat):
Increases the room temperature.
- Dry Operation (Dry):
Decreases the humidity in the room.
- Automatic Cooling/Heating Operation (Auto):
Cools and heats with automatic change-over.


3.3 Setting Method


NOTE

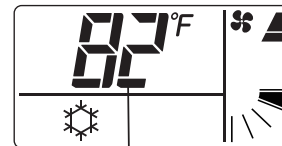
- The yellow light “” is turned ON with a beeping sound for receipt confirmation.
 - The beeping sound may not be heard if there is surrounding noise.
 - To adjust the airflow angle, refer to the installation and operation manuals for the indoor unit.
-

3.3.1 Temperature Setting

Point the transmitter toward the IR receiver kit and press one of the “Temp  ” buttons to set the temperature.

By pressing “”, the temperature is increased by 1°F (0.5°C).

By pressing “”, the temperature is decreased by 1°F (0.5°C).




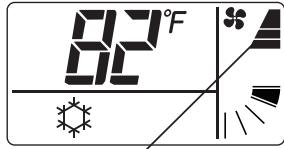
In this example, the temperature is set to 82F° (28°C) in the cooling operation.

NOTE:

- The temperature is not displayed during a shutdown. If the temperature is set during a shutdown, the temperature indication is turned ON only temporarily. It automatically turns OFF after being set.
- The temperature can be set for each operation mode.
- The temperature set-point is can be set from 62°F (17°C) to 86°F (30°C) by the wireless controller.
However, for an indoor unit where the setting temperature set-point range is 66°F (19°C) to 86°F (30°C), temperature settings of 62°F (17°C) and 64°F (18°C) are not an option.

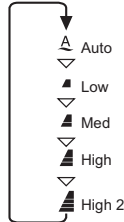
3.3.2 Fan Speed

Point the transmitter toward the IR receiver kit and press the “Fan ” button to set the fan speed.



The fan speed is set on “High” in the cooling operation.


By repeatedly pressing the button, the setting will change sequentially through Auto, Low, Med, High, and High2.

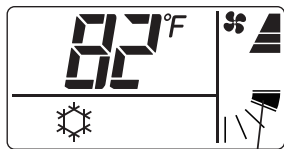


NOTES:


- The fan speed is not displayed during a shutdown. If the fan speed is set during a shutdown, the fan speed indication is turned ON only temporarily. It automatically turns OFF after being set.
- The fan speed can be set for each operating mode except Dry mode, which forces the fan operation at “LOW” speed only.

3.3.3 Airflow Direction


(1) Point the transmitter towards the IR receiver kit and press the “Louver ” button to set the louver angle.



The louver angle is set on 1 step at “High” in the cooling operation.

(2) By pressing the “Louver ” button, the louver angle will change as follows.

Step	LCD Indication	COOL, DRY	HEAT, FAN
-		Auto-Swing	
1		Recommended Angle	Angle Range
2			
3			
4			
5			
6		Recommended Angle	Angle Range
7			

 : Auto swing operation will start. At this time, the louver indication will swing repeatedly on the LCD.

NOTE:

- The louver angle is not displayed during a shutdown.
- The louver settings are only available from 1 step through 5 steps and auto-swing at the cooling, dry, and auto operation modes. Steps 6 and 7 can be used to avoid cold or hot air coming out of the unit blowing directly at someone or something you would rather not. It's a customer's airflow direction preference also. You may want hot air blowing straight down and cold air straight up. Cold air sinks and hot air rises.
- The louver angle may change automatically during the heating operation. (Refer to the installation and operation manuals for the indoor unit for details.)
- The louver may NOT stop immediately after the button is pressed.
- The auto louver mechanism is not available for duct-type units.
- To adjust the louver angle, refer to the installation and operation manuals for the indoor unit.

3.4 Automatic Cooling/Heating Operation

< Function >

Automatic Cooling/Heating Operation automatically switches the cooling and heating operation based on the set temperature for inlet air temperature conditions.



The cooling operation is performed when the inlet air temperature is approximately 5°F (3°C) higher than the set temperature.

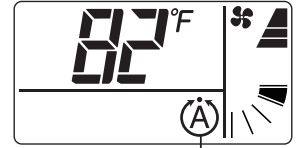
The heating operation is performed when the inlet air temperature is approximately 5°F (3°C) lower than the set temperature.

NOTE

- If the fan speed is set to “Low” during a heating operation, the operation stops by activating the protection devices.
In this instance, set to “Med”, “High”, or “High 2”.
 - The heating operation is not possible when the ambient temperature is higher than approximately 70°F (21°C).
 - The threshold of switching the temperature against the temperature set-point is $\pm 5^\circ\text{F}$ ($\pm 3^\circ\text{C}$) when using this function. Therefore, this function should not be utilized in a room where accurate temperature and humidity controls are required.
-

< Start Operation >



- (1) Press the “Mode  ” button several times.
The indication of “Auto  ” (automatic cooling/heating operation) will appear.






“AUTO” is set.

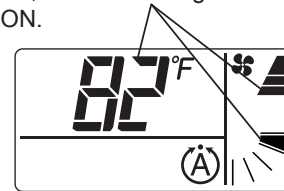
The functions for setting temperature, fan speed, and airflow angle are turned ON depending on what function is being operated on the control.

NOTE:



- The automatic cooling/heating operation requires other settings to be performed. Please contact your contractor for details.
- When the “Mode  ” button is pressed at “Auto  ”, the fan operation starts.

- (2) Point the transmitter toward the IR receiver kit and press the “On  ” button.
When the transmitting signal “ ” flashes, the yellow light “ ” on the receiver will turn on briefly.
The RUN indicator (red) on the receiver is turned ON and the operation is started.

The functions for setting temperature, fan speed, and airflow angle are turned ON.



NOTE:


Do not press the “On  ” or “Off  ” buttons repeatedly (less than 3 seconds). If the buttons are pressed repeatedly, the wireless controller may not work correctly.

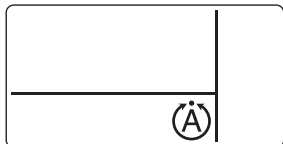
< Setting Temperature, Fan Speed, and Airflow Direction >

To set the temperature, fan speed, and airflow direction, refer to Section 3.3 “Setting Method”.

3.5 Timer Setting Method


< Stop Operation >

Point the transmitter toward the IR receiver kit and press the “Off  ” button again. The RUN indicator (red) of the receiver is turned OFF and the operation stops.





The functions for setting temperature, fan speed, and airflow angle are turned OFF.

NOTE

- The yellow light “ ” is turned ON with a beeping sound for receipt confirmation.
- The beeping sound may not be heard if there is surrounding noise.







< Function >

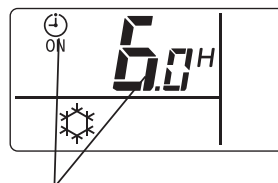
- This function is used to start or stop the unit operation when setting the timer.
- The timer setting can be set with both an “On Timer  ” and “Off Timer  ” button.

On Timer: The operation is started after setting the timer.

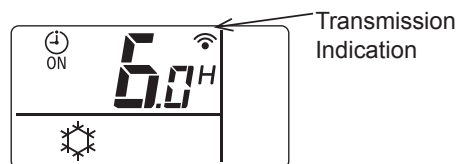
Off Timer: The operation is stopped after the set time has passed.

< Timer Setting >



- Press the “On Timer  ” or “Off Timer  ” button.
By repeatedly pressing “On Timer  ” or “Off Timer  ”, the setting time is changed.
- Point the transmitter toward the IR receiver kit and press the “On Timer  ” button to set the time and the LCD of the wireless controller indicates transmission “ ”.
- Time can be set for half-hour intervals up to 10 hours and at one-hour intervals up to 23 hours after the 10 hours.

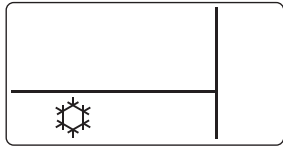


In this example, the “On Timer” is set for 6 hours.




< Cancel Setting >

To cancel the timer setting, point the transmitter towards the IR receiver kit and press “On Timer ” or “Off Timer ” button after proceeding up to 23 hours by repeatedly pressing the button.
The TIMER indicator (green) on the receiver is turned OFF.



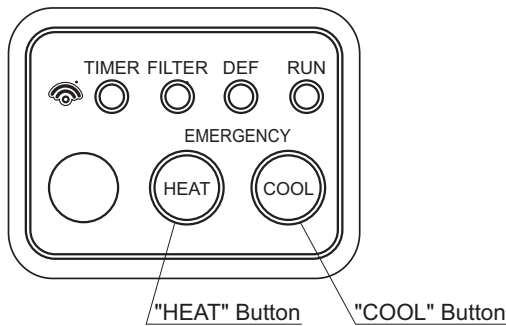
3.6 Emergency Operation

NOTE

- The setting temperature and the fan speed for the cooling/heating operation are the same as before starting an emergency operation.
- During the emergency operation, a yellow light  flashes (0.5 second ON/0.5 second OFF).

< Function >

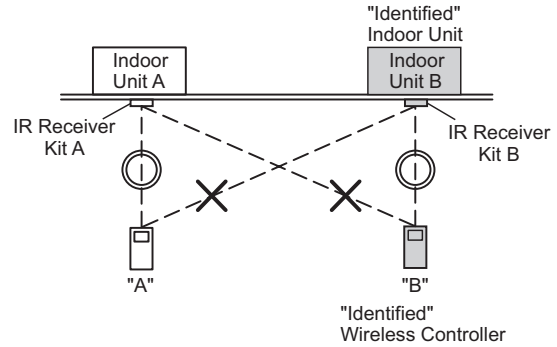
“COOL” and “HEAT” buttons are used for emergency operation when the batteries for wireless controller are low.



- “COOL” Button: Press “COOL” to start the cooling operation.
Press “COOL” again to stop the cooling operation.
- “HEAT” Button: Press “HEAT” to start the heating operation.
Press “HEAT” again to stop the heating operation.

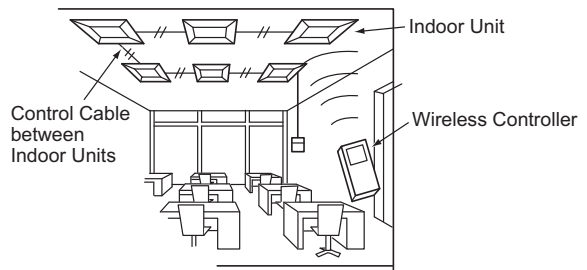
3.7 Identifying Indoor Units Installed Side by Side

When two indoor units are installed side by side, the commands from the wireless controller may be received by both indoor units. The function, “Identifying of Indoor Units Installed Side by Side” enables operation of an individual unit without interfering with the other unit’s operation. As shown in the figure below, the indoor units of A and B are set side by side. In this case, Unit B is set as “Identifying Indoor Units Installed Side by Side”. Contact your distributor for details.



3.8 Simultaneous Operation of Multiple Indoor Units

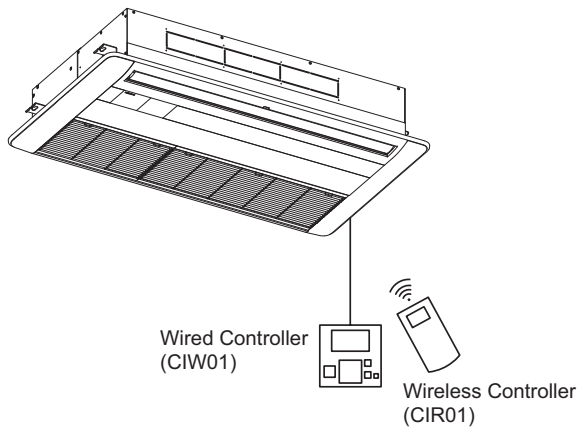
Multiple indoor units (a maximum of 16 units) can be started and stopped simultaneously by one wireless controller. For details, contact your distributor.



This is an example of Simultaneous Operation of Multiple Units

3.9 Operation with Wired Controller

The indoor unit can be operated by both wired and wireless controllers. Contact your distributor for details.



3.10 Automatic Operation

Refer to the installation and operation manuals for the indoor unit.

4. Maintenance

Refer to the installation and operation manuals for the indoor unit.

4.1 Cleaning Wireless Controller

- Wipe the controller with a soft, dry cloth.
- It is important not to use a wet cloth to clean. It may cause damage to the wireless controller.
- Do not use benzine, thinner, or detergent (Surfactant). If it is used, the wireless controller may be damaged or change color.

4.2 Replacing Batteries

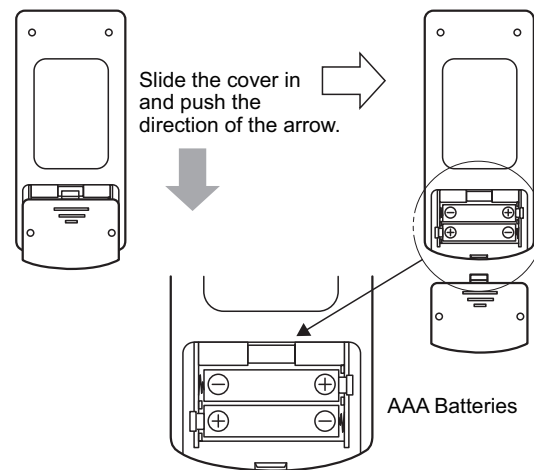
Under normal use, the battery life should be about one year (for alkaline batteries).

Replace the batteries if one of the following circumstances occurs:

The transmission distance between the wireless controller and the IR receiver kit can be too short for shrinks.

To replace batteries:

- (1) Remove the battery cover by sliding and pushing the cover in the direction of the arrow as shown in the figure below.
- (2) Replace the batteries. (Insert the batteries according to the + and - marks on the case.)



NOTE:

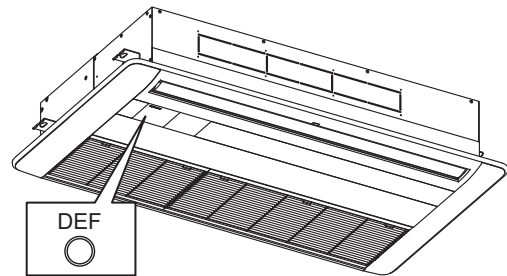
- Review the following to ensure using the batteries correctly. If not used correctly, there may be a leak or flare up.
 1. Never use new and used batteries together.
 2. Never use different types of batteries together (for example, manganese and alkaline) together.
 3. When the wireless controller is not used for a length of time (more than two or three months), replace the batteries.
- The batteries included at the factory are for validation and may be low.
- When replacing batteries, wait for more than 5 seconds after removing the old batteries to replace with new ones.
- All settings are reset after the batteries are replaced. Therefore, when "Identifying of Indoor Units Installed Side by Side" has been set, the setting is canceled once the batteries are replaced. After replacing the batteries, reset "Identifying of Indoor Units Installed Side by Side".
(Press and hold both the "On Timer" and "Off Timer" buttons simultaneously for 3 seconds. The indication "b" will appear. Refer to the installation manual for details.)

5. Indications of IR Receiver Kit

5.1 In Normal Condition

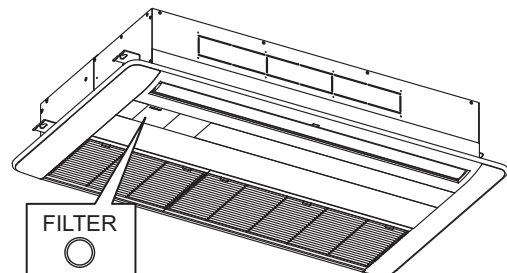
5.1.1 Defrost

- **Defrost Operation**
The DEF indicator (green) is turned ON during defrosting. The indoor fan is stopped. The louver is fixed at the horizontal position. However, the louver indication of the LCD continues to activate.
- **Operation Stoppage during Defrosting Operation**
The RUN indicator (red) is turned OFF when the operation is stopped during the defrost cycle. However, the operation continues when turning on the ON DEF indicator (green), and the unit is stopped after the defrost cycle is complete.



5.1.2 Filter Sign

When the filter indication LED turns yellow, the air filter needs to be cleaned or replaced. (Details for the cleaning method and filter cleaning time should be referred to in the installation and operation manuals for the indoor unit.) After cleaning, point the transmitter toward the IR receiver kit and press the "RESET" button to turn OFF the FILTER indicator.



5.1.3 Central Control

When the yellow light "☰" remains ON, the indoor unit is under centralized control. In this case, "RESET" and "RUN/STOP" buttons are only available for control from the wireless controller.

5.2 In Abnormal Condition

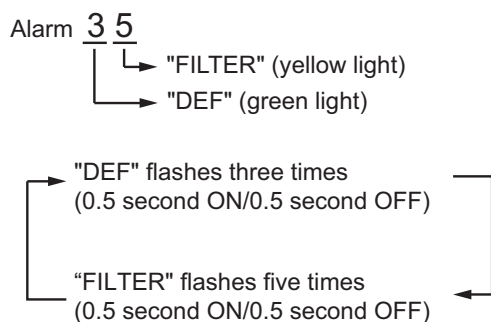
5.2.1 Abnormality

- If a malfunction occurs, such as a safety device actuation during the test run or the normal operation, "RUN" (red light) flashes (0.5 second ON/0.5 second OFF).
- The alarm codes are indicated by the number of flashes of the "DEF" (green light) and "FILTER" light.

The first LED light is green. The number of times this LED flashes (0.5 seconds on and off) will tell you the "DEF" Alarm Code.

The second LED light is yellow. The number of times this LED flashes (0.5 seconds on and off) will tell you the "FILTER" Alarm Code.

< Example >



These signals are repeated until the alarm is reset.

5.2.2 Power Failure

- All the indications are OFF.
- Once the unit is stopped by a power failure, it will not start again even if the power recovers. Perform the starting procedures again.
- If there is a temporary instantaneous power failure lasting two seconds, the unit will start again automatically.

5.2.3 Electromagnetic Interference (EMI)

There could be a situation where all the indications are OFF and the unit is stopped. This is a result of the micro computer activating protection for the unit because of the EMI. Perform the starting procedures again.

6. Troubleshooting

6.1 This is Not Abnormal

Refer to the installation and operation manuals for the indoor unit.

Phenomenon		Cause and Action
Stopped Operation	All indication lights on the IR receiver kit are turned OFF.	The micro-computer is activated to protect the device from electromagnetic waves. The operation can be recovered if it is started from the beginning.
	Power failure occurs.	Start the operation from the beginning.

6.2 Before Contact

Check the issues before contacting a distributor.

Refer to the installation and operation manuals for the indoor unit together.

Issue	Checking Point	Action
Not Operating	Is the transmitter of wireless controller pointed toward the IR receiver kit?	Point the transmitter toward the IR receiver kit.
	Check batteries of the wireless controller.	Replace batteries.
	Is the receiver surface covered by dust?	Wipe the receiver with a soft, dry cloth.
	Is the air conditioning controlled by a centralized control?	When the air conditioning is under centralized control, "RESET" and "RUN/STOP" buttons are only available for control from the wireless controller.
Not Cooling or Heating Well	Check that the operation mode is correct.	If the fan mode is selected, switch the operation mode to cooling (heating).
	Check that the set temperature is correct.	If not, change the set temperature by pressing "△" or "▽" with the wireless controller.
	Check that the airflow direction is correct.	If not, change the airflow direction.

6.3 Contact Distributor

If the trouble still remains even after checking the previous issues or other problems not mentioned, stop using the product and contact your distributor.

WARNING

If an abnormality (burnt odor, for example) occurs, stop the operation and turn OFF the main power source immediately. Otherwise, there may be damage to the product, an electric shock or a fire.

Contact your distributor.

Trouble	Action before Contact
The protection devices such as a fuse, breaker, or Ground Fault Circuit Interrupter (GFCI), are frequently activated or the main power source does not work.	Turn OFF the power source.
Water Leakage from Indoor Unit.	Stop the operation.
<ul style="list-style-type: none"> ● The RUN indicator (red) is flashing. ● The alarm codes are indicated by the flashing of DEF indicator (green) and FILTER indicator (yellow). Check the details for flashing indicators and contact your distributor. (Refer to Section 5.2.1 “Abnormality”.) 	Refer to the Alarm Code Table of the installation manual for the indoor unit. Inform your distributor of the details of the flashing indicator of the IR receiver kit.

Provide the following information to the distributor.

- 1) **Model Name**
- 2) **Description of Problem**
- 3) **Alarm Code Number or Details of Flashing Indicator (Refer to Section 5.2.1 “Abnormality” for details.)**

2.2.5 Infrared (IR) Receiver Kit (for Wall Mount Type and Ducted Type)



Model: CWDIRK01

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1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	---

- This system, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE

Take the following precautions to reduce the risk of property damage.

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the controller at a distance of at least 3 ft. (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.
- If the controller is installed in a location where electromagnetic radiation is generated, make sure that the controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage. Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35 to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices. If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions**⚠ WARNING**

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating. During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions



WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- Only use electrical protection equipment and tools suited for this installation.
- Insulate the infrared (IR) receiver kit against moisture and temperature extremes.
- Use specified cables between units and the infrared (IR) receiver kit.
- Communication cabling shall be a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the infrared (IR) receiver kit, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the infrared (IR) receiver kit as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

NOTICE

The wireless controller shall be utilized under the following conditions.
If not, it may cause failure of wireless controller.

Installation Place: Indoor

Ambient Temperature: 41 to 95°F (5 to 35°C)

Ambient Humidity: 35 to 90%

2. Before Operation

For details about operation procedures for the air conditioner, refer to the operation manual for each indoor unit.

2.1 Efficient Use of Indoor Unit

Refer to the operation manual for each indoor unit.

2.2 Efficient Use of Cooling and Heating

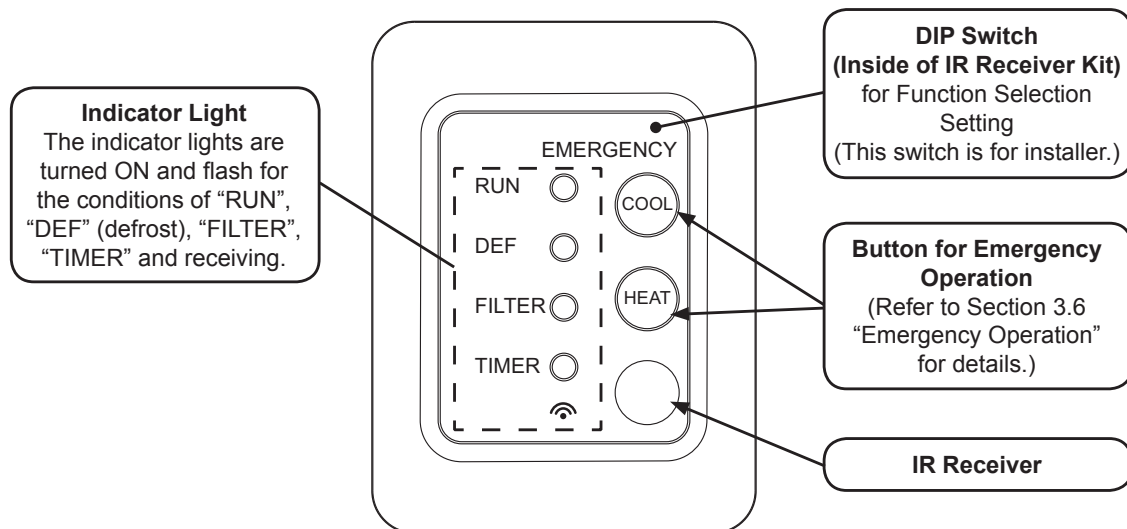
Refer to the operation manual for each indoor unit.

2.3 Names of Parts and Indications for Safety Considerations

Safety considerations are located on the indoor unit.

Read and understand this manual before using the IR receiver kit.

2.3.1 Receiver Kit (CWDIRK01)

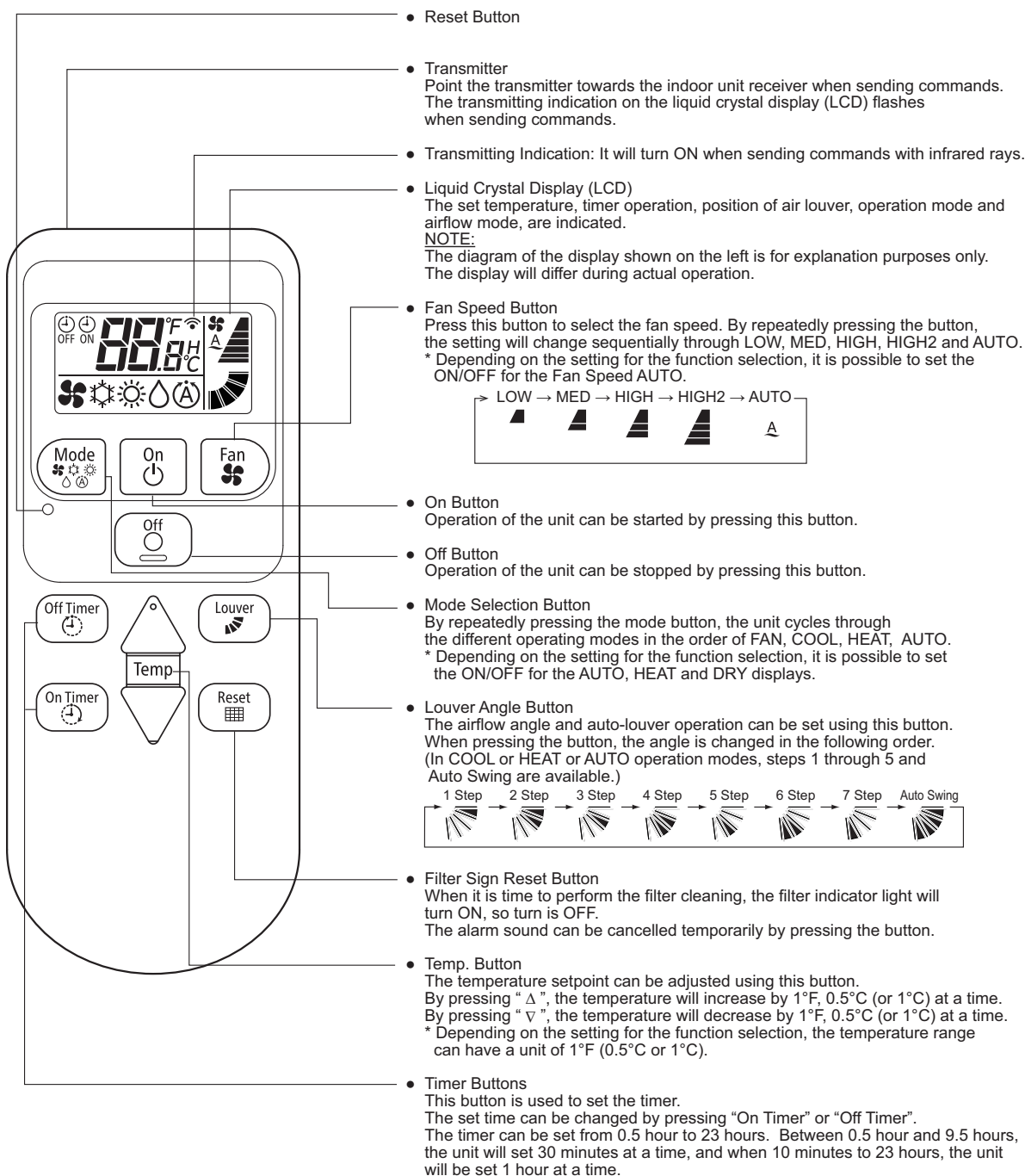


2.3.2 Wireless Controller

Model: CIR01

NOTE

- This wireless controller is used to send commands relating to the operation mode, timer settings, and so forth, to the indoor unit. Point the transmitter of the controller toward the receiver of the indoor unit and press the button of the required operation so that commands (by infrared rays) are sent to the indoor unit.
- The distance for transmitting is approximately 20 feet as a maximum. Refer to Section 2.4.2 “Horizontal Distance Limit for IR Receiver Kit” for details. (A suitable distance for transmission will be shorter if the transmitting angle is not vertical to the receiver or an electronic type light is used in the room.)
- CIR01 is only available paired with the IR receiver kit and the indoor unit which are supported in High2 mode.



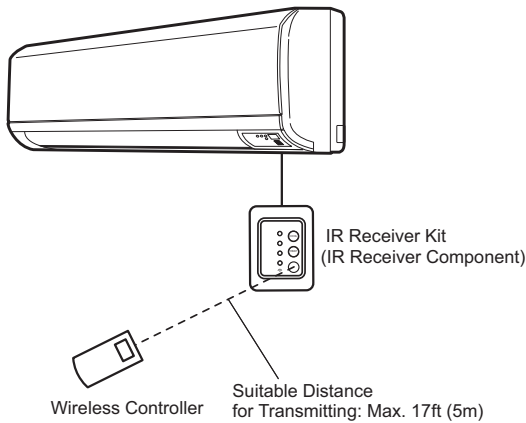
2.4 Handling Wireless Controller

NOTE

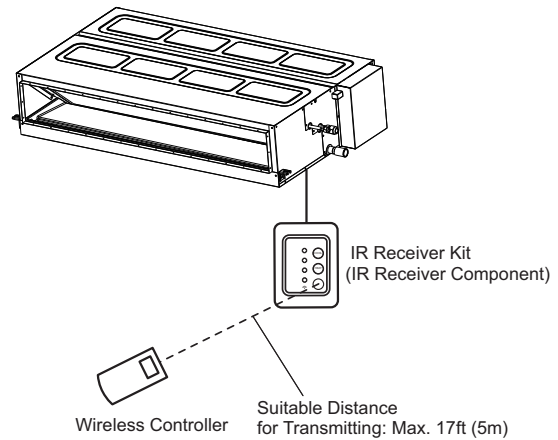
- Do not put the wireless controller in the following high-temperature environments. Heat may prevent it from operating correctly.
 - * Places of direct light, including sunlight.
 - * Places where hot air from a heater, or something similar, will affect it.
- Handle the wireless controller with care. If it falls or is splashed with water, the wireless controller may fail to operate.

2.4.1 Sending Commands from Wireless Controller

- The operation commands are sent by pressing the required operation button and pointing the transmitter of the wireless controller toward the receiver of the indoor unit.
- When commands are sent from the wireless controller, it should face vertically and be as close as possible to the receiver kit. The transmission distance will reduce in length when Wireless Controller is not vertical to the receiver or if there is electrical interference in the room.
- The wireless controller requires line of sight connection with the receiver.
- The transmission distance will reduce as the batteries lose power. If this occurs, replace the batteries.



(The figure is example for the wall mount indoor unit.)





(The figure is example for the ducted indoor unit.)


2.4.2 Horizontal Distance Limit for Receiver Kit

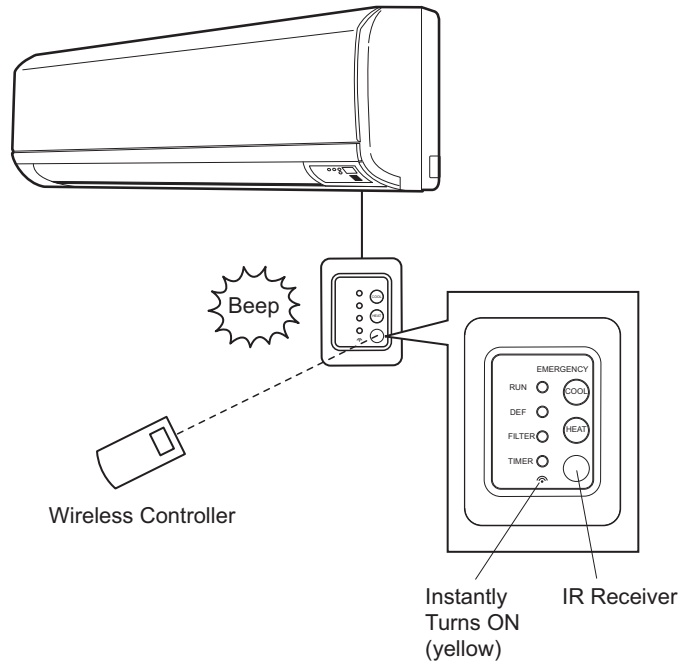
The receiver kit is installed onto a wall. The horizontal distance limit is a maximum of 17 ft (5m).

2.4.3 Receipt Confirmation of IR Receiver Kit

The “” light (yellow) on the receiver part of the indoor unit is turned ON for an instant when the IR receiver kit receives the commands from the wireless controller. If the “” light (yellow) is not turned ON, the commands may not have reached the receiver. Resend the commands.

NOTE

- The “” light (yellow) is turned ON with a beeping sound for receipt confirmation.
 - The beeping sound may not be heard if there is surrounding noise.
-






3. Operation

NOTICE








Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil. Do not turn OFF the power supply during a change of seasons.

NOTE

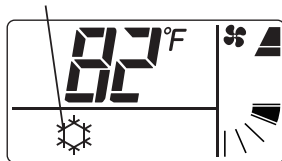
- The “” light (yellow) is turned ON with the beeping sound for receipt confirmation.
- The beeping sound may not be heard if there is surrounding noise.
- “” light (yellow) on the receiver of the indoor unit flashes (0.25 second ON/0.25 second OFF), and then turns OFF. While the “” light is flashing, the unit will not operate because it is initializing.

3.1 Basic Operation

< Start Operation >

- (1) Press the “Mode ” button. By repeatedly pressing the “Mode ” button, the unit cycles through the different operating modes in the order of  (Fan),  (Cool),  (Heat),  (Dry), and  (Auto).




Cooling mode is under operation.



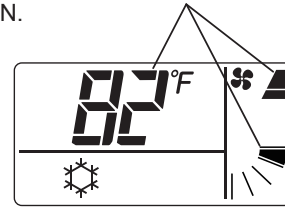
The indications for setting temperature, fan speed, and airflow angle may be turned ON depending on what function is being operated on the control.

NOTE:



For details about the automatic cooling/heating operation mode, refer to Section 3.4 “Automatic Cooling/Heating Operation”.

- (2) Point the transmitter toward the IR receiver kit and press the “On ” button. When the transmitting light “” signals on the LCD of the wireless controller, the “” light (yellow) on the receiver will turn on briefly. The RUN indicator (red) on the receiver is turned ON when the operation starts.

The functions for setting temperature, fan speed, and airflow angle are turned ON.




NOTE:

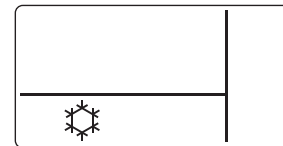
Do not press the “On ” or “Off ” buttons repeatedly (less than 3 seconds). If the buttons are pressed frequently, the controller may not work correctly.

< Temperature, Fan Speed, and Airflow Direction >

Once the setting is confirmed, the setting condition will be stored. Therefore, a daily setting is not required. In an instance where a the setting change is required, refer to Section 3.3 “Setting Method”.

< Stop Operation >

Point the transmitter toward the IR receiver kit and press the “Off ” button again. The RUN indicator (red) on the receiver is turned OFF and the operation is stopped.



The functions for setting temperature, fan speed, and airflow angle are turned OFF.

NOTE:

The indoor unit fan may continue to operate for up to two minutes following the heating cycle to dissipate residual heat from the indoor unit.


3.2 Operation Mode (Cooling, Heating, Dry, Fan, and Automatic Cooling/Heating Operation)

<Function>


- Fan Operation (Fan):
Circulates the air in the room.
- Cooling Operation (Cool):
Decreases the room temperature.
- Heating Operation (Heat):
Increases the room temperature.
- Dry Operation (Dry):
Decreases the humidity in the room.
- Automatic Cooling/Heating Operation (Auto):
Cools and heats with automatic change-over.


3.3 Setting Method


NOTE

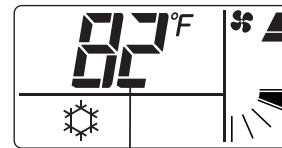
- The “” light (yellow) is turned ON with the beeping sound for receipt confirmation.
- The beeping sound may not be heard if there is surrounding noise.
- To adjust the airflow angle, refer to the installation and operation manuals of the indoor unit.

3.3.1 Temperature Setting

Point the transmitter towards the IR receiver kit and press the “Temp ” button to set the temperature.

By pressing “”, the temperature is increased by 1°F (0.5°C).

By pressing “”, the temperature is decreased by 1°F (0.5°C).




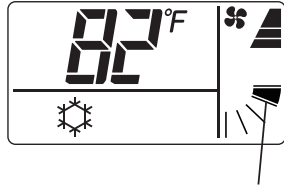
In this example, the set temperature is 82°F (28°C) in the cooling operation.

NOTE:

- The temperature is not displayed during a shutdown. If the temperature is set during a shutdown, the temperature indication is turned ON temporarily. It automatically turns OFF after being set.
- The temperature can be set for each operation mode.
- The temperature set-point can be set from 62°F (17°C) to 86°F (30°C) by the wireless controller button.
However, for the indoor unit where the temperature set-point range is 66°F (19°C) to 86°F (30°C), the temperature settings of 62°F (17°C) and 64°F (18°C) are not an option.

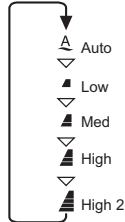
3.3.2 Fan Speed

Point the transmitter toward the IR receiver kit and press the “Fan ” button to set the fan speed.



The louver angle is set to 1 step at “High” in the cooling operation.

By repeatedly pressing the button, the setting will change sequentially through Auto, Low, Med, High and High2.



NOTES:


- The fan speed is not displayed during the stoppage. In the case that the fan speed is set during the stoppage, the fan speed indication is turned ON temporarily. It is automatically turned OFF after setting.
- The fan speed can be set for each operation mode. However, the fan speed will be fixed at “Low” in dry operation.

3.3.3 Airflow Direction


(1) Point the transmitter towards the IR receiver kit and press “Louver ” button to set the louver angle.



The louver angle is set on 1 step at “High” in the cooling operation.

(2) By pressing the “Louver ” button, the louver angle will change as follows.

Step	LCD Indication	COOL, DRY	HEAT, FAN
-		Auto-Swing	
1		Recommended Angle	↑
2			
3		Angle Range	↑
4			
5		Angle Range	↑
6			
7		Recommended Angle	↓

 : Auto swing operation will be started. At this time, the louver will swing repeatedly on the LCD.

NOTE:

- The louver angle is not displayed during a shutdown.
- The louver settings are only available from 1 step through 5 steps and the auto-swing at the cooling and dry operation modes.
- The louver angle may change automatically during the heating operation. (Refer to the installation and operation manuals of the indoor unit for details.)
- The louver may NOT stop immediately after the button is pressed.
- The auto louver mechanism is not available for duct-type units.
- To adjust the louver angle, refer to the installation and operation manuals for the indoor unit.

3.4 Automatic Cooling/Heating Operation

< Function >

The Automatic Cooling/Heating Operation automatically switches cooling and heating operation based on the set temperature for inlet air temperature conditions.



The cooling operation is performed when the inlet air temperature is approximately 5°F (3°C) higher than the set temperature.

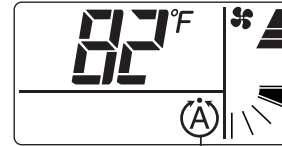
The heating operation is performed when the inlet air temperature is approximately 5°F (3°C) lower than the set temperature.

NOTE

- If the fan speed is set to “Low” during a heating operation, the operation stops by activating the protection devices.
In this instance, set to “Med”, “High” or “High 2”.
- The heating operation is not possible when the ambient temperature is higher than approximately 70°F (21°C).
- The threshold of switching the temperature against the temperature set-point is $\pm 5^\circ\text{F}$ ($\pm 3^\circ\text{C}$) when using this function. Therefore, this function should not be utilized in a room where accurate temperature and humidity controls are required.

< Start Operation >



- (1) Press the “Mode  ” button several times.
The indication “Auto  ” (automatic cooling/heating operation) will appear.






“Auto” is set.

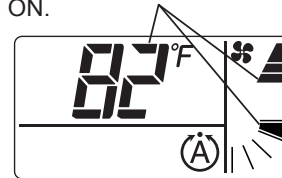
The functions of setting temperature, fan speed, and airflow angle are turned ON depending on what function is being operated on the control.

NOTE:



- The automatic cooling/heating operation requires more settings to be executed. Please contact your contractor for more details.
- When the “Mode  ” button is pressed at “Auto  ”, the fan operation is started.

- (2) Point the transmitter toward the IR receiver kit and press the “On  ” button.
When the transmitting indication “ ” flashes, the “ ” light (yellow) on the receiver will appear briefly.
The RUN indicator (red) on the receiver turns ON and the operation starts.

The indications of setting temperature, fan speed, and airflow angle are turned ON.




NOTE:

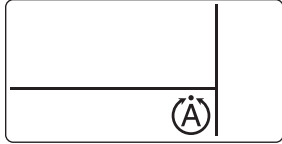
Do not press the “On  ” or “Off  ” buttons repeatedly (less than 3 seconds).
If the buttons are pressed repeatedly, the wireless controller may not work correctly.

< Temperature, Fan Speed and Airflow Direction >

To set the temperature, fan speed, and airflow direction, refer to Section 3.3 “Setting Method”.

< Stop Operation >


Point the transmitter toward the IR receiver kit and press the “Off  ” button again. The RUN indicator (red) of the receiver is turned OFF and the operation stops.





The indications of setting temperature, fan speed, and airflow angle are turned OFF.

3.5 Timer Setting Method

NOTE

- The “ ” light (yellow) is turned ON with a beeping sound for receipt confirmation.
- The beeping sound may not be heard if there is surrounding noise.







< Function >

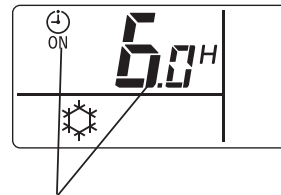
- This function is used to start or stop the unit operation when setting the timer.
- The timer setting set for both an “On Timer  ” and “Off Timer  ”.

On Timer: The operation is started after setting the timer.

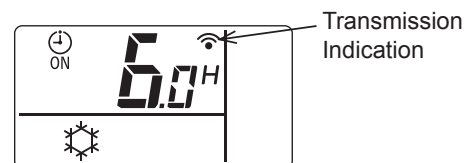
Off Timer: The operation is stopped after the set time has passed.

< Timer Setting >



- Press the “On Timer  ” or “Off Timer  ” button.
By repeatedly pressing “On Timer  ” or “Off Timer  ”, the setting time is changed.
- Point the transmitter toward the IR receiver kit and press the “On Timer  ” button to set the time and the LCD of the wireless controller indicates transmission “ ”.
- The time can be set at half-hour intervals up to 10 hours and at one-hour intervals up to 23 hours after the 10 hours.



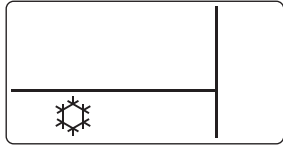
In this example, the setting time for the “On Timer” is set for 6 hours.



< Cancel Setting >

To cancel the timer setting, point the transmitter toward the IR receiver kit and press the "On Timer  " or "Off Timer  " button after proceeding up to 23 hours by repeatedly pressing the button.

The TIMER indicator (green) on the receiver is turned OFF.



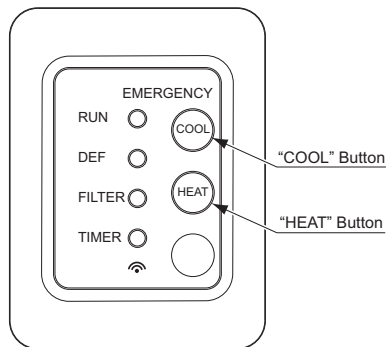
3.6 Emergency Operation

NOTE

- The setting temperature and the fan speed for a cooling/heating operation are the same as before starting an emergency operation.
- During an emergency operation, "📶" light (yellow) flashes (0.5 second ON/0.5 second OFF).

< Function >

"COOL" and "HEAT" buttons are used for an emergency operation when the batteries for the wireless controller are low.

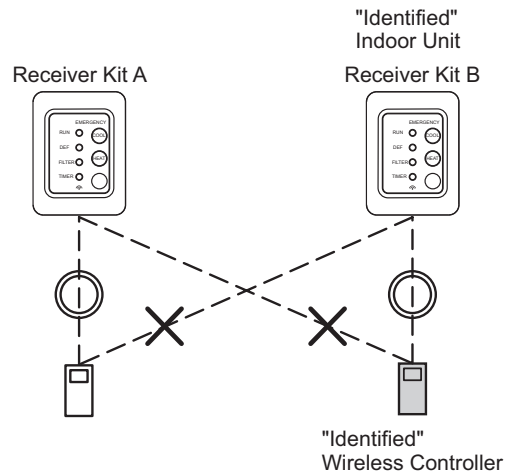


- "COOL" Button: Press "COOL" to begin the cooling operation. Press "COOL" again so that the cooling operation stops.
- "HEAT" Button: Press "HEAT" to begin a heating operation. Press "HEAT" again so that the heating operation stops.

3.7 Identifying Indoor Units Installed Side by Side

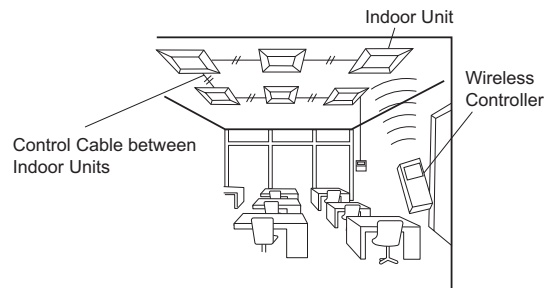
If two indoor units are installed side by side, the commands from the wireless controller may be received by both indoor units. The function, "Identifying of Indoor Units Installed Side by Side" enables operation of an individual unit correctly without interfering with the other unit's operation. As shown in the figure below, the indoor units of A and B are set side by side. In this example, unit B is set as "Identifying Indoor Units Installed Side by Side".

Contact your distributor for additional details.



3.8 Simultaneous Operation of Multiple Indoor Units

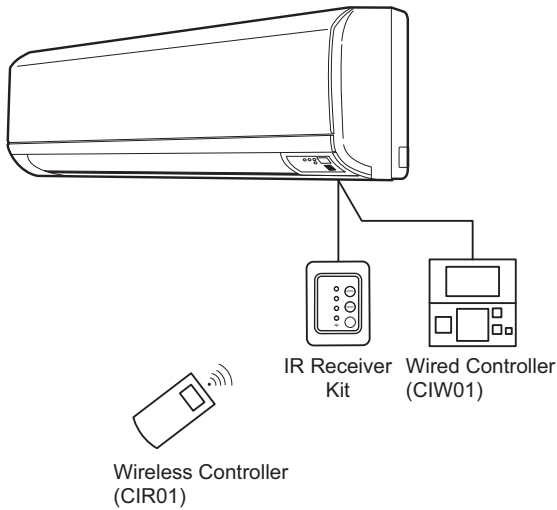
Multiple indoor units (a maximum of 16 units) can be started and stopped simultaneously by one wireless controller. For details, contact your distributor.



This is an example of Simultaneous Operation of Multiple Units.

3.9 Operation with Wired Controller

The indoor unit can be operated by both wired and wireless controllers. Contact your distributor for details.



3.10 Automatic Operation

Refer to the installation and operation manuals for the indoor unit.

4. Maintenance

Refer to the installation and operation manuals for the indoor unit.

4.1 Cleaning Wireless Controller

- Wipe the controller with a soft, dry cloth.
- It is important not to use a wet cloth to clean. It may cause damage to the wireless controller.
- Do not use benzine, thinner or detergent (Surfactant). If it is used, the wireless controller may be damaged or change color.

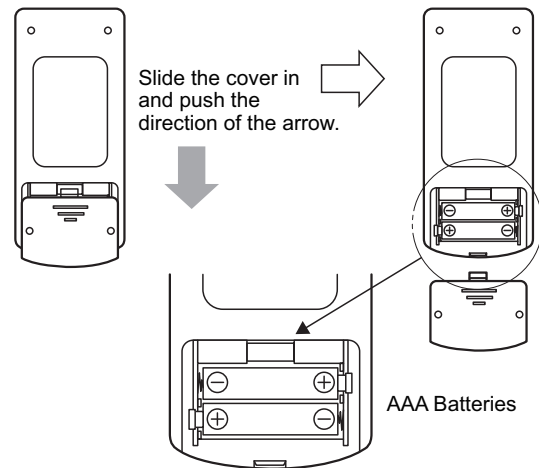
4.2 Replacing Batteries

Under normal use, the battery life should be about one year (for alkaline batteries).


Replace the batteries if one of the following circumstances occurs:

The transmission distance between the controller and the IR receiver kit is too short for operation or fan speed adjustment.

- (1) Remove the battery cover by sliding and pushing the cover in the direction of the arrow as shown in the figure below.
- (2) Set the batteries.
(Insert the batteries according to the + and - marks on the case.)



NOTE:

- Review the following to ensure using the batteries correctly. Not doing so may cause a leak or flare.
 1. Never use new and used batteries together.
 2. Never use different types of batteries (for example, manganese and alkaline) together.
 3. When the wireless controller is not used for a length of time (more than two or three months), replace the batteries from the wireless controller.
- The batteries included at the factory are for validation and may be low.
- When replacing batteries, wait for more than 5 seconds after removing the old batteries to replace with new ones.
- All settings are reset after the batteries are replaced. Therefore, when “Identifying of Indoor Units Installed Side by Side” is set, this setting is canceled once the batteries are replaced. After replacing the batteries, set the “Identifying of Indoor Units Installed Side by Side” again. (Press and hold the “ON TIMER” and “OFF TIMER” simultaneously for 3 seconds. The indication “” will appear. Refer to the installation manual for details.)


5. Indications of IR Receiver Kit**5.1 In Normal Condition****5.1.1 Defrost**

- **Defrost Operation**
DEF indicator (green) is turned ON during defrosting. The indoor fan stops. The louver is fixed at the horizontal position. However, the louver indication of the LCD continues to activate.
- **Operation Stoppage during Defrosting Operation**
The RUN indicator (red) is turned OFF when the operation is stopped during defrosting. However, the operation continues when turning on the ON DEF indicator (green), and the unit is stopped after the defrost operation is finished.

5.1.2 Filter Sign

When the filter indication LED turns yellow, the air filter needs to be cleaned or replaced. (Details for the cleaning method and filter cleaning time should be referred to in the installation and operation manuals for the indoor unit.) After cleaning, point the transmitter toward the IR receiver kit and press the “RESET” button to turn OFF the FILTER indicator.

5.1.3 Central Control

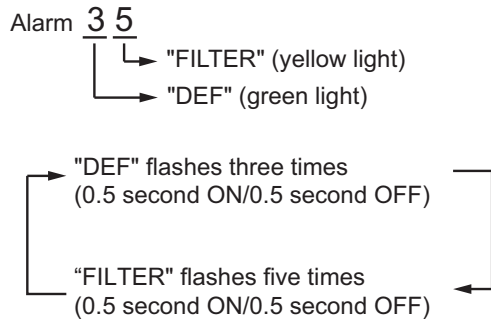
When the “” light (yellow) remains turned ON, the indoor unit is under centralized control. In this instance, “RESET” and “RUN/STOP” buttons are only available for control from the wireless controller.

5.2 In Abnormal Condition

5.2.1 Abnormality

- If a malfunction occurs, such as a safety device actuation, during the test run or the normal operation, the "RUN" (red light) flashes (0.5 second ON/0.5 second OFF).
- The alarm codes are indicated by the flashing of "DEF" (green light) and "FILTER" (light). The first LED light is green. The number of times this LED flashes (0.5 second ON and OFF) will tell you the "DEF" Alarm Code. The second LED light is yellow. The number of times this LED flashes (0.5 second ON and OFF) will tell you the "FILTER" Alarm Code.

< Example >



These signals are repeated until the alarm is reset.

5.2.2 Power Failure

- All the indications are OFF.
- Once the unit is stopped by a power failure, it will not start again even if the power recovers. Perform the starting procedures again.
- If there is a temporary instantaneous power failure lasting 2 seconds, the unit will start again automatically.

5.2.3 Electromagnetic Interference (EMI)

There could be a situation where all the indications are OFF and the unit is stopped. This is a result of the micro computer activating protection for the unit because of the EMI. Perform the starting procedures again.

6. Troubleshooting

6.1 This is Not Abnormal

Refer to the installation and operation manuals for the indoor unit.

Phenomenon		Cause and Action
Stopped Operation	All indication lights on the receiver kit are turned OFF.	The micro-computer is activated to protect the device from electromagnetic waves. The operation can be recovered if it is started from the beginning.
	Power failure occurs.	Start the operation from the beginning.

6.2 Before Contact

Check the issues before contacting the distributor.

Refer to the installation and operation manuals for the indoor unit.

Issue	Checking Point	Action
Not Operating	Is the transmitter of wireless controller pointed toward the IR receiver kit?	Point the transmitter toward the receiver kit.
	Check batteries of wireless controller.	Replace batteries.
	Is the receiver surface covered by dust?	Wipe the receiver with a soft, dry cloth.
	Is the air conditioning controlled by a centralized control?	When the air conditioning is under centralized control, "RESET" and "RUN/STOP" buttons are only available for control from the wireless controller.
Not Cooling or Heating Well	Check that the operation mode is correct.	If the fan mode is selected, switch the operation mode to cooling (heating).
	Check that the set temperature is correct.	If not, change the set temperature by pressing "△" or "▽" with the wireless controller.
	Check that the airflow direction is correct.	If not, change the airflow direction.

6.3 Contact Distributor

If the trouble still remains even after checking the previous issues or other problems not mentioned, stop using the product and contact your distributor.

! WARNING

If an abnormality (burnt odor, for example) occurs, stop the operation and turn OFF the main power source immediately. Otherwise, there may be damage to the product, an electric shock or a fire. Contact your distributor.

Trouble	Action before Contact
The protection devices such as a fuse, breaker or Ground Fault Circuit Interrupter (GFCI) are frequently activated or the main power source does not work.	Turn OFF the power source.
Water Leakage from Indoor Unit.	Stop the operation.
<ul style="list-style-type: none"> ● The RUN indicator (red) is flashing. ● The alarm codes are indicated by the flashing of DEF indicator (green) and FILTER indicator (yellow). Check the details for flashing indicators and contact your distributor. (Refer to Section 5.2.1 “Abnormality”.) 	Refer to the alarm code table of the installation manual for the indoor unit. Inform your distributor of the details of the flashing indicator of the IR receiver kit.

Provide the following information to the distributor.

- 1) Model Name**
- 2) Description of Problem**
- 3) Alarm Code Numbers or Details of Flashing Indicator (Refer to Section 5.2.1 “Abnormality” for details.)**

2.2.6 Mini Central Controller

Model: CCM01

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1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system, including this controller, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the wireless controller at a distance of at least three feet (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.

OPERATION

- If the wired controller is installed in a location where electromagnetic radiation is generated, make sure that the wired controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage.
Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35° to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices.
If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- If the remote sensors are not used with this controller, then do not install this controller...
 - In a room where there is no thermostat.
 - Where the unit is exposed to direct sunshine or direct light.
 - Where the unit will be in close proximity to a heat source.
 - Where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - In areas with poor air circulation and ventilation.
- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating.
During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions

WARNING

Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

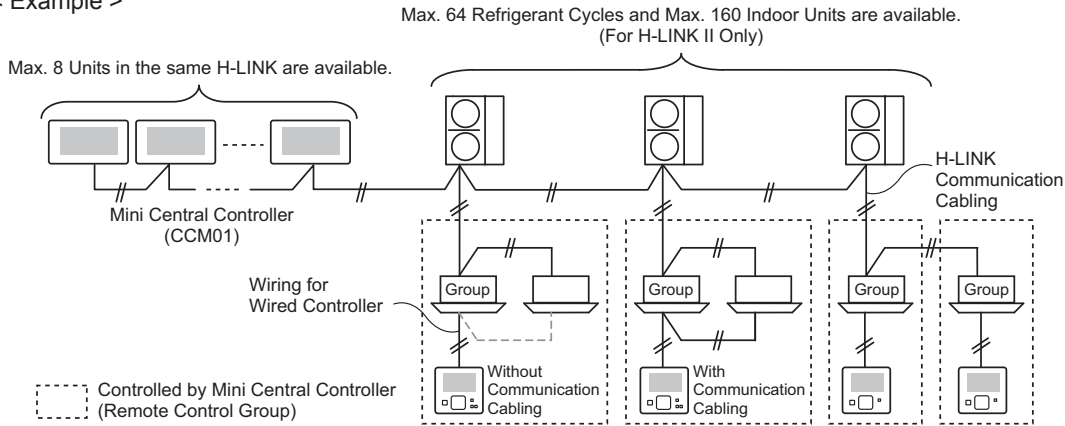
- Only use electrical protection equipment and tools suited for this installation.
- Insulate the wired controller against moisture and temperature extremes.
- Use specified cables between units and the controller.
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.

- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

2. System Configuration

This mini central controller (CCM01) is connected to H-LINK and used for the central control and monitoring of the air conditioners.

< Example >



3. Features

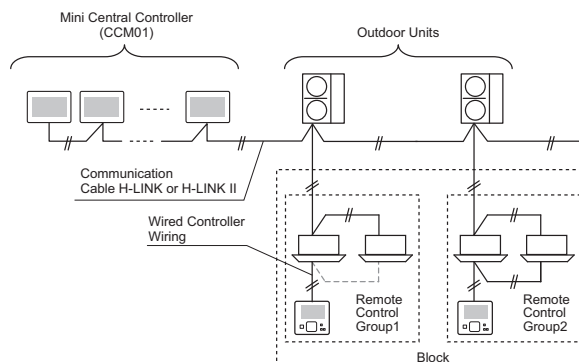
The following functions are available for the wired controller which is registered to All Groups, Blocks or each Block of the Air Conditioner unit.

1. Run/Stop, Operation Mode, Fan Speed Control, Swing Louver Direction Control, Temperature Setting, and Permitting/Prohibiting Operation by Wired Controller
2. Monitoring of Operating Conditions for Block/Groups
3. Schedule Operation (Run/Stop and Temperature Setting) for Block/Groups
4. Run/Stop, Emergency Stop and Demand Control by External Input
5. Run and Alarm Output by External Output
6. Control Exception Function of All Run/Stop Command for Selected Groups
7. Control Exception Function of All Run/Stop Command for Selected Groups by External Input
8. Indication and Calculation of Unit Accumulated Operation Time of Each Group
9. Indication of Alarm History Record
10. Registering Name of Blocks and Groups
11. Registration and Indication of Service Contact Information
12. Control Mode (Run/Stop Only) can be selected as follows:
 - Normal Mode
 - Control Mode of the main Run/Stop
13. Press the Icon Guide Button to indicate a description of the Icons

NOTE:

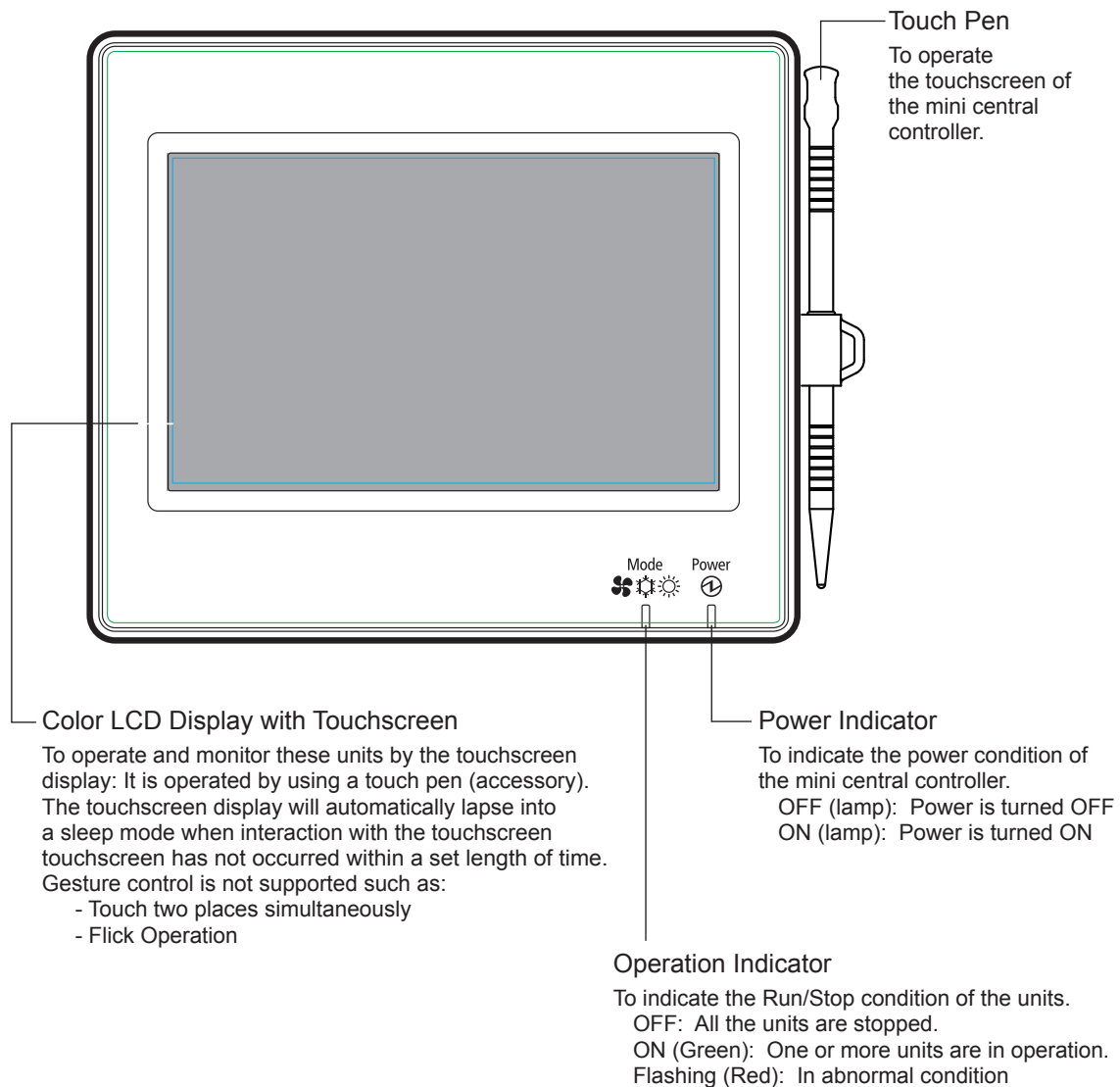
Group: Remote Control Group

Block: Collective of Remote Control Groups



4. Part Names and Functions

4.1 Part Names



NOTE:

Remove the protective film on the Liquid Crystal Display (LCD) before using this product.

4.2 Screen Display

“Monitor (All Groups)”

Present Indication
To display the present indication (all groups)

Unit Condition Icon
To indicate the unit condition such as “filter sign” or “demand”.

Block Button
To change the screen display into “Block” <Monitor (Block)> indication by touching this button.

Group Button
To indicate the operating condition of each group as follows.
Green: Run
Gray: Stop
Red: Abnormal
If the target group button is touched, “Settings” of the target group screen will be displayed.
* (Refer to Section 7.5.)

“Alarm Inform.” Button
To indicate any irregularity, Touch the button for details.

“Stop all gr.” Button
To stop all the units simultaneously which are controlled by the mini central controller.

“Run all gr.” Button
To run all the units simultaneously which are controlled by the mini central controller.

“Setting of all” Button
To change the setting of the units simultaneously which are controlled by the mini central controller.

“Menu” Button
To indicate the menu items such as “Filter Sign Reset”, “Schedule Setting”, and so on.

“Icon guide” Button
Touch this button to display an explanation of the Icons.

“Monitor (Block)”

Present Indication
To display the present indication (groups in block)

Unit Condition Icon
To indicate the unit condition such as “filter sign” and “demand”.

Block Tab
To change the monitor display into “Block” or “All Groups” setting.

Group Button
To indicate the operating condition
Green: Run
Gray: Stop
Red: Abnormal
If the target group button is touched, “Settings” of the target group screen will be displayed. *
*(Refer to Section 7.5.)

“Display Condit.” Button
The setting condition of the air conditioning unit is displayed.

“Air Temp Display” Button
The outside air temperature and the inlet temperature are displayed.

“Menu” Button,
“Icon guide” Button
“Alarm Inform.” Button
same function as in the screen above.

“Setting by Block” Button
To change the setting of the all groups in the target block simultaneously.

“Run by Block” Button
To run the all groups operation in the target block simultaneously.

“Stop by Block” Button
To stop the all groups operation in the target block simultaneously.

*This function can be used when the Control Mode (Run/Stop Only) is set in “Disable” mode.
If Control Mode (Run/Stop Only) is in “Enable” mode, the Run/Stop operation will be switched by touching on the target.

NOTE: The screen image may appear different from the actual screen.

5. Quick Reference

5.1 Screen Structure

The table below shows the display on screen and its related function.

Screen Display	Function	Page	
Monitor (All Groups)	To display the name of all groups and operating conditions	10	
Monitor (Block)	To display the name of groups in the block and operating conditions	11	
Menu	To display the list of menu items	22	
Filter Sign Reset	To reset the filter sign	24	
Schedule Settings	To set or change the weekly schedule	26	
	Schedule Timer Setting	To copy the schedule setting	28
		To delete the schedule timer setting	30
	Holiday Setting	To specify days of suspended schedule setting	33
	Schedule Timer ON/OFF Setting	To set schedule operation ON/OFF	34
Setting temp. range of the remote control	To adjust the setting temperature range of remote control	35	
Date and time Settings	To adjust the date and time	36	
Display of screen for cleaning	To lock the touchscreen for cleaning	36	
Touchscreen Calibration	To calibrate the touch position on the touchscreen	37	
Group Name Register	To register the name of block and group	38	
	To copy the name of block and group	39	
Screen Display Setting	Brightness	To adjust the back-lit brightness of the display screen	40
	Language	To set the displayed language	41
	Temperature Unit	To set the temperature unit	42
Accumulated Operation Time	Displays the sum total operation time on this unit	43	
Contact Information	To display the service contact address (if registered)	45	
Daylight Saving Time Setting	Used to set daylight savings time operation	45	
Service Menu	Use of this function is restricted to service personnel only. Do not use. If this function is used while the service menu is displayed on screen, select "Previous Screen". The screen will return to the previous menu.	-	

5.2 Functions

The table below shows the main functions.

< Operation Procedure >

Display All Groups in a List (All of Air Conditioner Registered to Mini Central Controller)	10
Display of Specified Block	11
Simultaneous Run/Stop for All Groups	12
Simultaneous Run/Stop for Each Block	13
Run/Stop for Each Group	14
Operation Mode Change	16
Fan Speed Setting	17
Louver Swing Direction	18
Temperature Setpoint	19
Permitting/Prohibiting Operation from Wired Controller	20

< Menu Function >

Menu (Menu Items and Details)	22
Menu	23
Filter Sign Reset	24
Schedule Operation	26
Adjusting Setting Temperature Range of Remote Control	35
Date and Time Settings	36
Display of Screen for Cleaning	36
Touchscreen Calibration	37
Registering Groups/Blocks Name	38
Screen Display Setting	40
Total accumulated Operation Time of Unit	43
Contact Information	45
Daylight Saving Time Setting	45

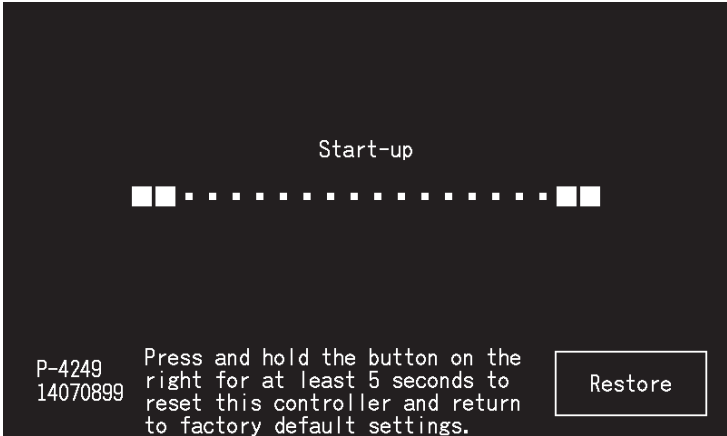
6. Initial Power Activation Settings

< **Preparation 1** >

Turn ON the power supply for the air conditioners.
To protect the compressor unit, the power supply should be energized 12 hours before the startup operation is begun. Do not turn OFF the power supply during in-season heating or cooling operation.

< **Preparation 2** >

After **Preparation 1** is completed, turn ON the power supply for the mini central controller. "Start-up" will be displayed for a while and the screen changes to "Monitor (All Groups)".



NOTE:

Setting date and time may be required after a long-term pause or power failure. In that case, "Set Date/Time" will be displayed on screen. If "Set" is selected, "Date and Time settings" will be displayed.



Refer to item 8.6 for setting the date and time.

7. Operational Procedure

7.1 Display of All Groups

1*

- Select "All Groups" on the touchscreen display.
* The tab of marked with (1), "All Groups" will not be displayed if only one Block has been registered.

2

- All groups are displayed on the touchscreen.
The operational status of each item is defined by the color of the Group button as follows:
Green: Run
Gray: Stop
Red: Abnormal
 - The "All Groups" screen may be different depending on the Control Pattern. The screen on the left indicates Pattern A; (4 Blocks × 8 Groups) set by the Control Pattern.

NOTE:

The touchscreen display will automatically lapse into sleep mode when interaction with the touchscreen has not occurred within a set length of time.

(To awaken, touch anywhere on the screen surface.)

7.2 Display of Specified Block

<Monitor (All Groups)>

<Monitor (Block)>

1. Select the target block from the screen display: "Monitor (All Groups)" or "Monitor (Block)".

2

2. Groups in the selected block will be displayed on the touchscreen. The operation status of each item is indicated by the color of the Group button as follows:
 - Green: Run
 - Gray: Stop
 - Red: Abnormal
 - The "Block" screen may be different depending on the Control Pattern. The screen on the left indicates the Pattern A: (4 Blocks x 8 Groups) as set by the Control Pattern.

3. Touch on "Air Temp Display" to display the outside air temperature and the air inlet temperature.
 - It may take time to display the temperature.
 - The inlet temperature is displayed only while the unit is in operation.

4. Touch on "Display Condit." to display the condition of the operation.

NOTE:

The touchscreen display will automatically lapse into sleep mode when interaction with the touchscreen has not occurred within a set length of time.

(To awaken, touch anywhere on the screen surface.)

7.3 Simultaneous Run/Stop for All Groups

The first screenshot shows the 'All Groups' screen with individual group controls for Group1 through Group8. The 'Run all gr.' button is highlighted in yellow. The second screenshot shows a grid view of all groups and a 'Run all gr.' button. The third screenshot shows a confirmation dialog box with the text 'Run All Groups?' and 'Yes' and 'No' buttons.

1. Touch on "All Groups" on the touchscreen display.
2. Touch "Run all gr." when all groups run simultaneously. Touch "Stop all gr." when all groups stop simultaneously.
3. The confirmation screen will display: Touch on "Yes". (All indoor units connected to this mini-central controller will go into simultaneous operation.) Touch on "No" to cancel this command.

NOTES:

- The "Run/Stop all gr." command will not exercise control over the groups specified in "Exception Setting of Run/Stop Operation".

7.4 Simultaneous Run/Stop for Each Block

The diagram illustrates the process of performing a simultaneous Run/Stop operation for a specific block. It is divided into three numbered steps:

- Step 1:** Select the target block from the touchscreen display to set a simultaneous Run/Stop operation. The screenshot shows the 'All Groups' menu with 'Block1' highlighted by a red dashed box.
- Step 2:** Touch on "Run by Block" when the selected Block runs simultaneously. Touch on "Stop by Block" when activity in the selected Block stops simultaneously. The screenshot shows the 'Run by Block' button highlighted in yellow.
- Step 3:** The confirmation screen will be displayed. Touch on "Yes". All groups (all indoor units) in the selected block connected to the mini-central controller go into simultaneous operation. Touch on "No" to cancel this command. The screenshot shows a dialog box asking "Run the entire 'Block1'?" with "Yes" and "No" buttons.

NOTES:

- The "Run/Stop by Block" command will not exercise control over the blocks specified in "Exception Setting of Run/Stop Operation".

7.5 Run/Stop for Each Group

The mode differs, depending on the setting of the Control Mode (Run/Stop Only).

Control Restricted (Run/Stop Only): Control Method when set as “Disable” Refer to item 7.5.1.

Control Restricted (Run/Stop Only): Control Method when set as “Enable” Refer to item 7.5.2.

7.5.1 Run/Stop for Each Group (Control Restricted (Run/Stop Only): “Disable”)

<Monitor (All Groups)> <Monitor (Block)>

1 1

1. Select the “Monitor (All Groups)” or “Monitor (Block)” screen. Select the Group to set by touching on the Group button.

2. The selected group setting will be indicated on the touchscreen display. Touch on: “ON” or “OFF”.

3. Touch on: “Monitor screen” to return to Monitor screen.

7.5.2 Run/Stop for Each Group (Control Restricted (Run/Stop Only): “Enable”)

<div style="margin-bottom: 20px;"> <p><Monitor (All Groups)></p> </div> <div style="margin-bottom: 20px;"> <p style="text-align: center;">▼</p> </div> <div> <p><Monitor (All Groups)></p> </div>	<ol style="list-style-type: none"> 1. Select the target group on the “Monitor Screen (All Groups)” in “Run/Stop Only” mode. 2. The selected group operation is alternately changed by touch as follows. <p style="text-align: center; margin: 10px 0;">“Stop” ←→ “Run”</p> <p>In this mode, simultaneous Run/ Stop operations for all groups is available by “Run all gr.” and “Stop all gr.” buttons. Refer to the item 7.3 for details.</p>
<div style="margin-bottom: 20px;"> <p><Monitor (Block)></p> </div> <div style="margin-bottom: 20px;"> <p style="text-align: center;">▼</p> </div> <div> <p><Monitor (Block)></p> </div>	<ol style="list-style-type: none"> 1. Select the target group at “Monitor (Block)” screen inside the “Run/ Stop Only” mode. 2. The selected group operation is alternately changed by touch as follows. <p style="text-align: center; margin: 10px 0;">“Stop” ←→ “Run”</p> <p>In this mode, simultaneous Run/ Stop operations for this Block are available on the “Run by Block” and “Stop by Block” buttons. Refer to the item 7.4 for details.</p>

7.6 Operation Mode Change

1

1. Select the target group: “Monitor (All Groups)” screen or “Monitor (Block)” screen to change the operation mode setting.
The pop-up: “Setting” for the selected Group is displayed on the touchscreen.
2. Touch “△” or “▽” at the Operation Mode to switch in order to “COOL”, “HEAT”, “DRY”, “AUTO” and “FAN”.

3 2

▫ The “AUTO” (Heating/Cooling Automatic Operation) will be included as an option if applicable.

3. Touch “Monitor screen” to return to the Monitor screen.

NOTES:

- By touching on “<” or “>” at the detailed setting screen, a Group will switch to another Group within the same Block.
- Control Restricted (Run/Stop Only): If the condition “Enable” is selected, each change of settings will apply for all Groups or Blocks.
Settings Changes are not possible for each Group.
- Some operational modes cannot be set depending on the type of air conditioner unit. Contact your distributor for detailed information.
- If the settings are mixed when multiple groups are selected, the display will remain blank.

7.7 Fan Speed Setting

The figure illustrates the steps to change the fan speed setting. It shows the navigation from the main monitor screen to a specific group's settings, and then to the fan speed control interface.

- Select the target Group on the "Monitor (All Groups)" screen or "Monitor (Block)" screen to change the fan speed setting. The pop-up: "Setting" for the selected Group is displayed on the touchscreen.
- Touch "△" or "▽" at the Fan Speed, to switch in this order: "LOW", "MEDIUM", "HIGH", "HIGH2", "AUTO".

- Settings "HIGH2" or "AUTO" may not be an option depending on the type of air conditioner.

- Touch "Monitor screen" to return to Monitor screen.

NOTES:

- By touching "<" or ">" at the detailed setting screen, the Fan Speed will be switched to another group in the same block.
- Control Restricted (Run/Stop Only): If the condition "Enable" is selected, each change of settings will apply to ALL Groups or Blocks. Settings changes are not possible for each Group.
- Actual fan speed during dry operation will be "LOW" regardless of the fan speed setting.
- The figure above shows an example of a connected air conditioner unit. Fan speed may not be displayed in certain instances.
- If the settings are mixed when multiple groups are selected, the display will remain blank.

7.8 Louver Swing Direction

<Monitor (All Groups)>

<Monitor (Block)>

- Select the target Group on the "Monitor (All Groups)" screen or "Monitor (Block)" screen to change the louver swing direction. The pop-up "Setting" for the selected Group is displayed on the touchscreen.
- By touching "△" or "▽" of the "LOUVER", the louver swing direction will be changed alternately as follows.
- Touch "Monitor screen" to return the Monitor screen.

[Setting]

← Angle Range →

← Angle Range →

Auto operation will be started.

3

NOTES:

- By touching "<" or ">" at the detailed setting screen, the Louver Swing Direction will be switched to another group in the same block.
- Control Restricted (Run/Stop Only): In case of "Enable", each Setting Change applies for all Groups or Blocks. Setting Change is not possible for each Group.
- Depending on the model of the air conditioner, the setting may not be possible or may be calibrated automatically.
- Louver position on the LCD and the actual louver position do not always match during the auto swing operation.
- The actual Louver Swing Direction may not stop immediately after the switch is pressed.
- If the settings are mixed when multiple groups are selected, the display will remain blank.

7.9 Temperature Setpoint

1. Select the target Group on the “Monitor (All Groups)” screen or “Monitor (Block)” screen to change the temperature setpoint. The pop-up “Setting” for the selected Group is displayed on the touchscreen.
2. Touch “△”, and the temperature is increased by 1°F (0.5°C). (Max. 86°F (30°C))
Touch “▽”, the temperature is decreased by 1°F (0.5°C).
 - At Cooling, Dry, Fan, and Auto operation: Min. 66°F (19°C),
 - At Heating operation: Min. 62°F (17°C).
3. Touch “Monitor screen” to return to Monitor screen.

NOTES:

- By touching “<” or “>” at the detailed setting screen, the Temperature Setpoint will be switched to another group in the same block.
- Control Restricted (Run/Stop Only): If the condition “Enable” is selected, each settings change will apply to all Groups or Blocks. A settings change is not possible for each Group.
- The figure above shows an example of the temperature setpoint for a connected Air Conditioner Unit. The temperature setpoint range may not be an option in certain cases.
- If the settings are mixed when multiple groups are selected, the display will remain blank.
- The temperature reading; 76°F (Fahrenheit) may be displayed in Celsius as 24°C or 24.5°C.
- The temperature reading; 78°F (Fahrenheit) may be displayed in Celsius as 25.5°C or 26°C.

7.10 Permitting/Prohibiting Operation from Wired Controller

This function is used for prohibiting the operation from the wired controller.

When the wired controller is set as prohibited (by Item/ All Items), control of the selected item will no longer be available. Those features that can be selected are: Run/Stop, Operation Mode, Fan Speed, Louver Swing and Temperature.

NOTE:

Pay attention to the following when the group support is prohibited.

- When setting “Remote control operation”, do not use the function control lock of the wired controller.
 - When using at the same time, “Remote control operation” and control lock functions, “Remote control operation” is prior and the control lock function cannot be set.
 - When changing settings from “All prohib.” to “All permit”, at “Remote control operation”, all settings for the control lock of the wired controller will be canceled.

<Monitor (All Groups)>

<Monitor (Block)>

1. Select the target group on the “Monitor (All Groups)” screen or “Monitor (Block)” screen to set the function of “RCS Operation Prohibited”. The pop-up “Setting” for the selected Group is displayed on the touchscreen.
2. Select “Remote control operation” by touching.
3. Select “Permitted” or “Prohibit.” for each item. The icon “' will be indicated when the item selected is “Prohibit.” If all the items are set as “Permitted” or “Prohibit.”, “All Permitt.” or “All Prohib.” can be selected.

NOTE:
Depending on the air conditioner unit or the wired controller used, only “All Permitt.” or “All Prohib.” will be available.

4. Touch “Monitor screen” to return to the Monitor screen.

NOTES:

- By touching “<” or “>” at the detailed setting screen, the wired controller Permitted/Prohibited will be switched to another group in the same Block.
- Control Prohibited (Run/Stop Only): If the condition “Enable” is selected, each settings change will apply to ALL Groups or Blocks. A setting change is not possible for EACH Group.
- Even if a wired controller is set to “Prohibit.”, it is possible to cease operation with the wired controller while running. It is also possible to restart operation using the wired controller. However, the Stop operation will be only used in case of an emergency. Do not use it in normal operation.
- If “Power Supply ON/OFF” (**d1, d3**) is set, do not set the wired controller to “Prohibit”. If the wired controller is restricted when using “Power Supply ON/OFF”, the function “Control lock” for the wired controller shall be used.
- If a communication error occurs, the wired controller “STOP” (by item) may be canceled. In this case, repeat the setting.

8. Menu

The table below shows menu item features and their functions.

Feature	Function	Page
Filter Sign Reset	This function is used for turning off the Filter Sign of the connected indoor units. Regardless of the occurrence or not of the Filter Sign, it is possible to reset the Filter Sign time display of the air conditioner unit.	24
Schedule Setting	This function is used as a Run/Stop control of air conditioner operation at any desired time.	26
Schedule Timer Setting	This function is used for setting time (by the minute), "Run/Stop" and temperature 66~86°F(19~30°C). For a weekly schedule setting, up to 10 scheduled items can be set per day. It is also possible to copy the settings contents.	26
Holiday Setting	This function is used for suspending the scheduled operation temporarily. The scheduled operation will be suspended when the day is set as "Holiday". This function is used for setting irregular holidays such as national holidays.	33
Schedule Timer ON/OFF Setting	"Schedule Timer OFF Setting" is used for suspending the schedule operation for the target group. The scheduled operation will not be available when the Schedule Timer is OFF. This function is used for a long holiday, sudden shutdowns, and national holidays.	34
Adjusting Temperature Setpoint Range of Remote Control	This function is used for adjusting the temperature setpoint range. It is possible to set a minimum cooling temperature or maximum heating temperature.	35
Date and Time Settings	This function is used for adjusting date and time.	36
Display of Screen for Cleaning	This function is used for cleaning the Liquid Crystal Display (LCD) of the mini central controller. The screen will return to "Menu" after 10 seconds of not being touched.	36
Touchscreen Calibration	This function is used for calibrating the touch position for the touchscreen. This function is used if the operation does not perform smoothly when the button on the touchscreen is touched.	37
Group Name Register	This function is used for registering a name of a block and group. The registrable number of character is a maximum of 16 characters for the name of each block or group. It is also possible to copy the name. If the group/block is registered without a name, it will be registered as "Group 1" or "Block 1" automatically.	38
Screen Display Setting	This function is used for setting the touchscreen display.	40
Brightness	This function is used for adjusting the brightness of the touchscreen display.	40
Language Setting	This function is used for changing the displayed language.	41
Temperature Unit	This function is used for changing the temperature of the unit.	42
Accumulated Operation Time of Unit	This function is used for indicating the accumulated operation time of the air conditioner. <ul style="list-style-type: none"> The accumulated operation time value will be indicated by month. The operation time is indicated for 16 months, including the current month. "Thermo ON Time" can be indicated by setting the controller option. 	43
Contact Information	This function is used for indicating the service contact address and the latest alarm code.	45
Daylight Saving Time Setting	This function is used for setting the daylight saving time operation.	45

8.1 Display Menu Screen

The setting items for the indoor unit and mini-central controller are laid out in the menu.

1

1. Touch "Menu" on the screen for "All Groups" or "Block".

2

3

2. The "Menu" screen will be displayed.
3. Select the item from the "Menu" screen.

8.2 Exit Menu Screen

1

1. Touch on "Monitor screen" to return to the Monitor screen.

8.3 Filter Sign Reset

8.3.1 Reset Filter Sign

1. Select "Filter Sign Reset" from the "Menu" screen. (This is available only when the filter sign is displayed.)

2. Select the target to reset the Filter Sign.

- Touch "Display with Sign" to display only the group with the Filter Sign.
- The target Groups are indicated in Yellow.
- When selected, the Group button will be indicated with a "✓" sign.

3. Touch "Execute reset".

4. Touch "Yes" on the confirmation screen.

- Filter Sign and operating time will be reset.
- Touch "No" to return to the Filter Sign Reset screen.

5. To reset the filter notification, press "Yes".

6. Touch "Menu" to return to the Menu screen.

NOTES:

- This screen may be different depending on the control pattern. The screen above displays pattern A (4 blocks × 8 groups) set by the control pattern.
- The Filter Sign will be displayed if the elapsed operating time of the filter reaches the time set.

8.3.2 Reset Filter Operation Time

1. Select "Filter Sign Reset" from the "Menu" screen. This is available only when the filter sign notification is activated.

2. Select the target to reset the Filter operating time.

- Touch "Display All Groups" to target all groups.
- The target Groups are indicated in Yellow.
- When selected, the Group button will be indicated with a "✓" sign.

3. Touch "Execute reset".

4. Touch "Yes" on the confirmation screen.

- An indicated group for Filter Sign will reset the Filter Sign and Filter operation time.
- A Group that did not display Filter Sign will reset only the Filter operation time.
- Touch "No" to return to the Filter Sign Reset screen.

5. Touch "Menu" to return to the Menu screen.

1. Select "Filter Sign Reset" from the "Menu" screen. This is available only when the filter sign notification is activated.
2. Select the target to reset the Filter operating time.
 - Touch "Display All Groups" to target all groups.
 - The target Groups are indicated in Yellow.
 - When selected, the Group button will be indicated with a "✓" sign.
3. Touch "Execute reset".
4. Touch "Yes" on the confirmation screen.
 - An indicated group for Filter Sign will reset the Filter Sign and Filter operation time.
 - A Group that did not display Filter Sign will reset only the Filter operation time.
 - Touch "No" to return to the Filter Sign Reset screen.
5. Touch "Menu" to return to the Menu screen.

NOTES:

- The screen may be different depending on the control pattern. The screen above displays pattern A (4 blocks × 8 groups) set by the control pattern.
- Filter Sign will display if the elapsed operation time of the filter reaches the time limit.

8.4 Schedule Operation

8.4.1 Schedule Setting

< Timer Setting for Weekly Schedule >

1

Filter Sign Reset	Schedule Settings	Setting temp. range of the remote control	Date and time Settings
Display of screen for cleaning	Touchscreen Calibration	Group Name Register	Screen Display Setting
Accumulated Operation Time	Contact Information	Daylight Saving Time Setting	
			Service Menu

2

Schedule Timer Setting	Holiday Setting	Schedule Timer ON/OFF Setting
------------------------	-----------------	-------------------------------

3 (Block)

Block1	Block2	Block3	Block4
Group1	Group2	Group1	Group2
Group3	Group4	Group3	Group4
Group5	Group6	Group5	Group6
Group7	Group8	Group7	Group8

3 (Group)

3 (All Groups)

4

Block1 Group1						
Monday	Tuesday	Wednesd.	Thursday	Friday	Saturday	Sunday
No. 1	No. 2	No. 3	No. 4	No. 5		
08:30 ON 82	12:00 OFF 82	--:--	--:--	--:--		
No. 6	No. 7	No. 8	No. 9	No. 10		
--:--	--:--	--:--	--:--	--:--		

5

to Next Page

1. Select "Schedule Settings" from the "Menu" screen.
2. Select "Schedule Timer Setting" from the "Schedule Settings" screen.
3. Select the target (All Groups, Block or Group).
 - The blue button indicates the Group with a setup schedule.
 - The white button indicates the Group without a setup schedule.
4. Select the target day of the week. (from Monday to Sunday.)
5. Select the scheduled item number (from 1 to 10).

6

6. Set the Scheduled Time, RUN/ STOP operation and temperature.

- Select the schedule item number (1 through 10) and set the time.
- Select “ON” , “OFF” or “Unspe.”.
- Set the temperature by touching “Δ” or “▽”.
- “-.-” will be shown when the time and temperature are not set.

7

7. Touch on “Setting completed” to confirm the setting. If “Cancel” is selected, the setting currently displayed will be canceled and the screen will return to the Scheduled Setting screen.

- To set the same day of the week, refer to item(5).
- To set other days of the week, refer to item (4).

8

8. Touch on “Return to Group sel.” to set the schedule timer for other Groups. The screen will return to Schedule Control selection screen.

- After the schedule is set, the registered schedule number (1 through 32) will be shown in the Group button. (The scheduled Group button color changes to blue.)
- In an instance where the setting is the same, the same registered schedule number will be displayed.
- Touch on “Submenu” to return to the “Schedule Setting” screen.
- The reading; 76°F (Fahrenheit) may be displayed in Celsius as 24°C or 24.5°C.
- The reading; 78°F (Fahrenheit) may be displayed in Celsius as 25.5°C or 26°C.

9

NOTES:

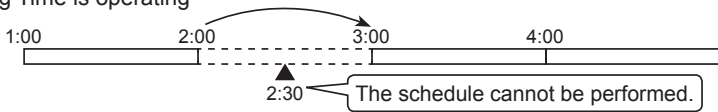
- Make sure that the time and RUN/STOP are set for the timer setting. (It is not necessary to set the temperature.)
- The schedule control selection screen may be different depending on the control pattern.

Daylight Saving Time (DST)

■ Schedule process when Daylight Saving Time is operating

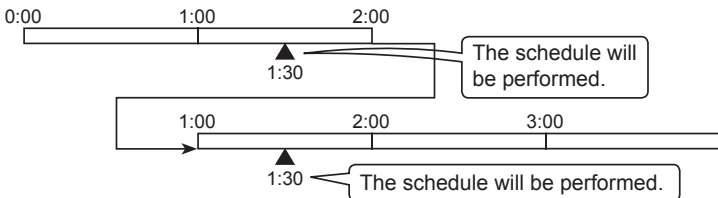
<Starting Time>

When starting at 2:00 with a 1 hour shifting time, the schedule set at 2:30 cannot be performed.



<Ending Time>

When ending at 2:00 with a 1 hour shifting time, the schedule set at 0:30 will be performed twice.



< Copying Schedule Setting by Days of Week >

4

5

6

8

1. Select "Schedule Settings" from the "Menu" screen.
2. Select "Schedule Timer Setting" from "Schedule Setting".
3. Select the target (All Groups, Block or Group).
4. Touch "Copy Day of Week".
5. Select the day of the week to copy. The selected day will be indicated in orange.
6. Select the day of the week tabs to paste.
 - After the day of the week is selected, a check mark "✓" will appear in the day of the week tab.
 - Multiple selections of days of the week are available to copy.
 - Touch "Day of Week" for reselecting the day of the week tabs.
7. Touch "Paste". The Schedule Setting is copied.
 - To copy the schedule for other days of the week, refer to item (5).
 - To finish, refer to item (8).
8. Touch on "Return to list" to return to the "Schedule setting" list screen.

< Copying Schedule Setting by Each Group >

The process is shown in four sequential screenshots:

- Setting Group Selection:** A grid with 4 blocks (Block1-4) and 8 groups (Group1-8). A 'Submenu' bar at the bottom contains 'All Groups selection', 'Copy Settings', and 'Delete Settings'. An arrow labeled '3' points to the 'Copy Settings' button.
- Copy Settings:** The same grid is shown, but the 'Group1' button in 'Block1' is highlighted with a red dashed border. An arrow labeled '4' points to this group.
- Copy Settings:** The 'Group1' button now has a checkmark. An arrow labeled '5' points to this group.
- Copy Settings:** The 'Paste' and 'Cancel selection' buttons are visible. An arrow labeled '6' points to the 'Paste' button.

Finally, an arrow labeled '7' points to the 'Return to Group sel.' button in the bottom-left corner of the final screenshot.

1. Select "Schedule Settings" from the "Menu" screen.
2. Select "Schedule Timer Setting" from the "Schedule Settings" screen.
3. Touch on "Copy Settings".
4. Select the Group to copy. (Block cannot be selected to copy.)
 - The selected Group button will be trimmed with an orange outline.
 - Touch on the selected Group again to cancel the selection. The orange outline goes away.
5. Select the group (block) to paste.
 - A check mark "✓" will be displayed in the button.
 - Multiple selections of the Group (including Block) are available to paste.
 - To cancel the selection, press the selected group again, the check mark "✓" will vanish.
6. Touch on "Paste". The schedule setting is copied.
 - To copy the schedule for other Groups, refer to item (4).
 - To finish, refer to item (7).
7. Touch "Return to Group sel." to return to Group Selection.

< Deleting Schedule Setting by Operation No. >

4

5

6

7

1. Select "Schedule Settings" from the "Menu" screen.
2. Select "Schedule Timer Setting" from the "Schedule Settings" screen.
3. Select the target (All Groups, Block or Group).
4. Touch on "Delete Setting".
5. Select the schedule item number for deleting schedule.
 - If other days of the week tabs are touched, the schedule item number for other days of the week can be selected.
 - If the schedule item number is selected, a check mark "✓" appears. Multiple selection of schedule item numbers are available.
6. Touch on "Proceed". The selected scheduled item number will be deleted.
 - To delete another schedule number, refer to item (5).
 - To finish, refer to item (7).
7. Touch on "Return to list" to return to the "Schedule Timer Setting" screen.

< Deleting Schedule Setting by Each Group >

The process is shown in four sequential screenshots:

- Setting Group Selection:** A grid with 4 blocks and 8 groups. A 'Delete Settings' button is at the bottom right.
- Delete Settings:** The same grid is shown with a red dashed border around it, indicating selection.
- Delete Settings:** A checkmark is visible in the 'Group1' cell of the grid.
- Delete Setting?** A confirmation dialog box asks 'Delete Setting?' with 'Yes' and 'No' options.

1. Select "Schedule Settings" from the "Menu" screen.
2. Select "Schedule Timer Setting" from the "Schedule Settings" screen.
3. Touch on "Delete Settings".
4. Select the Groups or Blocks to delete the setting.
 - If the Groups or Blocks are selected, a check mark "✓" is displayed.
 - Multiple selections of Groups and Blocks are available for deletion.
 - To cancel a selection, press the selected Group again and the check mark "✓" goes away.
5. Touch on "Proceed" and the confirmation screen will be displayed.
6. If "Yes" is selected, the scheduled setting will be deleted.
 - To delete the schedule for other Groups, refer to item (4).
 - To finish, refer to item (7).

OPERATION

▼

[Schedule] Delete Settings								2014/01/01 (Wed) 01:04		
Block1		Block2		Block3		Block4				
Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2			
Group3	Group4	Group3	Group4	Group3	Group4	Group3	Group4			
Group5	Group6	Group5	Group6	Group5	Group6	Group5	Group6			
Group7	Group8	Group7	Group8	Group7	Group8	Group7	Group8			
Return to Group sel.	Select the Group/Block to delete settings.						Proceed	Cancel selection		

7 —

7. Touch on "Return to Group sel." to return to Setting Group Selection.

8.4.2 Holiday Setting for Operation Suspended

2

[Schedule] Submenu 2014/01/01 (Wed) 00:54

Schedule Timer Setting Holiday Setting Schedule Timer ON/OFF Setting

Monitor screen Menu

3

[Schedule] Select, Holiday Setting Group 2014/01/01 (Wed) 02:28

Block1		Block2		Block3		Block4	
Group1	Group2	Group1	Group2	Group1	Group2	Group1	Group2
Group3	Group4	Group3	Group4	Group3	Group4	Group3	Group4
Group5	Group6	Group5	Group6	Group5	Group6	Group5	Group6
Group7	Group8	Group7	Group8	Group7	Group8	Group7	Group8

Submenu All Groups selection

4

[Schedule] Holiday Setting 2014/01/01 (Wed) 02:34

Mon	Tue	Wed	Thu	Fri	Sat	Sun	Block1 Group1
		1	2	3	4	5	< 2014/01 >
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30	31			

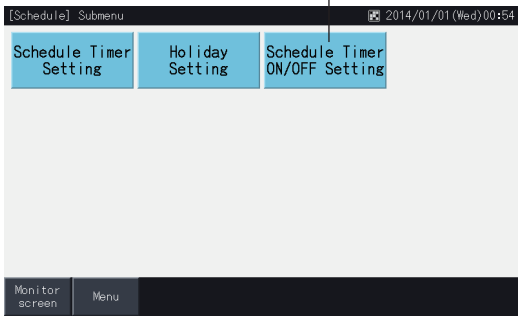
Setting completed Cancel

5

1. Select "Schedule Settings" from the "Menu" screen. (Refer to Section 8.3.1.)
2. Select "Holiday Setting" from the "Schedule Settings" screen.
3. Select the target (All Groups, Block or Group).
A calendar will be displayed.
 - The Blue button is displayed for the Group with a Holiday Setting.
 - Grey Button is for the Group without a Holiday Setting.

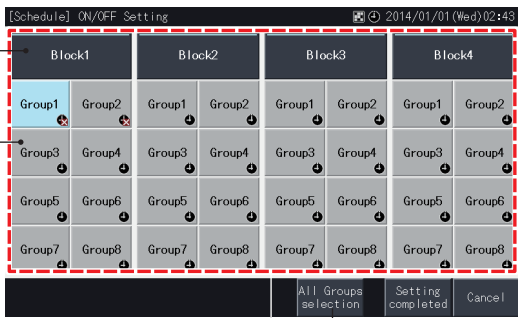
NOTE:
"Holiday" means "Operation Suspended Day".
4. Set the date to suspend the scheduled operation.
 - The calendar will scroll forward or backward by touching on "<" or ">".
 - By touching on the date on the calendar, the "Holiday" is set and displayed as "□". The "Holiday Setting" is canceled by touching the same date again.
 - A Holiday setting is not available for the days just prior to the present day.
 - A "□" symbol will be displayed for the day with the holiday setting.
 - With "All Groups" or "Block" selected, a check mark "☑" will appear, indicating the day when the Groups with holiday setup and the Groups without setup holiday are intermixed.
5. Touch on "Setting Completed" to confirm settings content and return to the "Holiday Setting" selection screen.
6. Touch on "Sub menu" at the Holiday Setting selection screen to return to Schedule Setting screen.

8.4.3 Schedule Timer ON/OFF Setting




2

3 (Block)



3 (Group)

3 (All Groups)



4

1. Select on "Schedule Settings" from the "Menu" screen. (Refer to Section 8.4.1.)
2. Select "Schedule Timer ON/OFF Setting" from schedule setting.
The screen will be changed to the "Schedule Timer ON/OFF Setting". At first, the setting is "ON" displayed as "🕒".
3. Select the target (All Groups, Block or Group).
By pushing the button for All Groups, Blocks or Groups, the selection is changed to the "OFF" setting as displayed as "🕒".
By touching on All Groups, Block or Group, the display begins to alternately indicate a "🕒" symbol and a "🕒" symbol.
 - The Blue button indicates the Group with a schedule set.
 - The Grey Button indicates a Group without a schedule setting.
 - Schedule is turned ON: 🕒
 - Schedule is turned OFF: 🕒
4. Touch on "Setting completed" to confirm the settings content and to return to the "Schedule Settings" screen.

8.5 Adjust Setting Temperature Range of Remote Control

The diagram illustrates the steps to adjust the temperature range of remote control through the system's menu.

- Step 1:** Select "Setting temp. range of the remote control" from the Menu screen.
- Step 2:** Select the target to set a temperature range. (All Groups/Block/Group)*
- Step 3:** Touch "Δ" or "∇" to set cooling minimum temperature or heating maximum temperature.
- Step 4:** Touch "Setting completed" to confirm the setting and to return to the Selection screen.
- Step 5:** If "Cancel" is selected, the setting displayed will be canceled and the screen will return to the selection screen.

1. Select "Setting temp. range of the remote control" from the Menu screen.
 - If the air conditioner does not support this function, the control target cannot be selected.
2. Select the target to set a temperature range. (All Groups/Block/Group)*
 - The Blue button indicates the Group with a temperature range setting.
 - The Grey button indicates a Group where a temperature range setting is not available.
 - The button is inactive for the Group with no temperature range setting.
 - Do not set in Group using IR Receiver kit.
 - The following cannot be selected:
 - Without a wired controller
 - The representative wired controller Group is not the standard unit supporting H-LINK II (temperature setpoint range is from 66 to 86°F for COOL, and from 62 to 86°F for HEAT).
3. Touch "Δ" or "∇" to set cooling minimum temperature or heating maximum temperature.
4. Touch "Setting completed" to confirm the setting and to return to the Selection screen.
5. If "Cancel" is selected, the setting displayed will be canceled and the screen will return to the selection screen.

8.6 Date and Time Settings

The diagram illustrates the process of setting the date and time. It starts with the 'Menu' screen where 'Date and time Settings' is selected. This leads to the 'Date and time display format' screen, where 'yyyy/mm/dd' is chosen. Below this, a numeric keypad allows for adjusting the year (2014), month (01), day (01), hour (00), and minute (46). The process concludes by pressing the 'Setting completed' button.

1. Select “Date and Time Settings” from the “Menu” screen.
2. Set in the following order: Year, Month, and Day
3. Touch or press-and-hold “△” or “▽” to adjust the date and time.
4. Touch “Setting completed” to return to the Menu screen.

NOTES:

- According to the backup function of the mini-central controller, the clock operates for approximately 10 days after the electric power failure. Set the date and time again after any long-term electric power failure.
- Periodical clock adjustments are recommended. (Clock accuracy: difference ±70 sec. per month)

8.7 Display of Screen for Cleaning

The diagram shows the 'Menu' screen where 'Display of screen for cleaning' is selected. This leads to a black screen with a white text box containing the following message: 'Return to the previous screen when not tapping for 10 seconds. After cleaning, wait without touching the screen. 10 s left'.

1. Select “Display of screen for cleaning” from the “Menu” screen.
2. The screen will be changed as shown in figure (2). The screen will be locked during the cleaning. The screen will return to the Menu screen after 10 seconds of no interaction.

- Clean and wipe the display with a dry, soft cloth.
- For oily fingerprint marks on the touchscreen, use diluted neutral liquid detergent. Before cleaning, wring out the water from the cloth. After that, again wipe down the display with dry, soft cloth.
- Do **not** use any benzine type thinners or active surface agents in order to protect the touchscreen and casing from damage or deterioration.

8.8 Touchscreen Calibration

1

Filter Sign Reset	Schedule Settings	Setting temp. range of the remote control	Date and time Settings
Display of screen for cleaning	Touchscreen Calibration	Group Name Register	Screen Display Setting
Accumulated Operation Time	Contact Information	Daylight Saving Time Setting	
			Service Menu

Monitor screen

2

Calibrating the Touchscreen.
Tap the intersection of white lines.
Make sure to use the Touch Pen.

3

Checking tap position of touchscreen.
Tap the intersection of white lines.
Make sure to use the Touch Pen.

1. Select "Touchscreen Calibration" from the "Menu" screen.
2. <Calibrating Touchscreen>
Touch on every intersection of white lines sequentially as indicated on screen.

After that, the screen will be changed. See figure (3).
If the intersections of white lines are not selected (touched) in sequence, "Calibration is canceled" will be displayed.
The screen will automatically revert to the "Monitor (All Groups)" screen or "Monitor (Block)" screen without calibrating.
3. <Checking Position Touchscreen>
Touch on the intersection of white lines in sequence according to what is indicated on screen at left.
 - White dots will display when touching on anything other than the intersection of white lines.
 When all intersections of white lines are selected in sequence, the screen will automatically revert to the "Monitor (All Groups)" screen or "Monitor (Block)" screen.

8.9 Registering Groups/Blocks Name

8.9.1 Registering Name of Group (Block)

The process is shown in three sequential screenshots:

- Menu Screen:** A grid of settings options. 'Group Name Register' is highlighted. A 'Service Menu' button is at the bottom right.
- Group Selection Screen:** A grid with columns 'Block1' through 'Block4' and rows 'Group1' through 'Group8'. A red dashed box highlights the entire grid.
- Text Input Screen:** A keyboard interface with 'Group1' entered in the input field. A red dashed box highlights the keyboard's character input row (ABC, abc, Symbols 1, Symbols 2, Symbols 3).

1. Select "Group Name Register" from the "Menu" screen.
2. Select the target (Block or Group) to register the name.
3. The Character Input screen will be displayed.
 - Select the letter type from "ABC", "abc", "Symbols 1", "Symbols 2", or "Symbols 3".
 - The heading will be only displayed in 1 line, even if a new line is entered to display the title of the Group (Block).
 - The title of the Group (Block) cannot be registered as blank. If it is left blank and "Register" is selected, the title of the factory default will be displayed.
4. Enter the Group (Block) name.
5. Touch on "Delete" to delete the character to the left.
6. When Input Character is completed, touch on "Register" to confirm the name. The screen will return to the Selection screen (2).
7. When Register Group name is completed, touch on "Menu" at the Selection screen (2) to return to the Menu screen.

NOTES:

- The name of the Group (Block) input is possible with a maximum of 16 characters. With a display of eight characters per line, the ninth character will have to start on the second line.
- The name of the Register selection screen may be different depending on the control pattern.

8.9.2 Copying Name of Group (Block)

1

2

3

4

5

1. Touch “Group Name Register” from the “Menu” screen. (Refer to Section 8.9.1.)
2. Select the source Group (Block) to copy.
 - Selected group (Block) button is trimmed with an orange outline.
 - Press the selected Group (Block) again to cancel the selection. The orange outline goes away.
3. Select the destination Group (Block) to paste.
 - A check mark “✓” will appear inside the button.
 - Multiple selections of Groups and (Blocks) are available to paste.
 - To cancel the selection, press the selected Group, (Block) again, and the check mark of “✓” goes away.
4. Touch “Paste”. The name of the Group (Block) is copied.
 - To copy the names of other groups, refer to item (3).
 - To finish, refer to item (6).
5. Touch “Return to Group sel.” to return to the Group Name Register selection screen.

8.10 Screen Display Setting

8.10.1 Adjusting Backlight Brightness of Touchscreen Display

The diagram illustrates the steps to adjust the backlight brightness of the touchscreen display through three sequential screens:

- Menu Screen:** Shows various settings options. 'Screen Display Setting' is selected, indicated by a line and the number 1.
- Screen Display Setting Submenu:** Shows options for 'Brightness', 'Language', and 'Temperature Unit'. 'Brightness' is selected, indicated by a line and the number 2.
- Screen Display Setting Brightness:** Shows a brightness slider with left and right navigation buttons. A line and the number 3 point to the slider.
- Setting completed:** Shows a confirmation screen with 'Setting completed' and 'Cancel' buttons. A line and the number 4 point to the 'Setting completed' button.

1. Select "Screen Display Setting" from the "Menu" screen.
2. Select "Brightness" from the "Screen Display Setting" screen.
3. Touch "<" or ">" and adjust the brightness of the back lighting.
4. Touch "Setting completed" to return to the Menu screen.

8.10.2 Language Setting

The diagram illustrates the process of changing the language through three sequential touch screen screens:

- Screen 1 (Menu):** Shows a grid of settings. 'Screen Display Setting' is highlighted with a callout '1'. Other options include Filter Sign Reset, Schedule Settings, Setting temp. range of the remote control, Date and time Settings, Display of screen for cleaning, Touchscreen Calibration, Group Name Register, Accumulated Operation Time, Contact Information, Daylight Saving Time Setting, and Service Menu.
- Screen 2 ([Screen Display Setting] Submenu):** Shows three options: 'Brightness', 'Language', and 'Temperature Unit'. 'Language' is highlighted with a callout '2'.
- Screen 3 ([Screen Display Setting] Language):** Shows two language options: 'English' (highlighted with a callout '3') and 'Français'. At the bottom right, there are two buttons: 'Setting completed' (callout '4') and 'Cancel'.

1. Select "Screen Display Setting" from the "Menu" screen.

2. Select "Language" from the "Screen Display Setting" screen.

3. The confirmation screen is displayed when selecting the language button.

4. Touch "Setting completed" to return to the "Screen Display Setting" screen.

8.10.3 Temperature Unit Setting

The image contains three sequential screenshots of a remote control's menu system, connected by downward-pointing arrows. The first screenshot shows a main menu with various options; 'Screen Display Setting' is highlighted with a line and the number '1'. The second screenshot shows a submenu titled '[Screen Display Setting] Submenu' with 'Temperature Unit' highlighted by a line and the number '2'. The third screenshot shows a screen titled '[Screen Display Setting] Temp. Unit' with two buttons, '°C' and '°F'. The '°C' button is highlighted with a red dashed box and a line and the number '3'. At the bottom right of this screen, there are two buttons: 'Setting completed' and 'Cancel', with a line and the number '4' pointing to them.

1. Select “Screen Display Setting” from the “Menu” screen.

2. Select “Temperature Unit” from the “Screen Display Setting” screen.

3. Select “°C” or “°F” for the operating button indication. The selected button color is changed.
4. Touch “Setting completed” to return to the “Screen Display Setting” screen.
5. Set the same temperature unit to the remote control and the central controller in the air conditioning system.

8.11 Accumulated Operation Time of Unit

8.11.1 Display by Month

The figure consists of two screenshots of a control panel interface, connected by a downward arrow. The first screenshot shows the 'Menu' screen with the following options: Filter Sign Reset, Schedule Settings, Setting temp. range of the remote control, Date and time Settings, Display of screen for cleaning, Touchscreen Calibration, Group Name Register, Screen Display Setting, Accumulated Operation Time, Contact Information, Daylight Saving Time Setting, and Service Menu. A line labeled '1' points to the 'Accumulated Operation Time' option. The second screenshot shows the 'Accumulated Operation Time' screen. At the top, it says 'Block1' with left and right navigation arrows. Below that, it shows '2014/01' with left and right navigation arrows. A line labeled '3' points to the '2014/01' text. Below this is a bar chart showing accumulated operation time for six groups: Group1 (100), Group2 (200), Group3 (300), Group4 (0), Group5 (0), and Group6 (0). The x-axis is labeled '(Time)' and ranges from 0 to 700. A line labeled '4' points to the right side of the bar chart. At the bottom, there are three buttons: 'Menu', 'Display by Month', and 'Display by Group'. A line labeled '5' points to the 'Menu' button, and a line labeled '2' points to the 'Display by Month' button.

1. Select "Accumulated Operation Time" from the "Menu" screen.
2. Touch "Display by Month".
3. Touch "<" or ">" to select the target Block.
4. Touch "<" or ">" to select the target Year and Month.
5. Touch "Menu" to return to Menu screen.

8.11.2 Display by Group

The diagram illustrates the navigation process through two screenshots. The first screenshot, titled "[Menu]", shows a grid of options including "Accumulated Operation Time" (indicated by a line and the number 1). The second screenshot, titled "[Accumulated Operation Time]", shows a hierarchy where "Block1" is selected (indicated by a line and the number 3), and within it, "Group1" is selected (indicated by a line and the number 4). A bar chart below shows data for various months, with "01/03" highlighted. At the bottom, "Display by Month" and "Display by Group" buttons are shown, with "Display by Group" being the active selection (indicated by a line and the number 2). A "Menu" button is also visible (indicated by a line and the number 5).

1. Select "Accumulated Operation Time" from the "Menu" screen.
2. Touch "Display by Group".
3. Touch "<" or ">" to select the target Block.
4. Touch "<" or ">" to select the target Group.
5. Touch "Menu" to return to the Menu screen.

NOTES:

- Accumulated operation time of this mini-central controller is only for reference. Warranty is not determined from accumulated run time stated at the controller, but rather is based on the installation date or shipping date, whichever is applicable.
- "Thermo-ON Time" can be displayed with the function selection setting. Contact your distributor for detailed information.

The screenshot shows the "Accumulated Operation Time" screen for "Block1" in "2014/01". It displays a bar chart for six groups. Red bars represent "Thermo-ON Time" and blue bars represent "Accumulated Operation Time". A red dashed box highlights the bars for Group1, Group2, and Group3. The legend below the chart states: "Red : Thermo-ON Time, Blue: Accumulated Operation Time" and "Left: Thermo-ON Time, Right: Accumulated Operation Time".

8.12 Contact Information

The 'Menu' screen displays various settings options. 'Contact Information' is highlighted with a callout '1'. The 'Contact Information' screen shows details for 'Contact Information 1' and 'Contact Information 2', including Block, Group, and Latest Alarm Code. A callout '2' points to the 'Menu' button at the bottom of the screen.

1. Select "Contact Information" from the "Menu" screen. The following information will be displayed:
 - Contact address
 - Block/Group name of the latest alarm
 - Latest alarm code
2. Touch "Menu" to return to the Menu screen.

NOTES:

- This function is not available if there is no contact address registered.
- Without an alarm occurrence, the name of the target Block/Group and the alarm code will not appear.









8.13 Daylight Saving Time Setting

The 'Menu' screen displays various settings options. 'Daylight Saving Time Setting' is highlighted with a callout '1'. The 'Daylight Saving Time Setting' screen shows options for 'Enable' and 'Disable', 'Start Date and Time', 'End Date and Time', and 'Shift Time'. Callouts '2' and '3' point to the 'Setting completed' and 'Cancel' buttons at the bottom of the screen.

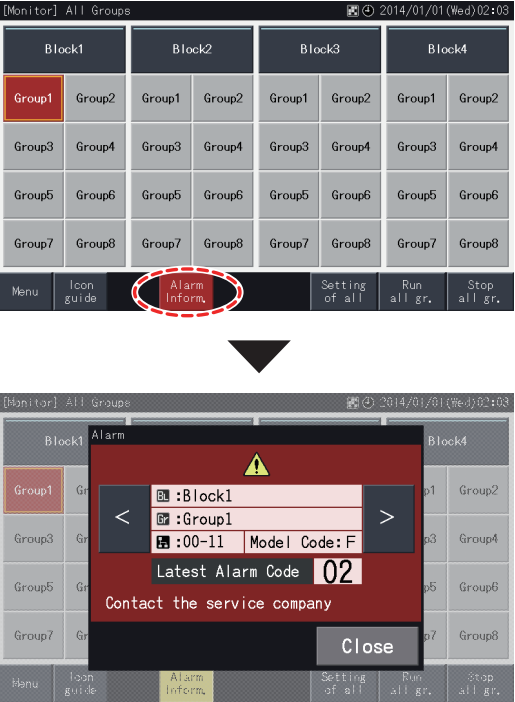
1. Select "Daylight Saving Time Setting" from the "Menu" screen.
2. Select the function concerning each item. The color of the selected function will change.
3. Touch "Setting completed" to confirm and return to the Menu screen.

9. Other Indications on LCD

9.1 In Normal Condition

Schedule		Displays when schedule is set.
Filter Sign		Displays when the filter or the dust box for the automatic cleaning filter needs cleaning. After cleaning, clear the display using the Filter Sign reset menu.
Filter Automatic Cleaning Error		Displays when there is an abnormal stop of the unit with auto-cleaning. Please contact your distributor where the product was purchased.
Demand		Displays when demand input is set by the optional external input function. The icon blinks during the demand control. Contact your distributor for detailed information.
Demand (Schedule)		Displays when the optional outdoor unit capacity control schedule is enabled and blinks during the control. Apart from the schedule, when the demand input of the external input function is set, the icon will blink during the demand control too. Contact your distributor for detailed information.
Heat Storage Operating		Indicates that the heat storage is operating. During this time, the air conditioner cannot operate.
Emergency Stop		Indicates when an emergency stop signal is set by an optional external input function. During the emergency stop, the indoor unit is stopped and operation by wired controller is not available. Contact your distributor for detailed information.
Wired Controller prohibited		Indicates a Group when operation by the wired controller is prohibited. The item set cannot be operated by the wired controller.

9.2 In Abnormal Condition

Abnormality	
<p>Abnormality</p>  <p>The first screenshot shows a monitor screen with a grid of units. The top bar indicates '[Monitor] All Groups' and the date/time '2014/01/01 (Wed) 02:03'. The grid is organized into four blocks (Block1-4) and eight groups (Group1-8). The 'Alarm Inform.' button at the bottom is highlighted with a red circle. A downward arrow points to the second screenshot, which shows the 'Alarm' dialog box. The dialog box displays a warning icon and the following information: 'Bl : Block1', 'Gr : Group1', 'No : 00-11', 'Model Code: F', and 'Latest Alarm Code 02'. It also includes the text 'Contact the service company' and a 'Close' button.</p>	<ol style="list-style-type: none"> 1. The operational status indicator will be flashing (red) when an abnormal condition has been identified in an air conditioning unit. 2. The red button is also displayed on screen when a fault has developed in a group of units. 3. The “Alarm Inform.” message will display on the lower screen. Touch “Alarm Inform.” to display the following items: <ol style="list-style-type: none"> a. Refrigerant cycle number, address and model number of the faulted air conditioning unit. b. Alarm code 4. If there are generated faults identified in multiple indoor units, the information details for those generated faults is displayed as described above. In this instance, the affected Group can also be selected by touching “<” or “>” on the “Alarm” information screen. Check the information and root cause of the LCD alarm and contact your distributor for details. <ul style="list-style-type: none"> ● Note that the model number may not be indicated depending on the type of air conditioner unit.
<p>Power Failure</p>	<ol style="list-style-type: none"> 1. The display is OFF. 2. Once the unit is stopped by a power failure, the unit will not start again after the power recovery. Perform the starting procedures again. 3. If there is an instantaneous power failure within two seconds, the unit will automatically start again.
<p>Noise</p>	<p>There could be an instance where the display is OFF and the unit is stopped. This is caused by the activation of the micro computer for the protection of the unit from electronic interference (EMI). When the unit has stopped, perform starting procedures again.</p>
<p>The Display “Start-up” Continue</p>	<p>There is a possibility that a communication error has occurred. Contact your distributor for detailed information.</p>

10. Troubleshooting

Check the following table before contacting your distributor for maintenance.

Condition	Cause
Indications on the touchscreen are not displayed.	<ul style="list-style-type: none"> • Check that the wiring for the power supply is connected to the plug. • Check that the power supply is turned ON.
The touchscreen display is "asleep".	<ul style="list-style-type: none"> • The touchscreen will automatically lapse into sleep mode when interaction with it has not taken place for a given length of time. Touch on the screen to awaken.
A part of the touchscreen is not turned ON or is constantly turned ON.	<ul style="list-style-type: none"> • There may be non-functioning areas of pixelation on the LCD. This is not faulty.
A button on the touchscreen cannot operate even if touched. The button next to the touched button will react.	<ul style="list-style-type: none"> • When the mini-central controller is used over a long period of time, the touchscreen may not match the position of what is indicated on the display. Refer to Section 8.8 for Touchscreen Calibration.
The air conditioning unit does not run.	<ul style="list-style-type: none"> • Check to see if the air conditioning unit is in heat storage mode. (Simultaneous heat storage units are an exception.) The air conditioner cannot operate while the heat storage unit is operation.
The setting of louver direction returns to the previous setting.	<ul style="list-style-type: none"> • When the operation mode is "AUTO", the direction of the louver is automatically corrected depending on the settings for the indoor unit model.
Scheduled operation does not run.	<ul style="list-style-type: none"> • Check to see if the Holiday Setting is turned ON. If so, cancel the Holiday Setting according to Section 8.4.2. • Check to see if the setting for scheduled operation is turned OFF. If so, the scheduled operation should be turned ON according to Section 8.4.3.
The "- -" symbol is indicated for the date and time.	<ul style="list-style-type: none"> • The "- -" symbol is displayed when electrical power has been shut down for a prolonged period of time. Set the date and time again according to Section 8.6.
The setting is not changed.	<ul style="list-style-type: none"> • When the mini-central controller is operated immediately after activating the air conditioners, the mini-central controller might not be able to operate because the air conditioners were started first. If this controller is operated immediately after turning ON the Air Conditioner, it is possible that this controller cannot be controlled in order to prioritize the starting process of the Air Conditioner. Please operate after a short interval of time.
The air conditioner unit does not RUN/STOP simultaneously.	<ul style="list-style-type: none"> • Check if Exception Set. Run/Stop Operation is selected. If so, cancel the setting.
The wired controller does not match-up with the main controller when the indoor unit is recovering from a power failure.	<ul style="list-style-type: none"> • The power supply became temporarily unstable while recovering from a power failure. The power supply was temporarily unstable when recovering from a power failure. Perform control by the main controller and synchronize the conditions of the wired remote controller and the main controller.

11. Maintenance

- Clean and wipe the display with a dry, soft cloth.
- For oily fingerprints on the touchscreen, use a diluted neutral liquid detergent mixed with water to clean. Before cleaning, wring-out the cloth well. After that, again wipe down the display with dry, soft cloth.
- Do not use benzine type thinners or active surface agents in order to protect the display and its casing from damage.

12. Reference

Model	CCM01
Outer Dimension <WxHxD+(Built-in Part)>	5-33/64 × 4-23/32 × 0-55/64 + (2-5/64 for wall embedding) inch (140 × 120 × 22 + (52.7 for wall embedding) mm)
Net Weight	1.1 LBS (0.5 kg) (Approximately)
Installation Location	Indoor Use
Installation Method	Wall embedded using the steel box (option)
Connected Indoor Unit (Qty.)	160 (Maximum)
Clock Accuracy	± 70 seconds/month (at normal temperature)
Ambient Temperature	41 to 95°F (5 to 35°C)
Ambient Humidly	35 to 90%
Display	5.0" TFT Color Liquid Crystal Display (800 x 480 dots)
Rated Power Supply	24VAC, 60Hz
Electrical Power Consumption	10W (Maximum)

2.2.7 Large Central Controller

Model: CCL01

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1. Safety Summary

Signal Words

 WARNING	Indicates a hazardous situation that, if not avoided, could result in death or serious injury.
 CAUTION	Indicates a hazardous situation that, if not avoided, could result in minor or moderate injury.
NOTICE	Indicates information considered important, but not hazard-related (for example, messages relating to property damage).

General Precautions

 WARNING	To reduce the risk of serious injury or death, read these instructions thoroughly and follow all warnings or cautions included in all manuals that accompanied the product and are attached to the unit. <i>Refer back to these safety instructions as needed.</i>
--	--

- This system, including this controller, should be installed by personnel certified by Johnson Controls, Inc. Personnel must be qualified according to local, state and national building and safety codes and regulations. Incorrect installation could cause leaks, electric shock, fire or an explosion. In areas where Seismic Performance requirements are specified, the appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. If the unit is not installed appropriately correctly, injuries may occur because of a falling unit.
- Use appropriate Personal Protective Equipment (PPE), such as gloves, protective goggles and electrical protection equipment and tools suited for electrical operation purposes.
- When transporting, be careful when picking up, moving and mounting these units. Although the controller may be packed using plastic straps, do not use them for transporting from one location to another. Do not stand on or put any material on the controller.
- When installing the controller cabling to the units, do not touch or adjust any safety devices inside the indoor or outdoor units. All safety features, disengagement, and interlocks must be in place and functioning correctly before the equipment is put into operation. If these devices are improperly adjusted or tampered with in any way, a serious accident can occur. Never bypass, wire around, or jump-out any safety device or switch.
- Use only Johnson Controls recommended, provided as standardized, or replacement parts.
- Johnson Controls shall will not assume any liability for injuries or damage caused by not following steps outlined or described in this manual. Unauthorized modifications to Johnson Controls products are prohibited as they...
 - May create hazards which could result in death, serious injury or equipment damage;
 - Will void product warranties;
 - May invalidate product regulatory certifications;
 - May violate OSHA standards;

NOTICE	Take the following precautions to reduce the risk of property damage.
---------------	---

- Do not touch the main circuit board or electronic components in the controller or remote devices. Make sure that dust and/or steam does not accumulate on the circuit board.
- When installing the unit in a hospital or other facility where electromagnetic waves are generated from nearby medical and/or electronic devices, be prepared for noise and electronic interference Electromagnetic Interference (EMI). Do not install where the waves can directly radiate into the electrical box, controller cable, or controller. Inverters, appliances, high-frequency medical equipment, and radio communications equipment may cause the unit to malfunction. The operation of the unit may also adversely affect these same devices. Install the unit at least 10 ft. (approximately 3m) away from such devices.
- Locate the wireless controller at a distance of at least three feet (approximately 1m) between the indoor unit and electric lighting. Otherwise, the receiver part of the unit may have difficulty receiving operation commands.

OPERATION

- If the wired controller is installed in a location where electromagnetic radiation is generated, make sure that the wired controller is shielded and cables are sleeved inside conduit tubing.
- If there is a source of electrical interference near the power source, install noise suppression equipment (filter).
- During the test run, check the unit's operation temperature. If the unit is used in an environment where the temperature exceeds the operation boundary, it may cause severe damage.
Check the operation temperature boundary in the manual. If there is no specified temperature, use the unit within the operation temperature boundary of 35° to 104°F (0 to 40°C).
- Read installation and appropriate user manuals for connection with PC or peripheral devices.
If a warning window appears on the PC, the product stops, does not work properly or works intermittently, immediately stop using the equipment.

Installation Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

- If the remote sensors are not used with this controller, then do not install this controller...
 - In a room where there is no thermostat.
 - Where the unit is exposed to direct sunshine or direct light.
 - Where the unit will be in close proximity to a heat source.
 - Where hot/cold air from the outdoors, or a draft from elsewhere (such as air vents, diffusers or grilles) can affect air circulation.
 - In areas with poor air circulation and ventilation.
- Perform a test run using the controller to ensure normal operation. Safety guards, shields, barriers, covers, and protective devices must be in place while the compressor/unit is operating.
During the test run, keep fingers and clothing away from any moving parts.

After installation work for the system has been completed, explain the "Safety Precautions," use, and maintenance of the unit to the customer according to the information in all manuals that accompanied the system. All manuals and warranty information must be given to the user or left near the Indoor Unit.

Electrical Precautions



Take the following precautions to reduce the risk of electric shock, fire or explosion resulting in serious injury or death:

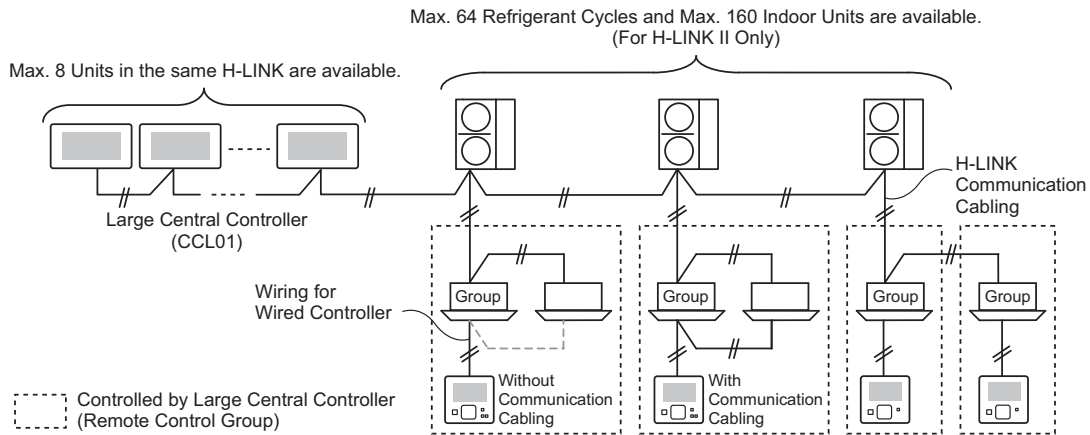
- Only use electrical protection equipment and tools suited for this installation.
- Insulate the wired controller against moisture and temperature extremes.
- Use specified cables between units and the controller.
- Communication cabling shall be a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded cabling is applied, proper bonding and termination of the cable shield is required as per Johnson Controls guidelines. Plenum and riser ratings for communication cables must be considered per application and local code requirements.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Highly dangerous electrical voltages may be used in this system. Carefully refer to the wiring diagram and these instructions when wiring. Improper connections and inadequate grounding can cause serious injury or death.
- Before installing the controller or remote devices, ensure that the indoor and outdoor unit operation has been stopped. Further, be sure to wait at least five minutes before turning off the main power switch to the indoor or outdoor units. Otherwise, water leakage or electrical breakdown may result.
- Do not open the service cover or access panel to the indoor or outdoor units without turning OFF the main power supply. Before connecting or servicing the controller or cables to indoor or outdoor units, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.

- Use an exclusive power supply at the controller's rated voltage.
- Be sure to install circuit breakers (ground fault interrupter, isolating switch, molded case circuit breaker, and so forth) with the specified capacity. Ensure that the wiring terminals are tightened securely to recommended torque specifications.
- Clamp electrical wires securely with a cord clamp after all wiring is connected to the terminal block. In addition, run wires securely through the wiring access channel.
- When installing the power lines, do not apply tension to the cables. Secure the suspended cables at regular intervals, but not too tightly.
- Make sure that the terminals do not come into contact with the surface of the electrical box. If the terminals are too close to the surface, it may lead to failures at the terminal connection.
- Do not clean with, or pour water into, the controller as it could cause electric shock and/or damage the unit. Do not use strong detergent such as a solvent. Clean with a soft cloth.
- Check that the ground wire is securely connected. Do not connect ground wiring to gas piping, water piping, lighting conductor, or telephone ground wiring.

2. System Configuration

This large central controller (CCL01) is connected to H-LINK and used for the central control and monitoring of the air conditioners.

< Example >

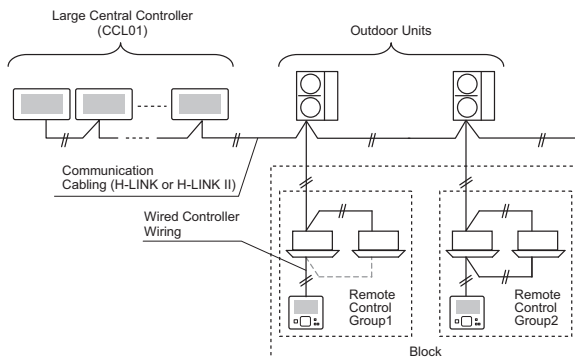


NOTE: When an indoor unit without a wired controller is connected, the mini central controller cannot be used.

3. Features

The following functions are available for all indoor units connected to the large central controller.

1. Setting, and Permitting/Prohibiting Operation by Wired Controller
2. Monitoring of Operating Conditions for Block/Groups
3. Schedule Operation (Run/Stop and Temperature Setting) for Block/Groups
4. Run/Stop, Emergency Stop and Demand Function by External Input
5. Run and Alarm Output by External Output
6. Control Exception Function of All Run/Stop Command for Selected Groups
7. Control Exception Function of All Run/Stop Command for Selected Groups by External Input
8. Indication and Calculation of Unit Accumulated Operation Time of Each Group
9. Display for Accumulated Operation Time of Air Conditioning Unit of Each Group or Save it in Memory Card
10. Indication of Alarm History Record
11. Registering Names of Blocks and Groups
12. Registration and Indication of Service Contact Information
13. Operation modes can be selected as follows.
 - Normal Operation
 - Run/Stop Only
14. Press the Icon Guide Button to Indicate Descriptions of Icons

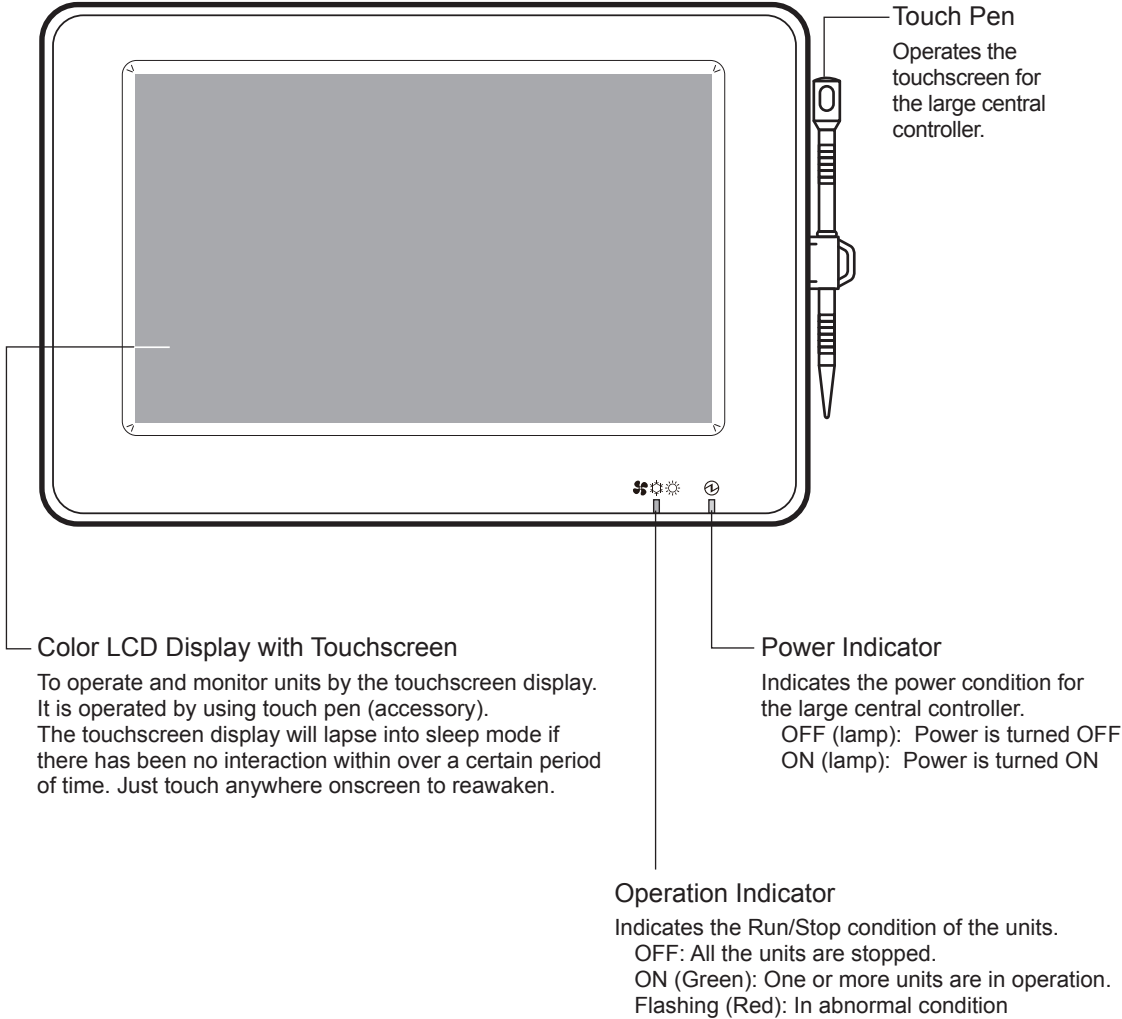


NOTE:

Group: Remote Control Group
Block: Collection of Remote Control Groups

4. Component Names and Functions

4.1 Component Names



NOTE:
Remove the protective laminate sheet on LCD (liquid crystal display) before using this product.

4.2 Screen Display

“Monitor 1 (All Groups)”

Present Status
Displays the present status (all groups)

Unit Condition
Indicates the unit condition such as filter sign, demand, and so on.

Block Button
Changes the screen display to “Block” <Monitor 2 (Block)> indication by touching on this button.

Group Button
Indicates the operating condition for each group as follows.
Green: Run
Grey: Stop
Red: Abnormal
If the target group button is touched, “Settings” for the target group screen will be displayed.
***(Refer to Section 7.5.)**

“Stop all” Button
Stops all the units simultaneously that are controlled by the large central controller.

“Run all” Button
Runs all the units simultaneously that are controlled by the large central controller.

“Setting of all” Button
Changes the settings for those units simultaneously that are controlled by the large central controller.

“Menu” Button
Displays menu items such as “Filter Sign Reset”, “Schedule Setting”, and so forth.

“Icon guide” Button
Displays explanations of icons. Touch the button for details.

“Alarm Inform” Button
Displays any abnormality. Touch the button for details.

“Monitor 2 (Block)”

Present Indication
Displays the present status; (groups in block)

Unit Condition
Indicates the unit condition such as filter sign, demand, and so forth.

Block Tab
Changes the monitor display to “Block” or “All Groups”.

Group Button
Indicates the operating condition
Green: Run
Grey: Stop
Red: Abnormal
If the target group button is touched, “Settings” of the target group screen will be displayed.
**** (Refer to Section 7.5.)**

“Stop by Block” Button
Stops the all groups operation in the target block simultaneously.

“Run by Block” Button
Runs the all groups operation in the target block simultaneously.

“Setting by Block” Button
Simultaneously changes the setting for all groups within the target block.

“Menu” Button
Indicates the menu items such as “Filter Sign Reset”, “Schedule Setting”, and so forth.

“Alarm Inform.” Button
Identifies and displays any irregularities. Touch the button for details.

*Only for the “Normal Mode” operation. In “Run/Stop Only” mode, the operation is switched back and forth between Run ↔ Stop.

**Only for the “Normal Mode” operation. In “Run/Stop Only” mode, the operation is switched back and forth between Run ↔ Stop.

5. Quick Reference

5.1 Screen Structure

The table below shows each display on the screen and its function.

Screen Display	Function	Page
Monitor 1 (All Groups)	To display the name of all groups and operating conditions	10
Monitor 2 (Block)	To display the name of groups in the block and operating conditions	11
Menu	To display the list of menu items	23
Filter Sign Reset	To reset the filter sign	24
Schedule Setting	To set or change the weekly schedule	25
Schedule Timer Setting	To copy the scheduled setting	27
	To delete the schedule timer setting	29
Holiday Setting	To specify days of suspended schedule setting	32
Schedule Timer ON/OFF Setting	To set scheduled operation ON/OFF	33
Remote Control Setting Temperature Range	To adjust the temperature setpoint range of the local wired controller	34
Adjusting Date/Time	To adjust the date and time	35
Touchscreen Cleaning	To lock the touchscreen for cleaning	35
Touchscreen Calibration	To calibrate the touch position on the touchscreen	36
Group Name Register	To register the name of blocks and groups	37
	To copy the name of blocks and groups	38
Screen Display Setting	To adjust the backlight brightness of the display screen	39
Brightness	To set the displayed language	40
Language Setting	To set the temperature unit	41
Temperature Unit	To display the accumulated operation time of the unit or to save in the memory card	42
Accumulated Operation Time	To display the service contact address (if registered)	45
Contact Information	To set the daylight saving time operation.	46
Daylight Saving Time Setting	This switch is for the serviceman only. If this switch is used and the service menu is displayed on the screen, touch "Previous Screen". The screen will return to the menu.	-
Service Menu		

5.2 Functions

The table below shows the main functions.

< Operation Procedure >

Display of All Groups (all the indoor units which are connected to the large central controller.)	10
Display of Specified Block (all the remote control groups in the block which are connected to the large central controller.)	11
Simultaneous Run/Stop for All Groups	12
Simultaneous Run/Stop for Block	13
Run/Stop for Each Group	14
Operation Mode Change	16
Fan Speed Setting	17
Louver Swing Direction	18
Setting Temperature	19
Permitting/Prohibiting Operation from Wired Controller	20

< Menu Function >

Menu (Menu Functions and Details)	21
Menu	22
Filter Sign Reset	23
Schedule Operation	24
Remote Control Setting Temperature Range	34
Adjusting Date/Time	35
Touchscreen Cleaning	35
Touchscreen Calibration	36
Registering Groups/Blocks Name	37
Screen Display Setting	39
Accumulated Operation Time of Unit	42
Contact Information	45
Daylight Saving Time Operation	46

6. Initial Power Activation Setting

Turn on the power supply to the air conditioners.
Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for pre-heating of the compressor oil. Do not turn off the power supply during the air conditioning season.

Turn ON the power supply to the large central controller.
“Start-up” will be displayed and the screen will change to “Monitor 1 (All Groups)”.



NOTE:
Setting the date and time may be required after a long-term power outage.
In that instance, “Set Date/Time” will be displayed on the screen. If “Set” is touched, “Adjusting Date/Time” will be displayed.




Refer to Section 8.5 for setting the date and time.

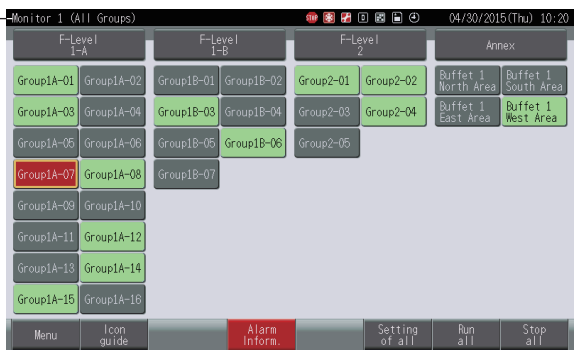
7. Operation Procedure

7.1 Display of All Groups

1*



2



1. Touch "All Groups" on the touchscreen display.
* The tab (top row) called out by "1", "All Groups", will not be displayed if only one block has been registered.

2. All groups are displayed on the touchscreen.
(All indoor units connected to the large central controller will be displayed.)
Each operation status is represented by the color of the Group button as follows:
 - Green: Run
 - Grey: Stop
 - Red: Abnormal

NOTE:

The touchscreen display will automatically lapse into sleep mode when no interaction takes place over a specified length of time. (To awaken, touch anywhere on the screen.)

7.2 Display of Specified Block

<Monitor 1 (All Groups)>

<Monitor 2 (Block)>

2

2

1. Select the target block from the “Monitor 1 screen, (All Groups)” or “Monitor 2 (Block)”.

2. The groups in the selected block will be displayed on the touchscreen. Each operation status is displayed by color of the group button as follows:

- Green: Run
- Gray: Stop
- Red: Abnormal

NOTE:
The touchscreen display will automatically lapse into sleep mode when no interaction takes place over a specified length of time. (To awaken, touch anywhere on the screen.)

7.3 Simultaneous Run/Stop for All Groups

1

2

3

1. Touch “All Groups” on the touchscreen display.
2. Touch “Run All” or “Stop All”.
3. The confirmation screen will be displayed. Touch “Yes”. (All indoor units connected to the large central controller will be simultaneously operated.) Touch “No” to cancel this command.

NOTE:

The “Run/Stop All” command does not affect those groups specified in “Exception Setting of Run/Stop Operation”.

7.4 Simultaneous Run/Stop for Block

The image shows a touchscreen interface for HVAC control. The top section displays a grid of 16 room temperature controls, each with a temperature reading and a mode icon. A red dashed box highlights the top row of blocks: 'F-Level 1-A', 'F-Level 1-B', 'F-Level 2', and 'Annex'. An arrow labeled '1' points to this box. Below the grid, a 'Run by Block' button is highlighted in red, with an arrow labeled '2' pointing to it. A confirmation dialog box is shown below, with a question mark icon and the text 'Run the entire "F-Level 1-A"?' and 'Block Name'. The dialog has 'Yes' and 'No' buttons, with an arrow labeled '3' pointing to the 'Yes' button.

1. Select the target block from the touchscreen display to set a simultaneous Run/Stop operation.
2. Touch "Run by Block" or "Stop by Block".
3. The confirmation screen will be displayed. Touch "Yes". All groups (all indoor units) in the selected block connected to the large central controller will be operated simultaneously. Touch "No" to cancel this command.

NOTE:

The "Run/Stop by Block" command will not affect those blocks specified in "Exception Setting of Run/Stop Operation".

7.5 Run/Stop for Each Group

Check the control mode before setting.

<Control Mode>

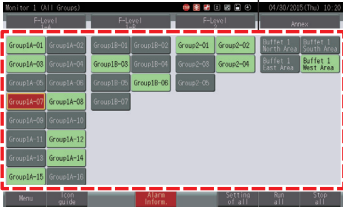
Normal setting: Refer to Section 7.5.1.

“Run/Stop Only” mode setting: Refer to Section 7.5.2.


Refer to the Installation Manual for the details of “Run/Stop Only” mode.


7.5.1 Run/Stop Operation for Each Group (Control Mode: Normal)


<Monitor 1 (All Groups)>



<Monitor 2 (Block)>







1. Select the “Monitor 1 (All Groups)” or “Monitor 2 (Block)” screen. Select the group to set by touching on the group button.
2. The selected group setting will be displayed on the touchscreen display. Touch “ON” or “OFF”.
3. Touch “Close” to return to “Monitor 1 (All Groups)” or “Monitor 2 (Block)”.

7.5.2 Run/Stop Operation for Each Group (Control Mode: “Run/Stop Only”)

<div style="margin-bottom: 20px;"> <p><Monitor 1 (All Groups)></p> </div> <div style="margin-bottom: 20px;"> <p style="text-align: center;">▼</p> </div> <div> <p>Monitor 1 (All Groups)</p> </div>	<ol style="list-style-type: none"> 1. Select the target group at “Monitor 1 (All Groups)” in the “Run/Stop Only” mode. 2. The selected group operation is alternately changed by touch as follows: <div style="text-align: center; margin: 5px 0;"> “Stop” ↔ “Run” </div> <p>In this mode, simultaneous “Run/ Stop” operations for all groups is an option using the “Run all” and “Stop all” buttons. Refer to Section 7.3 for details.</p>
<div style="margin-bottom: 20px;"> <p><Monitor 2 (Block)></p> </div> <div style="margin-bottom: 20px;"> <p style="text-align: center;">▼</p> </div> <div> <p>Monitor 2 (Block)</p> </div>	<ol style="list-style-type: none"> 1. Select the target group at the “Monitor 2 (Block)” in “Run/Stop Only” mode. 2. The selected group operation is alternately changed by touch, back and forth as follows: <div style="text-align: center; margin: 5px 0;"> “Stop” ↔ “Run” </div> <p>In this mode, simultaneous Run/ Stop operations for a block is an option by “Run by Block” and “Stop by Block” buttons. Refer to Section 7.4 for details.</p>

NOTE: Details for the setting of this function are found in Section 10.4 “Optional Function Setting” in the installation and maintenance manual.

7.6 Operation Mode Change

<Monitor 1 (All Groups)>

<Monitor 2 (Block)>

The "AUTO" (Heating/Cooling Automatic Operation) will be included as an option if applicable.

1. Select the target group at "Monitor 1 (All Groups)" or "Monitor 2 (Block)" to change the operation mode setting. A "Settings" pop-up for the selected group is displayed on the touchscreen.

2. By touching "Δ" or "∇" of the "OPE. MODE", the operation mode will be changed alternately as follows.

3. Touch "Close" to return to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

NOTES:

- When in the "Run/Stop Only" mode, a change of settings can only be made by way of the "Setting of All" or "Setting by Block" button. (A change of settings for each group is NOT available.)
- Some operational modes cannot be set depending on the unit model. Contact your distributor for detailed information.

7.7 Fan Speed Setting

1. Select the target group at “Monitor 1 (All Groups)” or “Monitor 2 (Block)” to change the fan speed setting. A “Settings” pop-up for the selected group is displayed on the touchscreen.

2. By touching “Δ” or “▽” of the “FAN SPEED”, the fan speed setting will be changed alternately as follows.

3. Touch “Close” to return to “Monitor 1 (All Groups)” or “Monitor 2 (Block)”.

NOTES:

- When in the “Run/Stop Only” mode, a change of settings can only be made by way of the “Setting of All” or “Setting by Block” button. (A settings change for each group is NOT available.)
- Actual fan speed during dry operation will be “LOW” regardless of the fan speed setting.
- The figure above shows an example of a standard unit. The fan speed may not be displayed for certain indoor unit models.

7.8 Louver Swing Direction

<Monitor 1 (All Groups)>

<Monitor 2 (Block)>

1. Select the target group at “Monitor 1 (All Groups)” or “Monitor 2 (Block)” to change the louver swing direction. A “Settings” pop-up for the selected group is displayed on the touchscreen.

2. By touching “Δ” or “∇” of the “LOUVER”, the louver swing direction will be changed alternately as follows:

LCD Indication							
COOL DRY	←		Angle Range		→		
HEAT FAN	←		Angle Range		→		

: The auto swing operation begins.

3. (Touch “Close” to return to “Monitor 1 (All Groups)” or “Monitor 2 (Block)”.

NOTES:

- When in the “Run/Stop Only” mode, a settings change can only be made by the “Setting of All” or “Setting by Block” button. (A setting change for each group is NOT available.)
- This function (louver swing direction) may not be set for all unit models.
- When louver operation is set to Auto-Swing, the louvers of the different indoor units will not be moving in synchronization or in the same direction. Some could be moving upwards when other could be moving downwards at any particular time. The position of the louver shown on the touchscreen graphic and the actual position of louvers are not always the same.
- The louver may not stop immediately after the switch is pressed.

7.9 Setting Temperature

<Monitor 1 (All Groups)>

<Monitor 2 (Block)>

1. Select the target group at “Monitor 1 (All Groups)” or “Monitor 2 (Block)” to change the temperature setpoint. A “Settings” pop-up for the selected group is displayed on the touchscreen.

- Touch “ Δ ”, and the temperature is increased by 1°C to a maximum of 30°C.
 Touch “ ∇ ”, and the temperature is decreased by 1°F/°C.
 - During Cooling; Dry and Fan operation: Minimum of 67° F (19°C)
 - During Heating operation: Minimum of 63°F (17°C).

3. Touch “Close” to return to “Monitor 1 screen (All Groups)” or “Monitor 2 (Block)”.

NOTES:

- When in the “Run/Stop Only” mode, a setting change can only be made by the “Setting of All” or “Setting by Block” button. (A setting change for each group is NOT available.)
- The figure above shows an example of the temperature setpoint for a standard unit. The temperature setting range may be different depending on those connected indoor units.

7.10 Permitting/Prohibiting Operation from Wired Controller

This function is used for prohibiting operation with the wired controller. While operation is prohibited, "Central Control" is indicated on the LCD of the wired controller and operation by the wired controller is not an option. When the wired controller is set as prohibited (by Item/All Items), the control of the selected item will not be an option. The functions that can be selected are: Run/Stop, Operation Mode, Fan Speed, Louver Swing and Temperature.

NOTES:

Pay attention to the following when the group function is prohibited.

- When setting of the remote control is prohibited, do not use the function control lock of the wired controller.
- When using the remote control to prohibit an operation and the control lock function at the same time, the control lock function cannot be set.
- When changing a setting from **remote control prohibited** to **remote control permitted**, all the settings for the control lock will be cancelled.

1. Select the target group at "Monitor 1 (All Groups)" or "Monitor 2 (Block)" to set the function of "Remote control operation". A "Settings" pop-up for the selected group is displayed on the touchscreen.

2. Touch to select "Remote control operation".

3. Select "Permitted" or "Prohibit." for each function. The icon "⊗" will display when selecting "Prohibit.". If all the functions are "Permitted" or "Prohibit.", "All Permitt." or "All Prohib." can be selected.

NOTE:
Depending on the air conditioner or the remote control used, only "All permitt." or "All prohib." will be available.

4. Touch "Close" to return to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

Icon

NOTES:

- When in the “Run/Stop Only” mode, a setting change can only be made by the “Setting of All” or “Setting by Block” button.
- Even if the wired controller is set as “Prohibited”, it is possible to stop the operation from running with the wired controller. It is also possible to restart operation using the wired controller. However, the Stop operation will only be used in an emergency. It should not be used in normal operation.
- If “Power Supply ON/OFF” (d1, d3) is set, don’t set the wired controller as “Prohibited”. If the wired controller is restricted when using “Power Supply ON/OFF”, use the function “Control Lock”.
- If a communication error occurs, the wired controller “STOP” (by function) may be canceled. If this happens, perform the setting again.

8. Menu

The table below shows menu features and its function.

Feature	Function	Page
Filter Sign Reset	This function is used for turning off the filter sign of the connected indoor units. This function can be used only for the indoor unit with a "Filter Sign".	24
Schedule Setting	This function is used for scheduled timer operations which can be set for each block or group.	25
Schedule Timer Setting	This function is used for setting the time (by the minute), "Run/Stop", and temperature 66~86°F (19~30°C). For weekly schedule settings, up to 10 schedule items can be set per day. It is also possible to copy the settings information.	25
Holiday Setting	This function is used for suspending a scheduled operation temporarily. The scheduled operation will not be possible when this function is set. This function is used for setting irregular holidays such as national holidays.	32
Schedule Timer ON/OFF Setting	"Schedule Timer OFF Setting" is used for suspending the scheduled operation for the target group. The scheduled operation is not possible when the Schedule Timer is OFF. This function is used for long holiday, sudden shutdowns, national holidays, and so forth.	33
Remote Control Setting Temperature Range	This function is used for restricting the temperature setpoint. It is possible to set a cooling minimum temperature or heating maximum temperature.	34
Adjusting Date/Time	This function is used for adjusting date and time.	35
Touchscreen Cleaning	This function is used for cleaning the liquid crystal display (LCD) of the large central controller. If the screen is not touched after 10 seconds, it will return to the menu screen.	35
Touchscreen Calibration	This function is used for calibrating the tap position for the touchscreen. This function is used if an operation is not carried out smoothly when the button on the touchscreen is tapped.	36
Group Name Register	This function is used for registering names of blocks and groups. The registrable number of letters are a maximum of 20 letters for the name of each block or group. It is also possible to copy the name. If the group/block is registered without a name, it will be registered as "Group 1" or "Block 1" automatically.	37
Screen Display Setting	This function is used for setting the screen display.	39
Brightness	This function is used for adjusting the brightness of the touchscreen display.	39
Language Setting	This function is used for changing the displayed language.	40
Temperature Unit	This function is used for changing the temperature of the unit.	41
Accumulated Operation Time	This function is used for indicating the accumulated operation time of the air conditioner. The accumulated operation time will be indicated by month. The operation time is saved for 15 months. It is possible to specify the thermo-ON time by setting the controller option and saving the accumulated operation time in the memory card.	42
Contact Information	This function is used for specifying the service contact address and the latest alarm code.	45
Daylight Saving Time Setting	This function is used for setting daylight saving time.	46

8.1 Menu

The setting functions for the indoor unit and large central controller are laid out in the menu.

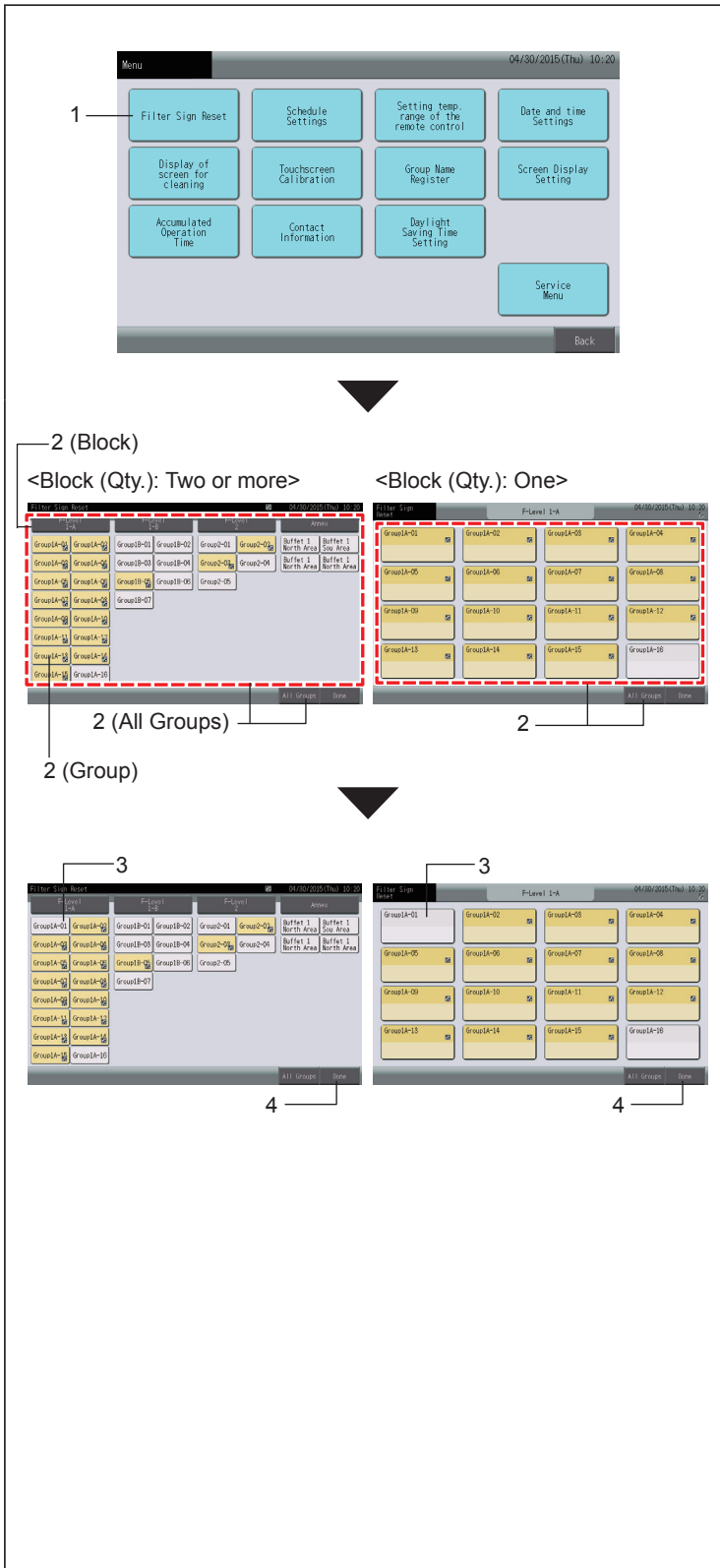
▼

1. Touch "Menu" at "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

2. The "Menu" screen will be displayed.
3. Select the function from the "Menu" screen.

4. Touch "Back" to return to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

8.2 Filter Sign Reset



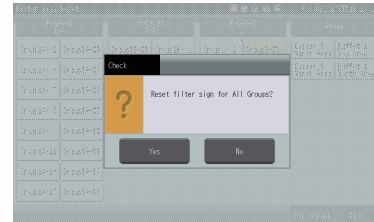
1. Select "Filter Sign Reset" from the "Menu" screen.
(This is possible only when the filter sign is indicated.)

2. Select the target (All Groups, Block, or Group) to reset the Filter Sign. The yellow button indicates the group or groups included in the Filter Sign.

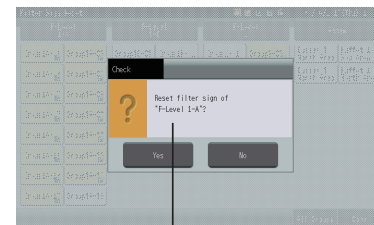
If there is a case of simultaneous reset of the Filter Sign:

Select "All Groups" or "Block". The following confirmation screen will be displayed. The Filter Sign can be reset by selecting "Yes".

When "All Groups" is touched



When "Block" is touched



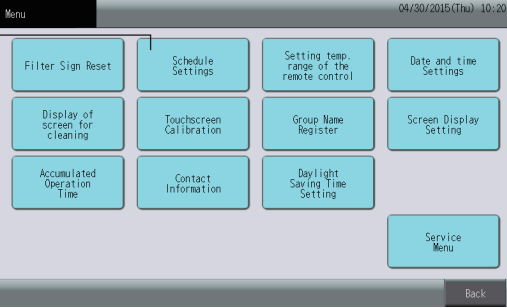
Block name is displayed.

3. When the Filter Sign is reset, the Group button color changes to white.
4. Touch "Done" to return to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

8.3 Schedule Operation


8.3.1 Schedule Setting


< Timer Setting for Weekly Schedule >



1


1. Select "Schedule Settings" from "Menu" screen.

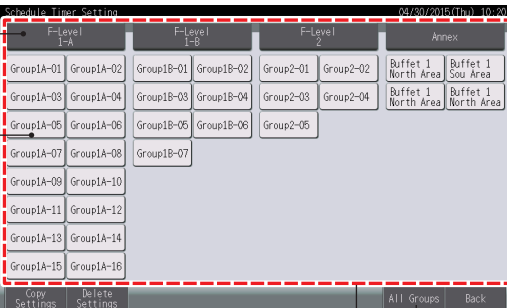




2

2. Select "Schedule Timer Setting" from the "Schedule Settings" screen.






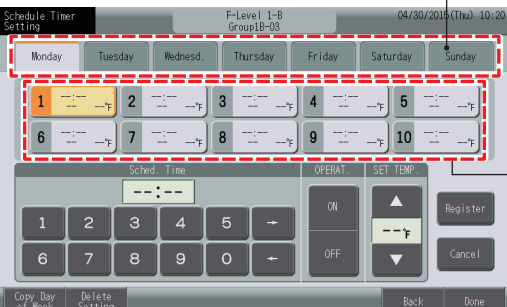
3 (Block)

3 (Group)

3. Select the target (All Groups, Block, or Group).

- The blue button indicates the group with a setup schedule.
- The white button indicates the group without a setup schedule.






3 (All Groups)

4

5

4. Select the target day of the week (from Monday through Sunday).

5. Select the scheduled number (from 1 to 10).



Continue to Next Page

The interface consists of three main screens:

- Screen 1 (Top):** Shows a weekly calendar for 'F-Level 1-B Group1B-03'. A red dashed box highlights the 'Sched. Time' input field (08:30), the 'OPERAT.' field (ON), and the 'SET TEMP.' field (72°F). A red arrow points to the 'Register' button.
- Screen 2 (Middle):** Shows the same calendar with item 1 selected. A label 'Schedule Item No.' points to the '1' in the top-left corner.
- Screen 3 (Bottom):** Shows a grid of 'Registered Schedule No.' for various groups. A label 'Registered Schedule No.' points to the grid.

- Set the scheduled time, ON/OFF operation, and temperature.
 - Select the scheduled item number (1~10) and set the time.
 - Select "ON" or "OFF".
 - Touch "Δ" or "∇" to set the temperature.
 - The "-" symbol displays when the time and temperature are not set.
- Touch "Register" to register the scheduled functions. Touch "Cancel" and a scheduled operation will be canceled.
 - To set the same day of the week, refer to step (5) above.
 - To set other days of the week, refer to step (4) above.
- Touch "Back" to set the timer for other groups. The screen will return to "Schedule Timer Setting". Refer to step (2) above.
 - After the schedule is set, the registered schedule number (1-64) will be displayed in the Group button. (The scheduled Group button turns blue.)
 - If settings are the same, the same registered schedule number will be displayed.
- Touch "Done" to return the "Monitor 1 (All Groups)" or "Monitor 2 (Block)".
 - If "Done" is touched without a registration action, those scheduled items are cancelled. And the screen will be changed to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

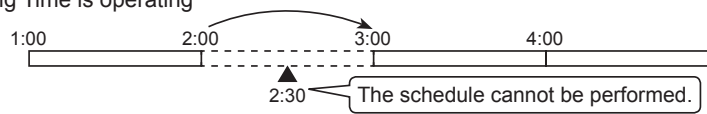
NOTE:
Make sure that the time and ON/OFF are set for the timer setting.
(It is not necessary to set the temperature.)

Daylight Saving Time (DST)

■ Schedule process when Daylight Saving Time is operating

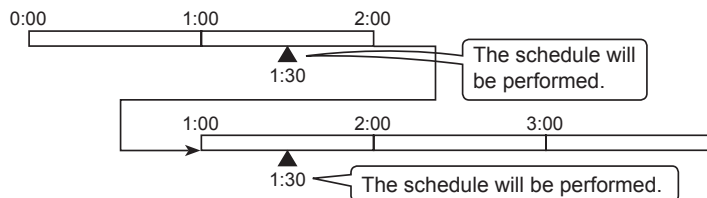
<Starting Time>

When starting at 2:00 with a 1 hour shifting time, the schedule set at 2:30 cannot be performed.



<Ending Time>

When ending at 2:00 with a 1 hour shifting time, the schedule set at 0:30 will be performed twice.



< Copying Schedule Setting by Days of Week >

4

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6

7

8

1. Select "Schedule Settings" from the "Menu" screen.
2. Select "Schedule Timer Setting" from the "Schedule settings" screen.
3. Select the target (All Groups, Block or Group).
4. Touch "Copy Day of Week".
5. Select the day of the week tab to copy.
 - All the schedules (Scheduled numbers 1 to 10) for the selected day are displayed in yellow.
6. Select the day of the week tabs to paste. In this case, it is Monday and Tuesday.
 - After the day of the week is selected, a red "✓" symbol will be displayed in the day of the week tab. (This shows that Monday and Tuesday were copied.)
 - It is possible to copy multiple day selections.
 - Touch the day of the week for reselecting the day of the week tabs.
7. Touch "Paste". The scheduled setting is copied and pasted.
 - Refer to step (5) above to copy the schedule for other days of the week.
 - To finish, refer to step (8) below.
8. Touch "Done" to return the screen to "Schedule Timer Setting".
 - If "Done" is touched without first touching "Paste", the information to be copied isn't copied and the operation is canceled.

< Copying Schedule Setting by Each Group >

3

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7

1. Select "Schedule Settings" from the "Menu" screen.
2. Select "Copy Settings" from the "Schedule Settings" screen.
3. Touch "Copy Settings".
4. Select the group to copy. (Block cannot be selected to copy.)
 - The selected Group button is trimmed with an orange outline.
 - Touch on the selected Group again to cancel the selection. The orange outline goes away.
5. Select the Group (Block) to paste.
 - A "✓" symbol will be displayed on the button.
 - It is possible to paste multiple selections of a Group (including Block).
 - To cancel the selection, press the selected Group again. The "✓" symbol will turn off.
6. Touch "Paste". The schedule setting is copied.
 - To copy the schedule for other groups, refer to step (4) above.
 - To finish, refer to step (7) below.
7. If "Done" is touched, the screen will return to "Schedule Timer Setting".
 - If "Done" is touched without first touching on "Paste", the copying operation is canceled.

< Deleting Schedule Setting by Operation No. >

4

5

6

7

1. Select “Schedule Settings” from the “Menu” screen.
2. Select “Schedule Timer Setting” from the “Schedule Settings” screen.
3. Select the target (All Groups, Block or Group).
4. Touch “Delete Setting”.
5. Select the scheduled tab number for deleting a schedule.
 - If choices on other days of the week are selected, (touched), scheduled item numbers for those days can be selected.
 - If a scheduled number is selected, a red “✓” symbol is displayed. Multiple selections of scheduled item numbers are possible.
6. Touch “Proceed”. The selected scheduled number will be deleted.
 - To delete other scheduled numbers, refer to step (5) above.
 - To finish, refer to step (7) below.
7. Touch “Done” and the screen will return to “Schedule Timer Setting”.
 - If “Done” is touched without first touching on “Proceed”, numbers selected to be deleted are left in place and the operation to delete is cancelled.

< Deleting Schedule Setting by Each Group >

3

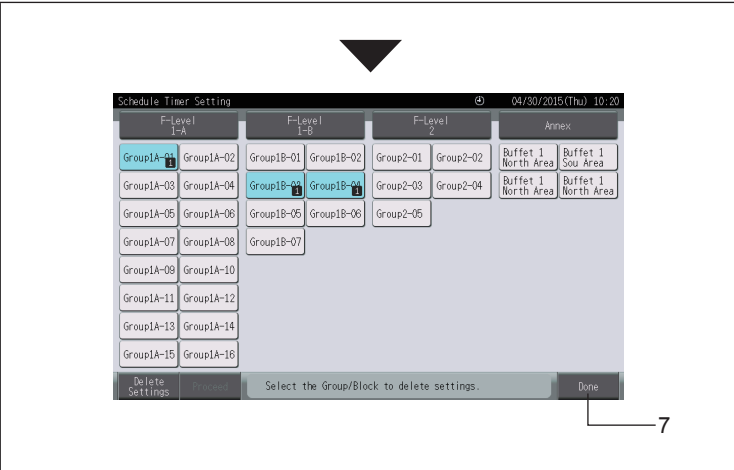
4

5

6

Continue to Next Page

1. Select "Schedule Settings" from the "Menu" screen.
2. Select "Schedule Timer Setting" from the "Schedule Settings" screen.
3. Touch "Delete Settings".
4. Select those Groups or Blocks to delete the setting.
 - When Groups or Blocks are selected, a red "✓" is displayed.
 - Multiple selections of Groups and Blocks can be deleted.
 - To cancel a selection, press on the selected Group again. The red "✓" goes away.
5. Touch "Proceed" and the confirmation screen will be displayed.
6. Touch "Yes", and the scheduled settings will be deleted.
 - To delete the schedule for other Groups, refer to step (4) above.
 - To finish, refer to step (7) on the following page.



7. Touch "Done", and the screen will return to "Schedule Timer Setting".

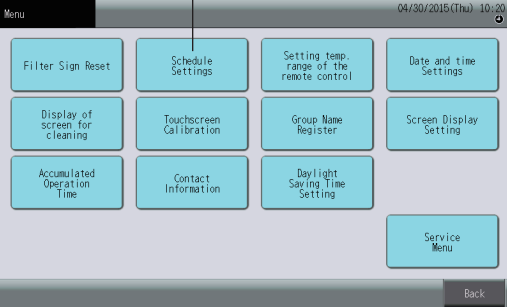
- If "Done" is touched without first touching on "Proceed", Groups selected for deletion are left in place and the operation to delete is cancelled.

8.3.2 Holiday Setting for Operation Suspended

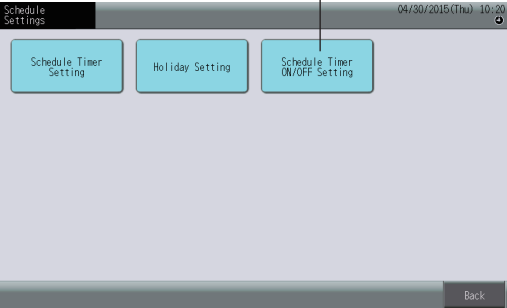
1. Select "Schedule Settings" from the "Menu" screen.
2. Select "Holiday Setting" from the "Schedule Settings" screen.
3. Select the target (All Groups, Block or Group). A calendar appears.
 - Blue buttons represent Groups with holiday settings.
 - White buttons represent Groups without holiday settings.

NOTE:
"Holiday" means "Operation Suspended Day".
4. Set the date to suspend a scheduled operation.
 - Scroll the calendar backward and forward touching "<" or ">".
 - By touching the date on the calendar, the "Holiday" is set and is represented with a "□". "Holiday Setting" is canceled by touching the same date again.
 - This "□" will represent the day with a holiday set.
 - With "All Groups" or "Block" selected, a "□" will represent a day when Groups with holiday setup and Groups without holiday setup are intermixed.
5. Touch "Back" to set the schedule for other groups. The screen will return to "Holiday Setting".
6. Touch "Done" to return to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

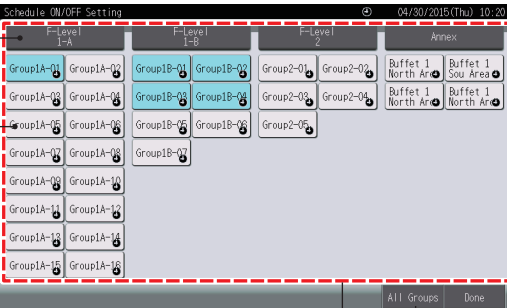
8.3.3 Schedule Timer ON/OFF Setting



1

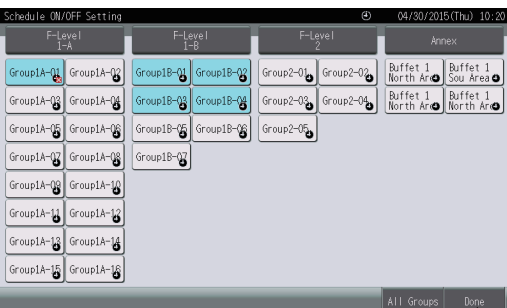


2



3 (Block)

3 (Group)



3 (All Groups)

4

1. Select "Schedule Settings" from the "Menu" screen.

2. Select "Schedule Timer ON/OFF Setting" from the Schedule Settings screen.
 The screen will change to the "Schedule Timer ON/OFF Setting". At first, the setting is "ON" as symbolized with a "⬆️".

3. Select the target (All Groups, Blocks or Groups).
 By touching on the button for All Groups, Blocks, or Groups, the display is changed to the "OFF" setting as represented by a "⊗" symbol.
 By touching on All Groups, Blocks, or Groups, the display is changed alternately in order of "⬆️" and a "⊗" symbol.
 - Blue buttons represent Groups with set schedules.
 - White buttons represent Groups with schedules not set.
 - Schedule is turned ON: ⬆️
 - Schedule is turned OFF: ⊗

4. Touch "Done" to return to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

8.4 Adjust Setting Temperature Range of Local Wired Controller

1

2

3

4

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1. Select "Setting temp. range of the remote control" from the "Menu" screen.
2. Select a target to set a temperature range (All Groups/Block/Group).
 - Blue buttons represent Groups with temperature range settings.
 - White buttons represent groups where temperature range settings are not available.
 - Wireless receiver kits with model numbers: C4IRK01, C2IRK01, C1IEK01, and CWDIRK01 should not be used to set up Groups in the Central Controller. A temperature setpoint outside the range can be set from a wireless controller.
3. Touch "Δ" or "▽" to set a minimum cooling temperature or maximum heating temperature.
4. Touch "Back" when setting other group temperature ranges, to return to the selection screen.
5. Touch "Done" to return to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

NOTE:
The following Group cannot be selected:

- Without a wired controller
- The representative wired controller Group is not the standard unit supporting H-LINK II (temperature setpoint range is from 66 to 86°F for COOL, and from 62 to 86°F for HEAT).

8.5 Adjusting Date/Time

1. Select "Date and time Settings" from the "Menu" screen.
2. Set in the following order: Year, Month, and Day.
3. Touch or press-and-hold "Δ" or "∇" to adjust the date and time.
4. Touch "Done" to return to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

NOTES:

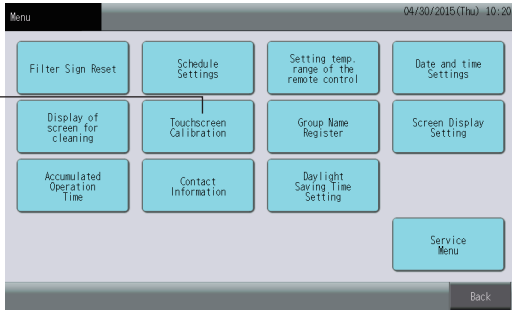
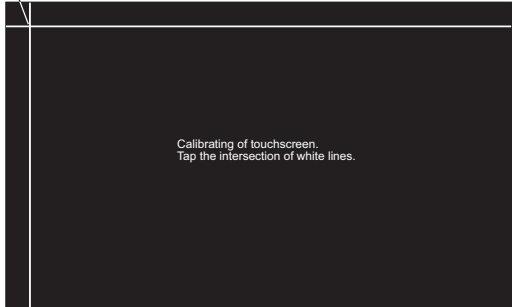
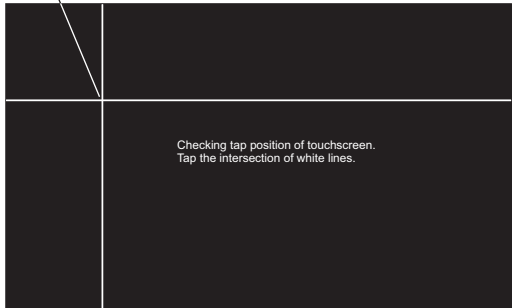
- According to the backup function for the large central controller, the clock will continue to run for approximately 10 days after an electrical power outage. Set the date and time again after a long-term electrical power outage.
- Periodic clock adjustment is recommended. (Clock accuracy: difference ±70 sec. per month)

8.6 Touchscreen Cleaning

1. Select "Display for Cleaning" from the "Menu" screen.
2. The screen will be changed as shown in figure (2).
 - The screen will be locked during the cleaning. The screen will return to the menu screen if not touched for 10 seconds.

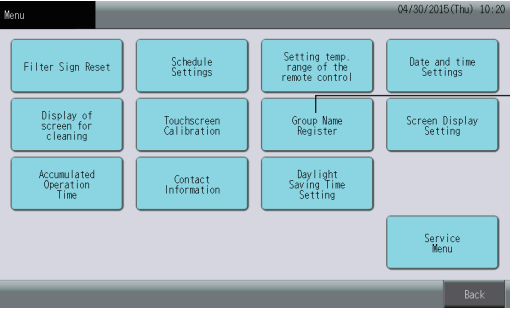
- Clean and wipe the display with a dry, soft cloth.
- Use a diluted neutral detergent to remove oily fingerprint marks on the touchscreen. Before cleaning, wring the water out of the cloth. After that, again wipe the display with a dry, soft cloth.
- Do not use benzine-based thinners, or any active surface agent in order to protect the touchscreen and case from damage or deterioration.

8.7 Touchscreen Calibration

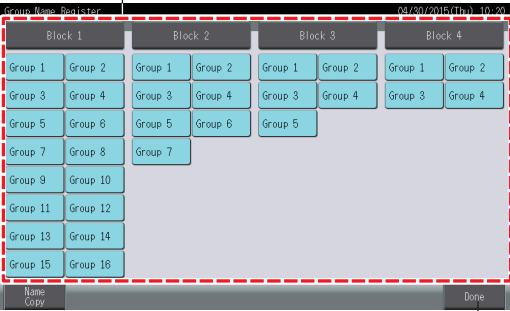
 <p>1</p>	<p>1. Select "Touchscreen Calibration" from the "Menu" screen.</p>
 <p>2</p>	<p>2. <Calibrating Touchscreen> Touch at the intersecting white lines in sequence as shown on the screen. After that, the screen will be changed. See figure (3) at left. If the intersecting white lines are not touched in sequence, a message reading "Calibration is canceled" will be displayed. The screen will automatically return to the "Monitor 1 (All Groups)" or "Monitor 2 (Block)" without calibrating.</p>
 <p>3</p>	<p>3. <Checking Position of Touchscreen> Touch on the intersecting white lines in sequence as shown on screen.</p> <ul style="list-style-type: none"> • White dots are displayed to signify contact outside of the designated intersecting white lines. <p>When all intersecting white lines have been touched in the proper order, the screen will automatically return to "Monitor 1 (All Groups)" or "Monitor 2 (Block)".</p>

8.8 Registering Groups/Blocks Name

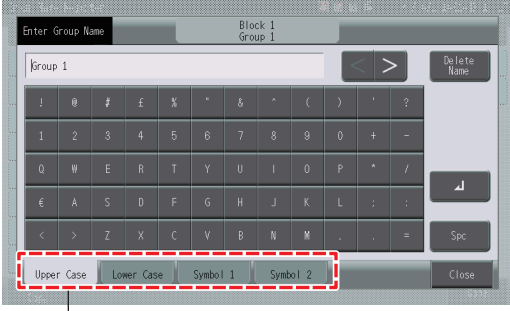
8.8.1 Registering Name of Group (Block)



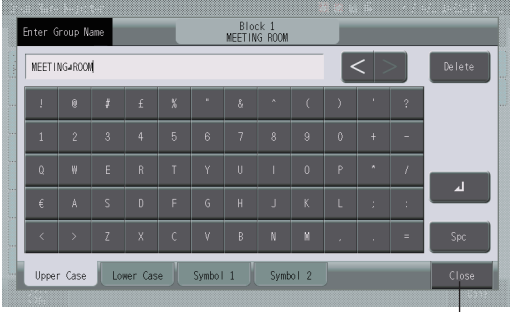
1



2



3



4

1. Select "Group Name Register" from the "Menu" screen.
2. Select the target (Block or Group) to register a name.
3. Select the letter type from "Upper Case", "Lower Case", "Symbol 1", or "Symbol 2".
 - If "Delete Name" is pressed, the registered name for the selected Group (Block) will be deleted. If "Close" is touched without entering, the screen will revert to "Group Name Register" and display the Group (Block) name as Group 1 (Block 1).
4. Enter the Group (Block) name and touch "Close".
The screen will return to "Group Name Register" and the entered name is stored.
5. Perform steps (3) and (4) to enter the Group (Block) name.
6. Touch "Done" on the screen (Figure 2 above) to return to the "Monitor 1 (All Groups)" or "Monitor 2 (Block)".

NOTE:
The keyboard is changed by touching on a tab.

NOTES:

- The name of Group (Block), input is permissible with a maximum up to 20 characters.
With a display of 10 characters per line, the 11th character will have to start on the second line.
- If the "↵" symbol is pressed, the name appears in two lines (10 letters/line) on the touchscreen display.

8.8.2 Copying Name of Group (Block)

1. Select "Group Name Register" from the "Menu" screen.

2. Touch "Name Copy".

3. Select the source Group (Block) to copy.

- Selected Group (Block) button is trimmed in an orange outline.
- Press the selected Group (Block) again to cancel the selection. The orange outline disappears.

4. Select the destination Group (Block) to paste.

- A "✓" will appear on the button.
- Multiple selections of a Group (Block) can be pasted.
- To cancel a selection, press the selected Group (Block) again. The "✓" will disappear.

5. Touch "Paste".

The name of the Group (Block) is copied.

- To copy the name of another Group, refer to step (3) above.
- To finish, refer to step (6) below.

6. Touch "Done" and the screen will return to "Group Name Register".

- If you touch "Done" without first touching on "Paste", the operation to copy those selected Groups or (Blocks) is canceled.

8.9 Screen Display Setting

8.9.1 Adjusting Backlight Brightness of Touchscreen Display

The diagram illustrates the steps to adjust the backlight brightness of the touchscreen display. It consists of three sequential screenshots:

- Step 1:** The 'Menu' screen. The 'Screen Display Setting' option is highlighted with a callout line labeled '1'.
- Step 2:** The 'Screen Display Setting' screen. The 'Brightness' option is highlighted with a callout line labeled '2'.
- Step 3:** The 'Brightness' adjustment screen. A vertical slider is shown with callout lines labeled '3' pointing to the top and bottom arrows, and '4' pointing to the 'Done' button at the bottom right.

1. Select "Screen Display Setting" from the "Menu" screen.
2. Select "Brightness" from the "Screen Display Setting" screen.
3. Touch "Δ" or "∇" to adjust the brightness of the backlight.
4. Touch "Done" to return to the "Screen Display Setting" screen.

8.9.2 Language Setting

The diagram illustrates the process of changing the language through four sequential screenshots:

- Step 1:** The 'Menu' screen is shown with various settings options. The 'Screen Display Setting' option is highlighted with a callout '1'.
- Step 2:** The 'Screen Display Setting' screen is shown with three options: 'Brightness', 'Language', and 'Temperature Unit'. The 'Language' option is highlighted with a callout '2'.
- Step 3:** The 'Language' screen is shown with two options: 'English' and 'Français'. The 'English' option is highlighted with a callout '3'.
- Step 4:** The 'Language' screen is shown with the 'Done' button at the bottom right highlighted with a callout '4'.

1. Select "Screen Display Setting" from the "Menu" screen.

2. Select "Language" from the "Screen Display Setting" screen.

3. The Language Confirmation screen displays different language selections. Press to select a language.

4. Touch "Done" to return to the "Screen Display Setting" screen.

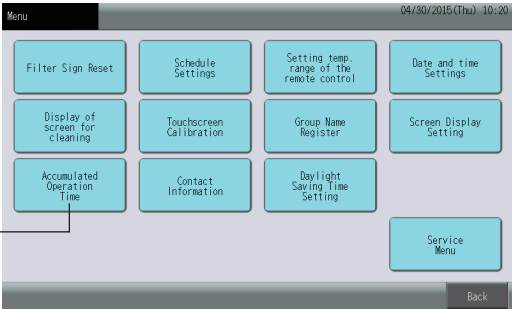
8.9.3 Temperature Unit Setting

The diagram illustrates the process of changing the temperature unit through three sequential screenshots of a touch-screen interface. The first screenshot shows the 'Menu' screen with various settings options; 'Screen Display Setting' is highlighted with a callout '1'. The second screenshot shows the 'Screen Display Setting' screen with 'Temperature Unit' highlighted by a callout '2'. The third screenshot shows the 'Temperature Unit' selection screen where 'Degrees C' is selected (indicated by a red dashed box and callout '3') and the 'Done' button is visible at the bottom right (indicated by callout '4').

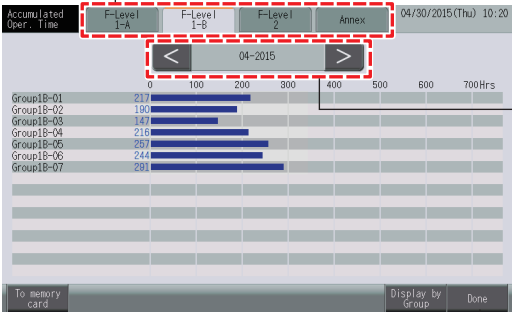
1. Select "Screen Display Setting" from the "Menu" screen.
2. Select "Temperature Unit" from the "Screen Display Setting" screen.
3. Press to select "Degrees C" or "Degrees F" unit for temperature display. The selected button color will change.
4. Touch "Done" to return to the "Screen Display Setting" screen.

8.10 Accumulated Operation Time of Unit

8.10.1 Display by Month



1



2

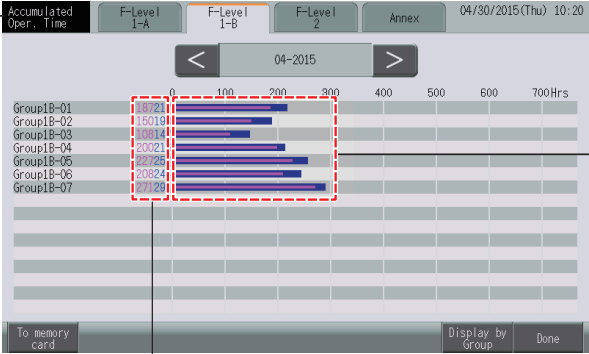
3

4

1. Select "Accumulated Operation Time" from the "Menu" screen.
2. Select the target block.
3. Touch "<" or ">" and select the target month.
4. Touch "Done" to return to the "Monitor 1 (All Groups)" or "Monitor 2 (Block)" screen.
5. Bottom Screen: The button at upper left; (Accumulated Oper. Time); displays total operation time for these Groups within the selected Block are shown for the selected month.

NOTE:

The thermo-ON time can be displayed on screen by the optional function selection setting . Contact your installation contractor for detailed information.



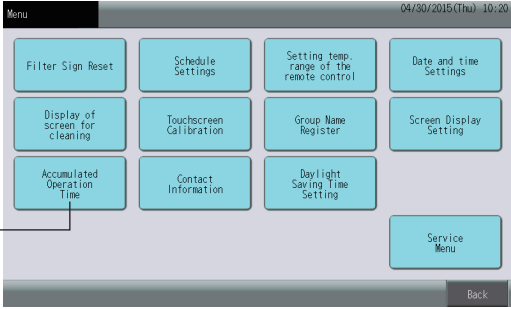
5

Left: Thermo-ON Time
Right: Accumulated Operation Time


Pink: Thermo-ON Time
Blue: Accumulated Operation Time

Accumulated Oper. Time
(Total time on unit or system as depicted in the blue bar graph).

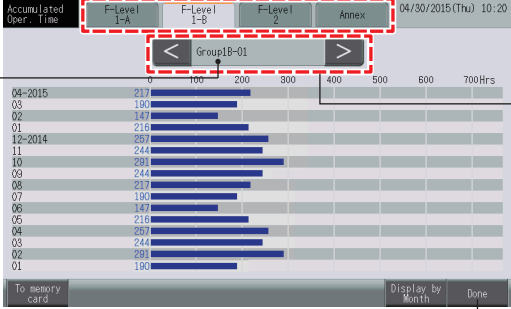
8.10.2 Display by Group



1



2



3

Group Name

4

5

1. Select "Accumulated Operation Time" from the "Menu" screen.

2. Touch "Display by Group".

3. Select the target Block tab (at top).
4. Touch "<" or ">" and select the target Group. The operation time for the Group in the selected Block appears.
5. Touch "Done" to return to the "Monitor 1 (All Groups)" or "Monitor 2 (Block)" screen.
 - If "Display by Month" is touched, the screen will change to "Display by Group".

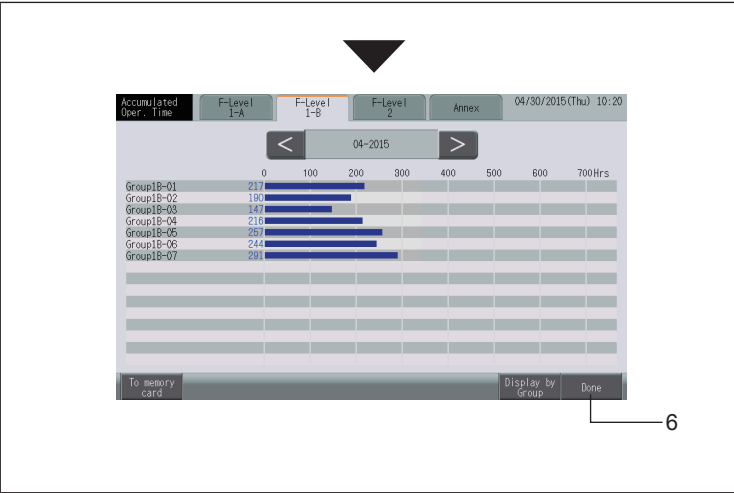
NOTE:

Depicted accumulated operation time for this large central controller is for reference only. The view above is only a simulation of an actual condition and is only meant as an instructional example.

8.10.3 Save Operation Time of Air Conditioner in Memory Card

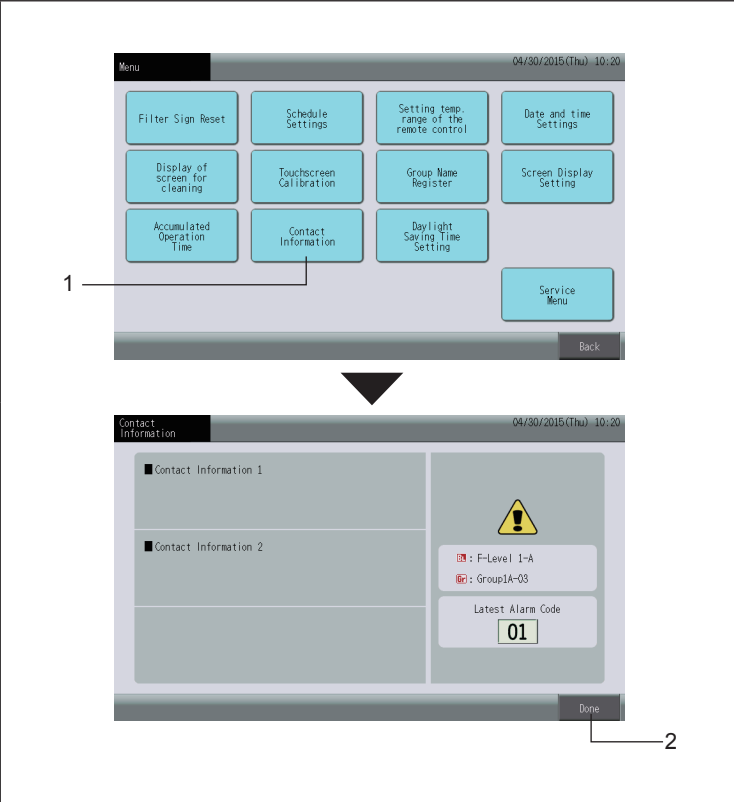
1. Insert the memory card into the controller. Refer to Section 10, "Notes for Using Memory Card".
2. Press the "Accumulated Operation Time" button from the "Menu" screen.
3. Touch "To memory card".
4. Confirm the file name and touch "Yes" to start saving operation time data to the memory card.
5. Touch "Finish" to return to the Accumulated Operation Time display screen.

Continue to Next Page



6. Touch “Done” to return to the “Monitor 1 (All Groups)” or “Monitor 2 (Block)” screen.
7. Remove the memory card from the controller. Refer to Section 10, “Notes for Using Memory Card”.

8.11 Contact Information



1. Select “Contact Information” from the “Menu” screen. The following information will be displayed.
 - Contact address
 - Block/Group name of the latest alarm
 - Latest alarm code
2. Touch “Done” to return to the “Monitor 1 (All Groups)” or “Monitor 2 (Block)” screen.

NOTES:

- This function does not provide information if there is no contact address registered.
- If there was no alarm incident, the name of the target Block/Group and code will not display.

8.12 Daylight Saving Time Setting

The image contains two screenshots of a control panel interface. The top screenshot shows the 'Menu' screen with various settings buttons. A line labeled '1' points to the 'Daylight Saving Time Setting' button. The bottom screenshot shows the 'Daylight Saving Time Setting' screen with options to 'Enable' or 'Disable', start and end dates, and a shift time. A line labeled '2' points to the 'Enable' button, and a line labeled '3' points to the 'Done' button at the bottom right.






















1. Select "Daylight Saving Time Setting" from the "Menu" screen.

2. Select the button concerning each function.
The color of the selected function will change.

3. Touch "Done" to save the content and return to the "Menu" screen.

9. Other Indications on LCD

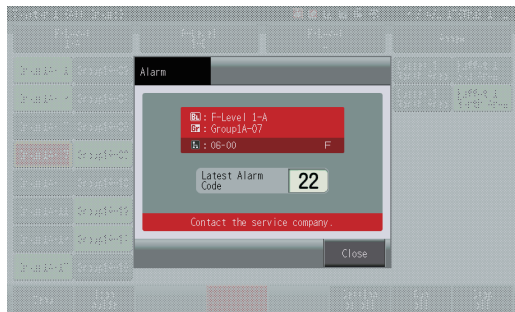
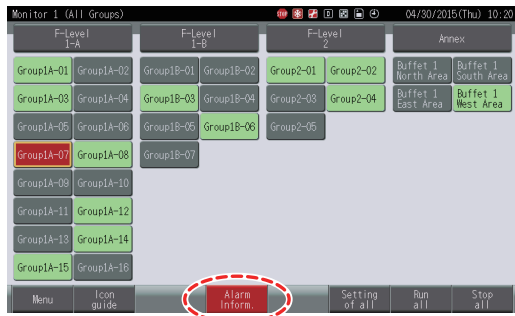
9.1 In Normal Condition

	Schedule	<ul style="list-style-type: none"> The symbol "" displays Group or Groups with a schedule setting
	Memory Card	<ul style="list-style-type: none"> The symbol "" displays when the memory card is inserted into the large central controller. If the symbol does not appear after inserting the card, insert it again. This symbol "" turns orange when it is activated. Do NOT remove the memory card while "" an orange.
	Remote Control Operation Prohibited	<ul style="list-style-type: none"> The symbol "" indicates for the group with remote control operation prohibited. The remote control operation does not work when remote control is prohibited (except for an emergency stop operation).
	Emergency Stop	<ul style="list-style-type: none"> The STOP symbol "" displays when emergency stop signal is set by an optional external input function. During the emergency stop phase, the indoor unit is stopped and the other remote control is unable to operate the unit. Contact your distributor for detailed information.
	Demand	<ul style="list-style-type: none"> The symbol "" displays when a demand signal is set by an optional external input function. The symbol "" will flash during the demand control phase. Contact your distributor for detailed information.
	Demand Schedule	<ul style="list-style-type: none"> The symbol "" displays when the optional outdoor unit capacity control schedule is enabled and "" flashes during the control. (In addition to the schedule, when the demand input by the external input function is set, this symbol "" flashes during the demand control also. Contact your distributor for detailed information.
	Filter Sign	<ul style="list-style-type: none"> The symbol "" displays when the air filter of the indoor unit is clogged. After cleaning the air filter, press "Filter Sign Reset" on the Menu screen and turn OFF this indicator.
	Heat Storage Operation	<ul style="list-style-type: none"> The symbol "" indicates when the heat storage is operating. During this time, the air conditioner cannot be operated.

9.2 In Abnormal Condition

Abnormalities	
<p>Power Failure</p>	<ul style="list-style-type: none"> The display is OFF. Once a unit is stopped by a power outage, it will not start again until proper starting procedures are performed again. If there is an abrupt power outage lasting only two seconds, the unit will automatically restart.
<p>Electronic Noise</p>	<ul style="list-style-type: none"> There could be an instance where the display is OFF and the unit has stopped. This is caused when the micro computer activates to protect the unit from Electromagnetic Interference (EMI). When the unit has shut down, repeat starting procedures again.
<p>Continues to Display "Start-up"</p>	<ul style="list-style-type: none"> There is a possibility that a communication error occurred. Contact your distributor for detailed information.

Abnormalities



- The operation indicator display will flash Red when an abnormal condition arises with the air conditioner unit.
- The red button illuminates on screen when there is a Group with an abnormal condition.
- "Alarm Inform." displays on the bottom of the screen. Touching "Alarm Inform." displays the following information.
 - Name of the Block/Group with the abnormal condition
 - System number, address and model code* of the indoor unit with the abnormal condition.
 - Alarm code
 - (* There may not be a model code shown depending on the unit model.)
- If multiple indoor units are found in an abnormal state, the details of this irregularity are displayed in a sequence as noted above. If an abnormal condition is detected within a Group, that Group can be selected by touching "<" or ">" on the "Alarm" information screen. After checking over the alarm details, contact your distributor for more information.

10. Notes for Using Memory Card

Prepare the memory card for the controller to automatically store the setting and operation data.

■ Compatible memory card:

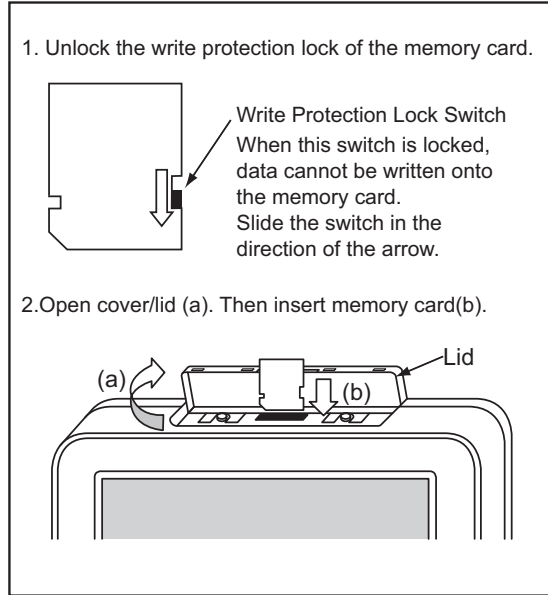
The Secure Digital (SD) and Secure Digital High Capacity (SDHC) memory cards based on the SD Standard are acceptable. However, some cards may not work properly.



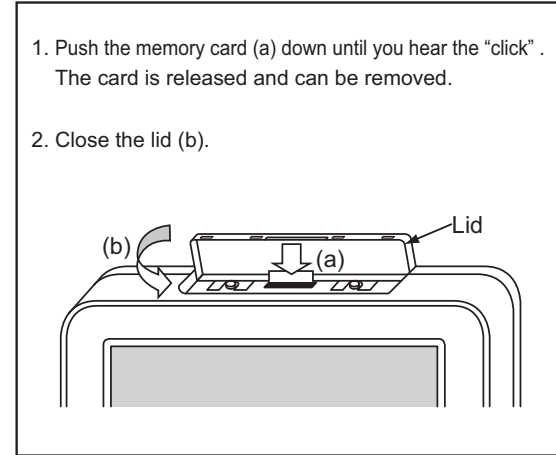
● These memory cards are considered acceptable by Johnson Controls:

- SanDisk Ultra® SD™/SDHC™ Card
- SanDisk® SD™/SDHC™ Card (standard type)

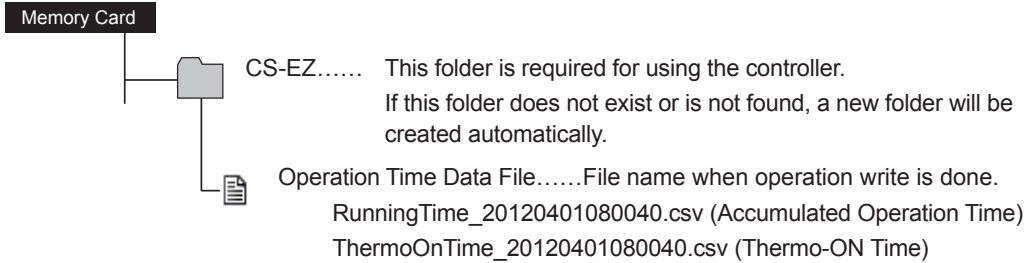
■ Insert the memory card.



■ Remove the memory card.



■ Folder and File



OPERATION

- Notes for using the memory card
 - The recommendation is to use the SD formatter when using the memory card for the first time. (See items 1 and 2 below.) Note that all data in the memory card will be erased by formatting the card.
NOTICE:
 - *1: Download the SD formatter software from the SD association site. (<http://www.sdcard.org/home>)
 - *2: When formatting the memory card improperly, it may fail to read/write data or take a long time for reading.
 - When formatting the memory card, it may not completely erase the data on the memory card. If disposing of, or transferring information, it is recommended that the data-erasing program on your PC be used to completely erase the data.
 - Do NOT remove the memory card or turn OFF the power while the memory card is reading or writing information. It will most likely damage the memory card surfaces, cause loss of data, or become unable to function under the following conditions:
NOTICE:
 1. While the memory card icon is flickering.
 2. While the message "Recognizing Memory Card" is displayed.
 3. Immediately following "Read", "Write", or "Yes" messages after reading or writing data;
(Immediately after the "Read" "Write" operation and the "Yes" buttons under the item 8.10.3.)
 - When carrying or storing the memory card, do NOT leave it where static or electronic noise can be directly radiated to memory card. If affected, it may ruin the data on the memory card.
 - It is recommended that you back up important data to other storage media regularly. Hitachi or York cannot be held responsible for loss of data due to a damaged memory card.



DO NOT insert into the slot any memory card other than the specified memory card. Doing so may lead to failure of the unit, electric shock, or fire.

Messages Shown on Screen

Message	Condition
Cannot access memory card.	Remove the memory card and insert it again.
This memory card is write-protected. Cannot add data.	Unlock the memory card.
Not enough space left on memory card. Cannot add data.	Free up some space on the memory card and try again.
Failed to write data to memory card.	<ul style="list-style-type: none"> • The memory card may not be supported by this controller. Check the compatibility shown in "Section 10, Notes for Using Memory Card". • Memory card may be damaged. Please try with different card. • Memory card is not formatted correctly. Please format the card.
Failed to read data from memory card.	
Unknown Error	<ul style="list-style-type: none"> • An SDXC type memory card may have been inserted. Check the compatibility shown in "Section 10, Notes for Using Memory Card". • There should be a "CS-EZ" folder but there may be a file name with "CS-EZ" on the memory card. Move the file to another location on the memory card.

11. Troubleshooting

Check the following table before contacting a distributor for maintenance.

Condition	Cause
Details on the touchscreen are not displayed.	<ul style="list-style-type: none"> • Check that wiring for the power supply is connected to the plug. • Check that the power supply is turned ON.
The touchscreen display is in "sleep" mode.	<ul style="list-style-type: none"> • The touchscreen will automatically lapse into sleep mode when there has been no interaction with it over a length of time. Touch anywhere on the screen to awaken it.
A part of the touchscreen is not turned ON or is constantly turned ON.	<ul style="list-style-type: none"> • There may be dead pixels on the LCD. This is not faulty.
The operation is not carried out smoothly when the switch is tapped.	<ul style="list-style-type: none"> • When the large central controller is used for a long time, the touchscreen may not match the position of display indication. Refer to the item 8.7 for the Touchscreen Calibration.
The symbol "- -" is indicated for the temperature setpoint. The temperature cannot be set.	<ul style="list-style-type: none"> • No temperature setpoint is set. Press and hold "Δ" or "∇" for 3 seconds on the setting touchscreen. Refer to Section 7.9.
The setting of louver direction returns to a previous setting.	<ul style="list-style-type: none"> • When the operation mode is "AUTO", the direction of the louver is automatically corrected depending on the indoor unit model.
The timer operation in the schedule setting does not run.	<ul style="list-style-type: none"> • Check to see if the holiday setting is turned ON. If so, cancel the holiday setting according to Section 8.3.2. • Check to see if the setting of schedule operation is turned OFF. If so, the schedule operation should be turned ON according to Section 8.3.3.
The symbol "- -" displays in place of date and time.	<ul style="list-style-type: none"> • The symbol "- -" is displayed when electrical power is shut down over a lengthy period of time. Set the date and time again according to the item 8.5.
The setting is not changed.	<ul style="list-style-type: none"> • When the large central controller is operated immediately after turning ON the air conditioners, the large central controller may not be possible to control because the starting up of the air conditioners are may not work because the air conditioners were started first. Wait a few minutes and try again.

12. Maintenance

- Clean and wipe the display with a clean and dry, soft cloth.
- For oily fingerprint marks on the touchscreen, use diluted neutral detergent mixed with water to clean. Before cleaning, wring out the cloth. After that, again wipe the display with a clean and dry soft cloth.
- Do not use a benzine-type thinners or any active surface agent in order to protect the display from damage.

13. Reference

Model	CCL01
Outer Dimension <WxHxD+(Built-in Part)>	9-27/32 × 6-11/16 × 31/32 + (2-5/32) inch (250 × 170 × 25 + (55) mm)
Net Weight	3.3 LBS (1.5 kg) (Approx.)
Installation Location	Indoor
Installation Method	Wall Built-in with Steel Box (Option)
Connected Indoor Unit (Qty.)	160 (Max.)
Clock Accuracy	± 70 Seconds/Month (at Normal Temperature)
Ambient Temperature	41 ~ 95°F (5 ~ 35°C)
Ambient Humidity	35 ~ 90% (No Dew Condensation)
Display	8.5" TFT Color Liquid Crystal Display (800 x 480 dots)
Rated Power Supply	24VAC, 60Hz
Electrical Power Consumption	30W (Max.)

2.2.8 Computerized Central Controller Management Software

Model: CCCS01

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Introduction

- This software applies to standard grade air conditioner units.
- Do not install this unit near the following locations. Serious internal damage to the adapter can result.
 - Places where oil (including machine oil) mists or stream drift.
 - Places where sulfide gas form as hot spring drifts.
 - Places where flammable gas may be generated or exist.
 - Places where high in salt contents surrounding as coast regions.
 - Places where atmosphere of acidity and alkalinity humid place.
- In case of using a medical equipment generating electro-magnetic waves, the system should be installed in an area where free from direct radiation to avoid malfunction.
The surface that is emitting electro-magnetic waves should not directly face the system.
- In case of using those equipment and radios generating electro-magnetic waves, this software should be installed where a location is at least 9.8 feet (3 m) away from the equipment to avoid any influence on radiation propagation in the air.
- Please note that in any situation which may result from the use of this product, we cannot assume any responsibility.
- Upon the utilization of this product, please use it after agreeing with the following licensing content.
The seller shall be under no liability for compensation for consequential damage, in particular for lost profits. Furthermore, secondary compensation for business loss and so forth caused by malfunction of the air conditioner is not provided.
- To improve the function and specification, few parts are subject to change without notice.

[Symbols Used in This Manual]

⚠ DANGER : Immediate hazards which WILL result in severe personal injury or death.

⚠ CAUTION : Hazards or unsafe practices which could result in minor personal injury or product or property damage.

NOTE: This sign indicates other alert information than DANGER.

NOTICE: Useful information for operation and/or maintenance.

Safety Summary

- Please carefully read this section before installation of the software.
- Contents with “DANGER” shows the certain cases where improper operation WILL result in severe personal injury or even death. For your safety, please follow this instruction.
- Keep this manual in a safe place for users' reference.

Installation and electrical work

⚠ DANGER

- Contact your distributor or qualified engineer for Installation work. Improper installation can cause electric shock, fire, or unexpected accidents.
- To avoid any electric shock or accident, ask the distributor to have electric work done by qualified electrician.

⚠ CAUTION

- Do NOT expose this system in direct sunlight or keep it in a place where there is a high temperature or humidity.

In Operation

⚠ DANGER

- Never operate the equipment with moist, bare hands. The risk of electrical shock and serious injury is high.
- Turn OFF power immediately after a breaker switch is thrown or anytime safe operation cannot be guaranteed. Any electrical short to ground or a voltage spike can trigger electric shock, fire, blown fuses, and serious injury. Contact your distributor or dealer immediately.
- Turn OFF power immediately if you detect the smell of melted insulation and burnt wiring. A fire could be present. Contact your distributor or dealer immediately.
- Do not disconnect the adapter from the computer while in operation. Data can be permanently lost.

For Repair and Removal

⚠ DANGER

- Please contact the distributor or your dealer for repair. Faulty/poor maintenance can cause electric shock and/or fire.
- Please contact your distributor or dealer upon removing the adapter. Poor or improper installation and unauthorized maintenance practices, removal of parts can cause electric shock, fire, serious injury, and lead to unexplained accidents.

How to Read This Manual

- This manual consists of **System Configuration**, **Monitor**, **Operation Ratio**, **Schedule**, **Trend**, **Alarm History**, **Setting**, **Check** and **Service and Maintenance** section.
- Refer to the installation manual (P5415517) for installation and initial settings.

System Configuration

- This chapter examines the specifics of system configuration.

Monitor

- Refer to this chapter when controlling and monitoring air conditioners.

Operation Ratio

- Refer to this chapter when calculating operation ratio.

Schedule

- Refer to this chapter when registering and checking schedule settings.

Trend

- Refer to this chapter when displaying trend data.

Alarm History

- Refer to this chapter when displaying alarm history.

Setting

- Refer to this chapter when setting and checking the system in detail.

Check

- This chapter is for our serviceman's reference.

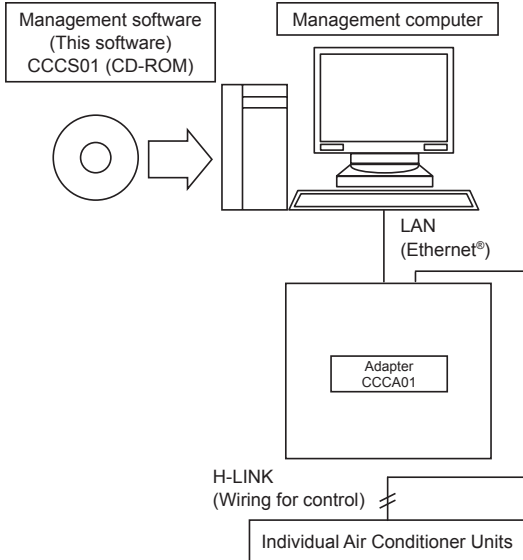
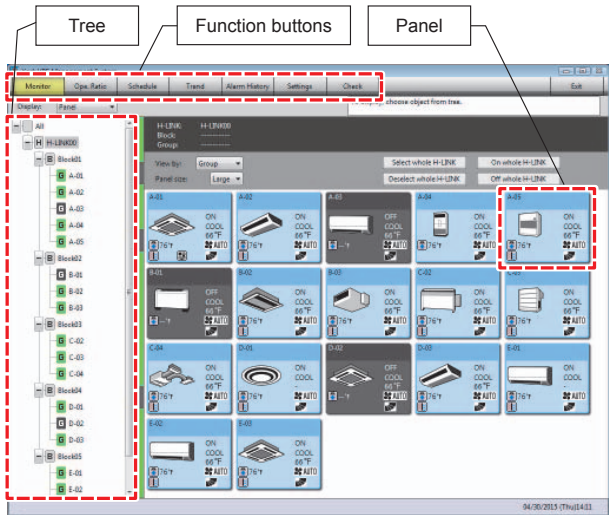
Service and Maintenance

- This chapter deals with related service issues.

/// Important Notice ///

- Device failure for any reason will severely impact all capabilities. Discuss an alternative recovery strategy that allows you to address and work around problems with the unit or by way of a remote controller monitor from outside the system.
- It is important to perform a daily Test Run on all indoor units upon startup of operation.
- When the air conditioning system appears to be running at less than peak efficiency, assume manual control and perform a reset. Monitor closely afterward.
- Use the management computer exclusively with this software. Shut the system down when using other system or operating other process as copying.
- The management computer and its specific software, adapter, and peripherals are assumed to be always ON. Trend data, alarm history, and check data might not be recorded while the computer is OFF or in a hibernation state.
- Monitoring and controlling are dependent on the clock in the management computer. Proper operation cannot be expected if an unnecessary changes are made to the clock setting.
- The service life of a management computer may differ from that of standard air conditioner units. Download necessary updates periodically and discuss the procedure in advance.
- The management computer is not part of the software package. Expenses for installation and data migration are not included in the price for the system.
- Upon utilizing CCCS01, up to 16 adapters can be connected with one management computer.
- In the main screen of the management computer, use the software application icons displayed on this screen.
- This software supports Tooltip (reminder information). It may appear when the mouse cursor is hovered over items (group name and block name, for example.) or the priority tree viewing window. Please note that Tooltip may not appear on all items or displays depending on operating state.
- Data input is restricted to the available keyboard.
- It is possible that when alarm 60, 61, 64, or 65 has occurred, because a communication error between each air conditioner in this system is indicated, each air conditioner setting value on the screen has the potential to be false.
- The reference photos printed in this manual are only examples. The displays depicted here may differ from the actual window information.
- In case a pop-up window like the control window does not fully appear on the screen, change the taskbar size with the point of the mouse so that the hidden part of the pop-up window is revealed.
- A format of the date is following the settings [Date and time formats] - [Long time] of the management computer at starting the software. When modifying the settings, exit the software first, and change the settings.

Words/Terms

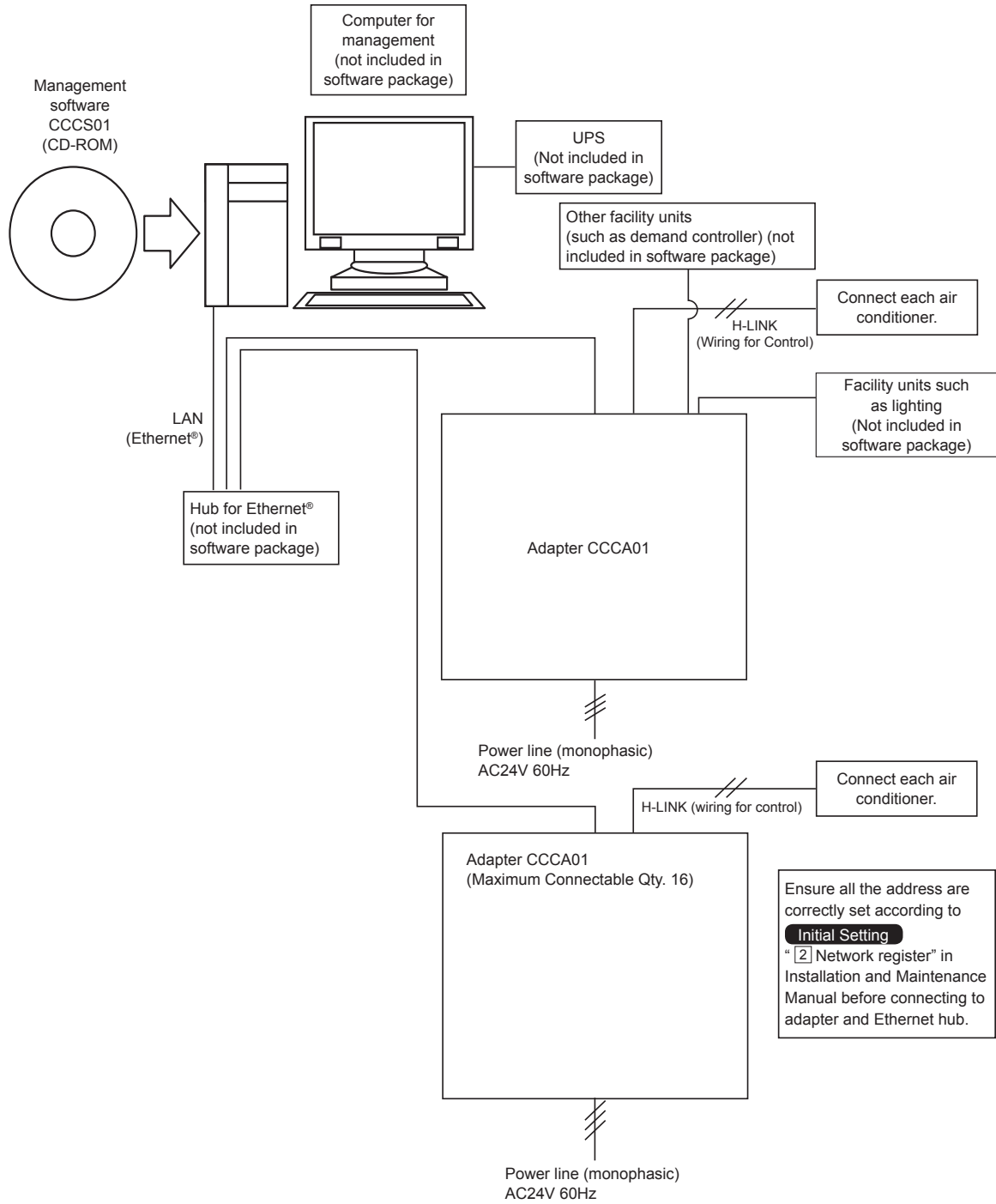


Ethernet® is a trade name or trademark registered by the Xerox Corporation in the United States and in various countries.

Terms	Definitions
Non RC equipped, (Remote Controller-less) unit	Non RC equipped units will display indoor units without a remote controller connected. This does not include instances where multiple indoor units are connected and monitored by a single remote controller.
Facility unit	The units are monitored or controlled by this software through external input/output(s).

System Configuration

1 System Configuration



2 Device Specification

Refer to 1 System Configuration in installation and maintenance manual (P5415508) for specification of the device in the system.

NOTE:

- Monitoring and control are dependent on precise clock function inside the management computer. Operation can be disrupted by unnecessary tampering or by attempting to self-adjust and should not be attempted.

3 Display

The display below is for controlling, managing each setting in air conditioners and facility units.

Function Buttons

Each function in the function group will be revealed as you select on the individual buttons. The functions will be described in the following chapter.

Panel

Shows current status of air conditioners and facility units.

Guide

Explanation of current display.

Exit

Closes down the system.

Status Bar

In this area are shown alarms, other alerts and check notices.

Control Window

This is a pop-up window for controlling air conditioners and facility units.

Priority Tree

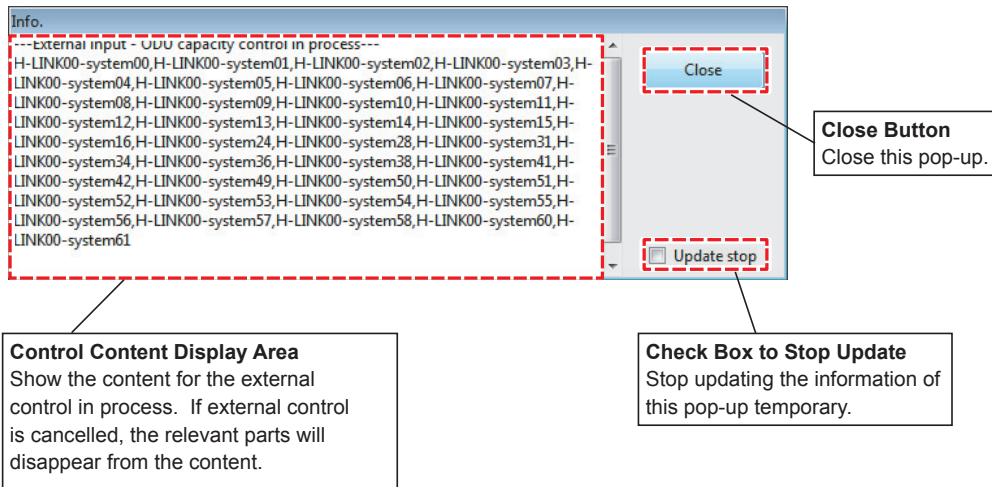
If shown in [Panel], data will be displayed by scrolling down to [H]: H-LINK > [B]: BLOCK > [G]: GROUP.
 If shown in [Layout], data will be displayed by scrolling down to [L]: Master Layout > [L]: Layout.
 [+] indicates more to follow. (Trees still can be scrolled down)
 [-] indicates that you can scroll no further down the tree.

Tree Status Indicator

Show the allocation of the unit alarm and running status in the tree.
 The order of priority is indicated as follows:
 Alarm (Red) > ON (Green) > OFF (Grey)
 * Tracking and recording actual conditions for any single unit is not possible.

Information Pop-up

When the status of the external input and output changes, an information pop-up will be displayed.



NOTICE:

- The pop-up message can be hidden by setting [Settings] > [Other1] > [Info. pop-up] > [No display].
- When closing the pop-up upon checking the box [Update stop], the pop-up will display when the status of the external input and output is updated.

NOTES:

- If turning OFF the adapter while the level signal is set in the external input, set the level signal after turning ON the adapter again until the pop-up for the connection confirmation disappears. In case that the adapter is turned ON without the level signal input, set the level signal again and then cancel setting for the level signal.
- Reassume control from the system when:
 1. When the external input status changed while the adapter or AC is turned OFF.
 2. When the power to the adapter or AC is turned from OFF to ON while the external input is set.
 3. When the external input status changed while a communication error between the adapter and the AC (Alarm 60, 61, 64, and 65) had occurred.
 4. When a communication error between the adapter and the AC (Alarm 60, 61, 64, and 65) occurred while the external input is set, then it recovered.
- When performing an emergency stop for the unit where the function selection for the indoor unit control is set, check the setting after canceling emergency stop.

Monitor

1 Monitoring

NOTICE:
When controlling from the monitor screen, the content of the control performed from this system remains visible on screen for one moment. During this time, even if controlling from the RC or other controllers, the content shown on the monitor screen will not be updated.

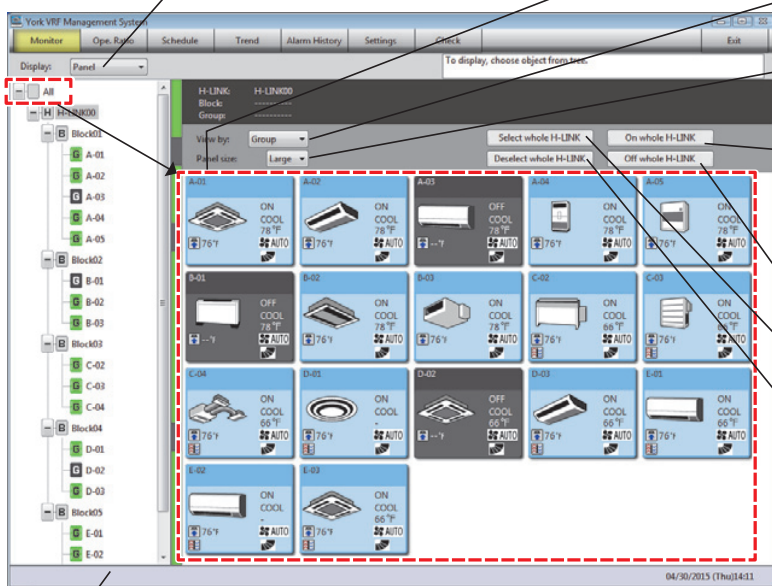
Monitoring air conditioners and facility units.

(1) Monitor display

Select the display format from [Panel] or [Layout].
* Only [Panel] is selectable when layout data is not created.

In this field, the data of selected object in the tree will be shown.

Choose one from [Unit], [Group], [Block] and [H-LINK].
*1 Upper categories than selected in the tree will not be shown.
*2 It will not be shown when [Layout] is selected.



Select the size of panel display from [Large] and [Small].
* It will not be shown when [Layout] is selected.

ON all units selected in the tree.
* The unit that is not included in All ON cannot run.

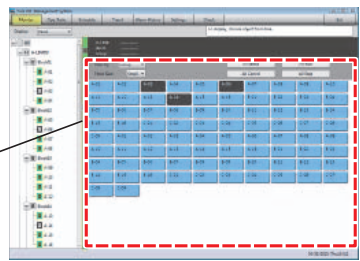
OFF all units selected in the tree.
* The unit that is not included in All Stop cannot stop.

Select all panels.

Cancel all the panel selections.

Alarm and GHP check notice information will run scroll from right to left as on a teleprompter.

Panel display [Small].



NOTICE:
Each Color in the Tree

Running Mode	ON (Cool)	ON (Heat)	ON (Dry)	ON (Fan)	ON (Auto)	ON (In multiple modes)	Alarm	OFF
Color	Lime Green						Red	Grey

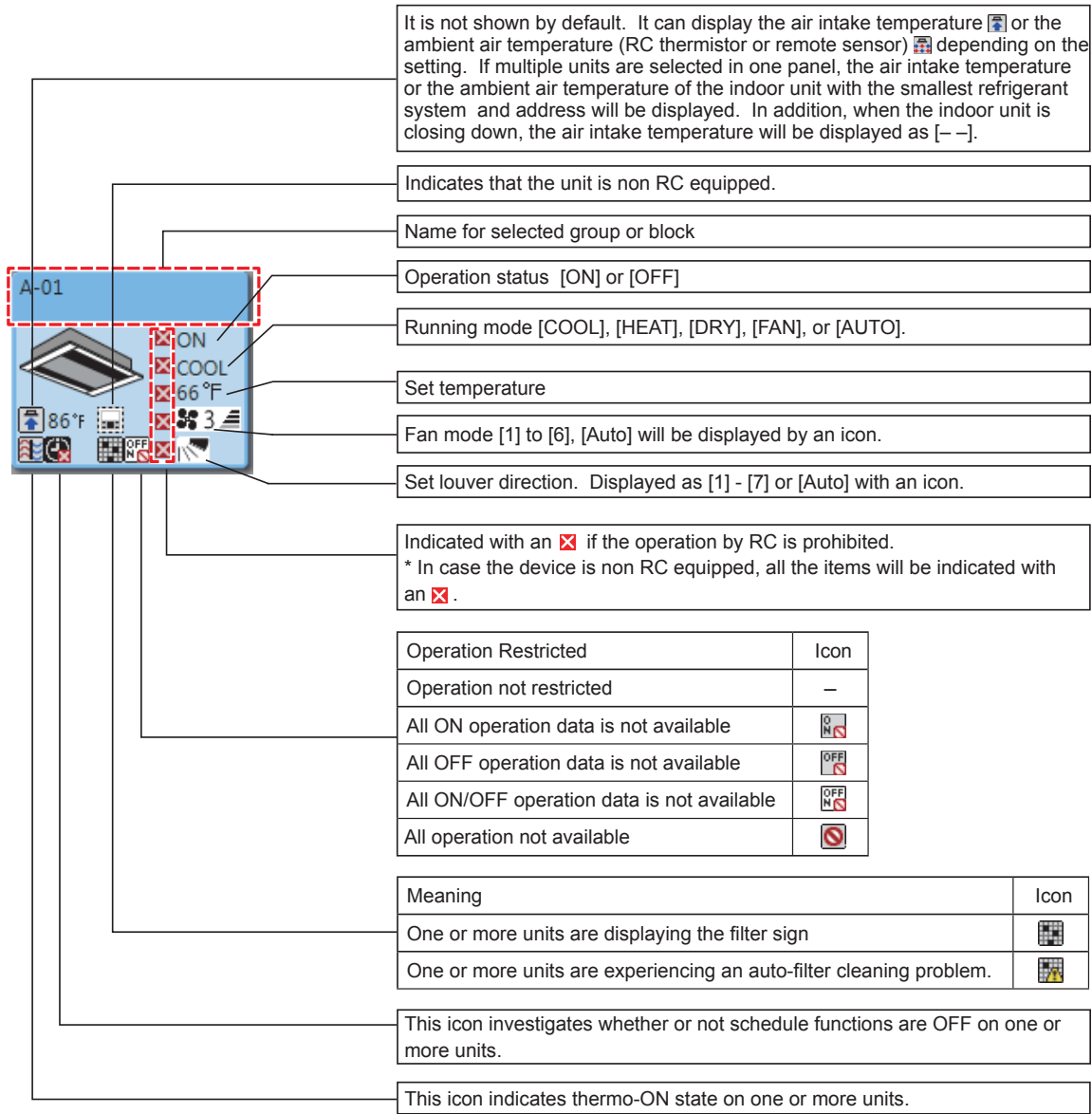
- In case of simultaneous occurrence, the color will be default in accordance to the following priority: "Alarm" > "Other status"
- In showing group or block (or both) that contain multiple units, the color will be determined according to the following priority.
 - (a) Shows in red (alarm) if one or more air conditioners are in an alarm state.
 - (b) Shows in the color of the running condition if one of the air conditioner units is in an alarm state and one or more other air conditioners are running.

NOTICE:
Upon Alarm Occurrence

- The display will automatically switch to display all units. If [Panel] is selected for "View by", the units will be displayed by each "H-LINK". To avoid this, a password, in this instance, can be used to switch the display.

OPERATION

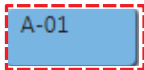
(2) Panel
Panel [Large]



NOTICE:

- The [-] or [- -] symbol will display if the units settings in the panel are inconsistent.
- The setting for displaying the air intake temperature or the ambient air temperature or non-display is selectable in [Settings] > [Display] > [Temp. display switch].
- When using the power saving function of the RC, the ambient temperature displayed may differ with the actual air temperature.

Panel [Small]



Name for selected group or block.

NOTICE:
Each Color on Panels

Color for Running mode	ON (Cool)	ON (Heat)	ON (Dry)	ON (Fan)	ON (Auto)	ON (In multiple mode)	Alarm	OFF
ON (with each mode color)	Light Blue	Orange	Sea Green	Light Grey	Light Blue and Orange	Light Purple	Red	Grey
OFF (without each mode color)	Lime Green						Red	Grey

*To set ON (with color) / OFF (without color), go to: [Settings] > [Display] > [Mode color].

- In case of simultaneous occurrence, the color will be in accordance with the following priority:
 - Alarm
 - Other status
- In showing group or block (or both) that contain multiple units, the color will be in accordance with the following priority:
 - Shows in red (alarm) if one or more air conditioners are in an alarm state.
 - Shows in color of a running condition if one of the air conditioners is not in an alarm state and one or more other air conditioners are running.

(3) Layout

When the layout data is registered, it can be displayed.

When displaying in the visual layout mode, control and monitoring functions are made easier.

After preparing the image data required for the layout, it is necessary to register all settings data through [Setting] > [Layout register].

Select all of panels.

Deselect all panels selected.

ON all units within the layout.
 * The unit that is selected in All ON cannot run.

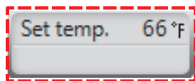
OFF all of units within the layout.
 * The unit that is not selected in All OFF cannot stop.

Name of selected block or group.
 * Possible to set no-display when creating layout data.

Status of selected block or group.
 * Possible to set no-display when creating layout data.

OPERATION

Status Display



The upper part indicates the setting temperature.

The lower part is not shown by default. It can display the air intake temperature or the ambient air temperature (RC thermistor or remote sensor), depending on the setting. (If multiple units are selected in one panel, the air intake temperature of indoor units with the smallest refrigerant system and address will be displayed. In addition, when the indoor unit is shutting down, the air intake temperature will be displayed as: [--].)

NOTES:

- The setting for displaying the air intake temperature or the ambient air temperature or non-display can be selected inside: [Settings] > [Display] > [Temp. display switch].
- When using the power saving function of the RC, the temperature may differ with the actual temperature.
- When the alarm occurred, the display will switch to the master layout automatically if it is created. However, if the password for switching display is set, it will not switch.

2 Controlling

Upon controlling air conditioners and facility units, select the desired items from control window after selecting a control group/block or unit.

(1) Control window

This panel shows present status of the selected group/block or unit.

This panel will display in blue when setting is changed.

Set running status from [ON] and [OFF]. (*1)

Set running mode from [COOL], [HEAT], [DRY], [FAN], [AUTO]. (*1)

Set set the temperature. (*1)

Set fan speed from [1] to [4] or [Auto]. (*1)

Set louver from [1] to [7] or [Auto]. (*1)

Set to disable the 1 day schedule for the indoor unit.

To undo the setting, click on this button. [Undo] button affects only either indoor units or outdoor units displayed in the current window.

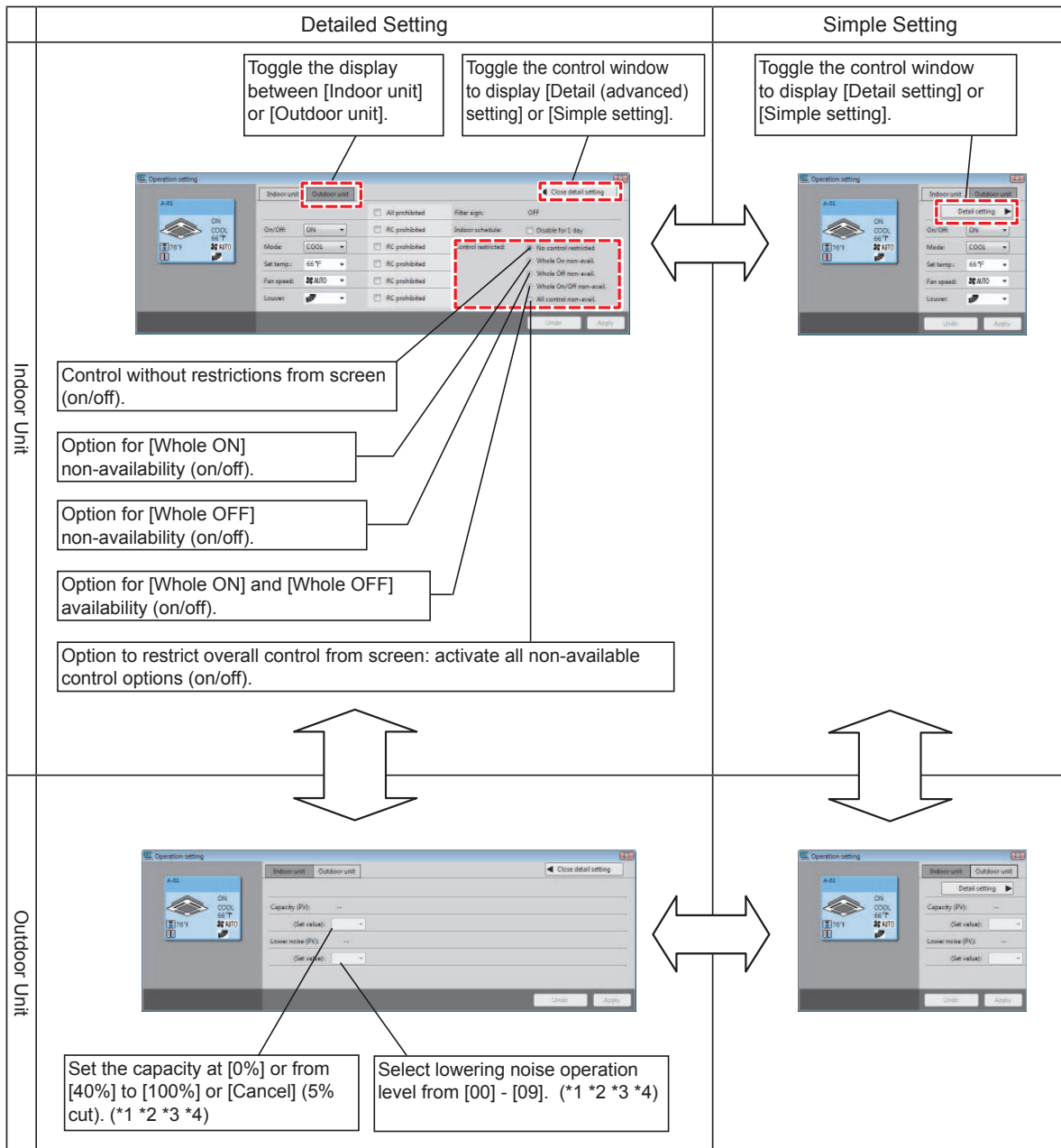
Upon completing all the settings, click [Apply]. All settings will become active.
The [Apply] button affects only either indoor units or outdoor units that are displayed in the "current window".

NOTICE:

- When using wireless remote controllers, there are restrictions for setting [RC prohibited] as follows:
 - When setting [RC prohibited] for ON/OFF, the fan speed cannot be set as [4].
 - When setting [RC prohibited] for running mode, the fan speed cannot be set as [4].
- When using wireless remote controllers, do not set the fan speed as [AUTO] for the indoor unit.

NOTE:

*1: Each setting may or may not affect all the units in the group/block or a single unit, depending on selected units. For details, refer to the installation and maintenance manual and the operation manual for selected units.

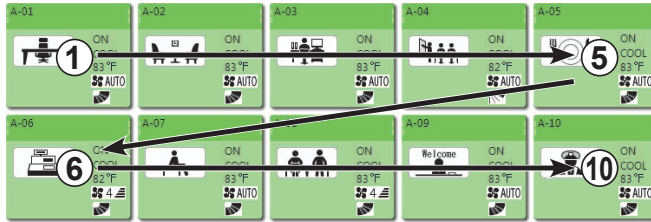


NOTE:

- *1: This item can be set only if the outdoor unit supports this function. Go to [Settings] > [Outdoor unit], then select on check box to enable the function. Contact your dealer or distributor for details.
- *2: The Capacity (Present value) and Lower noise level (Present value) display the value set for this system. The actual value may differ if those values were set or changed by another system or outdoor units.
- *3 This setting will be applied to outdoor unit. Another group/block connected to the same outdoor unit may be affected by changing this setting.
- *4 The new setting will take effect within 15 minutes after the setting was changed.

NOTICE:

- When multiple panels are selected, only the information displayed in the upper left sub-panel will be considered relevant.



- When multiple panels are selected, changing settings and clicking on the [Apply] button will affect all other panels currently selected.
- Items cannot be selected when the setting data for the item is not available.

3 Limitation

Some units have certain limitations placed on monitoring and control.

NOTICE:**Total Heat Exchanger**

- Single unit will use one refrigerant cycle. Other air conditioners cannot be connected to the Refrigerant cycle.
- The following functions are available if the following conditions are met.
If the wired controller is connected to air conditioners AND [Air conditioning + Ventilating] or [Ventilation] is set by the wired controller.

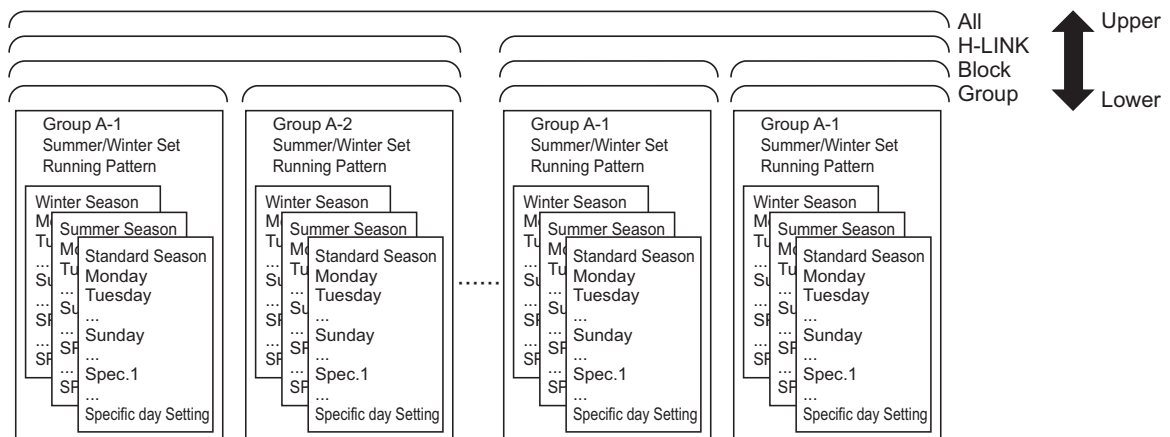
Operation Ratio

Refer to operation manual (P5415499) for management software, operation ratio (CCCS01); How to Use.

Schedule

The following items can be set in Schedule function.

- Management and control by each group.
- There are 16 items that can be scheduled for each day of the week and any specific day.
- There are 16 registered running patterns that can be applied to other groups as a schedule item.
- Scheduling can be set according to three seasons: “Standard season”, “Summer season”, and “Winter season”.
- Running pattern includes ON/OFF, Running mode, set temperature, Fan speed, Louver, Outdoor capacity control, and Lowered noise. (All items may or may not be available, depending on unit types. Consult each Installation Manual and Operation Manual for detail.)
- Each item in a running pattern can be changed and modified.
- A name for the running pattern can be set. The maximum number of characters allowed in a name is: 16.
- The latest date available to set to a specific day is December 31 of the following year. (This is two years from the current date at maximum.)
- The schedule register consists of: All, H-LINK, Block, and Group as follows.
- The set schedule item will be activated upon passing the scheduled time. The status may be inconsistent a with scheduled item when the air conditioner was turned OFF at the set time.
- Items set by the main unit will affect all sub units as well.



- All items will be overwritten to the current group/block, and to lower level items when selecting [overwrite all]. When selecting [Overwrite only where changed], those items where changed or edited will be specified, according to the table below, and overwritten to only where changes were made to.

Items	Setting items
Pattern info. 1	ON/OFF Running mode Set temperature Fan speed Louver RC prohibited - ON/OFF RC prohibited - Running mode RC prohibited - Set temperature RC prohibited - Fan speed RC prohibited - Louver
Pattern info. 2- Pattern info. 16	Same as those of pattern info. 1
Schedule info.	Monday Tuesday Wednesday Thursday Friday Saturday Sunday Specific day 1 Specific day 2 Specific day 3 Specific day 4 Specific day 5
Specific day last year, Specific day this year, Specific day the following year, Summer season, and Winter season	1/Jan -31/Dec, respectively, Beginning of summer season (yy/mm), end of summer season (yy/mm), beginning of winter season (yy/mm), end of winter season (yy/mm)

1 Setting Display

To switch the display, click on each tab.

NOTE:

- Set schedule item with time for at least 15 minutes after the current time.

(1) Common items
Common items in all the tabs are explained.

Select whether to [Overwrite all] or [Overwrite only where changed].

Click each tab to switch display.

Click [Done] after setting is completed.

Read the schedule data output by clicking on [Save CSV] when selecting [All] in the tree. It is not possible to select when selecting other than [All] in the tree.

Save the registered schedule data once as a CSV file when selecting [All] in the tree. It is not possible to select when selecting other than [All] in the tree.

The schedule is executed by each [Group].
If the content registered in [All], [H-LINK], [Block] does not agree with the content registered in this subordinate [Group], [Upper set content and lower set content different] will be displayed.

NOTICE

- The control setting for the outdoor unit will be applied within 15 minutes after being set.
- After creating a CSV file, when modifying the group registration or the block registration, the CSV file cannot be read. Always read the CSV file at the same condition of the group or the block as creating the CSV file.
- After creating a CSV file, when modifying the settings shown below, the CSV file cannot be read. Always read the CSV file at the same settings as creating the CSV file.
 - *Management software: [Language] or [Temp. display format]
 - *Management computer: [Date and time formats] - [Long Date], [Customize Format] - [Numbers] - [Decimal symbol] or [List separator]
- It takes around 10 seconds for each group and each block to [Save CSV] or [CSV reading]. Once executed, it is impossible to cancel.

OPERATION

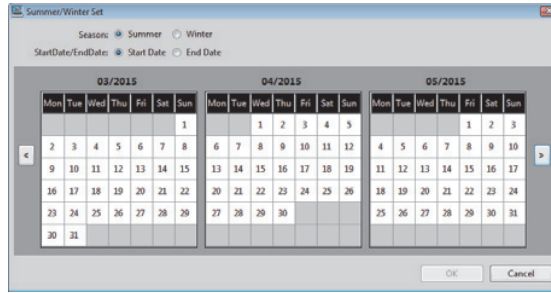
(2) Biweekly

Show and set the content of the schedule selected into the tree with 24 hours from Monday to Sunday.

NOTICE

- When summer/winter season is set, please check-off the set items after the year changes.

Set period for summer and winter season.



Set the start and end date of the summer season and winter season. Summer season is shown in pink and winter season in blue.

Select whether to [Overwrite all] or [Overwrite only where changed].

Click each tab to switch display.

Save the current schedule data as a csv file.

In this area are shown the schedule timetable for the All/H-LINK/block/group selected in the tree.

Click [Done] after setting is completed.

[Copy], [Paste], or [Delete] the selected schedule item.

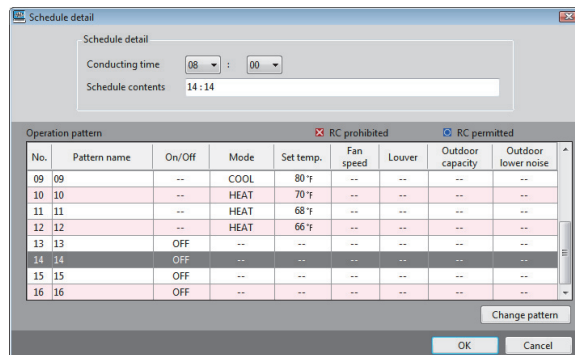
Scheduled contents set at the selected date and time will be shown. Up to 16 items can be set for each day of for week.

Switch the timetable to [Standard] season, [Summer] season, or [Winter] season specific.

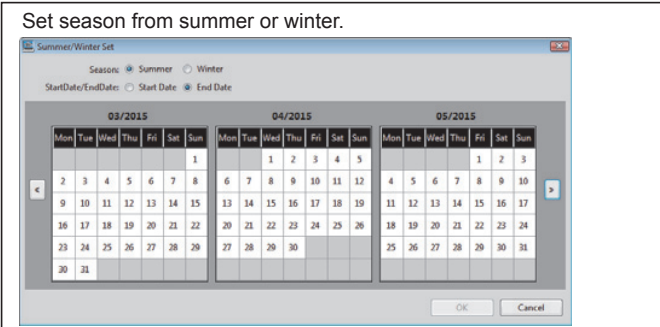
[Add], [Modify], [Duplicate], or [Delete] the selected scheduled contents.

NOTE:

The schedule is executed by each [Group]. If the content registered in [All], [H-LINK], or [Block] does not agree with the content registered in this subordinate [Group], [Upper set content and lower set content different] will be displayed.



(3) By each specific day
 The timetable for a specific day (1 through 5) will be shown. Set schedule from the timetable.



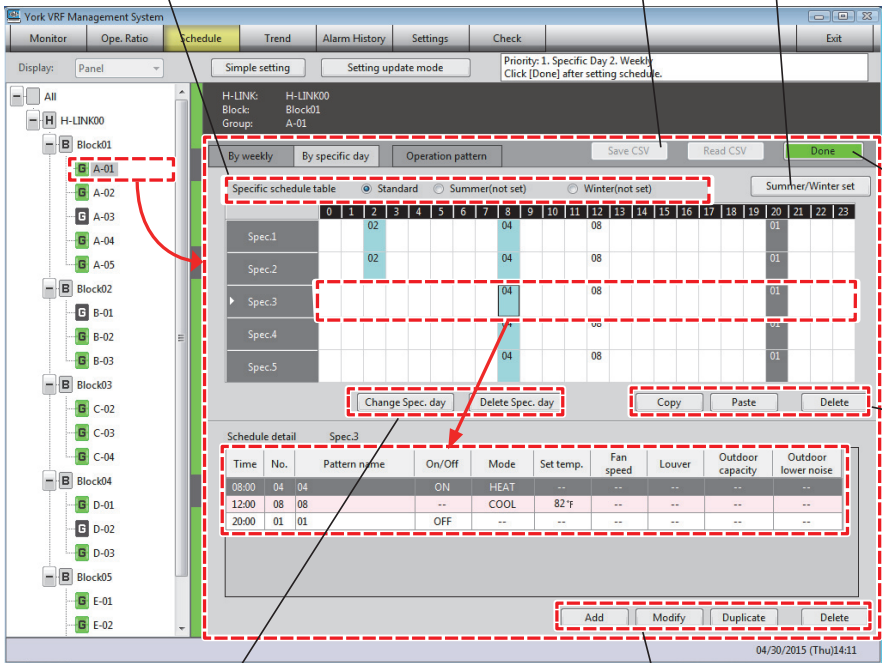
Set the start and end date for the summer season and winter season. The Summer season is shown in pink and winter season in blue.

NOTICE:
 • When summer/winter season is set, please check the set items after the year changes.

Switch the timetable to for [Standard] season, [Summer] season, or [Winter] season specific.

Save the current schedule data as a csv file.

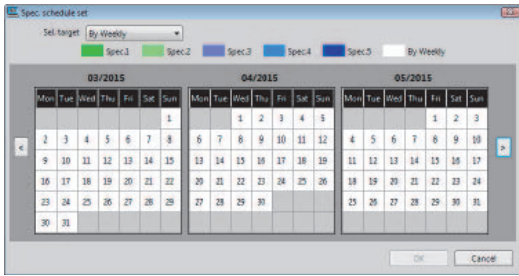
In this area are shown the schedule time table for the All/H-LINK/block/group selected in the tree.



Click [Done] after setting is completed.

[Copy], [Paste], or [Delete] the selected scheduled item.

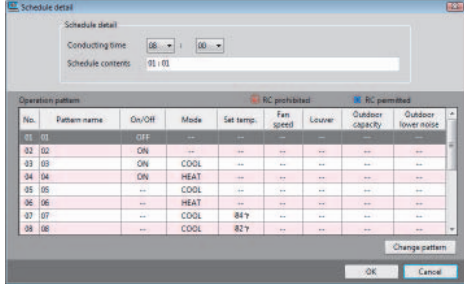
Change or delete the specific day. Select a specific day number from the list, and date from the calendar.



NOTE:
 • The specific day can be set to the end of the following year.
 • For continuous use of the same specific day setting, specific day contents need to be re-registered for the year.

NOTE:
 • If searching for a specific day when to register, click on [Change spec.day] and select that day on the calendar.

[Add], [Modify], [Duplicate], or [Delete] the selected scheduled contents.



OPERATION

(4) Checking running pattern

Show the scheduled running pattern from the All/H-LINK/block/group selected from the tree listing.

Scheduled running pattern for the All/H-LINK/block/group selected in the tree will be shown in a list.

No.	Pattern name	On/Off	Mode	Set temp.	Fan speed	Louver	Outdoor capacity	Outdoor lower noise
01	01	OFF	--	--	--	--	--	--
02	02	ON	--	--	--	--	--	--
03	03	ON	COOL	--	--	--	--	--
04	04	ON	HEAT	--	--	--	--	--
05	05	--	COOL	--	--	--	--	--
06	06	--	HEAT	--	--	--	--	--
07	07	--	COOL	84°F	--	--	--	--
08	08	--	COOL	82°F	--	--	--	--
09	09	--	COOL	80°F	--	--	--	--
10	10	--	HEAT	70°F	--	--	--	--
11	11	--	HEAT	68°F	--	--	--	--
12	12	--	HEAT	66°F	--	--	--	--
13	13	OFF	--	--	--	--	--	--
14	14	OFF	--	--	--	--	--	--
15	15	OFF	--	--	--	--	--	--
16	16	OFF	--	--	--	--	--	--

Up to 16 running patterns can be registered.

Each running pattern can be named.
*The maximum allowable limit for characters is 16.

Change the schedule pattern of the selected item.

Edit operation pattern

Indoor unit: Block01 Outdoor unit: Pattern name: 01

All RC prohibit/permit: All prohibited

On/Off: ON Individ. prohibit/permit: Prohibited

Mode: COOL Individ. prohibit/permit: Prohibited

Set temp.: 82°F Individ. prohibit/permit: Prohibited

Fan speed: -- Individ. prohibit/permit: Prohibited

Louver: -- Individ. prohibit/permit: Prohibited

OK Cancel

↔

Edit operation pattern

Indoor unit: Block01 Outdoor unit: Pattern name: 01

Capacity: 80%

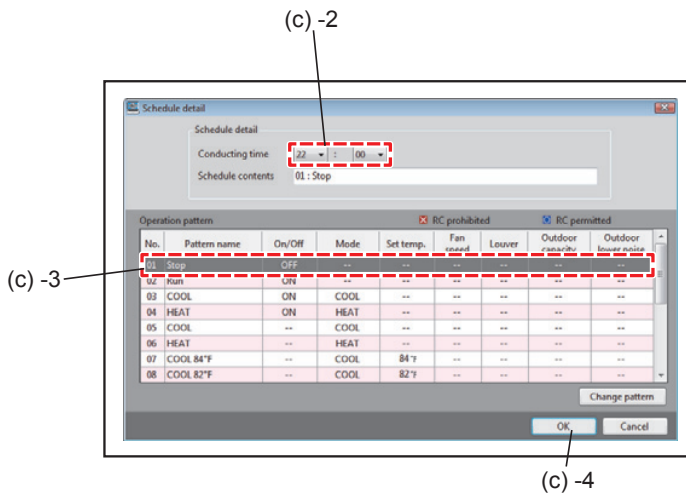
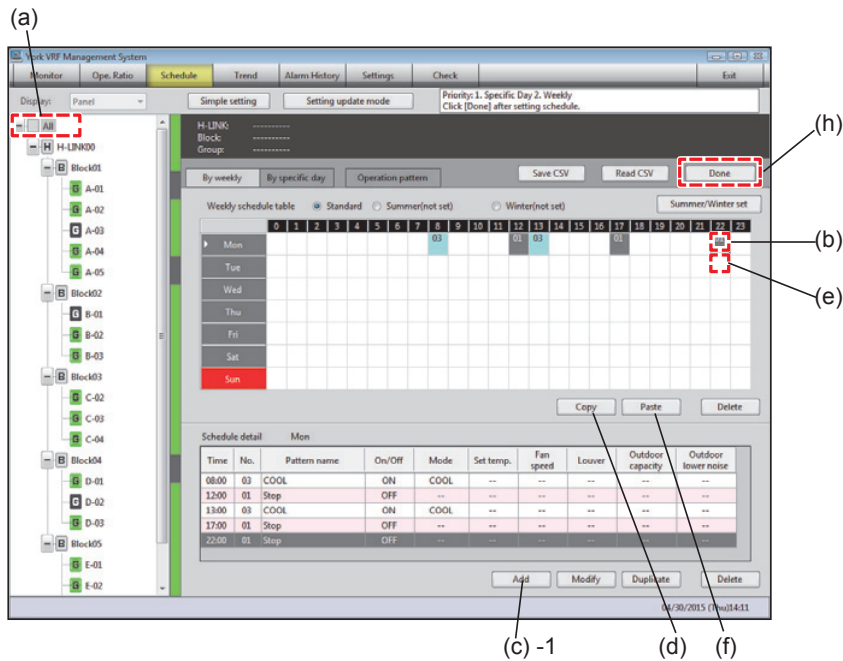
Lower noise: 01

OK Cancel

(5) Schedule setting sample
 The procedure to set the schedule below is as follows.

Purpose	To avoid unintended operation
Object	All
Day of week	Monday-Friday
Time	22:00
Setting	Stop

- (a) Select All from the tree.
- (b) Select day and time (Monday, 22:00)
- (c) -1 Click [Add].
- (c) -2 Select 22:00.
- (c) -3 Select Stop.
- (c) -4 Click [OK]
- (d) Click [Copy]
- (e) Select day and time (Tuesday, 22:00)
- (f) Click [Paste].
- (g) Repeat items (e) > (f) until schedule is set on Friday.
- (h) Click [Done] after setting is completed.



2 Simple Setting

NOTE:

- Schedule the setting to take effect 15 minutes after the setting is made.
- In [Simple setting], schedule with [summer/winter] or [Specific day 1-5] cannot be registered. To utilize those functions, set from [by each day of week] or [by each specific day] setting.

[Simple setting] is a user-friendly function in that schedules can be created and registered easily by following a procedure of selecting (a) Category, (b) Day of week and time, (c) Schedule contents, (d) Checking the contents and (e) Completing the setting.

Click on [Simple setting].

(a) Select Category (All/H-LINK/block/group)

Click [Next]

(b) Select time of day and day of week.

Click [Next]

(c) Select schedule contents

Click on [Change pattern] to change the running pattern.

Click [Next]

(d) Check schedule contents

Click [Next]

(e) Completing setting

Click this button to continue setting schedule by simple setting function. Items (a)-(e) can be repeatedly scheduled.

Click [Exit]

Click [Done] after setting is completed.

NOTE:

- Schedule items are applied to each [Group]. Schedule item registered to [All], [H-LINK], and [Block] may not be consistent with those in the subordinate [Group]. Please check the contents in each [Group] when a change is made.
- If the content registered in [All], [H-LINK], [Block], does not agree with the content registered in this subordinate [Group], [Upper set content and lower set content different] will be displayed.

Trend

In this section are shown graphics for elapsed operation time, elapsed thermo-ON time, average set temperature, average air intake temperature, average ambient air temperature, and average indoor air temperature.

Trend data will be shown as follows:

- The display format is [Panel] or [Layout]. When [Panel] is selected, [View by] is selectable from [H-LINK], [Block], [Group] or [Unit].
- Trend items will be displayed to the hour. Data from two years prior, or after Test Run completion only; to the current time will be available. For example, if the current date and time is: (07/01/2015 13:25), the available data window will be expressed as: 07/01/2013 14:00—07/01/2015 12:59.
- Available items are expressed as: elapsed operation time, elapsed thermo on time, average set temperature, average air intake temperature, average ambient air temperature, and average indoor air temperature.
- Data can be summarized by [by each hour], [by each day], [by each week] or [by each month].
- Graphics can be printed out.
- Data composed of graphics can be saved as a csv file.

NOTE:

- The recording interval for temperature data for graphics creation is five minutes and one minute for elapsed running time and thermo-ON time.
- Average ambient air temperature and average indoor air temperature may differ from the actual air temperature depending on location.
- Average indoor air temperature is available only when "01" (RC Thermistor) or "02" (Average of intake thermistor and RC thermistor) is set to "C8 (RC thermistor)" in RC optional settings. The temperature will coincide with the set value.
- When using the power saving function of the RC, the ambient air temperature may differ from the actual air temperature.
- When the indoor unit is shutting down, the air intake temperature will not be displayed.
- When alarms: 60, 61, 64, and 65 occur, because of a communication error between the AC and the adapter is indicated, the actual condition may not be shown.

NOTICE:

- When selecting [by each week] in [Time], one week is expressed as from Monday to Sunday. If the start day is not Monday or the last day is not Sunday, the calculation for this week will be recognized as six days or less.

Example:

If the period starts on 01/01/2015, 01/01/2015 to 01/04/2015 will be considered as 5th week of December, 2014. Similarly, 01/05/2015 to 01/11/2015 will be considered as 2nd week of January, 2015. As such, the week of 01/12/2015 to 01/18/2015 is recognized as 3rd week of January, 2015. Lastly, the week of 02/02/2015 to 02/08/2015 is recognized as the as 2nd week of February.

1 Display Trend

[1] Single selection

Use the single selection mode to display details one unit/group/block/H-LINK increments in chronological order. In this mode, a maximum of 16 trend graph screens can be displayed.

(1) Procedure

- (a) Select a display format from [Panel] or [Layout]. If there is no layout data, it will be selected as [Panel].
- (b) Select the selection mode as [Single sel.].
- (c) If a panel or an icon is selected, the trend pop-up window of the selected unit/group/block/H-LINK will be displayed. It is possible to show 16 windows, maximum.
- (d) Select the type of countdown time unit from the [Time] pull down menu.
Select [by each hour], [by each day], [by each week], or [by each month].
- (e) Select the countdown period.
The countdown period can be specified by the hour in a range from the current time up to two years prior. When specified, select this time period after Test Run is completed. Click on the icon for the year, month, and day from the calendar. Select time from the Time pull down menu.
- (f) Select the item to display.
Select one or more bar graph items and one or more line graph items.
- (g) Click on the [Display] button.



NOTICE:

- Because it takes around three minutes per month per unit, depending the selected content of the unit, group, or block, the potential exists that it can take one hour or more to display the graph. If it takes too much time, decrease the period or the number of units/groups/blocks/H-LINKs to display and click on [Display].

(2) Display content

The screenshot shows a software window titled 'Trend' with a 'Detail' view. The interface includes a top navigation bar with 'Time' set to 'by each hour', a date range from '04/01/2015 (Wed)' to '04/30/2015 (Thu)', and a 'Display' button. The main area contains two graphs: a line graph at the top and a bar graph at the bottom. The line graph plots 'Ave. set temp.' (red), 'Ave. suc temp.' (blue), 'Ave. amb temp.' (green), and 'Ave. out temp.' (purple) over time. The bar graph plots 'Running time' (green) and 'Thermo-On time' (red) in minutes. A red dashed box highlights the graphs, and a callout box explains that the enlarged display can be done from the actual size up to five times larger. Other callouts describe the data series and provide instructions for printing, saving to CSV, and closing the graph.

Name of selected unit/group/block/H-LINK.

The enlarged display can be done from the actual size up to five times larger.

Display the line graph.
 - (Red) Average set temperature
 - (Blue) Average suction temperature*1
 - (Green) Average ambient air temperature *2
 - (Purple) Average outdoor temperature

*1 The average suction temperature will not be indicated when the indoor unit has stopped.
 *2 The average ambient air temperature is available only when 01 (RC Thermistor) or 02 (Average of intake thermistor and RC thermistor) is set to "C8 (RC thermistor)" in RC optional settings. The temperature will adjust to the set value.

Print out the displayed graphics. The margin areas occupied by the scroll bar are not printed.

Save the current data to a csv file as a numerical value.

Close this trend graph.

Print
 CSV Save
 Close

Display the bar graph.
 (Green) Accumulated running time.
 (Red) Accumulated thermo-on time.

NOTICE:

- A small portion of all information might not display correctly depending on the type of air conditioner unit. Contact your dealer or distributor for details.

For facility Units:

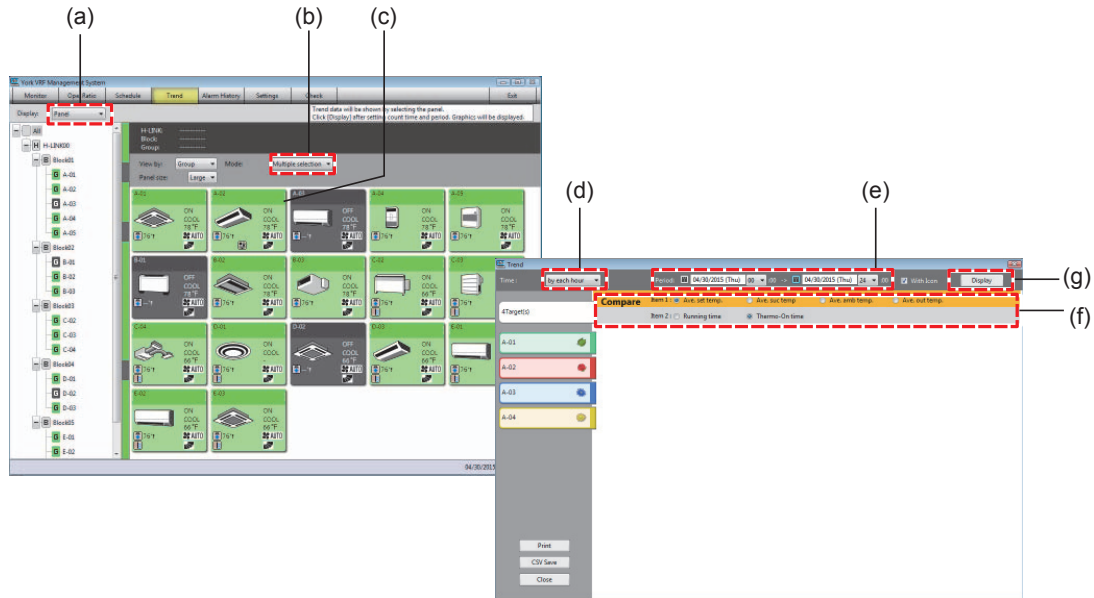
- Average set temperature, average air suction temperature, average ambient air temperature and average outdoor air temperatures are not available.
- Overall running time can be shown when monitoring ON and OFF status.
- Overall thermo-on time is zero (0).

[2] Multiple Selection

Use the multiple selection mode to display and compare multiple units/groups/blocks/H-LINKS. In this mode, it is possible to display and compare a maximum of eight units/groups/blocks/H-LINKS.

(1) Procedure

- (a) Select the display format from [Panel] or [Layout]. If there is no layout data, it will be fixed selected as [Panel].
- (b) Select the selection mode as [Multi sel.].
- (c) If a panel or an icon is selected, the trend pop-up window of the selected unit/group/block/H-LINK will be displayed. It is possible to display a maximum of eight windows.
- (d) Select the type of countdown time unit from the [Time] pull down menu. Select [by each hour], [by each day], [by each week], or [by each month].
- (e) Select the countdown period. The countdown period can be specified by the hour in a time range from the current time back to two years prior. When specified, select the period after Test Run is completed. Click on the icon for the year, month, and day from the calendar. Select the time from the [Time] pull down menu.
- (f) Select the item to display and compare. Select one item each from [Item 1] and [Item 2].
- (g) Click on the [Display] button.



NOTICE:

- Because it takes around three minutes per month per unit, depending the selected content of the unit, group, or block, the potential exists that it can take up to one hour or more to display the graph. If it takes too much time, decrease the period or the number of units/groups/blocks/H-LINKS to display and click on [Display].

(2) Display content

The number of selected unit/group/block/H-LINK.

Name of selected unit/group/block/H-LINK.

Display the line graph selected in [Item 1].
The average suction air temperature will not be displayed when the indoor unit is shutting down.
The average ambient air temperature is available only when 01 (RC Thermistor) or 02 (Average of intake thermistor and RC thermistor) is set to "C8 (RC thermistor)" in RC optional settings.
The temperature will adjust to the set value.

Display the bar graph selected in [Item 2].

Close this trend graph.

Print out the displayed graphics. The scroll margin areas are not printed.

The enlarged display can be done from the actual size up to five times larger.

Save the current data to a csv file as a numerical value.

NOTICE:

- A small portion of graphics might not display correctly depending on the type of air conditioner unit. Contact your dealer or distributor for details.

For facility Units:

- Average set temperature, average air suction temperature, average ambient air temperature and average outdoor air temperature are not available.
- Accumulated running time can be displayed when monitoring ON and OFF status.
- Accumulated thermo-ON time is zero (0).

OPERATION

All of these items can be displayed according to the table below.

Item	Available Time Period	Shown in csv file in
Elapsed operation time	Elapsed operation time can be calculated down to the last second prior to the stroke of the next hour. Note that 15 minutes must be allotted for every hour for calculation purposes. If not, elapsed operation time can be calculated down to the last second prior to the stroke of the next hour.	min.
Elapsed thermo-ON time	Sample: If the current time is 07/01/2015 13:25, operation time will be tabulated until 07/01/2015 12:59. If the current time is 07/01/2015 13:05, operation time will be tabulated until 07/01/2015 11:59.	min.
Average set temperature	Average temperature can be calculated with the value at the last time the clock hit o'clock.	°F / °C
Average air intake temperature	Note that 15 minutes must be allotted for every hour for calculation. If not, average temperature will be calculated to the existing temperature value at the last second prior to the stroke of the next hour.	°F / °C
Average ambient air temperature	Sample: If current time is 07/01/2015 13:25, temperature until 07/01/2015 12:59 will be affected the average. If current time is 07/01/2015 13:05, temperature until 07/01/2015 11:59 will be affected to the average.	°F / °C
Average indoor air temperature		°F / °C

Alarm History

1 Display Alarm History

History record of alarms occurred on this system will be shown in a list.

Up to 50,000 alarms (per system) can be recorded. When the total number of alarms exceeds this threshold, the oldest alarm record is deleted to create space for a new alarm record.

In this area are shown alarms occurred on All/H-LINK/block/group selected on the tree.

Reload alarm history listings.

Save the current alarm history list as a csv file.

Print out the current alarm history list.

Current alarm information will run from right to left as on a teleprompter.

<Alarm Codes>

Alarm Code	Contents	Active to Take
00-FF (Excludes 60,61, 62,63,64 and 65)	Alarm displayed on Air Conditioners	Refer to the installation and operation manual and the user's manual for each air conditioner unit.
60	Central controller-outdoor unit communication error (when more than 1 unit(s) operating)	A communication error has occurred on the H-LINK between the adapter for this system and the outdoor unit. Check if the H-LINK is properly connected.
61	Indoor unit- central controller communication error (when the indoor unit is operating)	A communication error has occurred on the H-LINK between the adapter for this system and the indoor unit. Check if the H-LINK is properly connected.
64	Central controller - outdoor unit communication error (when all indoor units are not operating)	A communication error has occurred on the H-LINK between the adapter for this system and the outdoor unit. Check if the H-LINK is properly connected.
65	Indoor unit - central controller communication error (when the indoor unit is not operating)	A communication error has occurred on the H-LINK between the adapter for this system and the indoor unit. Check if the H-LINK is properly connected.
S20	Insufficient Free Space on Hard Disk Drive	Remaining free space on the hard disk is less than 1GB. Clear the memory to create a margin of more than 1GB of free space or substitute the computer for another with more memory.
S21	Data Could Not Be Written	This error may be caused by memory shortage or a device failure. Substitute the hard disk with another if this error frequently occurs.
S22	Data Could Not Be Read	This error may be caused by device failure. Substitute the hard disk with another if this error frequently occurs.
S23	Adapter Communication Failure	Check if the power to the adapter is ON, and that LAN is properly wired between the adapter and the management computer, and that the power to the hub is ON.
S24	DST Setting Failure	Check if the power to the adapter is ON, and that LAN is properly wired between the adapter and the management computer, and that the power to the hub is ON.
S41	Invalid Download Data	This error can be caused by memory shortage or device failure. Substitute the hard disk with another if this error frequently occurs.
S42	Data Could Not be Written	Check if the power to the adapter is ON, and that LAN is properly wired between the adapter and the management computer, and the power to the hub is ON. This error may be caused by memory shortage or device failure. Substitute the hard disk with another if this error frequently occurs.
S43	Setting Data Could Not be Read	This error may be caused by device failure. Substitute the hard disk with another if this error frequently occurs.

Settings

Please refer to the installation and operation manual for setting the following items:

- Network register
- Unit register
- Remote Controller (RC) Group register
- Group register
- Block register
- Tenant register
- Layout register
- Indoor
- Outdoor
- Ext. input
- Ext. output
- Language
- Locale

1 Security Setting

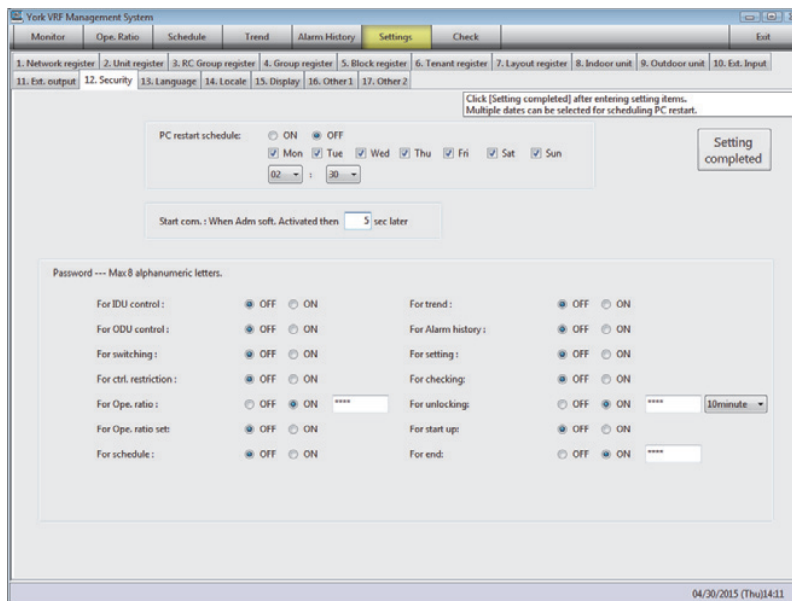
Setting schedule for computer restart and password for control item and display.

(1) Go to [Settings] > [Security setting] to set schedule for management computer to restart itself.

It is strongly recommended that you restart the management computer at least once per week or more often.

Set the schedule 10 minutes after the current time and reset the computer to see if the software properly completes restarting process, and then utilize this function.

Set the restarting schedule to a time when software monitoring activity is at low ebb, preferably during the late evening hours. Do not perform a schedule reset within one hour after midnight. Do not attempt to perform any kind of a reset during the transition period between (2am to 3am) on Sundays during the switch to daylight savings time or back to standard time. (A disruption in the logic of the timing mechanism will occur.)



NOTICE:

- To properly complete restarting process, unlock the password if security is set in BIOS.

(2) Set the password for each of the displays and management of controlling items.

Passwords are limited to eight characters. Passwords can be set for each of these items, respectively.

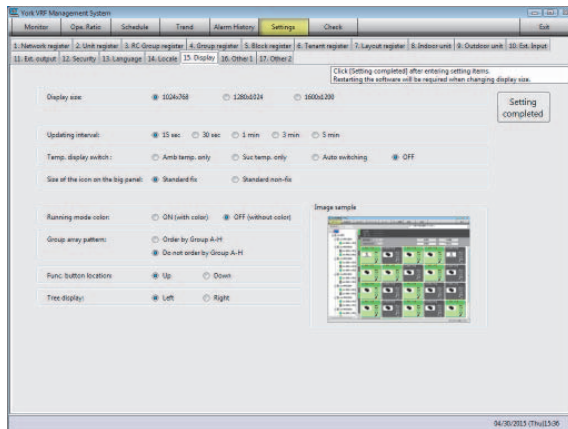
Passwords	When to use	Notes
Password for Indoor Unit Control	To authorize certain users to control indoor units.	
Password for Outdoor Unit Control	To authorize certain users to control outdoor units.	
Password for Switching Display	To authorize certain users to switch the window. The following functions will be protected by this password. <ul style="list-style-type: none"> • Selecting the monitoring layout. • Changing "View by" section to monitor units. • Changing the panel size in the monitor. • Selecting items from tree 	Setting display layout, panel size or tree will affect other windows. To avoid any collateral changes, it is strongly recommended to set passwords for each of these functions.
Password for Control Restriction	To authorize certain users to switch control restrictions.	The default password is "2468".
Password for Ope. Ratio Display	To authorize certain users for access to operation ratio data.	
Password for Charge Setting	To authorize certain users for checking and changing set items for operation ratio.	The default password is "2468"
Password for Schedule Display	To authorize certain users for checking and changing set items for schedule.	
Password for Trend Display	To authorize certain users to display the trend window.	
Password for Alarm History Display	To authorize certain users to display alarm history.	
Password for Setting Display	To authorize certain users to display Settings window. (Including password setting)	It is strongly recommended to set this password for security purposes.
Password for Checking Display	To authorize certain users for checking display.	The default password is "1357".
Password for Unlocking Display	To authorize certain users to unlock the display after inactivation period is passed.	
Password for Start Up	To authorize certain users to restart this system.	This password will not be required upon restarting at the scheduled restart.
Password for Exit	To authorize certain users to close down the system.	The default password is "2468".

NOTE:

- Passwords can be changed and modified from the settings display. It is strongly recommended to set For security purposes, it is strongly recommended to set the password for setting display.

2 Display / Sound Setting

Configuration of the display for the management computer.



(1) Go to [Settings] > [Display].

(2) Set the display size for this software.

The window cannot display correctly if the size set is bigger than the size of the Management Computer screen. Some items may be shown in smaller size when clicking on the maximize button (At the right upper end of the windows bar). Proportion each of the windows in this section.

The resolution where bar scroll will not be necessary to show scroll contents are as follows.

Display	Maximum number of panel display		
	Display Size	1024×768	1280×1024
Large	5×4=20	6×6=36	8×7=56
Small	10×13=130	13×20=260	17×24=408
Layout	10-30 (approx.)	20-40 (approx.)	30-60 (approx.)

* If setting [Order by Group A-H] in the group array pattern, the number of available displays may be small.

NOTICE:

- The display size above is a standard window size. They are shown in full-window when the maximize button on the upper right is selected.






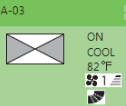
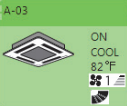




(3) In the updating interval, set the update cycle for current status.

(4) Set the temperature display switch of the monitor.

NOTE:

- To display the ambient air temperature, perform function selection C8 on the wired controller.
- Some units cannot display the ambient air temperature or the suction air temperature.
- When using the power save function of the wired controller, the displayed ambient air temperature may differ with the actual air temperature.

(5) Select the icon size for large panel. To fix the standard size or use original size when registered.

		[Standard fix]			[Standard non fix]		
Layout	Size	Extra small	Small	Standard	Extra small	Small	Standard
		Icon					
Large Panel							

NOTICE:

- Select [Standard fix] when using a small icon in the layout display.

(6) Select whether or not the panels shall show the running mode by way of color or not.

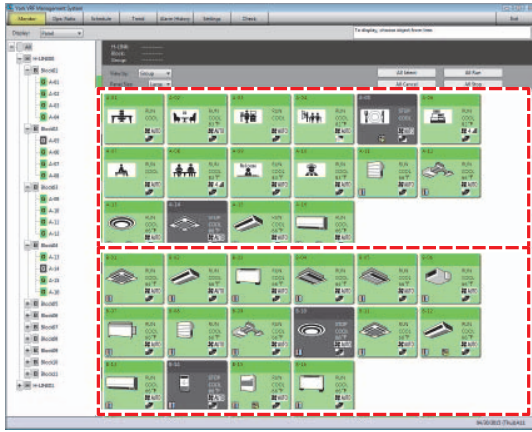
Running mode color setting	ON (Cool)	ON (Heat)	ON (Dry)	ON (Fan)	ON (Auto)	ON (In multiple mode)	Alarm	OFF
ON (with color)	Light Blue	Orange	Sea Green	Light Grey	Light Blue and Orange	Light Purple	Red	Grey
OFF (without mode color)	Lime Green						Red	Grey

NOTICE:

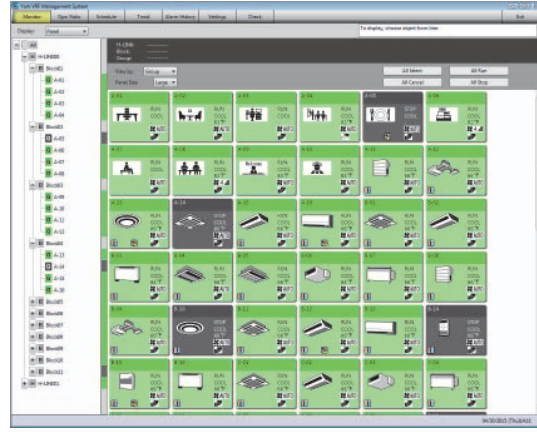
- The display size above is a standard window size. They are shown in full-window when the maximize button on the upper right is selected.
- In cases of simultaneous occurrence, the color will default according to the following priority.
“Alarm” > “Other status”
- In displaying a group or block that contains multiple units, the color will default according to the following priority:
 - (a) Shows in red (alarm) if one or more air conditioners are in an alarm state.
 - (b) Shows in the color indicative of a running condition if one of the air conditioners is not in an alarm state and one or more air conditioners are running.

OPERATION

(7) Select whether or not to insert line feed alphabetically.

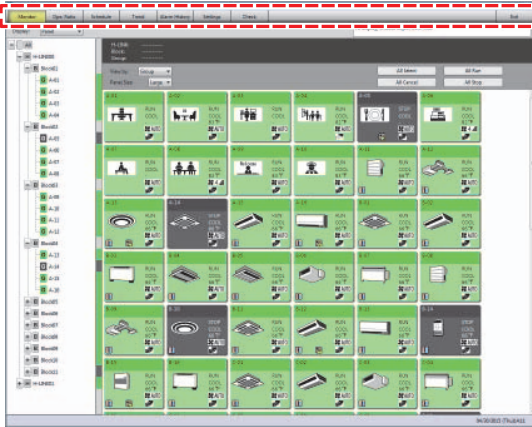


Set [Order by Group A-H]

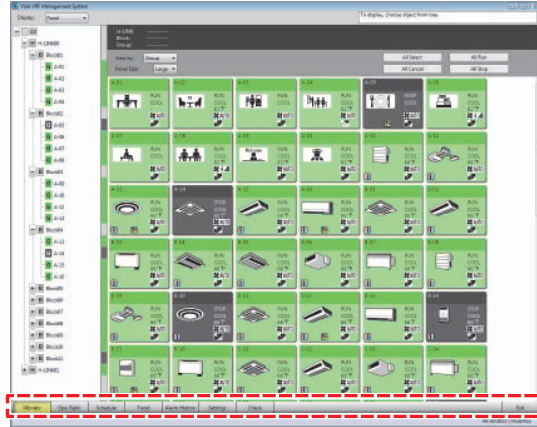


Set [Do not order by Group A-H]

(8) Select the location of the function buttons.

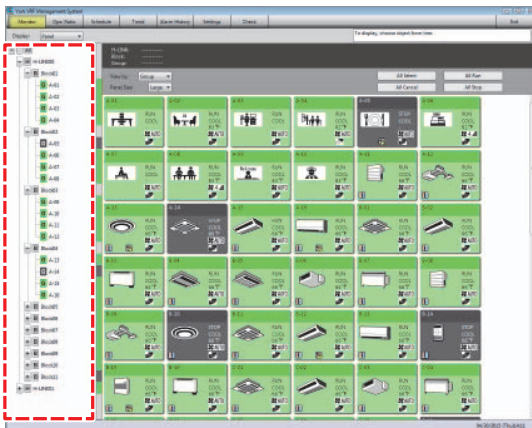


Set [Up]

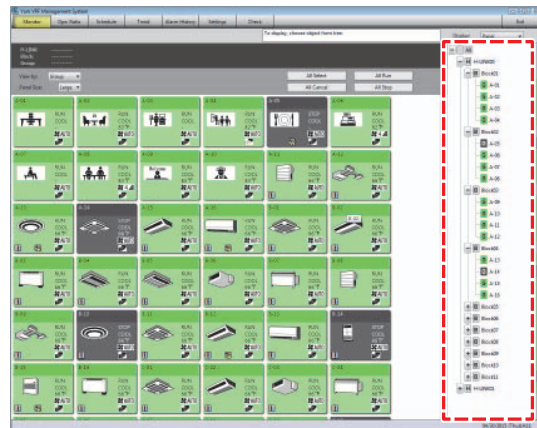


Set [Down]

(9) Select the location of the file status tree.



Set [Left]



Set [Right]

Check

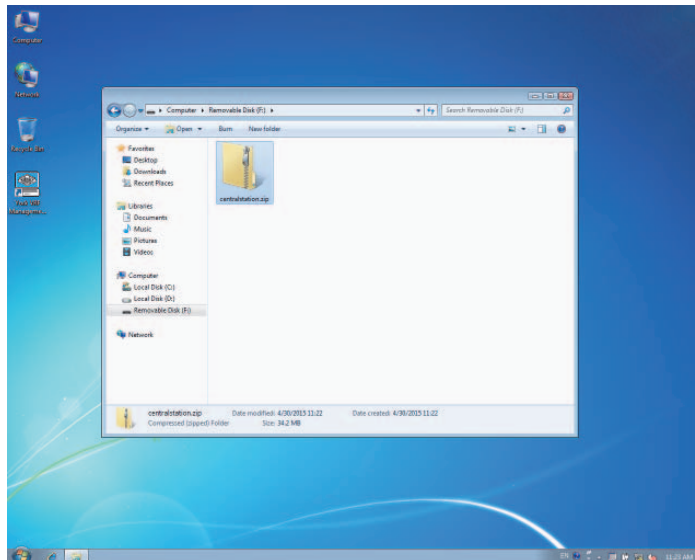
Refer to the **Service and Maintenance** section of the installation and maintenance manual (P5415508).

Service and Maintenance

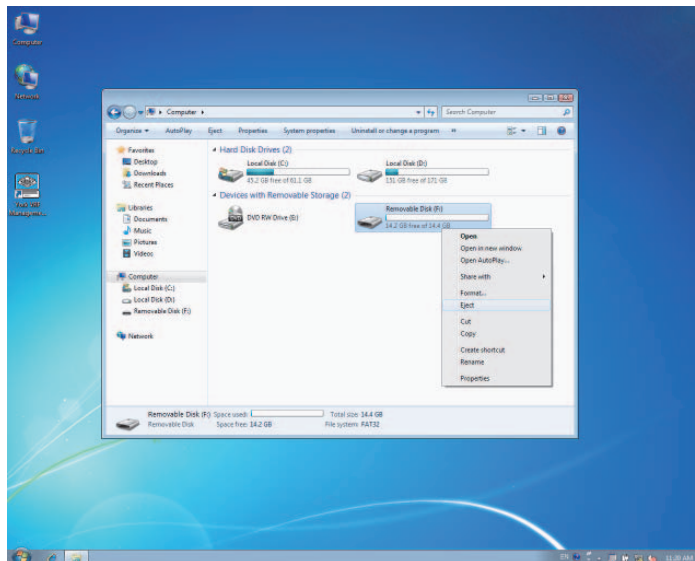
1 Data Backup

Periodic backups can ensure prompt recovery in case the management computer crashes. Please backup data after each setting, not only upon Test Run, but for other operation periodically.

- (1) Connect a USB flash drive or other external hard drive to the management computer.
- (2) Exit out of the management software.
- (3) The “/centralstation” folder is saved under the drive in which the software is installed. Copy the file over to a USB flash drive or other external memory device connected to the computer.



- (4) To remove the USB flash drive or other external memory device, select “Safely remove hardware” on the task bar.

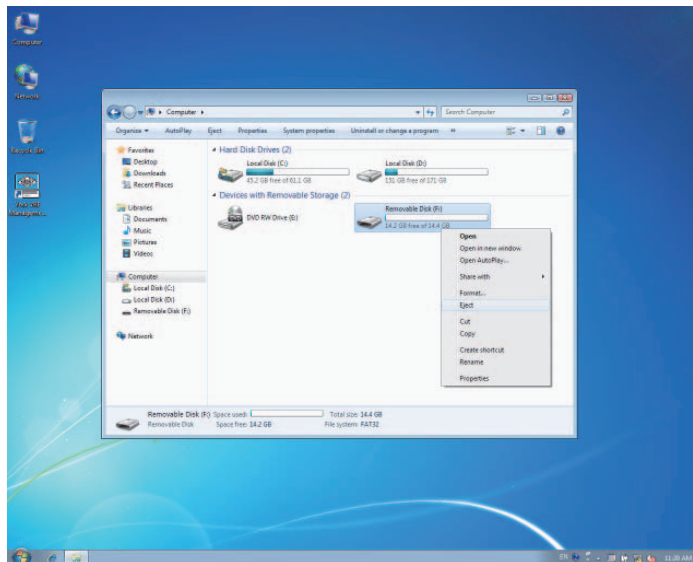


2 How to Restore with Backup Data

When restoring the computer with backup data saved in 1 after a computer crash or other faults, please follow the procedure described below:

Ensure that network settings such as the IP address are identical to those on the computer prior to computer or system crash.

- (1) Install the management software to the new management computer and set the IP address. As for the installing procedure, please refer to installation and maintenance manual (P5415508).
- (2) Connect the USB flash device or other external hard drive with backup data saved in 1 to the new management computer.
- (3) Overwrite the "/centralstation" folder, from the USB flash memory or other external hard drive, into the drive in where the software is installed.
- (4) To remove the USB flash drive or other external hard drive, select "Safely remove hardware" from the task bar.



2.2.9 Computerized Central Controller Software / Operation Ratio

Model: CCCS01

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1. Before Usage

1.1 Preface

- This software applies to normal type of air conditioner and its usage is limited for domestic use only.
- Please do not install this system in following places where installation may cause damage to the adapter.
 - Places where oil (including machine oil) mists or stream drift.
 - Places where sulfide gas form as hot spring drifts.
 - Places where flammable gas may be generated or exist.
 - Places where high in salt contents surrounding as coast regions.
 - Places where atmosphere of acidity and alkalinity humid place.
- In case of using a medical equipment generating electro-magnetic waves, the system should be installed in an area where free from direct radiation to avoid malfunction.
The surface that is emitting electro-magnetic waves should not directly face the system.
In case of using those equipment and radios generating electro-magnetic waves, this software should be installed where a location is at least 9.8 feet (3 m) away from the equipment to avoid any influence on radiation propagation in the air.
- The reference pictures printed in this manual are only sample. The display may differ from the actual window.

[Symbols Used in This Manual]

 **DANGER** : Immediate hazards which WILL result in severe personal injury or death.

 **CAUTION** : Hazards or unsafe practices which could result in minor personal injury or product or property damage.

NOTE: This sign indicates other alert information than DANGER.

NOTICE: Useful information for operation and/or maintenance.

1.2 Safety Summary

- Please carefully read this section before installation of the software.
- Contents with “DANGER” shows the certain cases where improper operation WILL result in severe personal injury or even death. For your safety, please follow this instruction.
- After installation is completed, conduct test running to ensure that no faulty condition is detected.
- Please also ensure to backup the data according to this manual upon completing installation.
- Keep this manual in a safe place for users' reference.

Installation and electrical work

 **DANGER**

- Contact your distributor or qualified engineer for Installation work. Improper installation can cause electric shock, fire, or unexpected accidents.
- To avoid any electric shock or accident, ask the distributor to have electric work done by qualified electrician.
- This system is for computer use only. If using with a general audio or music reproducing device, depending on the high level of sound, it may result in device damage or effects on the body.

 **CAUTION**

- Do NOT expose this system in direct sunlight or keep it in a place where there is a high temperature or humidity.

In Operation	
⚠ DANGER	<ul style="list-style-type: none">• Never operate the equipment with wet hands. It will cause electric shock.
	<ul style="list-style-type: none">• Immediately turn the power off if the safety equipments (such as breaker) frequently turns on, or when safe operation can not be assured. Earth leakage or over current can trigger electric shock, fire, and/or blowout. Please contact distributor or your dealer.
	<ul style="list-style-type: none">• Immediately turn the power off if unordinary condition (burnt smell, etc) occurs. Operation under unordinary condition can cause fire, or/and electric shock. Please contact distributor or your dealer.
	<ul style="list-style-type: none">• Do not disconnect the adapter from the computer while operation. Data in the memory can be broken.

For Repair and Remove	
⚠ DANGER	<ul style="list-style-type: none">• Please contact the distributor or your dealer for repair. Faulty/poor maintenance can cause electric shock and/or fire.
	<ul style="list-style-type: none">• Please contact the distributor or your dealer upon removing the adapter. Improper installation and removal can cause electric shock, fire, or unexpected accidents.

Other Important Notice	
⚠ DANGER	<ul style="list-style-type: none">• Keep the adapter away from water while cleaning. This adapter is equipped with electrical parts, which water can cause electric shock.
	<ul style="list-style-type: none">• Do not convert or change electric wiring. It can cause serious electric shock or other unexpected accidents.

1.3 How to Read This Manual

- This manual consists of **System Configuration**, **Calculating Air Conditioner Operation Ratio** and **Maintenance and Service** section.

System Configuration

- In this chapter are described the characteristics of the system.

Calculating Air Conditioner Operation Ratio

- In this chapter are described how to display operation ratio of each month and each data in detail.

Maintenance and Service

- In this chapter are described what are included in our service.

1.4 Important Notice

- Carefully read Installation Manual (P5415508) and Operation Manual (P5415517) before utilizing the functionality.
- The system can calculate correctly only when the management PC, the adapter and all other devices are working correctly. Accurate calculation may not be available upon device failure or other unexpected conditions. Please discuss the alternative plan (another calculation method independent from the computer and adapter condition) with your customer before utilizing the system.
- Operation ratio can not be calculated when the computer and/or the management software is OFF. Ensure the computer and Management Software are turned ON. Click calculation “Enable” button in “Ope. ratio setting” section before operation.
- This system will perform and save the calculation depending on the setting, each day or each hour. When set for each day, the calculation will be saved each day during 0:00 a.m. to 1:30 a.m..
If the Management software stops during calculating or saving result, the calculation result of the day before won't be saved. In that case, perform and save the next day calculation.
When set for each hour, the calculation will be saved each hour from 00 minutes to 30 minutes.
If the Management software stops during calculating or saving result, the calculation result of the hour before won't be saved. In that case, perform and save the next hour calculation.
- Supported calculation method may vary on adapter types. Refer to the installation manual (P5415500) for detail.
- The reference pictures printed in this manual are only sample. The display may differ from the actual window.
- In case that a pop-up window like the control window cannot appear entirely on the screen, change the taskbar size with the point of the mouse so that the hidden part of the pop-up window can be indicated.

Basic Operation Screen

The screenshot shows the 'Ope. Ratio' screen in the York VRF Management System. The interface includes a menu bar with 'Monitor', 'Ope. Ratio', 'Schedule', 'Trend', 'Alarm History', 'Settings', 'Check', and 'Exit'. Below the menu is a 'Display:' dropdown set to 'Panel'. A tree view on the left shows a hierarchy of H-LINK00, Block01 through Block05, and sub-blocks A-01 through A-16. The main area contains a table with columns for 'Day and time', 'Name/H-LINK No.', 'Running time [min]', and 'Thermo-ON time [min]'. The table data is as follows:

Day and time	Name/H-LINK No.	Running time [min]	Thermo-ON time [min]
34/24/2015	H-LINK00	57240	50069
34/25/2015	H-LINK00	223100	223100
34/26/2015	H-LINK00	240000	238806
34/27/2015	H-LINK00	230400	228960
34/28/2015	H-LINK00	214124	210207
34/29/2015	H-LINK00	180030	145840
34/30/2015	H-LINK00	0	0
Total		1144894	1097982
34/24/2015	H-LINK01	51982	49559
34/25/2015	H-LINK01	223648	171623
34/26/2015	H-LINK01	240000	240000
34/27/2015	H-LINK01	230400	230400
34/28/2015	H-LINK01	225600	225600
34/29/2015	H-LINK01	294363	294363
34/30/2015	H-LINK01	0	0

At the bottom of the screen, the date and time are displayed as '12/03/2014 (Wed)16:41'.

Word/Terms

- GHP: Stands for Gas Heat Pump air conditioner
- EHP: Stands for Electric Heat Pump air conditioner
- Facility : Stands for the target device when monitoring and controlling facility device using external input/output of this system.

1.5 System Configuration

1 System Configuration

Refer to **System Configuration** 1 System Configuration of Operation Manual (P5415517) for Management software.

2 Device Specification

Refer to **System Configuration** 2 Device Specification of Operation Manual (P5415517) for Management software.

3 Display

(a) Data Output Display, (b) Setting Charge Display and (c) Calc. Info. Display will be shown in Ope ratio display.

(a) Detailed Data Display: Shows accumulated data.

The screenshot shows the 'York VRF Management System' interface. On the left is a tree view with a red dashed box around it. The main area has a 'Detailed data' section with buttons for 'Ope ratio setting' and 'Calc. Info.'. Below this is a data table with columns: 'Day and time', 'Name/H-LINK No.', 'Running time [min]', and 'Thermo-ON time [min]'. The table contains data for various dates in April 2015, including a 'Total' row. Callout boxes (a), (b), and (c) are connected to the tree view, the 'Ope ratio setting' button, and the 'Calc. Info.' button respectively.

Tree

If shown in [Panel], data will be shown by clicking down to

[H]: H-LINK – [B]: Block – [G]: Group.

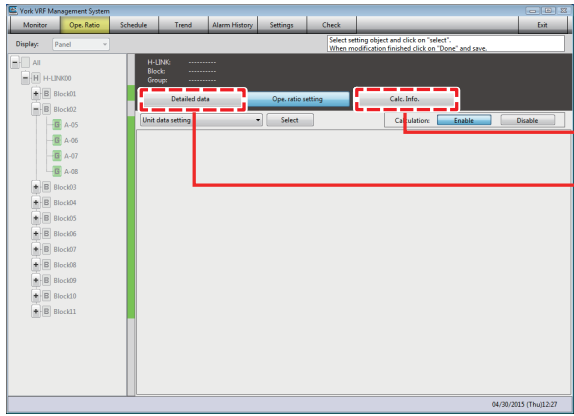
If shown in [Tenant], data will be shown by clicking down to

[T]: Tenant – [G]: Group.

* Some of the system support display by [H]: H-LINK only and tree view may not be selected.

* Display [Layout] cannot be used in Ope. ratio Display.

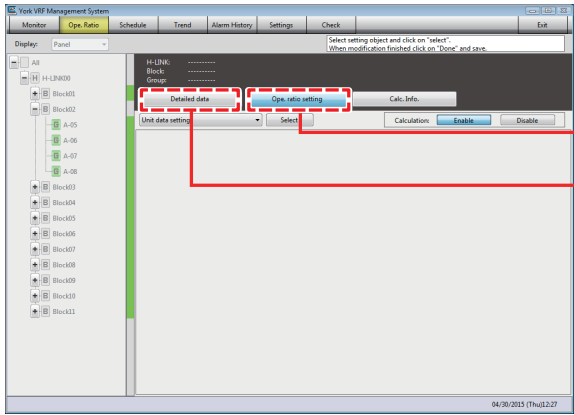
(b) Ope. ratio setting Display: Shows configuration data.



(c) Calc. Info. Display

(a) Detailed data Display

(c) Calc. Info. Display: Shows information that occurred during calculation.



(b) Ope. ratio setting Display

(a) Detailed data Display

2. How to Use

2.1 Calculating Air Conditioner Operation Ratio

1 Calculation Result Reference

Result of air conditioner operation ratio calculation will be output to file.

(1) The following data (calculation result) will be stored in "/centralstation/anbun/DriveRatio/Result/yyyymm".

- DAYS_mmyyyy.csv: operation ratio of EHP by each day
 - UNITS_mmddyyyy.csv: operation ratio of EHP by each air conditioner (for each day)
 - DAYS_GHP_mmyyyy.csv: operation ratio of GHP by each day (Not used)
 - UNITS_GHP_mmddyyyy.csv: operation ratio of GHP by each air conditioner (for each day) (Not used)
- *1 yyyy, mm and dd indicate year, month and day, respectively.
 *2 Depending on the management computer setting of data and time formats, "mmyyyy" is substituted for "yyyymm" and "mmddyyyy" is substituted for "ddmmyyyy" or "yyyymmdd".

NOTE:

The output cannot be done when selecting [Calculating ope. ratio for each day only] in [Ope. ratio setting] - [System setting] - [Ope. ratio calc. result file setting].

(2) The following data (calculation result) will be stored in "centralstation/anbun/DriveRatio/Result/yyyymm/dd".

- HOURS_mmddyyyy.csv: operation ratio of EHP by each hour
 - UNITS_mmddyyyy_hh.csv: operation ratio of EHP by each air conditioner (for each hour)
 - HOURS_GHP_mmddyyyy.csv: operation ratio of GHP by each hour (Not used)
 - UNITS_GHP_mmddyyyy_hh.csv: operation ratio of GHP by each air conditioner (for each hour) (Not used)
- *1 yyyy, mm, dd and hh indicate year, month, day and hour, respectively.
 *2 Depending on the management computer setting of data and time formats, "mmyyyy" is substituted for "yyyymm" and "mmddyyyy" is substituted for "ddmmyyyy" or "yyyymmdd".

NOTE:

The output cannot be done when selecting [Calculating ope. ratio for each day only] in [Ope. ratio setting] - [System setting] - [Ope. ratio calc. result file setting].

NOTE:

- The 4 files above will always be generated.
- The facility unit can only support mode 3. When selecting mode 1 or mode 2, the operation ratio of all the facility units will be 0%.

(3) Reference "operation ratio of EHP by each day" (DAYS_mmyyyy.csv)

This is a csv file contains the result of calculation of operation ratio in a day regarding maximum 31 days as 100%.

(a) Date	mmddyyyy, ddmmyyyy or yyyymmdd	4 digits for year, 2 digits each for month and day
(b) Accumulated load on outdoor units	In Mode 1:= Grand total of thermo on time x capacity of each indoor unit.	12 digits
	In Mode 2:= Accumulated electricity for operation for each outdoor unit.	12 digits
	In Mode 3:= Grand total of running time x capacity of each indoor unit.	12 digits
(c) A day/Elapsed days	Current date / total elapsed days. (ratio)	7 digits, 100% = 1000000

(a) Date	(b) Accumulated load on outdoor units	(c) A day/Elapsed days	Date 1	Date 2	Date 3	Date 4	Date 5	Date 30	Date 31
20140501	10623902	1000000							
20140502	10623902	487430	11171833	512570					
20140503	10623902	322254	11171833	338875	11171711	338871			
20140504	10623902	240682	11171833	253095	11171711	253092	11173456	253132	
20140505	10623902	192071	11171833	201977	11171711	201975	11173456	202006	11171481 201971
20140506	10623902	159800	11171833	168042	11171711	168040	11173456	168066	11171481 168037
20140507	10623902	138466	11171833	145607	11171711	145605	11173456	145628	11171481 145602
20140508	10623902	122202	11171833	128505	11171711	128503	11173456	128523	11171481 128501
20140509	10623902	107510	11171833	113055	11171711	113053	11173456	113071	11171481 113051
20140510	10623902	98156	11171833	103218	11171711	103217	11173456	103233	11171481 103215
.
.
.
20140530	10623902	32227	11171833	33889	11171711	33888	11173456	33894	11171481 33888 . . . 11233611 34076
20140531	10623902	31165	11171833	32772	11171711	32772	11173456	32777	11171481 32771 . . . 11233611 32953 11233611 32953

- (4) Reference “operation ratio of EHP by each air conditioner (for each day)” UNITS_mmddyyyy.csv:
 This is a csv file contains the result of calculation of operation ratio for each indoor unit regarding 1 refrigerant system or all refrigerant systems as 100%.

(a) Date	mmddyyyy, ddmmyyyy or yyyyMMdd	4 digits for year, 2 digits each for month and day
(b) Address	H-LINK number, refrigerant system, address	2 digits (In decimal)
(c) Block (No.)	Block Name, Block No.	2 digits in decimal for No.
(d) Group (No.)	Group Name, Group No.	First digit: Alphabet Last two digits: Decimal
(e) Load on Indoor units	In Mode 1::= Thermo on time x capacity	8 digits
	In Mode 2::= Accumulated expansion valve aperture x expansion valve coefficient	8 digits
	In Mode 3::= Running time x capacity	8 digits
(f) Load on Outdoor units	In Mode 1::= Thermo ON time in the refrigerant system x total capacity	8 digits
	In Mode 2::= Accumulated operation current	8 digits
	In Mode 3::= Running time in the refrigerant system x total capacity	8 digits
(g) Indoor / 1 outdoor	1 unit / All indoor units within one particular refrigerant system (ratio)	7 digits, 100% = 1000000
(h) Indoor/ All outdoor	1 unit/ All indoor units in all refrigerant system (ratio)	7 digits, 100% = 1000000

(a) Date	(b) H-LINK No., Refrigerant system, Address			(c) Block Name, Block No.	(d) Group Name, Group No.			(e) Load on indoor units	(f) Load on outdoor units	(g) IU/1 OU	(h) IU/All OU
20140501	0	0	0	BLOCK1	1	A1	A01	84000	269520	250000	6342
20140501	0	0	1	BLOCK1	1	A2	A02	84000	269520	250000	6342
20140501	0	0	2	BLOCK1	1	A3	A03	84000	269520	250000	6342
20140501	0	0	3	BLOCK1	1	A4	A04	84000	269520	250000	6342
20140501	0	1	4	BLOCK2	2	A5	A05	84000	269520	250000	6342
20140501	0	1	5	BLOCK3	3	A6	A06	84000	269520	250000	6342
20140501	0	1	6	BLOCK4	4	A7	A07	84000	269520	250000	6342
20140501	0	1	7	BLOCK4	4	A8	A08	84000	269520	250000	6342
20140501	0	2	8	BLOCK5	5	A9	A09	84000	269520	250000	6342
20140501	0	2	9	BLOCK5	5	A10	A10	84000	269520	250000	6342
20140501	0	2	10	BLOCK6	6	A11	A11	84000	269520	250000	6342
20140501	0	2	11	BLOCK6	6	A12	A12	84000	269520	250000	6342
20140501	0	3	12	BLOCK7	7	A13	A13	84000	269520	250000	6342
20140501	0	3	13	BLOCK7	7	A14	A14	84000	269520	250000	6342
20140501	0	3	14	BLOCK8	8	A15	A15	84000	269520	250000	6342
20140501	0	3	15	BLOCK8	8	A16	A16	84000	269520	250000	6342

NOTE:

- If a facility unit exists, refer to the data of (g) IU/1 OU.

OPERATION

(5) Reference “operation ratio of EHP by an hour” (HOURS_YYYYMMDD.csv)

This is a csv file contains the result of calculation of operation ratio in an hour regarding maximum 24 hours as 100%.

(a) Date	mmddyyyy, ddmmyyyy or yyyyMMdd	4 digits for year, 2 digits each for month and day
(b) Accumulated load on outdoor units	In Mode 1::= Grand total of thermo on time x capacity of each indoor unit.	12 digits
	In Mode 2::= Accumulated electricity for operation for each outdoor unit.	12 digits
	In Mode 3::= Grand total of running time x capacity of each indoor unit.	12 digits
(c) An hour/ Elapsed time	Current time /Total elapsed time (ratio)	7 digits, 100% = 1000000

(a) Date	(b) Accumulated load on outdoor units	(c) An hour/ Elapsed time	0:00		1:00		2:00		3:00		4:00		22:00		23:00		
20140501	10623902	1000000															
20140502	10623902	487430	11171833	512570													
20140503	10623902	322254	11171833	338875	11171711	338871											
20140504	10623902	240682	11171833	253095	11171711	253092	11173456	253132									
20140505	10623902	192071	11171833	201977	11171711	201975	11173456	202006	11171481	201971							
20140506	10623902	159800	11171833	168042	11171711	168040	11173456	168066	11171481	168037							
20140507	10623902	138466	11171833	145607	11171711	145605	11173456	145628	11171481	145602							
20140508	10623902	122202	11171833	128505	11171711	128503	11173456	128523	11171481	128501							
20140509	10623902	107510	11171833	113055	11171711	113053	11173456	113071	11171481	113051							
20140510	10623902	98156	11171833	103218	11171711	103217	11173456	103233	11171481	103215							
.							
.							
.							
20140530	10623902	32227	11171833	33889	11171711	33888	11173456	33894	11171481	33888	.	.	.	11233611	34076		
20140531	10623902	31165	11171833	32772	11171711	32772	11173456	32777	11171481	32771	.	.	.	11233611	32953	11233611	32953

- (6) Reference “operation ratio of EHP by each air conditioner (for each hour)” UNITS_yyyyymmdd_hh.csv:
 This is a csv file contains the result of calculation of operation ratio for each indoor unit regarding 1 system or all systems as 100%.

(a) Date	mmddyyyy, ddmmyyyy or yyyyymmdd	4 digits for year, 2 digits each for month, day and hour
(b) Address	H-LINK number, refrigerant system, address	2 digits (In decimal)
(c) Block (No.)	Block Name, Block No.	2 digits in decimal for No.
(d) Group (No.)	Group Name, Group No.	First digit: Alphabet Last two digits: Decimal
(e) Load on Indoor units	In Mode 1::= Thermo on time x capacity	8 digits
	In Mode 2::= Accumulated expansion valve aperture x expansion valve coefficient	8 digits
	In Mode 3::= Running time x capacity	8 digits
(f) Load on Outdoor units	In Mode 1::= Thermo ON time in the refrigerant system x total capacity	8 digits
	In Mode 2::= Accumulated operation current	8 digits
	In Mode 3::= Running time in the refrigerant system x total capacity	8 digits
(g) Indoor / 1 outdoor	All indoor units within one particular refrigerant system (ratio)	7 digits, 100% = 1000000
(h) Indoor/ All outdoor	1 unit/ All indoor units in all refrigerant system (ratio)	7 digits, 100% = 1000000

(a) Date	(b) H-LINK No., Refrigerant system, Address			(c) Block Name, Block No.	(d) Group Name, Group No.			(e) Load on indoor units	(f) Load on outdoor units	(g) IU/1 OU	(h) IU/All OU
20140501	0	0	0	BLOCK1	1	A1	A01	84000	269520	250000	6342
20140501	0	0	1	BLOCK1	1	A2	A02	84000	269520	250000	6342
20140501	0	0	2	BLOCK1	1	A3	A03	84000	269520	250000	6342
20140501	0	0	3	BLOCK1	1	A4	A04	84000	269520	250000	6342
20140501	0	1	4	BLOCK2	2	A5	A05	84000	269520	250000	6342
20140501	0	1	5	BLOCK3	3	A6	A06	84000	269520	250000	6342
20140501	0	1	6	BLOCK4	4	A7	A07	84000	269520	250000	6342
20140501	0	1	7	BLOCK4	4	A8	A08	84000	269520	250000	6342
20140501	0	2	8	BLOCK5	5	A9	A09	84000	269520	250000	6342
20140501	0	2	9	BLOCK5	5	A10	A10	84000	269520	250000	6342
20140501	0	2	10	BLOCK6	6	A11	A11	84000	269520	250000	6342
20140501	0	2	11	BLOCK6	6	A12	A12	84000	269520	250000	6342
20140501	0	3	12	BLOCK7	7	A13	A13	84000	269520	250000	6342
20140501	0	3	13	BLOCK7	7	A14	A14	84000	269520	250000	6342
20140501	0	3	14	BLOCK8	8	A15	A15	84000	269520	250000	6342
20140501	0	3	15	BLOCK8	8	A16	A16	84000	269520	250000	6342

2 Detailed Data Display

This window is to show accumulated data in detail.

(1) Display

Select the display format from [Panel] or [Tenant].

[Acc. data] fixed in "count mode" section.

Choose one from [Unit], [Group], [Block], [H-LINK], [Tenant] and [ALL].
* Upper categories than selected in the tree will not be shown.
[Tenant] will be displayed only if [Tenant] is selected. [Block], [H-LINK] will be displayed only if [Panel] is selected.

Choose one from [Hour], [Day], and [ALL] for "Count time".

Units can be specified when [Panel] and [H] is selected.

Click to save as a csv file.

Click to print the displayed items.

Display the detailed data of selected units or groups in the data display area.

Click to change (hide/show) the displayed items.

Select the period to display.
* Start time includes the specified time.
* End time does not include the specified time.

Choose desired object to show the data.

In this field, the data of selected object in the tree will be shown.
Concerning the display items, refer to (2).

Day and time	Name/H-LINK No.	Running time [min]	A/C run	Thermo-ON time [min]	F
04/24/2015	H-LINK00	57240		50069	
04/25/2015	H-LINK00	232100		223100	
04/26/2015	H-LINK00	240000		239806	
04/27/2015	H-LINK00	230400		228960	
04/28/2015	H-LINK00	214124		210207	
04/29/2015	H-LINK00	180030		148640	
04/30/2015	H-LINK00	0		0	
Total		1144894		1097982	
04/24/2015	H-LINK01	51982		49559	
04/25/2015	H-LINK01	223648		172023	
04/26/2015	H-LINK01	240000		240000	
04/27/2015	H-LINK01	230400		230400	
04/28/2015	H-LINK01	225600		224600	
04/29/2015	H-LINK01	294363		294363	
04/30/2015	H-LINK01	0		0	

NOTE:

- In case of displaying by unit, depending on the display format, it will be indicated in the following order.
 - [Panel] Block No. order (If Block No. is the same, then Group No. order)
 - [Tenant] Tenant No. order (If Tenant No. is the same, then Group No. order).
- The width of [Name] column is changeable by mouse dragging. It is possible to restore the column width to initial status by clicking [Change] and [Init. cell width].
- If change the column width, always click [Display].
- In case that all the texts (except label name) are not shown in a cell, the cell is colored with orange.

- (2) Each displayed items
[Count mode: Acc. Data]

Default display items are Thermo on time and refrigerant flow amount (IU) only.
To add displayed items, click [Change] button.

- (a) Day and Time
Specify the day and time.
This item can not be hidden by [Change] button.
Even if scrolling the screen, this item is always displayed.
This item will be printed on each printed document.
- (b) Name / H-LINK No.
Name of each unit identifier.
When the counting unit is [H-LINK], H-LINK No. is displayed.
If "Unit" is selected in [Count mode], (c) will be displayed in this column.
This item cannot be hidden by [Change] button.
Even if scrolling the screen, this item is always displayed.
This item will be printed on each printed document.
- (c) H-LINK No. System, Address
H-LINK No. System, and Address to identify each unit are shown in this column.
In case of the facility unit, [-] is displayed in [cycle] column, the facility unit No. is displayed in [Address] column.
If other than "Unit" is selected in [Count mode], (b) will be shown in this column.
This item can not be hidden by [Change] button.
Even if scrolling the screen, this item is always displayed.
This item will be printed on each printed document.
- (d) AC Run
Operation status of the Unit (ACC. data)
- (e) Thermal storage operation
Not used.
- (f) Running time
This item shows elapsed operation time of the indoor unit.
- (g) Thermo-ON time
This item shows elapsed thermo on time of the indoor unit.
In case of the facility unit, 0 is always displayed.
- (h) Refr. flow amount
This item shows accumulated Refrigerant flow amount of the indoor unit.
In case of the facility unit, 0 is always displayed.
- (i) Heater ON time
This item shows elapsed power distributing time of the indoor unit.
- (j) Acc. running current
This item shows accumulated running current of EHP outdoor unit.
- (k) Crankcase heater ON time
This item shows elapsed power distributing time of EHP outdoor unit.
- (l) Compressor heater ON time
This item shows elapsed compressor heater on time of GHP outdoor unit. (Not used)
- (m) Drain heater ON time
This item shows elapsed drain heater on time of GHP outdoor unit. (Not used)
- (n) Engine block heater ON time
This item shows elapsed engine block heater on time of GHP outdoor unit. (Not used)
- (o) Acc. O.U. load
This item shows accumulated engine speed of GHP outdoor unit. (Not used)
- (p) Refr. flow amount (Thermal storage)
This item shows accumulated Refrigerant flow amount of thermal storage unit.
- (q) Total time
This item shows elapsed accumulating time in total.

3 Sample Case

(1) Sample case for referencing file of operation ratio by each day

DAYS_201405.csv - (Reference file of operation ratio by each air conditioner (2014/May))

20140501	*****	100000																		
20140502	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
20140503	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
20140504	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
20140505	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
20140530	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
20140531	*****	55687	*****	75478	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	54862	*****	24789	*****

2014/5/1:5.5687%
 2014/5/2:7.5478%
 ⋮
 2014/5/30:5.4862%
 2014/5/31:2.4789%

UNITS_20140501.csv - (Reference file of operation ratio by each air conditioner (2014/May/1))

20140501	0	0	0	Design dep.	1	AC design	A01	*****	*****	*****	165484
20140501	0	0	1	Design dep.	1	AC design	A01	*****	*****	*****	246897
20140501	0	0	2	Design dep.	1	AC design	A01	*****	*****	*****	301245
20140501	0	1	0	Design dep.	1	Control design	A02	*****	*****	*****	116829
20140501	0	1	1	Design dep.	1	Control design	A02	*****	*****	*****	169545

Refrigerant system 0 Address 0 : 16.5484%
 Refrigerant system 0 Address 1 : 24.6897%
 Refrigerant system 1 Address 2 : 30.1245%
 Refrigerant system 1 Address 0 : 11.6829%
 Refrigerant system 1 Address 1 : 16.9545%

UNITS_20140502.csv - (Reference file of operation ratio by each air conditioner (2014/May/2))

20140502	0	0	0	Design dep.	1	AC design	A01	*****	*****	*****	182498
20140502	0	0	1	Design dep.	1	AC design	A01	*****	*****	*****	224689
20140502	0	0	2	Design dep.	1	AC design	A01	*****	*****	*****	298531
20140502	0	1	0	Design dep.	1	Control design	A02	*****	*****	*****	97856
20140502	0	1	1	Design dep.	1	Control design	A02	*****	*****	*****	196426

Refrigerant system 0 Address 0 : 18.2498%
 Refrigerant system 0 Address 1 : 22.4689%
 Refrigerant system 1 Address 2 : 29.8531%
 Refrigerant system 1 Address 0 : 9.7856%
 Refrigerant system 1 Address 1 : 19.6426%

< Method Sample >

- Ratio of Refrigerant system: 0 Address: 0 on 2014/May/1 is;
 Ratio on that day = 5.5687% (DAYS_201405.csv)
 Ratio on that unit = 16.5484% (UNITS_20140501.csv)
 Then $0.055687 \times 0.165484 \times 100 \approx 0.9215[\%]$
- Ratio of Refrigerant system: 0 Address: 0 on 2014/May/2 is;
 Ratio on that day = 7.5478% (DAYS_201405.csv)
 Ratio on that unit = 18.2498% (UNITS_20140502.csv)
 Then $0.075478 \times 0.182498 \times 100 \approx 1.3775[\%]$
- Total ratio of Refrigerant system: 0 Address : 0 from 2014/May/1 to 2014/May/2 is:
 $0.9215[\%] + 1.3775[\%] = 2.2990[\%]$ (from the result above)
 Apply the method above to the data stored in a month so that the result of the method will be total ratio in the month.

If applied to each unit, result of the method will be total ratio on each unit.

If the result shows ratio of 30% on Refrigerant system 0, Address 0, then the unit is responsible for 30% of the total electricity charge.

NOTE: Electricity amount of air conditioner usage (if any other is included)
 * 0.3 = charge for Refrigerant system 0, Address: 0

(2) Sample case for referencing file of operation ratio by an hour
 DAYS_201405.csv (Operation ratio by each day (2014/May))

20140501	*****	1000000																		
20140502	*****	*****	*****	*****																
20140503	*****	*****	*****	*****	*****	*****														
20140504	*****	*****	*****	*****	*****	*****	*****	*****	*****											
20140505	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
20140530	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
20140531	*****	55687	*****	75478	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	54862	*****	*****	24789

2014/5/1:5.5687%
 2014/5/2:7.5478%
 ⋮
 2014/5/30:5.4862%
 2014/5/31:2.4789%

HOURS_20140501.csv (Operation ratio by an hour (2014/May/1))

2014050100	*****	1000000																		
2014050101	*****	*****	*****	*****																
2014050102	*****	*****	*****	*****	*****	*****														
2014050103	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮	⋮
2014050122	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****
2014050123	*****	38745	*****	47565	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	*****	26345	*****	*****	28742

2014/May/1 0:00 : 3.8745%
 2014/May/1 1:00 : 4.7565%
 ⋮
 2014/May/1 22:00 : 2.6345%
 2014/May/1 23:00 : 2.8742%

UNITS_20140501_00.csv (Operation ratio by each air conditioner (for each hour) (2014/May/1/0:00))

2014050100	0	0	0	Design dep.	1	AC design	A01	*****	*****	*****	165484
2014050100	0	0	1	Design dep.	1	AC design	A01	*****	*****	*****	246897
2014050100	0	0	2	Design dep.	1	AC design	A01	*****	*****	*****	301245
2014050100	0	1	0	Design dep.	1	Control design	A02	*****	*****	*****	116829
2014050100	0	1	1	Design dep.	1	Control design	A02	*****	*****	*****	169545

Refrigerant system 0 Address 0 : 16.5484%
 Refrigerant system 0 Address 1 : 24.6897%
 Refrigerant system 1 Address 2 : 30.1245%
 Refrigerant system 1 Address 0 : 11.6829%
 Refrigerant system 1 Address 1 : 16.9545%

UNITS_20140501_01.csv (Operation ratio by each air conditioner (for each hour) (2014/May/1/1:00))

2014050101	0	0	0	Design dep.	1	AC design	A01	*****	*****	*****	182498
2014050101	0	0	1	Design dep.	1	AC design	A01	*****	*****	*****	224689
2014050101	0	0	2	Design dep.	1	AC design	A01	*****	*****	*****	298531
2014050101	0	1	0	Design dep.	1	Control design	A02	*****	*****	*****	97856
2014050101	0	1	1	Design dep.	1	Control design	A02	*****	*****	*****	196426

Refrigerant system 0 Address 0 : 18.2498%
 Refrigerant system 0 Address 1 : 22.4689%
 Refrigerant system 1 Address 2 : 29.8531%
 Refrigerant system 1 Address 0 : 9.7856%
 Refrigerant system 1 Address 1 : 19.6426%

<Method Sample>

1. Ratio on Refrigerant system 0, Unit 0 at 0:00 2014/May/1 is;
 Ratio on that day = 5.5687% (DAYS_201405.csv)
 Ratio at 0:00 = 3.8745% (HOURS_20140501.csv)
 Ratio on Refrigerant system 0, Unit 0 = 16.5484% (UNITS_20140501_00.csv)
 Then $0.055687 \times 0.038745 \times 0.165484 \times 100 \doteq 0.0357[\%]$
2. Ratio on Refrigerant system 0, Unit 0 at 1:00 2014/May/1 is;
 Ratio on that day = 5.5687% (DAYS_201405.csv)
 Ratio at 1:00 = 4.7565% (HOURS_20140501.csv)
 Ratio on Refrigerant system 0, Unit 0 = 18.2498% (UNITS_20140501_01.csv)
 Then $0.055687 \times 0.047565 \times 0.182498 \times 100 \doteq 0.0483[\%]$
3. Total ratio of Refrigerant system : 0 Address : 0 in 2 hours from 0:00 2014/May/1 to 2:00 is ;
 $0.0352[\%] + 0.0483[\%] = 0.0840[\%]$ (from the result above)
 Apply the method above to the data stored in a month so that the result of the method will be total ratio in the month.
 If applied to each unit, result of the method will be total ratio on each unit.

If the result shows ratio of 30% on Refrigerant system 0, Address 0, then the unit is responsible for 30 % of the total electricity charge.

NOTE: Electricity amount of air conditioner usage (if any other is included)
 * 0.3 = charge for Refrigerant system 0, Address: 0.

4 Operation Ratio Setting

Refer to the corresponding items in Installation & Maintenance Manual.

- Registering unit data
 Refer to **Operation Ratio Setting** “ **4** Unit Data Setting”.
- Setting accumulated data
 - Untaken data acquisition
 Refer to **Test Run** “ **2** Conduct Calculation”.
- Changing start date of data accumulation
 Refer to **Test Run** “ **5** Preparation for Actual Operation”.
- Setting Calc. Mode
 Refer to **Operation Ratio Setting** “ **3** Operation Ratio Mode Setting”.
- Checking connection information
 Refer to **Operation Ratio Setting** “ **6** Verifying Unit Connection and Registration”.
- Complete setup
 Refer to **Operation Ratio Setting** “ **7** Enable Calculation”.

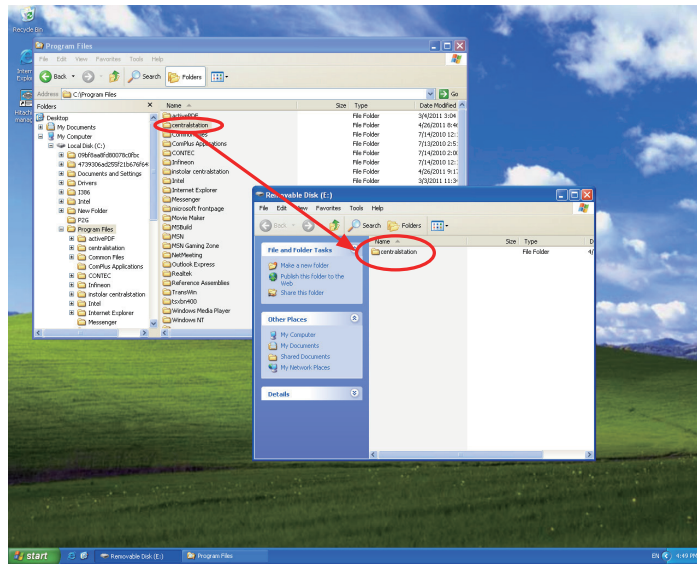
3. Service

3.1 Maintenance and Service

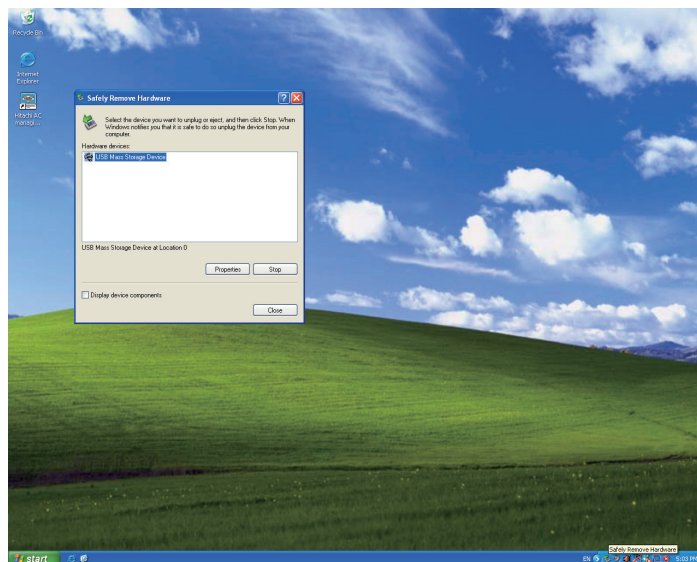
1 Data Backup Procedure

Periodic backup can ensure fast restoration in case management computer crashes. Please backup data after each settings not only upon test run, but upon other operation periodically.

- (1) Connect USB flash drive or other external hard drive to management computer.
- (2) Shut the management software.
- (3) “/centralstation” folder is saved under the drive in which the software is installed. Copy the file to USB flash drive or other external hard drive connected to the computer.



- (4) To remove the USB flash drive or other external hard drive, select “Safely remove hardware” from the task bar.

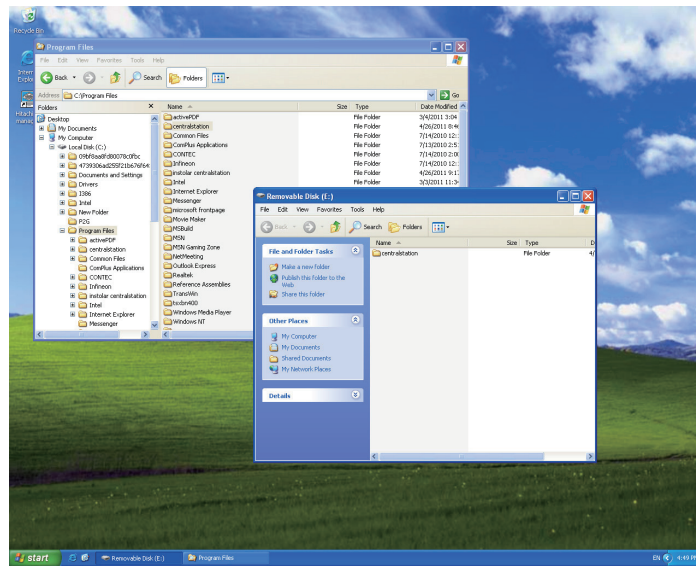


2 How to Restore with Backup Data

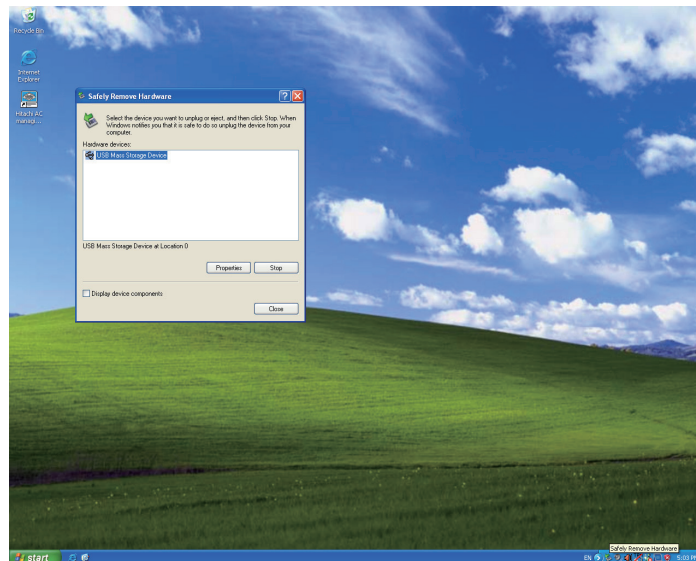
When restoring the computer with backup data saved in 1 upon computer crash or other faults, please follow the procedure described below.

Ensure that network settings such as IP address are identical to those of the computer before crash or system down.

- (1) Install the management software to the new management computer and set IP address. As for installing procedure, please refer to Installation & Operation Manual (P5415508).
- (2) Connect the USB flash device or other external hard drive with backup data saved in 1 to the new management computer.
- (3) Overwrite the “/centralstation” folder, from the USB flash memory or other external hard drive, in the drive in which the software is installed.
- (4) Overwrite the newly created “/centralstation” folder to the USB flash memory or other external hard drive.



- (5) To remove the USB flash drive or other external hard drive, select “Safely remove hardware” from the task bar.



3 Troubleshooting

No.	Condition	Items to be Checked	Action
1	Calculation information is shown.	Are all the adapters turned ON?	Turn all adapters ON.
		Is the Test run of the management software completed?	Please conduct connection confirmation and register groups and names.
		Are all the LAN wiring among computers and adapters active? Is the hub turned on?	Check the LAN wiring and hub to ensure everything is turned ON.
		Did the adapter turn off for certain period of time due to power failure or other accidents?	Data can not be accumulated while adapter is turned off. This software outputs calculation information for the period in which the adapter was off.
		Is 1GB of free space assured in the management computer?	Clear the memory to assure more than 1GB of free space or substitute the computer with another with larger space.
		Isn't the management computer set to standby state or hibernation state?	Go to [Start] - [Control Panel] - [Power Options]. Go to [Change plan settings] - [Change advanced power settings] of the Power Plan selected. <ul style="list-style-type: none"> • Check that all the items [Sleep] - [Sleep after] - [Hibernate after] are set as [Never]. Check the following setting when using a laptop. • Click [Power buttons and lid]. Check that [Lid close action] is [Do nothing].
		Are all the setting performed?	Check the setting content following the step of Operation Ratio Setting of installation and maintenance manual.
2	The operation ratio calculation result file is not generated.	Is current date before accumulation starting date?	Check the accumulation starting date in [Ope. ratio setting] - [ACC. data setting] - [ACC. starting date].
		Is accumulation data present?	Check if accumulation data is present in [/anbun/Data/H-LINKxx/OneHour] folder of the install folder . NOTE: xx indicates H-LINK No. +1.
		Is calculation enable?	Click calculation [Enable] in [Ope. Ratio setting].
3	The pop-up [Ope. ratio software can't start. Restart management software after checking the condition of adaptor connection.] is shown.	Is the adapter connected?	Check the connection and restart the management software. Also check each setting items in [Ope. ratio setting].
4	The pop-up [Error occurred when calculating. Reset the Ope. ratio setting after checking connection with adapter and restarting the management software.] is shown.	Is the adapter connected? Are the Ope. ratio settings correct?	Check the connection and restart the management software. Also check each setting items in [Ope. ratio setting].

OPERATION

No.	Condition	Items to be Checked	Action
5	The pop-up [Error has been occurred on PC. Management software restarted. Check the PC status. Click [Acquire untaken data] to acquire and calculate data. Avoid specifying 00-03 (min) in the hour.] is shown.	Is there any error occurred on the computer?	Check the computer system. Click [Acquire untaken data] to acquire and calculate data. Avoid specifying 00-03 (mins) in the hour.
		Did PC restart schedule start when the pop-up screen was displayed?	The management software cannot exit correctly when the pop-up screen is displayed. Do not let the pop-up screen opened while performing operations.
6	[No Response] is indicated on the title bar of the management software.	Does the process still running?	When performing a process that takes time, it is possible to have [No Response] displayed temporarily. This is a normal operation so please wait and do not perform any operation with the mouse or the keyboard. [No Response] will be removed when the process is completed.

3. Troubleshooting

3.1 Initial Troubleshooting

3.1.1 Checking Electrical Wiring and Power Source

Check the following items if there is any abnormality in the activation of the system.

No.	Check Situation	Check Method
1	Is any power source breaker or fuse blown out?	Check the voltage (secondary side) of the breaker and also check the continuity of the fuse with a tester.
2	Is voltage at the secondary side of the transformer correct?	Disconnect at the secondary side of the transformer and measure voltage with a tester.
3	Is wiring firmly secured and correctly connected?	Check that the following wiring connection on O.U./I.U. printed circuit boards (PCBs) is not loose. <ul style="list-style-type: none">• The connection for thermistors• The connection for the wired controller cable• The connection for communication cabling• Each connection for power source line Check that the wiring connection on O.U./I.U. PCBs is not loose or misconnected on the site according to the "Electrical Wiring Diagram" of the Engineering Manual.

NOTE:

If the fuse(s) on an I.U. PCB blow out, diagnose the cause of overcurrent and recover the fuse(s).

In addition, check the power source of optional parts because the fuse may blow out by the power source failure.

• For Outdoor Unit
Example for Electrical Wiring Connection

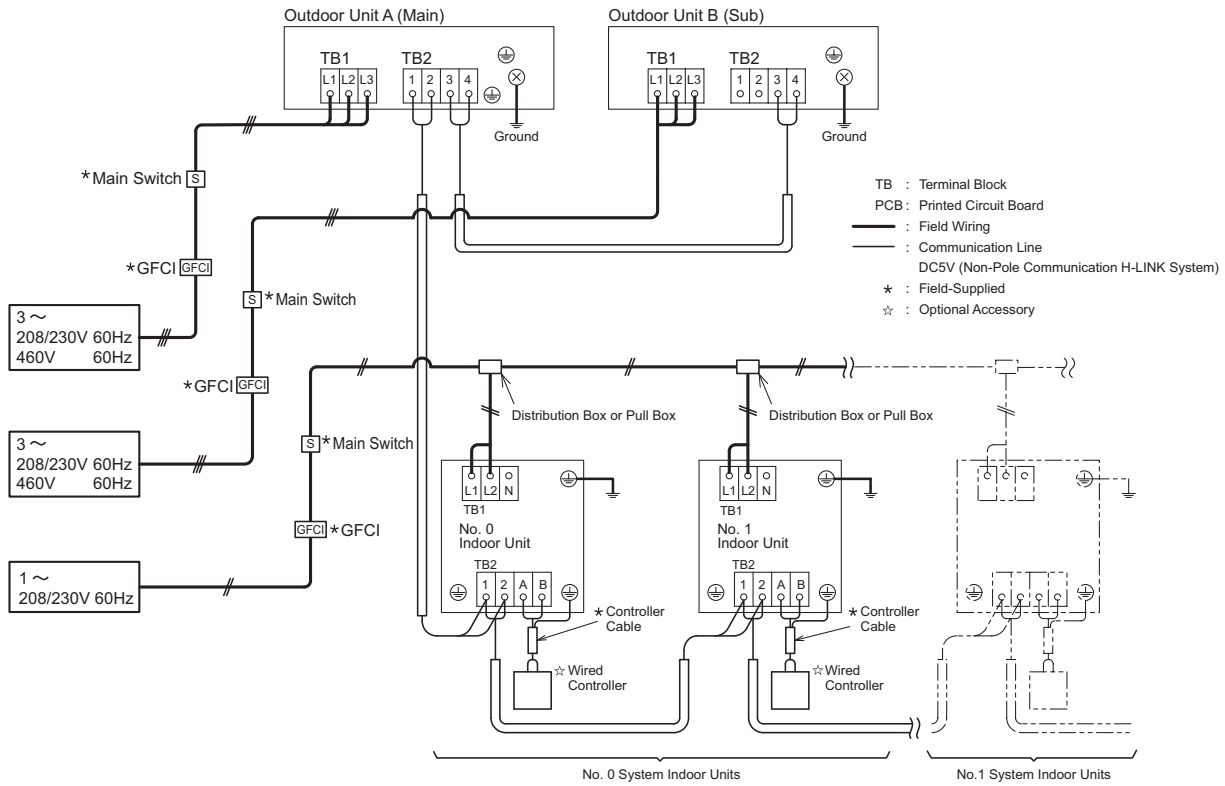


Fig. 1.1 Instruction for Electrical Wiring Connection (Heat Pump System)

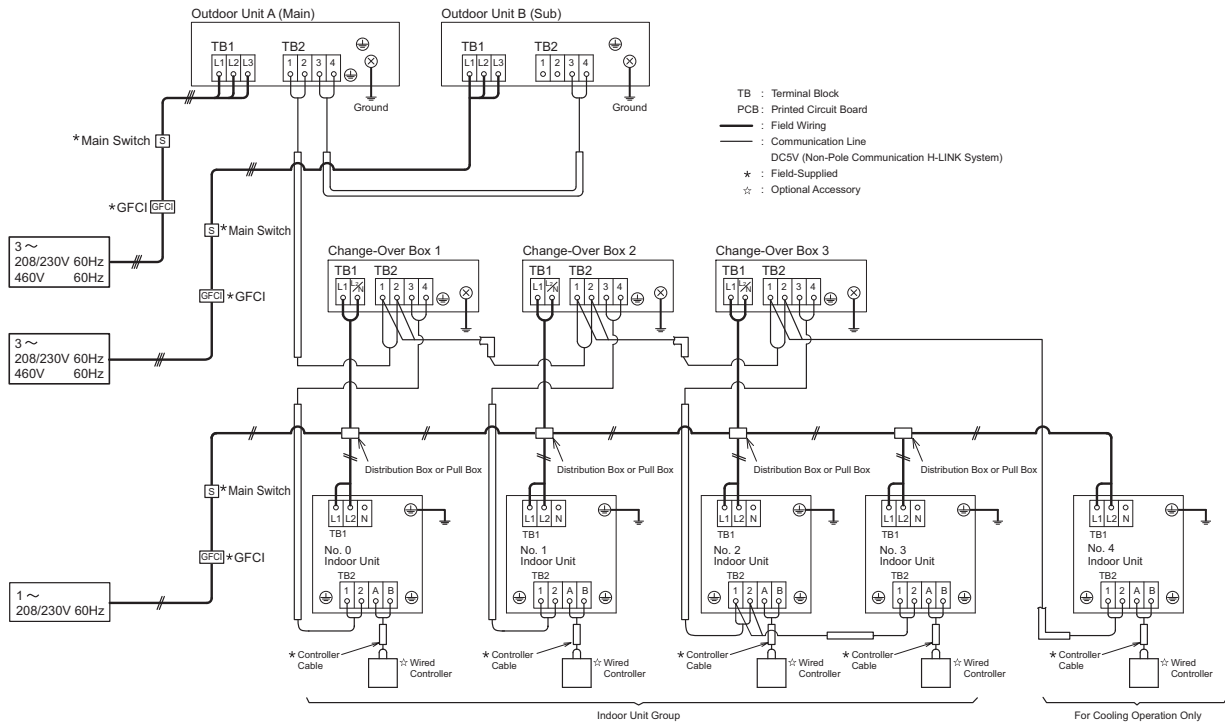


Fig. 1.2 Instruction for Electrical Wiring Connection (Heat Recovery System)

TROUBLESHOOTING

Table 1.1 Electrical Characteristics and Recommended Wiring Size

Model	Outdoor Unit						Inverter Comp.		
	Freq. [Hz]	Voltage [V]	Applicable Voltage		MCA [A]	MOP [A]	Max. Fuse [A]	RLA [A]	LRA [A]
			Max. [V]	Min. [V]					
(H,Y)VAH(P,R)072B31S	60	208/230	253	188	45/40	79/71	70/70	34.0/30.5	150
(H,Y)VAH(P,R)096B31S	60	208/230	253	188	55/50	84/76	80/70	15.7/14.5	150
(H,Y)VAH(P,R)120B31S	60	208/230	253	188	64/58	92/84	90/80	23.2/21.0	150
(H,Y)VAH(P,R)072B41S	60	460	506	414	24	41	40	17.5	75
(H,Y)VAH(P,R)096B41S	60	460	506	414	28	40	40	11	75
(H,Y)VAH(P,R)120B41S	60	460	506	414	34	49	40	15	75

Model	Fixed Speed Comp.		Fan Motor		Recommended Wiring Size		
	RLA (A)	LRA (A)	Output (kW)	FLA (A)	Power Supply [AWG]	Ground Wiring [AWG]	Communication Cable [AWG]
(H,Y)VAH(P,R)072B31S	-	-	0.75	4.8/4.4	6/6	6/6	18
(H,Y)VAH(P,R)096B31S	28.8/26.0	153	1.2	5.6/5.1	4/6	4/6	18
(H,Y)VAH(P,R)120B31S	28.8/26.0	153	1.2	5.6/5.1	4/4	4/4	18
(H,Y)VAH(P,R)072B41S	-	-	0.75	8.7	10	10	18
(H,Y)VAH(P,R)096B41S	12	74.2	1.2	8.7	10	10	18
(H,Y)VAH(P,R)120B41S	12	74.2	1.2	8.7	8	8	18

Model	Recommended Fuse [A]	Recommended Main Switch [A]	Recommended Ground Fault Circuit Interrupter*	
			Nominal Current [A]	Nominal Sensitive Current [mA]
(H,Y)VAH(P,R)072B31S	50/50	60/60	50/50	30
(H,Y)VAH(P,R)096B31S	60/60	70/60	60/50	30
(H,Y)VAH(P,R)120B31S	60/60	70/70	60/60	30
(H,Y)VAH(P,R)072B41S	25	30	25	30
(H,Y)VAH(P,R)096B41S	25	30	25	30
(H,Y)VAH(P,R)120B41S	30	40	30	30

MCA: Minimum Circuit Ampacity
MOP: Maximum Overcurrent Protective Device
RLA: Rated Load Ampacity
LRA: Locked Rotor Ampacity
FLA: Full Load Ampacity

* This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers/fuses/overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.

NOTES:

1. Select wire size based on the value of MCA.
2. Select fuse size less than MOP and allowable current of the wire.
3. Select Ground Fault Circuit Interrupter size more than or equal to the fuse size.
4. Select main switch size more than the Ground Fault Circuit Interrupter size.

NOTES:

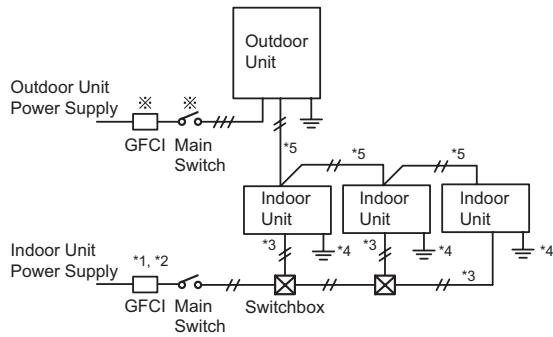
1. When the power supply wiring is longer, select the minimum wiring size if the voltage drop is within 2%. Follow all local codes, regulations, and NEC guidelines.
2. Power supply voltage should be satisfied with the followings.
 - Supply Voltage: Rated Voltage within $\pm 10\%$
 - Starting Voltage: Rated Voltage within -15%
 - Operating Voltage: Rated Voltage within $\pm 10\%$
 - Imbalance between Phases: Within 3%
3. Do not connect the ground wire to the gas pipe, water pipe, or lightning conductor.
 - Gas Pipe: An explosion and ignition may occur when gas leaks.
 - Water Pipe: There is no effect of ground wire when a hard vinyl pipe is used.
 - Lightning Conductor: The ground electric potential abnormally increases when a lightning conductor is used.

• For Indoor Units

The electrical wiring capacity of the outdoor unit is according to the “Installation and Maintenance Manual” of the outdoor unit. Setting DIP switches may be required depending on the combinations with the outdoor unit.

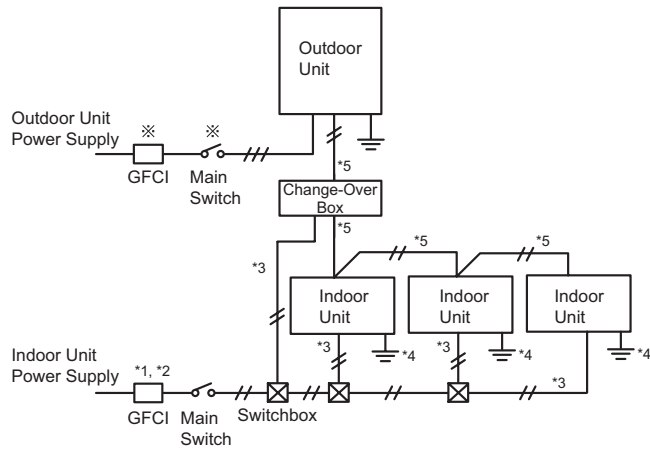
Select wiring capacity according to Tables 1.2 to 1.5 below. This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.

< Heat Pump System >



※ Refer to the "Installation and Maintenance Manual" for the connected outdoor unit for details of wire, GFCI and main switch for outdoor unit.

< Heat Recovery System >



※ Refer to the "Installation and Maintenance Manual" for the connected outdoor unit for details of wire, GFCI and main switch for outdoor unit.

NOTICE

- This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers/ fuses/ / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements. Check the recommended size of ELB shown in Tables 1.2 to 1.5. Select high-sensitive high speed ELB or GFCI when the rated sensitive current is less than 30mA. (The motion time should be within 0.1 second.)
- Between indoor and outdoor units, use dual-conductor, AWG18 (0.82mm²) stranded copper cable for communication cable. Do not use any cable with more than two conductors. Twisted pair or shielded cable can be used in environments with excessive electrical noise to reduce the possibility of communication errors between system components. Total cable length should not exceed 3281 ft (1000m).
- Select the wiring size, GFCI (Ground Fault Circuit Interrupter) in accordance with the regulations for each region, the “Installation and Maintenance Manual”, and the dedicated electrical circuit that must be used.
- Outside of the indoor unit, installation of the power supply wiring, communication cable, and wired controller cable should be spaced as far apart as possible.

- Ducted (High Static, Medium Static, Slim)

Table 1.2 Recommended Wiring Capacity and Size

Type	Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA (Minimum Circuit Ampacity) [A]		
			Power Source Wiring Size < Main >	Ground Wiring Size	Communication Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]			
Ducted	Ducted High Static	(H,Y)IDH018B21S	1~, 208/230V 60Hz	18(0.82)	18(0.82)	18(0.82)	15	30	15	15	1.45	
		(H,Y)IDH024B21S									2.10	
		(H,Y)IDH030B21S									2.10	
		(H,Y)IDH036B21S									2.88	
		(H,Y)IDH048B21S									3.12	
	Ducted Medium Static	(H,Y)IDM006B21S	1~, 208/230V 60Hz	18(0.82)	18(0.82)	18(0.82)	15	30	15	15	15	0.60
		(H,Y)IDM008B21S										0.60
		(H,Y)IDM012B21S										0.60
		(H,Y)IDM015B21S										0.60
		(H,Y)IDM018B21S										0.60
		(H,Y)IDM024B21S										1.01
		(H,Y)IDM030B21S										1.01
		(H,Y)IDM036B21S										1.01
	(H,Y)IDM048B21S	1.01										
	Ducted Slim	(H,Y)IDS006B21S	1~, 208/230V 60Hz	18(0.82)	18(0.82)	18(0.82)	15	30	15	15	15	0.20
		(H,Y)IDS008B21S										0.20
		(H,Y)IDS012B21S										0.20
		(H,Y)IDS015B21S										0.29
(H,Y)IDS018B21S		0.29										

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.
- 3) Total operating current should be less than 12A.

▪ 4-Way Cassette

Table 1.3 Recommended Wiring Capacity and Size

Type	Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA (Minimum Circuit Ampacity) [A]
			Power Source Wiring Size < Main >	Ground Wiring Size	Communication Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
4-Way Cassette	(H,Y)IC4012B21S	1~, 208/230V 60Hz	18(0.82)	18(0.82)	18(0.82)	15	30	15	15	0.4
	(H,Y)IC4015B21S									0.5
	(H,Y)IC4018B21S									0.9
	(H,Y)IC4024B21S									0.9
	(H,Y)IC4030B21S									1.1
	(H,Y)IC4036B21S									1.2

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.
- 3) Total operating current should be less than 12A.

▪ 1-Way Cassette

Table 1.4 Recommended Wiring Capacity and Size

Type	Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA (Minimum Circuit Ampacity) [A]
			Power Source Wiring Size < Main >	Ground Wiring Size	Communication Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
1-Way Cassette	(H,Y)IC1006B21S	1~, 208/230V 60Hz	18(0.82)	18(0.82)	18(0.82)	15	30	15	15	0.2
	(H,Y)IC1008B21S									0.3
	(H,Y)IC1012B21S									0.4
	(H,Y)IC1015B21S									0.5

NOTES:

- 1) Follow local codes and regulations when selecting field wires.
- 2) This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.
- 3) Total operating current should be less than 12A.

TROUBLESHOOTING

- Wall Mounted

Table 1.5 Recommended Wiring Capacity and Size

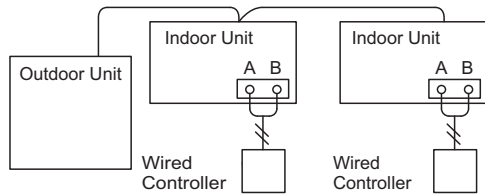
Type	Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA (Minimum Circuit Ampacity) [A]
			Power Source Wiring Size < Main >	Ground Wiring Size	Communication Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
Wall Mounted	TIWM006B21S	1~, 208/230V 60Hz	18(0.82)	18(0.82)	18(0.82)	15	30	15	15	0.3
	TIWM008B21S									0.3
	TIWM012B21S									0.5
	TIWM015B21S									0.4
	TIWM018B21S									0.6
	TIWM024B21S									0.7

NOTES:

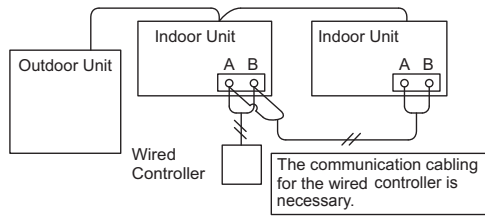
- 1) Follow local codes and regulations when selecting field wires.
- 2) This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.
- 3) Total operating current should be less than 12A.

• Wired Controller Connecting Diagram

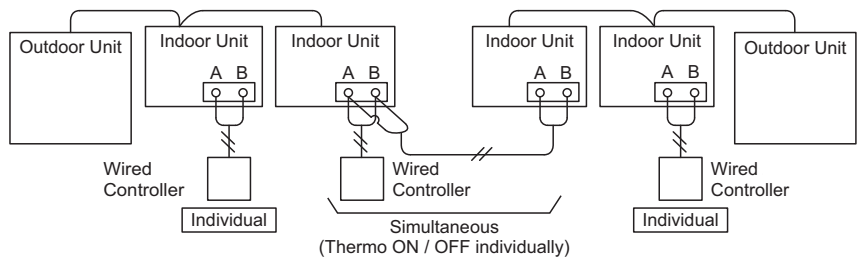
(a) Wired Controllers to each Unit for Individual Operation Setting



(b) One Wired Controller for Individual Operation Setting



(c) Connecting Wired Controller if Connecting between Individual Systems



NOTE:

Thermo-ON: The outdoor unit and some indoor units are running.

Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

TROUBLESHOOTING

- Change-Over Box

Example of Wiring Connection

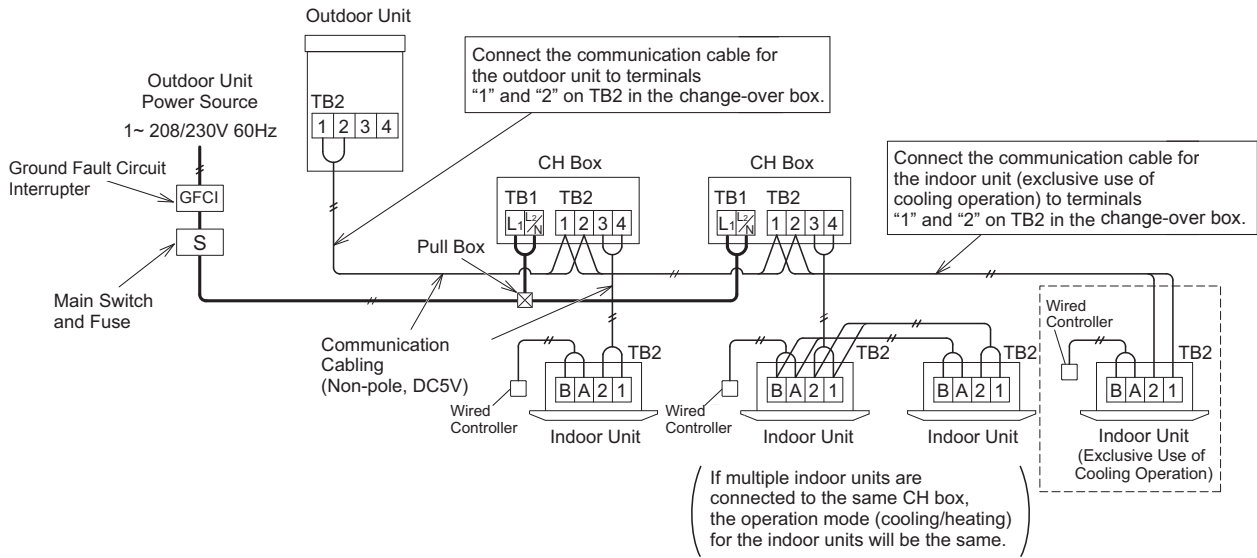


Table 1.6 Electrical Data and Recommended Wiring, Breaker Size

Model	Power Supply	Minimum Wire Thickness [AWG(mm ²)]				GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA Maximum Circuit Ampacity [A]
		Power Source Wiring Size		Ground Wiring Size	Communi-cation Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
		Main	Branch							
COBS048B21S COBS096B21S	1~, 208/230V 60Hz	14(2.1)	18(0.82)	18(0.82)	18(0.82)	15	30	15	15	0.1

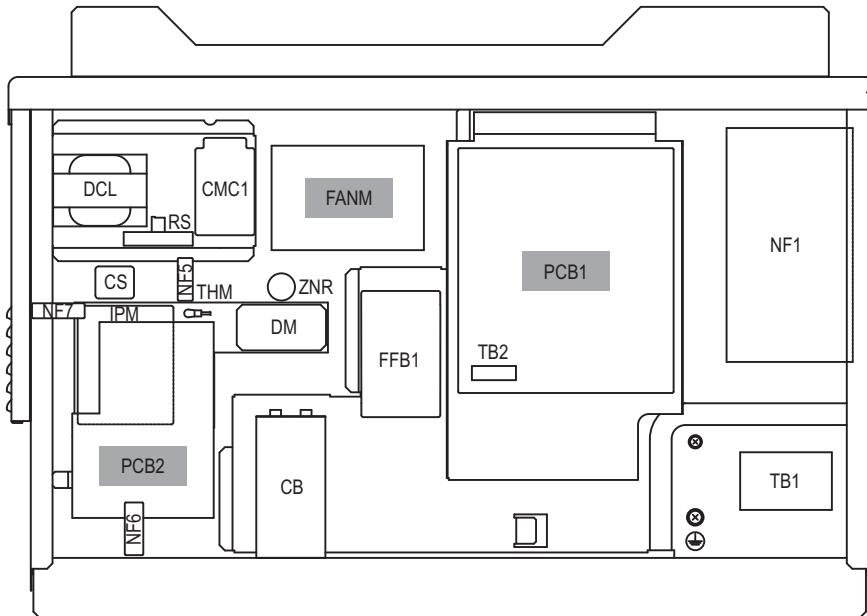
NOTES:

- 1) Follow local codes and regulations when selecting field wires. This equipment can be installed with a Ground Fault Circuit Interrupter (GFCI), which is a recognized measure for added protection to a properly grounded unit. Install appropriate sized breakers / fuses / overcurrent protection switches, and wiring in accordance with local, state and NEC codes and requirements. The equipment installer is responsible for understanding and abiding by applicable codes and requirements.
- 2) Use a shielded communication cable for the communication cabling and make sure the terminal is adequately shielded and grounded.
- 3) Total operating current should be less than 12A.

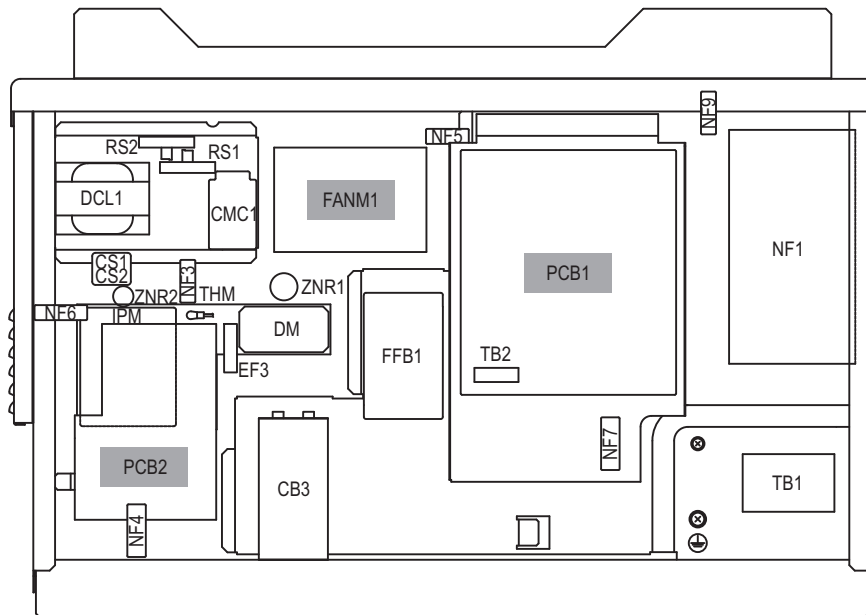
3.1.2 Location of Printed Circuit Boards (PCBs)

(1) Outdoor Unit

Model: (H,Y)VAH(P,R)072B31S to (H,Y)VAH(P,R)120B31S



Model: (H,Y)VAH(P,R)072B41S to (H,Y)VAH(P,R)120B41S

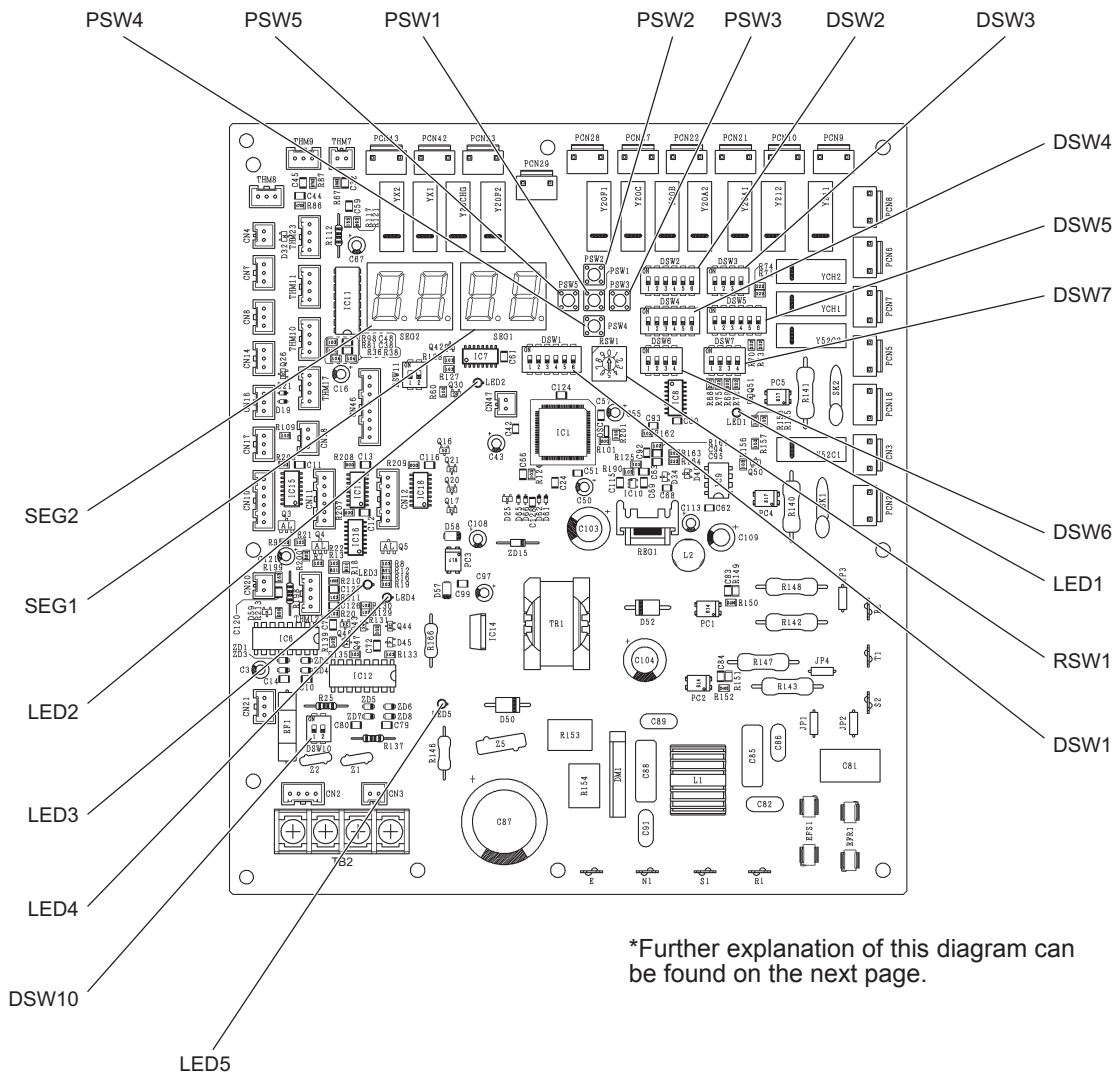


TROUBLESHOOTING

Purpose

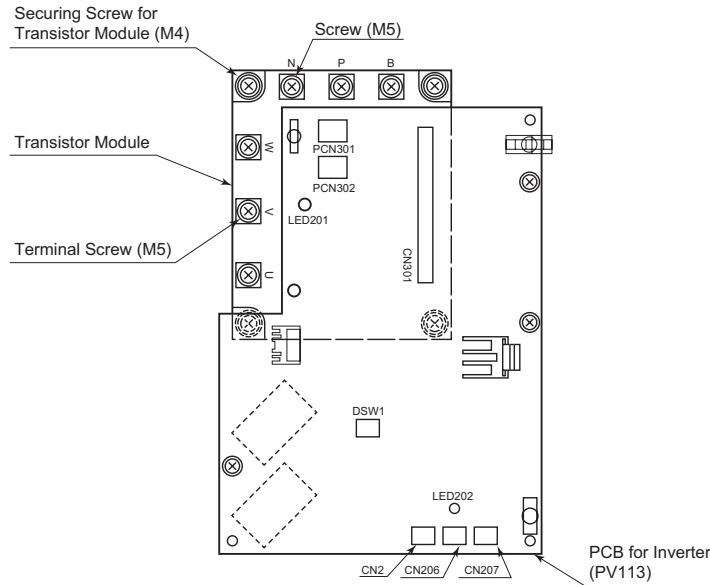
Symbol	PCB	Purpose
PCB1	Outdoor Unit PCB (for Control)	<ol style="list-style-type: none"> 1. Transmitting between Indoor Unit and Outdoor Unit 2. Processing for Sensor Input 3. Processing for DIP Switch Input 4. Operation Control for Above Items 1 to 3. Compressor Operation Control, Bypass Valve Control, Fan Control and Overcurrent Control 5. 7-Segment Indication 6. Processing of Safety Device Input 7. Processing of Relay Output 8. Reverse Phase Detection for Power Source
PCB2	Inverter PCB	<ol style="list-style-type: none"> 1. Inverter power part is driven by instruction of outdoor unit PCB and compressor is driven. 2. Overcurrent Control 3. Protection Control for Inverter Part
FANM	Fan Controller	<ol style="list-style-type: none"> 1. DC Fan Motor Speed Control 2. Overcurrent Control

a. Control Printed Circuit Board: PCB1 (Outdoor Unit PCB)



Part Name		Function Information
LEDs	LED1 (Red)	Power Source Indicator for Outdoor Unit PCB (Low Voltage) Normal Condition: Activated / ON Abnormal Condition: Deactivated / OFF
	LED2 (Green)	This LED2 indicates the communication state between the outdoor unit PCB and inverter PCB. Normal Condition: Flashing Abnormal Condition: Activated / ON or Deactivated / OFF
	LED3 (Yellow)	This LED3 indicates the communication state between the indoor unit and outdoor unit. Normal Condition: Flashing Abnormal Condition: Activated / ON or Deactivated / OFF
	LED4 (Orange)	This LED4 indicates the communication state between the outdoor units. Normal Condition: Flashing Abnormal Condition: Activated / ON or Deactivated / OFF
	LED5 (Red)	Power Source Indicator for Outdoor Unit PCB (High Voltage) Normal Condition: Activated / ON Abnormal Condition: Deactivated / OFF
SEGs	SEG1, SEG2	These indicate: "Alarm", "Protective Safety Device has Tripped" or "Checking Items".

b. Inverter Printed Circuit Board: PCB2 (Inverter PCB) and Transistor Module



Part Name	Function Information
LED201 (Red)	Power Source Indicator for Inverter PCB Normal Condition: Activated / ON Abnormal Condition: Deactivated / OFF
LED202 (Yellow)	This indicates the state of the microcomputer. Normal Condition: Activated / ON Abnormal Condition: Deactivated / OFF

• DSW1

No setting is required.

When setting the No.1 pin to ON, the electric current detection is canceled.

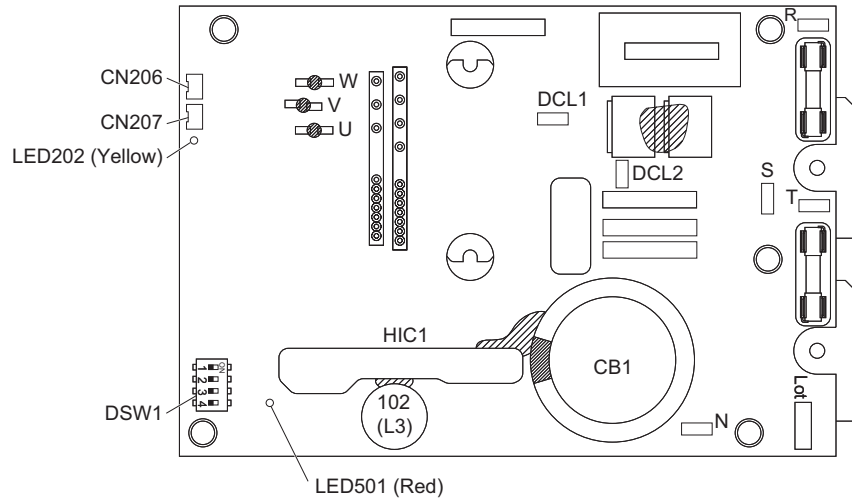
The No.1 pin should be set back to OFF after electrical work.



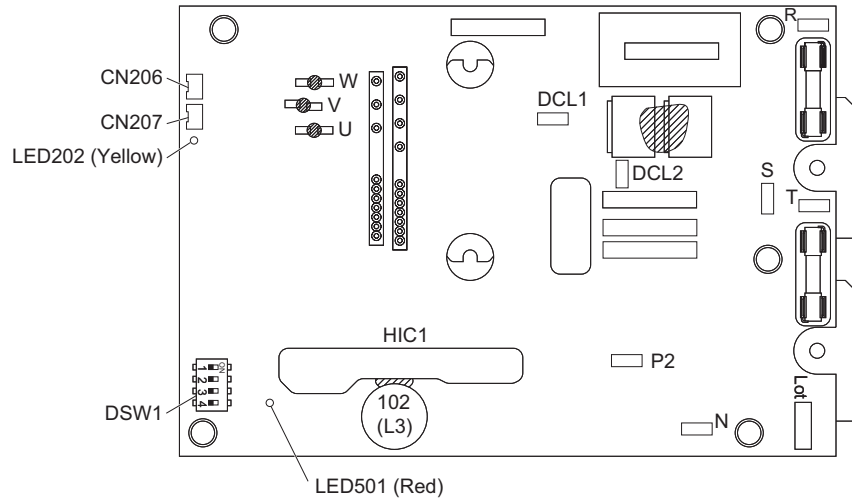
TROUBLESHOOTING

c. FANM (Fan Controller)

< 208/230V 60Hz >



< 460V 60Hz >



Part Name	Function Information
LED501 (Red)	Power Source Indicator for the Fan Controller Normal Condition: Activated / ON Abnormal Condition: Deactivated / OFF
LED202 (Yellow)	This indicates the state of the microcomputer. Normal Condition: Activated / ON Abnormal Condition: Deactivated / OFF

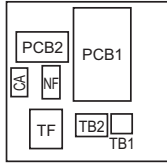
- DSW1
No setting is required.



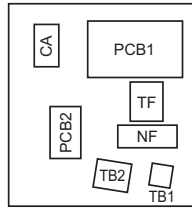
(2) Indoor Unit

- Ducted
Ducted High Static

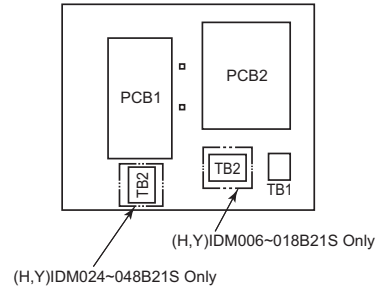
< (H,Y)IDH018B21S >



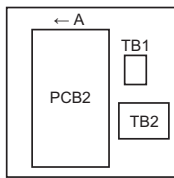
< (H,Y)IDH024B21S to
(H,Y)IDH048B21S >



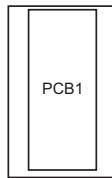
Ducted Medium Static



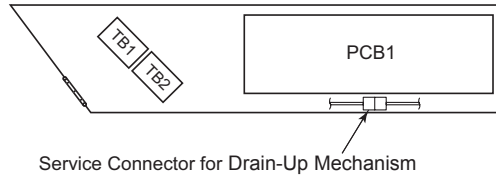
Ducted Slim Static



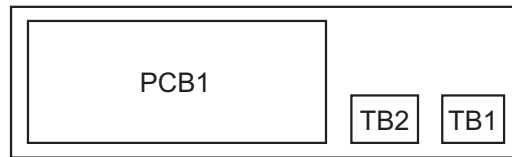
View from A



- 4-Way Cassette

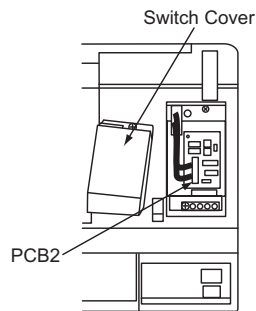


- 1-Way Cassette

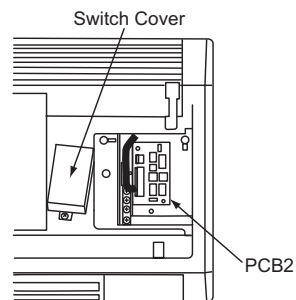


- Wall Mounted

< TIWM006B21S to TIWM012B21S >



< TIWM015B21S to TIWM024B21S >



3.1.3 Checking Rotary Switch and DIP Switch Settings

The following diagram indicates the factory settings of DSWs on PCBs in the indoor and outdoor units. When simultaneous operation control of multiple units or room thermo control is operated, the DSW setting will be different as shown below.

(1) Outdoor Unit (factory setting)

Turn OFF all power sources before the setting.

Without turning OFF all power sources, the switches do not work and the settings are invalid.

(However, DSW4-No.1, 2, 4 and push switches can be operated while the power source is ON.)

The “■” mark indicates positions of DIP switches.

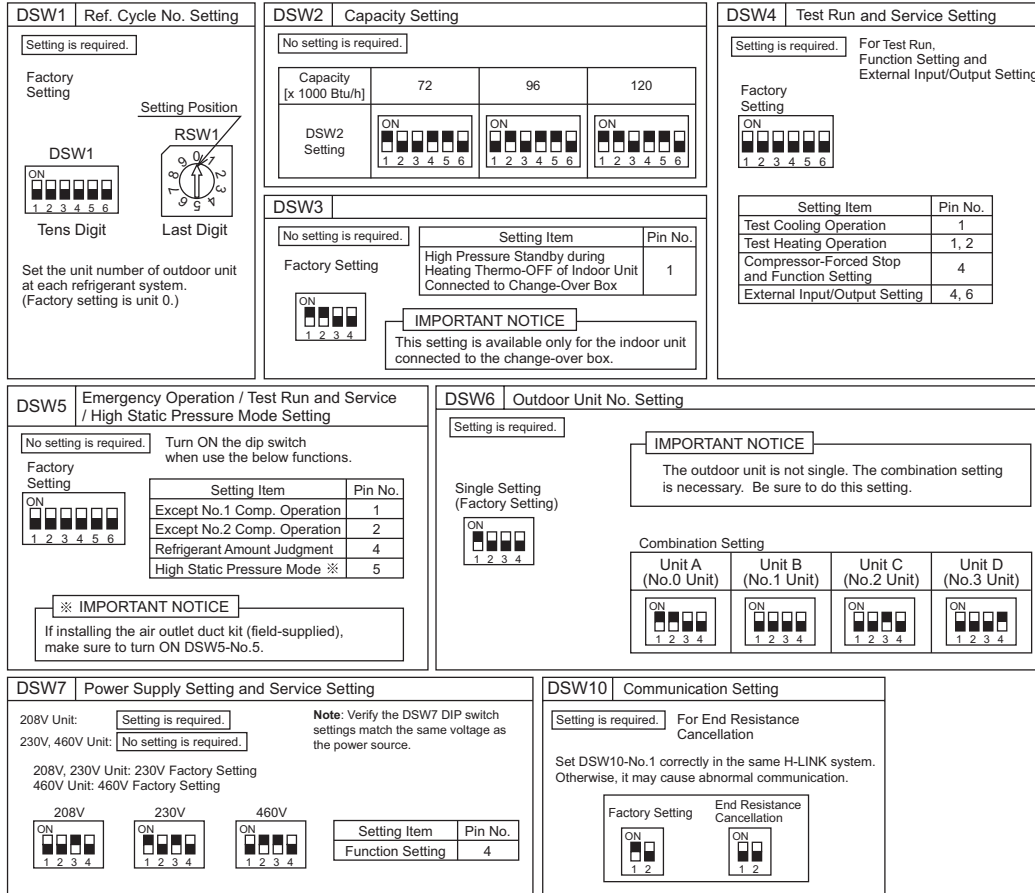


Fig. 1.3 DSW Setting

● **High Static Pressure Setting (DSW5-No.5: ON)**

Turn ON the DSW5-No.5 pin for the high static pressure setting.

This setting enables high static pressure operation up to a maximum of 0.24 in.W.G. (60Pa).

When the outdoor unit is installed in spaces such as a balcony or a floor where an external static pressure is required to secure a louver or a duct, this setting should be used.

NOTES:

1. If there is a combination of outdoor units, set this function for all the outdoor units.
2. While the unit operates in high static pressure mode, the operation sound value increases by 3dB from the nominal value.

● **Setting for Communication**

Setting the outdoor unit numbers, system numbers and end terminal resistance are requirements for this H-LINK system.

● **Setting of Outdoor Unit No.**

If there are combined outdoor units, set DSW6 as shown below.

Base Unit (Factory Setting)	Combination of Base Unit			
	Unit A (No.0)	Unit B (No.1)	Unit C (No.2)	Unit D (No.3)

● **Setting of Refrigerant Cycle Numbers**

In the same refrigerant cycle, set the same cycle number for the outdoor unit and the indoor units as shown below.

Setting the outdoor unit refrigerant cycle number is required only for the main unit.

The sub unit settings are not required.

As for setting the indoor unit refrigerant cycle number, set RSW2 and DSW5 on the indoor unit PCB.

	Setting Switch	
	10 digit	1 digit
Outdoor Unit	DSW1	RSW1
Indoor Unit	DSW5	RSW2

Ex.: Instance of Setting Refrigerant Cycle No. 25

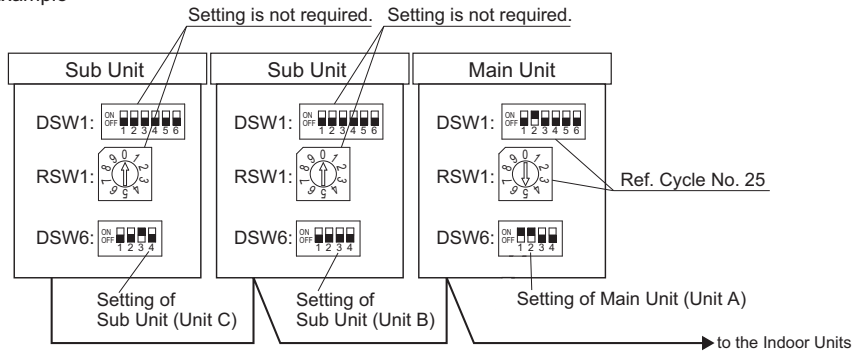


Turn ON No. 2 pin.

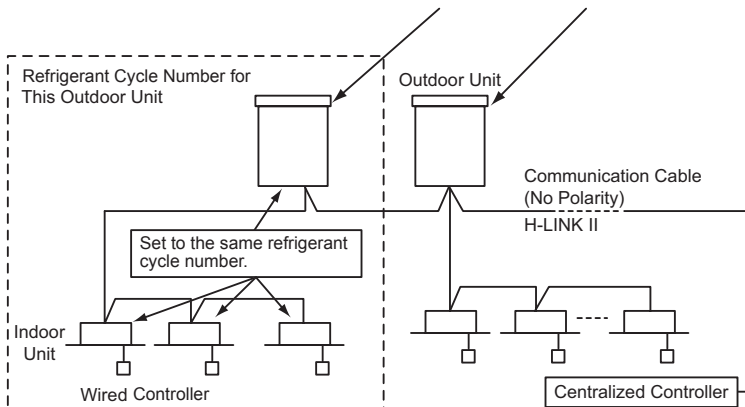
Set Dial No.5.

DSW and RSW factory setting is 0. Maximum in setting refrigerant cycle numbers is 63.

< Setting Example >



Set the refrigerant cycle number so there is no duplication of numbers with the other outdoor units.



Maximum Number of Connectable Outdoor Units and Indoor Units

Outdoor Unit	64
Indoor Unit	160

TROUBLESHOOTING

DSW7 Setting for Rated Voltage

DSW7 is used for setting of rated voltage for the outdoor unit as shown at the right.
When the site power source voltage is different from the factory setting, DSW7 setting is required.

NOTE:

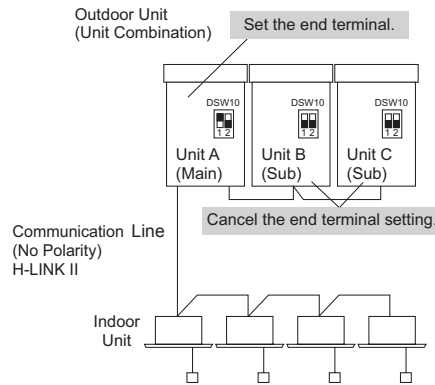
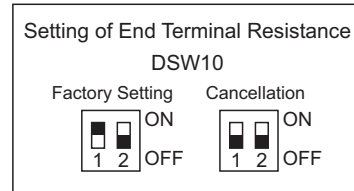
The same voltage setting is required for the main unit and sub unit(s).
Verify the DSW7 DIP switch settings match the same voltage as the power source.

Voltage	DSW7 Setting
208V	
230V	
460V	

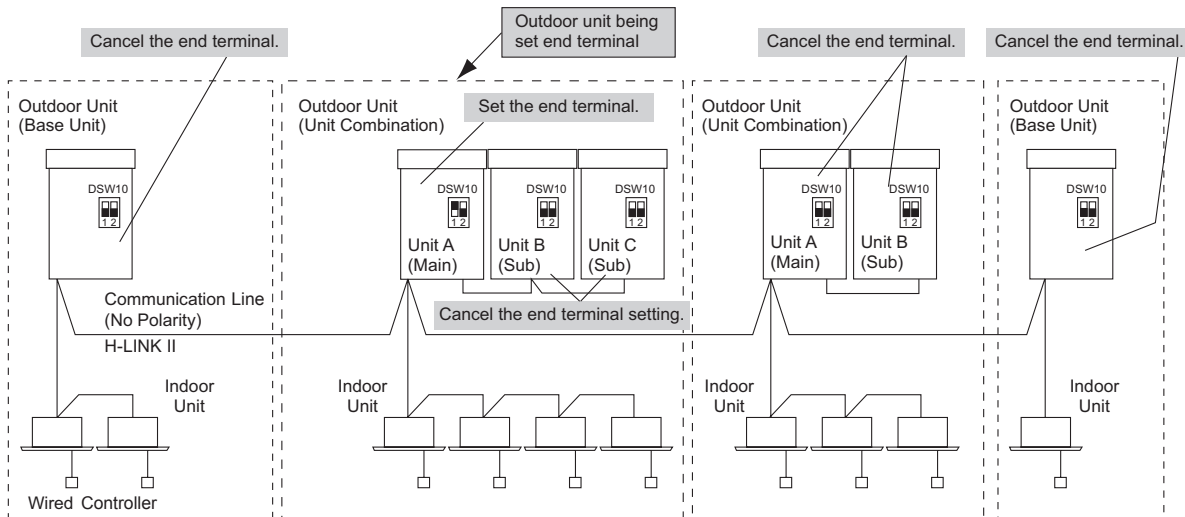
Setting of End Terminal Resistance

The factory setting for the No. 1 pin of DSW10 (for the setting of end terminal resistance) is in the "ON" position.

If there is one number in the same communication line (H-LINK II), set all No. 1 pins of DSW10 in the "OFF" position except the main outdoor Unit A.



If there is more than one refrigerant cycle in the same communication line (H-LINK II), set all No. 1 pins of DSW10 in the "OFF" position except one outdoor unit.

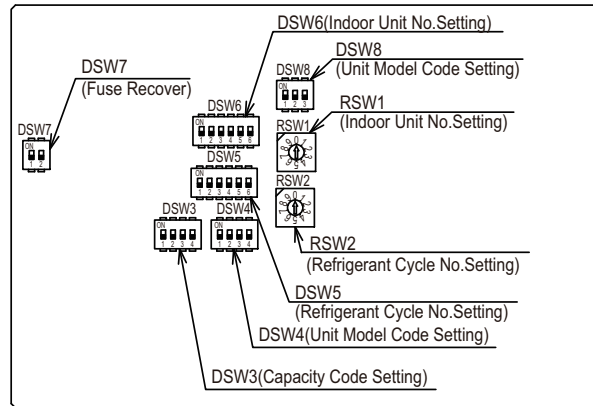


(2) Indoor Unit (Factory Setting)

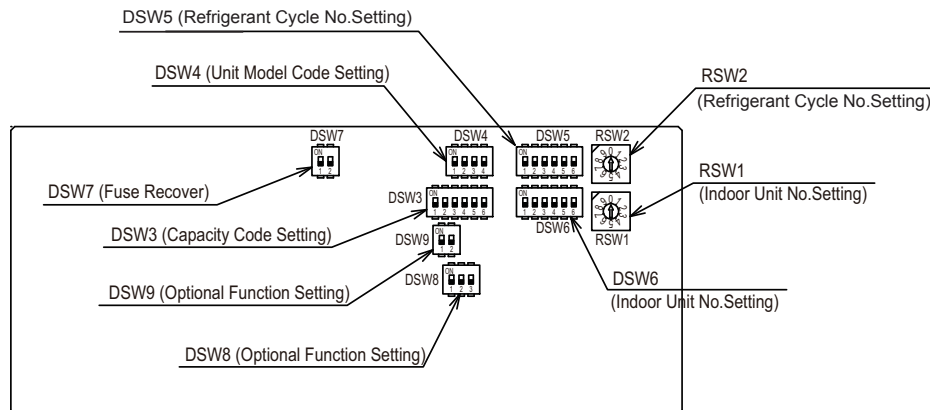
The positions of the DIP switches on the PCB are shown in the figure below. Turn OFF all power sources before setting.

Without turning OFF all power sources, the switches do not work and the settings are invalid. The "■" mark indicates the position of DIP switches.

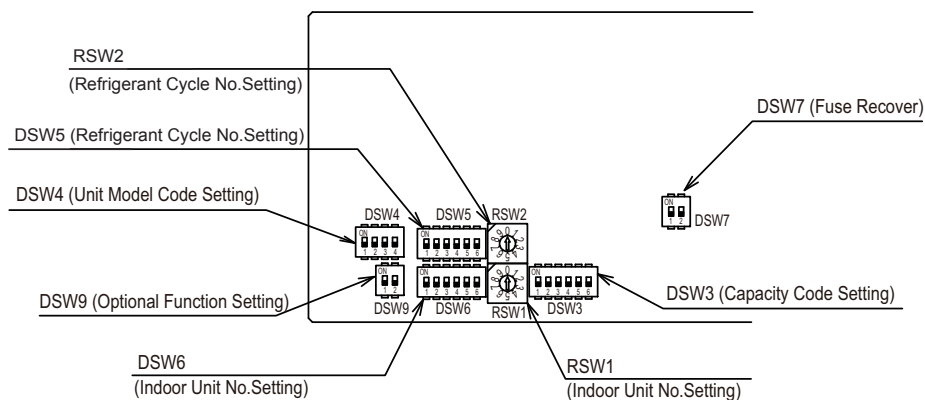
- Ducted
Ducted High Static



Ducted Medium Static and Slim



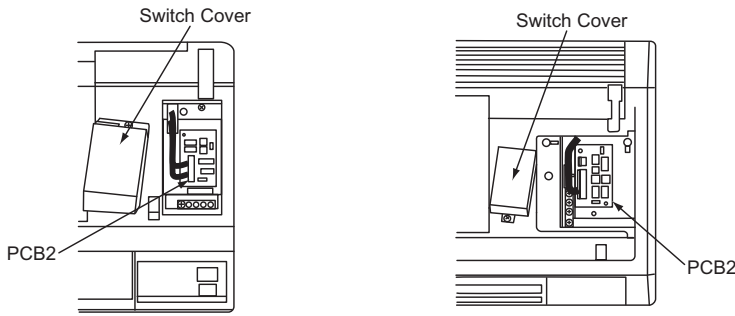
- 4-Way Cassette and 1-Way Cassette



TROUBLESHOOTING

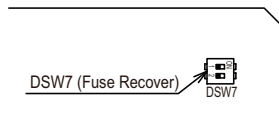
- Wall Mounted

< TIWM006B21S to TIWM012B21S > < TIWM015B21S to TIWM024B21S >

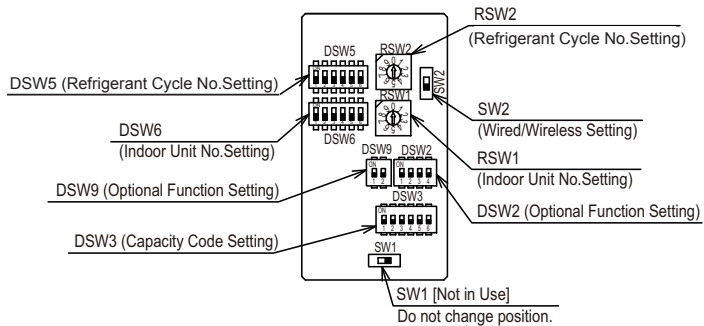


< DIP Switch >

Main PCB (PCB1) [Inside Electrical Box]



DIP Switch PCB (PCB2)



DIP Switch Settings

- (1) Turn OFF the power supply of the indoor unit and the outdoor unit before DIP switch setting. Not doing so makes the setting invalid.
- (2) Factory settings for DSW6 and RSW1 are set to "0". If connecting the indoor unit to H-LINK II supporting the outdoor unit without setting any DIP switches, auto-address setting will be performed by the wired controller.
- (3) Auto-Address Setting by Wired Controller
The address numbering is started from "0" by the auto-address function when the wired controller is connected to H-LINK II.
- (4) Unit No. Setting (RSW1 and DSW6)
The indoor unit numbers of all indoor units are not required. The indoor unit numbers are set by the auto-address function. If the indoor unit number setting is required, set the unit numbers of all indoor units respectively and serially by following setting positions. It is recommended to assign a number to each indoor unit beginning with "1." Though a maximum of 64 indoor units per refrigerant system can be connected to the H-LINK II System, available numbers range from 0 to 63. Therefore, the applicable number for the 64th indoor unit will be "0."
For centralized control, this setting is required.

Unit No. Setting

<p>DSW6 (Tens Digit)</p>	<p>RSW1 (Units Digit)</p> <p>Setting Position</p> <p>Set by inserting slotted screwdriver into the groove.</p>	<p>Ex.) Set at No.16 Unit</p> <p>DSW6</p> <p>Set No.1 Pin at ON side</p> <p>RSW1</p> <p>Set at "6"</p>
<p>Factory settings for DSW6 and RSW1 are set at "0".</p> <p>For the units supporting H-LINK II, the unit numbers can be set for a maximum of 64 indoor units (No.0 to 63).</p>		

(5) Capacity Code Setting (DSW3)

No setting is required because of the factory setting. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.

▪ Ducted

Ducted High Static

Indoor Unit Capacity (MBH)	18	24	30	36	48
DSW3 Setting Position					

Ducted Medium Static

Indoor Unit Capacity (MBH)	06	08	12	15	18
DSW3 Setting Position					
Indoor Unit Capacity (MBH)	24	30	36	48	
DSW3 Setting Position					

Ducted Slim

Indoor Unit Capacity (MBH)	06	08	12	15	18
DSW3 Setting Position					

▪ 4-Way Cassette

Indoor Unit Capacity (MBH)	12	15	18	24	30	36
DSW3 Setting Position						

▪ 1-Way Cassette

Indoor Unit Capacity (MBH)	06	08	12	15
DSW3 Setting Position				




▪ Wall Mounted

Indoor Unit Capacity (MBH)	06	08	12	15	18	24
DSW3 Setting Position						

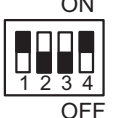


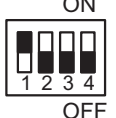

TROUBLESHOOTING

(6) Refrigerant Cycle Number Settings (RSW2 and DSW5) Setting is required. Factory settings are all OFF.

Refrigerant Cycle Number Setting

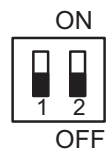
DSW5 (Tens Digit) 	RSW2 (Units Digit) Setting Position  Set by inserting slotted screwdriver into the groove.	Ex.) Set at No.5 Cycle DSW5  Set All Pins OFF
Factory settings for DSW5 and RSW2 are set at "0". For the units supporting H-LINK II, the refrigerant cycle numbers can be set for a maximum of 64 cycles. (No. 0 to 63)		

(7) Unit Model Code Setting (DSW4) < Except for Wall Mounted Models >
 No setting is required.
 This switch is utilized to set the model code of the indoor unit.

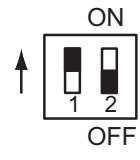
Ducted			4-Way Cassette	1-Way Cassette
High Static	Medium Static	Slim		
				

(8) Fuse Recover (DSW7) (for auxiliary use)

* Factory Setting

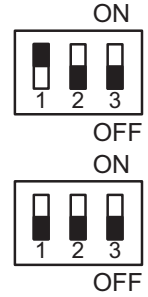


* When applying high voltage to terminals 1 and 2 of TB2, the fuse (0.5A) on the PCB is blown. If this happens, first connect the wiring to TB2, and then turn on the No. 1 pin.



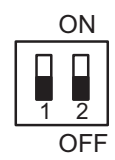
(9) Optional (DSW8) < Only for Ducted and Ducted Slim Models >

- Ducted High Static
No setting is required. This is for setting the model code of the indoor unit.
- Ducted Medium Static and Ducted Slim
No setting is required. Factory settings are all OFF.



(10) Optional Function Setting
 (DSW9: Except for Wall Mounted Model)
 (DSW2: Wall Mounted Model)

- Except for Wall Mounted
DSW9: No setting is required. Factory settings are all OFF.



▪ Wall Mounted

DSW2: No setting is required. Factory settings are all OFF.



* When setting the function “Identifying Indoor Units Installed Side by Side”, set No.3 pin of the DSW2 to “ON” when the wireless controller is used.

(When the setting is not required, leave the No.3 pin of the DSW2 “OFF” .)

For the function “Identifying Indoor Units Installed Side by Side”, the wireless controller should be set at “b mode”. (Refer to the “Installation and Maintenance Manual” for the wireless controller for the “b mode” setting.)



Set No. 3 pin of the DSW2 to “ON”.

NOTE

When using a receiver kit, setting DSW2 on the indoor unit PCB will not be required. Set the function “Identifying Indoor Units Installed Side by Side” with the receiver kit instead. Refer to the “Installation Manual” for the receiver kit for details on this setting.

3.1.4 Checking Wired Controller

Wired Controller Model: CIW01

Each "Check Menu" item and its function are explained in the following table.

Check Menu Item	Function
Check 1	Sensor condition of air conditioner will be monitored and indicated.
Check 2	Sensor data of air conditioner prior to alarm occurrence will be indicated.
Alarm History Display	Previous alarm record (date, time, alarm code) will be indicated.
Model Display	Model name and manufacturing number will be indicated.
I.U./O.U. PCB Check	The result of PCB check will be indicated.
Self Checking	Checking of wired controller will be carried out.

● Setting Method

< Normal Mode Display >

< Check Menu Display >

Press and hold "Menu" and "ECO" simultaneously for three seconds during the normal mode.

(1) Check 1 and Check 2

<p>(1) Press and hold "Menu" and "ECO" simultaneously for three seconds during the normal mode. The Check Menu is displayed.</p>	
<p>(2) Select "Check 1" (or "Check 2") from the Check Menu and press "OK".</p>	
<p>(3) Select the Set Indoor Unit by pressing "Δ ∇ ◀ ▶" and press "OK". This screen is NOT displayed when there is only one indoor unit connected with the wired controller. In this case, (4) below will be displayed.</p>	
<p>(4) Press "Δ" or "∇" to change the screen.</p>	

Features of Check Mode 1

No.	Item	Data Name
1	b1	Set Temp.
2	b2	Inlet Air Temp.
3	b3	Discharge Air Temp.
4	b4	Liquid Pipe Temp.
5	b5	Remote Thermistor Temp.
6	b6	Outdoor Air Temp.
7	b7	Gas Pipe Temp.
8	b8	Evaporating Temp. at Heating
9	b9	Condensing Temp. at Cooling
10	bA	Comp. Top Temp.
11	bb	Thermo Temp. of Wired Controller
12	bC	Not Prepared
13	C1	I.U. Micro-Computer
14	C2	O.U. Micro-Computer
15	d1	Stopping Cause State Indication
16	E1	Times of Abnormality
17	E2	Times of Power Failure
18	E3	Times of Abnormal Transmitting
19	E4	Times of Inverter Tripping
20	F1	Louver Sensor State
21	H1	Discharge Pressure

No.	Item	Data Name
22	H2	Suction Pressure
23	H3	Control Information
24	H4	Operating Frequency
25	J1	I.U. Capacity
26	J2	O.U. Code
27	J3	System Number (1)
28	J4	System Number (2)
29	L1	I.U. Expansion Valve
30	L2	O.U. Expansion Valve 1
31	L3	O.U. Expansion Valve 2
32	L4	O.U. Expansion Valve B
33	P1	Comp. Current
34	P2	Comp. Operating Accumulated Time
35	q1	Motion Sensor Reaction Rate * ¹
36	q2	Radiation Sensor Temp. * ¹
37	q3	Motion Sensor 1 Reaction Rate * ¹
38	q4	Motion Sensor 2 Reaction Rate * ¹
39	q5	Motion Sensor 3 Reaction Rate * ¹
40	q6	Motion Sensor 4 Reaction Rate * ¹
41	q7	Setting Temp. Collected Value

*¹ The average value for 30 seconds (update cycle time of Check Mode) is displayed on the LCD.

Features of Check Mode 2

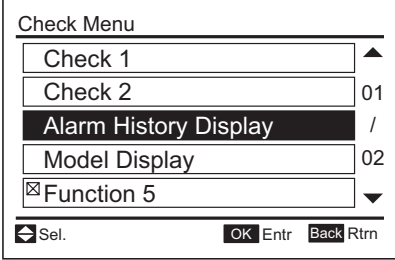
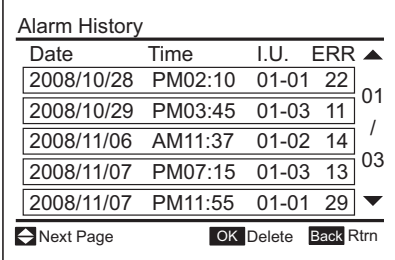
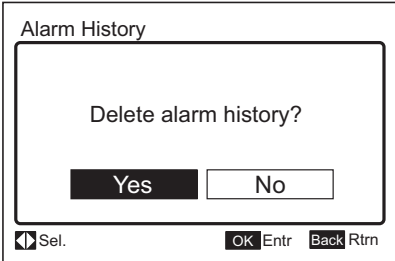
No.	Item	Data Name
1	q1	Inlet Air Temp.
2	q2	Discharge Air Temp.
3	q3	Liquid Pipe Temp.
4	q4	Outdoor Air Temp.
5	q5	Gas Pipe Temp.
6	q6	Evaporating Temp. at Heating
7	q7	Condensing Temp. at Cooling
8	q8	Comp. Top Temp.

No.	Item	Data Name
9	q9	Discharge Pressure
10	qA	Suction Pressure
11	qb	Control Information
12	qC	Operating Frequency
13	qd	I.U. Expansion Valve
14	qE	O.U. Expansion Valve 1
15	qF	Comp. Current

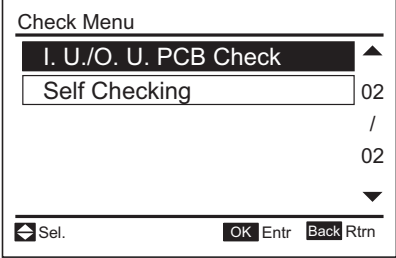
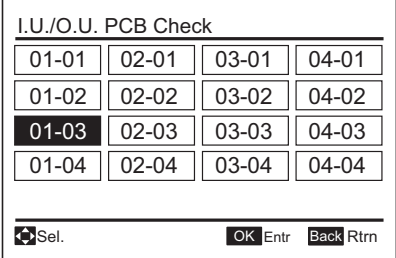
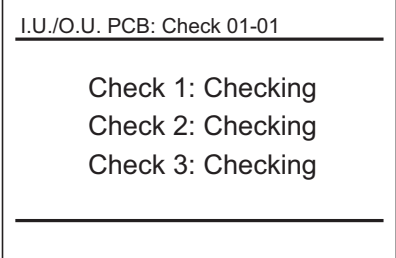
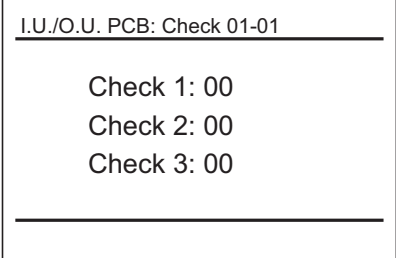
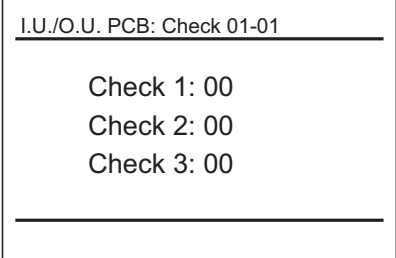
TROUBLESHOOTING

(2) Alarm History Display

The Alarm History Display is accessed from the Check Menu.

<p>(1) Press and hold "Menu" and "ECO" simultaneously for 3 seconds during the normal mode. The Check Menu is displayed.</p>	
<p>(2) Select "Alarm History Display" from Check Menu and press "OK".</p>	
<p>(4) To delete the alarm history, press "OK". The confirmation screen will be displayed. Select "Yes" and press "OK". The alarm history is deleted and the screen will return to (3) above. If "No" is pressed, the screen will return to (3) above.</p>	

(3) I.U./O.U. PCB Check

<p>(1) Press and hold "Menu" and "ECO" simultaneously for three seconds during the normal mode. Check Menu is displayed.</p>	
<p>(2) Select "I.U./O.U. PCB Check" from the Check Menu and press "OK".</p>	
<p>(3) Select the indoor unit to be set by pressing "Δ ∇ ◀ ▶" and press "OK". This screen is NOT displayed when there is only one indoor unit connected with the wired controller. In this case, (4) below will be displayed.</p>	
<p>(4) The indoor unit PCB and the outdoor unit PCB checks are started. * If "Menu" is pressed during the check, the check is canceled and the screen will return to (2). * If "Back/Help" is pressed during the check, the check is canceled and the screen will return to (3) above.</p>	
<p>(5) After completing the check, the results of the PCB check will be indicated. Press "Back/Help" and return to (3) above.</p>	

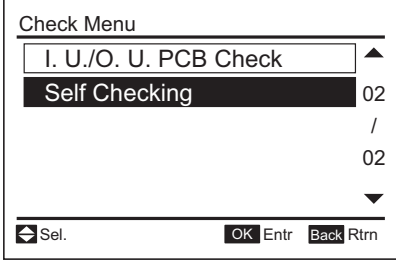
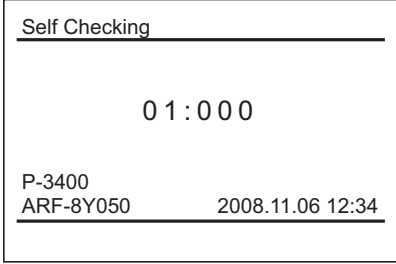
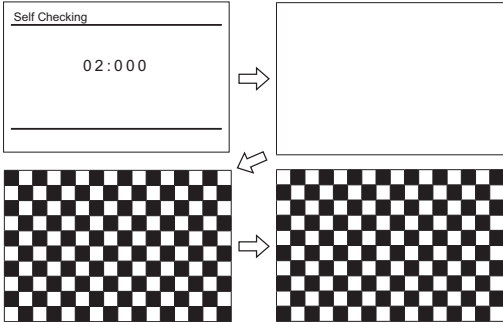
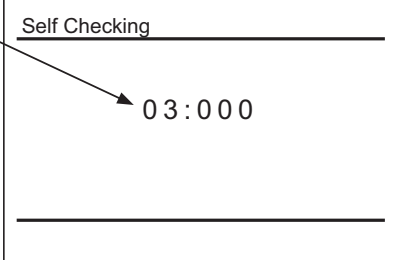
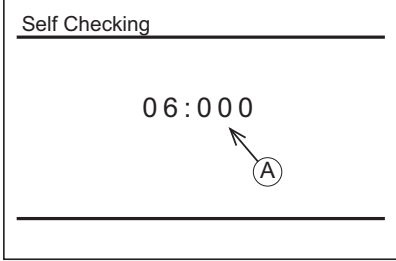
< Results of Check Table >

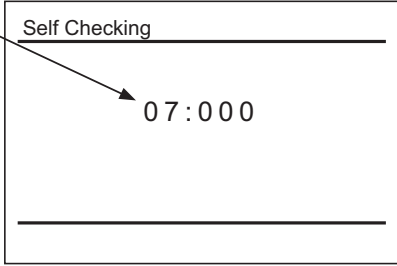
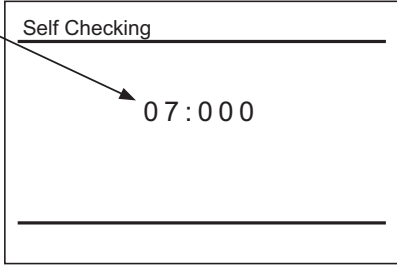
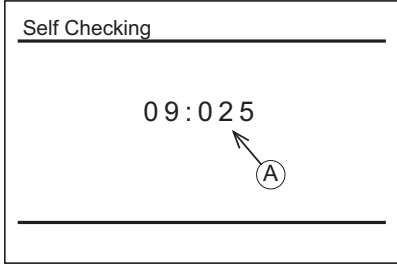
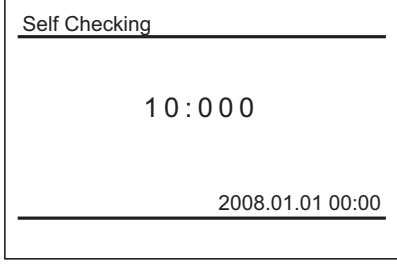
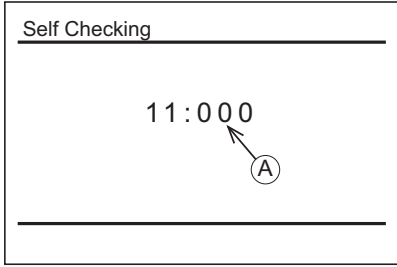
Indoor Unit PCB		Outdoor Unit PCB	
00	Normal	00	Normal
01	Abnormality of Inlet Air Temp. Thermistor	07	Abnormality of Transmission of Outdoor Unit
02	Abnormality of Outlet Air Temp. Thermistor	F4	ITO Input Failure
03	Abnormality of Liquid Pipe Temp. Thermistor	F5	PSH Input Failure
04	Abnormality of Remote Thermistor	F6	Abnormality of Protection Signal Detection Circuit
05	Abnormality of Gas Pipe Temp. Thermistor	F7	Abnormality of Phase Detection
08	Abnormality of Transmission of Central Station	F8	Abnormality of Transmission of Inverter
0A	Abnormality of EEPROM	FA	Abnormality of High Pressure Sensor
0b	Zero Cross Input Failure	Fb	Abnormality of Comp. Discharge Gas Temp. Thermistor
EE	Abnormality of Transmission of I.U. during Check	Fc	Abnormality of Low Pressure Sensor
		Fd	Abnormality of Evaporating Temp. Thermistor at Heating
		FF	Abnormality of Ambient Air Temp. Thermistor

TROUBLESHOOTING

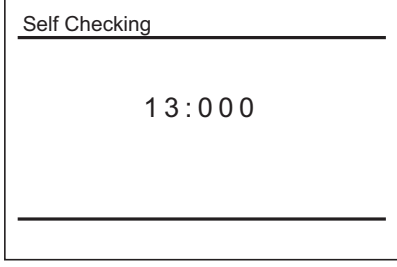
(4) Self-Checking

Self-Checking checks the wired controller and clears EEPROM (storage cell inside of the wired controller).

<p>(1) Press and hold "Menu" and "ECO" simultaneously for three seconds during the normal mode (when unit is not operating). The Check Menu is displayed.</p>	
<p>(2) Select "Self Checking" from the Check Menu and press "OK".</p>	
<p>(3) Select the process for "Self Checking". * To start self check, press "ECO". * To clear EEPROM, press "▽" and "ECO" simultaneously. → See EEPROM clear process (15) below.</p>	
<p>(4) LCD Test Press "OK" and the screen will change as shown at the right.</p>	<p>03: Backlight Test 04: Contrast Test 05: Run Indicator Test</p>
<p>(5) Backlight Test LCD brightness is changed gradually by pressing "OK".</p>	
<p>(6) Contrast Test Contrast of the LCD gradually changes by pressing "OK".</p>	<p>(7) Run Indicator Test Press "OK" and the run indicator will flash in red and green twice for each.</p>
<p>(8) Button Input Test Press the nine buttons one-by-one. The number indicated with "A" will count up as buttons are being pressed. * The order of pressing buttons is random. Do not press more than one button at a time. It will not be counted.</p>	

<p>(9) No Function This function is not used. Press "OK" to proceed.</p>	<p>07: No Function 08: Transmission Test</p> 
<p>(10) Communication (Transmission) Circuit Test The wired controller automatically starts to check the communication circuit.</p>	
<p>(11) Wired Controller Thermistor Test The detected temperature by the wired controller thermistor is displayed at "A" in the figure at the right.</p>	
<p>(12) Date/Time Test The date and time is changed from "2012.03.04 12:34" to "2008.01.01 00:00".</p>	
<p>(13) EEPROM Test < EEPROM Clearing Cancel > Press "?" (help). < EEPROM Clear > Press "OK" or wait 15 seconds. EEPROM data will be cleared. During the process, the numbers will indicate the location with "A". If A has a value of "999", EEPROM is in a faulty condition. *If "A" has "999", the process does not proceed to the next step.</p>	

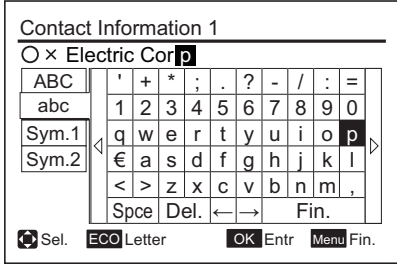
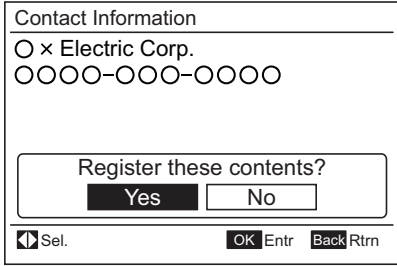
EEPROM Process

<p>(14) Clear EEPROM The wired controller will automatically start the EEPROM clearing process.</p>	
<p>(15) After several seconds pass, the self checking is completed and the wired controller is automatically restarted.</p>	

TROUBLESHOOTING

(5) Contact Information Registration

Contact information can be registered from “Contact Information”.

<p>(1) Press and hold “Menu” and “Back/Help” simultaneously for at least three seconds during the normal mode (when unit is not operating). The Test Run Menu will be displayed.</p>	
<p>(2) Select “Contact Information” from the Test Run Menu and press “OK”. Contact Information 1 will be displayed.</p>	
<p>(3) Press “Back/Help” to change font types.</p>	 <p>The screenshot shows a screen titled "Contact Information 1". At the top, it says "O x Electric Corp" with a cursor at the end. Below this is a numeric keypad with two rows of letters: "Sym.1" (q w e r t y u i o p) and "Sym.2" (€ a s d f g h j k l). The bottom row of the keypad includes "Spce", "Del.", and "Fin.". At the bottom of the screen, there are navigation buttons: "Sel.", "ECO Letter", "OK Entr", and "Menu Fin.".</p>
<p>(4) Press “△ ▽ ◀ ▶” to select letters.</p>	
<p>(5) Press “OK” to confirm the letters. (Max.: 28 letters)</p>	
<p>(6) Select “Fin.” and press “OK” (or simply press “Menu”), (7) will be displayed.</p>	
<p>(7) Repeat (3) through (5) to register contact information and continue. Select “Fin.” and press “OK”, the confirmation screen will be displayed. (Also, press “Menu” and the confirmation screen will be displayed.)</p>	
<p>(8) Select “Yes” and press “OK”. The Test Run Menu will be displayed after the setting is confirmed. If “No” is pressed, the screen will return to (3) above.</p>	 <p>The screenshot shows a screen titled "Contact Information". It displays "O x Electric Corp." followed by "OOOO-OOO-OOOO". Below this is a box containing the text "Register these contents?" with two buttons: "Yes" and "No". At the bottom of the screen, there are navigation buttons: "Sel.", "OK Entr", and "Back Rtrn".</p>

3.1.5 Checking Using 7-Segment Display

! WARNING

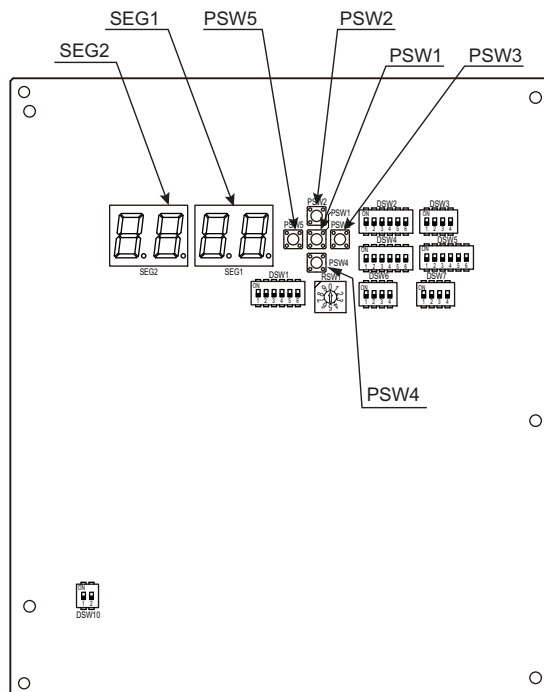
Only an authorized person can check using this method.

- **Before Checking**

- 1) Turn ON the main power source. Wait for more than 20 seconds to start checking.
- 2) Checking Items
 - * Expansion Valve Opening
 - * Temperature Readings from Thermistors
 - * Number of Indoor Units Connecting in the Same System
- 3) Check the locations of 7-segment and push switches.
- 4) AC208-230V is applied to the PCB and electrical parts. Never touch electrical parts and wires without appropriate personal protective equipment (PPE) when checking.

- **Location of Push Switches and 7-Segment Display**

The push switches and 7-segment display are located on the PCB1.



TROUBLESHOOTING

• Simple Checking using 7-Segment Display

1 * Turn on All Indoor Units

* All the Indoor Units Connected in the Same System

2 Turn on the Outdoor Unit

3 Auto-addressing Starts

Outdoor Unit
Printed
Circuit Board
(PCB)

During auto-addressing, the following items can be checked using the outdoor unit's on-board 7-segment LED display.

- (1) Disconnection of power supply to the indoor unit.
- (2) Reverse connection of the operating line between the outdoor and indoor units.
In this instance, "03" appears after 30 seconds.
- (3) Duplication of indoor unit number. See Alarm Code 35.

Normal Case (1) The outdoor unit's on-board 7-segment LED display is not indicated.

Abnormal Instance

(2) The outdoor unit's on-board 7-segment LED display indicates the following if there is something wrong.

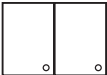
(A) Alarm code will be displayed on the 7-segment LED display when an alarm is received from an indoor unit in normal mode.
As for the following alarm codes, however, an alarm code will be displayed on the 7-segment LED display when an alarm is detected by an outdoor unit itself.

- Alarm Code "03" (Abnormal Transmission between Indoor Unit and Outdoor Unit)
- Alarm Code "35" (Incorrect Indoor and Outdoor Unit No. Setting)


(B) Alarm code of smaller indoor unit Address No. will be displayed when alarm is received from multiple indoor units.

(C) The following 7-segment LED display appears and flashes every 0.5 seconds.

SEG2



SEG1



Alarm Code


(D) SEG1 and SEG2 are as follows.

7-Segment Display

<Instance of Unit No. 63, Alarm Code "01">


SEG2: Indoor Unit No. (0~63)
SEG1: Alarm Code

SEG2



Indoor Unit No.

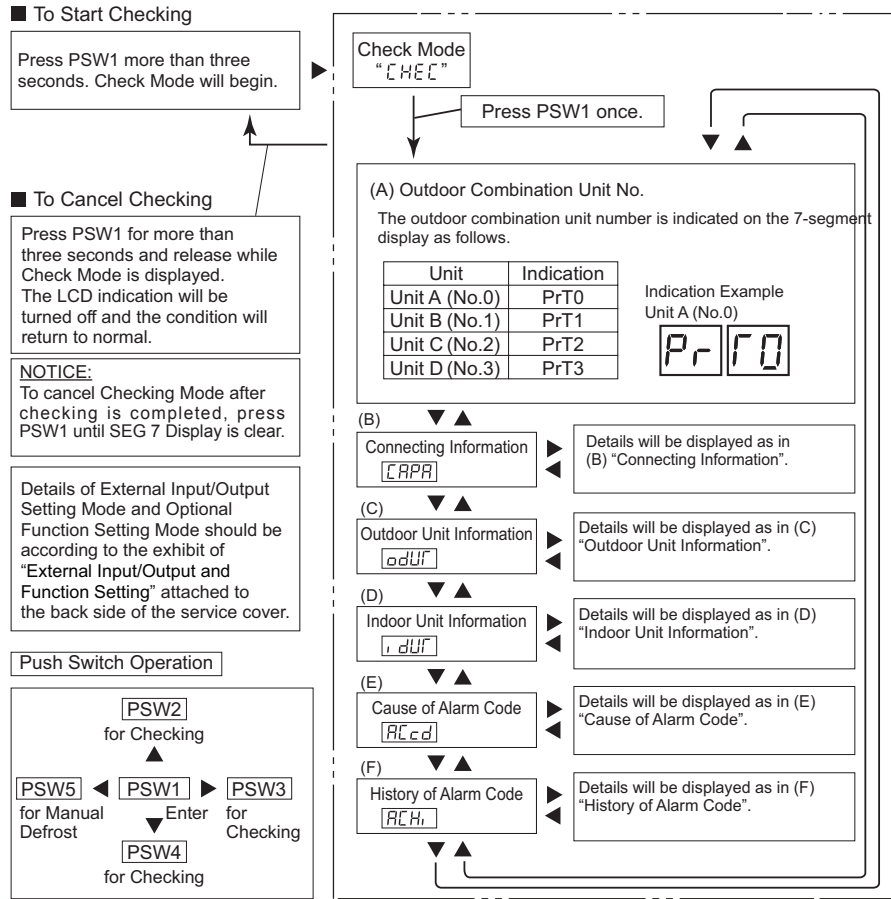
SEG1



Alarm Code

● **Checking Method Using Checking Mode**

Operating conditions and each part of a system can be checked using a 7-segment display and push on the PCB1 in the outdoor unit.



(B) Connecting Information

This information is indicated on Unit A (No. 0) only.
Press PSW4 (▼) to move forward or PSW2 (▲) to move backward.
The information will be indicated alternately as "Item" → "Details".

Indication Details

Item	7-Segment Display		Details
	SEG2	SEG1	
1 Total Capacity of Connected Outdoor Units (*1)	□	CP	Total Capacity of O.U. Combination Refer to "Outdoor Unit Capacity Table".
2 O.U. Constitution Quantities	□	RR	Constitution Quantities of O.U. Combination
3 Total Capacity of Connected Indoor Units (*2)	,	CP	Total Capacity of Connected Indoor Units
4 Connected I.U. Number	,	RR	Connected Indoor Unit Number
5 Refrigerant Group		GR	Refrigerant Group Number
6 Total Capacity of Operated I.U.		oP	Total Capacity of Operated Indoor Units Refer to "Indoor Unit Capacity Table".
7 Total Comp. Frequency		Hz	Unit: Hz
8 Accumulated Operation Time		UU	Unit: Hour (Indication x 10 Hours)

*1: Outdoor Unit Capacity Table

Indication	Type (Capacity) [x 1000 Btu/h]	Refrigeration Ton [RT]
96	072	6.0
112	096	8.0
128	120	10.0

NOTE:
In case of combination unit, the indication of outdoor unit capacity is total capacity of each unit.

< Example >
Instance of 216 type

216 type = 072 type x 3
96 x 3 = 288
Indication "288" will be displayed.

*2: Indoor Unit Capacity Table

Indication	Type (Capacity) [x 1000 Btu/h]	Refrigeration Ton [RT]
6	006	0.5
8	008	0.7
11	012	1.0
16	015	1.3
20	018	1.5
26	024	2.0
32	030	2.5
40	036	3.0
48	048	4.0

TROUBLESHOOTING

(C) Outdoor Unit Information

Select the outdoor unit number to be displayed only for the example of Unit A (No.0).

Units B and D (Nos.1 to 3) show each unit number. only.

When the selection is changed, press PSW4 (▼) to forward or PSW2 (▲) to backward.

Select the outdoor unit number for indication.

Press PSW3 (▶) for detailed information of selected unit number.

Press PSW4 (▼) to move forward or PSW2 (▲) to move backward. The information will be indicated alternately as "Item" → "Details".

Press PSW5 (◀) to return to Outdoor Combination Unit No. Selection.

Unit	Indication
Unit A (No.0)	0d00
Unit B (No.1)	0d01
Unit C (No.2)	0d02
Unit D (No.3)	0d03

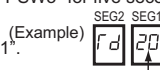
Details of Indication

Item	7-Segment Display		Details
	SEG2	SEG1*3)	
1 Outdoor Unit Capacity	CR	0	Unit Capacity Indication Refer to "Outdoor Unit Capacity Table"
2 Output State of Outdoor Micro-Computer	SC	0	Output State of Outdoor Micro-Computer Indication Refer to "Location of Push Switches and 7-Segment Display"
3 Running Frequency of Inverter Compressor MC1	H1	0	Running Frequency of INV. Compressor Indication (Hz)
4 Total Number of Running Compressor	CC	0	Total Number of Running Compressor Indication
5 Airflow Rate	FO	0	Airflow Rate Indication (0 to 25 Steps)
6 Outdoor Expansion Valve MV1 Opening	E1	0	Outdoor Expansion Valve MV1 Opening Indication (Unit: %)
7 Outdoor Expansion Valve MVB Opening for Bypass	Eb	0	Expansion Valve Opening for Bypass Indication (Unit: %)
8 Discharge Pressure (High)	Pd	0	Unit: Psi Indication of Thermistor Open Circuit: 815 Indication of Thermistor Short Circuit: -90
9 Suction Pressure (Low)	PS	0	Unit: Psi Indication of Thermistor Open Circuit: 326 Indication of Thermistor Short Circuit: -36
10 Ambient Air Temperature (Ta)	To	0	Unit: °F Indication of Thermistor Open Circuit: -197 Indication of Thermistor Short Circuit: 261
11 Discharge Gas Temperature on the Top of Compressor MC1 (TD1)	Td	10	Unit: °F Indication of Thermistor Open Circuit: 32 Indication of Thermistor Short Circuit: 491
12 Discharge Gas Temperature on the Top of Compressor MC2 (TD2)	Td	20	Unit: °F Indication of Thermistor Open Circuit: 32 Indication of Thermistor Short Circuit: 491 8RT, 10RT only
13 Evaporating Temperature TE at Heating	TE	0	Unit: °F Indication of Thermistor Open Circuit: -197 Indication of Thermistor Short Circuit: 261
14 Outdoor Heat Exchanger Gas Temperature	TO	0	Unit: °F Indication of Thermistor Open Circuit: -197 Indication of Thermistor Short Circuit: 261
15 Supercooling Temperature	TC	40	Unit: °F Indication of Thermistor Open Circuit: -197 Indication of Thermistor Short Circuit: 261
16 Supercooling Temperature at Bypass	Tb	00	Unit: °F Indication of Thermistor Open Circuit: -197 Indication of Thermistor Short Circuit: 261
17 Inverter Fin Temperature	FF	0	Unit: °F
18 Fan Controller Fin Temp.	FF	FD	Unit: °F
19 Compressor MC1 Current*1)	R1	0	Unit: A
20 Compressor MC2 Current*1)	R2	0	Unit: A 8RT, 10RT only
21 Fan Motor (MOF1) Current*1)	RF	0	Unit: A
22 Accumulated Operation Time of Compressor MC1	UU	10	Unit: Hour (Indication x 10 Hours)
23 Accumulated Operation Time of Compressor MC2	UU	20	Unit: Hour (Indication x 10 Hours) 8RT, 10RT only
24 Accumulated Operation Time of Compressor MC1	cU	10	Unit: Hour (Indication x 10 Hours) Accumulated operation time can be reset.*2)
25 Accumulated Operation Time of Compressor MC2	cU	20	Unit: Hour (Indication x 10 Hours) 8RT, 10RT only Accumulated operation time can be reset.*2)
26 Cause of Inverter Stoppage	IF	10	Refer to "Inverter Stoppage Cause Table" Comp. No. 0.U. No.
27 Cause of Fan Controller Stoppage	FF	10	Refer to "Fan Controller Stoppage Cause Table" Fan Controller No. 0.U. No.

*1) The indicated current is reduced value. Use a clamp meter for the accurate current value.

*2) For resetting the accumulated operation time, press "PSW1 + PSW3" for five seconds while the accumulated data is displayed.

*3) The outdoor unit number is indicated on the first digit of "SEG1".



(D) Indoor Unit Information

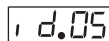
This information is indicated on Unit A (No. 0) only.

Select the indoor unit number for the information indication. Press PSW4 (▼) to move forward or PSW2 (▲) to move backward.

Unit No.	Indication
No.0	, d00
No.1	, d01
↓	↓
No.63	, d63

NOTE:

For indoor unit connecting to change-over box, “*” will be indicated next to “d”.



(Example)
Instance of change-over box connecting to Indoor Unit No.5; the indication is as shown at the left.

Select the outdoor unit number for indication.

Press PSW3 (▶) for detailed information of selected unit number

Press PSW4 (▼) to move forward or PSW2 (▲) to move backward. The information will be indicated alternately as “Item” → “Details”.

Press PSW5 (◀) to return to the Outdoor Combination Unit No. Selection.

Details of Indication

	Item	7-Segment Display		Details
		SEG2	SEG1 *1)	
1	Indoor Unit Capacity	CR	00	Unit Capacity Indication Refer to “Indoor Unit Capacity Table”.
2	Expansion Valve Opening	, E	00	Unit: %
3	Heat Exchanger Liquid Piping Temp.	FL	00	Unit: °F
4	Heat Exchanger Gas Piping Temp.	FG	00	Unit: °F
5	Air Inlet Temp.	Fi	00	Unit: °F
6	Air Outlet Temp.	FO	00	Unit: °F
7	Unit Stoppage Cause Code	d1	00	Indoor Unit Stoppage Cause Code Indication Refer to “Cause of Indoor Unit Stoppage Table”.

*1) The indoor unit number is indicated on “SEG1”.
(Example)

(E) Cause of Alarm Code Information

This information is indicated on Unit A (No. 0) only.

Press PSW4 (▼) to move forward or PSW2 (▲) to move backward.

The information will be indicated alternately as “Item” → “Details”.

Details of Indication

	Item	7-Segment Display		Details
		SEG2	SEG1	
1	Alarm Cause Code		AC	Latest O.U. Stoppage Alarm Code Indication Refer to “Alarm Code Table”.
2	Degeneracy Control for Pressure Ratio Decrease Protection	C	11	□ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
3	Degeneracy Control for High Pressure Increase Protection	C	13	□ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
4	Degeneracy Control for Inverter Fin Temp. Increase Protection	C	14	□ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
5	Degeneracy Control for Discharge Gas Temp. Increase Protection	C	15	□ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
6	Degeneracy Control for Td SH Decrease Protection	C	16	□ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.
7	Degeneracy Control for Overcurrent Protection	C	17	□ : Degeneracy Control is not Activated. ! : Degeneracy Control is Activated.

TROUBLESHOOTING

(F) Alarm Code History Information

This information is indicated on Unit A (No. 0) only.

If a history of abnormality exists, it is indicated up to a maximum of 15 instances in chronological order.

Press PSW4 (▼) to move forward or PSW2 (▲) to move backward.

Press PSW3 (▶) for detailed information.

Press PSW4 (▼) to move forward or PSW2 (▲) to move backward.

Press PSW5 (◀) to return to Data No. Selection.

Data No.	7-Segment Display	
	SEG2	SEG1
1 (Latest Data)	no	01
↓	↓	↓
15 (Oldest Data)	no	15

Details of Indication

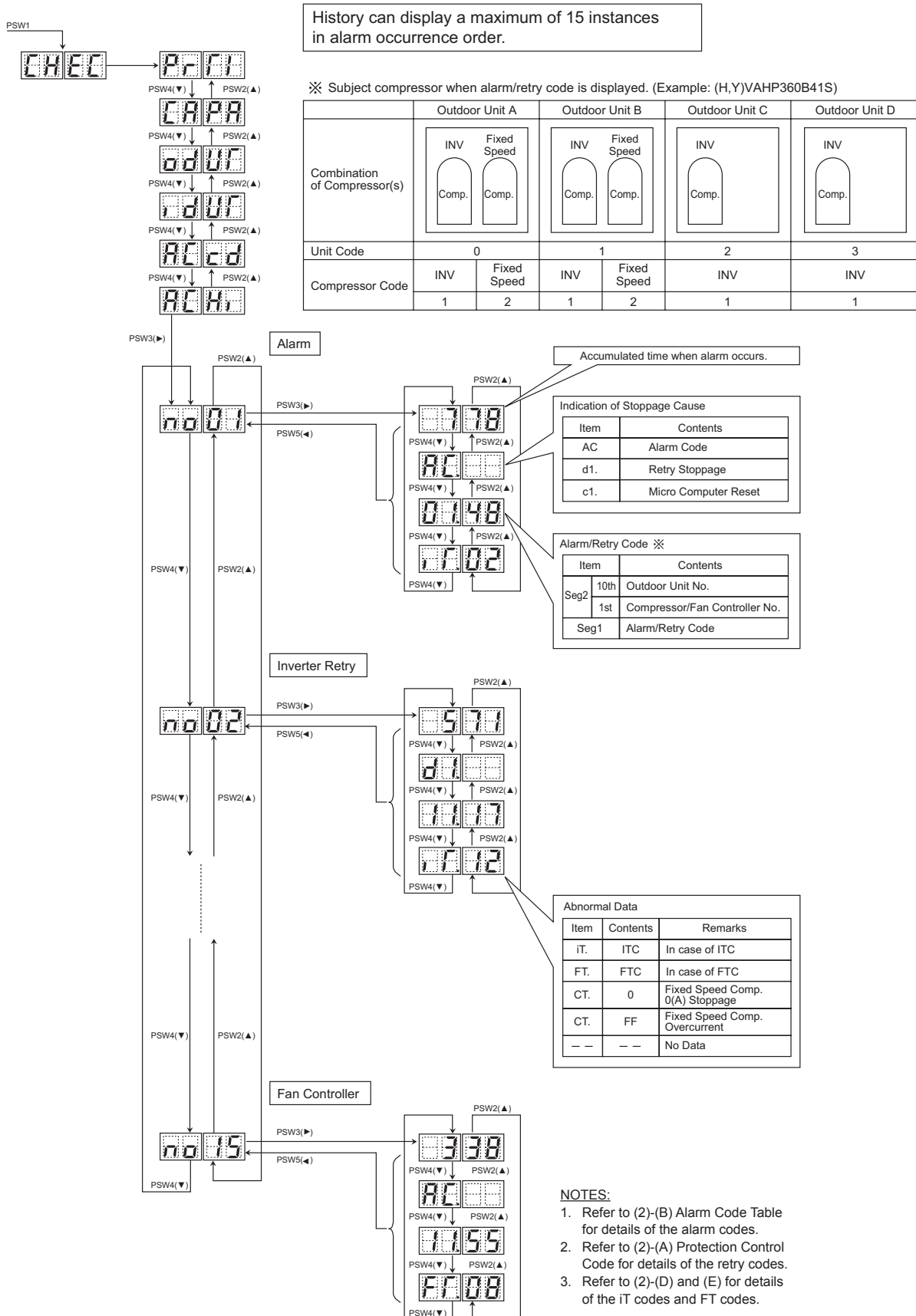
Item	7-Segment Display		Details
	SEG2	SEG1	
1 Unit Accumulated Operation Time	07	08	O.U. Accumulated Operation Time at Stoppage Unit: Hour (Indication x 10 Hours)
2 Cause of Stoppage	AL		Alarm Stoppage
	d1		Retry Stoppage
	C1		Control Information
3 Alarm / Stoppage Cause Code	01	48	Alarm and Stoppage Cause Code O.U. No. is indicated on 10 digit of SEG2. Compressor and fan controller No. are indicated on one digit of SEG2. Alarm and stoppage code are indicated on SEG1.
4 Abnormal Data Indication	1F	12	Inverter stoppage cause code is indicated when IT code is existing on SEG2.
	FF	12	Fan controller stoppage cause code is indicated when FT code is existing on SEG2.
	CF	0	Stoppage cause of constant speed compressor abnormal current is 0A stoppage.
	CF	FF	Overcurrent Stoppage of Constant Speed Comp.
	--	--	No Data

3.1.6 Checking Alarm Code History

Alarm code history is indicated in the following order while the Check Mode is displayed.

“no01” (latest) ↔ history data ~ “no15” (oldest) ↔ history data

Refer to the figure below as an example.



- NOTES:**
1. Refer to (2)-(B) Alarm Code Table for details of the alarm codes.
 2. Refer to (2)-(A) Protection Control Code for details of the retry codes.
 3. Refer to (2)-(D) and (E) for details of the iT codes and FT codes.

TROUBLESHOOTING

(1) Register of Alarm Code History

Cause of Stoppage (Alarm Code or Stoppage Code)	Contents	Indication of Alarm Code History					
		Time	* Alarm	Alarm Code			Abnormal Data
				O.U. Unit No.	Comp. No.	Fan No.	
02	Activation of protection device	Accumulated Time	AC.	○	○		--
03	Abnormality transmitting between indoor units and outdoor units	Accumulated Time	AC.				--
04	Abnormality transmitting between inverter PCB and outdoor unit PCB	Accumulated Time	AC.	○	○		--
04.	Abnormality transmitting between fan controller and outdoor unit PCB	Accumulated Time	AC.	○		○	--
05	Abnormality of power source phase	Accumulated Time	AC.	○			--
06	Abnormality of inverter voltage	Accumulated Time	AC.	○	○		iTC
d1-18		Accumulated Time	d1.	○	○		iTC
06.	Abnormality of fan controller voltage	Accumulated Time	AC.	○		○	FTC
07	Decrease in discharge gas superheat	Accumulated Time	AC.	○	○		--
d1-16		Accumulated Time	d1.	○	○		--
08	Increase in discharge gas temperature at the top of compressor	Accumulated Time	AC.	○	○		--
d1-15		Accumulated Time	d1.	○	○		--
0A	Abnormality transmitting between outdoor units	Accumulated Time	AC.				--
0b	Incorrect outdoor unit address setting	Accumulated Time	AC.				--
0c	Incorrect outdoor main unit setting	Accumulated Time	AC.				--
21	Abnormality of high pressure sensor	Accumulated Time	AC.	○			--
22	Abnormality of thermistor for outdoor air temperature	Accumulated Time	AC.	○			--
23	Abnormality of thermistor for discharge gas temp. on top of compressor	Accumulated Time	AC.	○	○		--
24	Abnormality of thermistor for outdoor unit heat exchanger liquid pipe (Te/Tchg)	Accumulated Time	AC.	○		Thermistor Signal Te: E Tchg: C	--
25	Abnormality of thermistor for outdoor unit heat exchanger gas pipe (Tg/TbG)	Accumulated Time	AC.	○		Thermistor Signal TG: G TbG: b	--
29	Abnormality of low pressure sensor	Accumulated Time	AC.	○			--
31	Incorrect capacity setting of indoor unit and outdoor unit	Accumulated Time	AC.				--
35	Incorrect indoor unit No. setting	Accumulated Time	AC.				--
36	Incorrect indoor unit combination	Accumulated Time	AC.				--
38	Abnormality of picking up circuit for protection in outdoor unit	Accumulated Time	AC.	○			--
39	Abnormality of running current at constant speed compressor	Accumulated Time	AC.	○			CT Detected Value
d1-14		Accumulated Time	d1.	○			
3A	Abnormality of outdoor unit capacity	Accumulated Time	AC.				--
3b	Incorrect setting of outdoor unit model combination or voltage	Accumulated Time	AC.				--
3d	Abnormality transmitting between main unit and sub unit(s)	Accumulated Time	AC.				--
3E	Abnormal Combination between Inverter PCB	Accumulated Time	AC.	○			--

* (Details of Alarm)

AC.: Alarm

d1.: Retry

Cl.: Control Information

iTC: Inverter Stoppage Code

FTC: Fan Controller Stoppage Code

Cause of Stoppage (Alarm Code or Stoppage Code)	Contents	Indication of Alarm Code History					
		Time	* Alarm	Alarm Code			Abnormal Data
				O.U. Unit No.	Comp. No.	Fan No.	
43	Abnormality of low compression ratio	Accumulated Time		○			--
d1-11		Accumulated Time	d1.	○			--
44	Abnormality of low-pressure increase	Accumulated Time	AC.	○			--
d1-12		Accumulated Time	d1.	○			--
45	Abnormality of high-pressure increase	Accumulated Time	AC.	○			--
d1-13		Accumulated Time	d1.	○			--
47	Activation of low-pressure decrease protection device (Vacuum operation protection)	Accumulated Time	AC.	○			--
d1-15		Accumulated Time	d1.	○			--
48	Activation of inverter overcurrent protection device	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
51	Abnormality of inverter current sensor	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
53	Inverter error signal detection	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
54	Abnormality of inverter fin temperature	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
55	Inverter failure	Accumulated Time	AC.	○	○		iTC
d1-17		Accumulated Time	d1.	○	○		iTC
57	Activation of fan controller protection device	Accumulated Time	AC.	○		○	FTC
5A	Abnormality of fan controller fin temperature	Accumulated Time	AC.	○		○	FTC
5B	Activation of overcurrent protection	Accumulated Time	AC.	○		○	FTC
5C	Abnormality of fan controller sensor	Accumulated Time	AC.	○		○	FTC
b5	Incorrect setting of indoor unit connection number	Accumulated Time	AC.				--
EE	Compressor protection alarm	Accumulated Time	AC.				--
A1	Abnormality of Active Filter	Accumulated Time	AC.	○			--
d1-05	Instantaneous power failure	Accumulated Time	d1				--
d1-18	Abnormality of inverter and other	Accumulated Time	d1				iTC
d1-26	Abnormality of high pressure decrease	Accumulated Time	d1				--
d1-32	Retry stoppage by indoor unit auto address setting	Accumulated Time	d1				--
d1-36	Retry stoppage by outdoor unit thermo-OFF stoppage after defrosting operation	Accumulated Time	d1				--
Control Information	Micro-computer reset by abnormality of inverter transmission	Accumulated Time	Ci.				1
	Micro-computer reset by abnormality of fan controller transmission	Accumulated Time	Ci.				2
	Micro-computer reset by abnormality of indoor unit transmission	Accumulated Time	Ci.				3
	Micro-computer reset by abnormality transmitting between outdoor unit and outdoor unit	Accumulated Time	Ci.				4
	Micro-computer reset for abnormality of control state	Accumulated Time	Ci.				6

* (Details of Alarm)

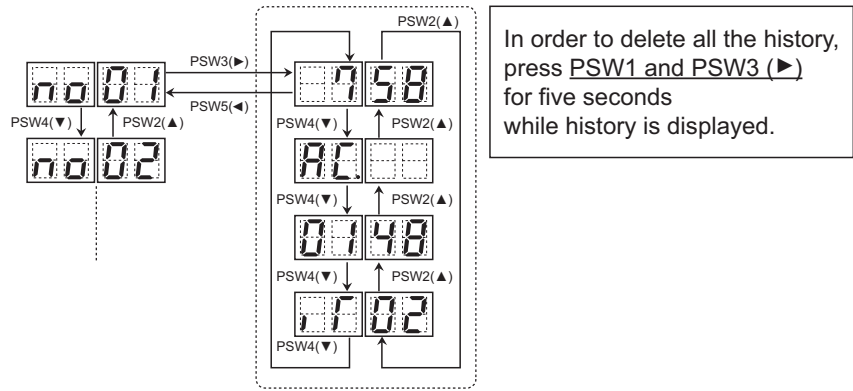
AC.: Alarm
d1.: Retry
Ci.: Control Information

*Thermo-ON: The outdoor unit and some indoor units are running.
Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

iTC: Inverter Stoppage Code
FTC: Fan Controller Stoppage Code

TROUBLESHOOTING

- (2) Deletion of Alarm Code History
Press PSW1 and PSW3 for five seconds while the history data is displayed. (All history can be deleted.)



(A) Protection Control Code

The control information during operation are displayed.

The protection control code is different from the code displayed during unit operation stoppage.

Code	Protection Control	Code	Protection Control
P01	Pressure Ratio Control	P11	Pressure Ratio Decrease Retry
P02	High Pressure Increase Protection	P12	Low Pressure Increase Retry
P03	Inverter Current Protection	P13	High Pressure Increase Retry
P04	Inverter Fin Temp. Increase Protection	P14	Overcurrent Retry of Constant Speed Comp.
P05	Discharge Gas Temp. on Top of Comp. Increase Protection	P15	Vacuum/Discharge Gas Temp. Increase Retry
P06	Low Pressure Decrease Protection	P16	Discharge Gas SUPER HEAT Decrease Retry
P09	High Pressure Decrease Protection	P17	Inverter Trip Retry
P0A	Demand Current Control	P18	Retry Related to Inverter
P0d	Low Pressure Increase Protection	P26	High Pressure Decrease Retry

NOTE: If the degeneration control is activated, the indications PC1 to PC5 are indicated instead of P01 to P05.

(B) Alarm Code Table

Code	Category	Content of Abnormality	Leading Cause
01	Indoor Unit	Activation of Protection Device (Float Switch)	Activation of Float Switch (High Water Level in Condensation Drainage Pan, Problem with Drain Piping, Float Switch, or Condensation Drainage Pan)
02	Outdoor Unit	Activation of Protection Device (High Pressure Cut)	Activation of PSH (Pipe Clogging, Excessive Refrigerant, Inert Gas Mixing)
03	Communication	Operational Irregularities between Indoor and Outdoor	Incorrect Wiring, Loose Terminals, Disconnect Wire, Blowout of Fuse, Outdoor Unit Power OFF
04		Problem between Inverter PCB and Outdoor PCB	Inverter PCB - Outdoor PCB Communication Failure (Loose Connector, Wire Breaking, Blown of Fuse)
04.		Problem between Fan Controller and Outdoor PCB	Fan Controller - Outdoor PCB Communication Failure (Loose Connector, Wire Breaking, Blown of Fuse)
05	Supply Phase	Problem of Power Source Phases	Incorrect Power Source, Connection to Reversed Phase, Open-Phase
06	Voltage	Abnormal Inverter Voltage	Outdoor Voltage Drop, Insufficient Power Capacity
06.		Abnormal Fan Controller Voltage	Outdoor Voltage Drop, Insufficient Power Capacity
07	Cycle	Decrease in Superheated Discharge Gas	Excessive Refrigerant Charge, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Opened Position (Disconnect Connector)
08		Increase in Discharge Gas Temperature	Insufficient Refrigerant Charge, Pipe Clogging, Failure of Thermistor, Incorrect Wiring, Incorrect Piping Connection, Expansion Valve Locking at Closed Position (Disconnect Connector)
0A	Communication	Problem between Outdoor and Outdoor	Incorrect Wiring, Breaking Wire, Loose Terminals
0b	Outdoor Unit	Incorrect Outdoor Unit Address Setting	Duplication of Address Setting for Outdoor Units (Sub Units) in Same Refrigerant Cycle System
0C		Incorrect Outdoor Unit Main Unit Setting	Two (or more) Outdoor Units Set as "Main Unit" Exist in Same Refrigerant Cycle System
11	Sensor on Indoor Unit	Inlet Air Thermistor	Incorrect Wiring, Disconnecting Wiring Breaking Wire, Short Circuit
12		Outlet Air Thermistor	
13		Freeze Protection Thermistor	
14		Gas Piping Thermistor	
15		Outdoor Air Thermistor (ECONO)	
16		Remote Sensor (DOAS)	
17		Thermistor Built-in Remote Controller (DOAS)	
19	Fan Motor	Activation of Protection Device for Indoor Fan	Fan Motor Overheat, Lockup
21	Sensor on Outdoor Unit	High Pressure Sensor	Incorrect Wiring, Severed or Disconnecting Wiring, Short Circuit
22		Outdoor Air Thermistor	
23		Discharge Gas Thermistor on Top of Compressor	
24		Heat Exchanger Liquid Pipe Thermistor	
25		Heat Exchanger Gas Pipe Thermistor	
29		Low Pressure Sensor	

TROUBLESHOOTING

Code	Category	Content of Abnormality	Leading Cause
31	System	Incorrect Capacity Setting of Outdoor Unit and Indoor Unit	Incorrect Capacity Code Setting of Combination Excessive or Insufficient Indoor Unit Total Capacity Code
35		Incorrect Setting of Indoor Unit No.	Duplication of Indoor Unit No. in same Refrigerant Group
36		Incorrect Indoor Unit Combination	Indoor Unit is Designed for R22
38		Problem with Protective Pickup Circuit in Outdoor Unit	Failure of Protection Detecting Device (Incorrect Wiring of Outdoor PCB)
39	Compressor	Problem with Running Current at Constant Speed Compressor	Overcurrent, Blown Fuse, Current Sensor Failure, Instantaneous Power Failure, Voltage Drop, Abnormal Power Supply
3A	Outdoor Unit	Problem with Running Outdoor Unit Capacity	Outdoor Unit Capacity > 360 MBH
3b		Incorrect Setting of Outdoor Unit Models Combination or Voltage	Incorrect Setting of Main and Sub Unit(s) Combination or Voltage
3d		Communication Problem between Main Unit and Sub Unit(s)	Incorrect Wiring, Disconnect Wire, Breaking Wire, PCB Failure
3E		Communication Problem between Inverter PCB and Outdoor PCB	Incorrect Combination between Inverter PCB and Outdoor PCB
43	Protection Device	Activation of Compression Ratio Decrease Protection Device	Defective Compression (Failure of Compressor of Inverter, Loose Power Supply Connection)
44		Activation of Low Pressure Increase Protection Device	Overload at Cooling, High Temperature at Heating, Expansion Valve Locking (Loose Connector)
45		Activation of High Pressure Increase Protection Device	Overload Operation (Clogging, Short-Pass), Pipe Clogging, Excessive Refrigerant, Inert Gas Mixing
47		Activation of Low Pressure Decrease Protection Device (Vacuum Operation Protection)	Insufficient Refrigerant, Refrigerant Piping, Clogging, Expansion Valve Locking at Open Position (Loose Connector)
48		Activation of Inverter Overcurrent Protection Device	Overload Operation, Compressor Failure
51	Sensor	Problem with Inverter Current Sensor	Current Sensor Failure
53	Inverter	Inverter Error Signal Detection	Driver IC Error Signal Detection (Protection for Overcurrent, Low Voltage, Short Circuit)
54		Abnormality of Inverter Fin Temperature	Abnormal Inverter Fin Thermistor, Heat Exchanger Clogging, Fan Motor Failure
55		Inverter Failure	Inverter PCB Failure
57	Fan Controller	Activation of Fan Controller Protection	Driver IC Error Signal Detection (Protection for Overcurrent, Low Voltage, Short Circuit), Instantaneous Overcurrent
5A		Abnormality of Fan Controller Fin Temperature	Fin Thermistor Failure, Heat Exchanger Clogging, Fan Motor Failure
5b		Activation of Overcurrent Protection	Fan Motor Failure
5C		Problem with Fan Controller Sensor	Failure of Current Sensor (Instantaneous Overcurrent, Increase of Fin Temperature, Low Voltage, Ground Fault, Step-Out)
EE	Compressor	Compressor Protection Alarm (It can not be reset from Wired Controller)	This alarm code appears when the following alarms* occurs three times within 6 hours. *02, 07, 08, 39, 43 to 45, 47
b1	Outdoor Unit No. Setting	Incorrect Setting of Unit and Refrigerant Cycle Number	There are 64 or More Number is Set for Address or Refrigerant Cycle.
b5	Indoor Unit No. Setting	Incorrect Indoor Unit Connection No. Setting	There are 17 or More Non-Corresponding to H-LINK II Units are Connected to One System.
C1	Change-Over Box	Incorrect Indoor Unit Connection	2 or More Change-Over Boxes are Connected between Outdoor Unit and Indoor Unit.
C2		Incorrect Indoor Unit Connection No. Setting	9 or More Indoor Units Connected to Change-Over Box
C3		Incorrect Indoor Unit Connection	Indoor Units of Different Refrigerant Cycle is Connected to Change-Over Box.

(C) Cause of Indoor Unit Stoppage

Code	Cause	Code	Cause
0	Operation OFF, Power OFF	16	Retry due to Decrease of Discharge Gas Superheat
1	Thermo-OFF		
2	Alarm	17	Retry due to Inverter Tripping
3	Freeze Protection, Overheating Protection	18	Retry due to Voltage Decrease, Other Retry of Inverter
5	Instantaneous Power Failure at Outdoor Unit/Reset	19	Expansion Valve Opening Change Protection
6	Instantaneous Power Failure at Indoor Unit/Reset	21	Enforced Thermo-OFF
7	Stoppage of Cooling Operation due to Low Outdoor Air Temp. Stoppage of Heating Operation due to High Outdoor Air Temp.	22	Enforced Thermo-OFF (Hot Start Control at Crankcase Heater Preheating) Refer to Cancellation Method
		26	Retry due to High Pressure Decrease
9	Stoppage of Reversing Valve Switching Control	28	Stoppage due to Outlet Temp. Decrease in Cooling
10	Demand Enforced Stoppage		
11	Retry due to Pressure Ratio Decrease	30	Stoppage of Thermo-OFF due to Compressor Excepting
12	Retry due to Low Pressure Increase	32	Retry due to Abnormal Transmission of Outdoor Unit
13	Retry due to High Pressure Increase	36	Retry after Defrosting Operation
14	Retry due to Abnormal Current of Constant Speed Compressor	39	Stoppage of Thermo-OFF due to Energy Saving Control
15	Retry due to Vacuum Abnormality, Discharge Gas Temp. Increase		

Cancellation of Enforced Thermo-OFF
 Press PSW5 for more than three seconds.
 This function may damage compressor.
 Use this function only in unavoidable condition.

NOTE:
 Even if stoppage Alarm "02" is not always indicated.

*Thermo-ON: The outdoor unit and some indoor units are running.

*Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

(D) Cause of Inverter Stoppage

Code	Cause
1	Driver IC Error Signal Detection
2	Instantaneous Overcurrent
3	Fin Temp. Increase
4	Electronic Thermal Activation (Inverter Overcurrent)
5	Voltage Decrease
6	Voltage Increase
7	Abnormal INV. Transmission
8	Abnormal Current Sensor
9	Instantaneous Power Failure Detection
11	Micro Computer Reset
12	Ground Fault Detecting
13	Abnormal Power Source Phase
16	Inverter Retry
17	Abnormal Control
21	Abnormal Fan Motor (Step-out)
22	Abnormal Setting of PCB

(E) Cause of Fan Controller Stoppage

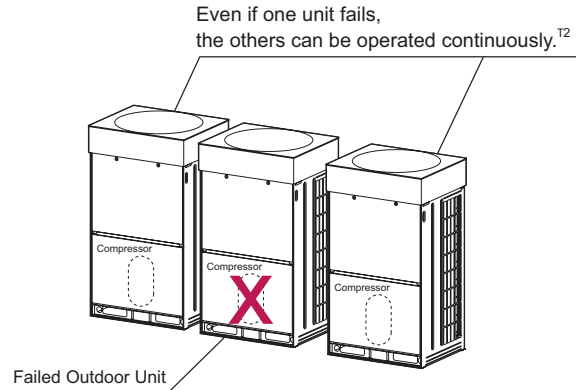
Code	Cause
1	Driver IC Error Signal Detection
2	Instantaneous Overcurrent
3	Fin Temp. Increase
4	Electronic Thermal Activation
5	Voltage Decrease
6	Voltage Increase
7	Abnormal INV. Transmission
8	Abnormal Current Sensor
9	Instantaneous Power Failure Detection
11	Micro Computer Reset
12	Ground Fault Detecting
15	Reverse Driving
16	Inoperative Fan Motor Detection
17	Abnormal Control
21	Abnormal Fan Motor (Step-out)

3.1.7 Emergency Operation

- (1) Emergency Mode Operation from Wired Controller
 ((H,Y)VAHP144B(3,4)1S to (H,Y)VAHP360B(3,4)1S and (H,Y)VAHR144B(3,4)1S to (H,Y)VAHR360B(3,4)1S)
 If the compressor fails, an emergency operation mode is accessible by the wired controller. Even if the compressor fails, the air conditioning operation is continuously available until troubleshooting is performed.

This Backup Operation Function prevents the system from coming to a complete stop when the outdoor unit failure occurs. *1

Emergency operation starts with the wired controller after an alarm occurrence. *3



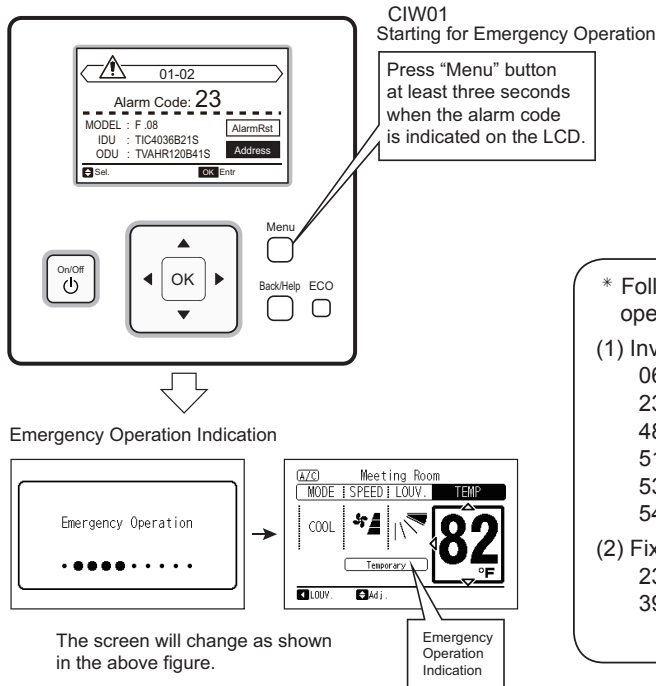
NOTE:

- *1: At least two outdoor units are required for this function.
- *2: Do not perform emergency operation more than eight hours. Going beyond that may damage the unit.
- *3: The emergency operation can be performed when the specified alarm code occurs. Refer to the following.

(a) Procedure

<For CIW01>

By pressing "MENU" for three seconds, emergency operation starts. "EMG" is displayed on the LCD during this operation.



- * Following these alarm codes, emergency operation is possible.
- (1) Inverter Compressor Failure
 - 06: Abnormality of Inverter Voltage
 - 23: Abnormality of Discharge Gas Thermistor
 - 48: Activation of Overcurrent Protection Device
 - 51: Abnormality of Inverter Current Sensor
 - 53: Inverter Error Signal Detection
 - 54: Abnormality of Inverter Fin Temperature
 - (2) Fixed Speed Compressor Failure
 - 23: Abnormality of Discharge Gas Thermistor
 - 39: Abnormality of Running Current at Fixed Speed Compressor

(b) Operation Condition

This emergency operation is NOT applicable to the compressors installed in the failed outdoor unit.

NOTES:

- Emergency operation is available only when the alarm codes above (*) are indicated.
- The emergency operation is not available for malfunction of the inverter PCB or fan controller.
- This emergency operation is not a normal operation but a temporary operation until the service people come. If the alarm is indicated again during the emergency operation, the alarm cannot be canceled.
- Do not perform an emergency operation for more than eight hours. Otherwise, the unit may be damaged.

(2) Emergency Mode Operation from Outdoor Unit PCB for Compressor Failure

① For Combination of Outdoor Units

((H,Y)VAHP144B(3,4)1S to (H,Y)VAHP360B(3,4)1S and (H,Y)VAHR144B(3,4)1S to (H,Y)VAHR360B(3,4)1S)

<Alarms Corresponding to Inverter Compressor Failure>

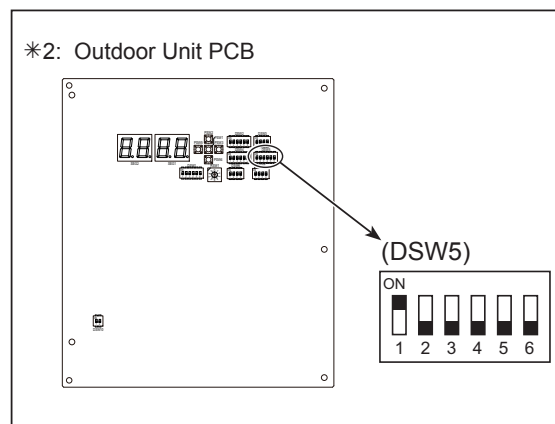
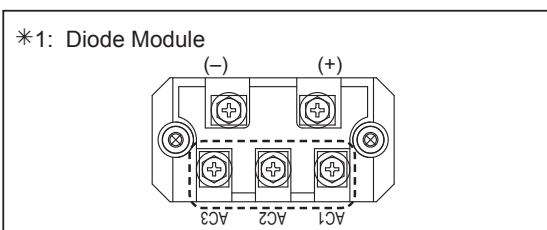
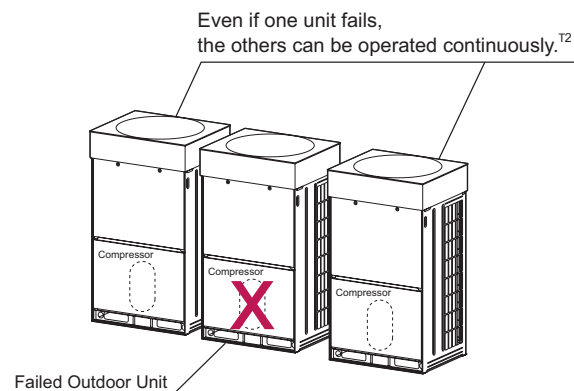
- 04: Abnormal Communication between inverter PCB and Outdoor Unit PCB
- 06: Abnormality of Inverter Voltage
- 23: Abnormality of Discharge Gas Thermistor
- 48: Activation of Overcurrent Protection Device
- 51: Abnormality of Inverter Current Sensor
- 52: Abnormality by Inverter Overcurrent
- 53: Inverter Error Signal Detection
- 54: Abnormality of Inverter Fin Temperature

<Alarms Corresponding to Fixed Speed Compressor Failure>

- 23: Abnormality of Discharge Gas Thermistor
- 39: Abnormality of Running Current at Fixed Speed Compressor

(a) Procedures

1. Turn OFF all the main switches of the outdoor and indoor units.
2. If the inverter compressor is faulty, disconnect the wiring (U, V, W) of the diode module.
(Insulate the disconnected terminals.) *1
3. Turn DSW5-No.1 or No.2 ON to stop the compressor operation. If either is set, NONE of the compressors in the failed outdoor unit will operate. *2
For the heat pump system, fully close the stop valves (for gas/liquid) of the failed outdoor unit.
4. Turn ON the power supply.
5. Start the operation with the wired controller.



PROCEDURE REMINDERS:

- Measure the insulation resistance of the malfunctioning compressor.
Do not perform the emergency operation when the insulation resistance is 0Ω .
The other compressors may be damaged because there is a possibility that refrigerant oil is oxidized.
- In this emergency operation, compressor frequency cannot be controlled normally.
Therefore, an alarm code "07", "43", "44", "45" or "47" may be indicated on the LCD.
- This emergency operation may not provide sufficient cooling and heating capacity.
- This operation is a temporary emergency operation when the compressor is damaged. Therefore, replace it with a new one as soon as possible.
- Turn OFF DSW5-No.1 and No.2 of the outdoor unit PCB after replacing the compressor.
If this setting is not performed, the compressor will be damaged.

② For Outdoor Unit without Combination

[at Inverter Compressor Failure]

(H,Y)VAHR096B(3,4)1S to (H,Y)VAHR120B(3,4)1S and

(H,Y)VAHP096B(3,4)1S to (H,Y)VAHP120B(3,4)1S)

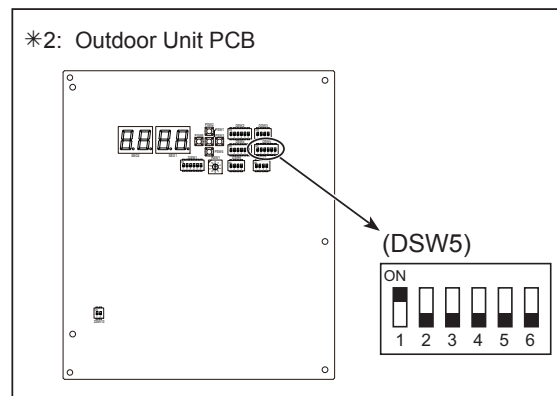
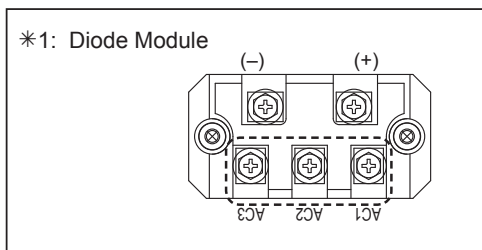
This operation is an emergency operation by the fixed speed compressor when the inverter compressor fails.

<Alarms Corresponding to Inverter Compressor Failure>

- 04: Abnormal Communication between inverter PCB and Outdoor Unit PCB
- 06: Abnormality of Inverter Voltage
- 23: Abnormality of Discharge Gas Thermistor
- 48: Activation of Overcurrent Protection Device
- 51: Abnormality of Inverter Current Sensor
- 52: Abnormality by Inverter Overcurrent
- 53: Inverter Error Signal Detection
- 54: Abnormality of Inverter Fin Temperature

(a) Procedures

1. Turn OFF all the main switches of outdoor and indoor units.
2. Disconnect the wiring (U, V, W) of diode module. *1
(Insulate the disconnected terminals.)
3. Turn DSW5-No.1 ON to stop the inverter compressor operation. Not all the compressors in the failed outdoor unit will stop the operation. If two compressors are stopped simultaneously, the stoppage cause is supposed to be d1-30. *2
4. Turn ON the power supply.
5. Start the operation with the wired controller.



(b) Operation Condition

< Indoor Unit Operation Capacity >

The compressor is forced to stop for compressor protection under the following condition:

Total Capacity of Thermo ON I.U. < 50% of O.U. Capacity and

Total Capacity of Thermo ON I.U. < 90kBtu/h

(A lack of a thermo ON indoor unit may lead to a fixed speed compressor failure because the compressor is operated and stopped repeatedly.)

NOTE:

Thermo-ON: The outdoor unit and some indoor units are running.

Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

PROCEDURE REMINDERS:

- Measure the insulation resistance of a failed compressor.
Do not perform an emergency operation when the insulation resistance is 0Ω
The other compressors may be damaged because there is a possibility that refrigerant oil is oxidized.
- Total operating capacity of indoor unit should be 90kBtu/h and over.
(Less than 90kBtu/h: Forced stoppage)
- In this emergency operation, compressor frequency cannot be controlled normally.
Therefore, an alarm code "07", "43", "44", "45" or "47" may be indicated on the LCD.
- This emergency operation may not provide sufficient cooling and heating capacity.
- This operation is a temporary emergency operation when the inverter compressor is damaged.
Therefore, replace it with the new one as soon as possible.
- Turn OFF DSW5-No.1 and No.2 of the outdoor unit PCB after replacing the compressor.
If this setting is not performed, the inverter compressor will be damaged.

[at Fixed Speed Compressor Failure]

(H,Y)VAHR096B(3,4)1S to (H,Y)VAHR120B(3,4)1S and
(H,Y)VAHP096B(3,4)1S to (H,Y)VAHP120B(3,4)1S)

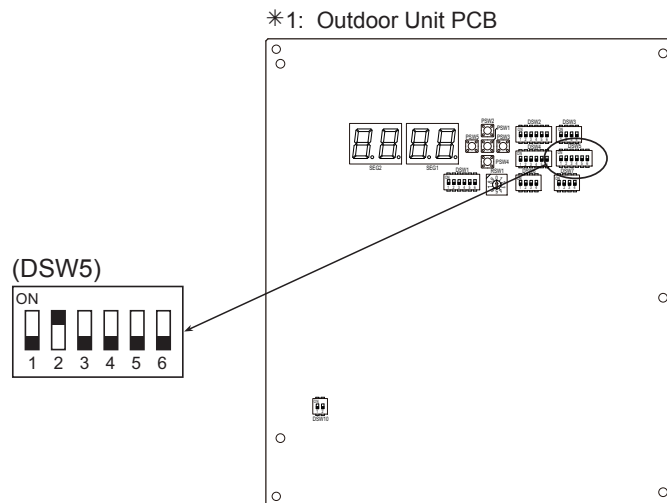
This operation is an emergency operation by the inverter compressor when the fixed speed compressor fails.

<Alarms Corresponding to Fixed Speed Compressor Failure>

- 23: Abnormality of Discharge Gas Thermistor
- 39: Abnormality of Running Current at Fixed Speed Compressor

(a) Procedures

1. Turn OFF all the main switches of the outdoor and indoor units.
2. Turn ON DSW5-No.2 to stop the fixed compressor operation. Not all the compressors in the failed outdoor unit will stop the operation. If two compressors are stopped simultaneously, the stoppage cause is supposed to be d1-30. *1
3. Turn ON the power supply.
4. Start the operation with the wired controller.



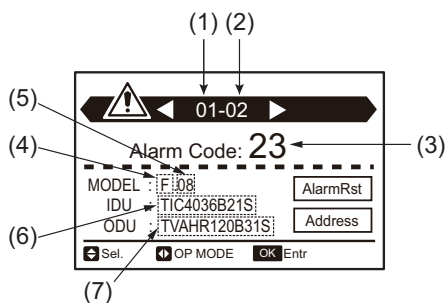
PROCEDURE REMINDERS:

- Measure the insulation resistance of the fixed speed compressor.
Do not perform an emergency operation when the insulation resistance is 0Ω.
The other compressors may be damaged because there is a possibility that refrigerant oil is oxidized.
- In this emergency operation, compressor frequency cannot be controlled normally.
Therefore, an alarm code “07”, “43”, “44”, “45”, or “47” may be indicated on the LCD.
- This emergency operation may not provide sufficient cooling and heating capacity.
- This operation is a temporary emergency operation when the fixed speed compressor is damaged.
Therefore, replace it with a new one as soon as possible.
- Turn OFF DSW5 of the outdoor unit PCB after replacing the compressor.
If this setting is not performed, the fixed speed compressor will not operate.

3.2 Troubleshooting Procedures

● Alarm Code Indication of Wired Controller

< CIW01 >

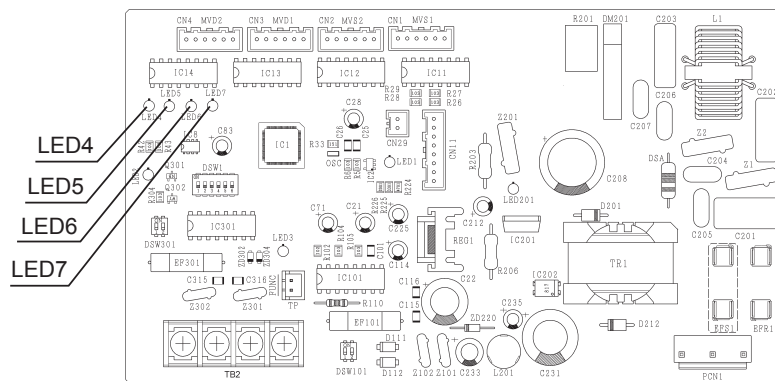


- (1) Refrigerant Cycle No. (*1)
- (2) Indoor Unit No. (*1)
- (3) Alarm Code
- (4) Unit Model Code
- (5) Total Number of Indoor Units in the Same System as the Indoor Unit Having Trouble
- (6) Indoor Unit Model (*2) (*3)
- (7) Outdoor Unit Model (*2) (*3)

- (*1): If two or more indoor units having trouble are connected to the wired controller, the indicated indoor unit is selectable.
- (*2): The initial of model names are indicated as "T". These "T" shall be replaced with "H" or "Y". (Except for the wall mount model.)
When there is a combination of outdoor units, ODU indication is the model of the main outdoor unit (Unit A).
- (*3): The model names are not indicated depending on the unit type.

● The alarm code is indicated by the LED on the change-over box PCB.

< PCB of Change-Over Box >



LED				Alarm Code	Contents
4	5	6	7		
○	○	X	X	03	Abnormal communication between change-over box and outdoor unit.
X	X	○	○	03	Abnormal communication between change-over box and indoor unit.
○	○	○	○	C1	Two or more change-over boxes are connected between outdoor unit and indoor unit.
○	○	○	X	C2	Nine or more indoor units are connected to change-over box.
X	○	○	X	C3	The indoor units of different systems are connected to change-over box.

○ : Flashing (Turn ON; 0.5 sec./Turn OFF; 0.5 sec.), X: Turn OFF.

3.2.1 Alarm Code Table

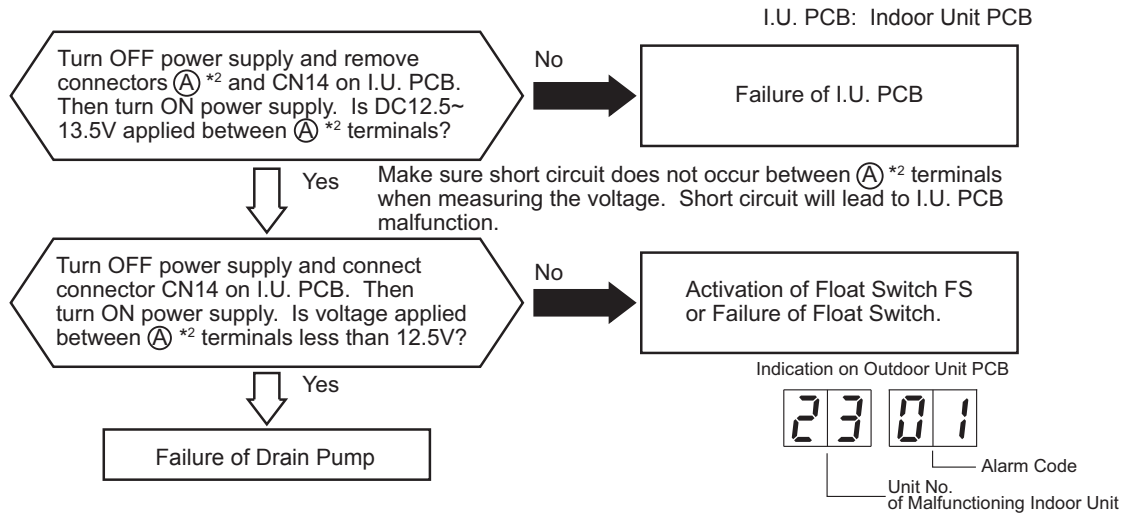
Refer to Section 3.1.6 (2)-(B) "Alarm Code Table".

TROUBLESHOOTING

3.2.2 Troubleshooting Using Alarm Codes

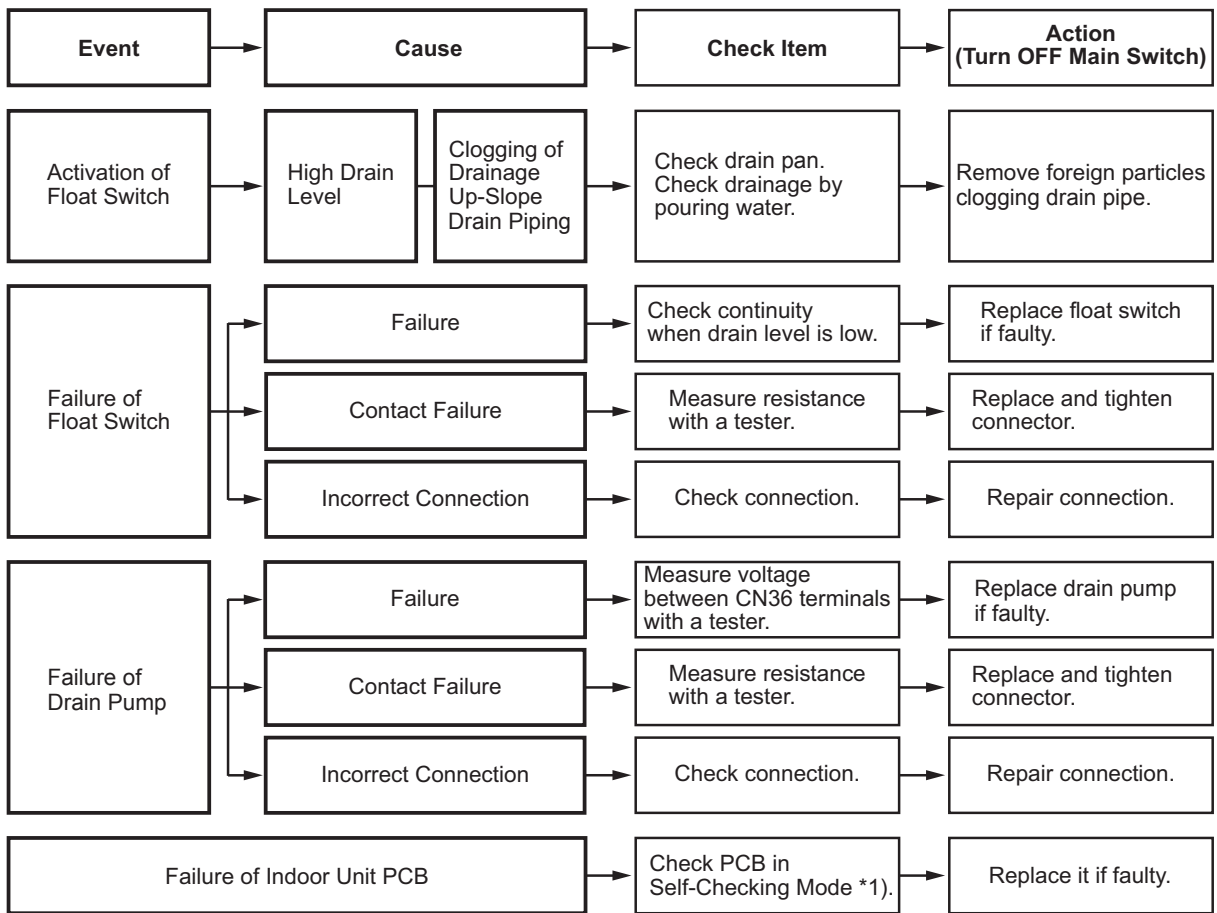
Alarm Code	01	Activation of Protection Device (Float Switch) in Indoor Unit (Except for Wall Mount Type)
------------	----	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.
- ★ This alarm code is displayed when the contact between #1 and #2 of CN14 on the I.U. PCB is opened for over 120 seconds during the cooling, dry, fan, or heating operation.



*2): Connector for Drain Pump

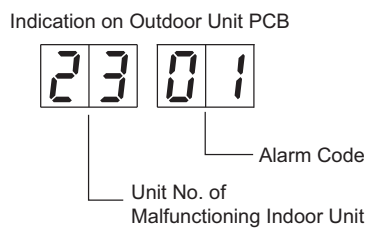
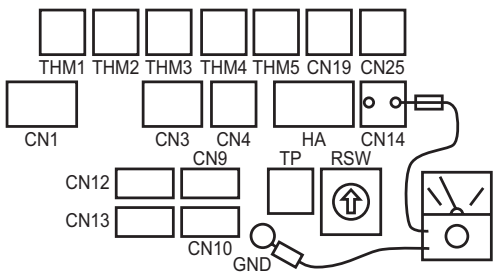
Indoor Unit Type	(A) Connector for Drain Pump
Ducted High Static	PCN6 on PCB1
Ducted Medium Static	PCN6 on PCB1
Ducted Slim	PCN6 on PCB1
4-Way Cassette	CN36 on PCB1
1-Way Cassette	CN36 on PCB1



*1): Refer to Section 3.1.4 (3) above for details.

Alarm Code	01	Activation of Protection Device (Float Switch) in Wall Mount Type Indoor Unit
------------	----	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *¹⁾ Except for some models.
- ★ This alarm code is displayed when the contact between #1 and #2 of CN14 on the I.U. PCB is opened for over 120 seconds during the cooling, dry, fan, or heating operation.

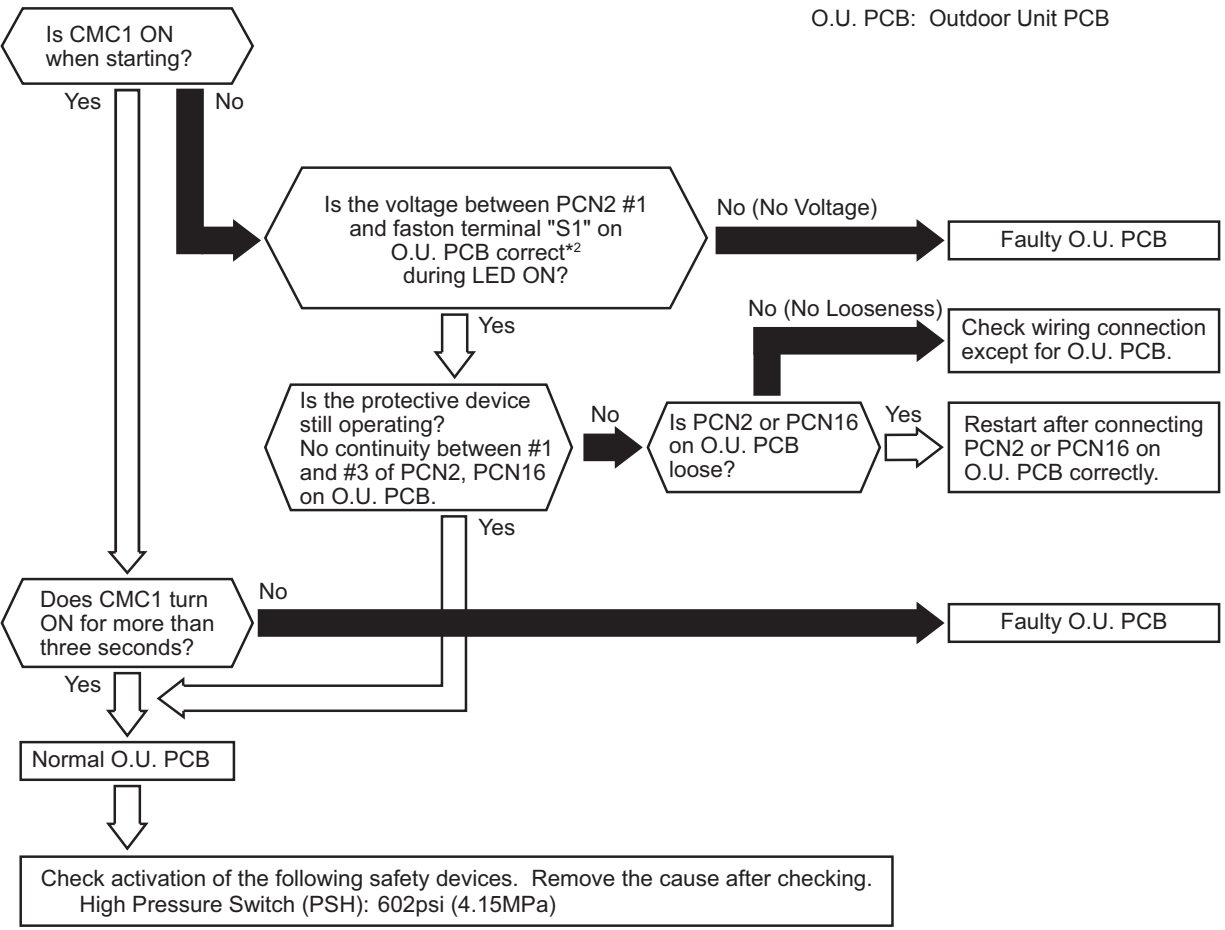


Event	Cause	Check Item	Action (Turn OFF Main Switch)
Activation of Float Switch (when drain-up mechanism is installed)	High Drain Level	Clogging of Drainage Upward Slope Drain Piping	Check drain pan. Check drainage by pouring water.
	Failure of Float Switch	Failure	Check continuity when drain level is low.
		Contact Failure	Measure resistance with tester.
		Connection Failure	Check connection.
Failure of Indoor Unit PCB		Check PCB in Self-Checking Mode *1).	Replace it if faulty.
Failure of Wiring		Check whether short-circuited connector is connected to CN14.	Connect them correctly.

*1): Refer to Section 3.1.4 (3).

Alarm Code 02	Activation of Protection Device in Outdoor Unit
--	--

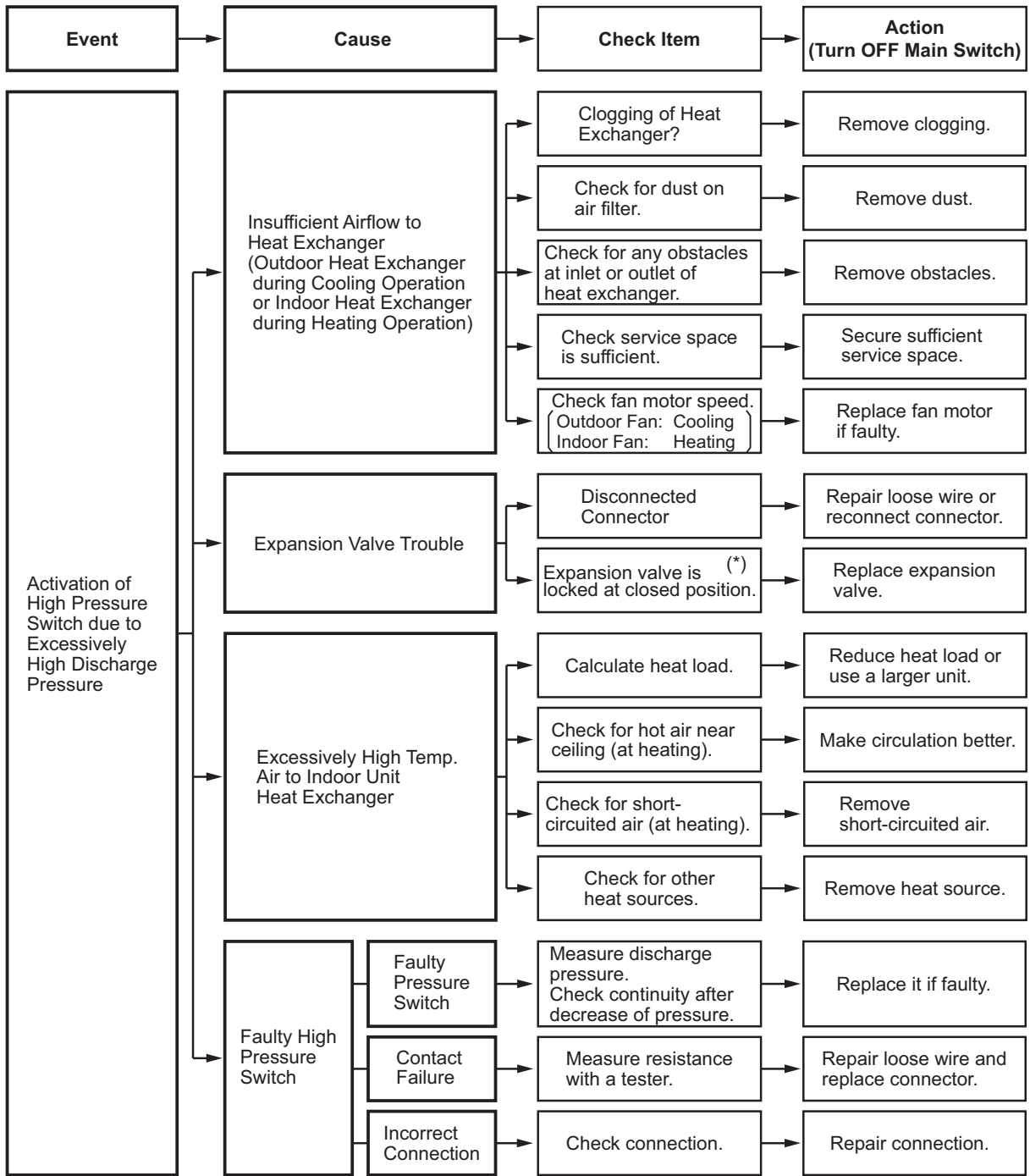
- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.
- ★ This alarm code is indicated when the high pressure switch (PSH) is activated during the compressor operation (Y52C is turned ON).



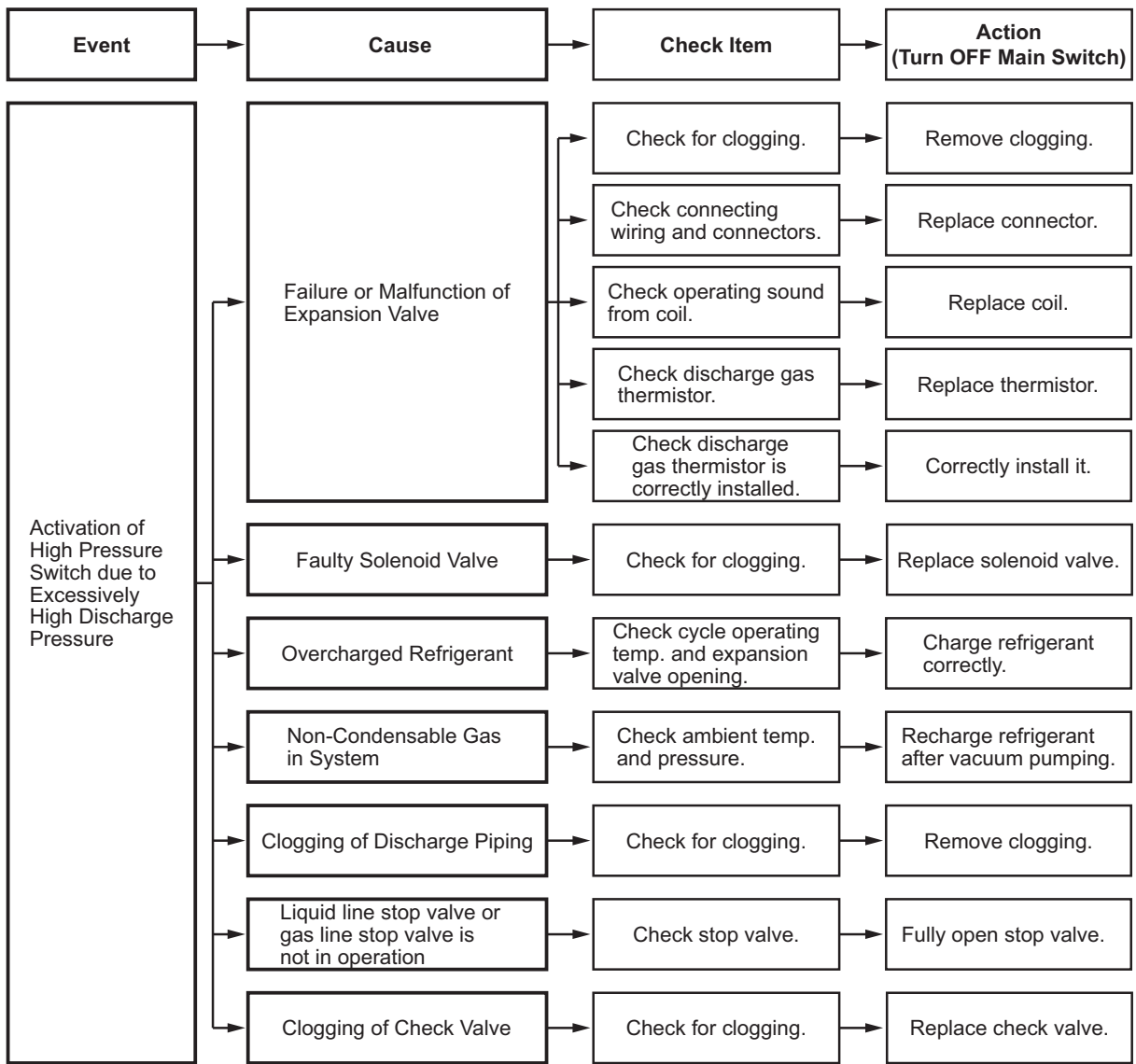
*2): CMC Voltage and Number of Pressure Switch

Model	Correct Voltage between PCN2#1 and Faston Terminal S1	High Pressure Switch	
		PSH1 (PCN2)	PSH2 (PCN16)
(H,Y)VAHP072B31S (H,Y)VAHR072B31S	208-230V	○	—
(H,Y)VAHP096 ~ 120B31S (H,Y)VAHR096 ~ 120B31S	208-230V	○	○
(H,Y)VAHP072B41S (H,Y)VAHR072B41S	220V	○	—
(H,Y)VAHP096 ~ 120B41S (H,Y)VAHR096 ~ 120B41S	220V	○	○

TROUBLESHOOTING



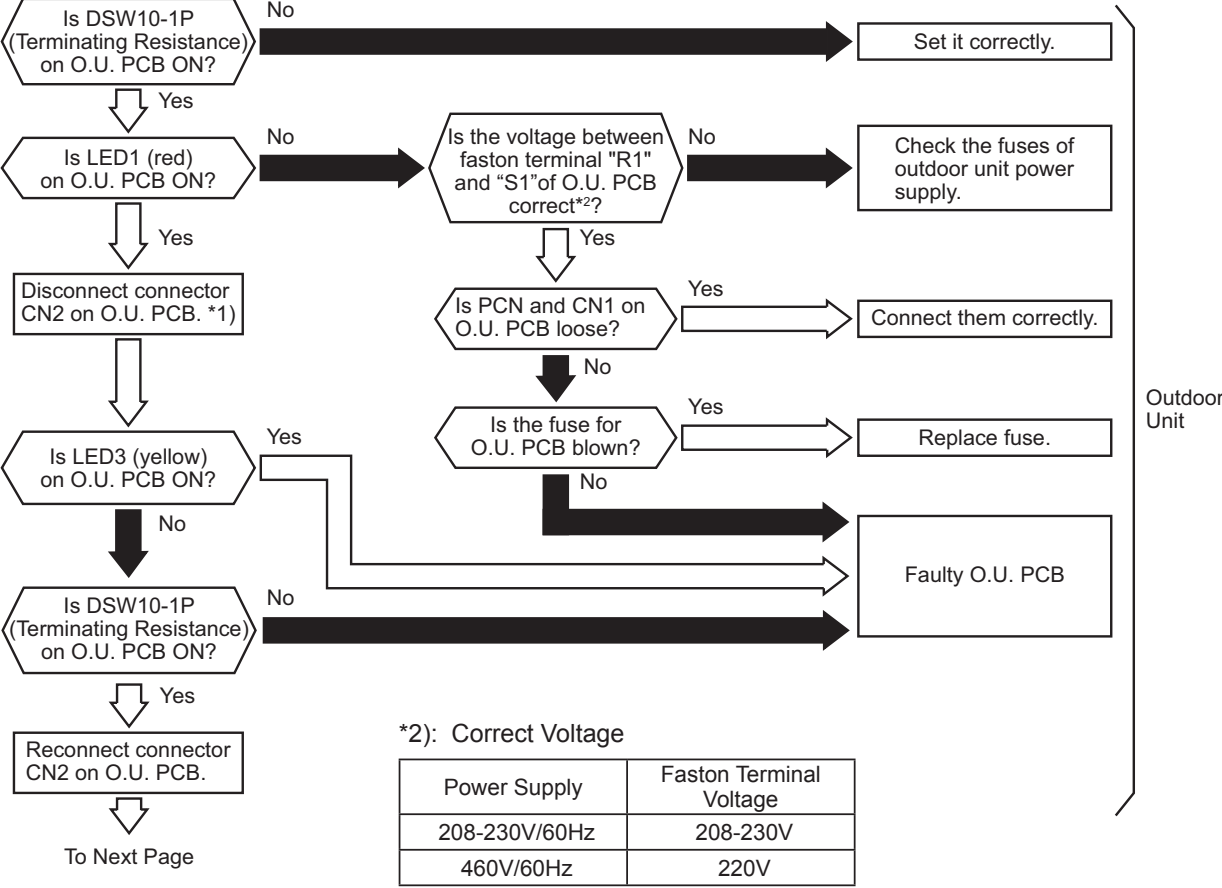
(*): Refer to Section 4.3.1.6.



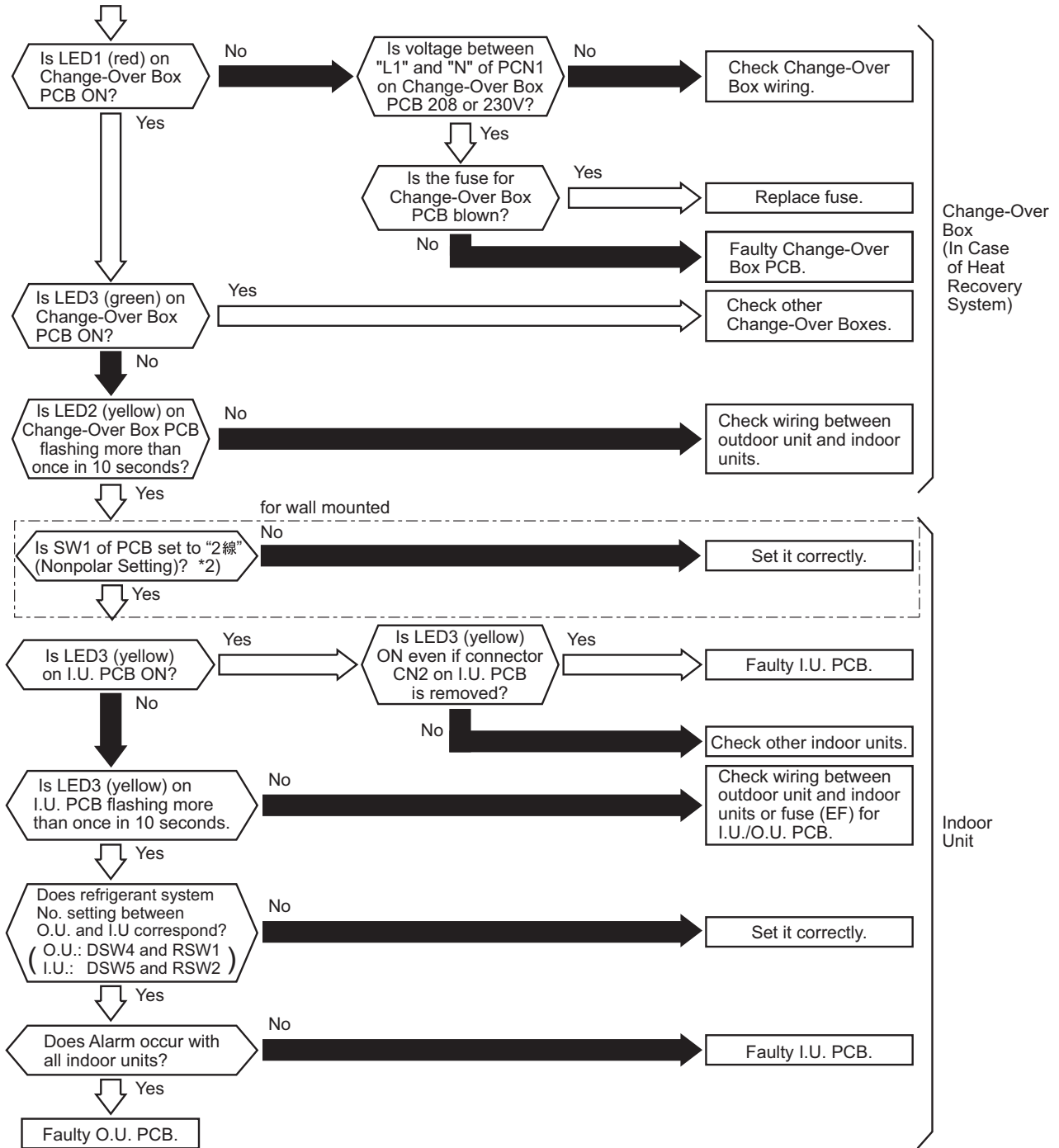
TROUBLESHOOTING

Alarm Code	03	Abnormal Communication between Indoor Units and Outdoor Units
------------	----	---

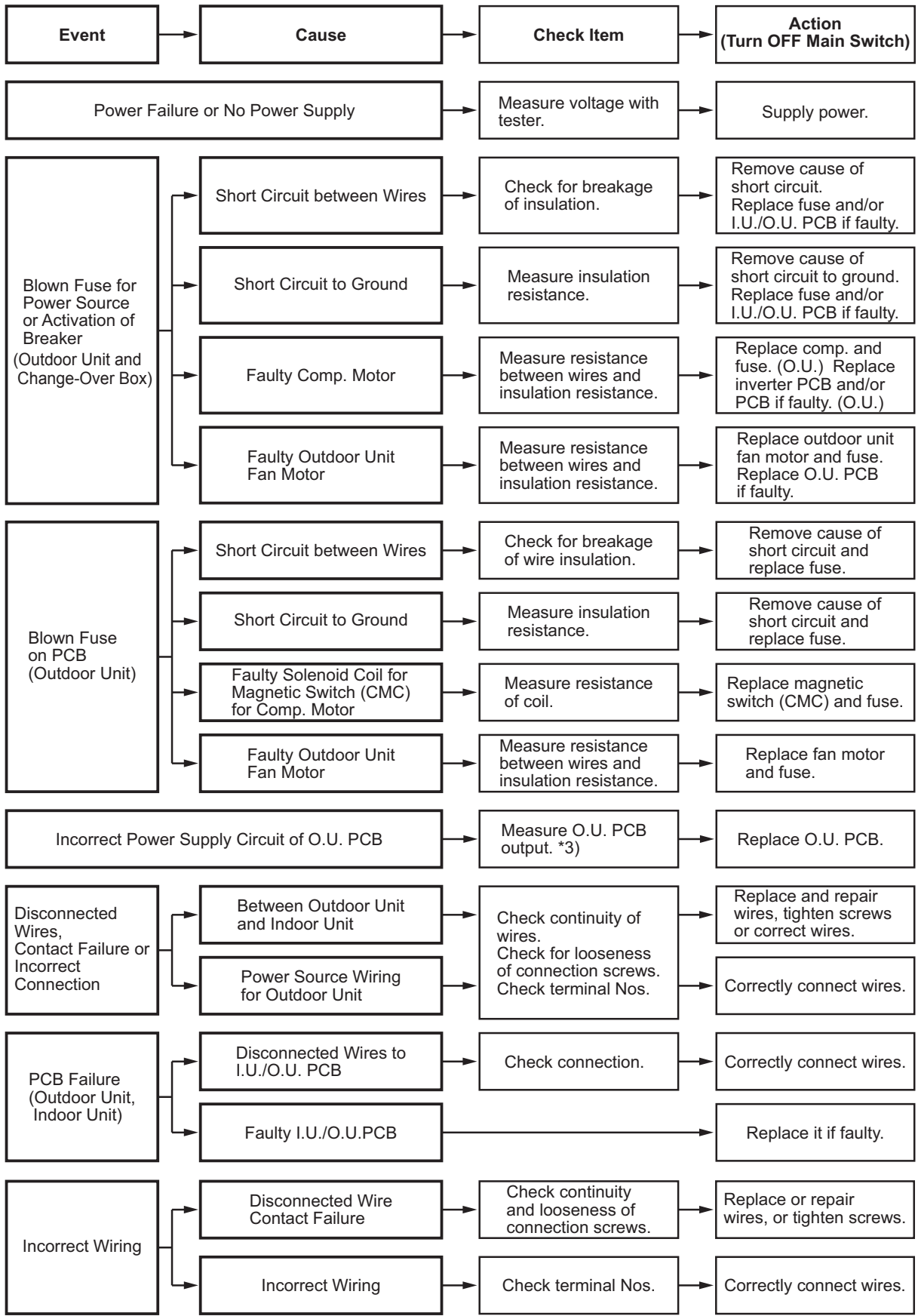
- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD, and the indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *1) Except for some models.
- ★ When fuses are blown, or the circuit breakers are activated, check the cause of overcurrent and take necessary action.
- ★ This alarm code is displayed when an abnormal condition continues for three minutes after normal communication between indoor units and outdoor units. The abnormal condition continues for 30 seconds even after the micro-computer is automatically reset. If communication failure occurs from the beginning, the alarm code is displayed after 30 seconds from start up.



O.U. PCB: Outdoor Unit PCB
I.U. PCB: Indoor Unit PCB



TROUBLESHOOTING



O.U. PCB: Outdoor Unit PCB
 I.U. PCB: Indoor Unit PCB

*1): If the end terminal resistance (DSW10) is set to OFF for H-LINK connection, set the end terminal resistance to ON when CN2 is disconnected. Set the end terminal resistance to OFF when CN2 is reconnected.

*2): Communication setting for the wall mounted: (SW1)

Item	Setting Position
SW1	“2 線” Side

SW1 for communication on the indoor unit PCB is set to “2 線” by default. No setting is required for SW1. If it is set to “3 線”, alarm 03 will occur.

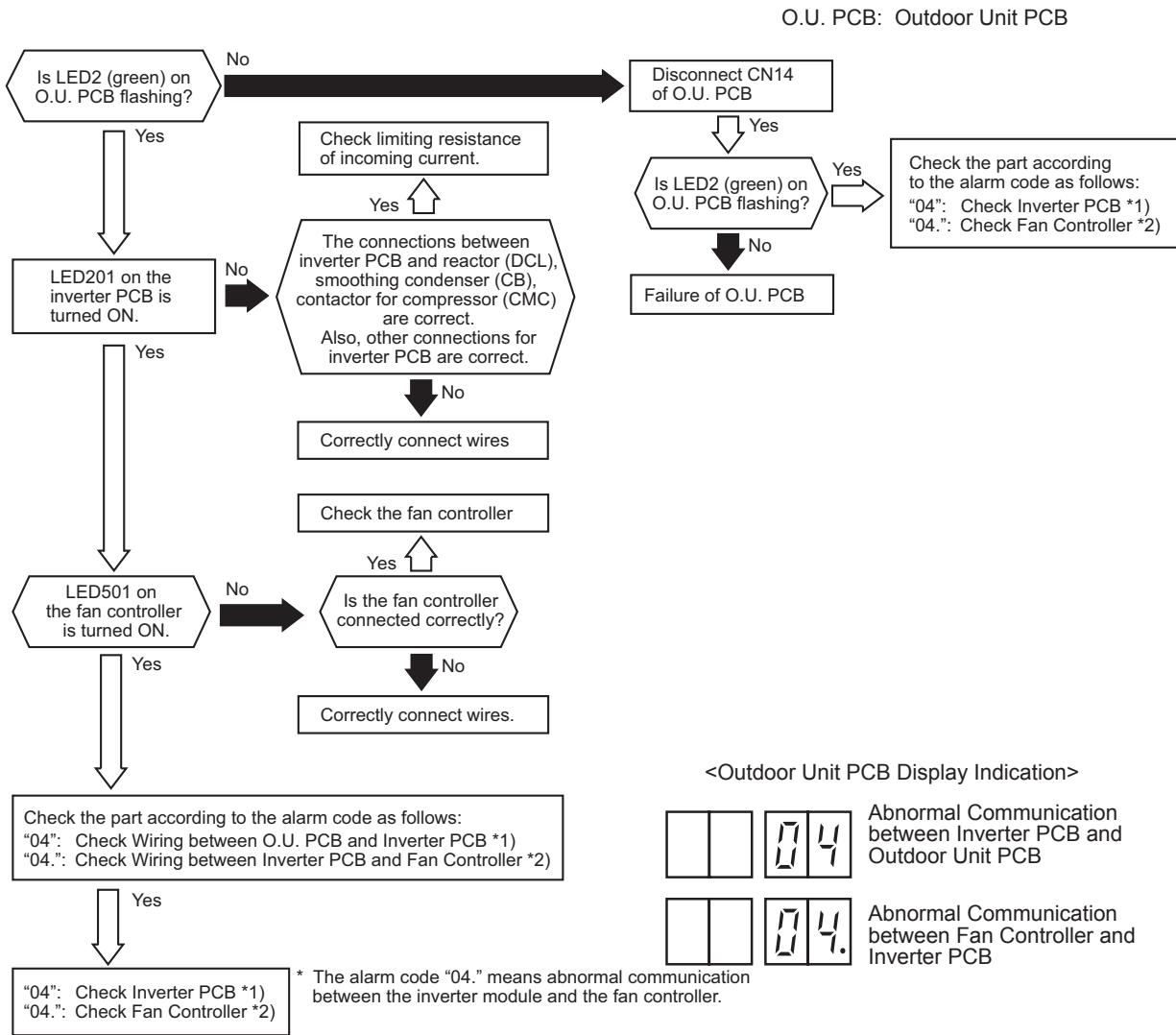
*3): 12VDC between VCC12 and GND2
 5VDC between VCC05 and GND1
 12VDC between VCC12 and GND1
 15VDC between VCC15 and GND1
 24VDC between VCC24 and GND1
 12VDC between VCC12T and GND1

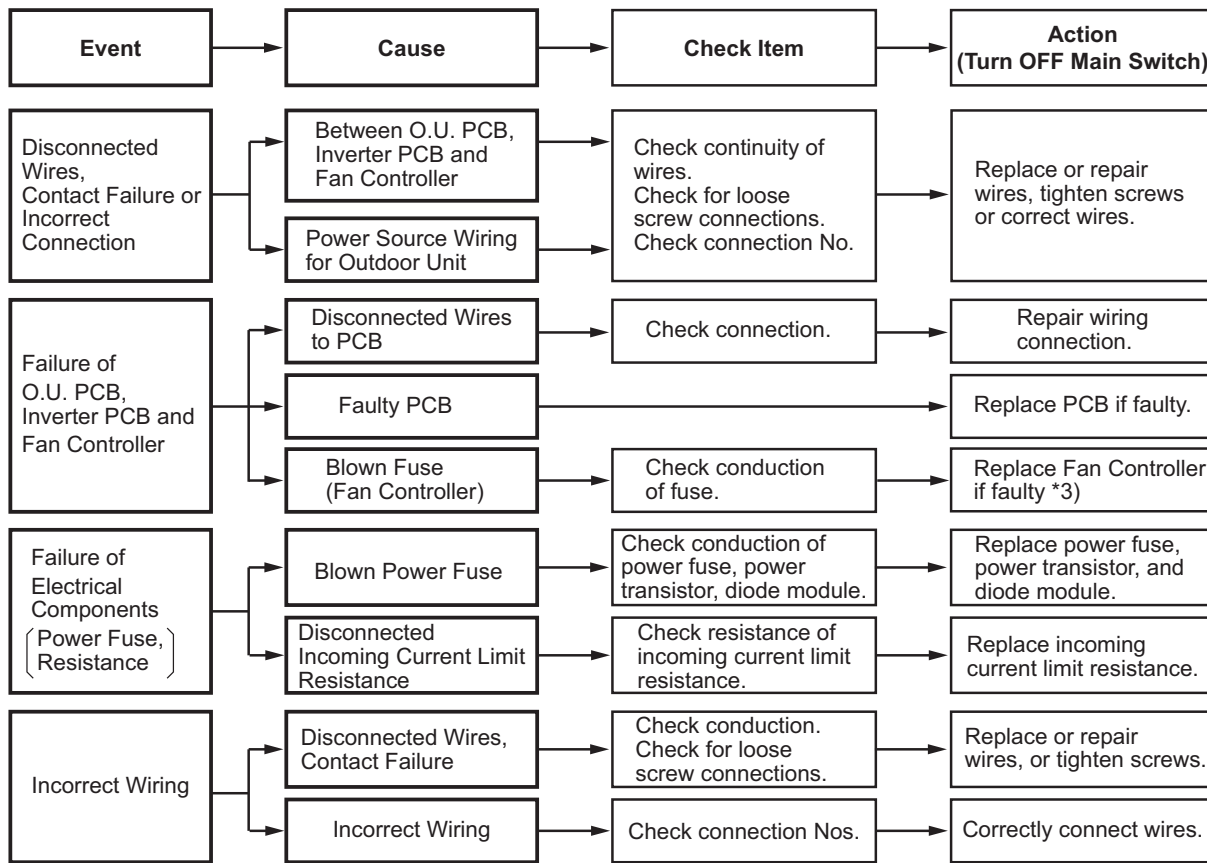
TROUBLESHOOTING

Alarm Code 04	Abnormal Communication between Inverter PCB and Outdoor Unit PCB
----------------------	--

Alarm Code 04.	Abnormal Communication between Inverter PCB and Fan Controller
-----------------------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.
- ★ This alarm code is displayed when an abnormal condition continues for 30 seconds after normal communication between the outdoor unit PCB and the inverter PCB. The abnormal condition continues for 30 seconds even after the micro-computer is automatically reset. If communication failure occurs from the beginning, the alarm code is displayed after 30 seconds from start up.





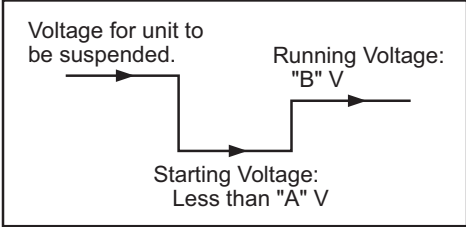
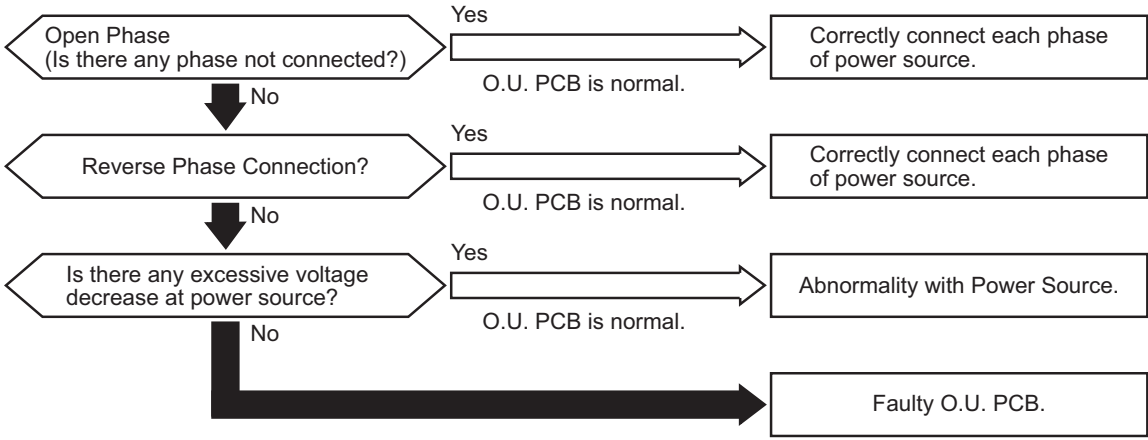
- *1): When replacing or checking for the inverter part, make sure to perform the electric discharge work according to Section 4.3.1.1 "High Voltage Discharge Work for Replacing Parts".
- *2): When replacing or checking for the fan controller, make sure to perform the electric discharge work according to Section 4.3.1.1 "High Voltage Discharge Work for Replacing Parts".
- *3): When the fuse for the fan controller is blown, the fan controller may be broken too. In this instance, the fan controller should be replaced.

TROUBLESHOOTING

Alarm Code	05	Abnormality of Power Source Phase
------------	----	-----------------------------------

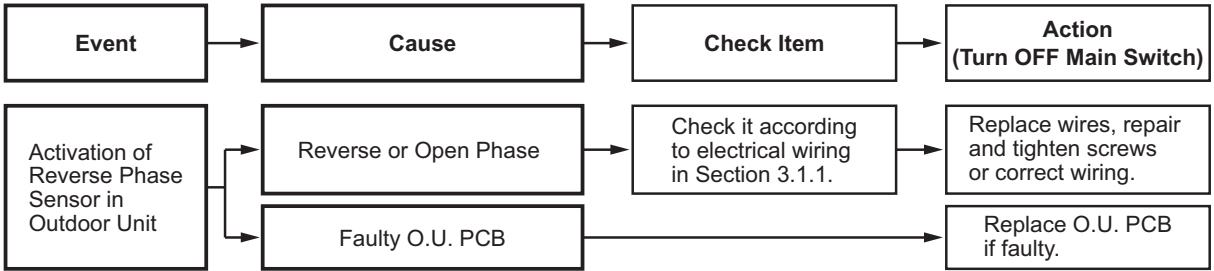
- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.
- ★ This alarm code is displayed when the main power source phase is reversely connected or one phase is not connected.

O.U. PCB: Outdoor Unit PCB



Check Item

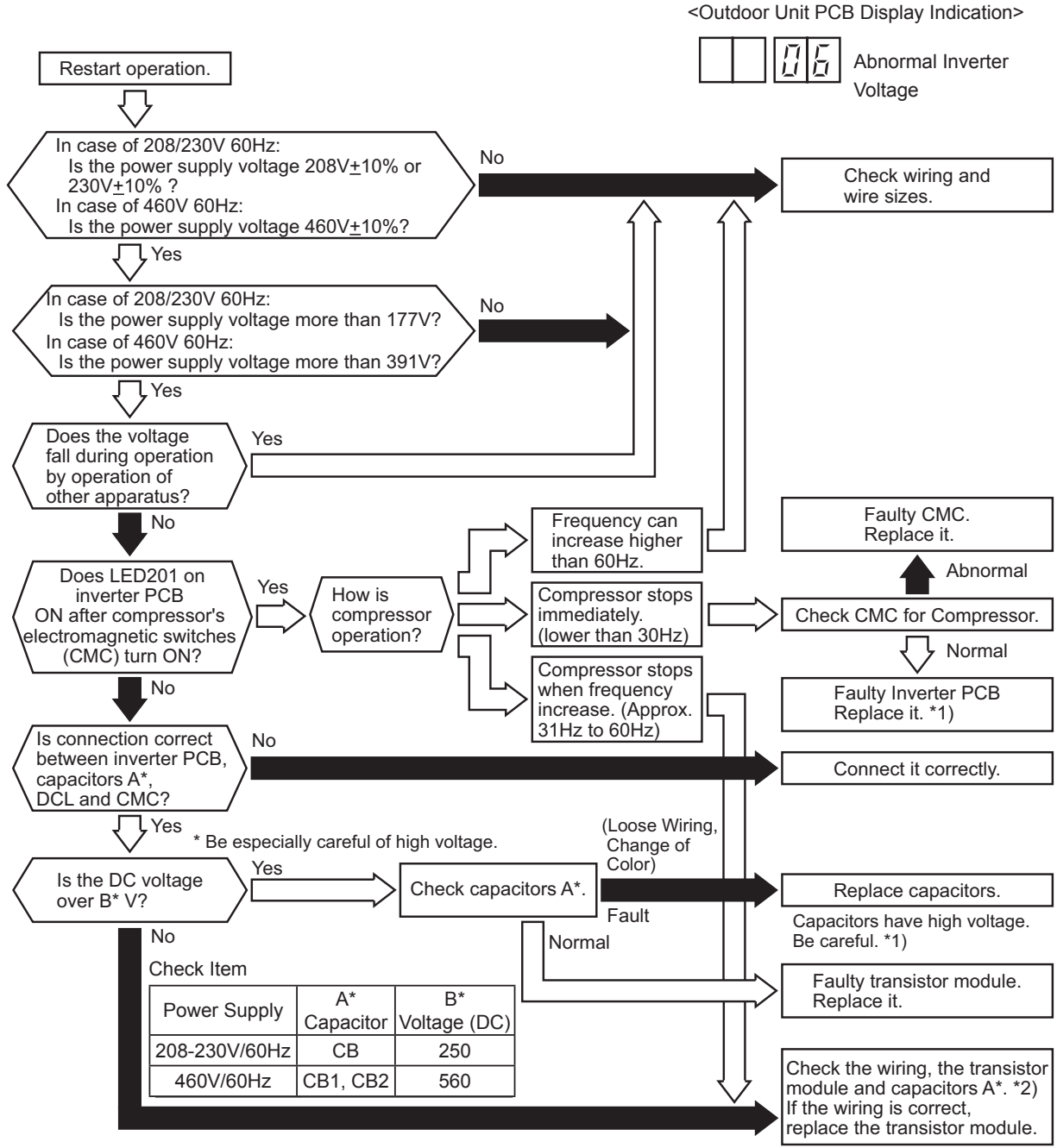
Power Supply	"A"	"B"
208-230V/60Hz	177	188 to 253
460V/60Hz	391	414 to 506



Alarm Code	06	Abnormal Inverter Voltage (Insufficient Inverter Voltage or Overvoltage)
------------	----	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ When insufficient voltage is detected between terminals “P” and “N” of the transistor module (IPM) three times in 30 minutes, the operation stops and this alarm code is displayed. If this occurs less than three times in 30 minutes, the operation automatically restarts.

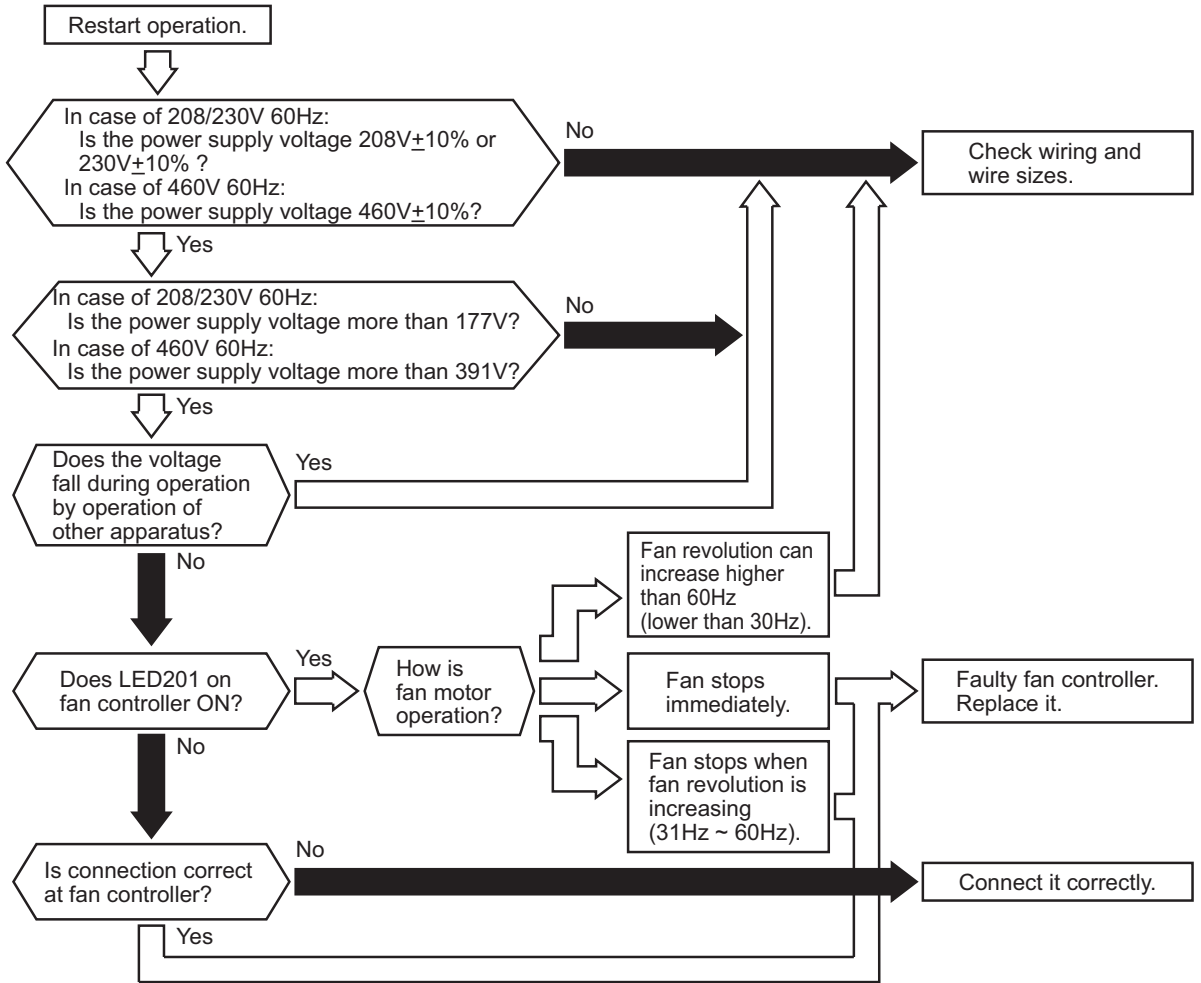


*1): If the capacitor has high voltage, perform the high voltage discharge work according to Section 4.3.1.1.
 *2): Refer to Section 4.3.1.1 for checking procedures for the transistor module.
 *3): Refer to Section 4.3.1.1 for checking procedures for the capacitor.

TROUBLESHOOTING

Alarm Code	06.	Abnormal Fan Controller Voltage (Insufficient Fan Controller Voltage or Overvoltage)
------------	-----	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *¹⁾ Except for some models.
- ★ When insufficient voltage or overvoltage is detected between terminals “R” and “S” of the fan controller three times in 30 minutes, the operation stops and this alarm code is displayed. If this occurs less than three times in 30 minutes, the operation automatically restarts.

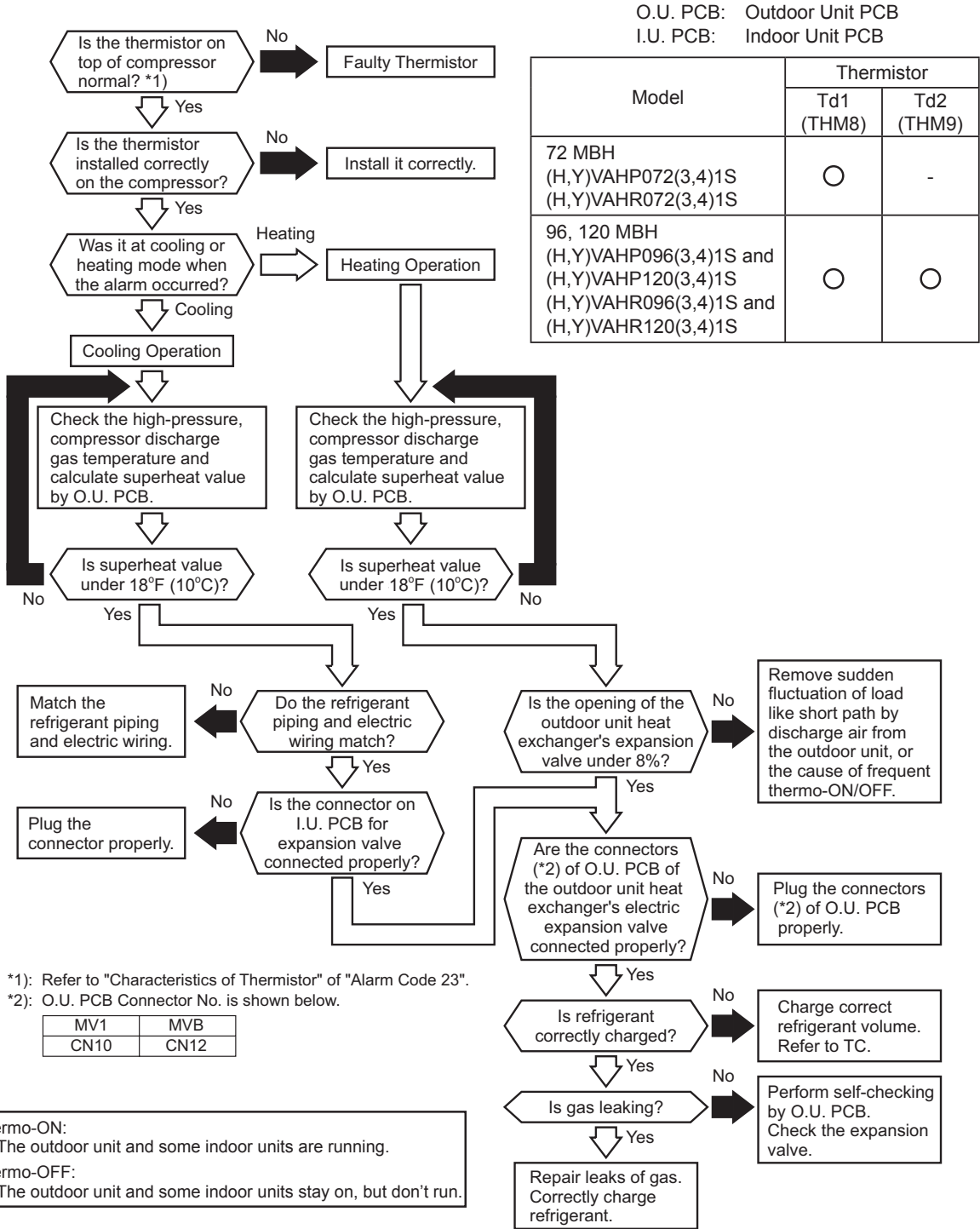


<Outdoor Unit PCB Display Indication>
 Abnormal Fan Controller Voltage

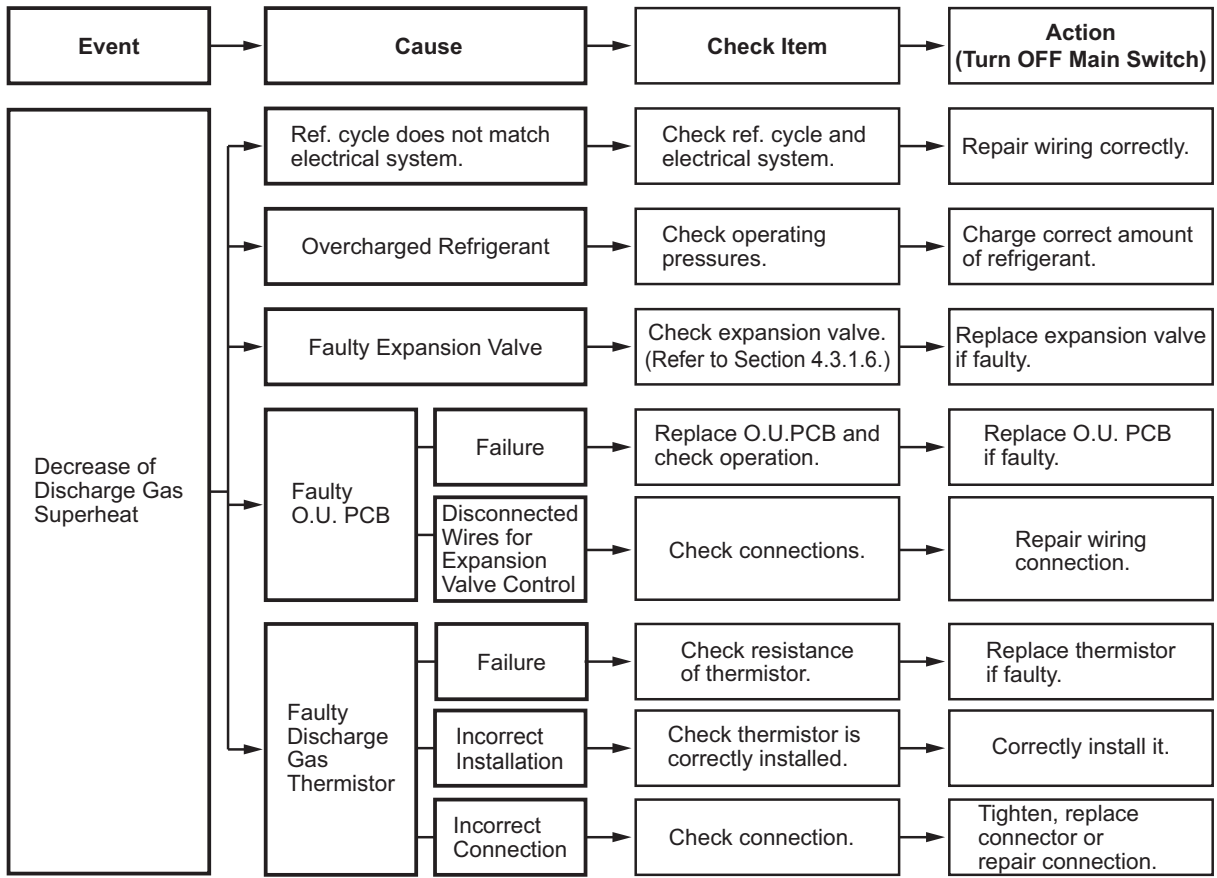
*1): If the fan controller has high voltage, perform the high voltage discharge work according to Section 4.3.1.1.
 *2): For the maintenance and replacement of the fan controller, perform the high voltage discharge work according to Section 4.3.1.1.

Alarm Code	07	Decrease in Discharge Gas Superheat
------------	----	-------------------------------------

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *1) Except for some models.
- ★ If the discharge gas superheat is less than 10 deg. at the top of the compressor continues for 30 minutes, retry operation is performed. However, when the alarm occurs twice within 120 minutes, this alarm code is indicated.



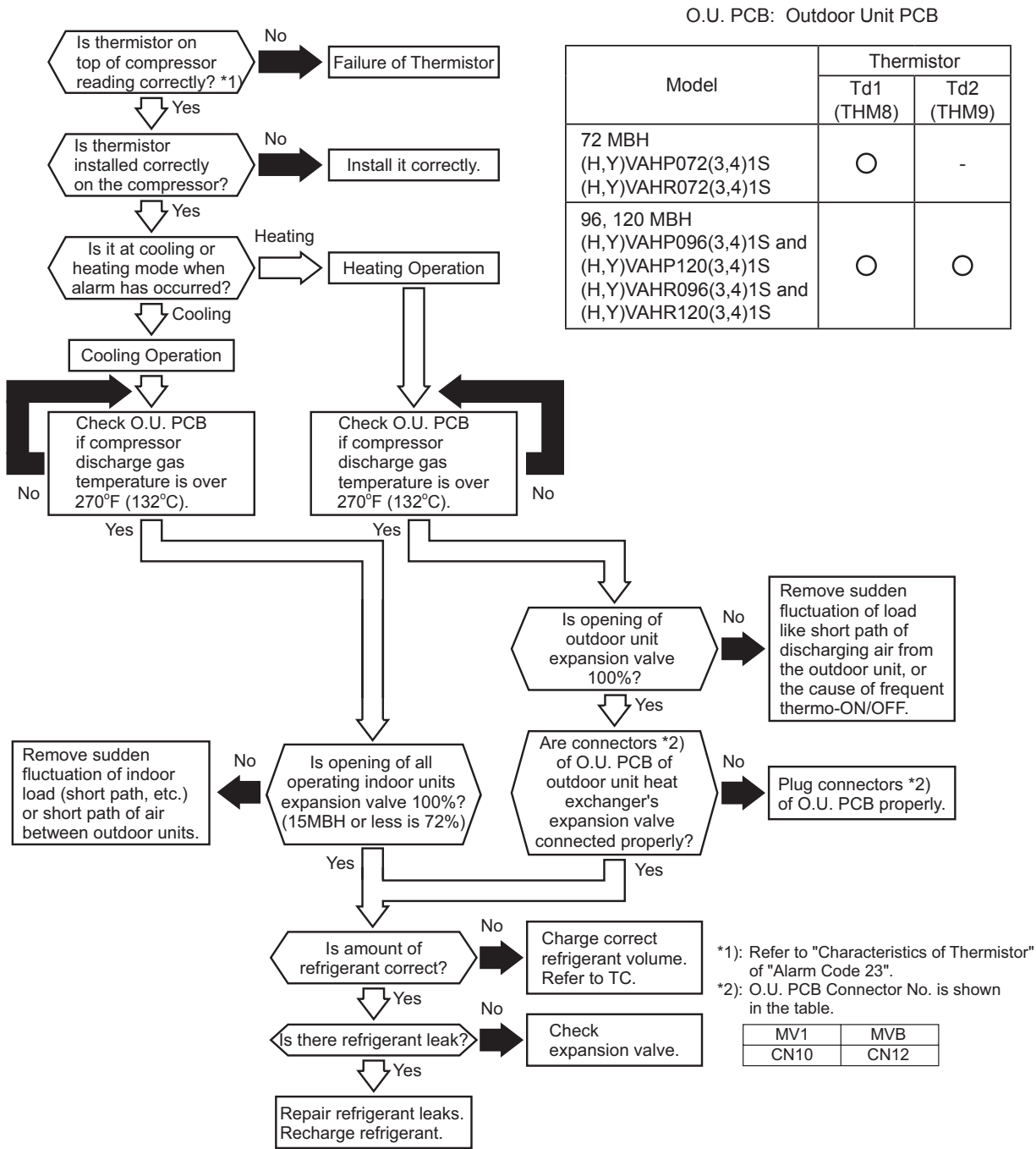
TROUBLESHOOTING



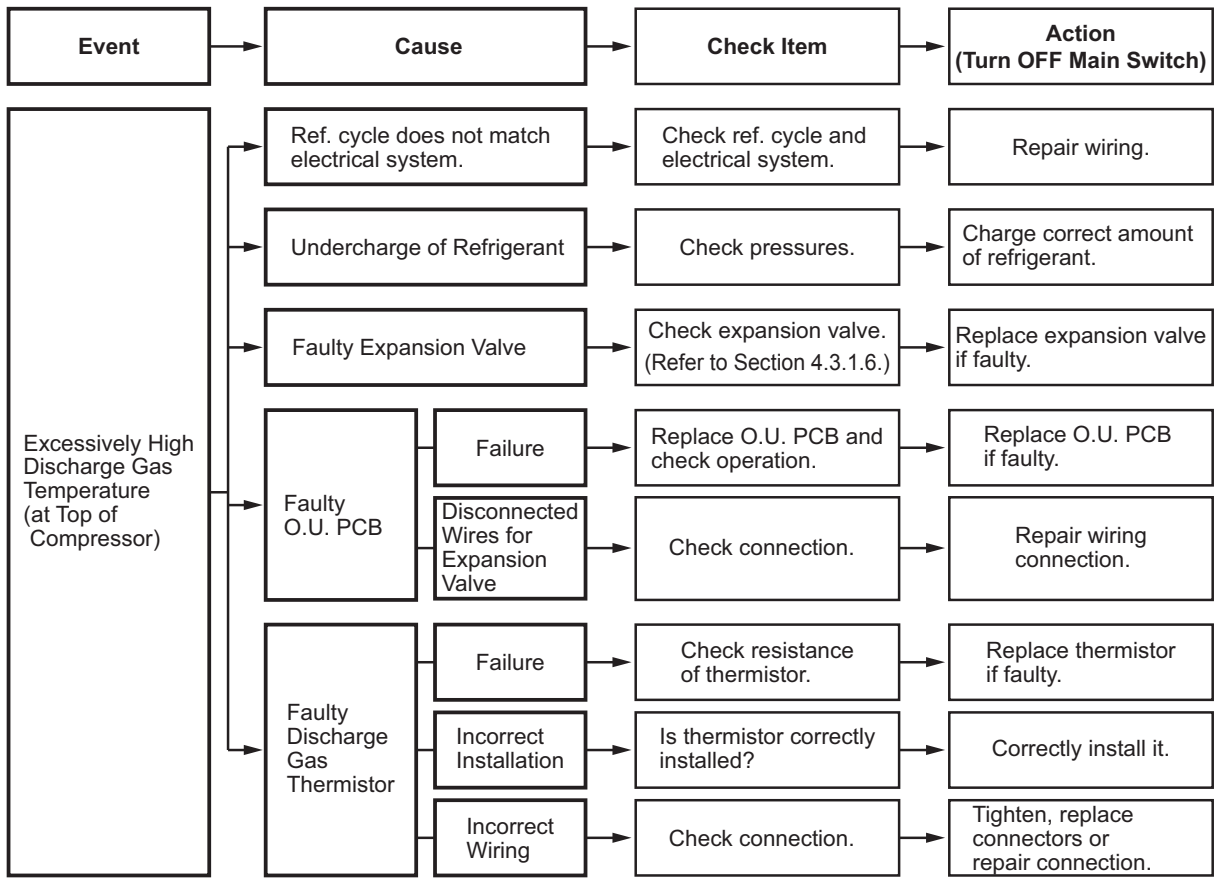
Alarm Code	08	Increase in Discharge Gas Temperature at the Top of Compressor
------------	----	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ If the temperature at the top of the compressor is above 270°F (132°C) for 10 minutes or above 284°F (140°C) for five seconds during operation, the compressor stops and then the operation is automatically retried. If this occurs again twice in the next 60 minutes, this alarm code is displayed.

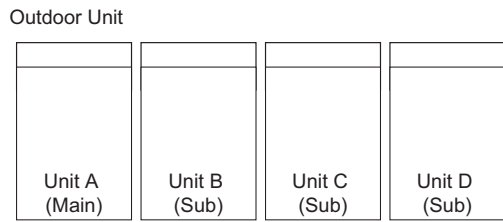
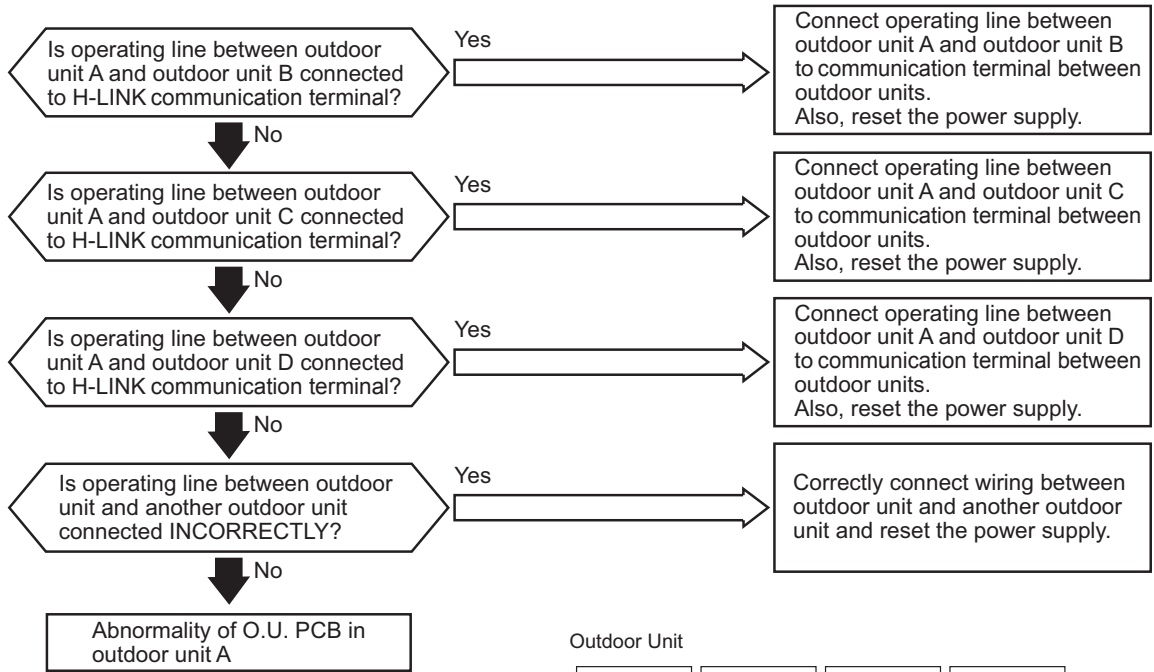


TROUBLESHOOTING



Alarm Code 0A	Abnormal Communication between Outdoor Units
--	--

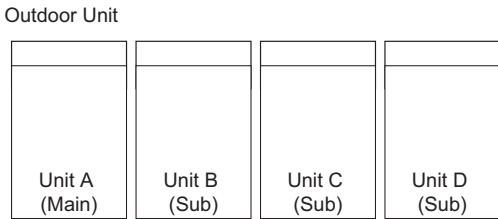
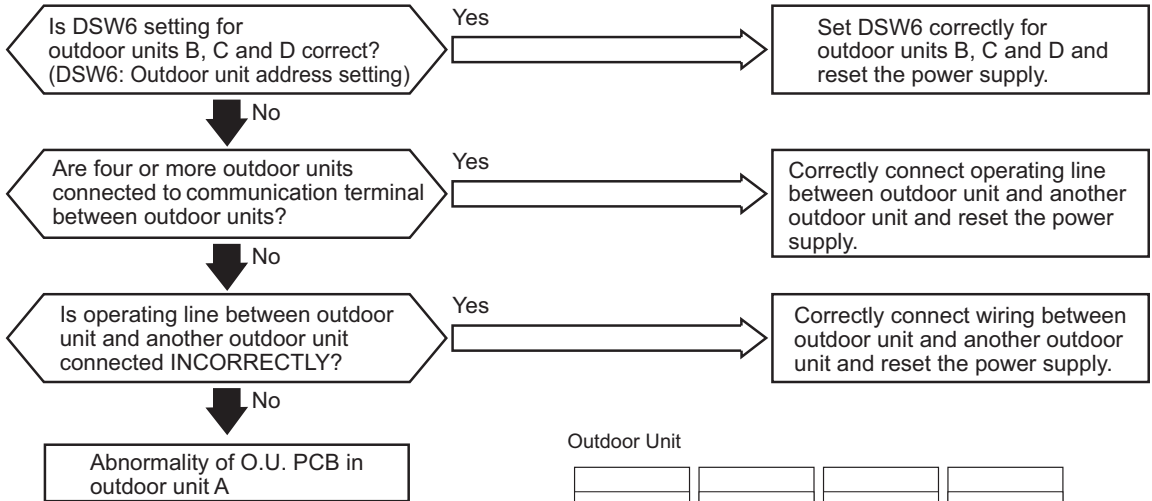
- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.



TROUBLESHOOTING

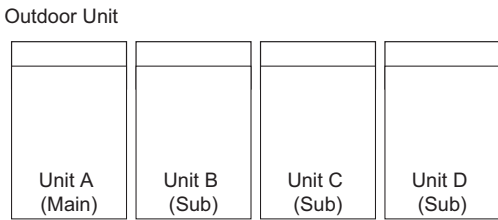
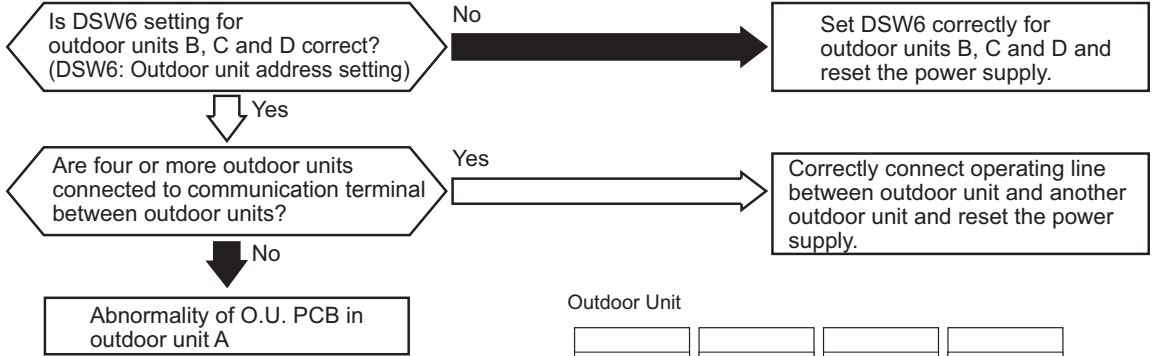
Alarm Code **06** Incorrect Outdoor Unit Address Setting

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.



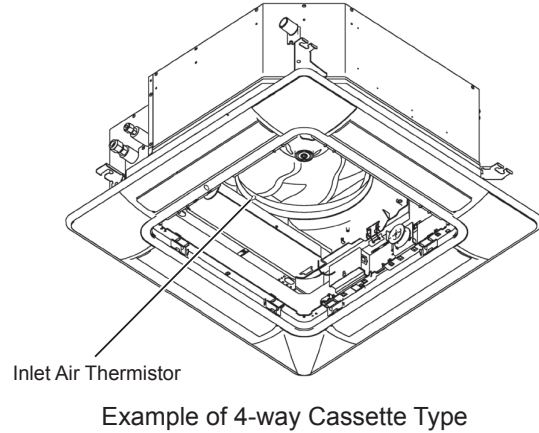
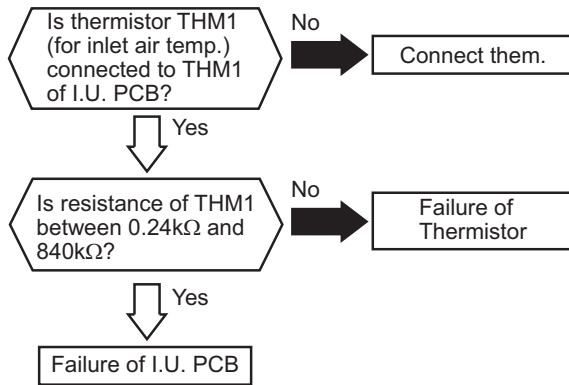
Alarm Code **07** Incorrect Setting of Main Outdoor Unit

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

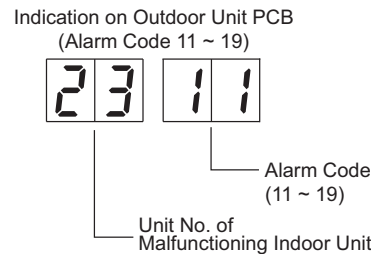
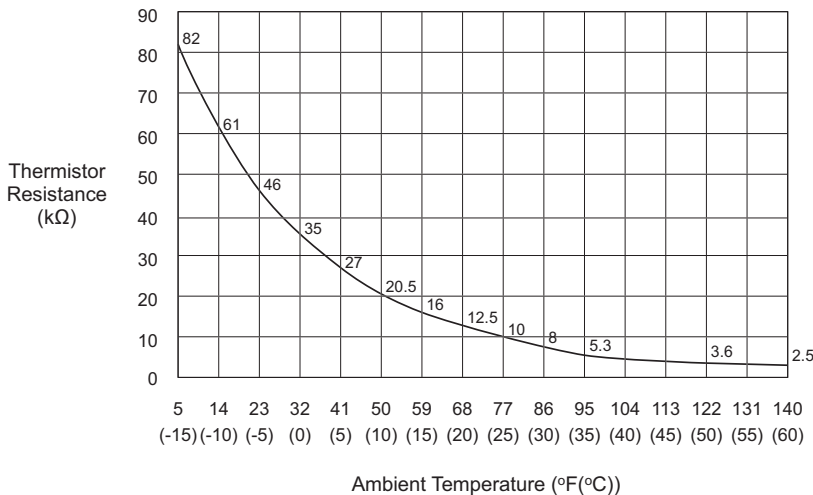


Alarm Code	11	Abnormality of Thermistor for Indoor Unit Inlet Air Temperature (Inlet Air Thermistor)
------------	----	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *¹⁾ Except for some models.
- ★ This alarm code is displayed when a short circuit (0.24kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected during a heating or cooling operation. The operation automatically restarts when the malfunction is removed.



Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Inlet Air Thermistor	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check connection.	Correctly connect wires.
Failure of I.U. PCB		Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.



NOTE:

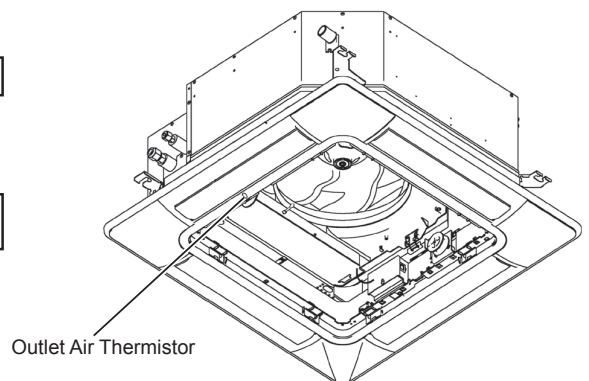
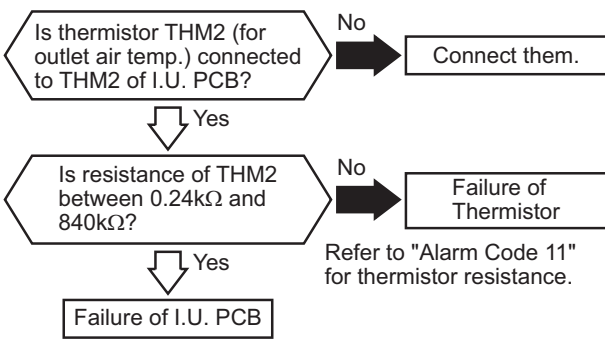
This figure is applicable to the following thermistors.

1. Inlet Air Thermistor (THM1), 2. Liquid Pipe Thermistor (Freeze Protection) (THM3), 3. Gas Pipe Thermistor (THM5), 4. Outlet Air Thermistor (THM2), 5. Outside Air Thermistor or Remote Thermistor (THM4)

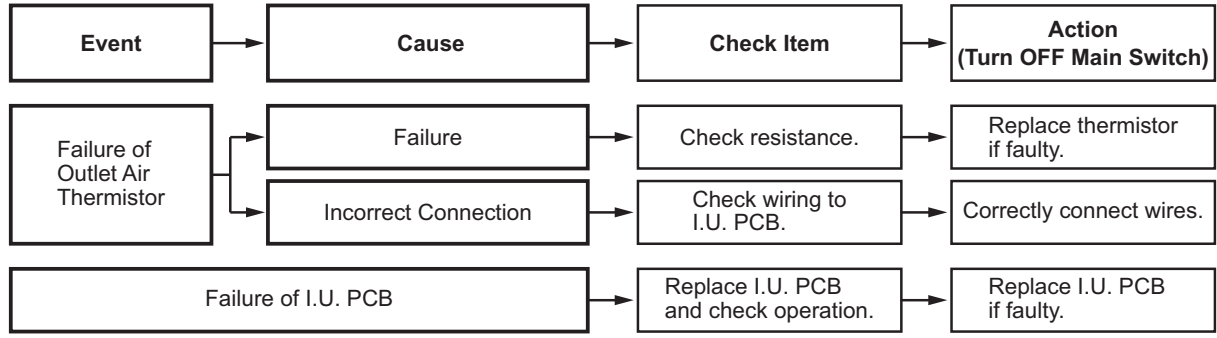
TROUBLESHOOTING

Alarm Code	12	Abnormality of Thermistor for Indoor Unit Outlet Air Temperature (Outlet Air Thermistor)
------------	----	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *¹⁾ Except for some models.
- ★ This alarm code is displayed when a short circuit (0.24kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected during a heating or cooling operation. The operation automatically restarts when the malfunction is removed.



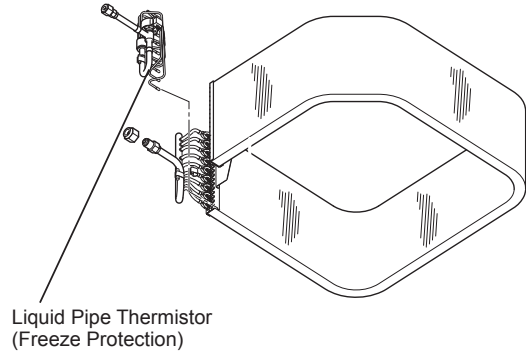
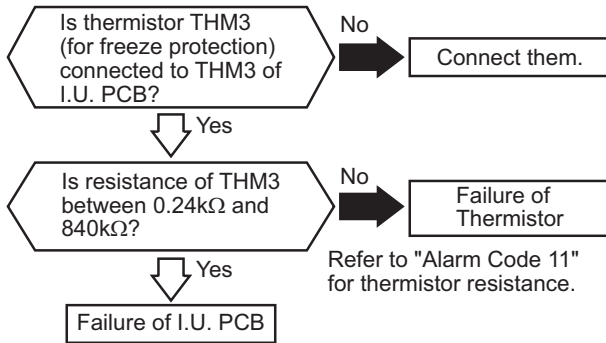
Example of 4-way Cassette Type



Alarm Code	13	Abnormality of Thermistor for Liquid Refrigerant Pipe Temperature at Indoor Unit Heat Exchanger (Freeze Protection Thermistor)
------------	-----------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ This alarm code is displayed when a short circuit (0.24kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected during a heating or cooling operation. The operation automatically restarts when the malfunction is removed.



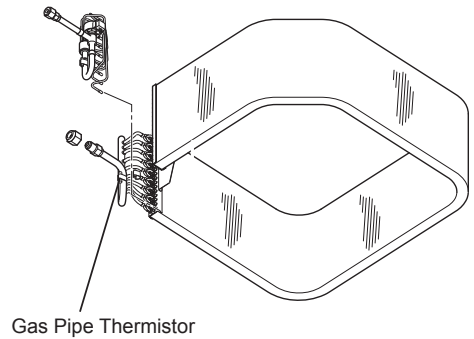
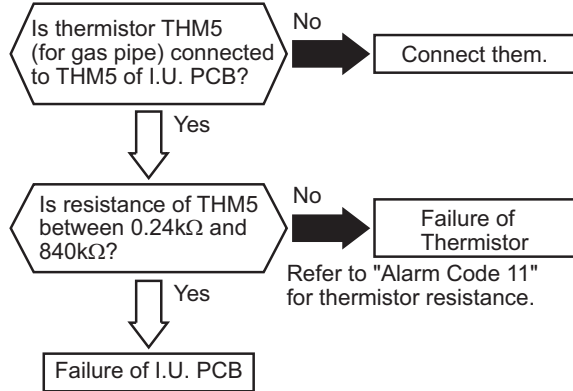
Example of 4-way Cassette Type

Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Freeze Protection Thermistor	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to I.U. PCB.	Correctly connect wires.
Failure of I.U. PCB		Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.

TROUBLESHOOTING

Alarm Code	14	Abnormality of Thermistor for Gas Refrigerant Pipe Temperature at Indoor Unit Heat Exchanger (Gas Pipe Thermistor)
------------	-----------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *¹⁾ Except for some models.
- ★ This alarm code is displayed when a short circuit (0.24kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected during a heating or cooling operation. The operation automatically restarts when the malfunction is removed.



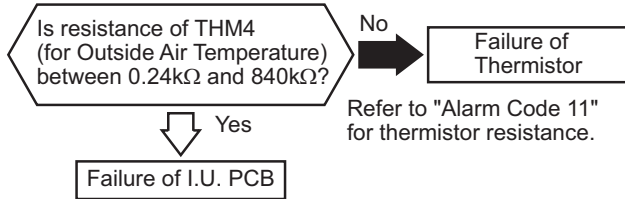
Example of 4-way Cassette Type

Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Thermistor for Indoor Unit Heat Exchanger Gas Pipe Temp.	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to I.U. PCB.	Correctly connect wires.
Failure of I.U. PCB		Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.

*1): The heating operation is available only during the test run.

Alarm Code	15	Abnormality of Thermistor for Outside Air Temperature (for Econo Fresh)
------------	----	--

- The RUN indicator (red) flashes.
- The indoor unit number and the alarm code are displayed on the LCD. The alarm code is displayed on the 7-segment display of the outdoor unit PCB.
- ★ This alarm code is displayed when a short circuit ($0.24k\Omega$ or less) or disconnection ($840k\Omega$ or more) of the thermistor is detected during a heating or cooling operation.

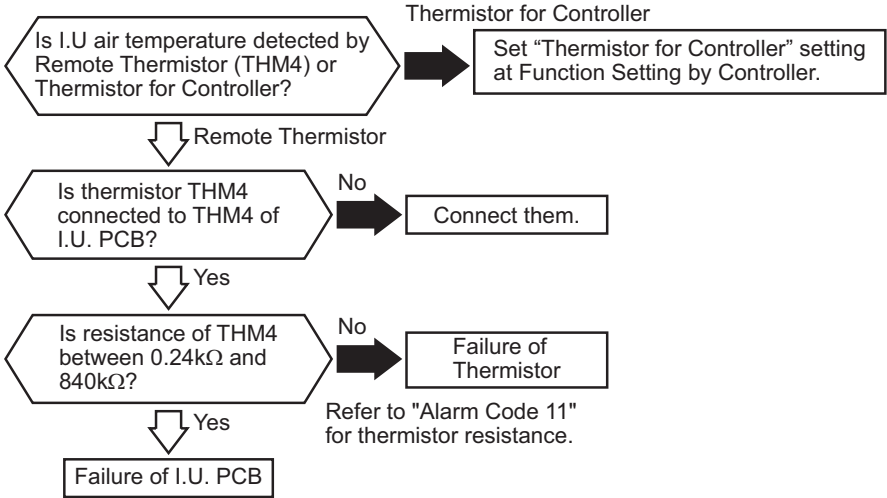


Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Thermistor for Outside Air Temperature	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to I.U. PCB.	Correctly connect wires.
Failure of I.U. PCB		Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.

TROUBLESHOOTING

Alarm Code	16	Abnormality of Remote Thermistor (for DOAS)
------------	-----------	--

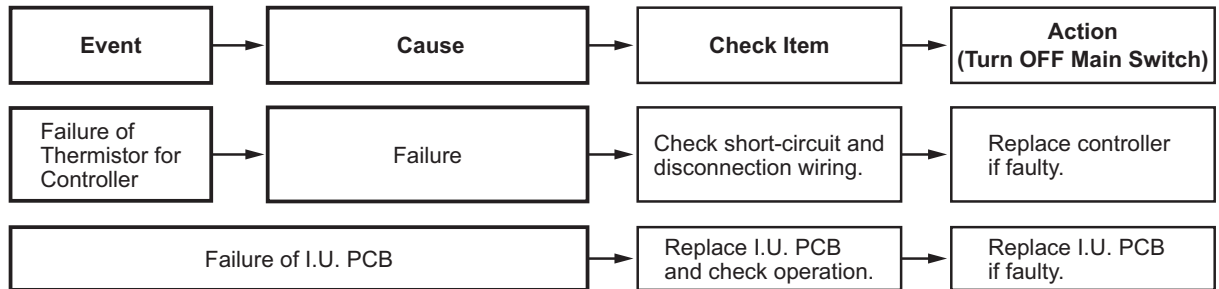
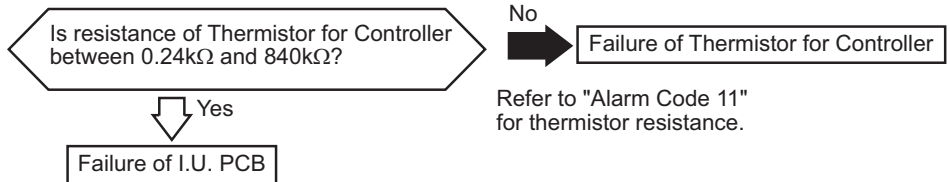
- The RUN indicator (red) flashes.
- The indoor unit number and the alarm code are displayed on the LCD. The alarm code is displayed on the 7-segment display of the outdoor unit PCB.
- ★ This alarm code is displayed when a short circuit ($0.24k\Omega$ or less) or disconnection ($840k\Omega$ or more) of the thermistor is detected during a heating, cooling or fan operation.



Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Remote Thermistor	Failure	Check resistance.	Replace remote thermistor if faulty.
	Incorrect Connection	Check wiring to I.U. PCB.	Correctly connect wires.
Failure of I.U. PCB		Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.

Alarm Code	17	Abnormality of Thermistor for Controller (for DOAS)
------------	----	--

- The RUN indicator (red) flashes.
- The indoor unit number and the alarm code are displayed on the LCD. The alarm code is displayed on the 7-segment display of the outdoor unit PCB.
- ★ This alarm code is displayed when a short circuit (0.24kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected during a heating or cooling operation.



NOTE:

This DOAS has function using both Remote Thermistor (THM4) and Thermistor for Controller. While operating by this function,

- even if either of the thermistor is failure, operation can be continued by using detection value measured from an available Thermistor,
- if both of thermistors are failure, this alarm code is displayed.

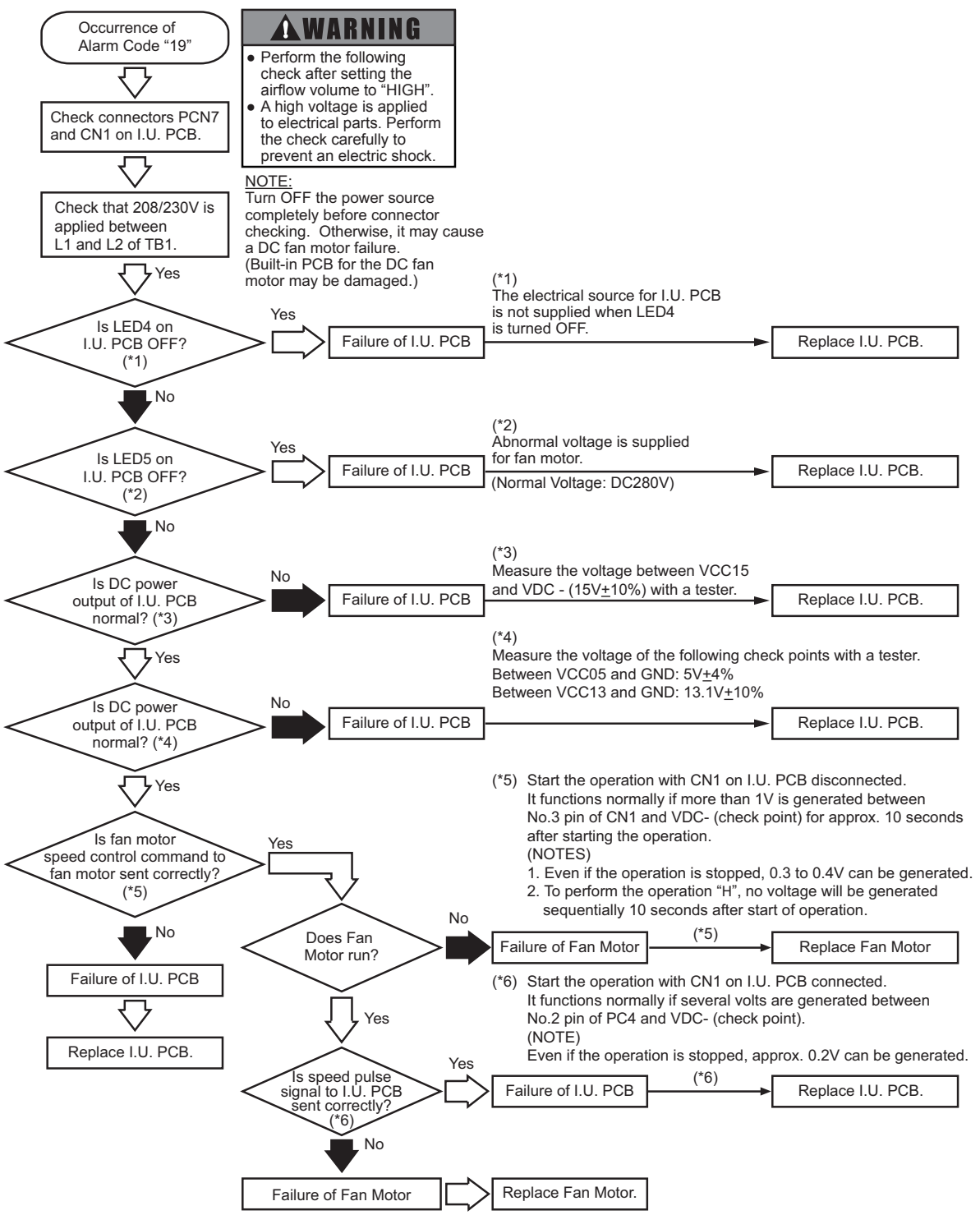
For this reason, when both Remote Thermistor (THM4) and Thermistor for Controller are using and this alarm code is displayed means both of Thermistor are failure. As for Remote Thermistor (THM4), follow the previous page, "Alarm Code 16: Abnormality of Remote Thermistor (DOAS)" for checking.

TROUBLESHOOTING

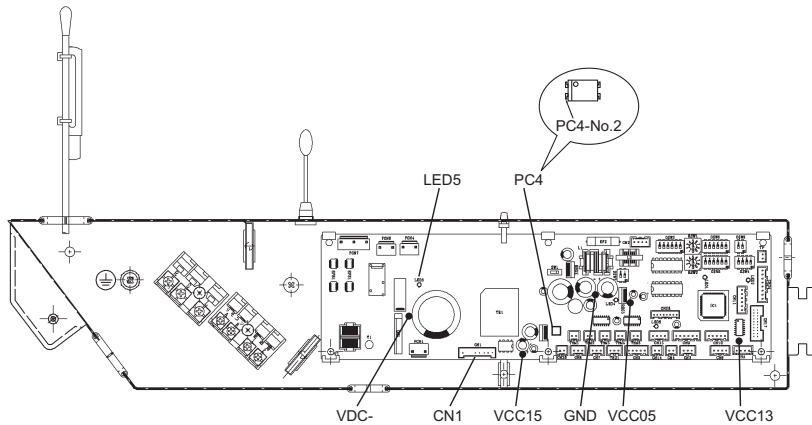
Alarm Code	19	Activation of Protection Device for Indoor Fan Motor (Indoor Unit with DC Motor)
------------	-----------	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ This alarm code is displayed when the indoor fan motor rotates at less than 70rpm for five seconds three times in 30 minutes during the operation.



• 4-Way Cassette Type



< Checking for Fan Motor >

Remove the connector of the fan motor and measure the resistance value between each of the pins (twice). Check whether the resistance value is over or not according to the table shown below. When performing the second measuring, make sure to change the tester (Red/ Black).

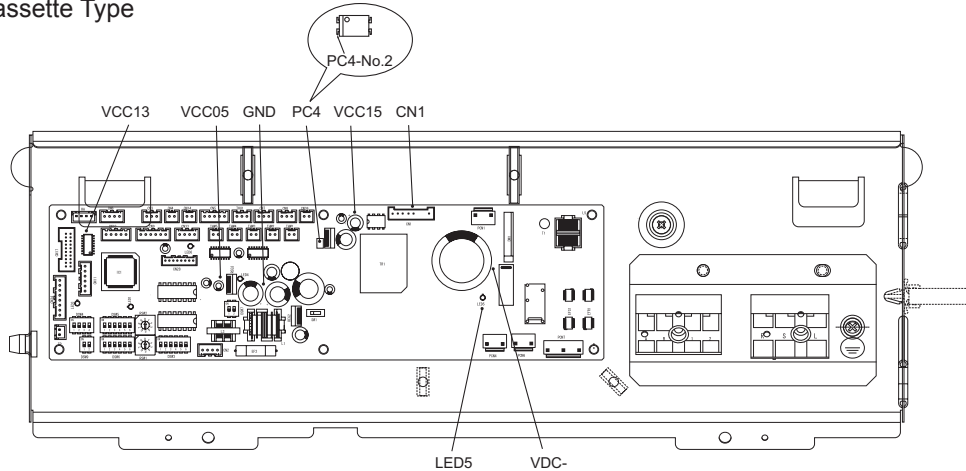
1st		
Tester		Resistance Value
Red	Black	Ω
FG	GND	
Vsp	GND	
Vcc	GND	
Vdc	GND	

2nd		
Tester		Resistance Value
Red	Black	Ω
GND	FG	
GND	Vsp	
GND	Vcc	
GND	Vdc	

Decision Basis

Resistance values of both 1st and 2nd measurings are over 10

• 1-Way Cassette Type



< Checking for Fan Motor >

Remove the connector of the fan motor and measure the resistance value between each of the pins (twice). Check whether the resistance value is over or not according to the table shown below. When performing the second measuring, make sure to change the tester (Red/ Black).

1st		
Tester		Resistance Value
Red	Black	Ω
FG	GND	
Vsp	GND	
Vcc	GND	
Vdc	GND	

2nd		
Tester		Resistance Value
Red	Black	Ω
GND	FG	
GND	Vsp	
GND	Vcc	
GND	Vdc	

Decision Basis

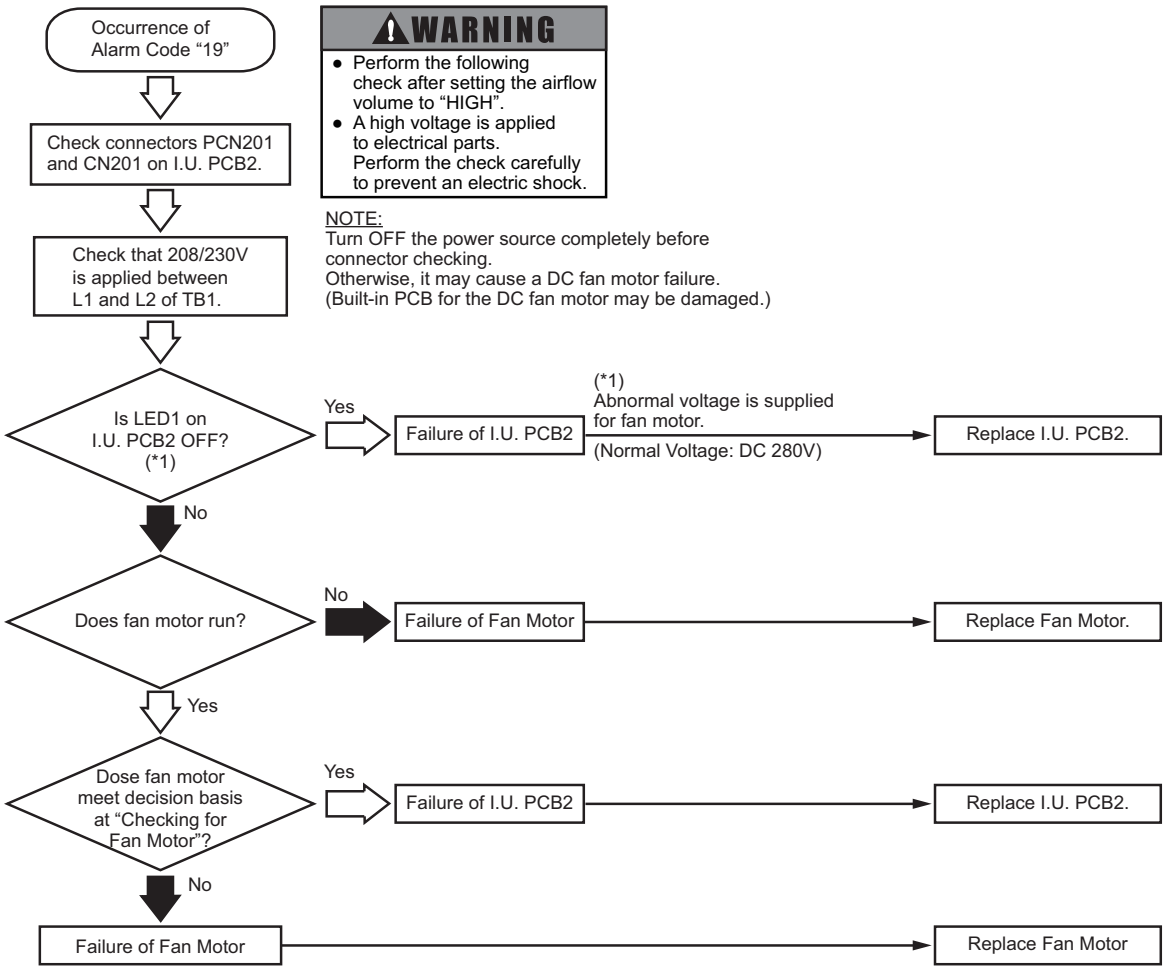
Resistance values of both 1st and 2nd measurings are over 10

Connector for Fan Motor

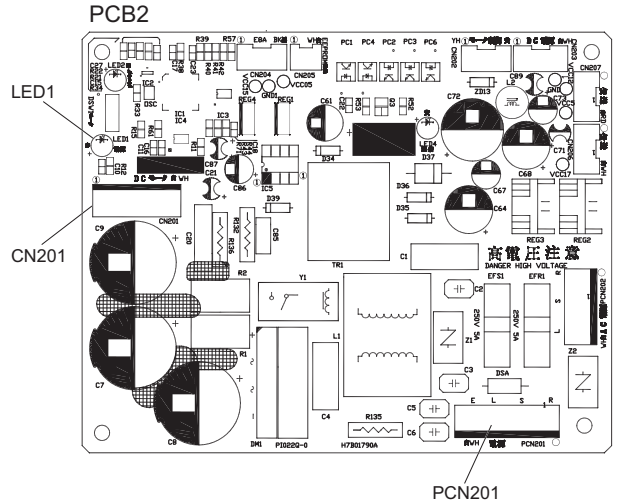
TROUBLESHOOTING

Alarm Code	19	Activation of Protection Device for Indoor Fan Motor (Ducted (Medium Static and Slim) Type)
------------	-----------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *¹⁾ Except for some models.
- ★ This alarm code is displayed when the indoor fan motor rotates at less than 70rpm for five seconds three times in 30 minutes during the operation.

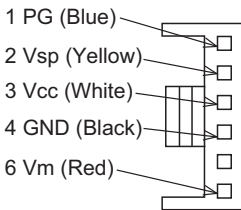


• Ducted Medium Static Type



< Checking for Fan Motor >

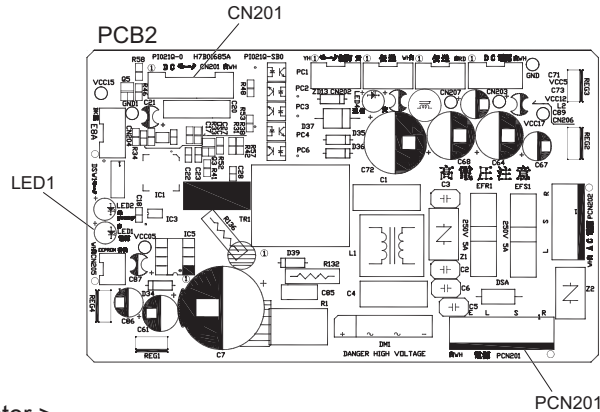
Remove the connector of the fan motor and measure the resistance value between each of the pins (twice). Check whether the resistance value is over or not according to the table shown below. When performing the second measuring, make sure to change the tester (Red/ Black).



1st			2nd		
Tester		Resistance Value	Tester		Resistance Value
Red	Black	Ω	Red	Black	Ω
PG	GND		GND	PG	
Vsp	GND		GND	Vsp	
Vcc	GND		GND	Vcc	
Vm	GND		GND	Vm	

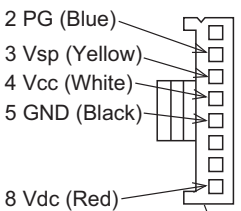
Decision Basis
Resistance values of both 1st and 2nd measurements are over 10

• Ducted Slim Type



< Checking for Fan Motor >

Remove the connector of the fan motor and measure the resistance value between each of the pins (twice). Check whether the resistance value is over or not according to the table shown below. When performing the second measuring, make sure to change the tester (Red/ Black).



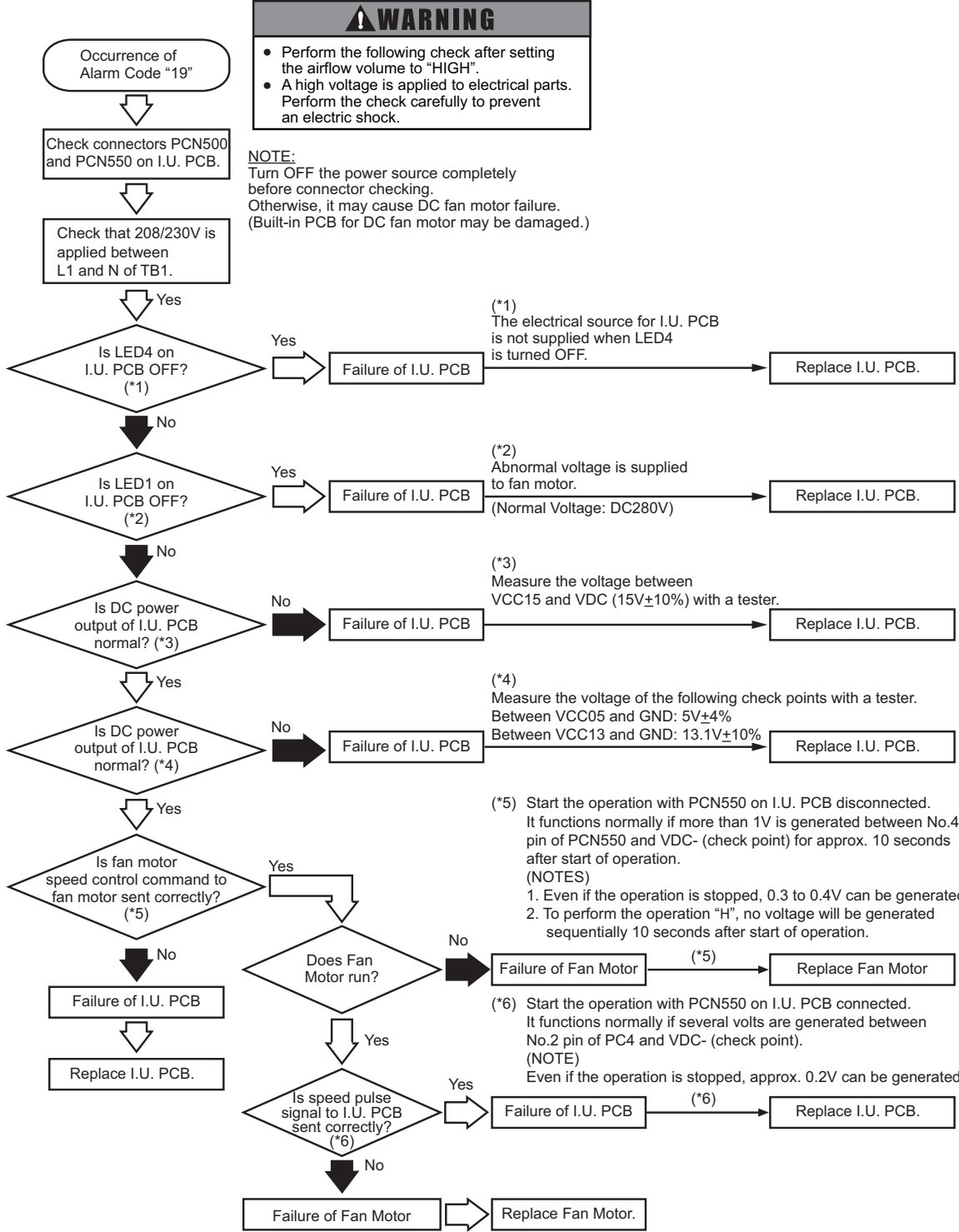
Connector for Fan Motor

1st			2nd		
Tester		Resistance Value	Tester		Resistance Value
Red	Black	Ω	Red	Black	Ω
PG	GND		GND	PG	
Vsp	GND		GND	Vsp	
Vcc	GND		GND	Vcc	
Vdc	GND		GND	Vdc	

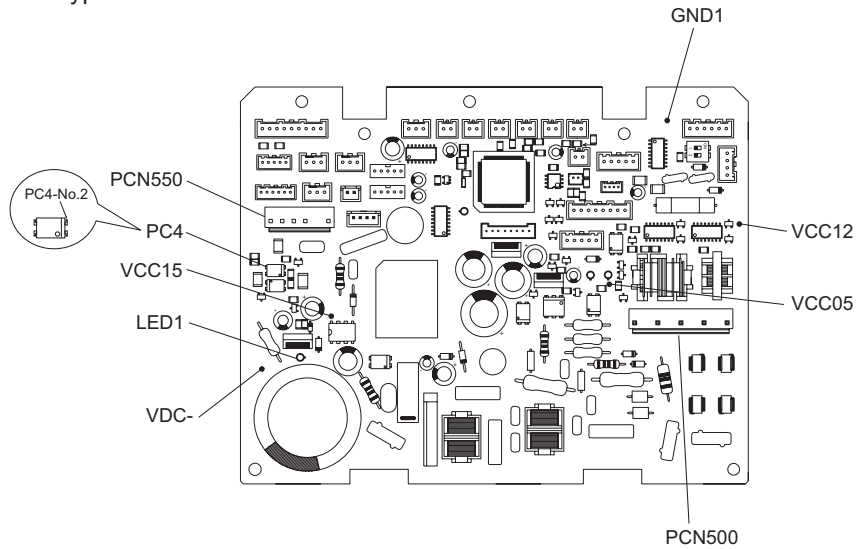
Decision Basis
Resistance values of both 1st and 2nd measurements are over 10

Alarm Code	19	Activation of Protection Device for Indoor Fan Motor (Wall Mount Type)
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- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *1) Except for some models.
- ★ This alarm code is displayed when the indoor fan motor rotates at less than 70rpm for five seconds (for 40 seconds during auto swing operation) three times in 30 minutes during the operation.



• Wall Mount Type



< Checking for Fan Motor >

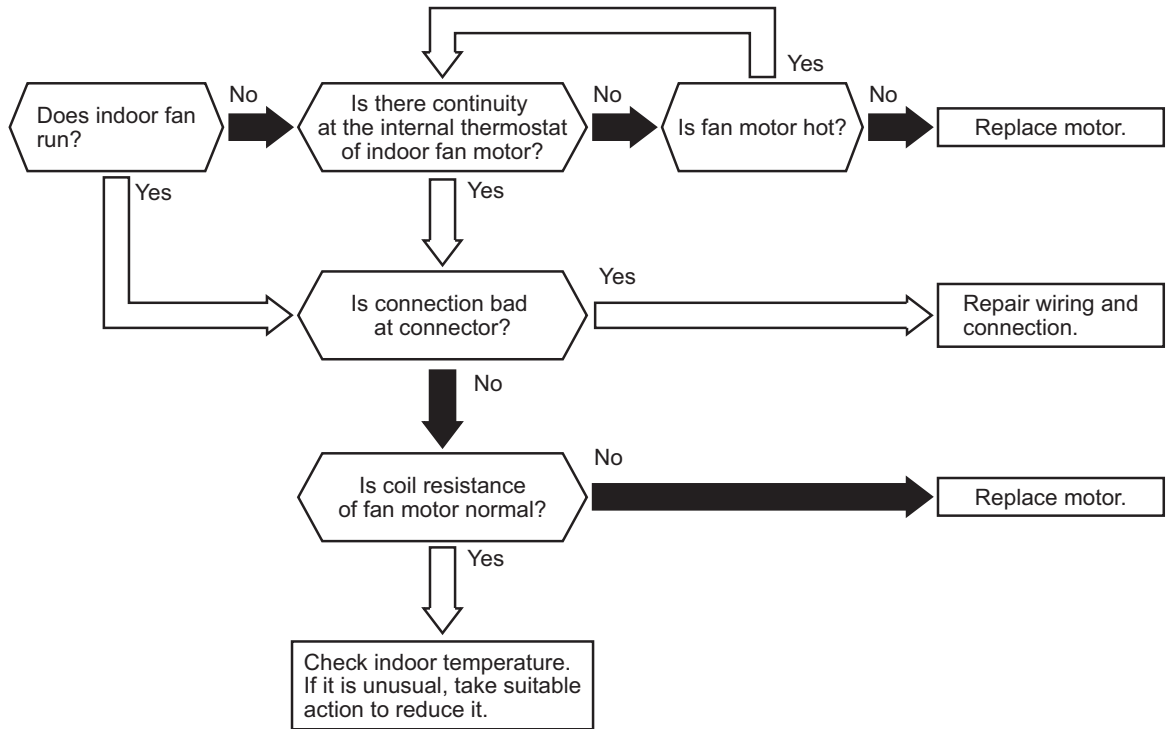
Remove the connector of the fan motor and measure the resistance value between each of the pins (twice). Check whether the resistance value is over or not according to the table shown below. When performing the second measuring, make sure to change the tester (Red/ Black).

		1st			2nd			Decision Basis
		Tester		Resistance Value	Tester		Resistance Value	
1 Vm (Red)		Red	Black	Ω	Red	Black	Resistance values of both 1st and 2nd measurings are over 10	
3 GND (Black)		FG	GND		GND	FG		
4 Vcc (White)		Vsp	GND		GND	Vsp		
5 Vs (Yellow)		Vcc	GND		GND	Vcc		
6 PG (Blue)		Vdc	GND		GND	Vdc		

TROUBLESHOOTING

Alarm Code	19	Activation of Protection Device for Indoor Fan Motor (Indoor Unit with AC Motor)
------------	----	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
*1) Except for some models.
- ★ This alarm code is displayed when over approximately 1A is applied to the indoor unit fan motor.

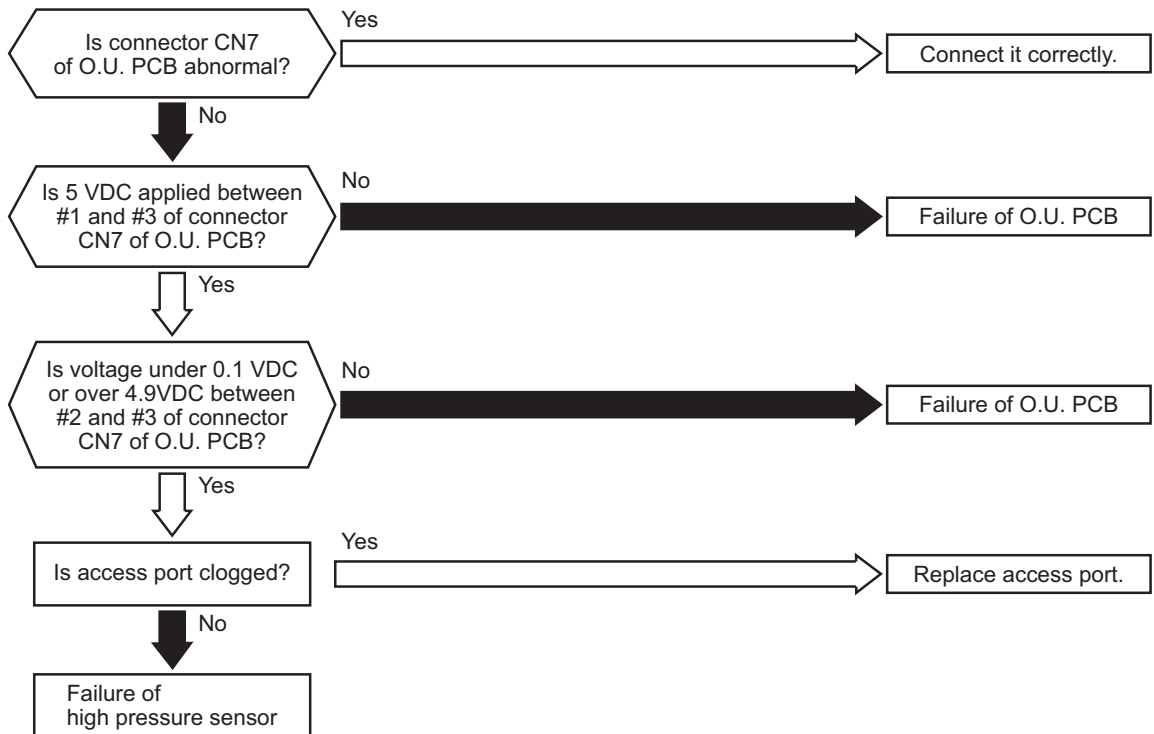


Event	Cause	Check Item	Action (Turn OFF Main Switch)	
Activation of Internal Thermostat for Indoor Unit Fan Motor	Faulty Indoor Unit Fan Motor	Measure coil resistance and insulation resistance.	Replace motor if faulty.	
	Faulty Internal Thermostat	Failure	Check continuity after fan motor temperature decreases to room temp.	Replace fan motor if no continuity.
		Contact Failure	Measure resistance with a tester.	Correct by tightening. Replace connectors.
		Incorrect Connection	Check connection.	Repair connection.

Alarm Code 21	Abnormality of High Pressure Sensor for Outdoor Unit
----------------------	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *¹⁾ Except for some models.
- ★ This alarm code is displayed when output voltage of the pressure sensor decreases to 0.1V or less, or increases to 4.9V or more during operation.

O.U. PCB: Outdoor Unit PCB

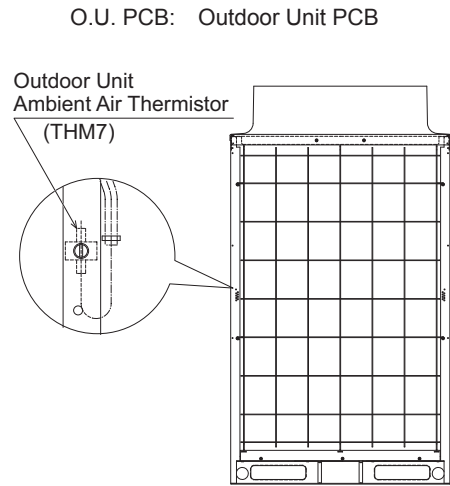
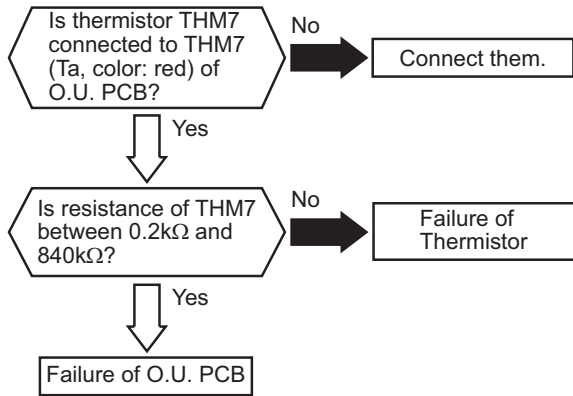


Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Thermistor on Top of Compressor	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to O.U. PCB.	Repair wiring and connection.
Failure of O.U. PCB		Replace O.U. PCB and check operation.	Replace O.U. PCB if faulty.
Indicated Value of Pressure Value is Excessively High or Low	Malfunction of Pressure Sensor due to Faulty Access Port	Check for clogging of access port.	Replace access port.

TROUBLESHOOTING

Alarm Code	22	Abnormality of Thermistor for Outdoor Air Temperature (Outdoor Unit Ambient Thermistor)
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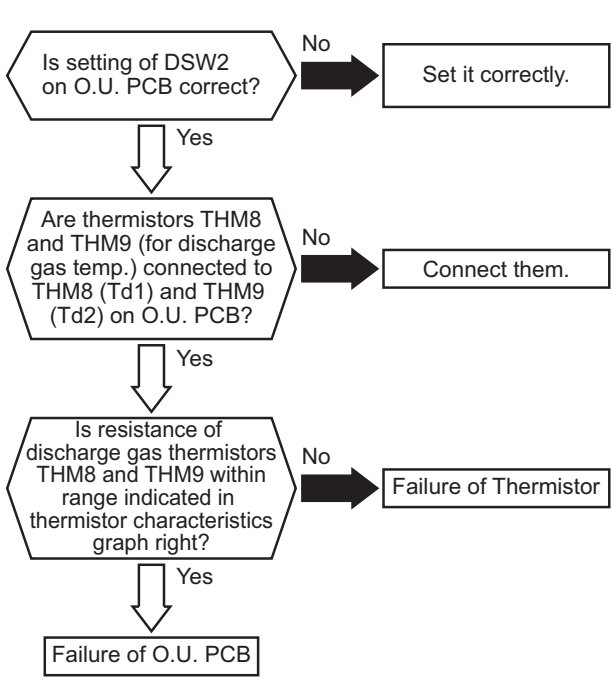
- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *¹⁾ Except for some models.
- ★ This alarm code is displayed when a short circuit (0.2kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected during operation.



Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Thermistor for Outdoor Air Temp.	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to O.U. PCB.	Repair wiring and connection.
Failure of O.U. PCB		Replace O.U. PCB and check operation.	Replace O.U. PCB if faulty.

Alarm Code 23	Abnormality of Thermistor for Discharge Gas Temperature on the Top of Compressor
---	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB. (For the combination of outdoor units, the alarm code is displayed on the PCB of outdoor Unit A.) Additionally for the outdoor unit number and compressor number with an abnormal thermistor, check the alarm code history.
- *1) Except for some models.
- ★ This alarm code is displayed when a short circuit for one minute (0.9kΩ or less) or disconnection (5946kΩ or more) of the thermistor is detected for a second time during operation.

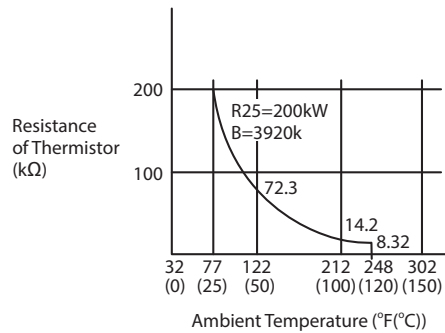


O.U. PCB: Outdoor Unit PCB

Model	Thermistor	
	Td1 (THM8)	Td2 (THM9)
72 MBH (H,Y)VAHP072(3,4)1S (H,Y)VAHR072(3,4)1S	○	-
96, 120 MBH (H,Y)VAHP096(3,4)1S and (H,Y)VAHP120(3,4)1S (H,Y)VAHR096(3,4)1S and (H,Y)VAHR120(3,4)1S	○	○

If there is a combination of outdoor units, abnormalities can be detected for each unit.

Characteristics of Thermistor



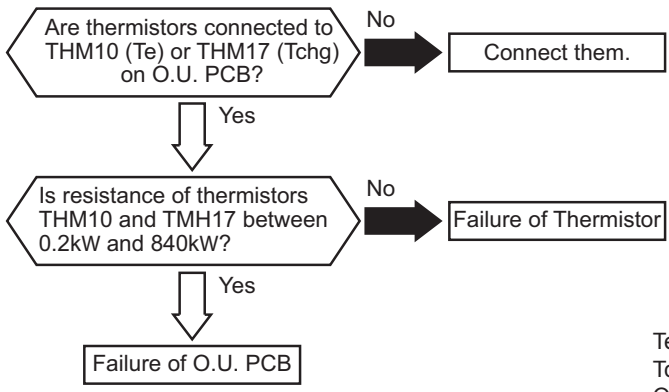
Event	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Discharge Gas Thermistor	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to O.U. PCB.	Repair wiring and connection.
Faulty O.U. PCB		Replace O.U. PCB and check operation.	Replace O.U. PCB if faulty.
Incorrect Setting of DSW2 on O.U. PCB		Check setting of DSW2 on O.U. PCB.	Correctly set DSW2 on O.U. PCB.

TROUBLESHOOTING

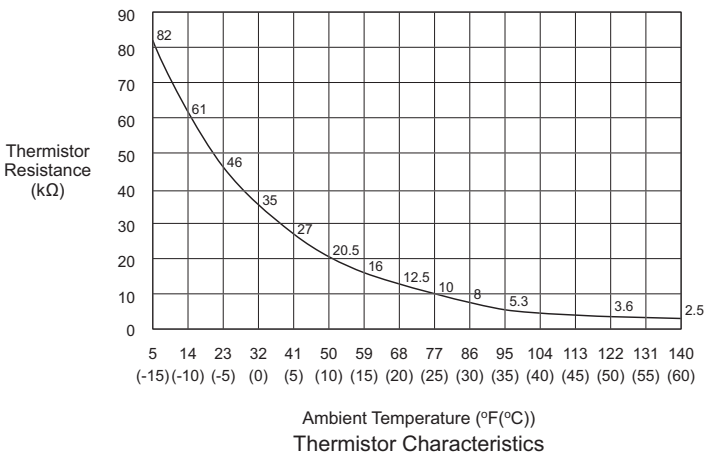
Alarm Code	24	Abnormality of Thermistor for Evaporating Temperature during Heating Operation (Outdoor Unit Evaporating Thermistor)
------------	----	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB. (For a combination of outdoor units, the alarm code is displayed on the PCB of outdoor Unit A.) Additionally, for the outdoor unit number and compressor number with an abnormal thermistor, check the alarm code history.
- *1) Except for some models.

★ This alarm is displayed when a short circuit (0.2kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected for eight minutes during operation.

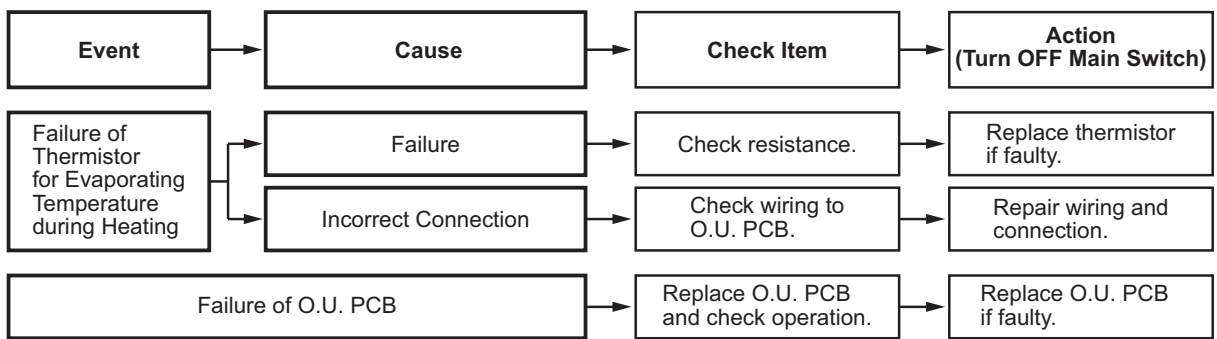


Te: Thermistor for Outdoor Liquid Pipe
 Tchg: Thermistor for Super Cooling Main Line
 O.U. PCB: Outdoor Unit PCB



NOTE:
 This data is applicable to the following thermistors.

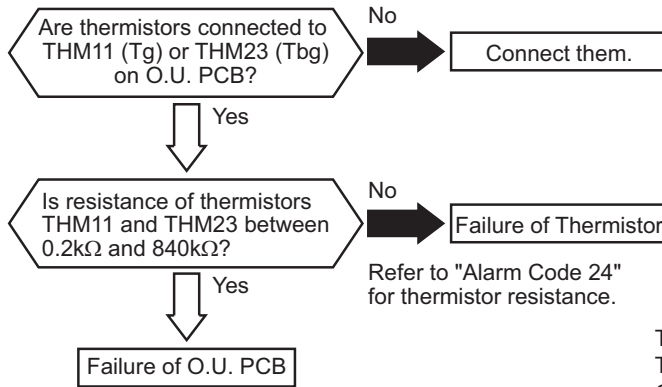
1. Ambient Temperature Thermistor (THM7)
2. Evaporation Liquid Line Thermistor (THM10)
3. Evaporation Gas Line Thermistor (THM11)
4. Supercooling Main Line Thermistor (THM17)
5. Supercooling Bypass Line Thermistor (THM23)



Alarm Code 25	Abnormality of Thermistor for Outdoor Unit Heat Exchanger Gas Pipe (Tg/Tbg)
----------------------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB. (For a combination of outdoor units, the alarm code is displayed on the PCB of outdoor Unit A.) Additionally for the outdoor unit number and compressor number with an abnormal thermistor, check the alarm code history.
- *1) Except for some models.

★ This alarm is displayed when a short circuit (0.2kΩ or less) or disconnection (840kΩ or more) of the thermistor is detected for eight minutes during operation.



Tg: Thermistor for Outdoor Gas Pipe
 Tbg: Thermistor for Super Cooling Bypass Line
 O.U. PCB: Outdoor Unit PCB

Event	Cause	Check Item	Action (Turn OFF Main Switch)
Failure of Outdoor Unit Gas Pipe Thermistor	Failure	Check resistance.	Replace thermistor if faulty.
	Incorrect Connection	Check wiring to O.U. PCB.	Repair wiring and connection.
Failure of O.U. PCB		Replace O.U. PCB and check operation.	Replace O.U. PCB if faulty.

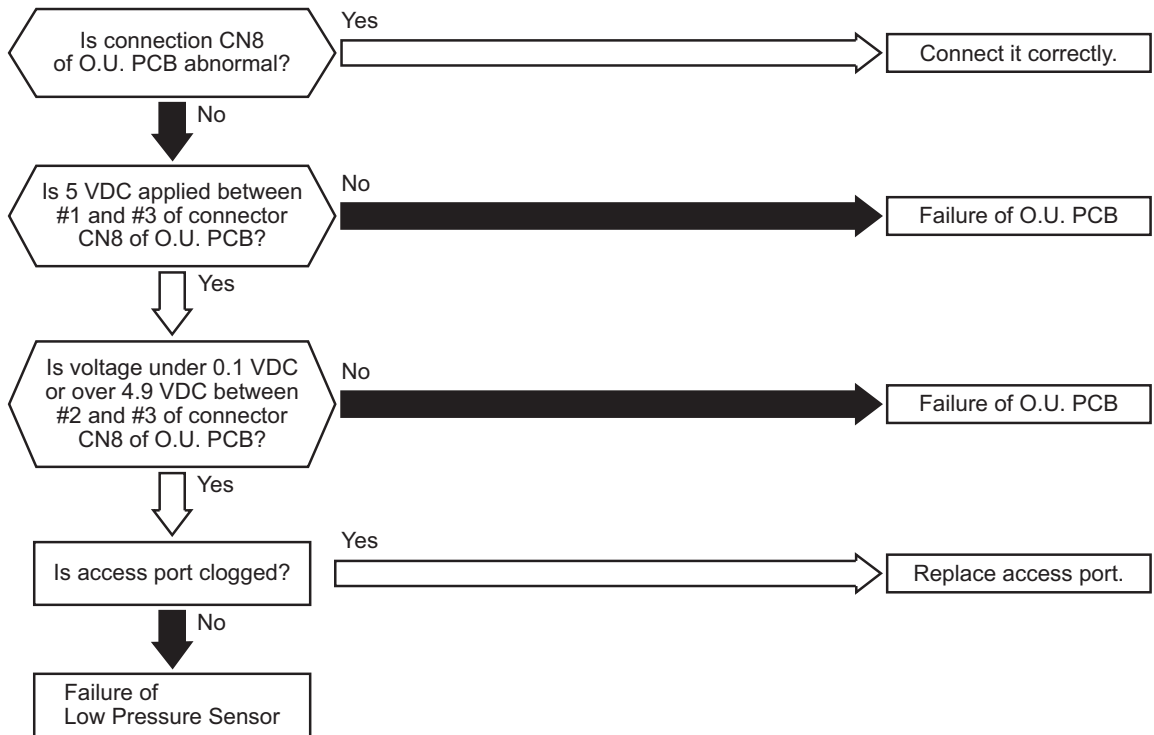
TROUBLESHOOTING

Alarm Code	29	Abnormality of Low Pressure Sensor for Outdoor Unit
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- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *¹⁾ Except for some models.

★ This alarm code is displayed when output voltage of the pressure sensor decreases to 0.1V or less or increases to 4.9V or more during operation.

O.U. PCB: Outdoor Unit PCB

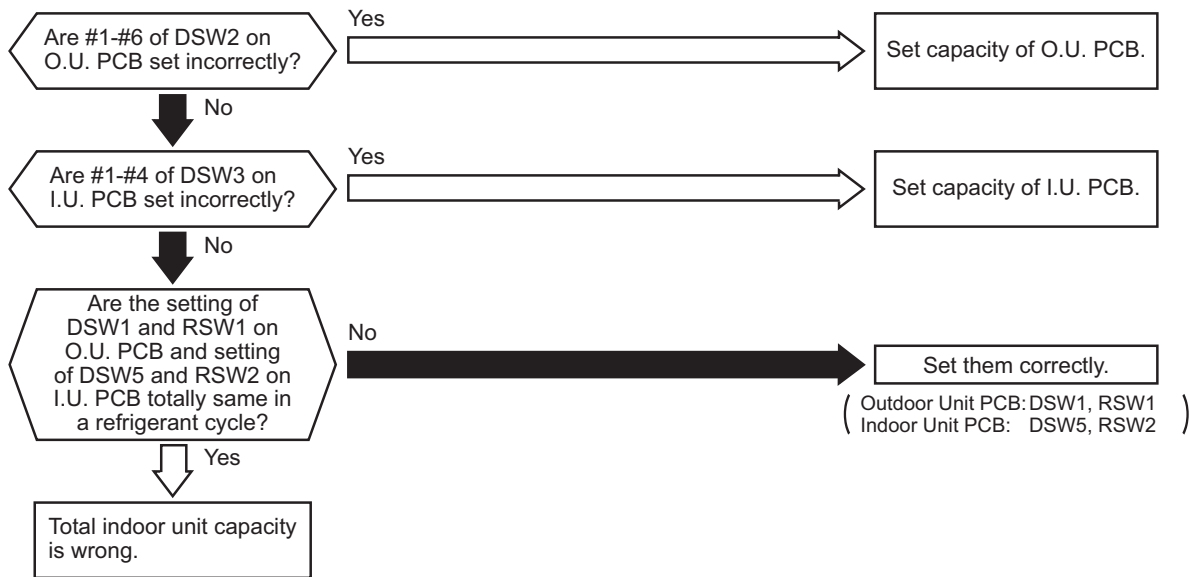


Event	Cause	Check Item	Action (Turn OFF Main Switch)
Faulty Low Pressure Sensor	Failure	Check output voltage is correct.	Replace pressure sensor if faulty.
	Incorrect Connection	Check wiring to O.U. PCB.	Repair wiring and connection.
Faulty O.U. PCB		Replace O.U. PCB and check operation.	Replace O.U. PCB if faulty.
Indicated Value of Pressure Value is Excessively High or Low	Malfunction of Pressure Sensor due to Faulty Access Port	Check for clogging of access port.	Replace access port.

Alarm Code	31	Incorrect Capacity Setting of Indoor Unit and Outdoor Unit
------------	----	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *1) Except for some models.
- ★ This alarm code is indicated when the capacity setting DIP switch, DSW2, on the outdoor unit PCB, is not set (all the settings from #1 to #6 are OFF) or set incorrectly.
- ★ This alarm code is displayed when the total indoor unit capacity is less than 50% or more than 130% of the combined outdoor unit capacity.

O.U. PCB: Outdoor Unit PCB
I.U. PCB: Indoor Unit PCB

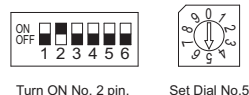


Event	Cause	Check Item	Action (Turn OFF Main Switch)
Incorrect Capacity Setting of Indoor Unit		Check combination of indoor units and capacity setting of I.U. PCB.	Correctly set DIP switch, DSW3.
Incorrect Capacity Setting of Outdoor Unit		Check capacity setting of O.U. PCB.	Correctly set DIP switch, DSW2.
Total Indoor Unit Capacity Connected to Outdoor Unit is Beyond Permissible Range		Check outdoor unit model by calculating total indoor units capacity.	Ensure that total indoor unit capacity is from 50% to 130%.
Refrigerant Cycle Setting of Outdoor Unit and Indoor Unit is Different		Check refrigerant cycle setting of O.U. PCB and I.U. PCB.	Set them correctly.

Refrigerant Cycle No. Setting

	Setting Switch	
	10 digit	1 digit
Outdoor Unit	DSW1	RSW1
Indoor Unit	DSW5	RSW2

Example of Setting Refrigerant Cycle No.25



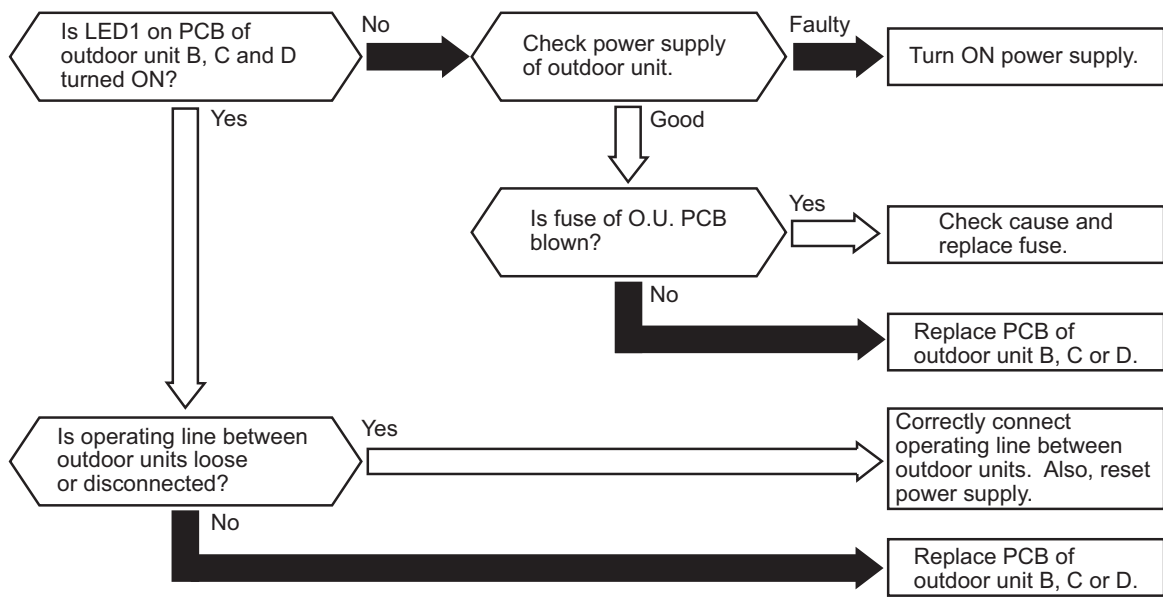
DSW and RSW factory setting is 0.
Maximum in setting refrigerant cycle No. is 63.

TROUBLESHOOTING

Alarm Code 31	Abnormal Communication between Outdoor Units
----------------------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB..
- *1) Except for some models.
- ★ This alarm code is displayed when an abnormal condition continues for 30 seconds after normal communication between outdoor units, and also the abnormal condition continues for 30 seconds even after the micro-computer is automatically reset.

O.U. PCB: Outdoor Unit PCB



Outdoor Unit

Unit A (Main)	Unit B (Sub)	Unit C (Sub)	Unit D (Sub)

Alarm Code 35	Incorrect Indoor Unit No. Setting
---------------	-----------------------------------

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ This alarm code is displayed five minutes after power-on of the outdoor unit, if the indoor unit number set by DSW6 and RSW1 duplicates in the same refrigerant group.

Alarm Code 36	Incorrect Indoor Unit Combination
---------------	-----------------------------------

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

TROUBLESHOOTING

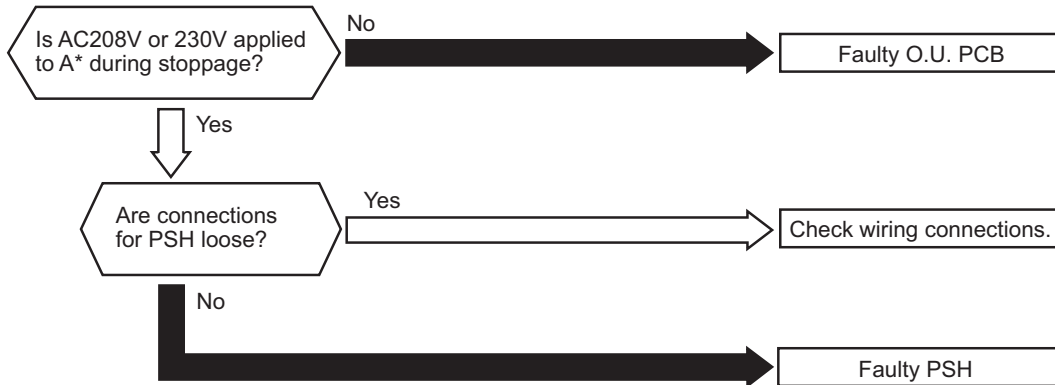
Alarm Code	38	Abnormality of Picking up Circuit for Protection in Outdoor Unit
------------	-----------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

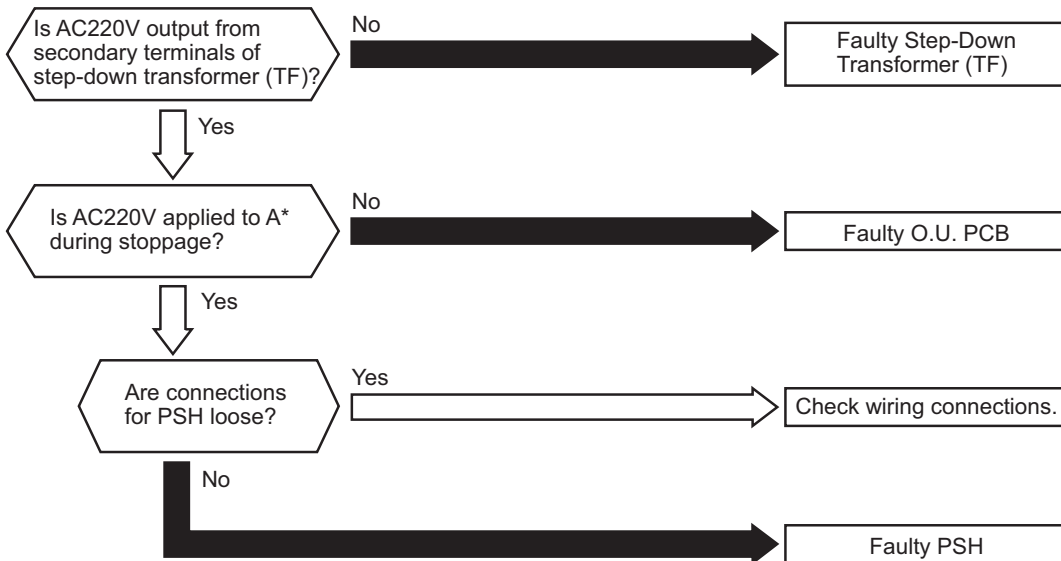
★ This alarm code is displayed when AC 208/230V or 220V is not detected in A* during inverter compressor stoppage.

O.U. PCB: Outdoor Unit PCB

• (H,Y)VAH(P,R)***B31S

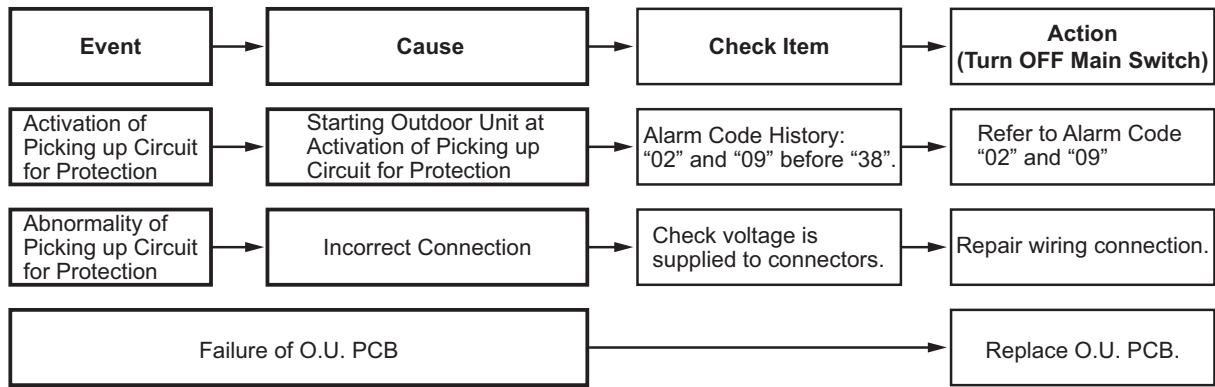


• (H,Y)VAH(P,R)***B41S



A*: Between Terminals 3# of PCN2 (or 3# of PCN16) and "S1" on O.U. PCB

TROUBLESHOOTING



- 1): This alarm code may be indicated when the high pressure switch (PSH) is connected incorrectly or fails (open fault). The item for alarm code 02 should be checked as well.
- 2): Especially, check the wiring connection for PCN2 and PCN16 on O.U. PCB.

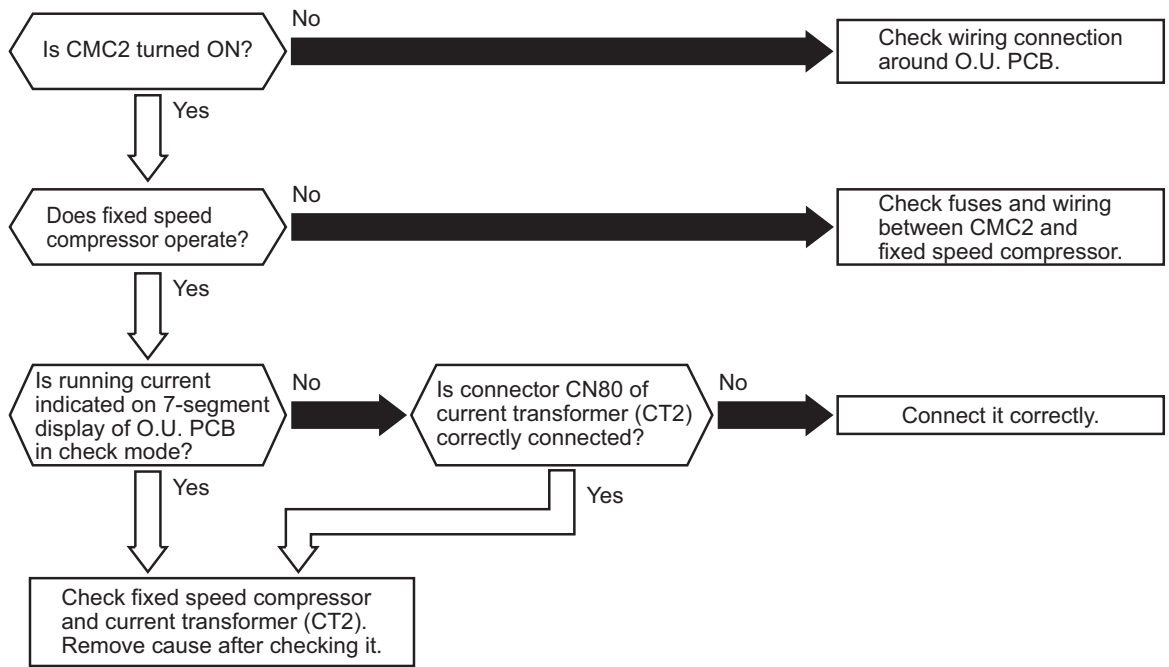
TROUBLESHOOTING

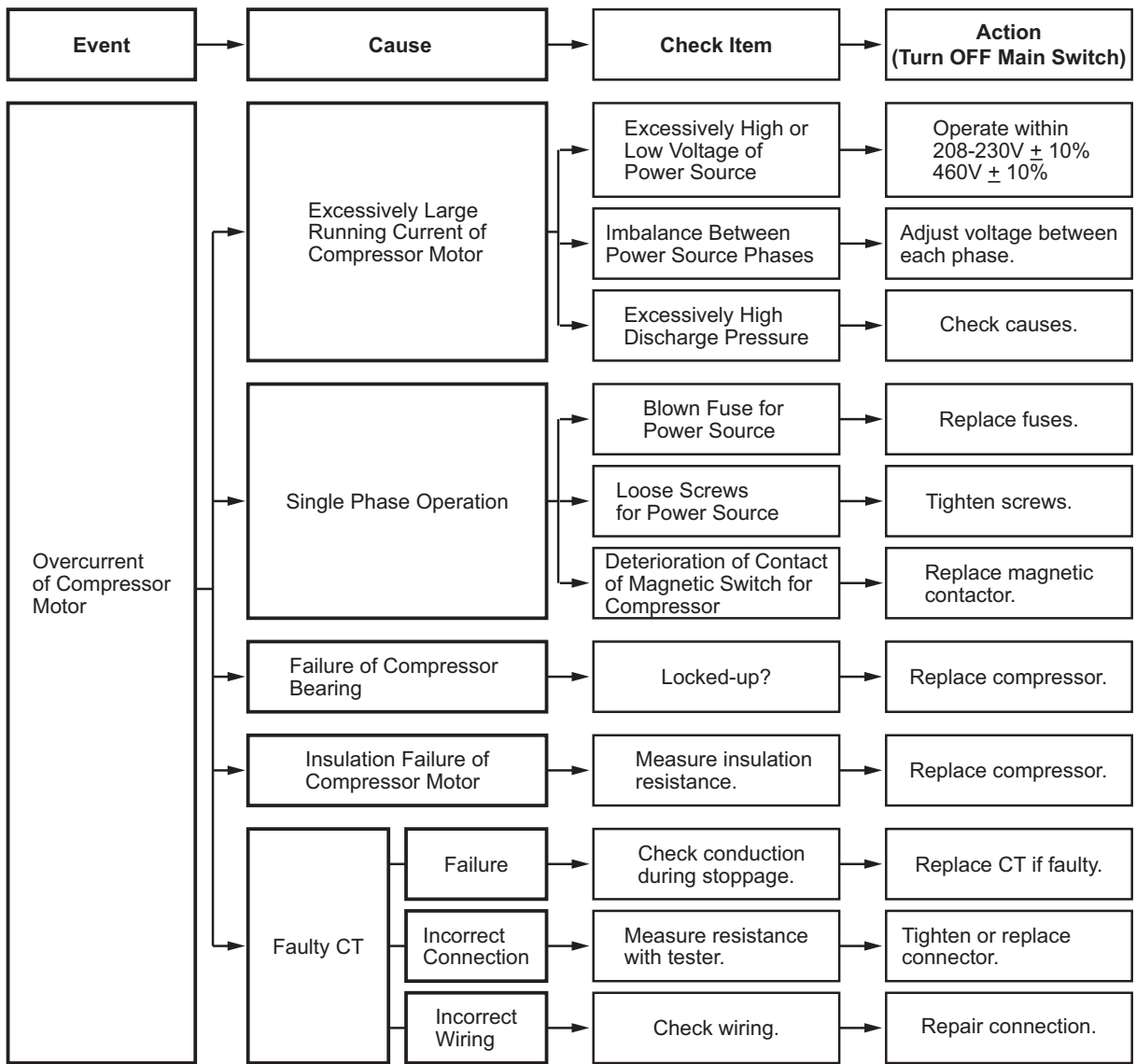
Alarm Code	39	Abnormality of Running Current at Fixed Speed Compressor
------------	-----------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB. (For a combination of outdoor units, the alarm code is displayed on the PCB of outdoor Unit A.) Additionally for the outdoor unit number and compressor number with an abnormal thermistor, check the alarm code history.
- *1) Except for some models.

★ When the running current of the fixed speed compressor is 0A or exceeds the overcurrent limit during the operation, all the compressors stop. The operation automatically restarts after three minutes. If this occurs again in the same compressor twice in the next 30 minutes, this alarm code is displayed.

O.U. PCB: Outdoor Unit PCB

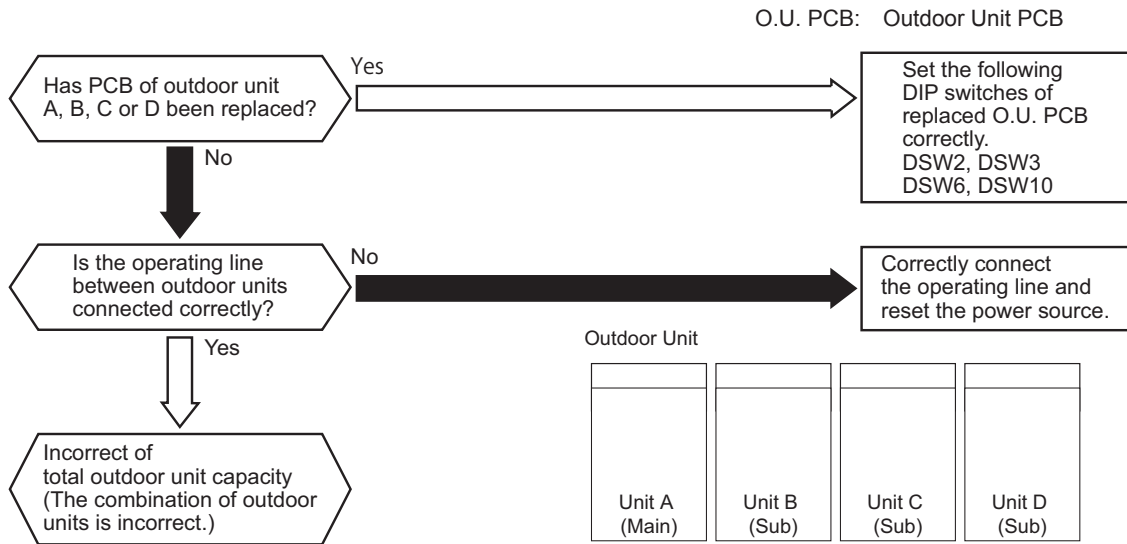




TROUBLESHOOTING

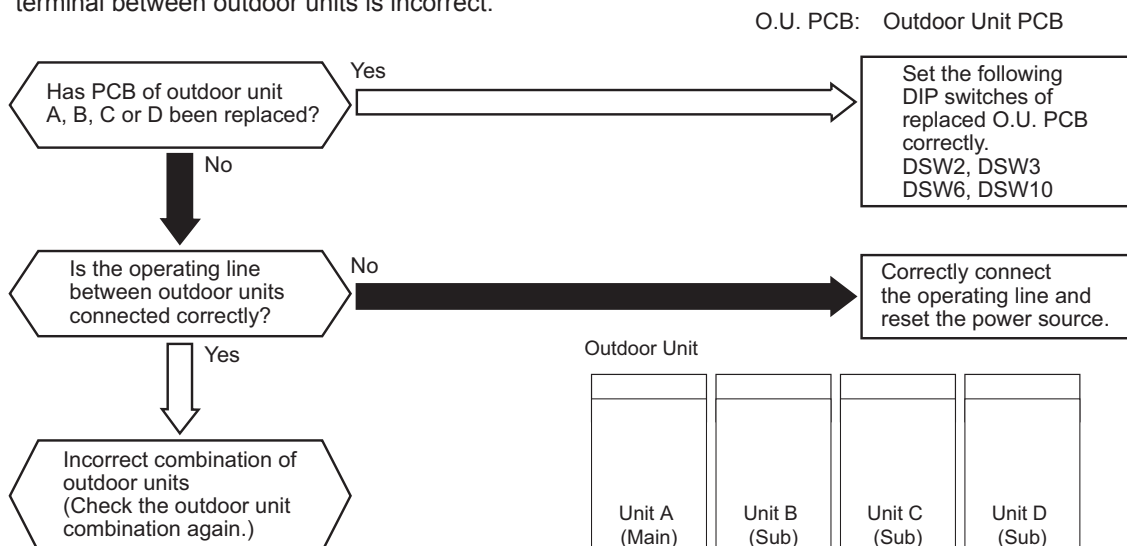
Alarm Code	3A	Abnormality of Outdoor Unit Capacity
------------	----	--------------------------------------

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
 - *1) Except for some models.
- ★ This alarm code is indicated when the total capacity of the outdoor unit connected to the communication terminal between outdoor units exceeds 360 MBH.



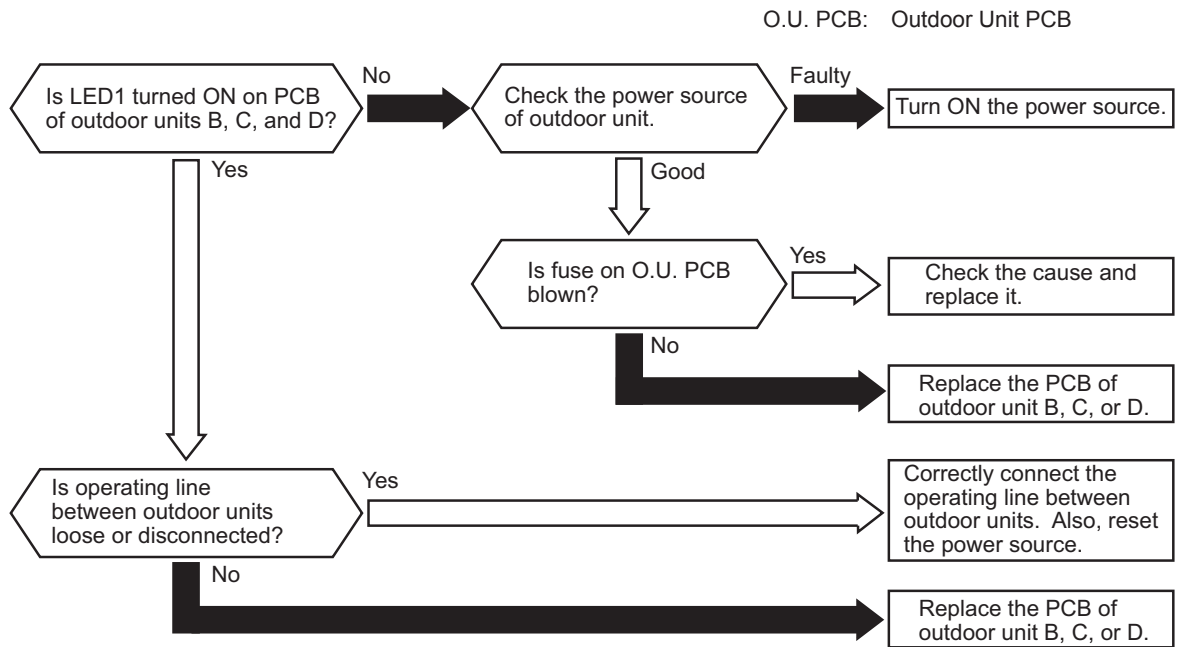
Alarm Code	3B	Incorrect Setting of Outdoor Unit Model Combination or Voltage
------------	----	--

- The RUN indicator (Red) flashes.
 - The indoor unit number (Refrigerant System No. - Address No.), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on LCD, and the indoor unit number and the alarm code are displayed on the 7-segment of outdoor unit PCB.
 - *1) Except for some models.
- ★ This alarm code is displayed when the model setting for outdoor unit connected to the communication terminal between outdoor units is incorrect.



Alarm Code	3d	Communication Failure between Main Unit and Sub Unit(s)
------------	-----------	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.
- ★ For combination of outdoor units, this alarm code is displayed when the communication to outdoor Unit B, C, or D is NOT provided for 30 seconds.
(Alarm code “31” will be displayed when communication to all the outdoor units connected to the communication terminals between outdoor units is NOT provided.)



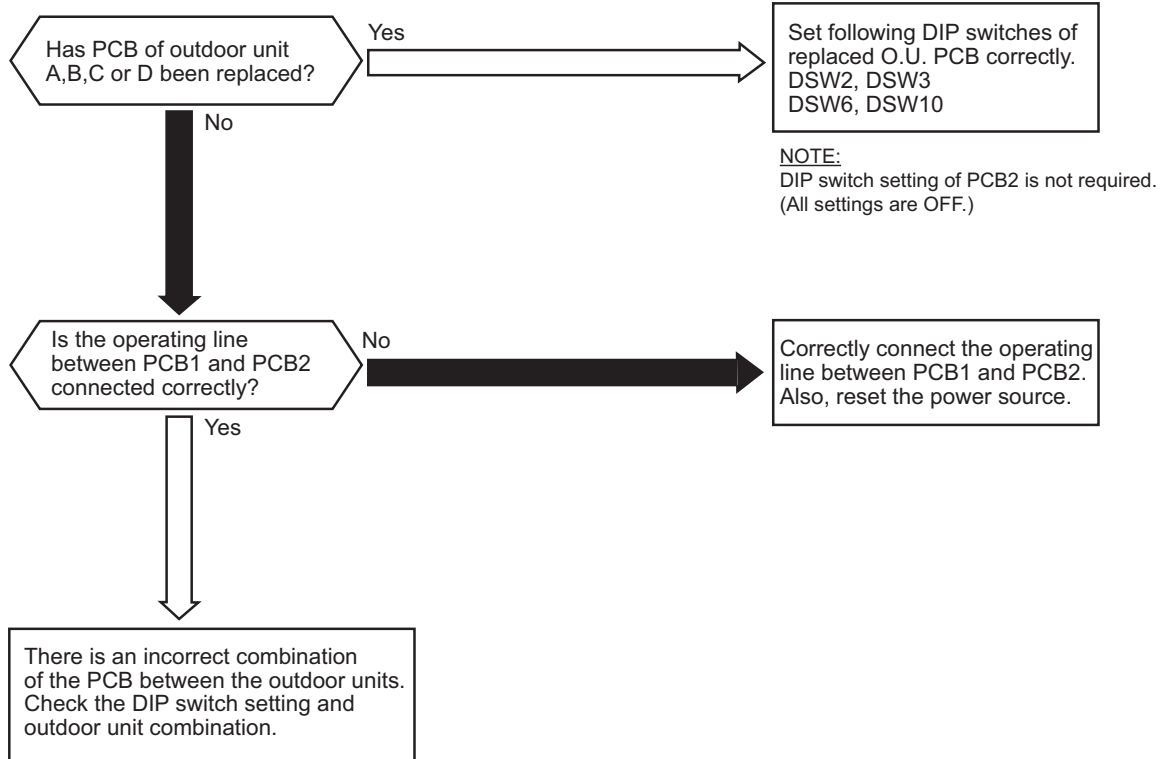
Outdoor Unit

Unit A (Main)	Unit B (Sub)	Unit C (Sub)	Unit D (Sub)

TROUBLESHOOTING

Alarm Code	3E	Abnormality of Inverter PCBs Combination of Outdoor Unit
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- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address*¹), the alarm code, the model code*¹, the model name*¹) and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.
- ★ This alarm code is indicated when an incorrect model code setting of the outdoor unit is connected to the terminals between the outdoor units' communication terminal (TB2 No. 3 and 4 terminals on the PCB1 for the outdoor unit combination)..

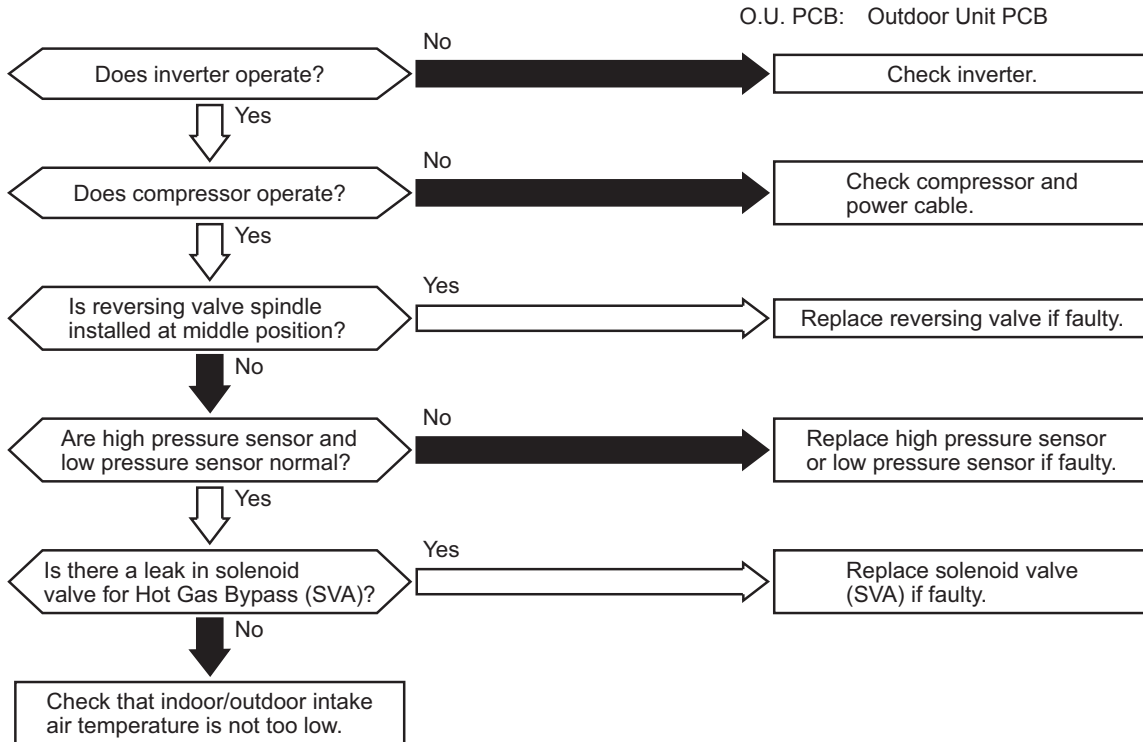


Alarm Code 43	Activation of Low Compression Ratio Protection Device
----------------------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ This alarm code is displayed when the following condition occurs more than twice in an hour.

Compression ratio $\varepsilon = \{(Pd + 14.5 \text{ psi (0.1 MPa)}) / (Ps + (8.7 \text{ psi (0.06 MPa)}))\}$, calculated from a discharge pressure (Pd) and suction pressure (Ps) is lower than 1.8.



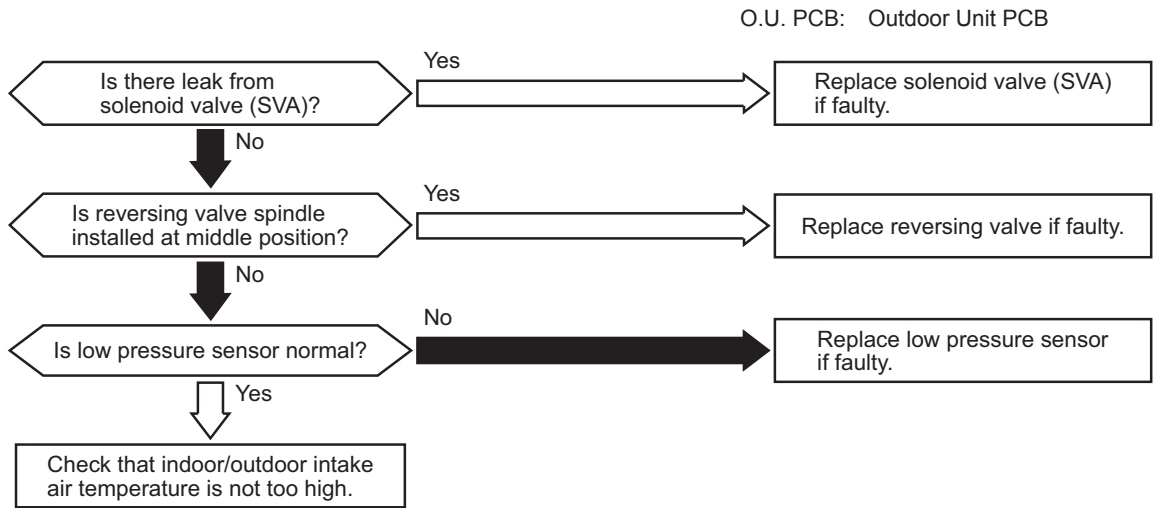
Event	Cause	Check Item	Action (Turn OFF Main Switch)
Excessively Decrease Low Compression Ratio	Inverter is not functioning.	Check inverter.	Repair faulty part.
	Compressor is not operating.	Check compressor.	Replace comp. if faulty.
	Valve Stoppage at Middle Position of Reversing Valve	Measure suction pipe temp. of reversing valve.	Replace reversing valve if faulty.
	Abnormality of High or Low Pressure Sensor	Check connector for O.U. PCB, power source and pressure indication.	Replace sensor if faulty.
	Excessively Low Indoor Intake Air Temperature	Check indoor unit and outdoor unit air temp. thermistor.	Replace thermistor if faulty.
	Leakage from Solenoid Valve (SVA)	Check Solenoid Valve.	Replace SVA if there is leakage.

TROUBLESHOOTING

Alarm Code	44	Activation of Low Pressure Increase Protection Device
------------	----	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ If the suction pressure (Ps) of the compressor is more than 203 psi (1.4 MPa) for a minute, all the compressors stop. The operation automatically restarts after three minutes. If this occurs again twice in the next 30 minutes, this alarm code is displayed.

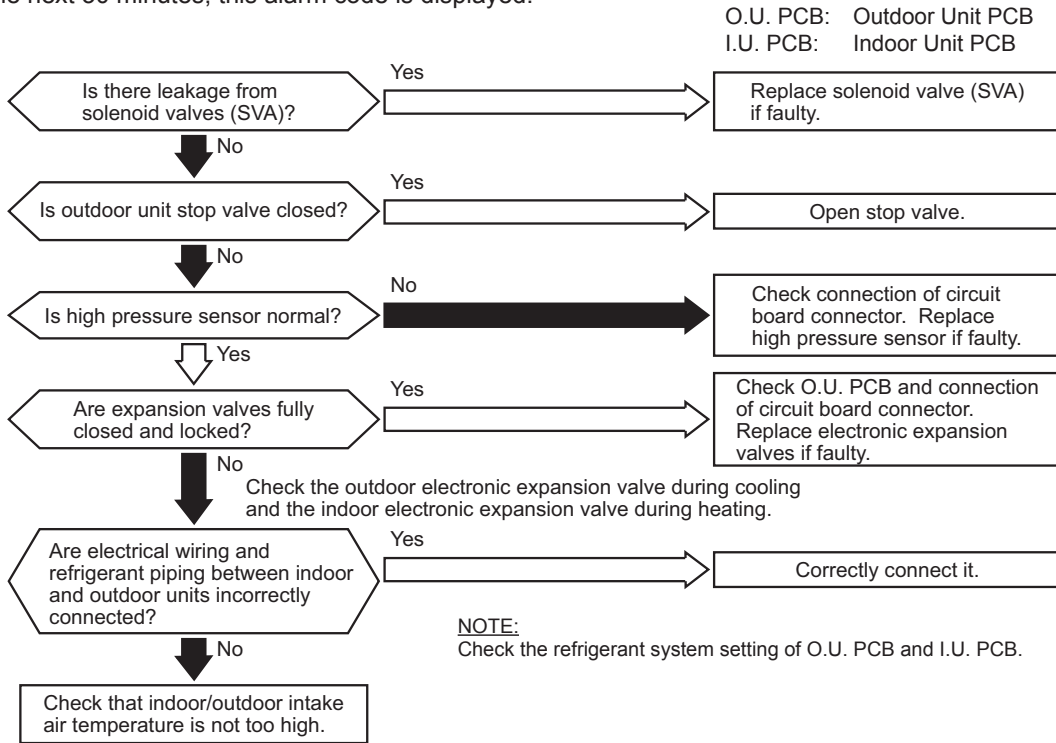


Event	Cause	Check Item	Action (Turn OFF Main Switch)
Excessively Increase Low Suction Pressure	Leakage from Solenoid Valve (SVA)	Check outlet pipe temp. of solenoid valve (SVA).	Check connecting wires. Replace solenoid valve (SVA) if faulty.
	Valve Stoppage at Middle Position of Reversing Valve	Measure suction gas pipe temp. of reversing valve.	Replace reversing valve if faulty.
	Abnormal Suction Pressure Sensor	Check connectors of O.U. PCB and power source.	Replace sensor if faulty.
	Excessively High Indoor Unit and Outdoor Unit Suction Air Temperature	Check indoor unit and outdoor unit suction air temp. thermistor.	Replace thermistor if faulty.

Alarm Code	45	Activation of High Pressure Increase Protection Device
------------	-----------	---

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ If the discharge pressure (Pd) of the compressor is more than 551 psi (3.8 MPa) for a minute, all the compressors stop. The operation automatically restarts after three minutes. If this occurs again twice in the next 30 minutes, this alarm code is displayed.



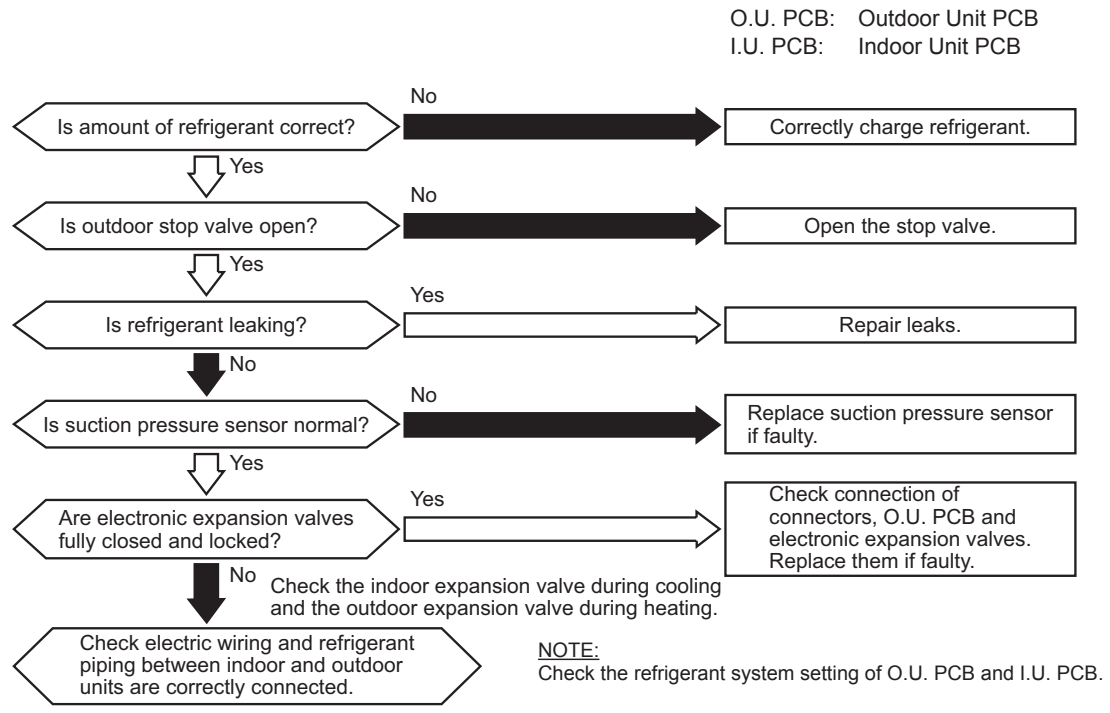
NOTE:
Check the refrigerant system setting of O.U. PCB and I.U. PCB.

Event	Cause	Check Item	Action (Turn OFF Main Switch)
Excessively High Discharge Pressure	Leakage from Solenoid Valve (SVA)	Check outlet temp. of solenoid valve (SVA).	Check connection. Replace solenoid valve (SVA) if faulty.
	Closed Stop Valve	Check stop valve.	Open stop valve.
	Abnormal High Pressure Sensor	Check connectors for O.U. PCB.	Replace pressure sensor if faulty.
	Excessively High Indoor Unit and Outdoor Unit Inlet Air Temp.	Check thermistor for indoor unit and outdoor unit inlet air temp.	Replace thermistor if faulty.
	Incorrect Connection between Indoor Unit and Outdoor Unit	Check electrical system and ref. cycle.	Correctly connect them.
	Locked Expansion Valve (Fully Closed)	Check connector for O.U. PCB.	Repair connector for O.U. PCB or expansion valve. Replace it if faulty.
Stoppage of Indoor Fan <Wall Mounted Only>	Blown Fuses	Check continuity of fuses.	Replace fuses.
	Faulty I.U. PCB	Replace I.U. PCB and check operation.	Replace I.U. PCB if faulty.

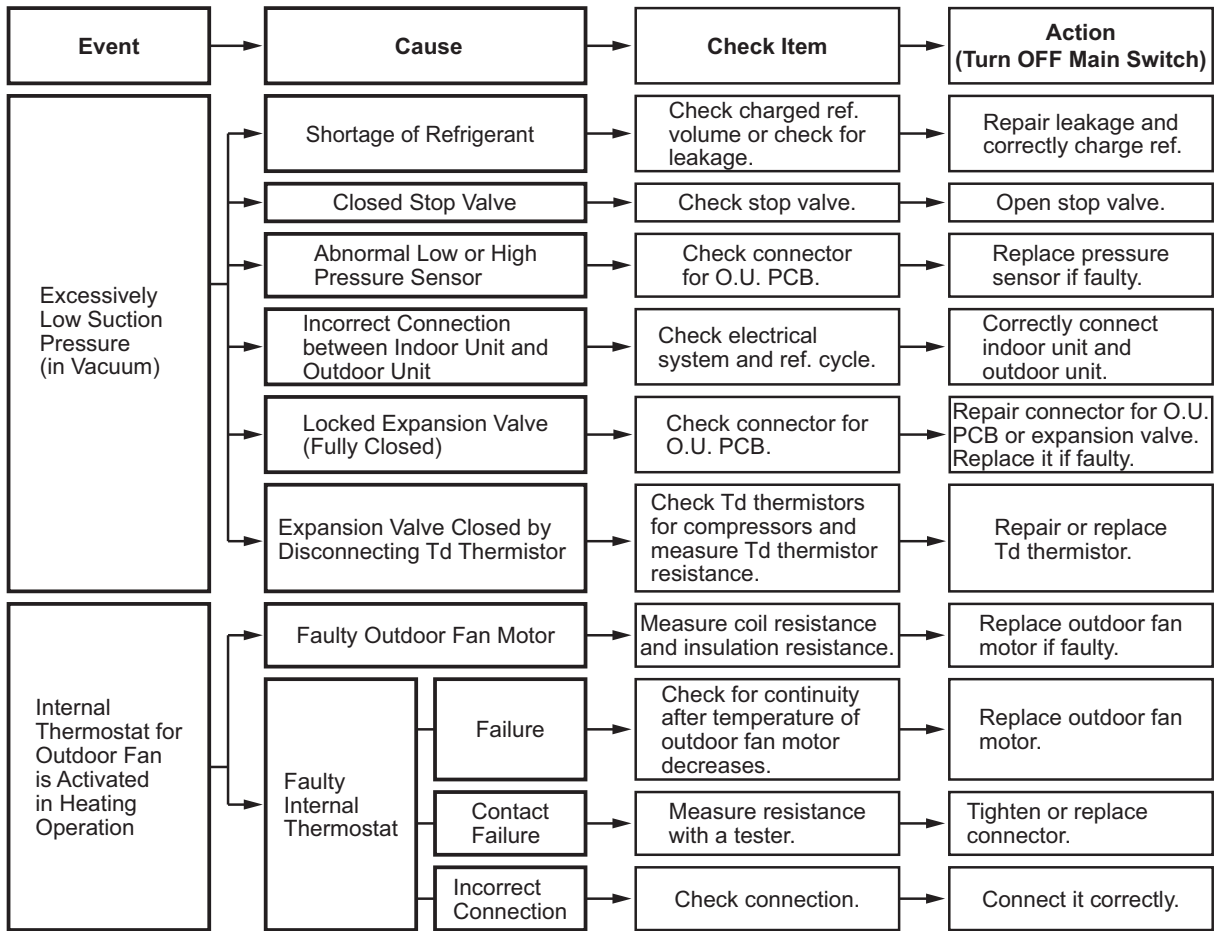
TROUBLESHOOTING

Alarm Code	47	Activation of Low Pressure Decrease Protection Device (Vacuum Operation Protection)
------------	-----------	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.
- ★ If the suction pressure (Ps) of the compressor is less than 13 psi (0.09 MPa) for 12 minutes, the compressor stops. If this occurs again twice in the next 60 minutes, this alarm code is displayed.



TROUBLESHOOTING



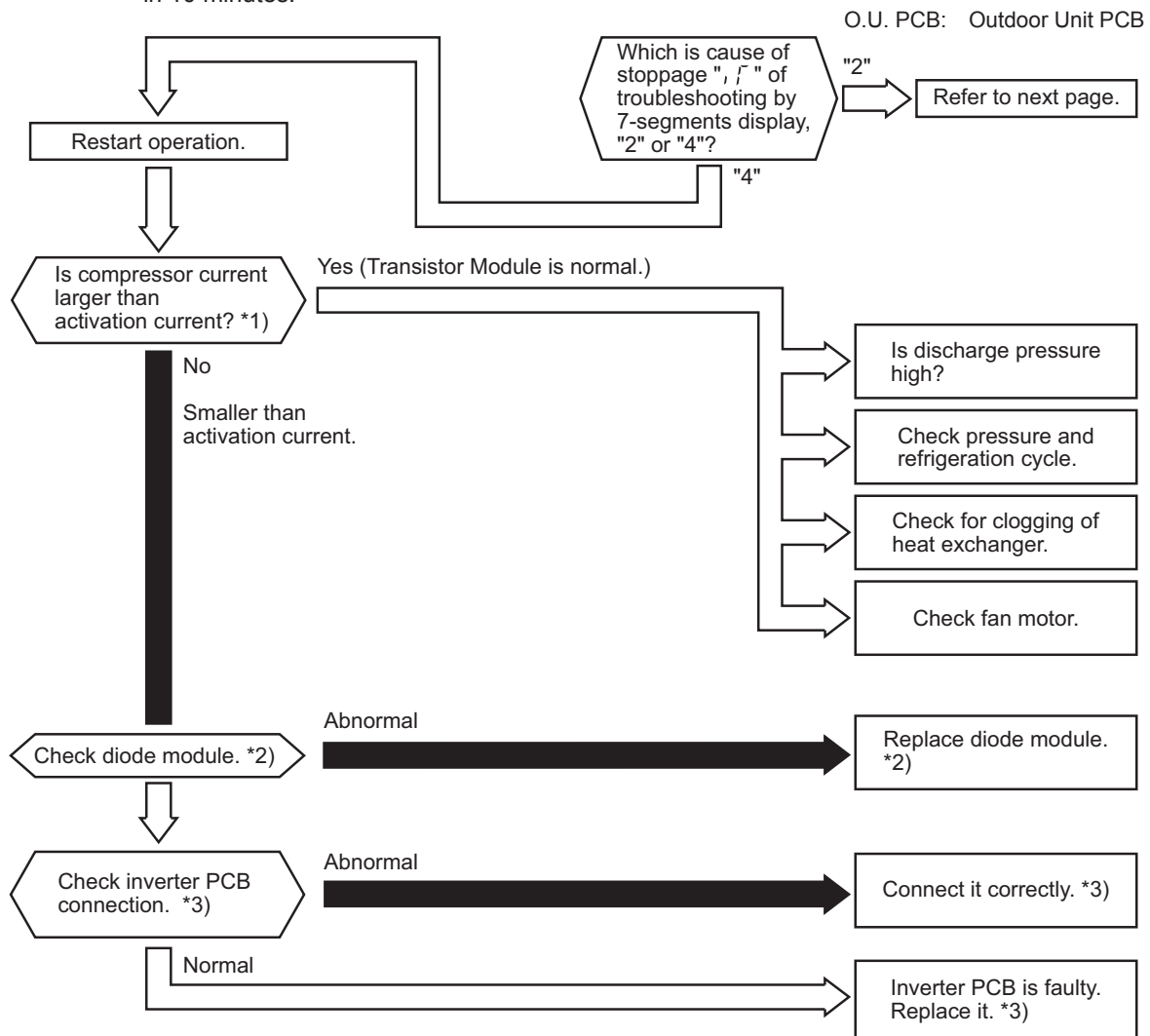
Alarm Code	48	Activation of Inverter Overcurrent Protection Device (1)
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- The RUN indicator (red) flashes.
- The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB. Check the inverter stoppage code when this alarm code is displayed.
*1) Except for some models.

★ This alarm code is displayed when the inverter electronic thermal protection is activated six times within 30 minutes. If this occurs less than six times in 30 minutes, the operation is automatically retried.

Conditions of Activation:

- (1) Inverter current with 105% of the rated current runs for 30 seconds continuously.
- (2) Inverter current runs intermittently and the accumulated time reaches up to three minutes, in 10 minutes.



*1): Regarding the setting value of activation current, refer to Section 4.3.1.1.
 *2): Regarding replacing or checking diode module, refer to Section 4.3.1.1.
 *3): Regarding replacing or checking method for inverter parts, refer to Section 4.3.1.1.

Inverter Stoppage Code

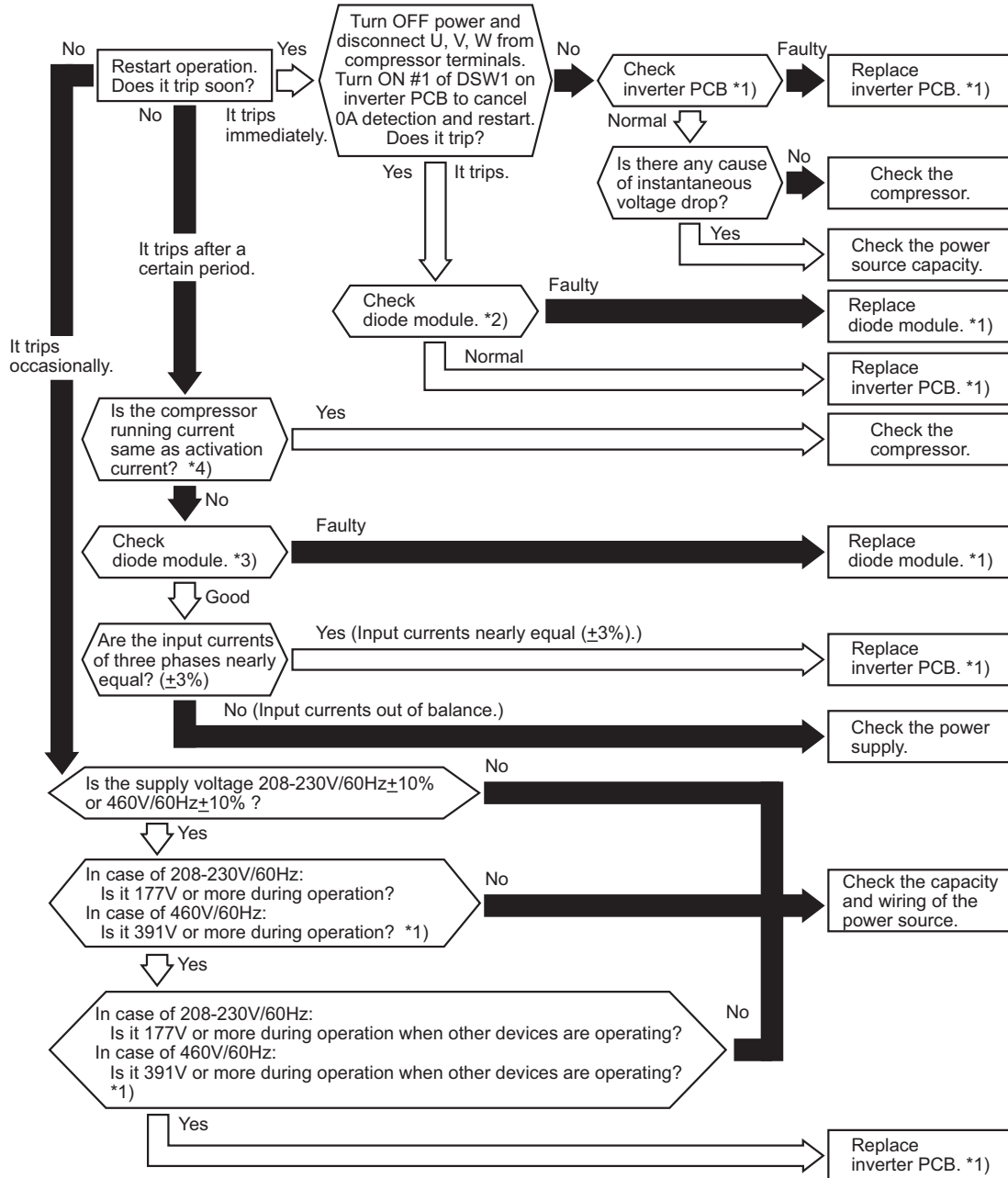
itc	Cause of Inverter Stoppage
2	Instantaneous Overcurrent
4	Inverter Overcurrent

Alarm Code	48	Activation of Inverter Overcurrent Protection Device (2)
------------	----	--

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ This alarm code is displayed when instantaneous overcurrent occurs six times within 30 minutes. If this occurs less than six times in 30 minutes, the operation automatically restarts.

Conditions of Activation: Inverter current with 150% of the rated current



*1): For the maintenance and replacement of inverter PCB, perform the high voltage discharge work according to Section 4.3.1.1.

*2): Refer to Section 4.3.1.1 for details of checking procedures of transistor module.

*3): Refer to Section 4.3.1.1 for details of checking procedures of diode module.

*4): Regarding the setting value of activation current, refer to Section 4.3.1.1.

TROUBLESHOOTING

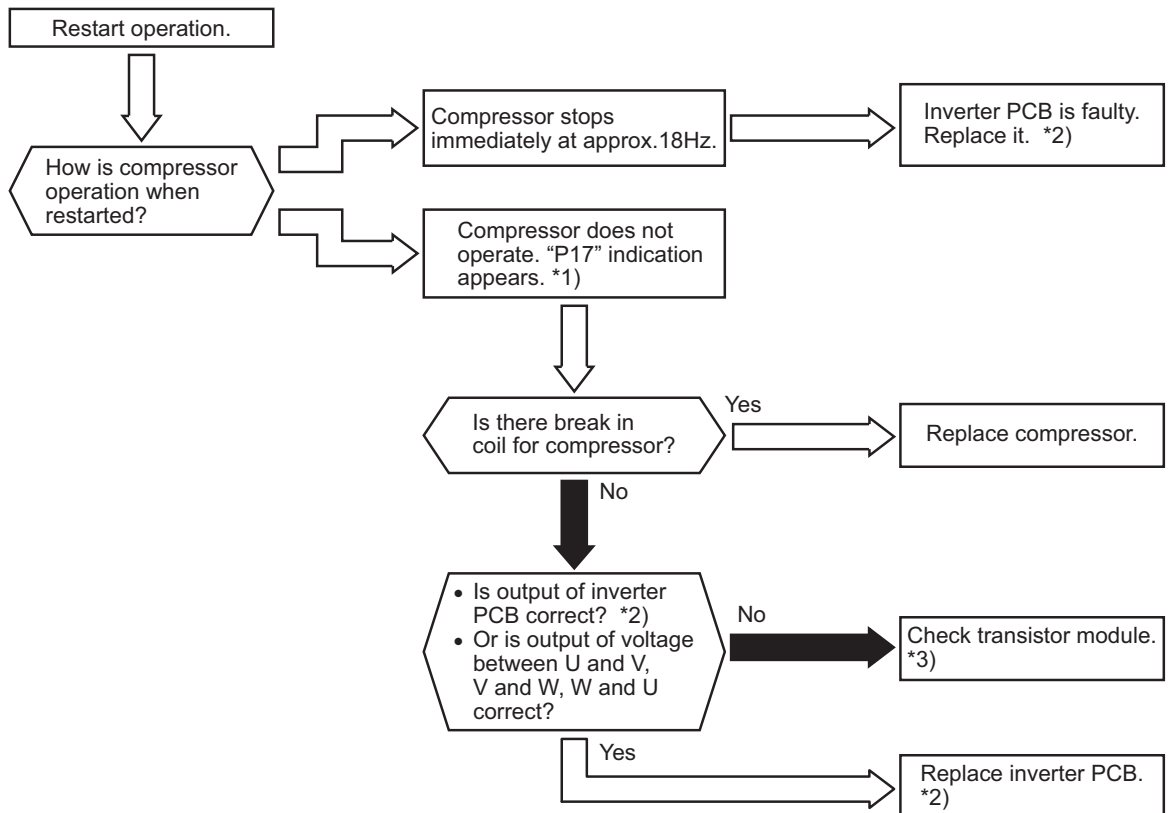
Alarm Code	51	Abnormality of Current Sensor
------------	----	-------------------------------

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ In an instance where abnormal current sensor (0A detecting) occurs three times within 30 minutes, this alarm code is displayed. If this occurs less than three times in 30 minutes, the operation automatically restarts.

Condition of Activation:

- (1) When the compressor's operating frequency reaches 15 to 18Hz after the compressor starts, the effective value of running current at each phase (U+, U-, V+ and V-) is 1.5A or less.
- (2) The wave height value of running current for the phase positioning is less than 5A before the compressor starts (at the end of the phase positioning).



*1): P17 appears on 7-segment display of the outdoor unit PCB.
 *2): For the maintenance and replacement of inverter PCB, perform the high voltage discharge work according to Section 4.3.1.1.
 *3): Refer to Section 4.3.1.1 for details of checking procedures of transistor module.

Inverter Stoppage Code

itc	Cause of Inverter Stoppage
8	Abnormal Current Sensor

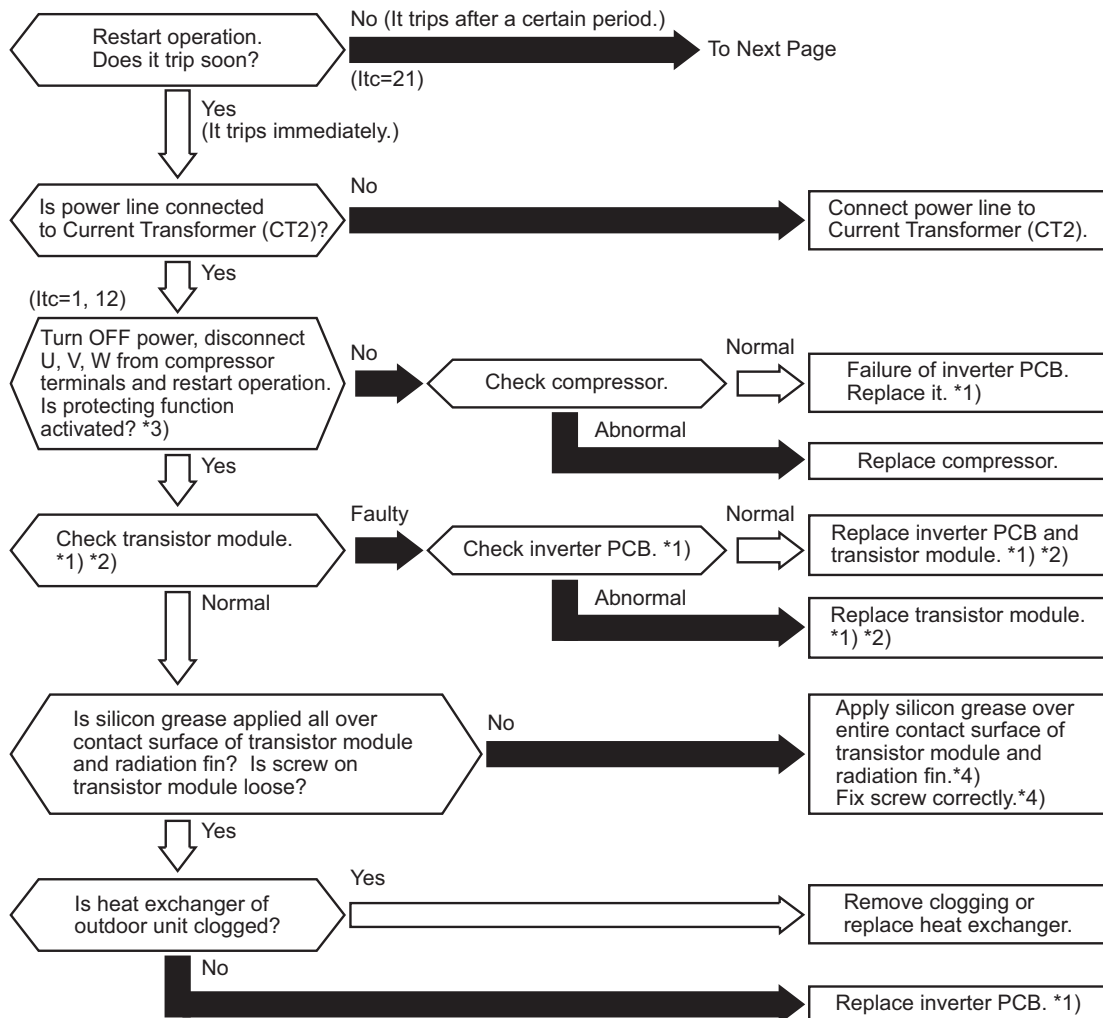
Alarm Code	53	Inverter Error Signal Detection
------------	----	---------------------------------

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ IPM (Transistor Module) of the inverter PCB has the abnormality detection function. This alarm is displayed when any of the following conditions is met seven times in 30 minutes. If this occurs less than seven times in 30 minutes, the operation automatically restarts.

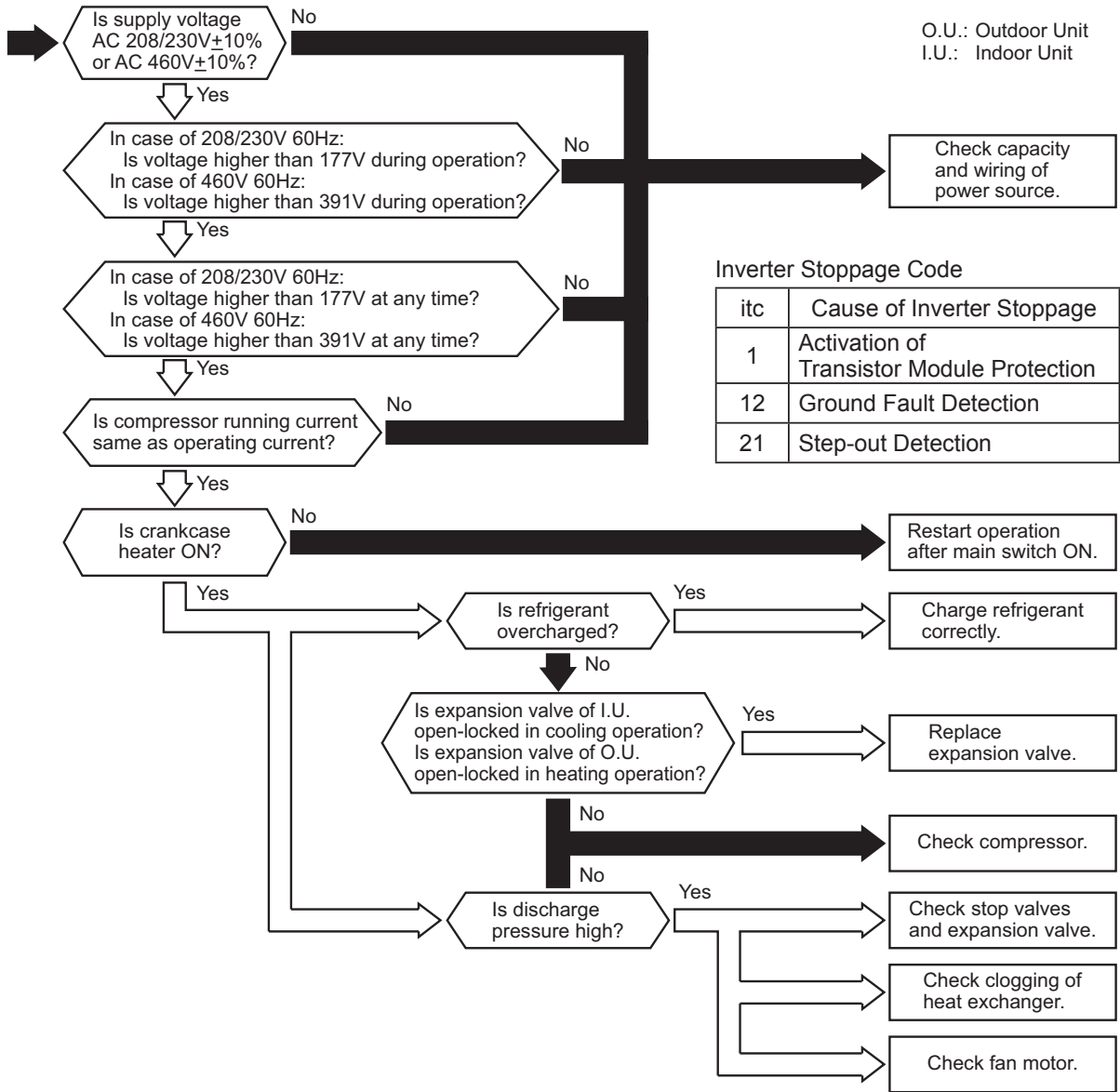
Condition of Activation:

- (1) An abnormal current is applied to the transistor module due to a short circuit, a ground fault or overcurrent.
- (2) The temperature at transistor module increases abnormally.
- (3) The control voltage decreases.



References to *1), *2), *3) and *4) here are on the next page.

TROUBLESHOOTING



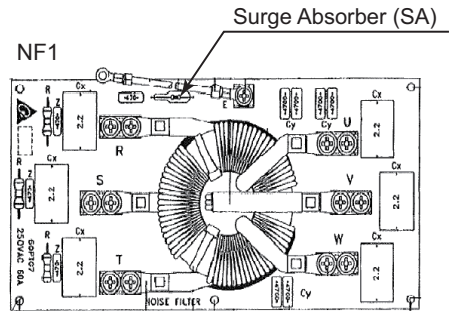
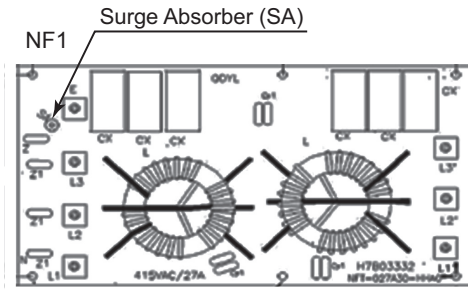
These references are from previous page:

- *1): For the maintenance and replacement of the inverter PCB, perform the high voltage discharge work according to Section 4.3.1.1.
- *2): Refer to Section 4.3.1.1 for details of checking procedures of transistor module.
- *3): Turn ON the No.1 switch of DSW1 on the inverter PCB when restarting the operation with the terminals of the compressor disconnected. After troubleshooting, turn OFF the No.1 switch of DSW1 on inverter PCB.
- *4): Use the silicon grease provided as an accessory (Service Parts No.: P22760).

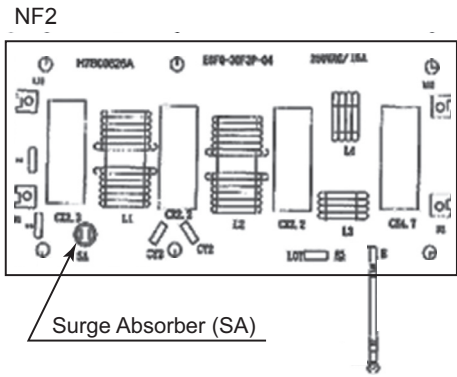
NOTE:

When an excessive surge current is applied to the unit due to lightning or other causes, this alarm code "53" or the inverter stoppage code (IT) "11" will be indicated and the unit cannot be operated. In this case, check the surge absorber/surge arrester (SA) on the noise filter (NF1, NF2). The surge absorber may be damaged if the inner surface of the surge absorber is black. In that case, replace the surge absorber. If the inside of the surge absorber is normal, turn OFF the power once and wait for LED201 on the inverter PCB (red) OFF (approximately five minutes) and turn it ON again.

< Position of Surge Absorber >



(208/230V)

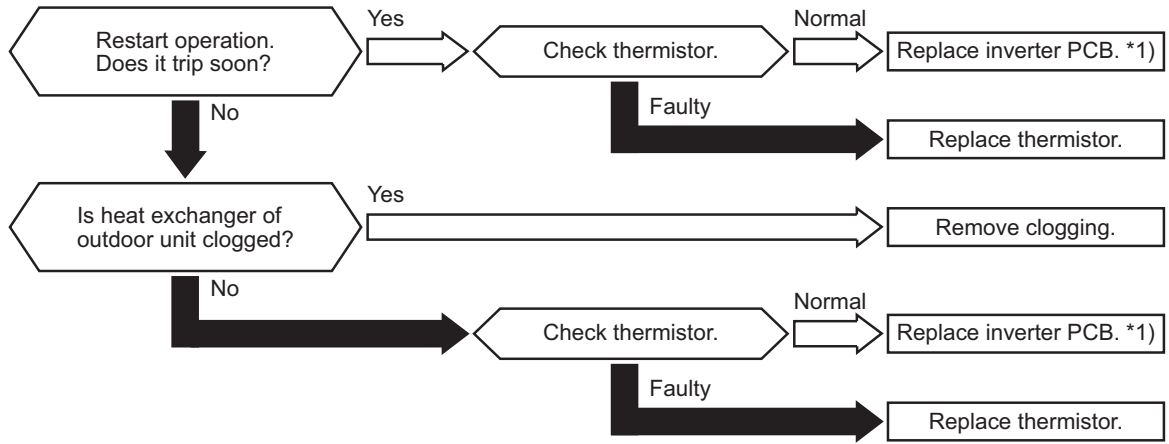


(460V)

TROUBLESHOOTING

Alarm Code	54	Abnormal Inverter Fin Temperature
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- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB..
- *1) Except for some models.
- ★ If the temperature of the radiation fin thermistor exceeds 194°F (90°C) three times in 30 minutes, this alarm code is displayed. If this occurs less than three times in 30 minutes, the operation is automatically retried.



*1): For the maintenance and replacement of inverter PCB, perform the high voltage discharge work according to Section 4.3.1.1.

Inverter Stoppage Code

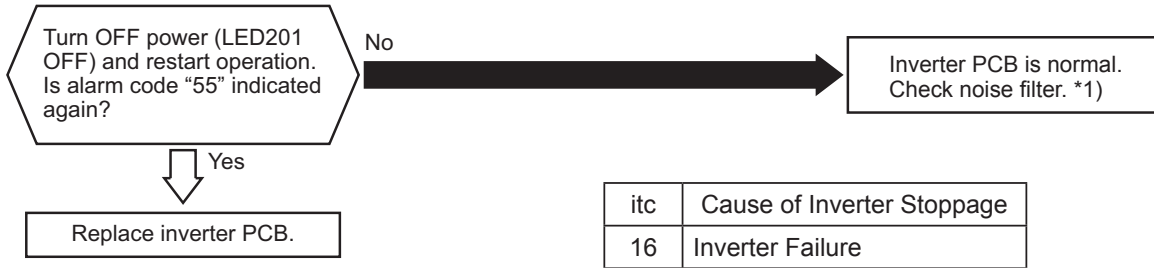
itc	Cause of Inverter Stoppage
3	Abnormal Inverter Fin Temperature

Alarm Code	55	Inverter Failure
------------	----	------------------

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ An abnormality is detected when the actual frequency from the inverter PCB is less than 10Hz after the inverter frequency is output from the outdoor unit PCB to the inverter PCB. This alarm code is displayed when this occurs three times in 30 minutes. If it occurs less than three times in 30 minutes, the operation is automatically retried.

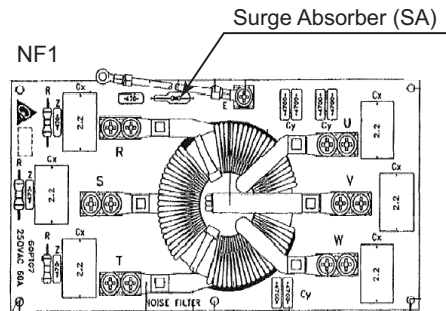
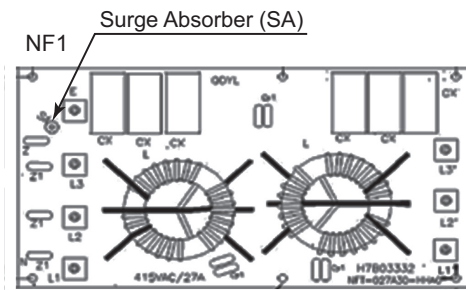
Conditions of Activation: Inverter PCB does not operate normally.



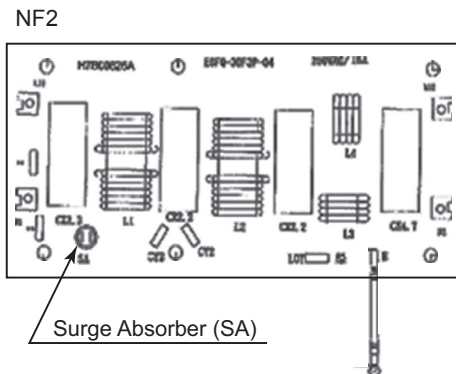
itc	Cause of Inverter Stoppage
16	Inverter Failure

*1): When an excessive surge current is applied to the unit due to lightning or other causes, this alarm code "55" or the inverter stoppage code (IT) "11" will be indicated and the unit cannot be operated. In this case, check the surge absorber/surge arrester (SA) on the noise filter (NF1, NF2). The surge absorber may be damaged if the inner surface of the surge absorber is black. In that case, replace the surge absorber. If the inside of the surge absorber is normal, turn OFF the power once and wait for LED201 on the inverter PCB (red) OFF (approximately five minutes) and turn it ON again.

< Position of Surge Absorber >



(208/230V)



(460V)

TROUBLESHOOTING

Alarm Code	57	Activation of Fan Controller Protection
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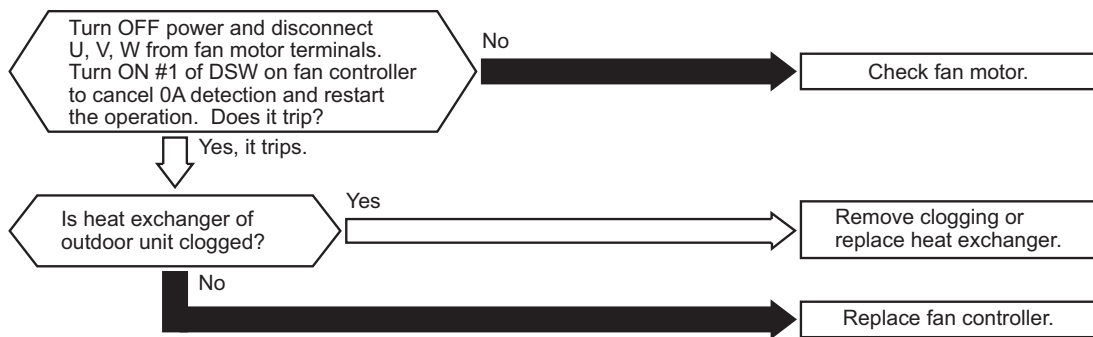
- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ IPM (Transistor Module) has abnormality-detecting function.

This alarm code is displayed when the abnormality is detected 10 times within 30 minutes. If this occurs less than 10 times in 30 minutes, the operation automatically restarts.

Condition of Activation:

- (1) The abnormal current such as a short-circuit current, a ground-fault current or the overcurrent occurs at the transistor module.
- (2) The control voltage decreases.

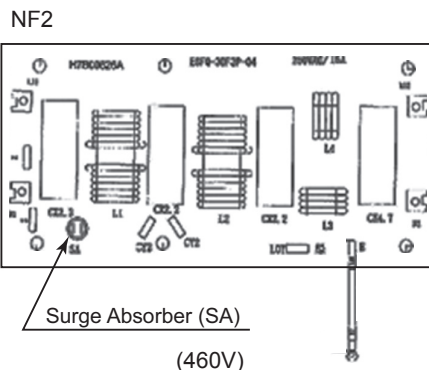
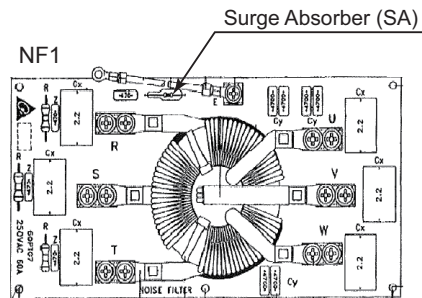
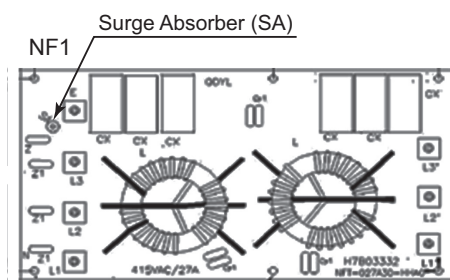


NOTE:

When an excessive surge current is applied to the unit due to lightning or other causes, this alarm code "57" or the inverter stoppage code (IT) "11" will be indicated and the unit cannot be operated. In this case, check to ensure the surge absorber/surge arrester (SA) on the noise filter (NF1, NF2). The surge absorber may be damaged if the inner surface of the surge absorber is black. In that case, replace the surge absorber.

If the inside of the surge absorber is normal, turn OFF the power once and wait for LED201 on the inverter PCB (red) OFF (approximately five minutes) and turn it ON again.

< Position of Surge Absorber >



(208/230V)

(460V)

For the maintenance and replacement of the fan controller, perform the high voltage discharge work according to Section 4.3.1.1.

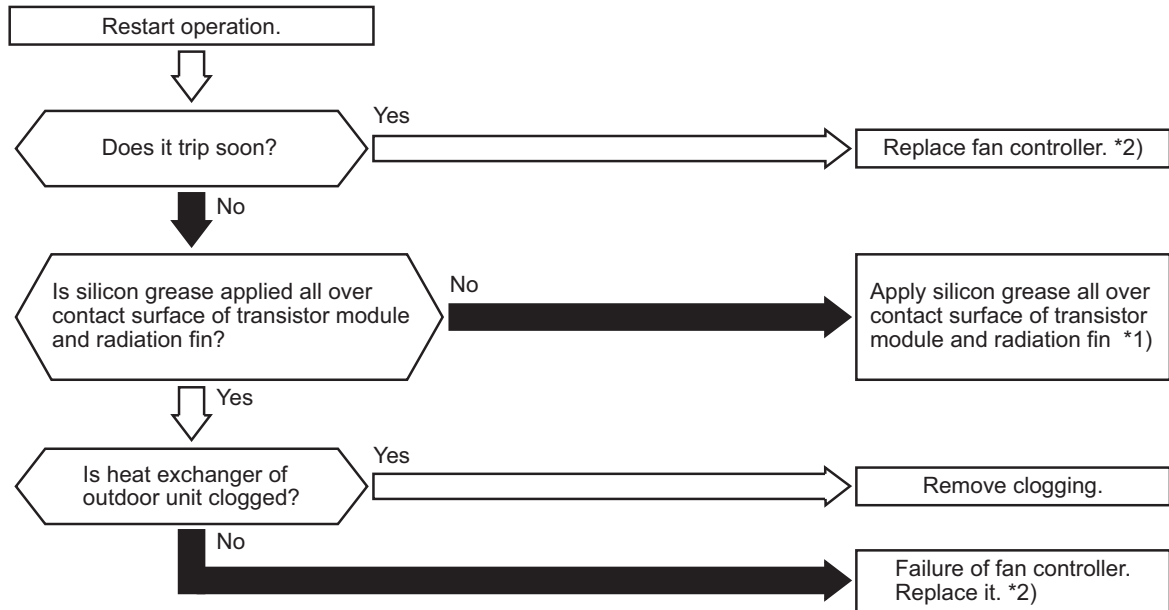
Alarm
Code

5A

Abnormality of Fan Controller Fin Temperature

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

- ★ If the temperature of the thermistor inside the transistor module exceeds 212°F(100°C) 10 times in 30 minutes, the operation stops and this alarm code is displayed. If this occurs less than 10 times in 30 minutes, the operation automatically restarts.



*1): Use the silicon grease provided as an accessory (Service Parts No.: P22760).

*2): For the maintenance and replacement of the fan controller, perform the high voltage discharge work according to Section 4.3.1.1.

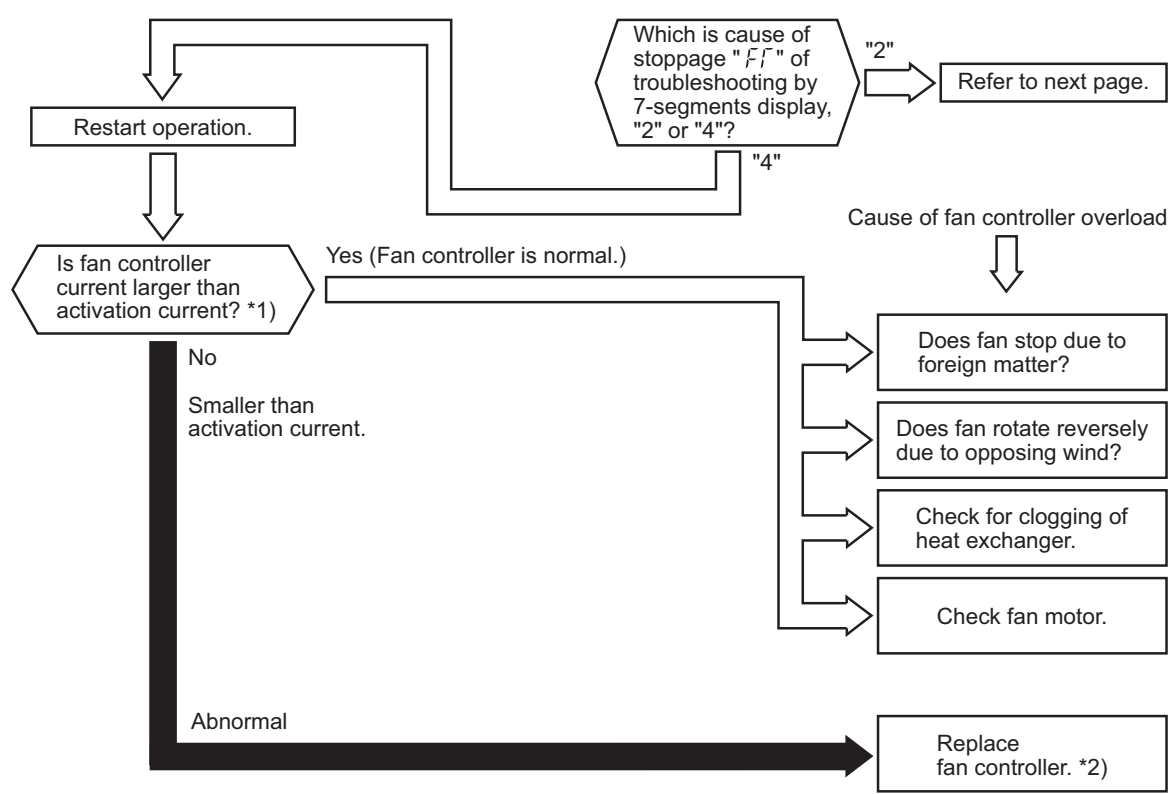
Alarm Code	56	Activation of Fan Controller Overcurrent Protection Device (1)
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- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ This alarm code is displayed when the fan controller electronic thermal protection is activated 10 times within 30 minutes. If this occurs less than 10 times in 30 minutes, the operation automatically restarts.

Conditions of Activation:

- (1) Electric current with 105% of the rated current runs for 30 seconds continuously.
- (2) Electric current runs intermittently and the accumulated time reaches up to three minutes, in 10 minutes.



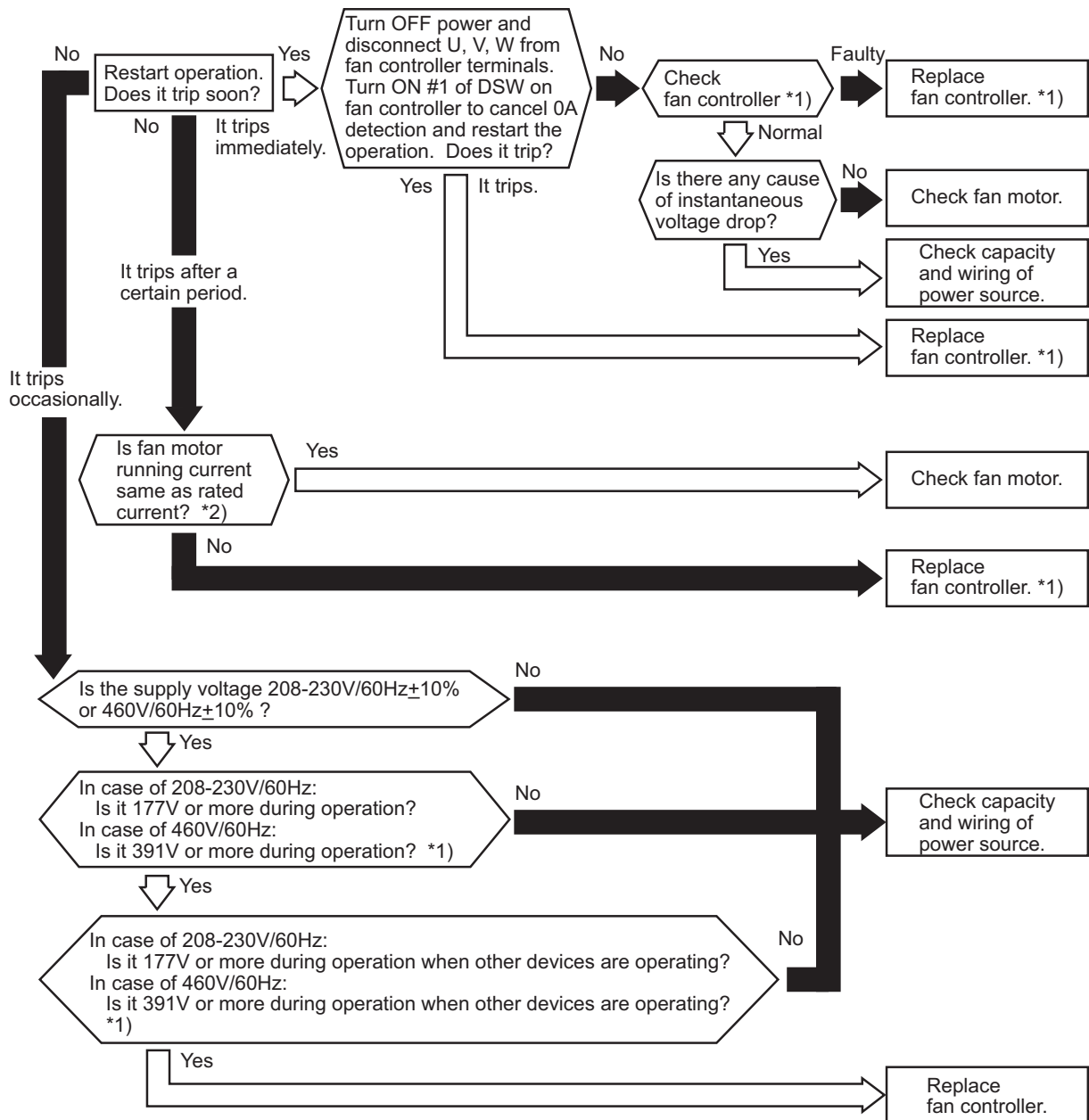
*1): Regarding the setting value of activation current, refer to Section 4.3.1.1.
 *2): For the maintenance and replacement of fan controller, perform the high voltage discharge work according to Section 4.3.1.1.

Alarm Code 56	Activation of Fan Controller Overcurrent Protection Device (2)
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- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ This alarm code is displayed when instantaneous overcurrent occurs 10 times within 30 minutes. If this occurs less than 10 times in 30 minutes, the operation is automatically retried.

Conditions of Activation: The running current exceeds the rated current of the transistor module.



*1): For the maintenance and replacement of a fan controller, perform the high voltage discharge work according to Section 4.3.1.1.

*2): Regarding the setting value of activation current, refer to Section 4.3.1.1.

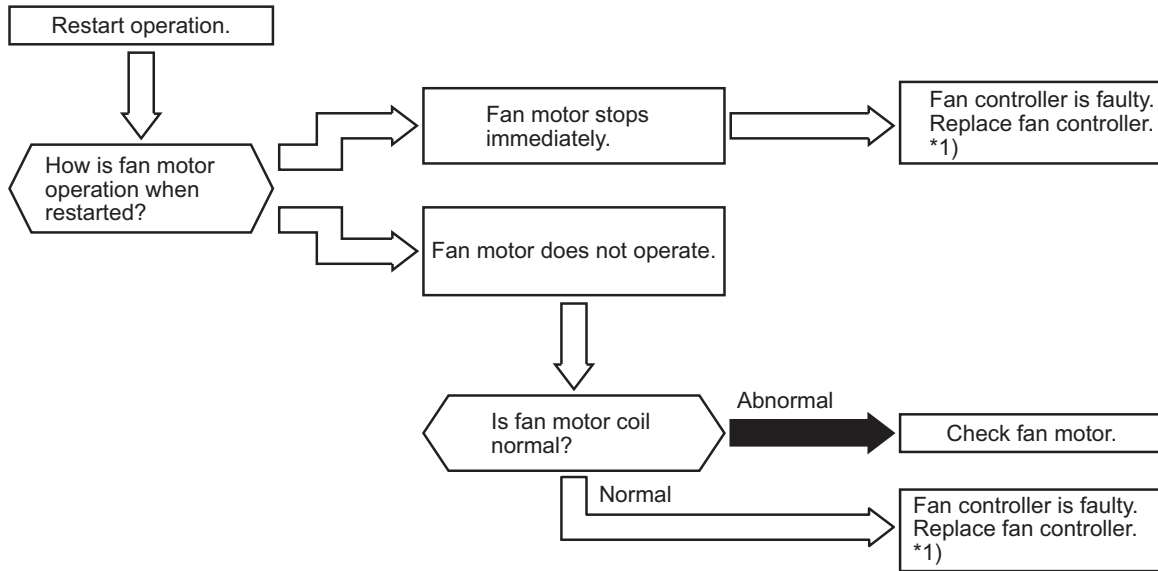
TROUBLESHOOTING

Alarm Code	5E	Abnormality of Fan Controller Sensor
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★ Conditions of Activation:

This alarm code is displayed when the following conditions occur.

- (1) After the fan motor operation is started, the fan controller current does NOT exceed 1.5A.
- (2) Before the fan motor operation is started (at completing the phase positioning), the wave height value of the running current for the phase positioning is less than 4A.



*1): For the maintenance and replacement of the fan controller, perform the high voltage discharge work according to Section 4.3.1.1.

Alarm Code	EE	Compressor Protection
------------	-----------	-----------------------

★ This alarm code is displayed when any of the following alarms causing serious compressor damages occurs three times in six hours. While this alarm is displayed, alarm reset is not possible.

<i>Alarm Code:</i>	<i>Information of Abnormality</i>
02	<i>Activation of Protection Device in Outdoor Unit</i>
07	<i>Decrease in Discharge Gas Superheat</i>
08	<i>Increase in Discharge Gas Temperature</i>
39	<i>Abnormality of Running Current at Fixed Speed Compressor</i>
43	<i>Activation of Low Compression Ratio Protection Device</i>
44	<i>Activation of Low Pressure Increase Protection Device</i>
45	<i>Activation of High Pressure Increase Protection Device</i>
47	<i>Activation of Low Pressure Decrease Protection Device (Vacuum Operation Protection)</i>

These alarms can be checked by the CHECK Mode 1. Follow the action indicated in each alarm chart. These alarms are cleared only by turning OFF the main power switch to the system. **However, great care must be taken before starting, since there is a possibility of causing serious damage to the compressors.**

Alarm
Code

60

Incorrect Setting of Unit Model Code

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.
- ★ This alarm code is displayed in the following condition. Check the unit model code setting (DSW4) of I.U. PCB after turning OFF the power source.

Condition	Action
The unit model code setting (DSW4) is not set (all pins are "OFF"), or is set for the incorrect indoor unit type.	Set DSW4 correctly.

Alarm
Code

61

Incorrect Setting of Unit and Refrigerant Cycle Number

- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.
- ★ This alarm code is displayed in the following condition. Check the settings of the DIP switch (DSW) and the rotary switch (RSW) after turning OFF the power source.

Condition	Action
The unit No. setting (DSW6 and RSW1) or the refrigerant cycle No. setting (DSW5 and RSW2) is set as "64" or more, or more than 2 pins of DSW5 or DSW6 are set.	<p>a) Unit No. Setting / Ref. Cycle No. Setting Starting from "1" (recommended) Set the unit No. and the refrigerant cycle No. from "1" to "63". (Setting No. for the 64th unit shall be "0".)</p> <p>b) Unit No. Setting / Ref. Cycle No. Setting Starting from "0" Set the unit No. and the refrigerant cycle No. from "0" to "63." (Setting No. for the 64th unit shall be "63".)</p>

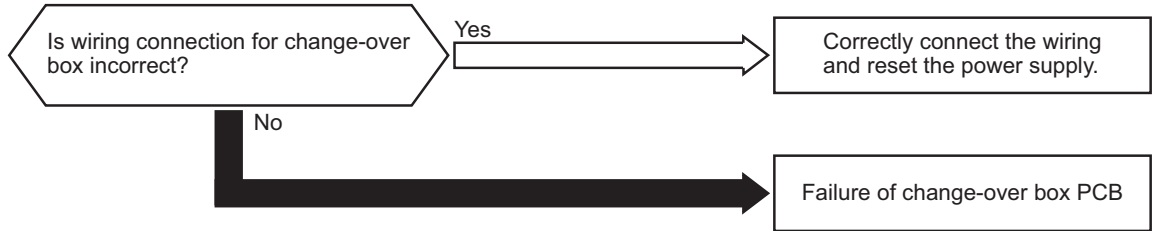
TROUBLESHOOTING

Alarm Code	E1	Incorrect Indoor Unit Connection (Change-Over Box)
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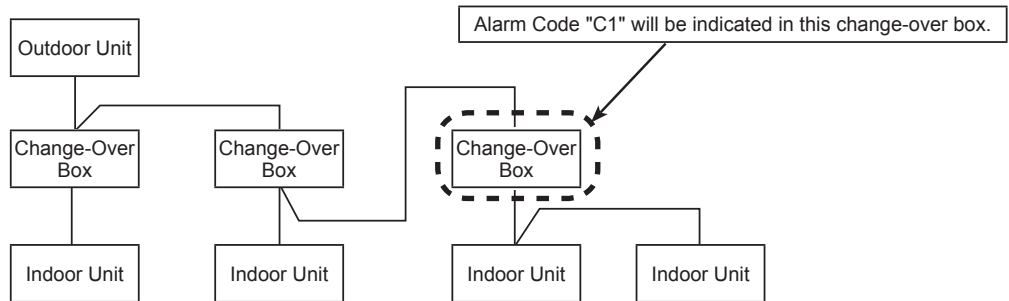
- The RUN indicator (red) flashes.
 - The indoor unit number (refrigerant cycle number - address number), the alarm code, the model code*¹⁾, the model name*¹⁾ and the number of connected indoor units are displayed on the LCD. The indoor unit number and the alarm code are displayed on the 7-segment display of the outdoor unit PCB.
- *1) Except for some models.

★ <Heat Recovery System>

This alarm code is displayed when two or more change-over boxes are connected between outdoor units and indoor units.



- Alarm Code "C1" will be indicated when the units are connected as follows.

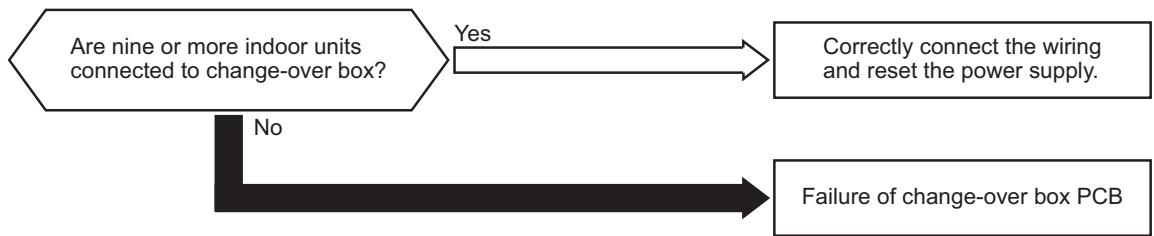


Alarm Code	C2	Incorrect Indoor Unit Connection Number Setting (Change-Over Box)
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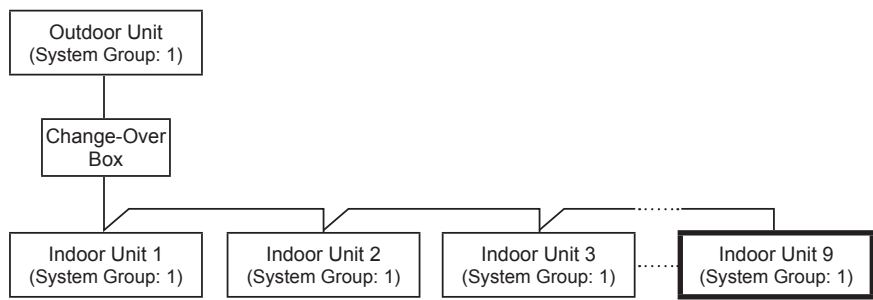
- The indoor unit number, the alarm code ("35"), the unit model code, and the connected number of indoor units are displayed on the LCD of the wired controller which is connected to the indoor unit with an abnormal change-over box .
- LED (LED 4, 5, 6) on the change-over box PCB flashes.

★ <Heat Recovery System>

This alarm code is displayed when nine or more indoor units are connected to a change-over box.



• Alarm Code "C2" will be indicated when the units are connected as follows.



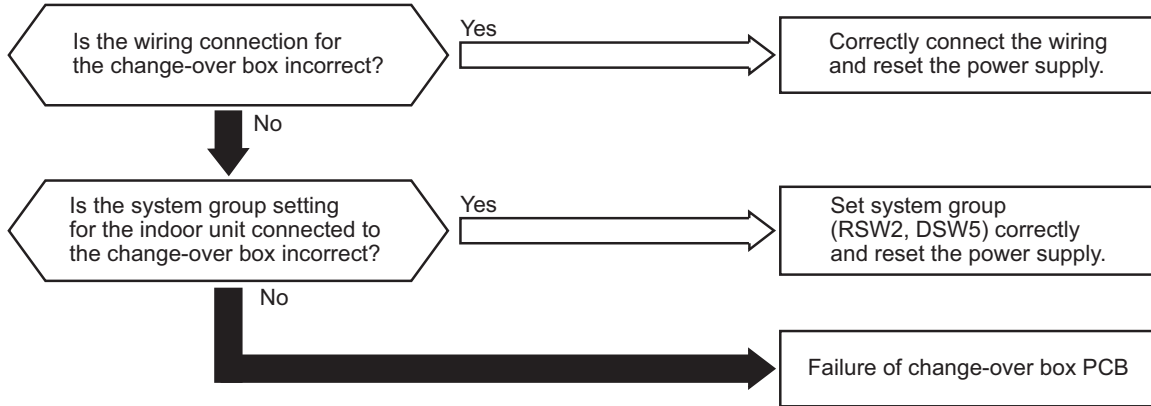
TROUBLESHOOTING

Alarm Code	C3	Incorrect Indoor Unit Connection (Change-Over Box)
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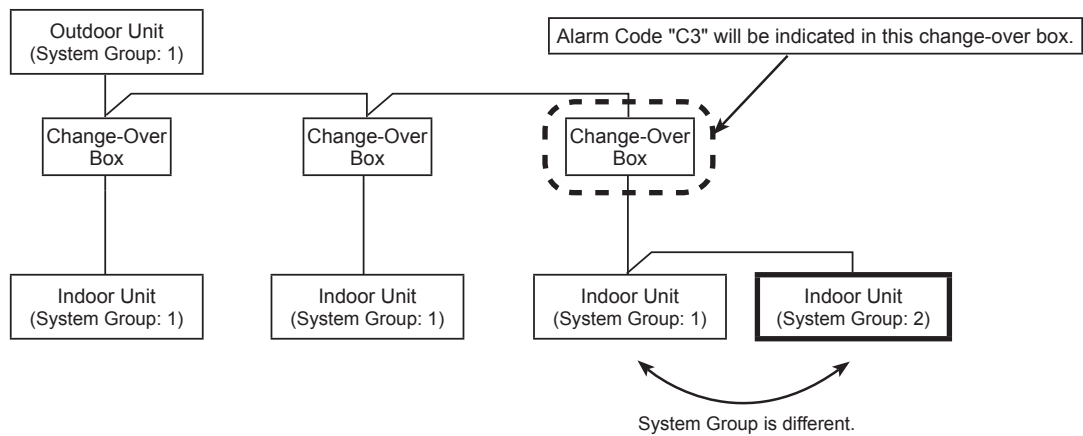
- The indoor unit number, the alarm code ("35"), the unit model code, and the connected number of indoor units are displayed on the LCD of the wired controller which is connected to the indoor unit with an abnormal change-over box .
- LED (LED 5, 6) on the change-over box PCB flashes.

★ <Heat Recovery System>

This alarm code is displayed when indoor units with different system groups are connected to the change-over box.



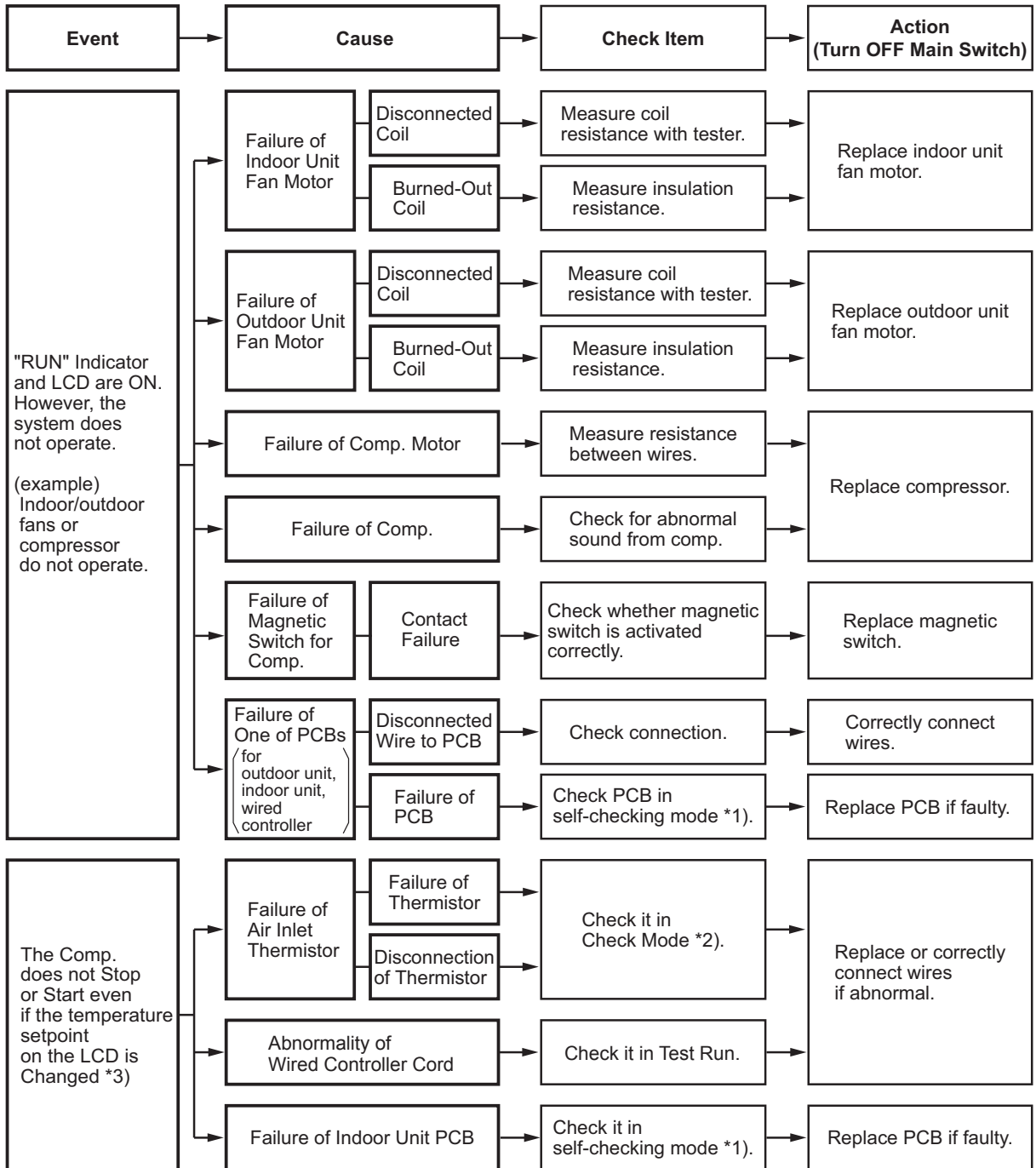
• Alarm Code "C3" will be indicated when the units are connected as follows.



3.2.3 Abnormalities of Devices

Other Abnormalities	Abnormalities of Devices
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If there is no abnormality (Alarm Code) indicated on the wired controller, and normal operation is not available, take necessary action according to the following procedures.



*1): For CIW01, refer to Section 3.1.4 (3).

*2): For CIW01, refer to Section 3.1.4 (2).

*3): Even if controllers are normal, the compressor does not operate under the following conditions.

* Indoor Air Temp. is lower than 69.8°F (21°C) or Outdoor Air Temp. is lower than 23°F (-5°C) during cooling operation.

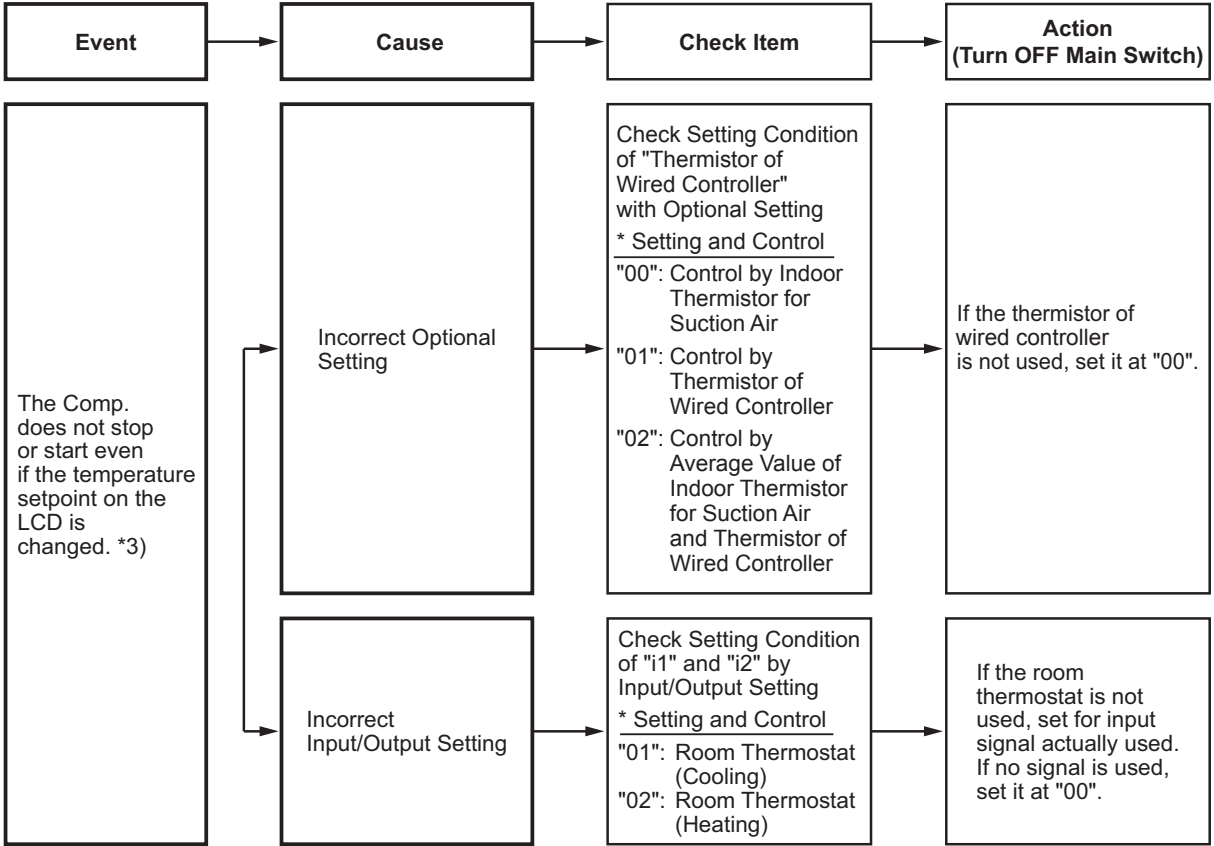
* Indoor Air Temp. is higher than 86°F (30°C) or Outdoor Air Temp. is higher than 73.4°F (23°C) during heating operation.

* When a cooling (or heating) operation signal is given to the outdoor unit and a different operation signal is given to indoor units.

* When demand signal or emergency stop signal is given to outdoor unit.

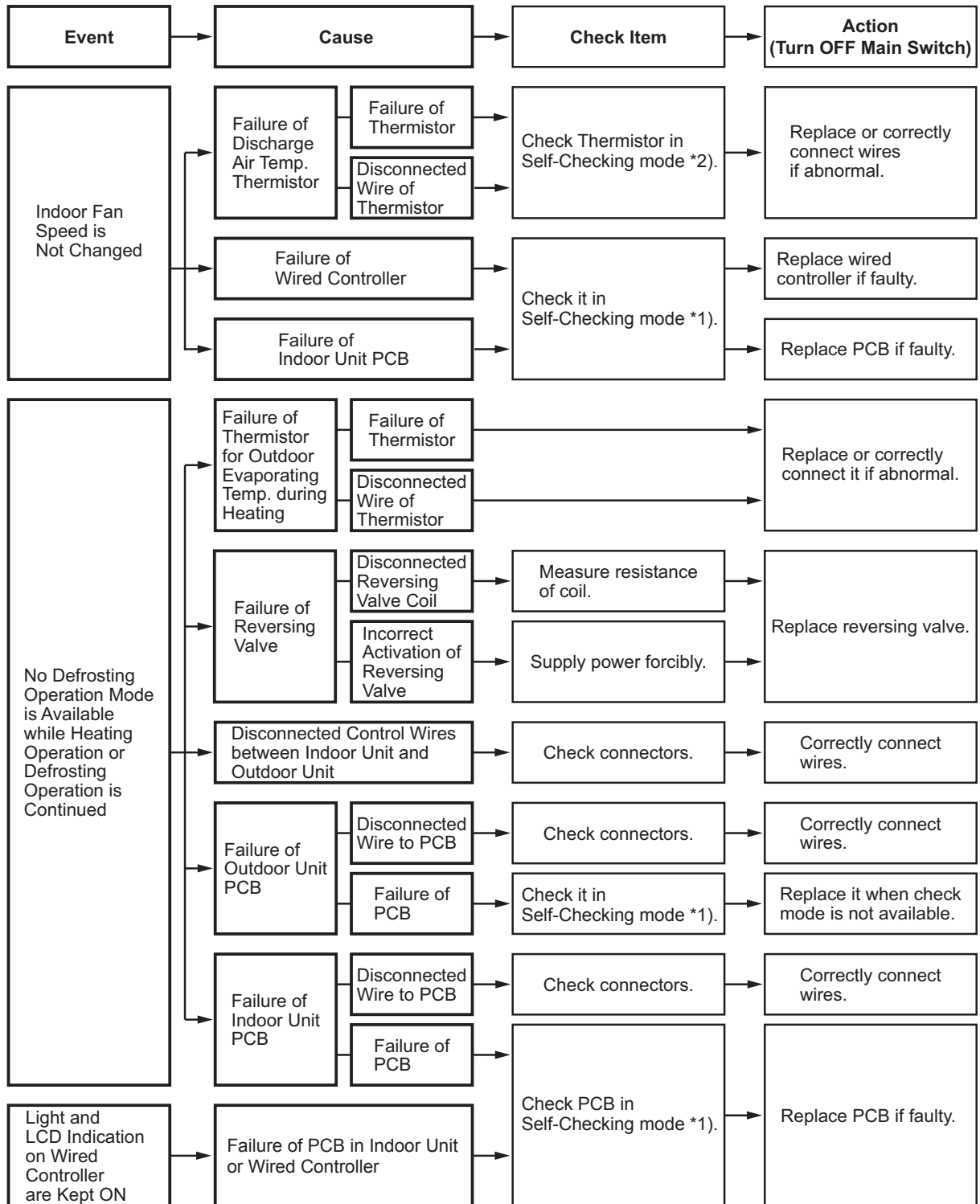
TROUBLESHOOTING

Other Abnormalities	Abnormalities of Devices
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*1): For CIW01, refer to Section 3.1.4 (3).
 *2): For CIW01, refer to Section 3.1.4 (2).
 *3): Even if controllers are normal, the compressor does not operate under the following conditions.
 * Indoor Air Temp. is lower than 69.8°F (21°C) or Outdoor Air Temp. is lower than 23°F (-5°C) during cooling operation.
 * Indoor Air Temp. is higher than 86°F (30°C) or Outdoor Air Temp. is higher than 73.4°F (23°C) during heating operation.
 * When a cooling (or heating) operation signal is given to the outdoor unit and a different operation signal is given to indoor units.
 * When demand signal or emergency stop signal is given to outdoor unit.

Other Abnormalities	Abnormalities of Devices
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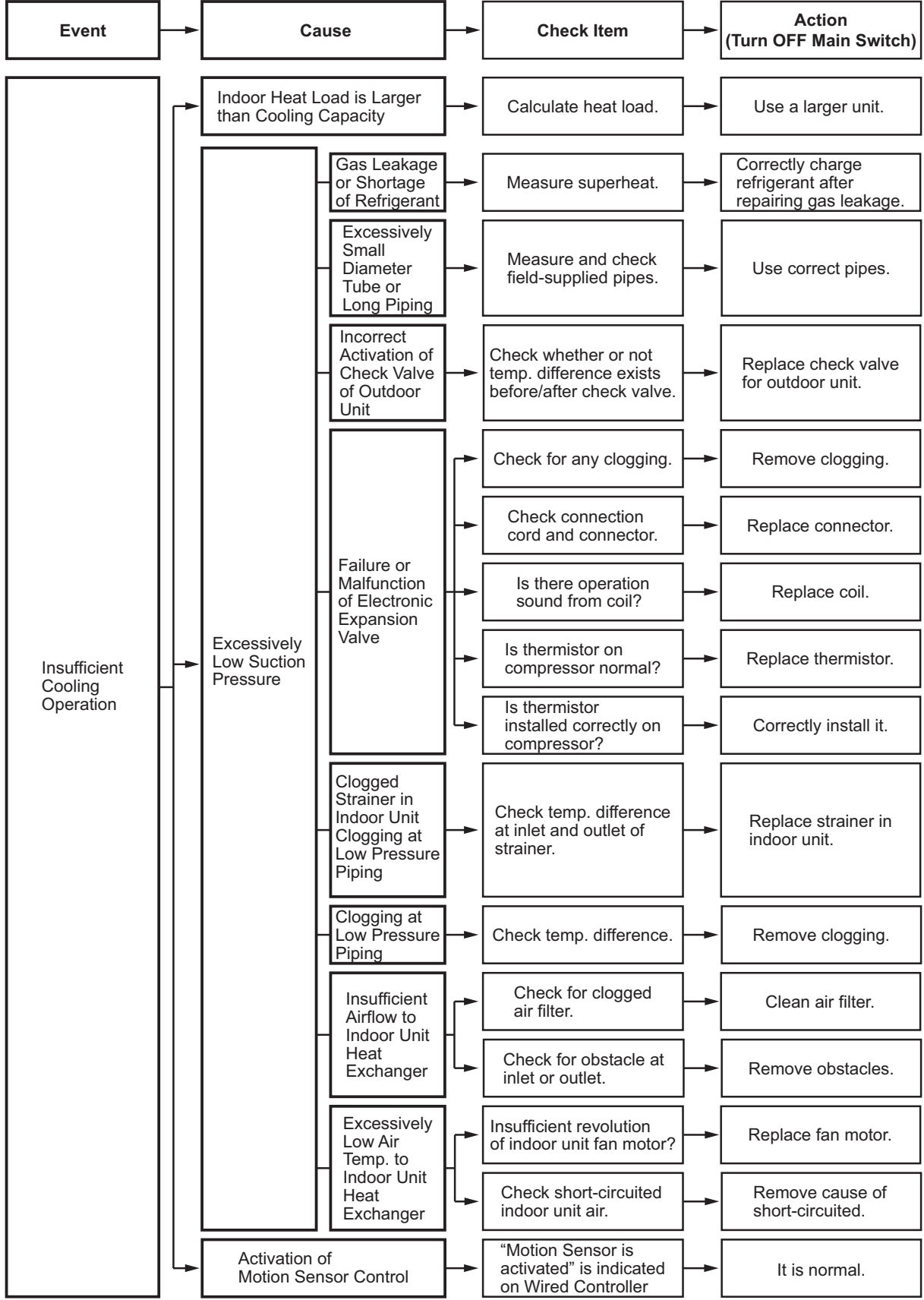


*1): For CIW01, refer to Section 3.1.4 (3).

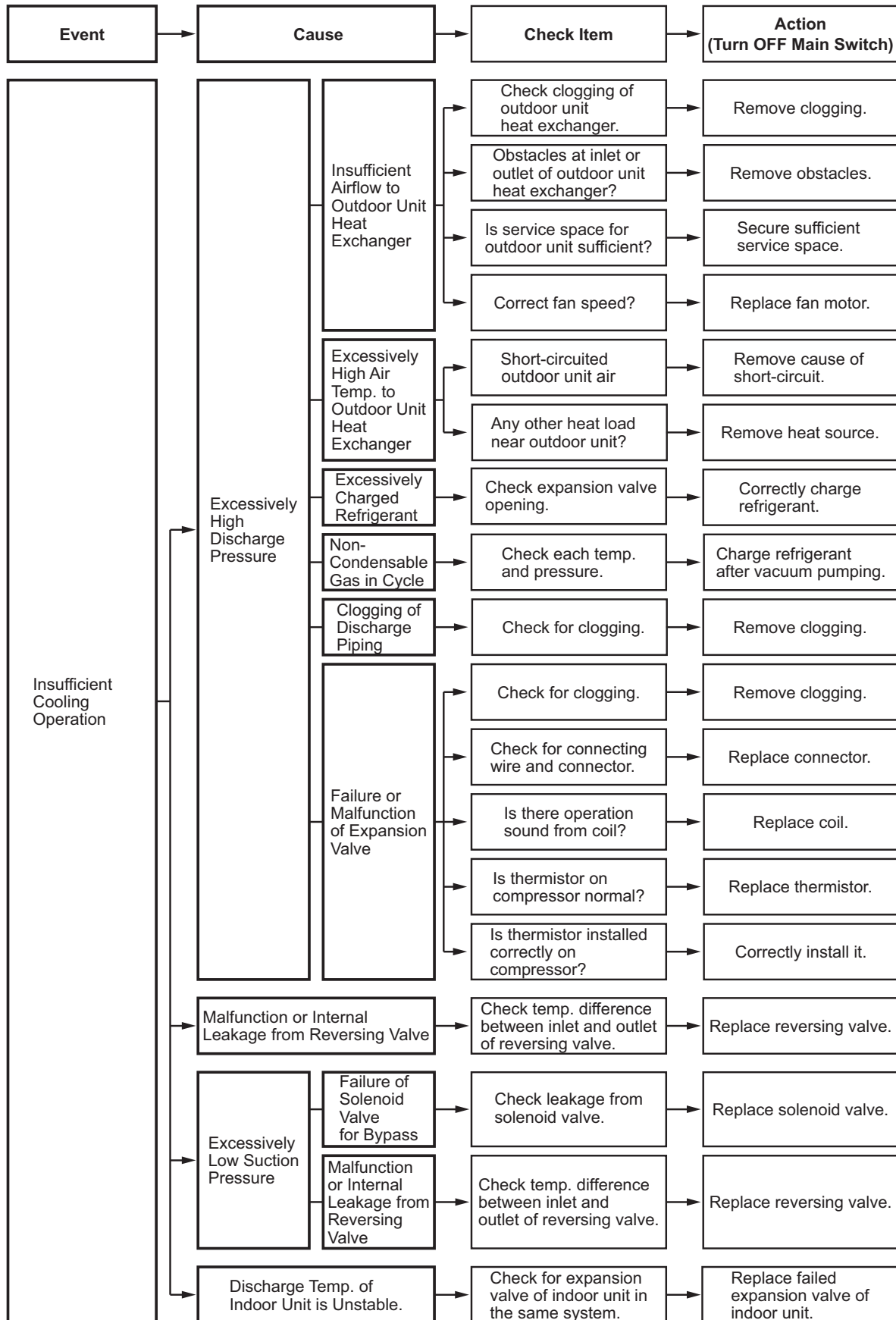
*2): Refer to Section 3.1.4 (2).

TROUBLESHOOTING

Other Abnormalities **Abnormalities of Devices**

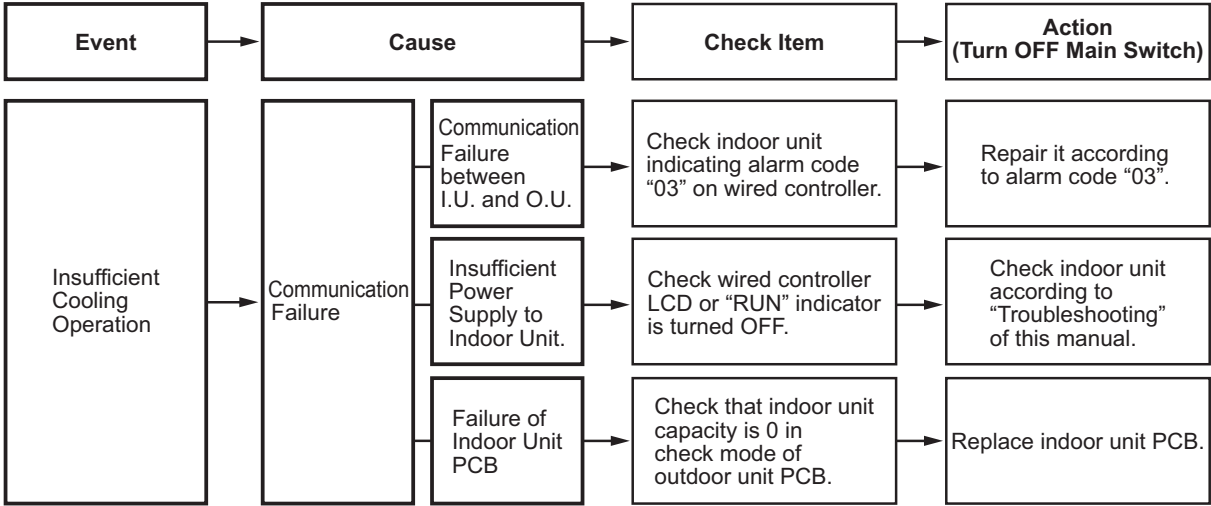


Other Abnormalities	Abnormalities of Devices
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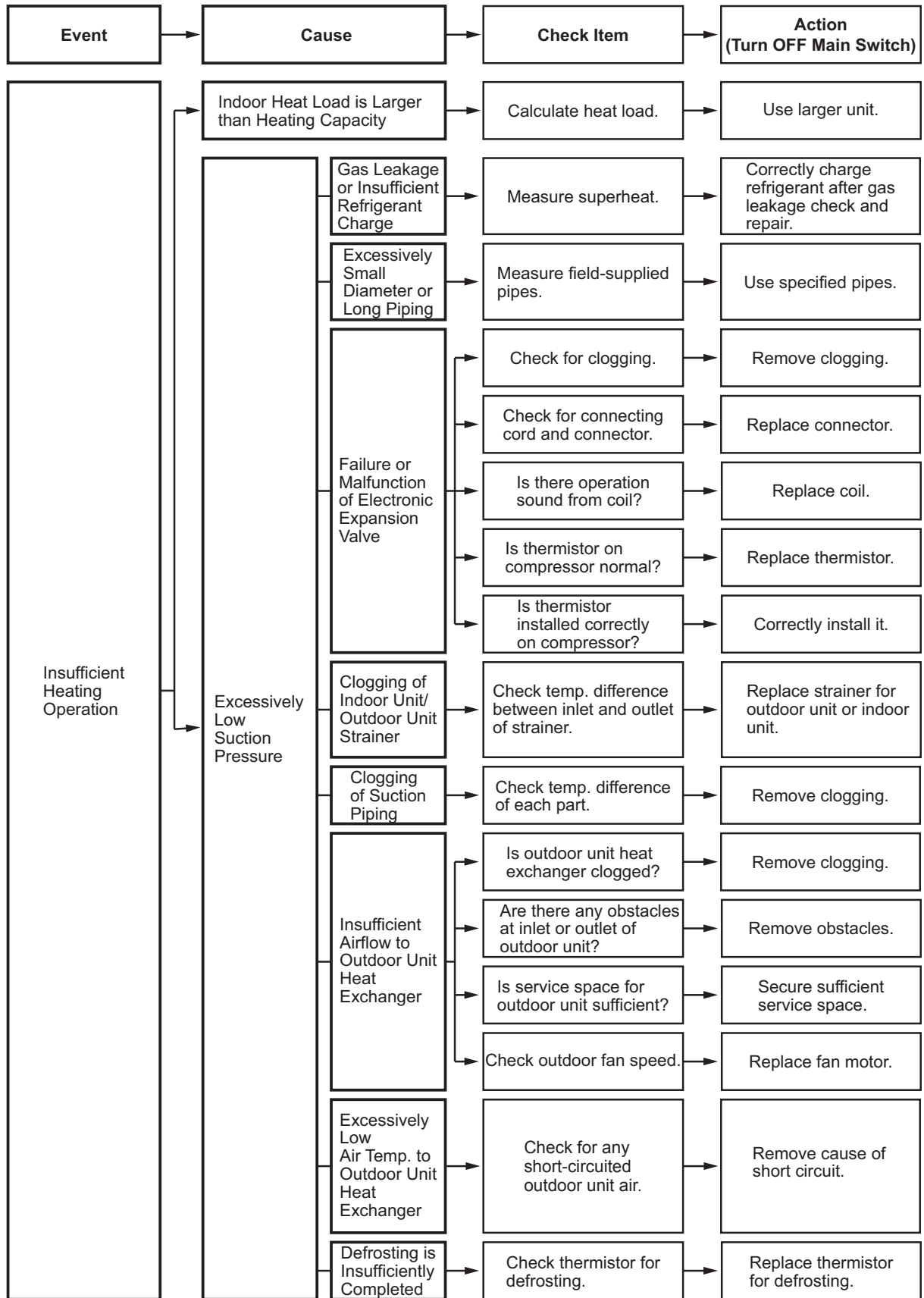


TROUBLESHOOTING

Other Abnormalities	Abnormalities of Devices
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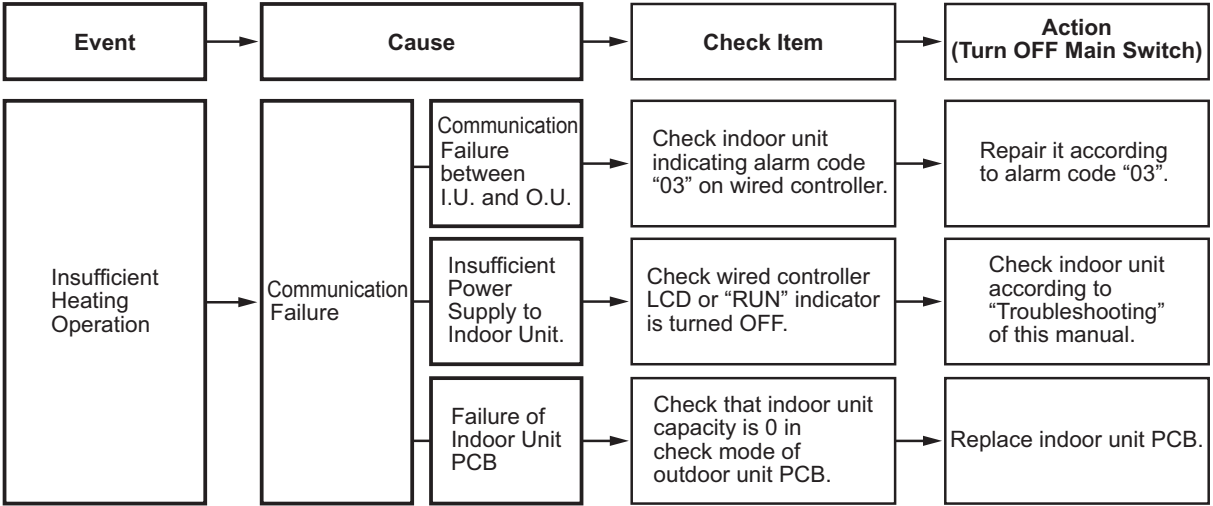


Other Abnormalities	Abnormalities of Devices
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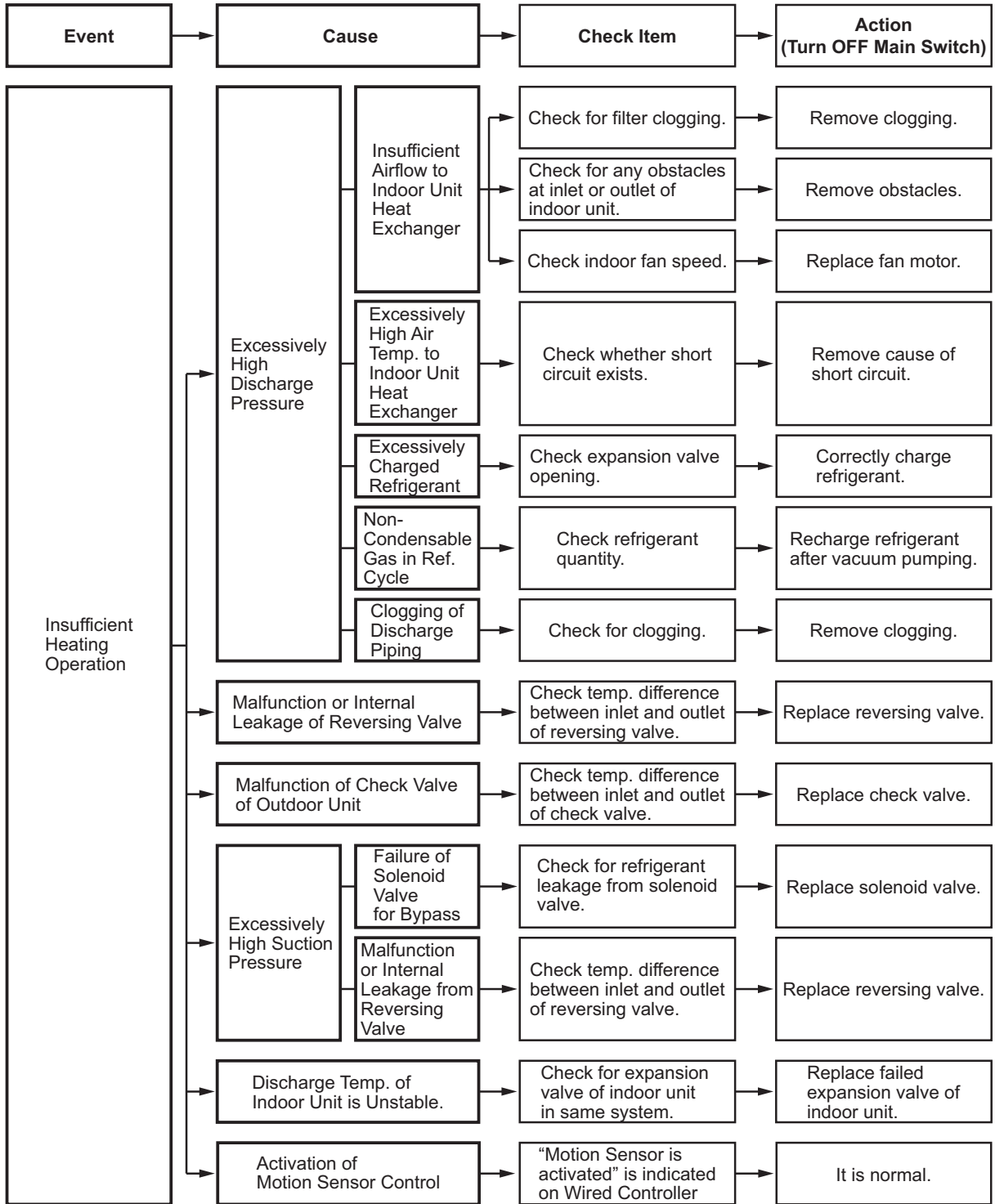


TROUBLESHOOTING

Other Abnormalities	Abnormalities of Devices
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Other Abnormalities	Abnormalities of Devices
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TROUBLESHOOTING

Other Abnormalities		Abnormalities of Devices		
Event	Cause	Check Item	Action (Turn OFF Main Switch)	
Cooling or Heating Operation with Abnormal Sound	Foreign Particles Inside Fan Casing	Check it by viewing.	Remove foreign particles.	
	Indoor Unit Fan Wheel Contacts Casing	Check it by viewing.	Adjust position of fan wheel.	
	Outdoor Unit Propeller Fan Comes in Contact with Fan Shroud	Check it by viewing.	Adjust position of propeller fan.	
	Abnormal Sound from Compressor	Failure of Installation	Check each part is tightly secured.	Tightly secure it.
		Liquid Ref. Compression	Check expansion valve opening.	Ensure superheat.
		Wear or Breakage of Internal Comp. Parts	Is there any abnormal sound from inside of compressor?	Replace compressor.
		Crankcase Heater does Not Get Warm	Check resistance of crankcase heater or fuse.	Replace crankcase heater or fuse.
	Humming Sound from Magnetic Contactor	Check surface of contacts.	Replace magnetic switch.	
Abnormal Vibration of Cabinets	Check each tightening screws.	Tightly secure it.		
Outdoor Fan does Not Operate even when Compressor is Operating	Obstacle at Outdoor Fan	Check obstacles.	Remove obstacles.	
	Preparatory State for Heating Operation	Wait for switching of reversing Valve. (1 to 3 minutes)	If the reversing valve is not switched, check for insufficient refrigerant.	
Indoor Fan does Not Operate even when Compressor is Operating	Discharge pressure does not increase higher than 319 psi (2.2MPa) due to insufficient refrigerant.	Check operation pressure.	Add refrigerant.	
	Disconnected Wire for Indoor Fan	Check wiring.	Correctly connect wires.	
	Failure of AC chopper	Check AC chopper.	Replace AC chopper.	

Other Abnormalities Abnormalities of Devices
(Motion and Radiation Sensor for 4-Way Cassette Type)

Event	Cause	Check Item	Action (Turn OFF Main Switch)
"Motion Sensor is activated" is indicated on Wired Controller LCD.	Reaction rate is always 100%.	Check the "Check Mode 1: q1" on the wired controller. ↓ Check if there is motion sensor with "Reaction rate always 100%".	True: Replace motion and radiation sensors PCB. False: Replace control PCB.
Operation Stops though Someone is Present.		Operate under detection area of motion sensor and check the "Check Mode 1: q1" on the wired controller.	True: Replace motion and radiation sensors PCB.
Not Operating in "Avoid Air" or "Receive" though Someone is Present.	Reaction rate is always 0%.	Check if there are motion sensors with "Reaction rate always 0%".	False: Sensitivity may be low. Adjust the [Optional Function: K6] to [01: High Sensitivity] and see if there are any changes. If the symptom continues, replace motion and radiation sensors PCB.
Operation Continues though No One is Present.	Motion sensor setting is disabled on the wired controller.	Check setting on the wired controller.	Correct the setting.
	Motion sensor setting of No presence is set to other than "Stop" on the wired controller.	Check setting on the wired controller.	Correct the setting.
	There are heat source other than human in the detecting area of the sensor.	Check heat source (a moving object whose temperature is different from surroundings).	Remove it.
	There is sensor with high sensitivity.	Stop the operation from the wired controller, no motion in the detection area of the motion sensor and check the "Check Mode 1: q1". ↓ Check if there is no motion sensor with "Reaction rate 0%".	True: Replace motion and radiation sensors PCB. False: No problem. Adjust the [Optional Function: K6] to [02: Low Sensitivity] and see if there are any changes. If the symptom continues, replace motion and radiation sensors PCB.
Operating in "Avoid Air" or "Receive" though No One is Present.	15 minutes has not passed since someone left the room.	Check the louver operation after no one has been in the room for more than 15 minutes.	Not operating in "Avoid Air" or "Receive". This is normal operation.
	There are heat sources other than human in the detection area of the sensor.	Check heat source (a moving object whose temperature is different from surroundings).	Remove it.
"Radiation Sensor is activated" is indicated on Wired Controller LCD.	Radiation sensor element is abnormal.		Replace motion and radiation sensors PCB.

↑ Operating in "Avoid Air" or "Receive".

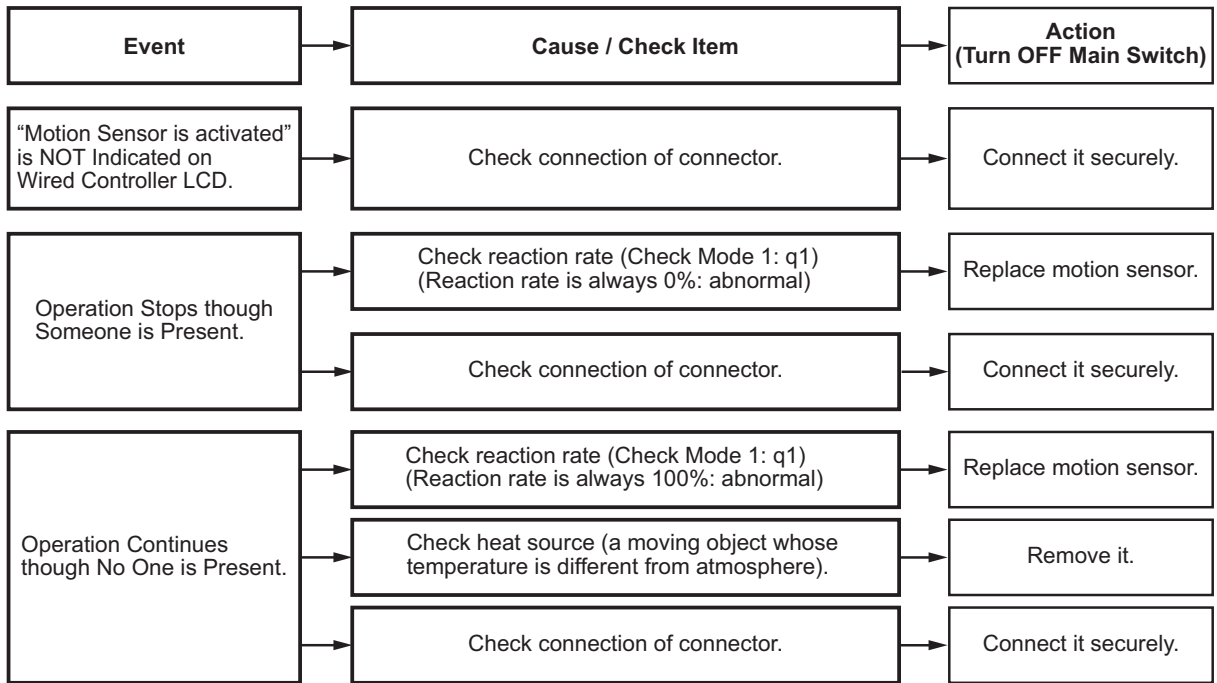
TROUBLESHOOTING

Other Abnormalities **Abnormalities of Devices**
(Motion and Radiation Sensor for 4-Way Cassette Type)

Event	Cause	Check Item	Action (Turn OFF Main Switch)
Operation of Heating Radiation Sensor though the Room is already Heated.	Setpoint on the wired controller is high and the difference against the radiated temperature is big.	Immediately after "Radiation Sensor is activated" indication on wired controller LCD, check the "Check Mode 1: q2". ↓ Check if there is more than 7°F (4°C) difference between the radiated temperature and the setpoint on the wired controller.	True: No problem. This control targets the setpoint on the wired controller with heating operation. If setpoint is high, this control is activated even though the room is heated. False: Replace control PCB.
	Radiated temperature is detected as low.	Stop the operation from the wired controller and check the "Check Mode 1: q2". ↓ Check if there is more than 18°F (10°C) differences between the temperature near to the floor*1 and radiated temperature.	True: Replace motion and radiation sensors PCB. False: Adjust the [Optional Function: K7] to [01: Upward] and see if there are any changes. If the symptom continues then replace motion and radiation sensors PCB.
No Operation of Heating Radiation Sensor though the Room is Cold.	Radiation sensor setting is disabled on the wired controller.	Check setting on the wired controller.	Correct the setting.
	There is a heat sources other than human in the detection area of the sensor.	Check heat source (a moving object whose temperature is different from surroundings).	Remove it. Depending on the heat source, the control is hard to operate.
	Setpoint on the wired controller is low and the difference against the radiated temperature is small.	Immediately after "Radiation Sensor is activated" indication on wired controller LCD, check the "Check Mode 1: q2". ↓ Check if there is less than 5°F (3°C) difference between the radiated temperature and the setpoint on the wired controller.	True: No problem. This control will not operate when the difference between setpoint on the wired controller and radiated temperature is small. False: Replace control PCB.
	Radiated temperature is detected as high.	Stop the operation from the wired controller and check the "Check Mode 1: q2". ↓ Check if there is more than 18°F (10°C) difference between the temperature near to the floor*1 and radiated temperature.	True: Replace motion and radiation sensors PCB. False: Adjust the [Optional Function: K7] to [02: Downward] and see if there are any changes. If the symptom continues, replace motion and radiation sensors PCB.
	Communication error between indoor unit control PCB and motion and radiation sensors PCB.	Check connection and connectors.	If the symptom continues, replace motion and radiation sensors PCB.

*1) Prepare thermometer for checking. Make sure there are no heat sources before taking measurement.

Other Abnormalities	Abnormalities of Devices (Motion Sensor for 1-Way Cassette Type)
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3.3 Procedures for Checking

3.3.1 Self-Checking of PCBs using Wired Controller

Refer to Section 3.1.4 "Checking Wired Controller"

3.3.2 Self-Checking of Wired Controller

Refer to Section 3.1.4 "Checking Wired Controller"

3.4 Test Run

**Turn OFF all the power source switches.
Use a tester and make sure that all the switches are turned OFF.**

Before the test run, check that the unit is appropriately installed according to the Installation and Maintenance Manual. After that, inspect the following items.

Check Item		Contents
1	Damage	Are the unit appearance and inside of the unit damaged?
2	Fan Motor	Is the fan motor runner installed in the center of the casing? Is the fan motor installed away from the casing? (The fan motor should NOT be touched by the casing.)
3	Fasteners	Are the screws loose due to vibration during transportation? Check that the fasteners are secured firmly during installation, <u>especially for electrical wiring.</u>
4	Refrigerant Leaks	<u>Check that there are NO refrigerant leaks.</u> The tightening part of the pipe (flare part) may be loose because of vibration during transportation.
5	DSW Setting	Check that the DSW setting is the same as the factory setting. (Refer to Section 3.1.3.)
6	Insulation ^{*1)}	Measure resistance between electrical component terminal and ground with a tester. It is normal if the resistance is 1MΩ and over. If 1MΩ or less, do not perform the operation due to insulation failure of electrical parts. <u>Do NOT apply electricity to the terminal board of operating line. (Control PCB may be damaged.)</u>
7	Stop Valve Fully Open	Prior to test run, check that the stop valve of the outdoor unit is completely open.
8	Power Source Phase	The operation is NOT possible with the incorrect power phase order or lacking phase. • Alarm "05" will be indicated on the LCD of the wired controller. • "05" will be indicated on the 7-segment display of the outdoor unit. Check the power source phase according to the caution label attached close to the outdoor unit terminal block or inside of the service cover.
9	Turn ON Crankcase Heater ^{*2)}	After completion of item checks 1 to 8, turn ON the power supply of the outdoor unit. Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil..
10	Indoor and Outdoor Temperature	<For Use in both Cooling and Heating Operation> Is indoor temperature DB80°F (27°C) or less during heating operation? (Heating operation may not be operated due to the activation of the overload operation prevention under the ambient temperature of 66°F (19°C) or over.) To perform the test run, set the test run mode with the wired controller.

*1): Insulation Resistance

- If the unit has been turned OFF for long periods, insulation resistance may decrease to 1MΩ or less because the refrigerant is retained in the compressor. Check the following points.
 - (a) Disconnect the cables of the compressor and measure the insulation resistance of the compressor itself. If the resistance is 1MΩ or less, an insulation failure of another electrical charge part has occurred.
 - (b) If the resistance is 1MΩ or less, reconnect the compressor and turn ON the main power supply. The compressor will warm up automatically. Check the insulation resistance again after applying current for at least three hours. (Preheating time depends on the air condition, piping length or refrigerant condition.)
- Before the leakage breaker is activated, check the rated capacity.

*2): Stoppage of Compressor Operation

The compressor may NOT be operational for a maximum of four hours if the power supply is NOT turned ON in advance.

At this time, the stoppage Code (d1-22) is displayed on the LCD of wired controller and the forced Thermo-OFF function starts.

If operation of the compressor is necessary, turn ON the power supply of the outdoor unit, wait for 30 seconds and press PSW5 on the outdoor unit PCB for at least three seconds. The forced Thermo-OFF function (d1-22) will be cancelled and the compressor operation will be available.

NOTE:

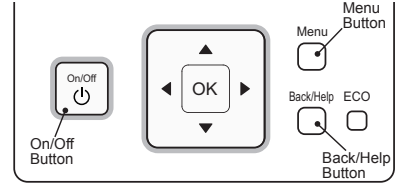
Thermo-ON: The outdoor unit and some indoor units are running.

Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

3.4.1 Test Run Using Wired Controller

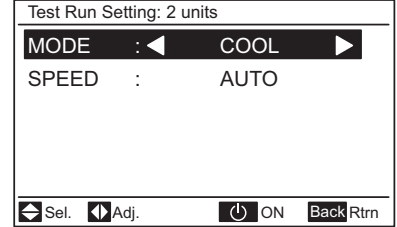
(1) Wired Controller (CIW01)

- (1) Turn ON the power source of the indoor and outdoor units.
- (2) Set the TEST RUN mode with the wired controller.



Press and hold the "Menu" and the "Back/Help" buttons simultaneously for more than three seconds. Select "Test Run" by pressing "Δ∇" and press "OK". The Test Run screen will be displayed.

NOTE:
For other controllers, refer to the "Installation Manual" for each controller.



Normal → If "TEST RUN" and the total number of the units connected to the wired controller (for example "2 units") are indicated on the wired controller, the connection of the controller cable is correct.

- * The total number of indoor units connected is indicated on the liquid crystal display (LCD).
- * If the indicated number is not equal to the actual number of connected indoor units, the auto-address function is not performed correctly due to incorrect wiring, or electromagnetic interference. Turn OFF the power supply, and correct the wiring after checking the following points. (Do not repeat turning ON and OFF within 10 seconds.)
 - (a) The power supply for the indoor unit is NOT turned ON or incorrect wiring.
 - (b) Loose connection between Indoor Units or Wired Controller.
 - (c) Incorrect Setting of Indoor Unit Address (The indoor unit address is duplicated.)

NOTE:
When "00 unit" is indicated, the auto-address function may be performing. Cancel "Test Run" mode and set it again.

Abnormal → If no indication or "00" appears, or the number of units indicated is less than the actual number of units, there is an abnormality.

(3) Checking Procedures for Abnormalities

Wired Controller Indication	Fault	Inspection Points after the Power Source is OFF
No Indication	<ul style="list-style-type: none"> * The power source is not turned ON. * The connection of the controller cable is incorrect. * The connecting wires of power supply line are incorrect or loose. 	<ul style="list-style-type: none"> 1. Connection between Connector and Wires 2. Connecting Points of Controller Cable 3. Contact of Connectors of Controller Cable 4. Connection Order of each Terminal Block 5. Screw Fastening of each Terminal Block
Number of connected units is incorrect.	<ul style="list-style-type: none"> * The electrical wiring between indoor unit and outdoor unit is disconnected, or the power source is not turned ON. * The setting of unit number is incorrect. * The connection of control cables between each indoor unit are incorrect. (When one wired controller controls multiple units.) 	<ul style="list-style-type: none"> 6. RSW Setting on Indoor Unit Printed Circuit Board 7. Wire Connecting Order of Bridge Cable 8. Connecting Points of Bridge Cable 9. Contact of Connectors of Bridge Cable

Back to (1) after checking







Move to (4) on the next page. ←

(4) Press "On/Off" button.

Normal → The test run operation will be started. The operation mode, the airflow volume, the airflow direction and the test run time can be set on the Test Run screen.
 Select the item by pressing "△▽<▷".
 The test run will be completed by pressing the "Back/Help" button during the stoppage or "On/Off" button during the operation.

Abnormal → If the units do not start or the operation light on the wired controller flashes, there is an abnormality.

(5) Checking Procedure for Abnormalities

Wired Controller Indication	Unit Condition	Fault	Inspection Points when the Power Source is OFF		
The operation light flashes. (1 time/1 sec.) And the Unit No. and Alarm Code "03" flash.	The unit does not start.	The power source is not turned ON.	1. Connecting Order of each Terminal Block. The fuse on the PCB may be blown due to miswiring. (Can be recovered only once by the DSW on the PCB) <div style="border: 1px solid black; padding: 5px;"> Procedures for Recovery When Transmitting Circuit Fuse is Blown 1. Correct the wiring for the terminal block. 2. Setting positions of the model code are shown below. <table border="1" style="width: 100%; text-align: center;"> <tr> <td style="width: 50%; padding: 5px;"> Indoor Unit PCB DSW7 ON OFF ↑  </td> <td style="width: 50%; padding: 5px;"> Outdoor Unit PCB DSW10 ON OFF ↑  </td> </tr> </table> </div> 2. Screw Fastening of each Terminal Block. 3. Connecting Order of Power Line Between Indoor Units and Outdoor Unit.	Indoor Unit PCB DSW7 ON OFF ↑ 	Outdoor Unit PCB DSW10 ON OFF ↑ 
		Indoor Unit PCB DSW7 ON OFF ↑ 		Outdoor Unit PCB DSW10 ON OFF ↑ 	
The connecting wires of operating line are incorrect or loose.					
The operation light flashes. (1 time/2 sec.)	The unit does not start.	The connection of controller cable is incorrect.	This is the same as above items 1 through 3.		
Other alarm codes or indications than those above (Refer to the Alarm Code Table.)	The unit does not start, or starts once and then stops.	The connection of the thermistors or other connectors are incorrect. Tripping of protector exists.	An authorized service person should check the unit using the Alarm Code Table in this manual.		
The operation light flashes. (1 time/1 sec.) And the Unit No. 00 . Alarm Code dd and Unit Code E.00 flash.	The unit does not start.	The connecting wires of operating line are incorrect or loose.	An authorized service person should check the unit using the Alarm Code Table in this manual.		

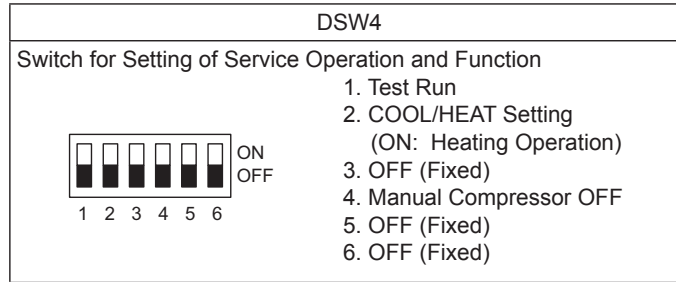
Back to (1) after checking

TROUBLESHOOTING

3.4.2 Test Run from Outdoor Unit Side

The procedures for the test run from the outdoor unit side are indicated below. Setting of this DIP switch is possible with the power source ON.

Setting of DIP Switch (Factory Setting)



! WARNING


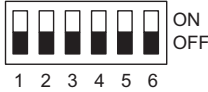

- Do not touch any other electrical part when operating switches on the PCB.
- Do not attach or detach the service cover when the power source for the outdoor unit is supplied and the outdoor unit is operated.
- Turn all the DIP switches of DSW4 OFF when the test run operation is completed.

	DIP Switch Setting	Operation	Remarks
Test Run	<p>1. Setting of Operation Mode</p> <p>Cooling: Set DSW4-2 OFF.</p> <p>Heating: Set DSW4-2 ON.</p>	<p>1. The indoor unit automatically starts operating when the test run of the outdoor unit is set.</p> <p>2. The ON/OFF operation can be performed from the wired controller or DSW4-1 of the outdoor unit.</p> <p>3. The operation continues for two hours without Thermo-OFF.</p>	<p>* Note that the indoor units operate in conjunction with the test run operation of the outdoor unit.</p> <p>* If the test run is started from the outdoor unit and stopped from the wired controller, the test run function of the wired controller is cancelled. However, the test run function of the outdoor unit is not cancelled. Check to ensure that the DSW4-1 of the outdoor unit PCB is turned OFF.</p> <p>* If multiple indoor units are connected with one wired controller, perform the test run operation individually for each refrigerant system one by one. Then, make sure to turn the power source OFF for the indoor units in other refrigerant systems not included in the test run.</p>
	<p>2. Starting Test Run</p> <p>Set DSW4-1 ON and the operation is started after a few to 20 seconds.</p> <p>When heating operation, leave DSW4-2 at ON.</p>		
			<p>* The setting of DSW4 is not required for the test run from the wired controller.</p>

NOTE:

Thermo-ON: The outdoor unit and some indoor units are running.

Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

	DIP Switch Setting	Operation	Remarks
Manual OFF of Comp.	<p>1. Setting *Compressor Manual OFF: Set DSW4-4 ON.</p>  <p>1 2 3 4 5 6</p> <p>2. Canceling *Compressor ON: Set DSW4-4 OFF.</p>  <p>1 2 3 4 5 6</p>	<p>1. When DSW4-4 is ON during compressor operation, the compressor stops operating immediately and the indoor unit is under the condition of Thermo-OFF.</p> <p>2. When DSW4-4 is OFF, the compressor starts operating after the cancellation of three-minutes guard.</p>	<p>* Do not repeat compressor ON/OFF frequently.</p>
Manual Defrost	<p>1. Manual Defrost Operation Press PSW5 for more than three seconds during heating operation, and the defrosting operation starts after two minutes. This function is not possible within five minutes after starting heating operation.</p> <p>2. Manual Defrost Operation Completion Defrosting operation automatically ends and the heating operation restarts.</p>	<p>1. Defrosting operation is available regardless of frost condition and total time of heating operation.</p> <p>2. Defrosting operation is not performed when the temperature of outdoor heat exchanger is higher than 50°F(10°C), high pressure is higher than 3.3MPa or the unit is Thermo-OFF.</p>	<p>* Do not continuously repeat defrosting operation. * When manual defrosting operation is accepted by PSW5, the time left before starting defrosting operation is indicated on the 7-segment display on the PCB.</p>  <p>Time Left (Every Four Seconds)</p>

NOTE:

Thermo-ON: The outdoor unit and some indoor units are running.

Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

When the test run operation is complete, turn all switches of DSW4 OFF.

- (1) If the wired controller is set to a different mode, the test run function will not start.
In this case, perform the following actions before the test run.
Wired Controller: STOP
Central Station: STOP and Wired Controller is available mode.
COOL/HEAT Change-Over Switch: Connector (CN17) of outdoor unit PCB is open.
During the test run mode, do not control the wired controller, the central station and cool/heat change-over switch. Otherwise, the operation mode will be changed or the test run will end.
If necessary, control them after the test run is complete.
- (2) If an alarm code is indicated during the test run, reset the system by turning the main power supply OFF, then back ON. The system should then operate.

TROUBLESHOOTING

3.4.3 Checking the Test Run

(1) Indoor and Outdoor Fan

Check that the indoor fan and outdoor fan rotate correctly and the airflow is smooth.

(2) Power Supply Voltage

Check the power supply.

If the power supply is abnormal, contact the electric power company.

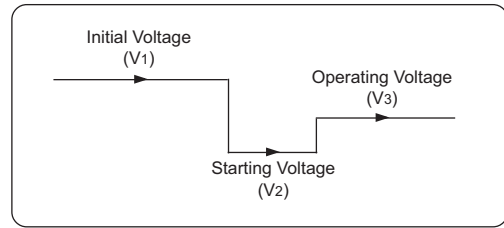
Usually, voltage drop will occur when starting the operation as shown in the figure (V₂).

In order to protect the device, comply with the following normal range of the power supply voltage.

<Normal Range of Power Supply Voltage>

- Supply Voltage: Rated Voltage ≤ ±10%
- Starting Voltage (V₂): Rated Voltage ≥ -15%

< Voltage Change >



Operating Voltage (V₃): Rated Voltage ≤ ±10%
Voltage Imbalance between Phase: ≤ 3%

(3) Normal Operating Pressure

Normal operating suction pressure is 29 to 159.5 psi (0.2 to 1.1 MPa) and normal operating discharge pressure is 145 to 507.6 psi (1.0 to 3.5 MPa) when the refrigerant charge quantity is correct. Check the operation pressure in the test run mode.

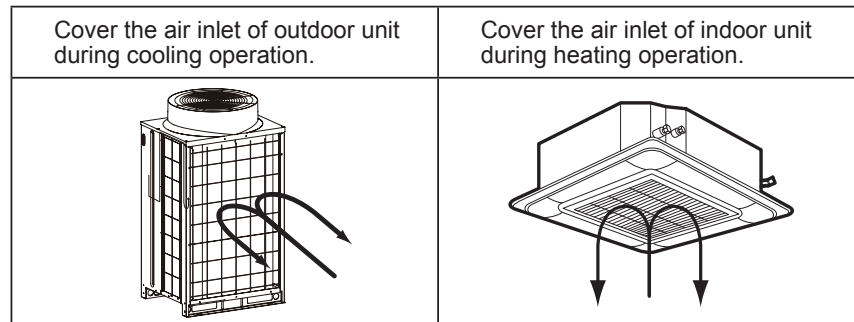
(4) High Pressure Switch

Check the operation pressure of the high pressure switch in the table below.

Refrigerant	Operation Pressure
R410A	601 psi (4.15MPa)

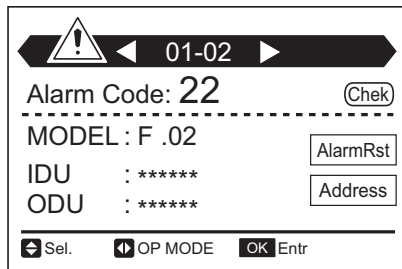
(5) High Pressure Increase Retry (Protection Control)

(a) High pressure will increase when the following procedure is performed.



(b) When the high pressure retry control is activated, alarm code “P13” will be indicated on the 7-segment display of the outdoor unit PCB. If the high pressure retry control occurs three times or more within 30 minutes, alarm code “45” will be indicated on the LCD of the wired controller or the 7-segment display of the outdoor unit PCB.

< For CIW01 >



NOTE:

High pressure may not increase until the high pressure switch is activated because of the temperature condition.

3.4.4 Checklist for Refrigerant System

The system data can be checked on the 7-segment display of the outdoor unit PCB during the test run and the troubleshooting. However, it may take time for checking because the operation cycle changes depending on the operating condition.

To check the quality of the refrigerant system, the following checklist shall be used at the test run, troubleshooting, and emergency check.

(1) Refrigerant System Check

The most important thing for the refrigerant system is to check that each expansion valve opening and the operating frequency is within the specified range. Each item varies in the value depending on the operating frequency, indoor temperature and ambient temperature.

- (2) The service system tester, which automatically calculates Td and SH, facilitates the refrigerant system check. If possible, record the operating cycle data using the service system tester.

CHECKLIST FOR TEST OPERATION

CLIENT: _____ INSTALLER: _____ DATE: _____
 O.U. MODEL: _____ O.U. SERIAL NO.: _____ CHECKER: _____

I.U. Model							
I.U. Serial No.							

I.U.: Indoor Unit, O.U.: Outdoor Unit

Piping Length: _____ feet Additional Refrigerant Charge: _____ lb

(1) General

No.	Check Item	Result
1	<Combination of Base Units> Is DSW6 setting for outdoor unit No. correct?	
2	Are the power source wire and the communication wire separate from refrigerant pipings?	
3	Is a ground wire connected?	
4	Is there any short circuit?	
5	Is there any voltage abnormality among each phase? (L1-L2, L2-L3, L3-L1)	

(2) Refrigerant System

a. Operation (Cooling/Heating)

No.	Check Item	Result
1	Operate all the units ("TEST RUN" mode).	
2	Operate all the indoor units at "HIGH" speed.	
3	In an instance where the constant compressor is turned ON and OFF repeatedly, switch off an indoor unit with a small capacity.	

b. Sampling Data (Cooling/Heating, Indoor Temperature 70°F~86°F (21°C~30°C))

No.	Check Item	Result
1	Check the operating data after 20-minute operation.	
2	Check <u>Pd</u> and <u>Td</u> . Is Td-SH 59 to 113°F (15 to 45°C) ?	
3	Is <u>Ps</u> 22 to 189 psi (0.15 to 1.3 MPa) ?	
4	Is <u>Pd</u> 145 to 522 psi (1.0 to 3.6 MPa) ? (If the outdoor temperature is high, <u>Pd</u> becomes high.)	

NOTE:

The symbol with an underline indicates an item to check.

TROUBLESHOOTING

(3) Check Item after Sampling Data

a. Cooling Operation (It is applicable when the outdoor temperature is higher than 59°F(15°C).)

No.	Check Item	Standard	Causes	Result
1	Is fan actually running when <u>F_o</u> (Airflow Rate of O.U. Fan) is not "0"?	-	<ul style="list-style-type: none"> • Fan Motor Failure • O.U. PCB Failure • Condenser Failure 	
2	Is the total of <u>iE</u> (I.U. Ex. Valves Opening) abnormally low or high?	-	<ul style="list-style-type: none"> • Low → Excessive Refrigerant • High → Insufficient Refrigerant or Excessive Pipe Pressure Loss 	
3	Is <u>TL</u> (Liquid Pipe Temp. of I.U. Heat Exchanger) lower than <u>Ti</u> (Intake Air Temp. of I.U.)?	It is normal when $TL - Ti < -9^{\circ}F (-5^{\circ}C)$.	<ul style="list-style-type: none"> • TL Thermistor Failure • I.U. Ex. Valve; Fully Closed • Short-Circuit 	
4	Is <u>TG</u> (Gas Pipe Temp. of I.U. Heat Exchanger) lower than <u>Ti</u> (Intake Air Temp. of I.U.)? (It is applicable when Intake Air Temp. is 5°F (3°C), higher than Setting Temp.)	It is normal when $TG - Ti < -9^{\circ}F (-5^{\circ}C)$.	<ul style="list-style-type: none"> • TG Thermistor Failure • I.U. Ex. Valve; Fully Closed or Slightly Open • Short-Circuit 	
5	Is there any excessive difference in SH (<u>TG-TL</u>) of I.U. heat exchanger among I.U.s? (It is applicable when Intake Air Temp. 5°F (3°C), higher than Setting Temp.)	It is normal if the difference among units is within 13°F (7°C).	<ul style="list-style-type: none"> • TL/TG Thermistor Failure • I.U. Ex. Valve; Fully Open, Slightly Open or Fully Closed 	
6	Is there any I.U. with the I.U. heat exchanger SH (<u>TG-TL</u>) excessively lower than the other units' value and is <u>iE</u> (I.U. Ex. Valves Opening) lower than "5"?	It is normal if SH of the unit is up to -5°F (-3°C) lower than the other units.	<ul style="list-style-type: none"> • I.U. Ex. Valve; Locked and Fully Open • Mismatched Wiring and Piping 	
7	Is there any I.U. with the I.U. heat exchanger SH (<u>TG-TL</u>) excessively lower than the other units' value and is <u>iE</u> (I.U. Ex. Valves Opening) lower than "100"?	It is normal if SH of the unit is up to 5°F (3°C) higher than the other units.	<ul style="list-style-type: none"> • I.U. Ex. Valve; Locked and Slightly Open or Closed • Mismatched between Wiring and Piping 	
8	Is the temperature difference between I.U.s* more than 13°F (7°C)? * The temperature difference between I.U.s means the following; <u>b3</u> (Discharge Air Temp.) - <u>b2</u> (Intake Air Temp.) indicated on the wired controller by check mode.	13°F (7°C) and over	-	

b. Heating Operation (It is applicable when outdoor temperature is higher than 32°F(0°C).)

No.	Check Item	Standard	Causes	Result
1	Are <u>oE1</u> and <u>oE2</u> (O.U. Ex. Valves Opening) abnormally low or high when TdSH is 59°F to 113°F (15°C to 45°C)?	-	<ul style="list-style-type: none"> • Low → Excessive Refrigerant • High → Insufficient Refrigerant 	
2	Is <u>Pd</u> "232" to "522" psi ("1.6" to "3.6" MPa)?	232 - 522 psi (Pd is high when the indoor temperature is high.)	<ul style="list-style-type: none"> • Low → Solenoid Valve SVA Leakage • High → Excessive Gas Pipe Pressure Loss 	
3	Is <u>Ps</u> "22" to "189" psi ("0.15" to "1.3" MPa)?	22 - 189 psi	<ul style="list-style-type: none"> • Low → O.U. Short-circuit • Low/High → O.U. Fan • Motor Failure, Fan Module Failure or Outdoor Ambient Thermistor Failure 	
4	Is the temperature difference between I.U.s* more than 18°F (10°C) when <u>iE</u> (I.U. Ex. Valve) is "100"? * The temperature difference between I.U. means the following; <u>b3</u> (Discharge Air Temp.) - <u>b2</u> (Intake Air Temp.) indicated on the wired controller by check mode. However, this is applicable only when <u>b2</u> (Intake Air Temp.) - <u>b1</u> (Setting Temp.) is higher than 5°F (3°C).	18°F (10°C) and over	<ul style="list-style-type: none"> • Failure in PCB, Wiring, I.U. Ex. Valve and Coil • Excessive Pipe Pressure Loss • Thermistor Failure for Discharge Air 	

NOTE:

The symbol with an underline indicates a checking item and the mark " " indicates checking data.

3.4.5 Automatic Judgment System for Refrigerant Amount

< Prior to Refrigerant Amount Judgment >

- (1) Check the indoor and outdoor air temperature in the figure.
- (2) Calculate refrigerant amount for the pipe length and add it.

< Procedure of Refrigerant Amount Check Operation >

- (1) Check that all the switches of indoor units are turned OFF.
- (2) Turn No.4 of DSW5 (PCB of main outdoor unit) ON as shown in the figure. Then, the 7-segment display will be indicated as shown below.

7-segment Display



The refrigerant amount judgment is carried out automatically during a cooling operation. (This function is NOT available during a heating operation.) Before starting, check the indoor and outdoor air temperature.

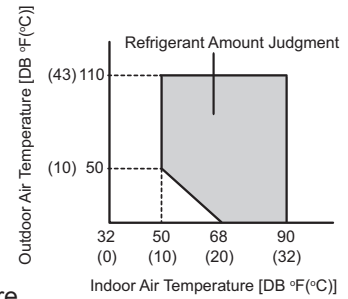
- (3) Check the 7-segment display and press PSW1. The outdoor fan and compressor will be activated and the 7-segment display will be indicated as shown below.



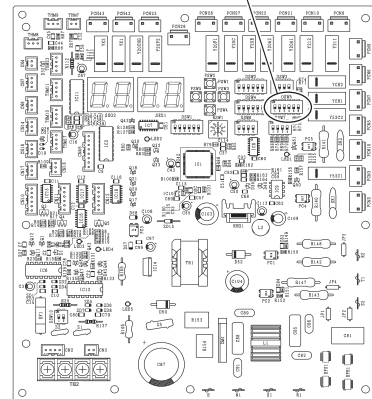
The judgment takes 30 to 40 minutes.

Refer to the table below for the result indications.

When the judgment result is excessive refrigerant, insufficient refrigerant, or abnormal termination, find out the cause of the abnormality and perform the refrigerant amount check operation again.



DSW5-4



Judgment Result Indication

7-segment Indication	Result	Remarks
	Sufficient Refrigerant	The refrigerant amount is sufficient. * Turn No.4 of DSW5 OFF and perform Test Run.
	Excessive Refrigerant	The refrigerant amount is excessive. * Calculate the additional refrigerant amount according to the piping length. Collect the refrigerant using a collector and charge the correct refrigerant amount.
	Insufficient Refrigerant	The refrigerant amount is insufficient. * Check if the additional refrigerant has been charged. * Calculate the additional refrigerant amount according to the piping length and charge the refrigerant.
	Abnormal Termination	Find out the cause of the abnormal termination as shown below. After resolving the cause of the abnormal termination, restart the check operation. (1) Is No.4 pin of DSW5 ON before turning on the power supply? (2) Are all indoor units ready and waiting, before turning ON No.4 pin of DSW5? (3) Is the outdoor ambient temperature within the applicable range (23°F to 110°F (-5°C to 43°C))? (In some cases, when the connected indoor unit number exceeds the recommended number and the outdoor ambient temperature exceeds 95°F (35°C), this check operation cannot be performed.) (4) Is the total indoor units operation capacity 30% (indoor units capacity ratio) or less? (5) Is No.4 of DSW4 (compressor forced stoppage) OFF?

- (4) Turn No.4 of DSW5 OFF when the refrigerant amount is sufficient. Wait for at least three minutes after turning No.4 of DSW5 OFF and then the outdoor unit is ready to operate.

NOTE:

The 7-segment display indication during the check operation may be changed to the protection control code by the activation of protection control. However, it is normal.

3.4.6 Reset for Accumulated Operation Time of Compressor 1-2 (cUJ1-cUJ2)

There are accumulated operation times of the compressor after maintenance and after starting operation. The following procedures show how to reset the accumulated operation time of the compressor after maintenance. Perform it for each outdoor unit.

<Procedure>

Press PSW1 and PSW3 for five seconds while the accumulated operation time of compressor data is displayed. The accumulated operation time of the compressor is reset.

<Example of Compressor 1>



Press PSW2 to display the accumulated operation time of the compressor. (Press PSW4 to return to the indication "cUJ1".)

PSW2 ↑↓ PSW4



Press PSW1 and PSW3 for five seconds while the accumulated operation time is displayed.



The indication will be changed to "0".

(The accumulated operation time of the compressor 1 is reset.)



NOTE:

In an instance of 144 to 360 MBH, it is required to reset the accumulated operation time for each outdoor unit.

4. Maintenance

4.1 Maintenance of Outdoor Unit

⚠ DANGER

Use the specified non-flammable refrigerant (R410A) for the outdoor unit in the refrigerant cycle. Do not charge material other than R410A into the unit such as hydrocarbon refrigerants (propane), oxygen, flammable gases (acetylene) or poisonous gases when installing, maintaining and moving. These flammables are extremely dangerous and may cause an explosion, a fire, and injury.

⚠ WARNING

TURN OFF all power source switches.

4.1.1 Removing Front Service Cover

(1) Removing Service Cover

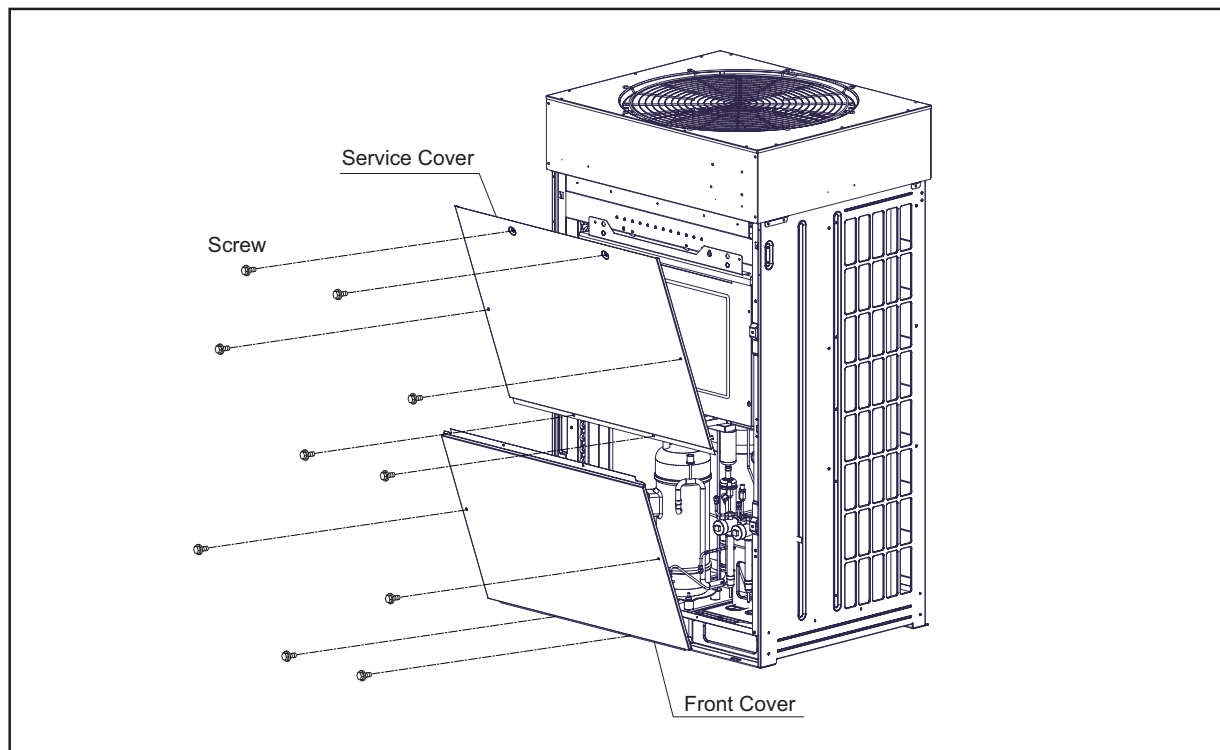
- (a) Remove six screws from the service cover.
- (b) Put your hands on the groove at the bottom of the service cover and draw the service cover forward.

(2) Removing Front Cover

- (a) Remove four screws from the front cover. (Remove the lower side first.)
- (b) Hold the top side of the front cover and lift it upward. Remove the front cover from the hook on the right and left sides. Then, draw the front cover forward.

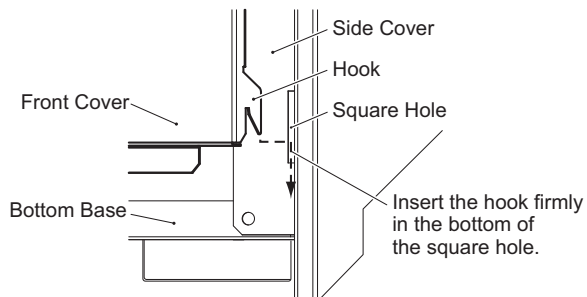
Tool

Phillips Screwdriver



NOTES:

1. When attaching / removing the front service cover, be careful not to get injured by the plate edge.
2. When attaching the front cover, insert the hook in the bottom end of the square hole at the side cover as shown in the figure. DO NOT insert the front cover lower end to the inside bottom base.



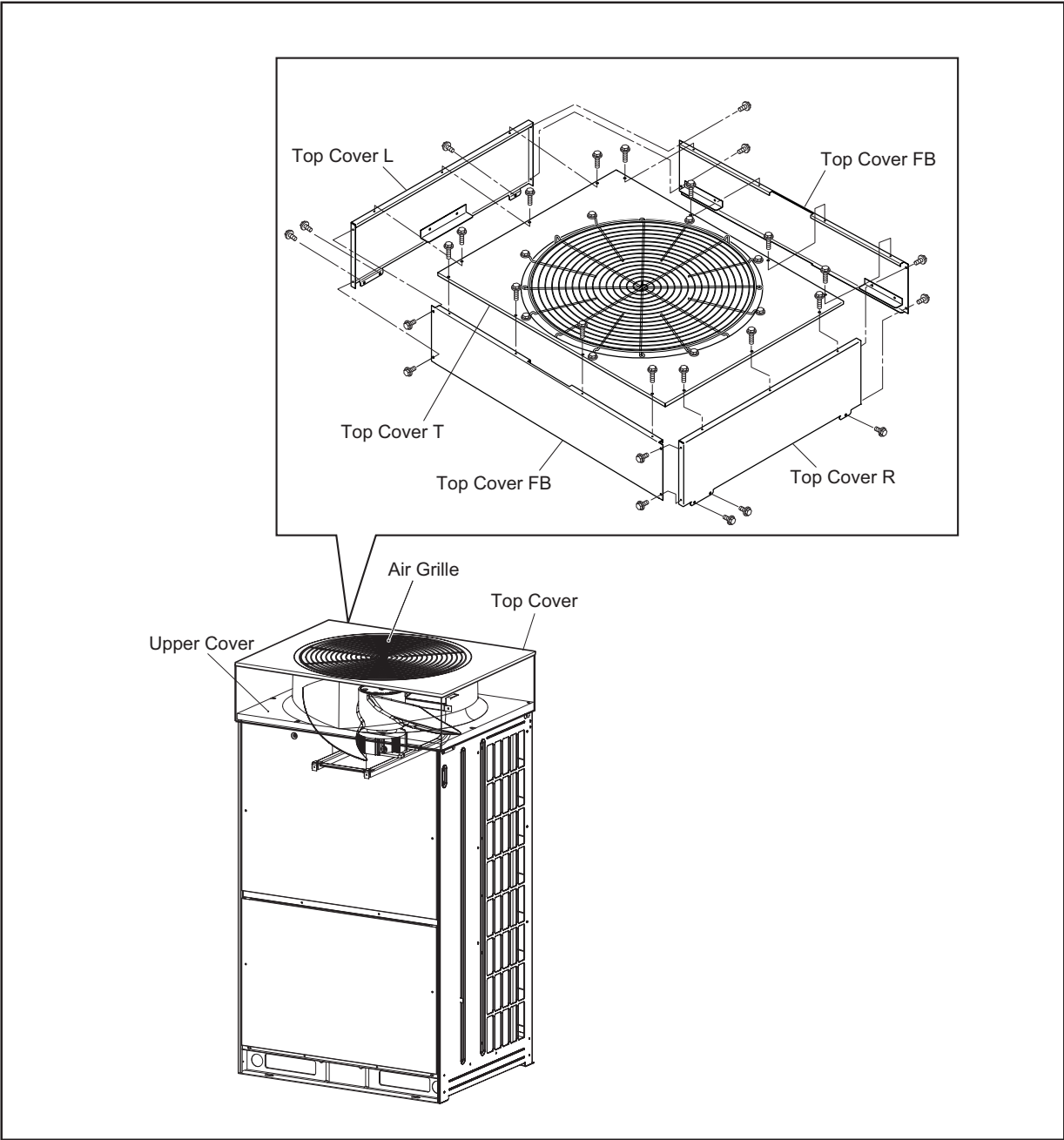
! WARNING

TURN OFF all power source switches.

4.1.2 Removing Top Cover and Upper Cover

- (1) Remove the 28 screws securing the top cover T, R, L, and FB.

Tool	Phillips Screwdriver
------	----------------------



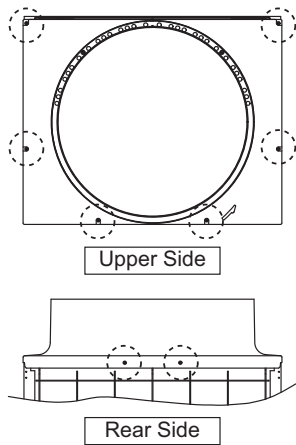
! WARNING

TURN OFF all power source switches.

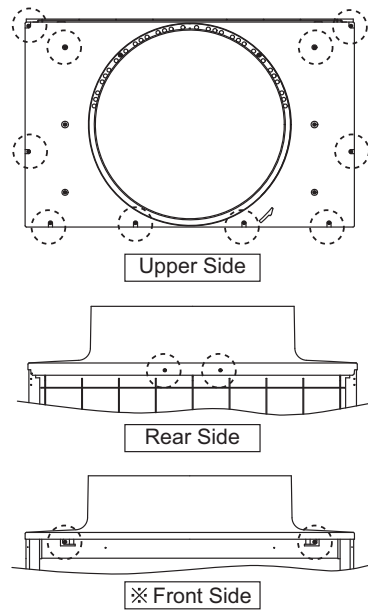
- (2) Remove the screws securing the upper cover.
 - (H,Y)VAHP072B(3,4)1S, (H,Y)VAHR072B(3,4)1S: 8 screws
 - (H,Y)VAHP096, 120B(3,4)1S, (H,Y)VAHR096, 120B(3,4)1S: 14 screws
- (3) Lift up the upper cover. When removing the upper cover, make sure that it does not come in contact with the propeller fan.

Tool	Phillips Screwdriver
------	----------------------

- (H,Y)VAHP072B(3,4)1S, (H,Y)VAHR072B(3,4)1S



- (H,Y)VAHP096, 120B(3,4)1S, (H,Y)VAHR096, 120B(3,4)1S



* When removing two screws on the front side, remove the service cover according to Section 4.1.1 "Removing Front Service Cover".

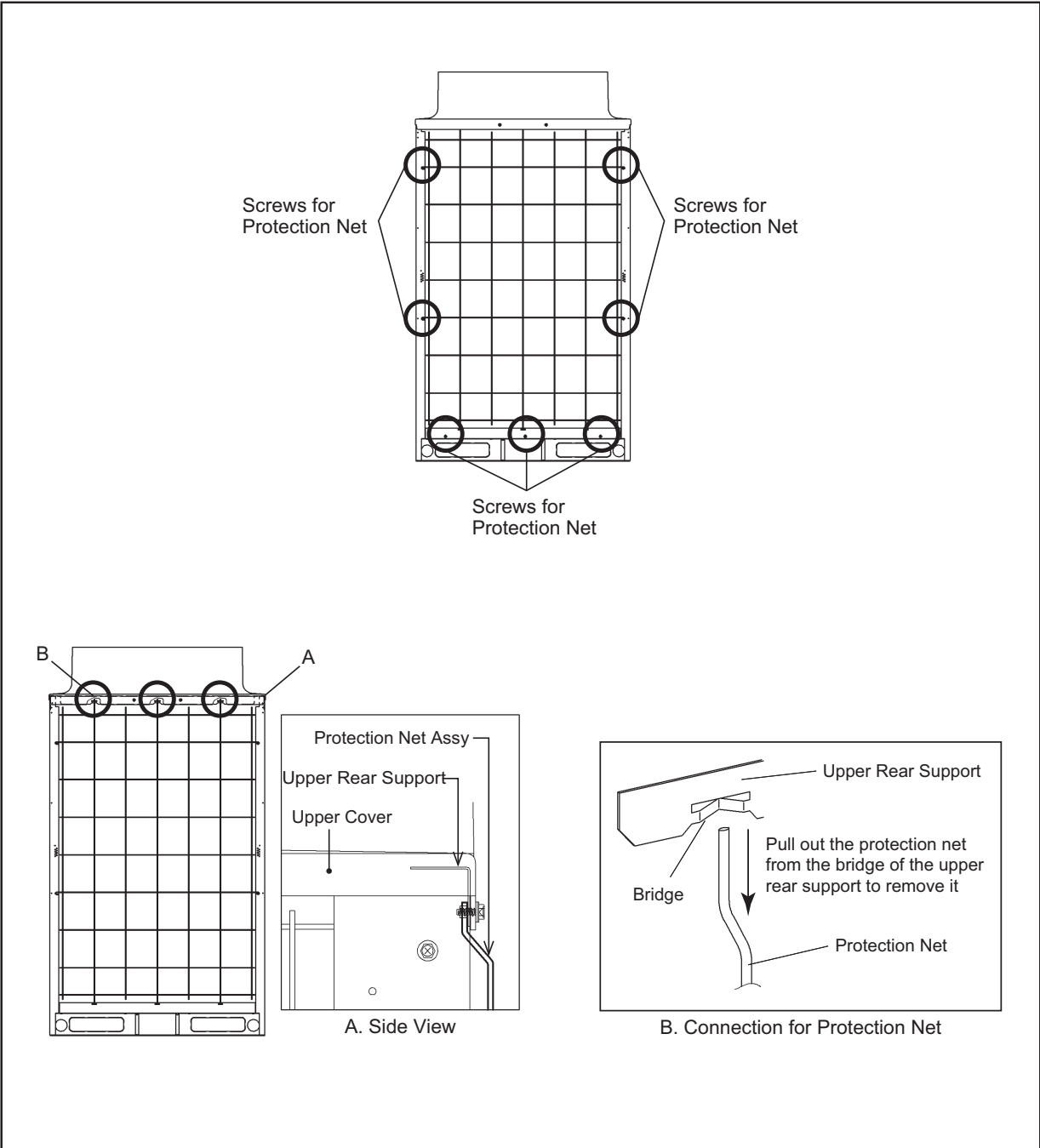
! WARNING

TURN OFF all power source switches.

4.1.3 Removing Protection Net

- (1) Remove seven screws securing the protection net.
- (2) Pull out the protection net from the bridge of the upper rear support to remove it.

Tool	Phillips Screwdriver
------	----------------------



! WARNING

TURN OFF all power source switches.

4.1.4 Removing Electrical Box Cover

A. (H,Y)VAHP072B(3,4)1S, (H,Y)VAHR072B(3,4)1S

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove two screws for the electrical box 1 cover and loosen two securing screws*.
- (3) Push the electrical box 1 cover up and remove the electrical box cover by drawing it forward from the securing screws*.

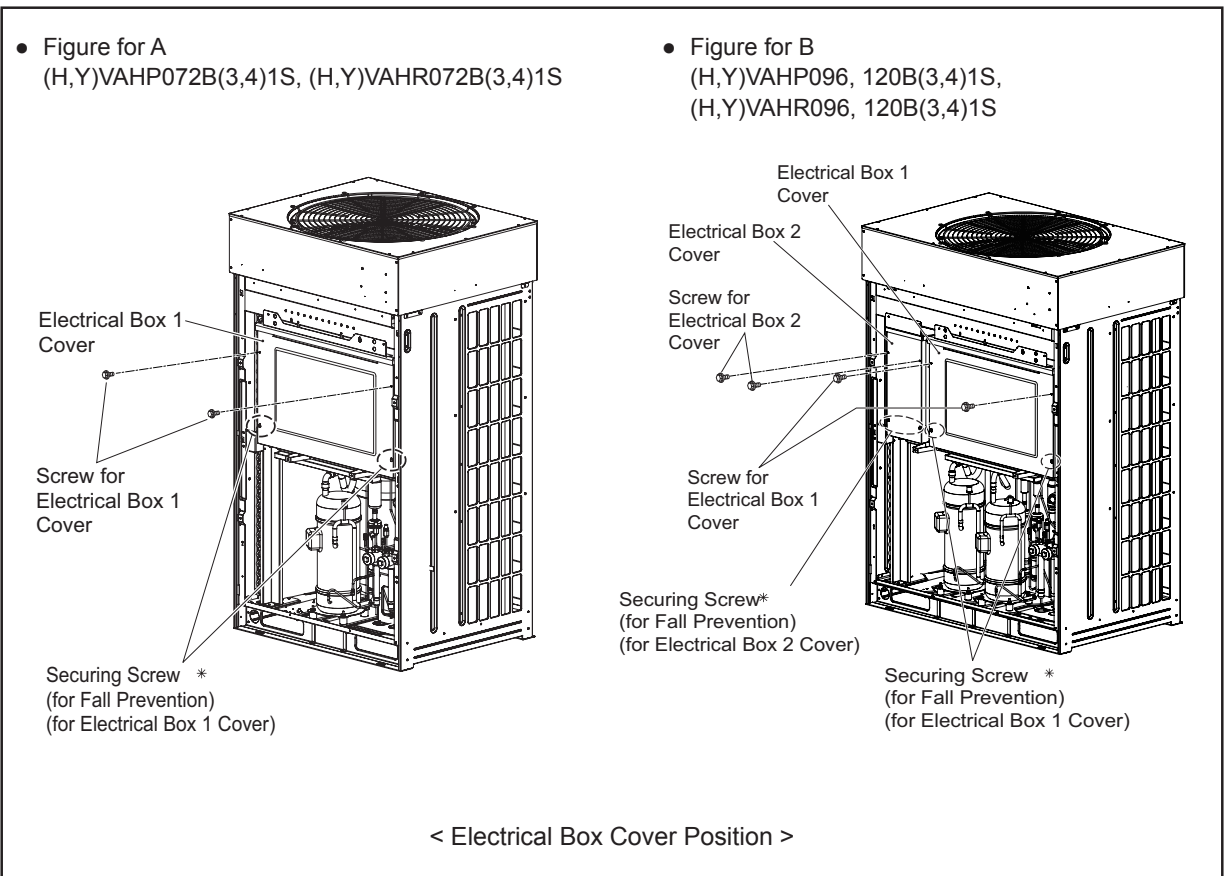
B. (H,Y)VAHP096, 120B(3,4)1S, (H,Y)VAHR096, 120B(3,4)1S

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove two screws for the electrical box 1 cover and loosen two securing screws*.
- (3) Push the electrical box 1 cover up and remove the electrical box cover by drawing it forward from the securing screws*.
- (4) Remove two screws for electrical box 2 cover and loosen two securing screws*.
- (5) Push the electrical box 2 cover up.
Remove the electrical box 2 cover by drawing it forward from the securing screws*.

NOTES:

1. Before removing the screws securing the electrical box 1 cover and electrical box 2 cover, ensure that the securing screws* are attached to the cover so that the cover will not fall.
2. Be careful not to get injured by the front cover edge when removing the electrical box cover.

Tool	Phillips Screwdriver
------	----------------------



! WARNING

TURN OFF all power source switches.

4.1.5 Removing Electrical Box

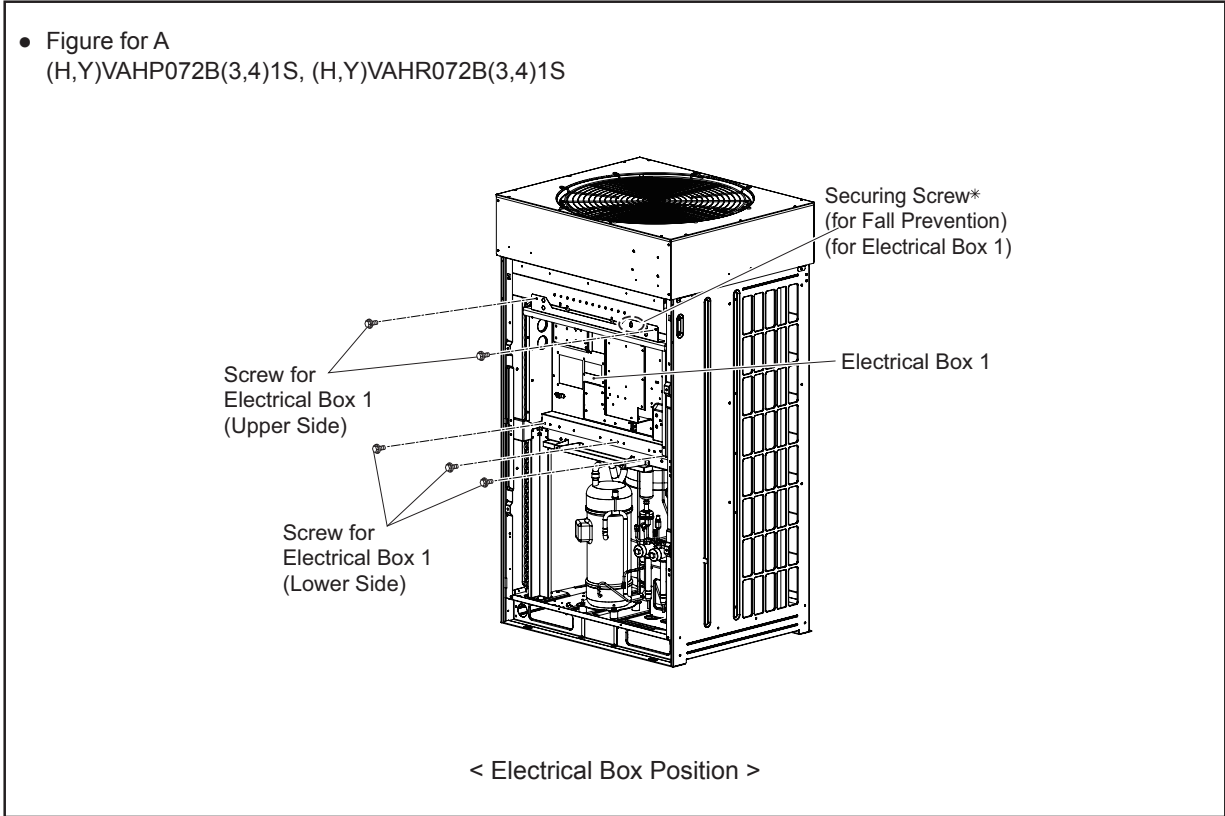
A. (H,Y)VAHP072B(3,4)1S, (H,Y)VAHR072B(3,4)1S

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove the electrical box 1 cover according to Section 4.1.4 "Removing Electrical Box Cover".
- (3) Remove the screws securing the power source wiring, compressor wires, operating line, and ground wire.
- (4) Disconnect the connector for the fan motor, solenoid valve, crankcase heater, and high pressure switch.
- (5) Disconnect the connector for the thermistor, electronic expansion valve and pressure sensor on PCB1.
- (6) Remove three screws securing the lower side of the electrical box 1.
- (7) Install the electrical box 1 cover.
- (8) Remove two screws securing the upper side of the electrical box 1 and loosen the securing screw*.
- (9) Push the electrical box 1 up and draw it forward from the securing screw*.

NOTE:

Use safety awareness measures to prevent equipment falls leading to injuries.

Tool	Phillips Screwdriver
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! WARNING

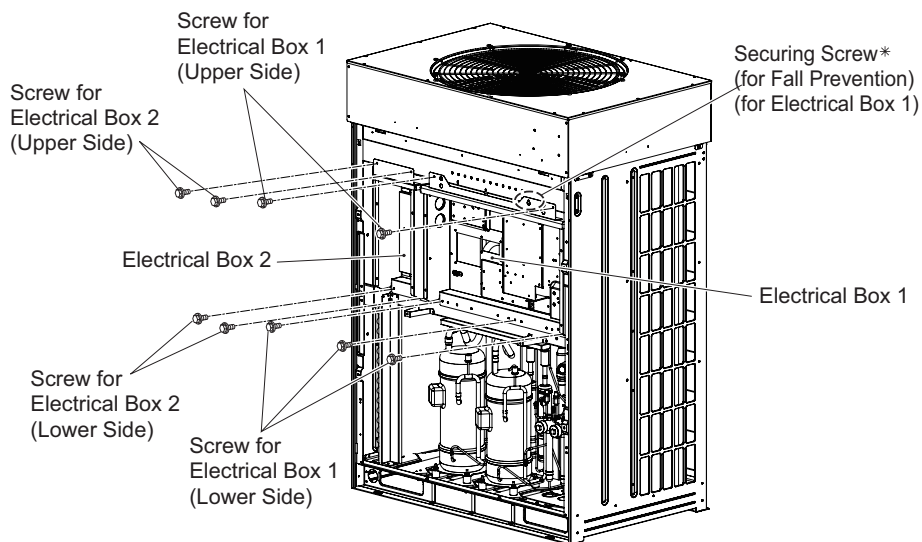
TURN OFF all power source switches.

B. (H,Y)VAHP096, 120B(3,4)1S, (H,Y)VAHR096, 120B(3,4)1S

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove the electrical box 1 cover and electrical box 2 cover according to Section 4.1.4 "Removing Electrical Box Cover".
- (3) Remove the screws securing the power source wiring, compressor wires, operating line, and ground wire.
- (4) Disconnect the connector for the fan motor, solenoid valve, crankcase heater, and high pressure switch.
- (5) Disconnect the connector for the thermistor, electronic expansion valve, and pressure sensor on PCB1.
- (6) Remove three screws securing the lower side of electrical box 1.
- (7) Install the electrical box 1 cover.
- (8) Remove two screws securing the upper side of electrical box 1 and loosen the securing screw*.
- (9) Push the electrical box 1 up and draw it forward from the securing screw*.
- (10) Remove two screws securing the lower side of electrical box 2.
- (11) Install the electrical box 2 cover.
- (12) Remove two screws securing the upper side of electrical box 2. Then, remove electrical box 2.

Tool	Phillips Screwdriver
------	----------------------

- Figure for B
(H,Y)VAHP096, 120B(3,4)1S, (H,Y)VAHR096, 120B(3,4)1S



< Electrical Box Position >

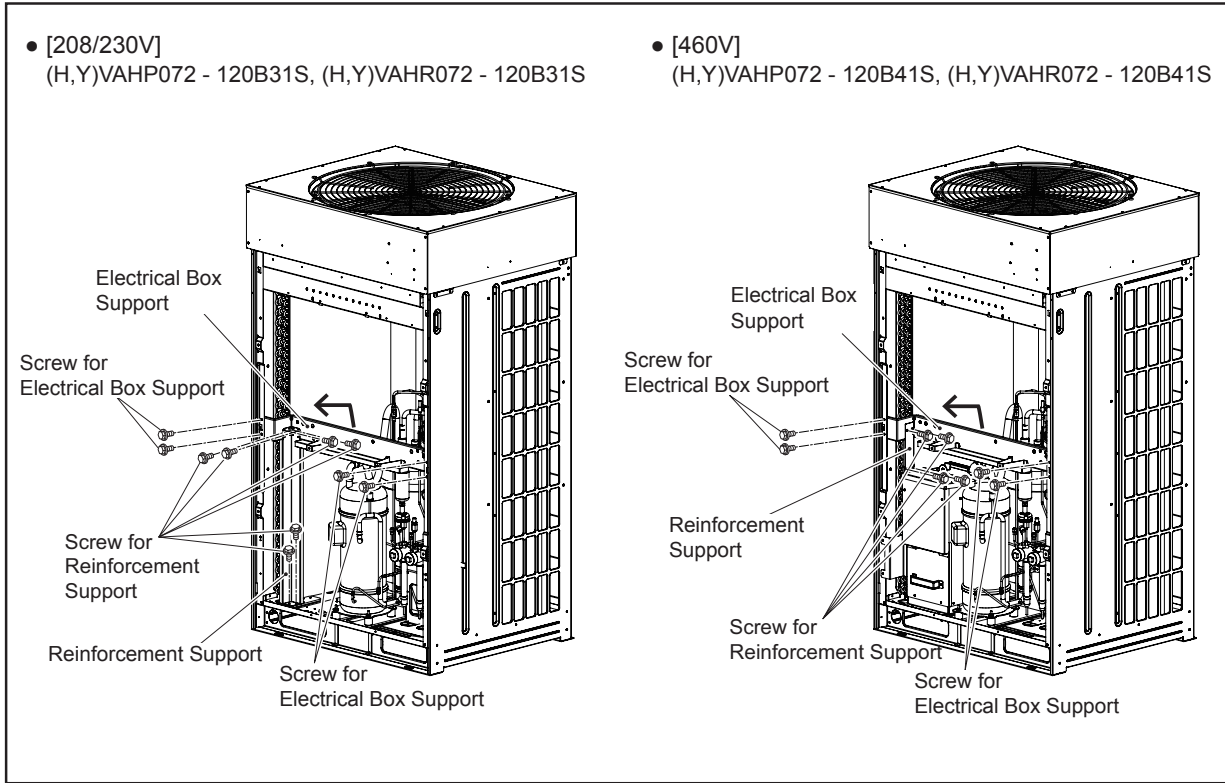
! WARNING

TURN OFF all power source switches.

4.1.6 Removing Electrical Box Support and Reinforcement Support

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove the electrical box according to Section 4.1.5 "Removing Electrical Box".
- (3) Remove the screws securing the reinforcement support.
[208/230V] (H,Y)VAHP072 - 120B31S, (H,Y)VAHR072 - 120B31S: 6 screws
[460V] (H,Y)VAHP072 - 120B41S, (H,Y)VAHR072 - 120B41S: 4 screws
- (4) Remove four screws securing the electrical box support.
- (5) Lift up the electrical box support. Remove the electrical box support from the hooks on the right and left sides and draw it forward in the direction of the arrow.

Tool	Phillips Screwdriver
------	----------------------



! WARNING

TURN OFF all power source switches.

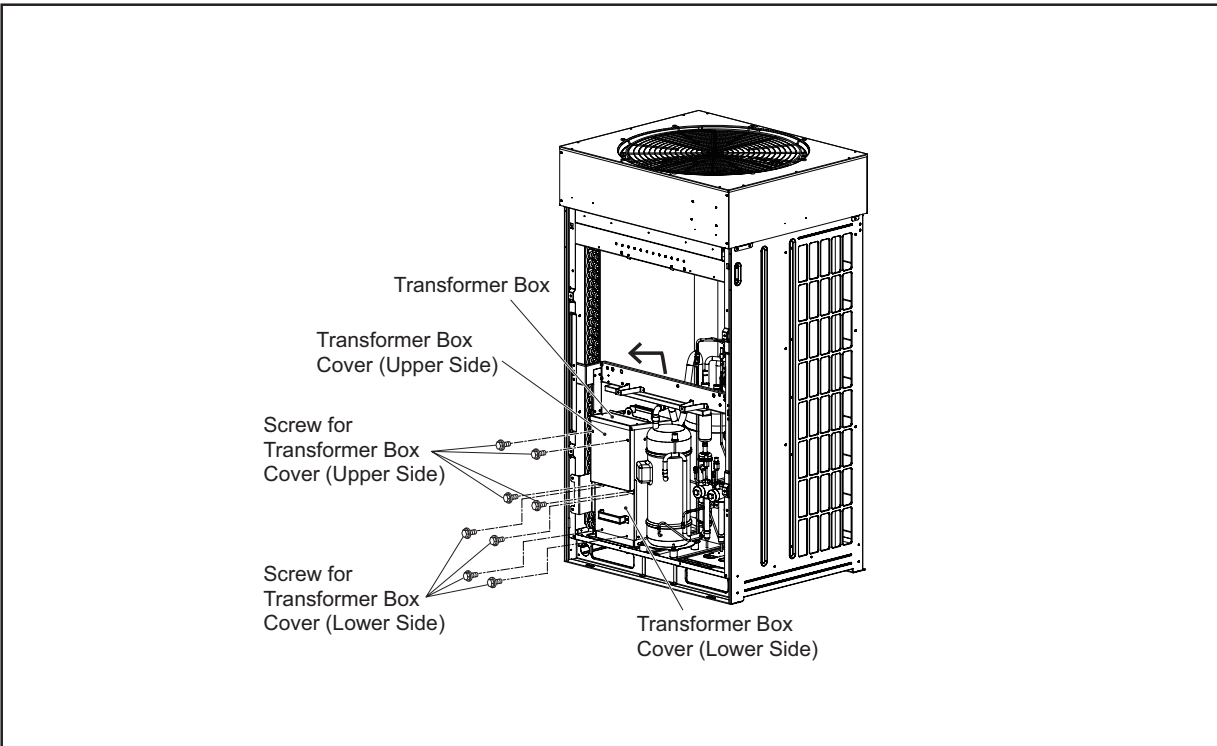
4.1.7 Removing Transformer Box Cover

[460V] (H,Y)VAHP***B41S and (H,Y)VAHR***B41S Only

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove four screws from the transformer box cover (upper side) and remove the transformer box cover (upper side).
- (3) Remove four screws from the transformer box cover (lower side) and remove the transformer box cover (lower side).

Tool

Phillips Screwdriver



! WARNING

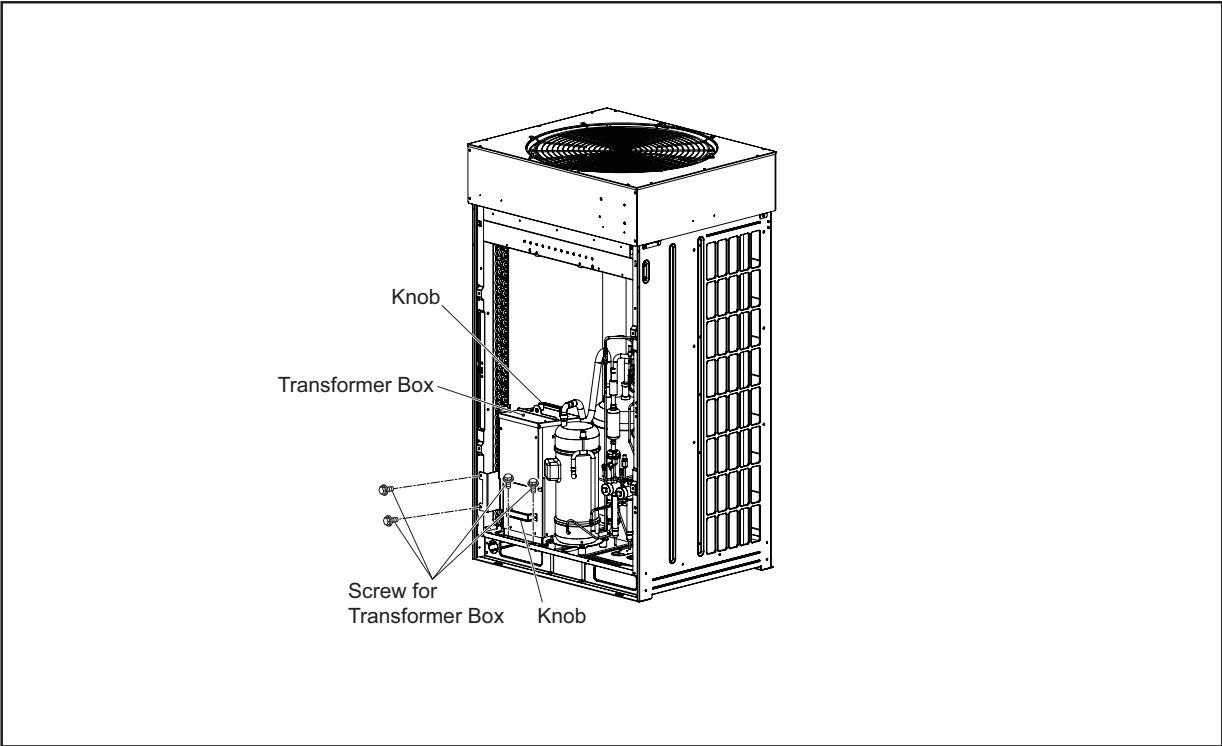
TURN OFF all power source switches.

4.1.8 Removing Transformer Box

[460V] (H,Y)VAHP***B41S and (H,Y)VAHR***B41S Only

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove the reinforcement support according to Section 4.1.6 "Removing Electrical Box Support and Reinforcement Support".
- (3) Remove four screws securing the transformer box.
- (4) Remove the transformer box by pulling the knobs of the front and upper sides of the transformer box and slide forward.

Tool	Phillips Screwdriver
------	----------------------



! WARNING

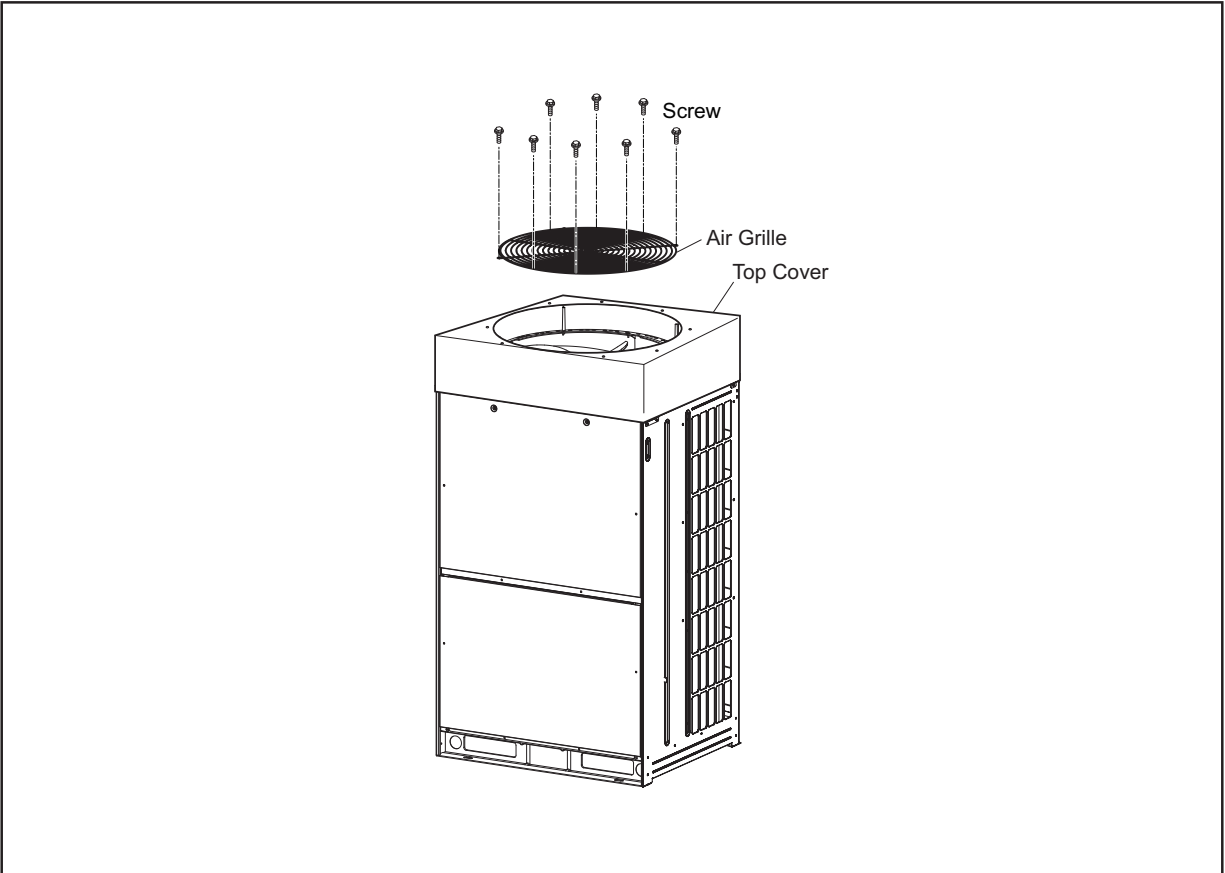
TURN OFF all power source switches.

4.1.9 Removing Air Grille

Remove eight screws securing the air grille.
Remove the air grille.

NOTE:
DO NOT apply excessive force to the top cover to avoid damage.

Tool	Phillips Screwdriver
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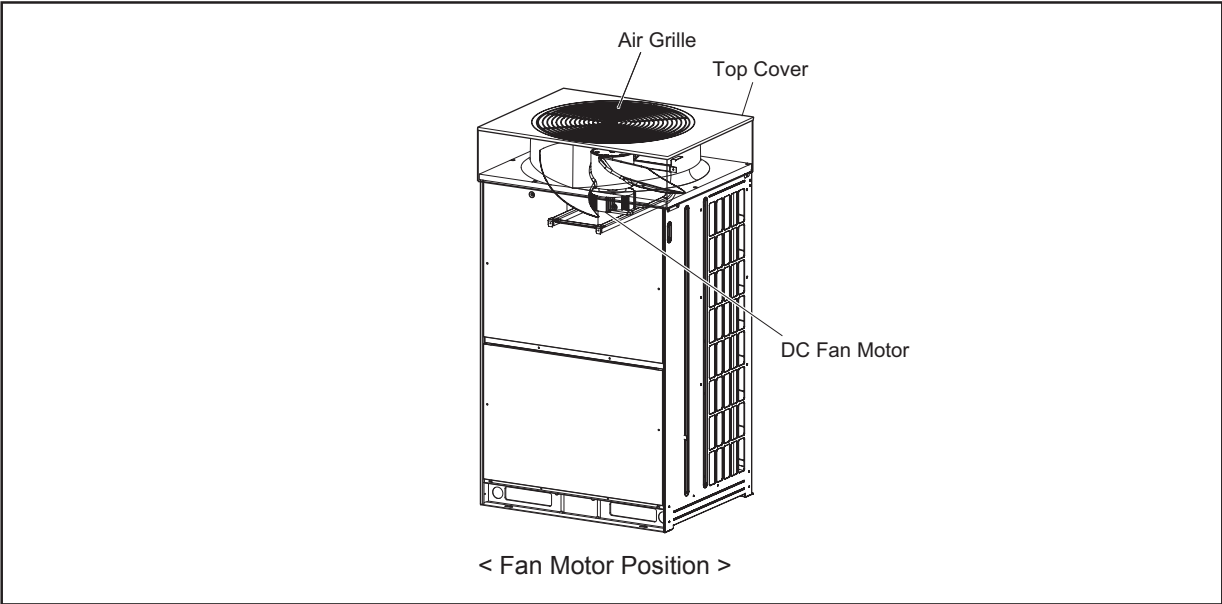
! WARNING

TURN OFF all power source switches.

4.1.10 Removing Outdoor Fan Motor

- (1) Remove the top cover with the air grille according to Section 4.1.2 "Removing Top Cover and Upper Cover".

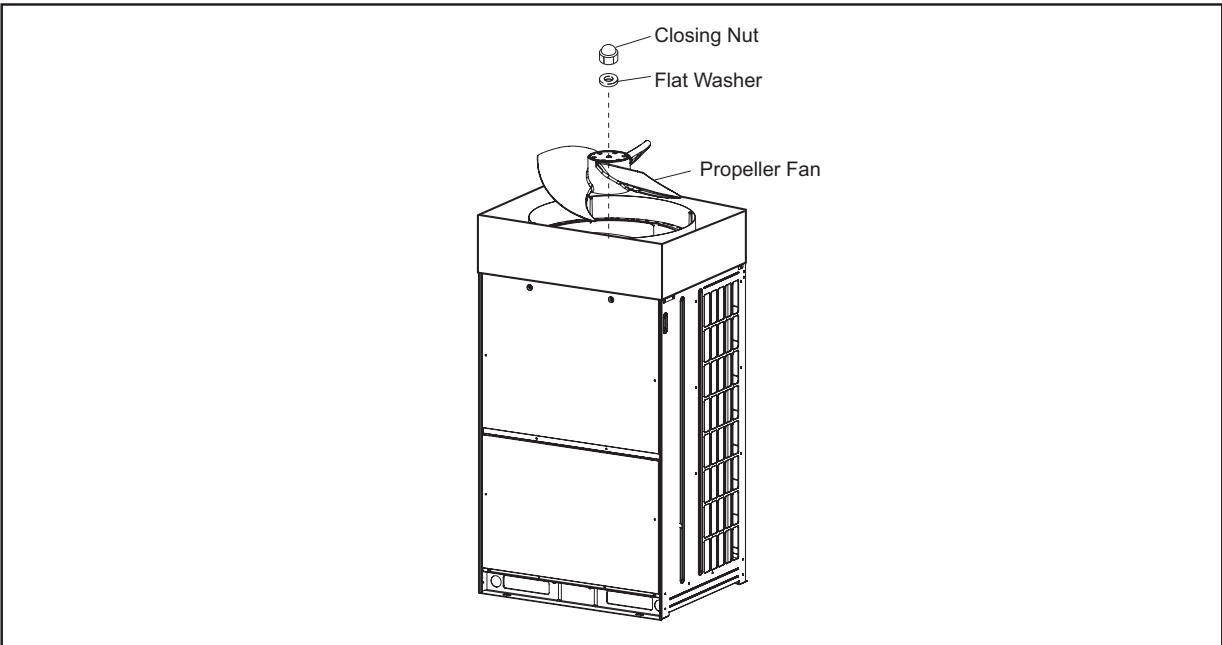
Tool	Adjustable Wrench, Puller, Phillips Screwdriver, Wire Cutter, Box Wrench
------	--



- (2) Remove the closing nut and the flat washer securing the propeller fan onto the motor shaft using a box wrench. Remove the propeller fan from the motor shaft. If it is difficult to remove the fan, use a puller.

NOTE:
DO NOT apply excessive force to the upper cover (plastic part) to avoid damage.

Tool	Adjustable Wrench, Puller, Phillips Screwdriver, Wire Cutter, Box Wrench
------	--



! WARNING

TURN OFF all power source switches.

- (3) Removing Wire
 - (a) Remove the service cover and the electrical box 1 cover according to Section 4.1.1 “Removing Front Service Cover” and Section 4.1.4 “Removing Electrical Box Cover”.
 - (b) Disconnect the connector for the motor in the electrical box 1.
- (4) Remove four screws securing the motor, and remove the motor.
 - (H,Y)VAHP072B(3,4)1S, (H,Y)VAHR072B(3,4)1S: M6
 - (H,Y)VAHP096, 120B(3,4)1S, (H,Y)VAHR096, 120B(3,4)1S: M5
- (5) When reassembling the outdoor fan, perform the procedures for removal in reverse.

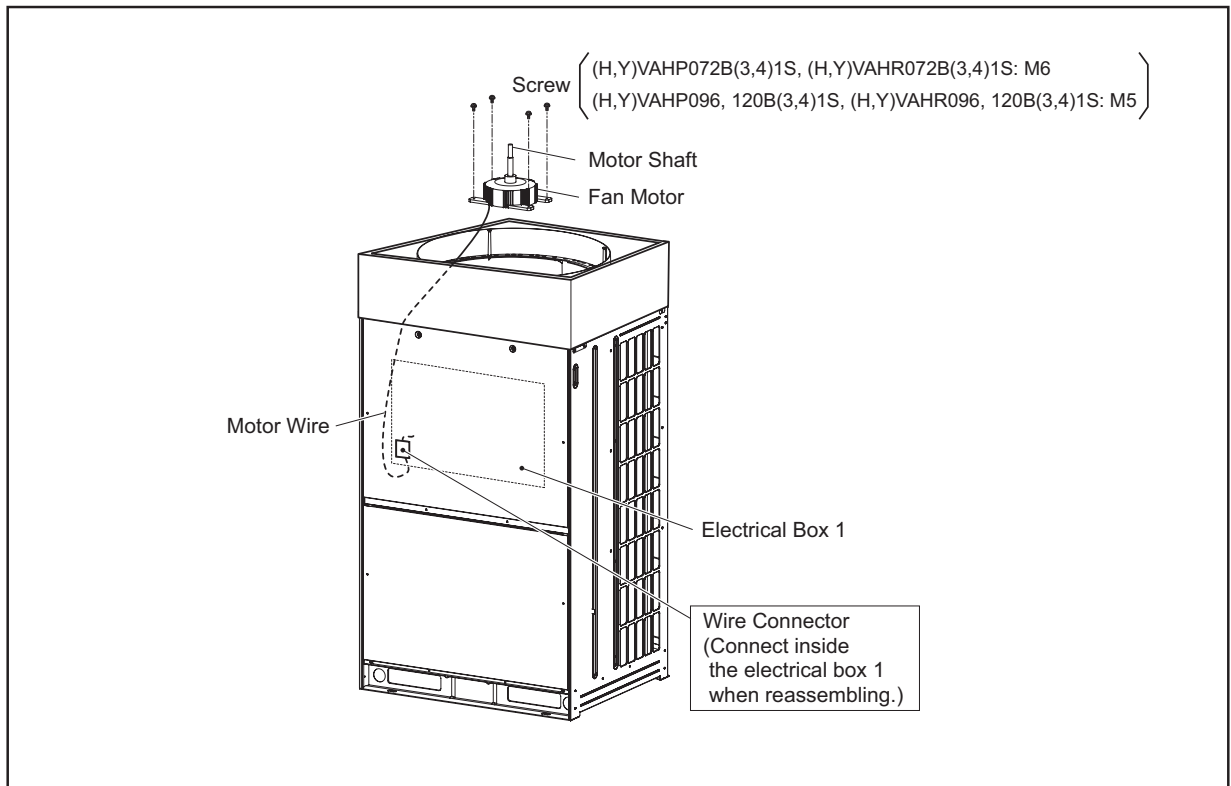
NOTES:

- 1. Fix the motor wire onto the motor clamp with the plastic tie to avoid contact with the propeller fan.
- 2. When mounting the propeller fan, place and push the propeller fan with matching the mark (⊖ with the cut out part of the motor shaft). Firmly install the propeller fan with a 22.1 lbf·ft (30N·m) torque after the head of the fan shaft comes up.

Torque for Mounting Propeller Fan
22.1 lbf·ft (30N·m)

- 3. Connect the motor wire connector with the wire connector in electrical box 1.
- (6) Check that the gap between the propeller fan and the upper cover is even by observing from the upper cover top. Also check that there is no noise caused by the propeller fan coming in contact with the upper cover during the propeller fan operation.

Tool	Adjustable Wrench, Wire Cutter, Phillips Screwdriver, Puller
------	--



! WARNING

TURN OFF all power source switches.

4.1.11 Removing Compressor

Recover the refrigerant by operating the compressor.

In other instances, recover the refrigerant before starting the work, and turn OFF the power source of the unit.

NOTE:

Do NOT touch the compressor or the high pressure refrigerant piping during operation or when immediately stopping the unit because of the high temperature.

When removing the wiring or reassembling the compressor, be aware not to let the wiring come in contact with the compressor or the refrigerant piping.

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
If the outdoor unit is installed close to the wall, remove the refrigerant piping and move the outdoor unit away from the wall.
- (2) Release the tack for the soundproof cover of the compressor and remove the soundproof cover.
- (3) Remove the Td thermistor on top of the compressor.

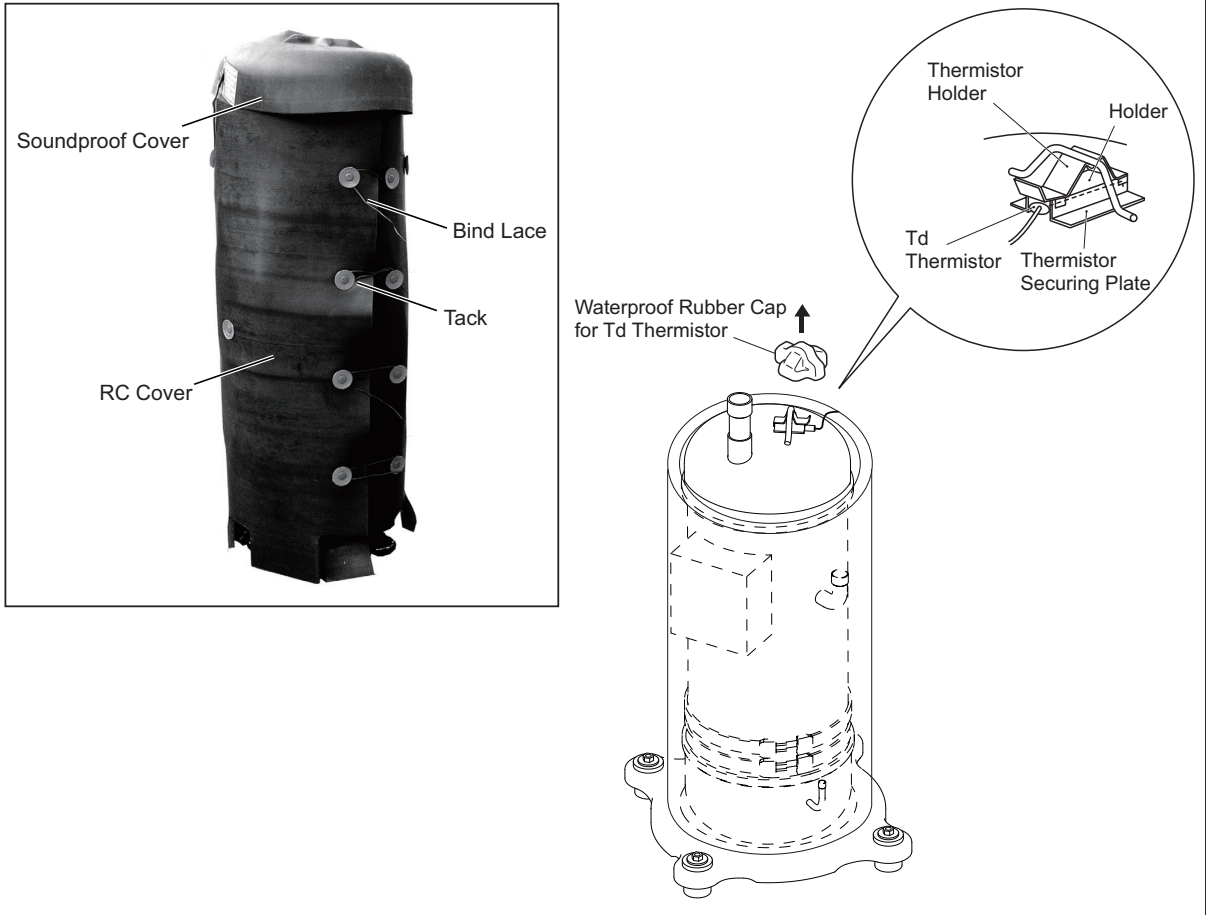
NOTE:

The thermistor holder, thermistor securing plate, and the RC cover are used again when reassembling. Keep them in a container so that the parts are stored correctly.

Tool	Long-nose Pliers
------	------------------

NOTE:

When removing the compressor, the electrical box located above the compressor may be disturbed when removing the RC cover. So the electrical box should be removed before starting work. If not, the inner aluminum sheet may be damaged when removing the RC cover.



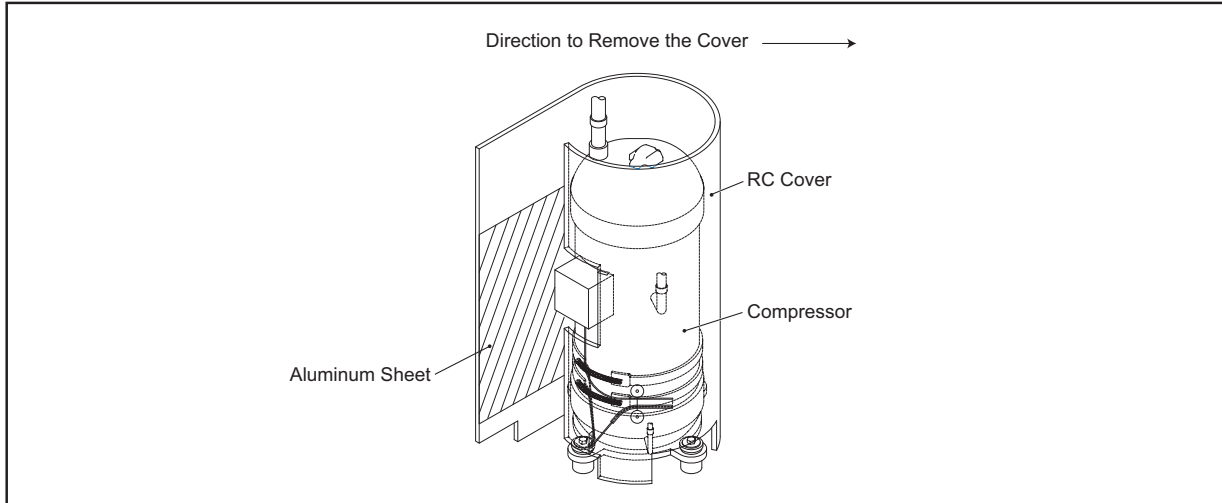
! WARNING

TURN OFF all power source switches.

- (4) Release the bind lace of the RC cover for removal.

NOTES:

1. When removing the RC cover, be careful not to deform the piping around the cover. The braze joint may become damaged due to pipe deformation.
2. When removing the compressor, be careful not to be injured by the sheet metal edge or the heat exchanger fins.
3. The aluminum sheet is conductive. If the aluminum sheet is damaged, it may lead to a malfunction because of contact with electrical wiring. To avoid such a failure, check the RC cover conditions when repair is complete.

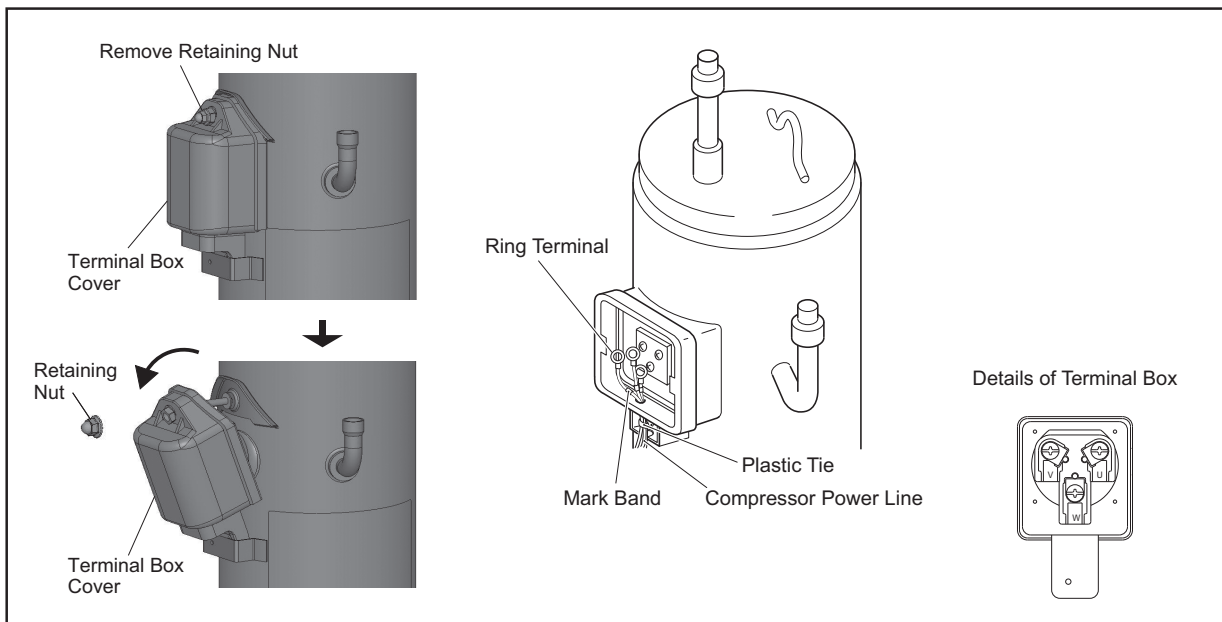


- (5) Remove the terminal cover for the compressor and disconnect the wiring to the compressor terminals. Match the terminal numbers with the mark band numbers when reassembling. If the wiring is connected incorrectly, the compressor may be damaged due to reverse rotation.

NOTES:

1. When replacing the compressor, check for the ring terminal condition. If the ring terminal is damaged or something appears wrong with it, replace it with a new one.
2. Secure the lead wire firmly with plastic ties.
3. Retighten the compressor screws after replacing.

Tool	Phillips Screwdriver, Adjustable Wrench
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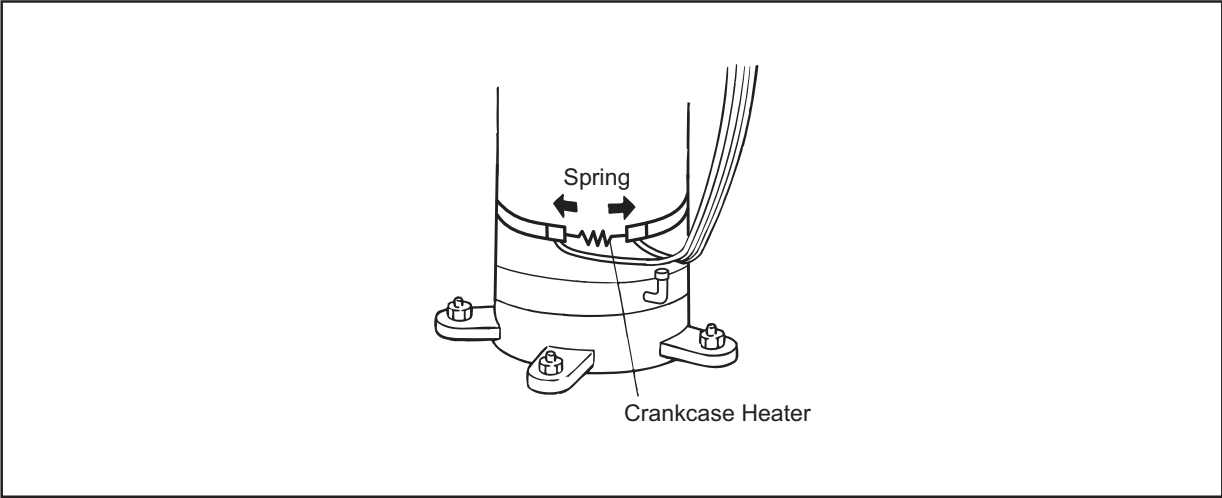


! WARNING

TURN OFF all power source switches.

- (6) Release the spring to remove the crankcase heater.

Tool	Long-nose Pliers
------	------------------



! WARNING

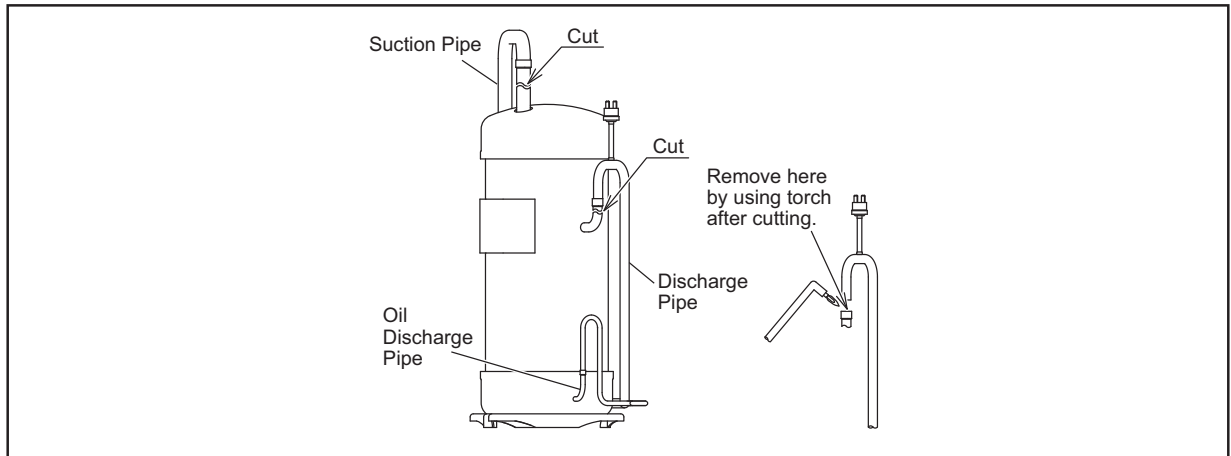
TURN OFF all power source switches.

- (7) Disconnect the discharge and suction pipes from the compressor. Check that the pressure inside the pipe is equal to the atmospheric pressure. Cut the pipe at the closer position to the compressor from the braze joint. After cutting, remove the pipe from the brazing part of the compressor.

NOTES:

1. All the pipes are connected by brazing. When applying the torch flame to the pipe connections, the oil adhered inside the pipe may burn. When brazing, clear the flammable materials from around the compressor.
2. Torch work while system is under pressure is very dangerous. Make sure to cut the pipes first before applying heat from a torch.

Tool	Torch, Pipe Cutter
------	--------------------

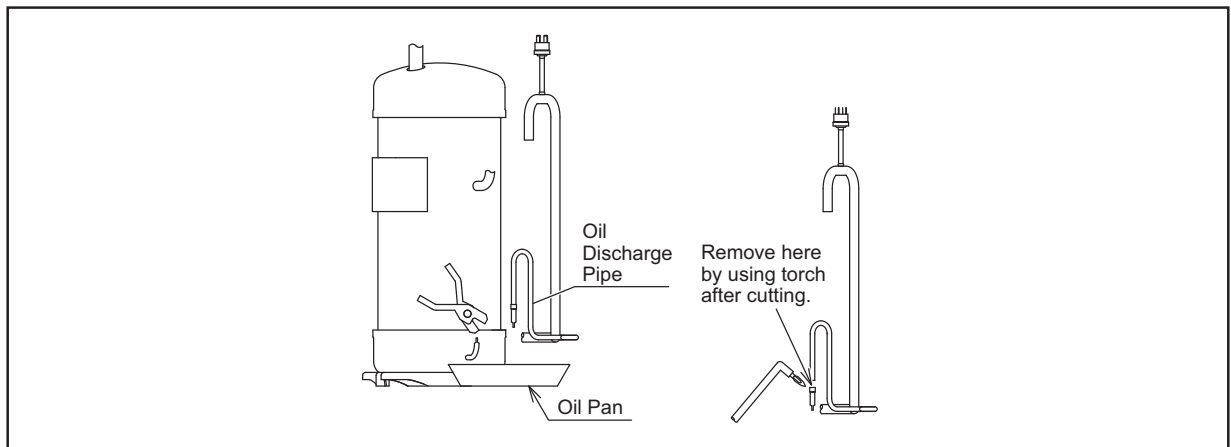


- (8) Disconnect the oil discharge pipe from the compressor. When disconnecting, pinch and cut the pipe at the closer position to the compressor from the braze joint, so that the refrigerant oil remaining inside the compressor does not spill from the oil discharge pipe. Before disconnecting the oil discharge pipe at the system piping side, check that the oil at the brazing part is completely removed.

NOTES:

1. If the oil discharge pipe is disconnected without performing the above procedure (for example, applying the torch directly to the braze joint), the refrigerant oil will spill from the oil discharge pipe can catch fire. Make sure to follow the procedures for safety.
2. When disconnecting the oil discharge pipe, use an oil pan in case the remaining refrigerant oil spills.
3. **DO NOT** throw out the oil that is collected in the oil pan.
Oil quantity is measured afterward.

Tool	Pincher, Torch, Oil Pan
------	-------------------------



! WARNING

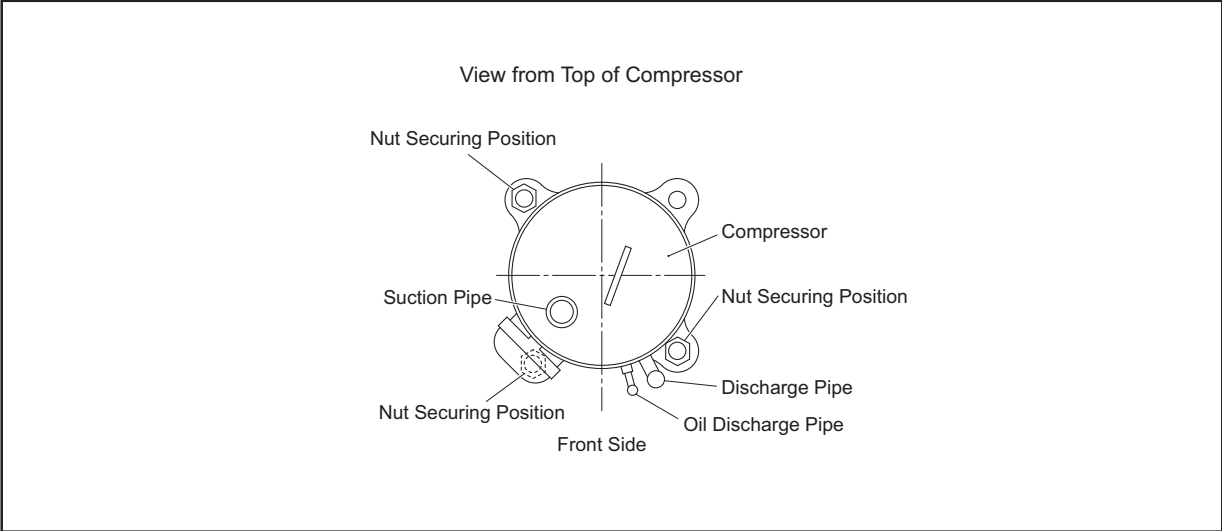
TURN OFF all power source switches.

- (9) Remove three nuts securing the compressor and remove the compressor.

NOTES:

- 1. When removing the compressor, be aware that it does not come in contact with surrounding pipes. If contacted, pipes may become deformed.
- 2. Be aware of potential injuries from sheet metal edges when working with sheet metal.
- 3. When removing the compressor secured with the oil discharge pipe, seal the pipe ends with tape to avoid spilling any remaining refrigerant oil spill.
- 4. Do not expose the refrigerant cycle to the environment for a long period in order to avoid foreign particles in the water.
After removing the compressor, mount the new one quickly.
- 5. When removing the compressor, remove the electrical box and transformer box (460V only) located above the compressor to make the work easier. The box wrench (13/32 inch (10mm)) is required to remove the nuts securing the compressor.

Tool	Adjustable Wrench, Box Wrench, Phillips Screwdriver,
------	--



! WARNING

TURN OFF all power source switches.

(10) Take out the remaining refrigerant oil in the compressor from the discharge pipe, and measure the oil quantity. This procedure should be performed for the constant speed compressor or the inverter compressor replacement.

NOTES:

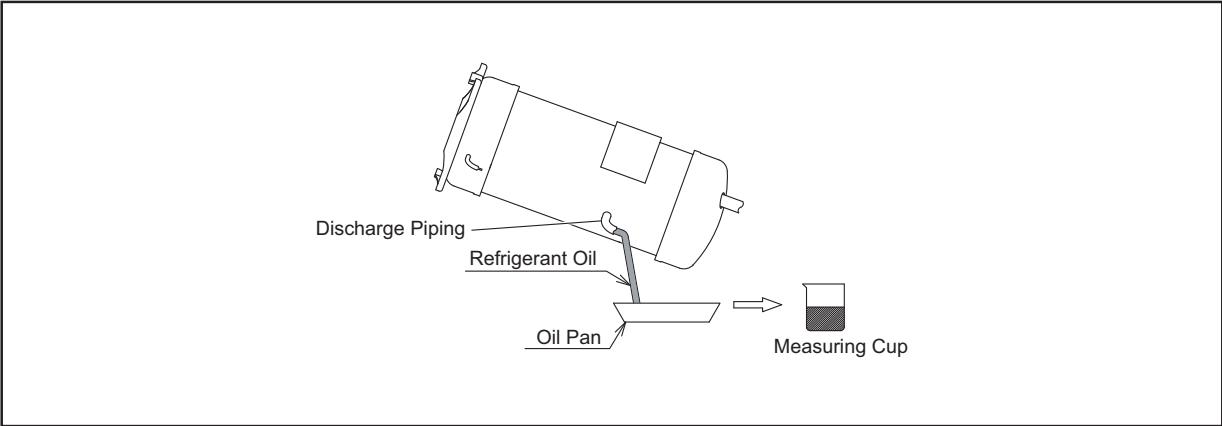
1. Additional refrigerant oil charge is required if:
remaining refrigerant oil quantity in the old compressor is more than the pre-charged refrigerant oil in the new compressor
2. No additional refrigerant oil charge is required if:
remaining refrigerant oil quantity in the old compressor is less than the pre-charged refrigerant oil in the new compressor
3. The recharged quantity of the refrigerant oil to the cycle is calculated as follows:
(Remaining quantity in the old compressor + Collected quantity in Section 4.1.11 (8) + 0.05 gal. (200cc)*) - (Initial charged quantity in the compressor for each model)

Compressor	Initial Charged Refrigerant Oil
For Inverter (DA65PHD)	0.29 gal. (1100cc)
For Constant Speed (E655DH, DA65PHC)	0.13 gal. (500cc)

* 0.05 gal. (200cc): This value is considered not to be removed from the chamber.

4. If the refrigerant oil is contaminated, exchange all with new refrigerant oil.

Tool	Oil Pan, Measuring Cup
------	------------------------



! WARNING

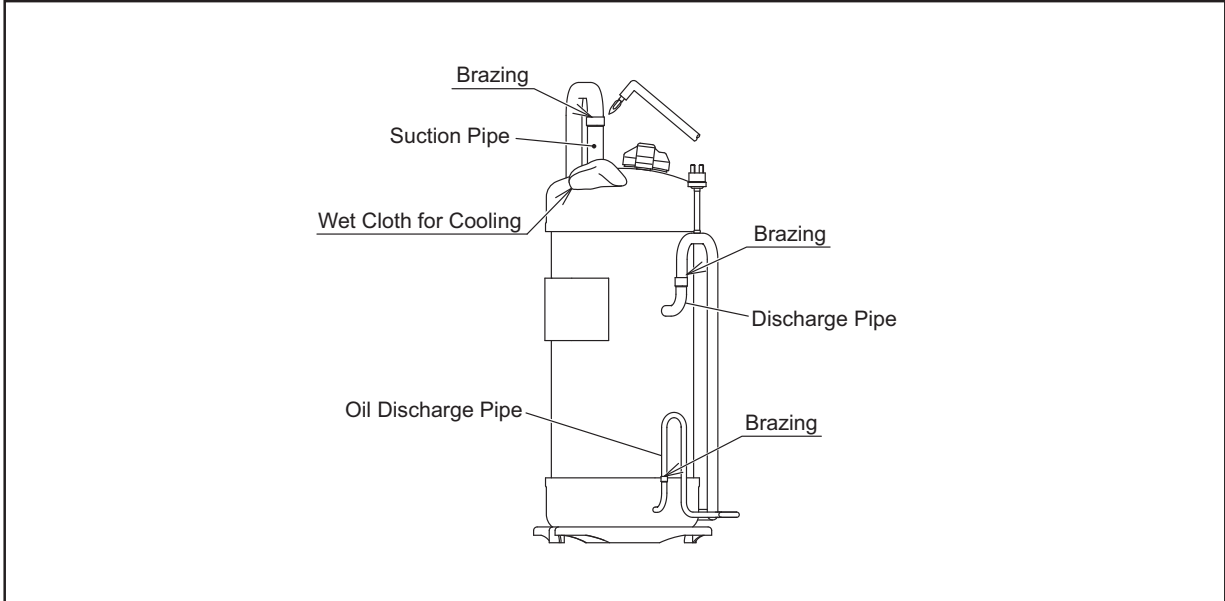
TURN OFF all power source switches.

- (11) Mount the new compressor. When attaching the nut at the front side, pay attention not to deform the discharge piping.
Perform the brazing according to the following order:
(a) Oil Discharge Pipe
(b) Discharge Pipe
(c) Suction Pipe

NOTES:

1. When mounting the new compressor on the base, pay attention not to come in contact with piping. If contacted, piping may become deformed.
2. The new compressor should be mounted with the cap. Remove the cap just before starting the brazing work.
3. Connect the charging hose with the access port at the low pressure side to release pressure.
4. When brazing the suction pipe, make sure that the connecting part is firmly inserted into the compressor. Keep compressor piping cool using a wet cloth in order to avoid bringing the brazing material into the compressor.

Tool	Torch, Wet Cloth, Plier
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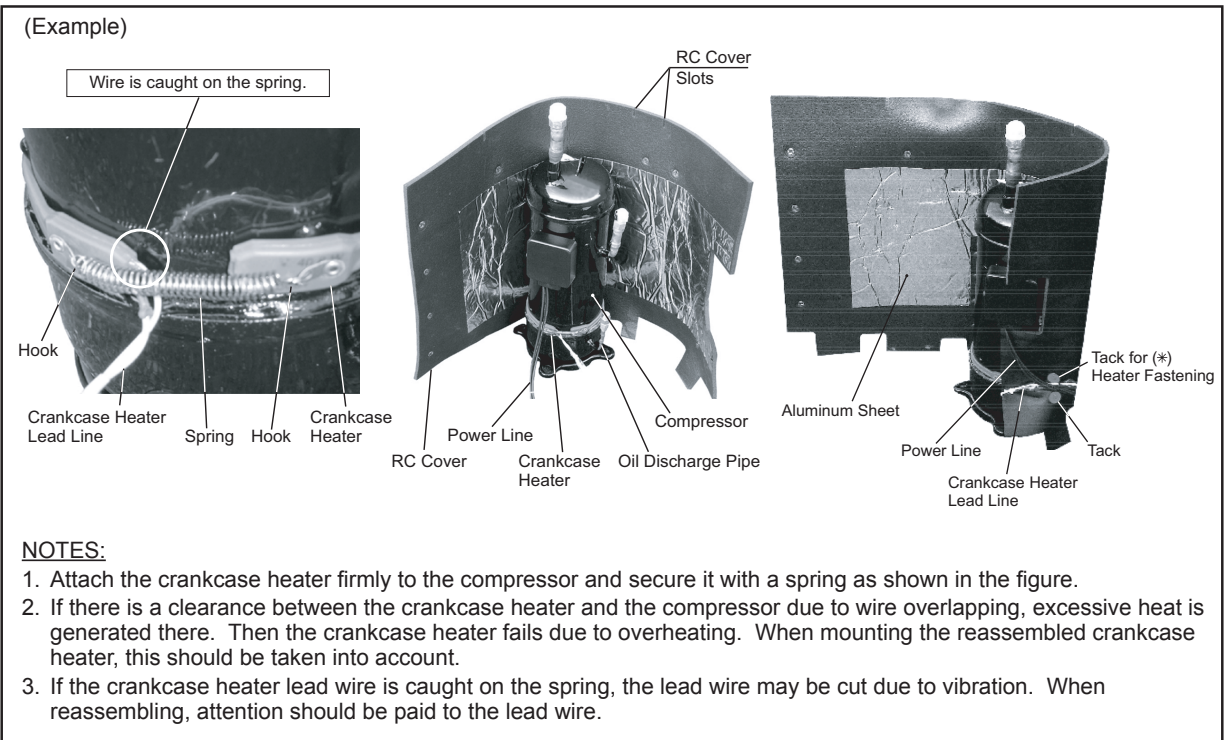
! WARNING

TURN OFF all power source switches.

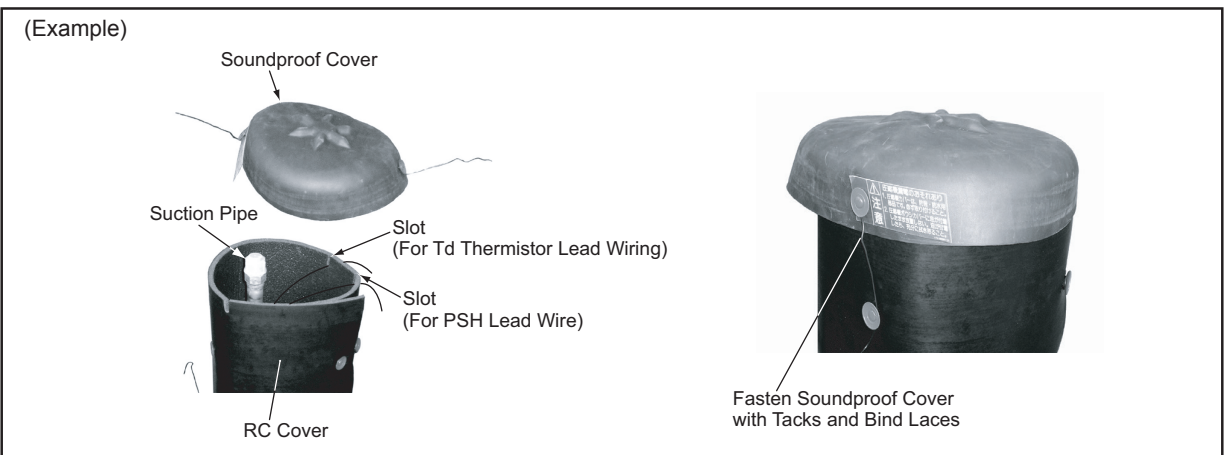
- (12) Wind the crankcase heater around the compressor.
Crankcase heater mounting position: Back to the original setting (Refer to Section 4.1.11 (6))
- (13) Attach the RC cover.
- (14) Reconnect all wires in the original positions.
 - (a) The crankcase heater lead wire is fixed inside the RC cover with the tack(*) without coming in contact with the power line and the piping.
 - (b) Draw the lead wire for the high pressure switch (PSH) and attach the Td thermistor. Pull out the wires from the slotted part at the top of the RC cover.

NOTES:

1. If the power line or the crankcase heater lead line comes in contact with a high temperature part such as oil discharge pipe or compressor chamber, the wire may be cut or fired. Protect the wire from overheating and protect the edge with the RC cover.
2. Check that the high pressure switch (PSH) does not contact with the RC cover aluminum sheet.



- (c) Fasten the cover firmly with two tacks to keep water from entering the clearance between the RC cover and the soundproof cover.



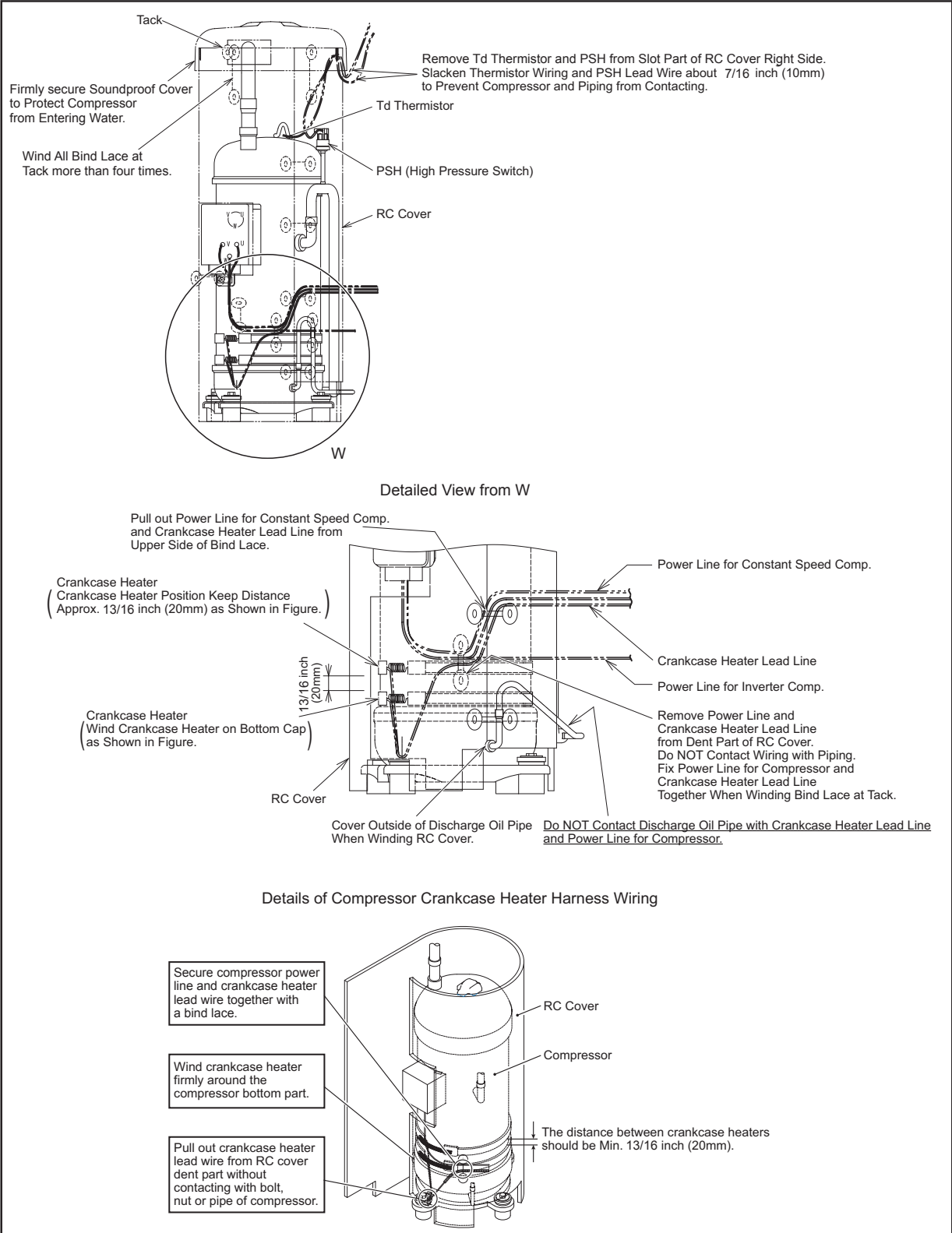
! WARNING

TURN OFF all power source switches.

(15) Perform the final check for wiring conditions referring to the drawing below.

NOTE:

Ensure that all wires do not come in contact with the compressor, piping or plate edges. If there are contacts, broken wires or a fire can occur.



! WARNING

TURN OFF all power source switches.

4.1.12 Replacing Refrigerant Oil

4.1.12.1 Replacing Refrigerant Oil (No Blockage in Return Oil Circuit)

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) < (H,Y)VAHP072 - 120B(3,4)1S (Heat Pump System) >
Close (A) high/low pressure gas stop valve and (C) liquid stop valve.
< (H,Y)VAHR072 - 120B(3,4)1S (Heat Recovery System) >
Close (A) high/low pressure gas stop valve, (B) low pressure gas stop valve and (C) liquid stop valve.
- (3) Recover the refrigerant in the outdoor unit from (E) low pressure access port and (F) high pressure access port. Ensure that the pressure does not increase at this time.

NOTE:

If the pressure increases, recover all the refrigerant in the system.

- (4) Connect the charge hose (for R410A) to (D) access port for recovering refrigerant oil.
- (5) Charge nitrogen (22 psi (0.15 MPa)) from (E) low pressure access port and recover the refrigerant oil in the accumulator by applying pressure. (approx. 20 minutes)

NOTE:

Ensure that the pressure for (F) high pressure access port is NOT abnormal when nitrogen is charged.

- (6) Stop charging nitrogen after refrigerant oil has been completely recovered.
Perform vacuuming from (E) low pressure access port and add the same quantity as the collected refrigerant oil.

NOTE:

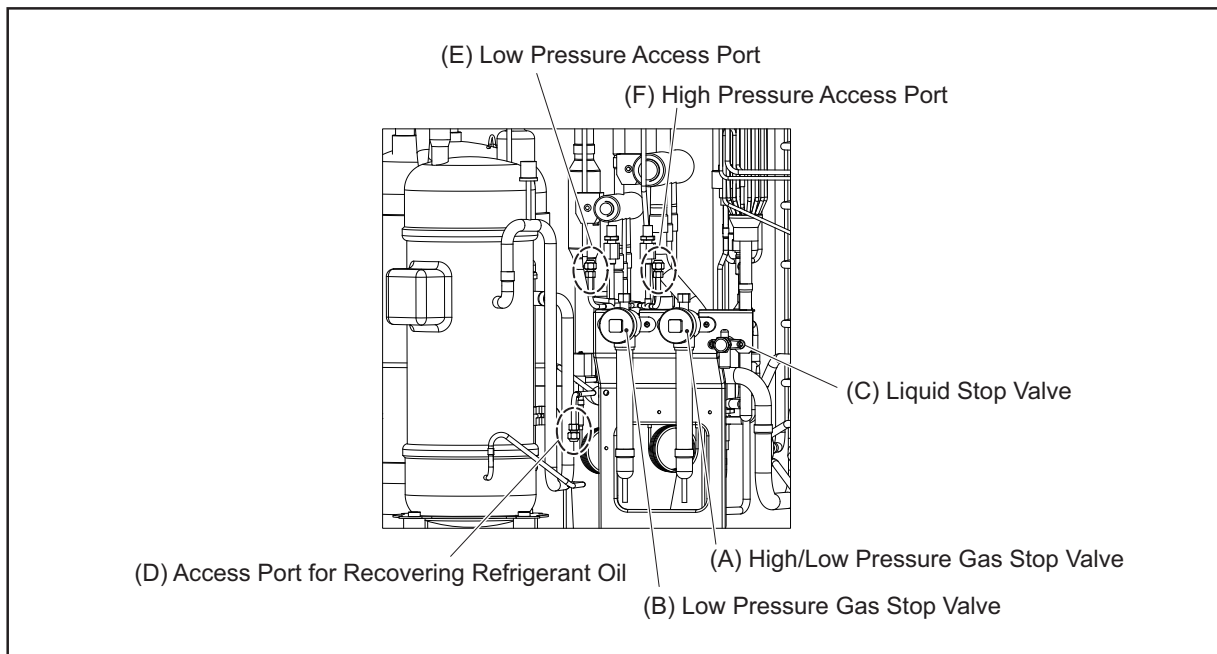
When the collected refrigerant oil is 0.79 gal. (3L) or less, a blockage may exist in the return oil circuit. In that case, replace the return oil circuit according to Section 4.1.12.2 "Replacing Refrigerant Oil (Blockage in Return Oil Circuit) and Replacing Return Oil Circuit".

- (7) When the procedures above are completed, perform the vacuuming again from (E) low pressure access port and recharge the refrigerant. After recharging, open the stop valves.

NOTE:

1. Use a clean charging hose.
2. Charge the refrigerant oil in a short amount of time (within approximately 20 minutes).
Use a container with a small opening so that the refrigerant oil does not absorb the moisture from the atmosphere.

Tool	Adjustable Wrench
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! WARNING

TURN OFF all power source switches.

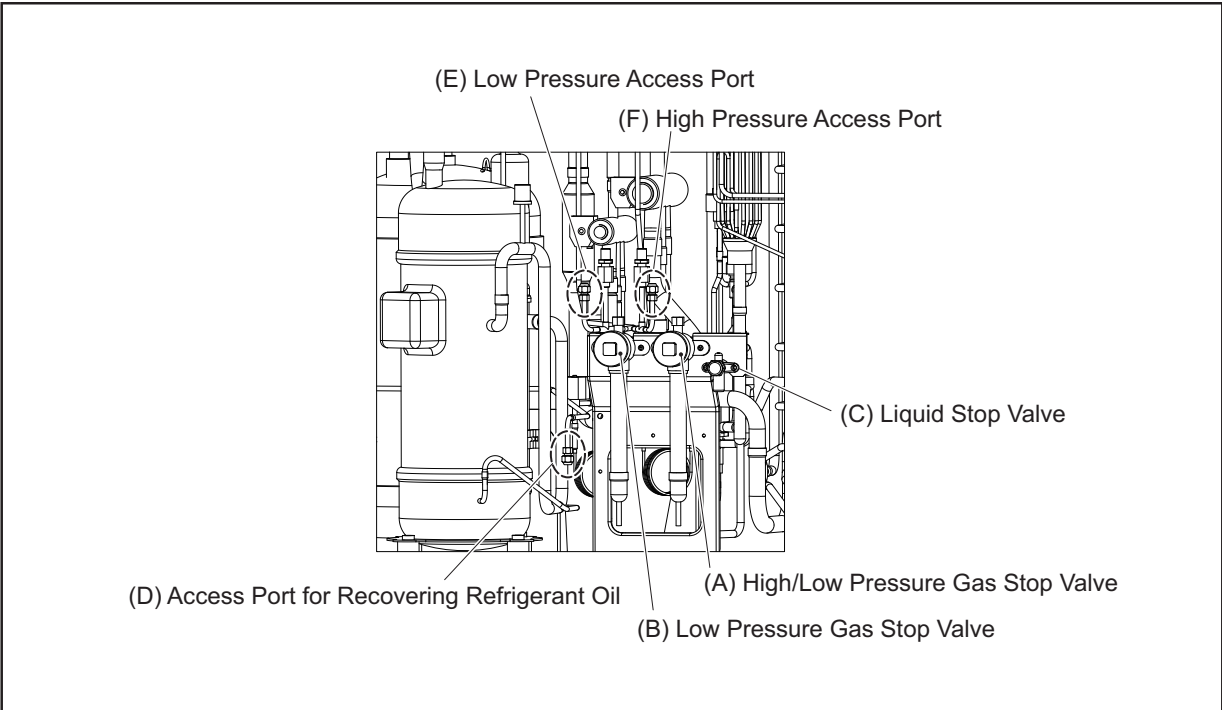
4.1.12.2 Replacing Refrigerant Oil (Blockage in Return Oil Circuit) and Replacing Return Oil Circuit

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove the electrical box, wirings, electrical box support and transformer box (460V only) according to Section 4.1.5, 4.1.6 and 4.1.8.
- (3) < (H,Y)VAHP072 - 120B(3,4)1S (Heat Pump System) >
Close (A) high/low pressure gas stop valve and (C) liquid stop valve.
< (H,Y)VAHR072 - 120B(3,4)1S (Heat Recovery System) >
Close (A) high/low pressure gas stop valve, (B) low pressure gas stop valve and (C) liquid stop valve.
- (4) Recover the refrigerant in the outdoor unit from (E) low pressure access port and (F) high pressure access port. Ensure that the pressure will not increase at this time.

NOTE:

If the pressure increases, recover all the refrigerant in the refrigerant cycle.

Tool	Adjustable Wrench
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! WARNING

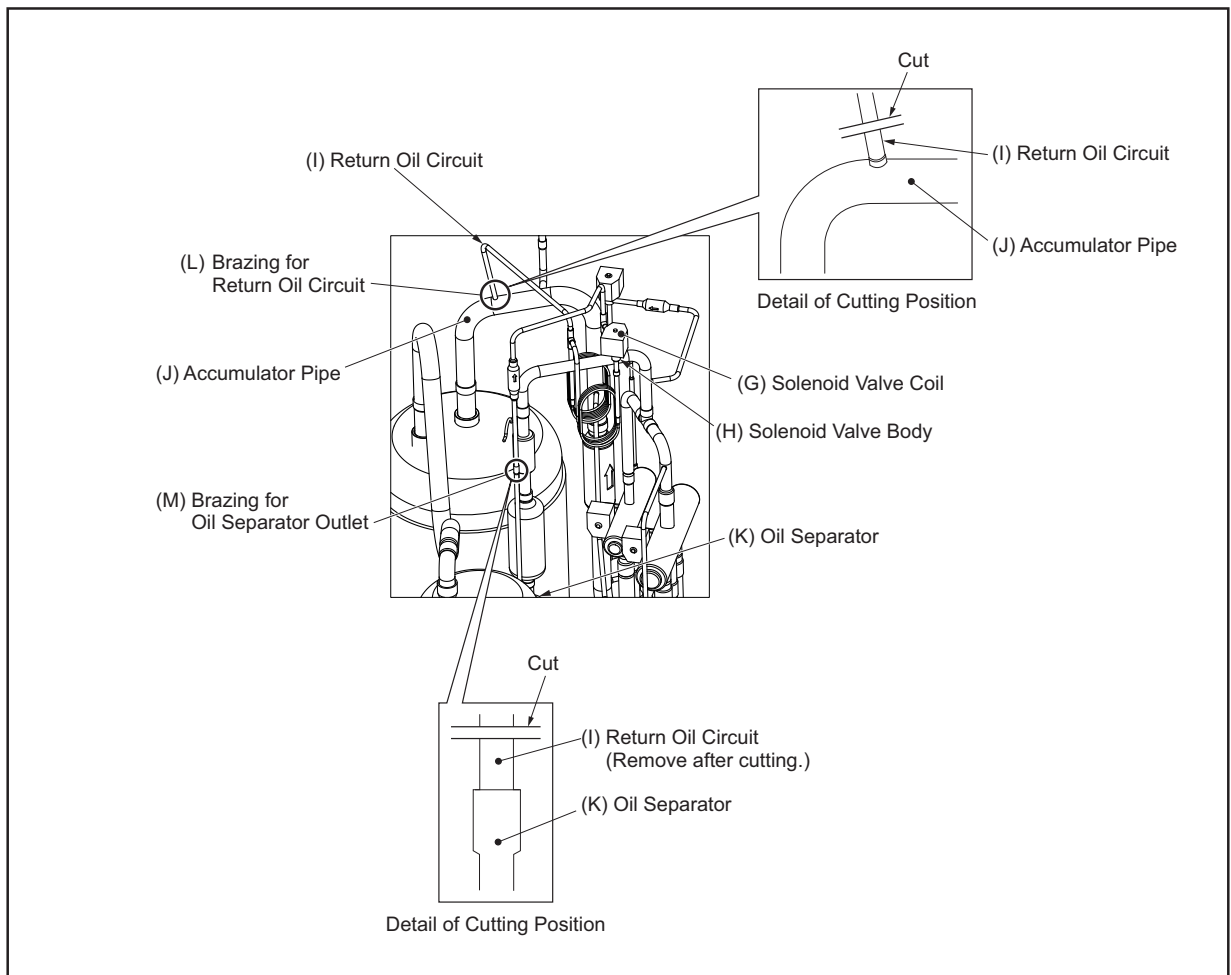
TURN OFF all power source switches.

- (5) Remove (G) solenoid valve coil connected to (H) solenoid valve body of the return oil circuit according to Section 4.1.13.2 "Removing Solenoid Valve Coil".
- (6) Cut off (I) return oil circuit connecting with (J) accumulator pipe at the cutting position indicated in the figure below.
After that, remove remaining return oil circuit inside of (L) brazing for return oil circuit.
- (7) Cut (I) return oil circuit off from (K) oil separator outlet port at the point indicated in the figure.
Remove (I) return oil circuit from the unit. Then, remove (M) brazing for oil separator outlet.

NOTES:

1. When cutting (I) return oil circuit off, cut the closer part to (I) return oil circuit to prevent the refrigerant oil remaining in (I) return oil circuit from spilling out.
2. When cutting (I) return oil circuit off, do not use a saw.
3. After cutting (I) return oil circuit off, remove the cut-off piping from (M) brazing for oil separator outlet.
4. When removing (L) brazing for return oil circuit at the upper part of the return oil circuit and (M) brazing for oil separator outlet, refrigerant oil may come out. Prepare the oil pan before the work to receive the refrigerant oil.

Tool	Adjustable Wrench
------	-------------------



! WARNING

TURN OFF all power source switches.

- (8) Cover the hole of (L) brazing for return oil circuit using tape. Connect a charging hose to (M) brazing for oil separator outlet. Then, charge nitrogen (22 psi (0.15 MPa)) from the upper union of (E) low pressure access port, and recover refrigerant oil in the (K) oil separator, applying pressure.

NOTE:

In an instance where the unit has two return oil circuits and two oil separators (Example: (H,Y)VAHP120B31S), collect the refrigerant oil from one oil separator and then from the other.

- (9) Stop charging nitrogen after the refrigerant oil has completely been collected and connect the return oil pipe. After connecting the pipe, perform the nitrogen pressurization from (E) low pressure access port. During the work, check that the oil does not spill out from the flare nut connection and braze joint.

- (10) Perform vacuuming from (E) low pressure access port and add the same quantity of oil that was collected from (D) access port for recovering refrigerant oil.

NOTE:

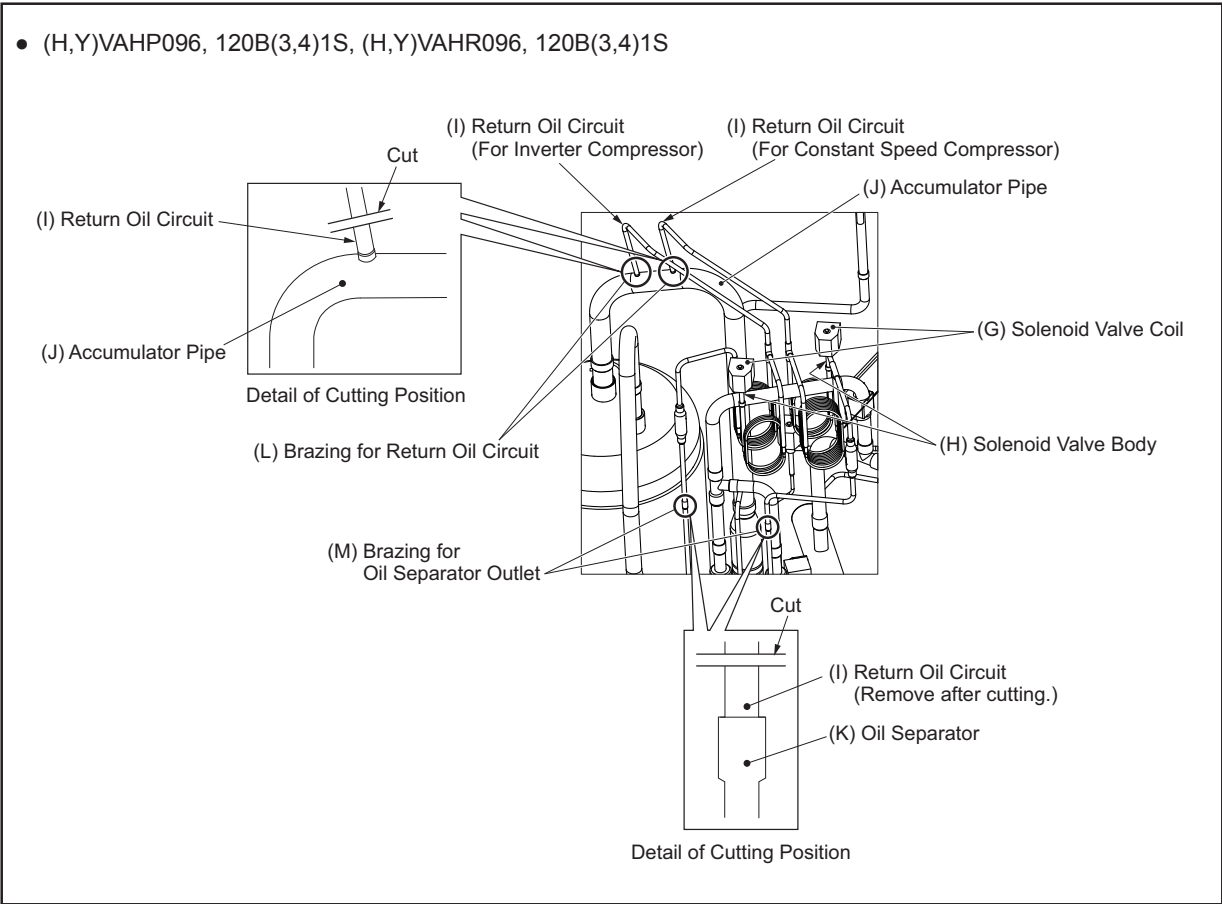
If replacing the return oil circuit only, procedures (8) and (9) are not required.

- (11) When the procedures have been completed, perform vacuuming again from (E) low pressure access port and recharge the refrigerant. After recharging, open the stop valves.

NOTES:

1. Use a clean charging hose.
2. Charge the refrigerant oil in a short amount of time (within approximately 20 minutes). Use a container with a small opening so that the refrigerant oil will not absorb moisture from the atmosphere.

Tool	Adjustable Wrench
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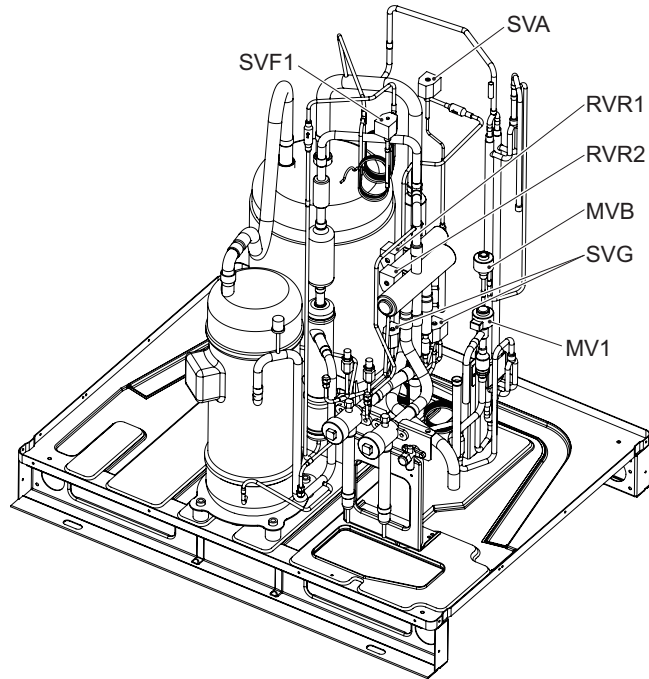
! WARNING

TURN OFF all power source switches.

4.1.13 Removing Coils

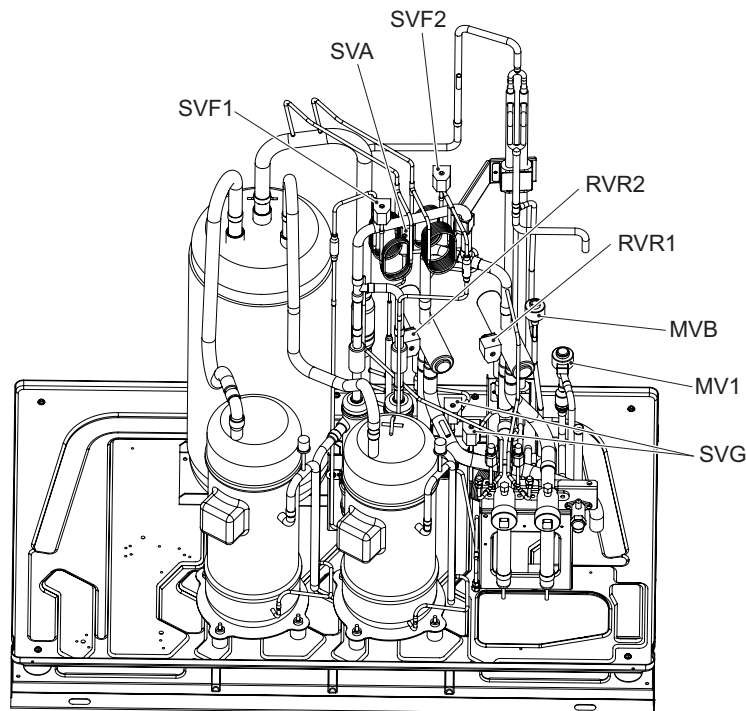
The following figures indicate positions of coils.

- (H,Y)VAHP072B(3,4)1S, (H,Y)VAHR072B(3,4)1S



- SVF1: Solenoid Valve Coil
- SVF2: Solenoid Valve Coil
- SVA: Solenoid Valve Coil
- SVG: Solenoid Valve Coil
- RVR1: Reversing Valve Coil
- RVR2: Reversing Valve Coil
- MV1: Expansion Valve Coil
- MVB: Expansion Valve Coil

- (H,Y)VAHP096, 120B(3,4)1S, (H,Y)VAHR096, 120B(3,4)1S



< Coil Position >

! WARNING

TURN OFF all power source switches.

4.1.13.1 Removing Expansion Valve Coil (MV1, MVB)

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Turn the expansion valve coil in a counterclockwise direction as shown in the figure. Remove the expansion valve coil bracket from the expansion valve slot. Then, pull the coil upward.
 - Pay attention to the thermistor wiring when removing the expansion valve coil.

NOTE:

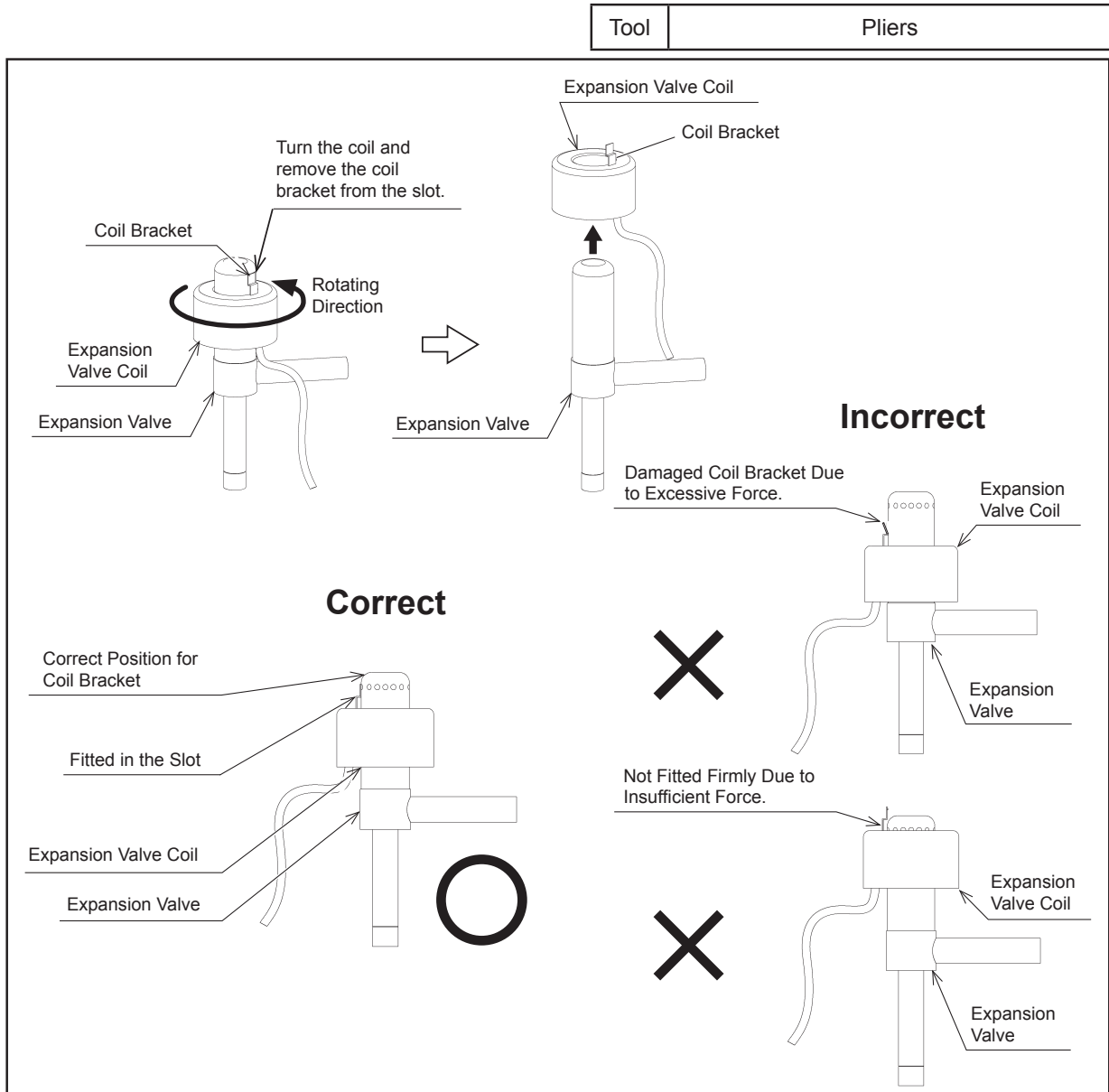
Make sure to remove the coil bracket from the coil before pulling it out. If not, your hand may hit against the piping. Follow the above procedures carefully to avoid any injuries.

- (3) For replacing the expansion valve coil, press the coil into the expansion valve slot by turning the coil. If an excessive force is applied to the coil, the coil bracket may become damaged. As a result, the coil cannot be fixed at the correct position as shown in the figure.

- Any slots on the expansion valve inner surface are acceptable to fix.

NOTE:

The expansion valve coil should be tightened to 44.3 lbf-ft (60 N·m) or less. After securing, check the expansion valve coil position.



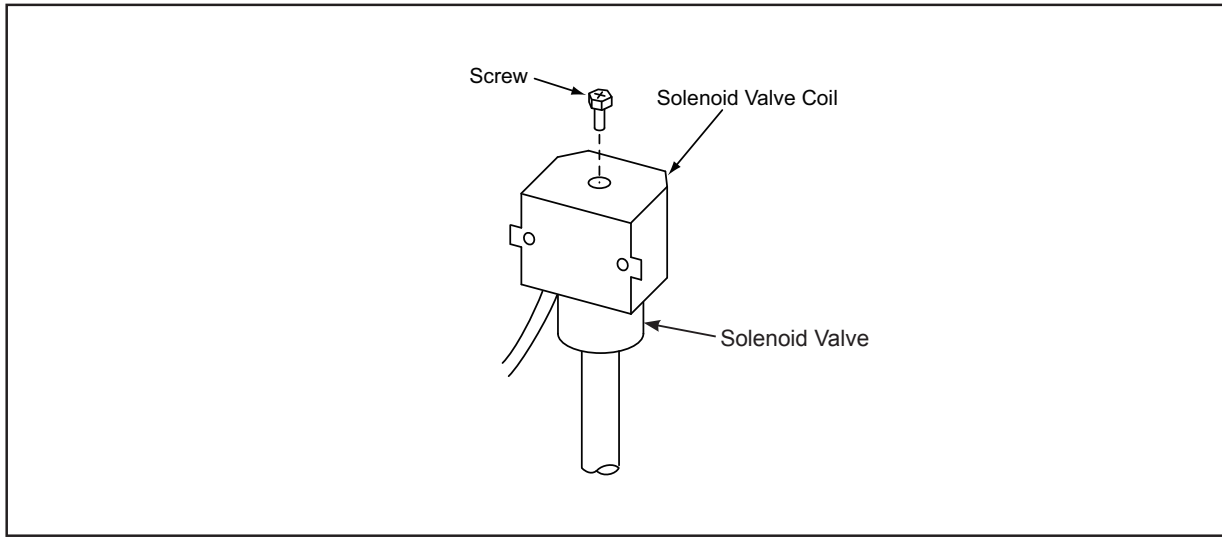
! WARNING**TURN OFF all power source switches.**

4.1.13.2 Removing Solenoid Valve Coil (SVA, SVG, SVF)

- (1) Remove one screw securing the solenoid valve coil with a Phillips screwdriver. If the screw is difficult to remove, use an adjustable wrench.
- (2) Remove the solenoid valve coil.

Tool

Phillips Screwdriver



! WARNING

TURN OFF all power source switches.

4.1.13.3 Removing Solenoid Valve (SVA, SVG)

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) < (H,Y)VAHP072 - 120B(3,4)1S (Heat Pump System) >
Close high/low pressure gas stop valve and liquid stop valve.
< (H,Y)VAHR072 - 120B(3,4)1S (Heat Recovery System) >
Close high/low pressure gas stop valve, low pressure gas stop valve and liquid stop valve.
- (3) Recover refrigerant in the outdoor unit from low pressure access port and high pressure access port. Ensure that the pressure does not increase at this time.

NOTE:

If the pressure increases, collect all the refrigerant in the system.

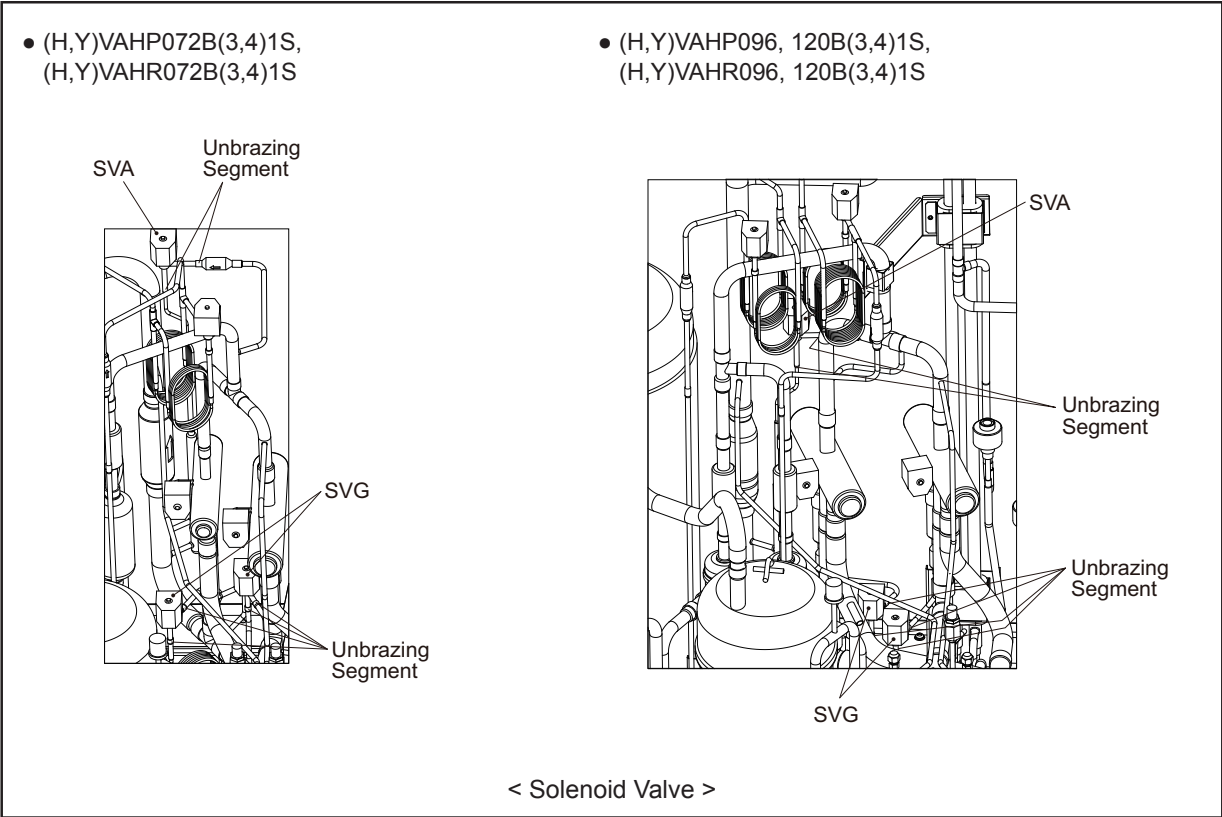
- (4) Remove the solenoid valve coils according to Section 4.1.13.2 "Removing Solenoid Valve Coil".
- (5) Unbraid at the following segments:
Solenoid Valve Coil (SVA): Two brazing segments
Solenoid Valve Coil (SVG): Two brazing segments for each valve

NOTE:

1. When performing brazing work, cover the solenoid valve with a wet cloth for cooling.
2. Pay attention not to burn the connecting wiring and piping insulation while brazing.

- (6) For reassembly, perform the removal procedure in reverse order.

Tool	Phillips Screwdriver, Charging Hose, Torch, Wet Cloth, Pliers
------	---



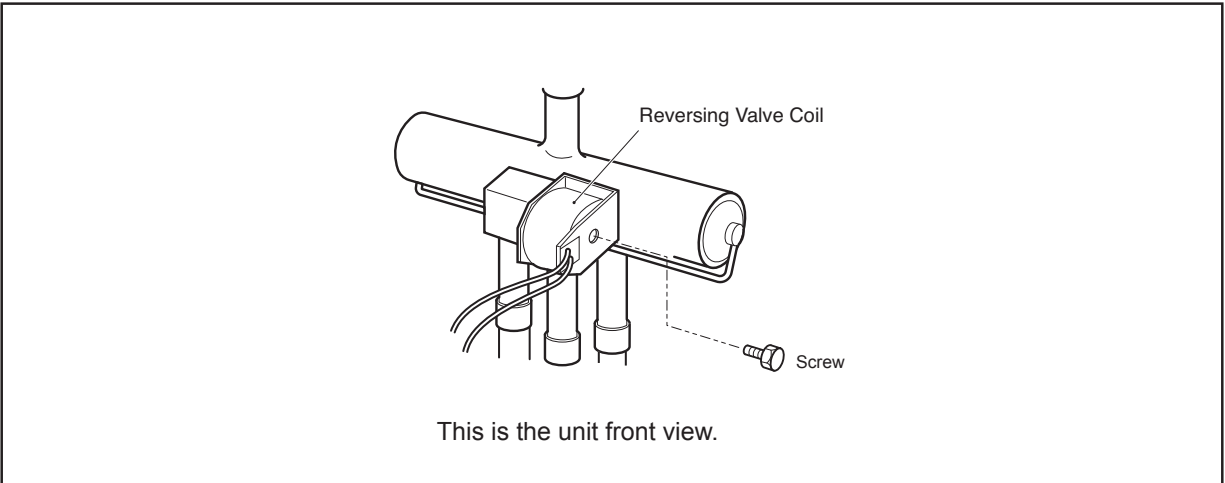
! WARNING

TURN OFF all power source switches.

4.1.13.4 Removing Reversing Valve Coil (RVR1, RVR2)

- (1) Remove one screw securing the reversing valve coil with a Phillips screwdriver.
If the screw is difficult to remove, use an adjustable wrench.
- (2) Remove the reversing valve coil.

Tool	Phillips Screwdriver
------	----------------------



! WARNING**TURN OFF all power source switches.**

4.1.13.5 Removing Reversing Valve

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove the electrical box, wirings and electrical box support according to Section 4.1.5 "Removing Electrical Box."
- (3) Before starting this work, recover the refrigerant into a recovery cylinder from the system, and turn OFF the power source of the unit.
- (4) The reversing valve securing position is as shown in the figure.
- (5) Disconnect the wiring for the reversing valve coil.
- (6) Remove the reversing valve coils according to Section 4.1.13.4 "Removing Reversing Valve Coil".
- (7) Unbraid as shown in the figure by covering the reversing valve with a wet cloth for cooling.

NOTE:

1. Unbraid only at the indicated segment in the figure. If not, leakage may occur when reassembling.
2. In an instance of (H,Y)VAHP072 - 120B(3,4)1S (Heat Pump System), connect the charging hose to the access port for the low pressure gas stop valve before unbrazing.

- (8) Remove the reversing valve assembly.
Unbraid as shown in the figure by covering the reversing valve with a wet cloth for cooling.
Unbraid in the following order:
 - (a) Braiding at right and left branch pipes of three pipes from the reversing valve.
 - (b) Braiding at the center branch pipe of three pipes from the reversing valve.

NOTE:

When unbrazing, cover the reversing valve with a wet cloth for cooling.

- (9) For reassembly, perform the removal procedure in a reverse order.

NOTE:

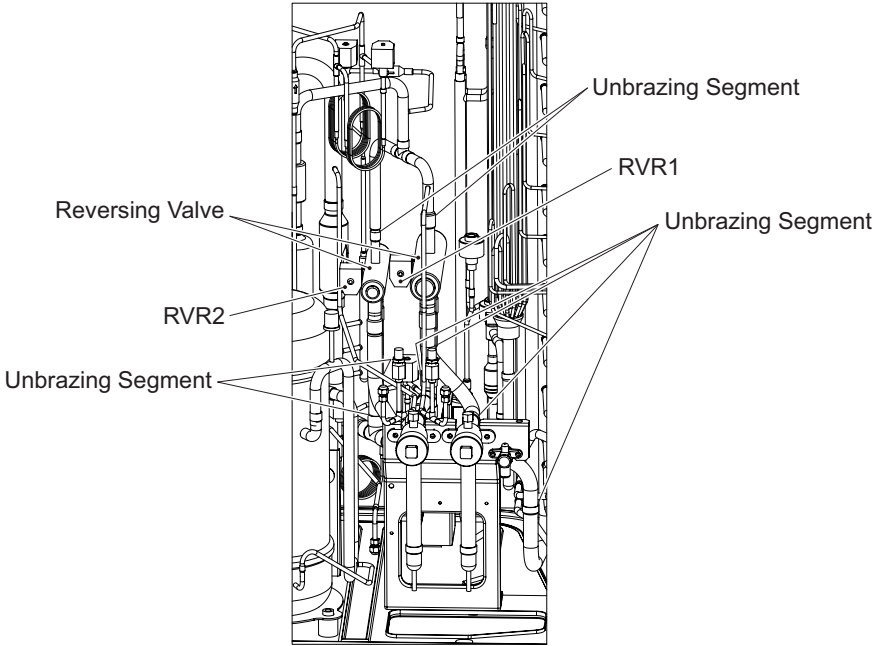
When performing brazing work, cover the reversing valve with a wet cloth for cooling.

! WARNING

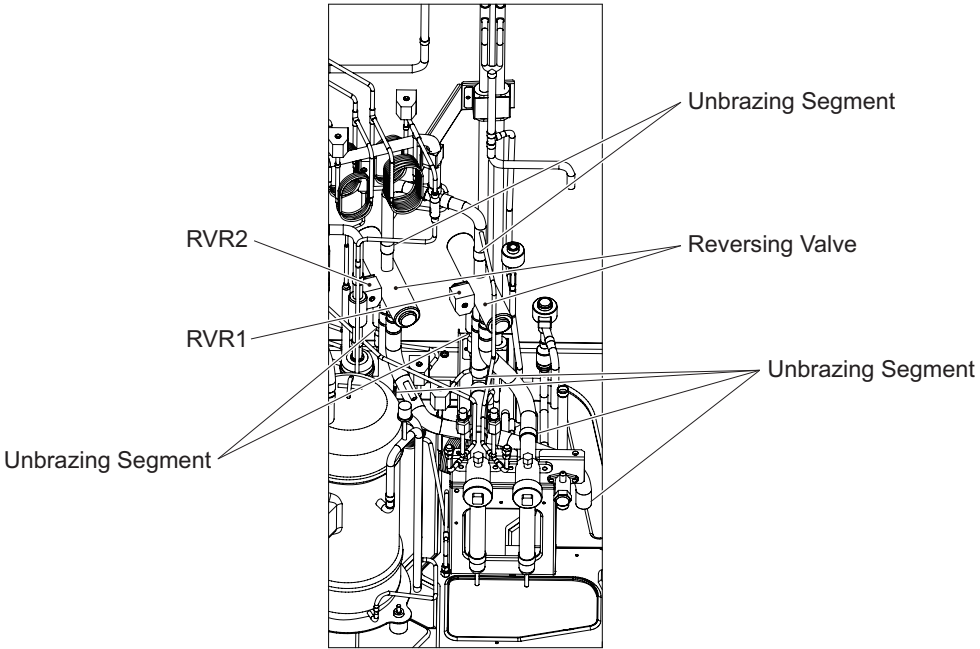
TURN OFF all power source switches.

Tool	Adjustable Wrench, Phillips Screwdriver, Torch, Pipe Cutter, Pliers, Pinching Tool, Charging Hose
------	---

- (H,Y)VAHP072B(3,4)1S, (H,Y)VAHR072B(3,4)1S



- (H,Y)VAHP096, 120B(3,4)1S, (H,Y)VAHR096, 120B(3,4)1S



< Reversing Valve Position >

! WARNING

TURN OFF all power source switches.

4.1.14 Removing Stop Valve

Before starting this work, recover the refrigerant into a recovery cylinder from the system, and turn OFF the power source of the unit.

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) When removing the (A) high/low pressure gas stop valve and (B) low pressure gas stop valve, cover the stop valves with a wet cloth for cooling and then unbraid. When removing the (C) liquid stop valve, unbraid the pipe for the stop valve as shown in the figure.

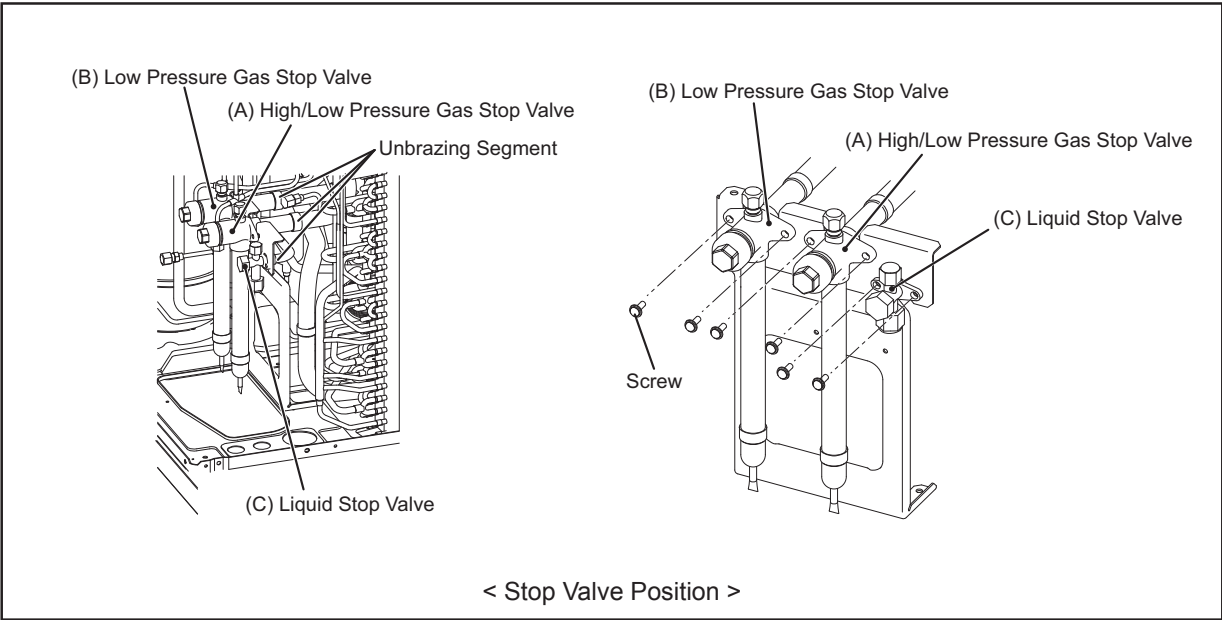
NOTE:

- 1. In an instance of (H,Y)VAHP072 - 120B(3,4)1S (Heat Pump System), connect the charging hose to the access port for the low pressure gas stop valve.
- 2. To unbraid for the (A) high/low pressure gas stop valve and (B) low pressure gas stop valve, the RC cover should be removed or protected with a metal plate.
- (3) After unbrazing for the stop valves, remove the screws securing the plates as shown in the figure and pull out the stop valves and the plates.
- (4) Set the stop valves using a reverse procedure.

NOTE:

When brazing the stop valves or unbrazing, cover the stop valves with a wet cloth for cooling.

Tool	Wet Cloth, Torch, Pliers, Phillips Screwdriver
------	--



! WARNING

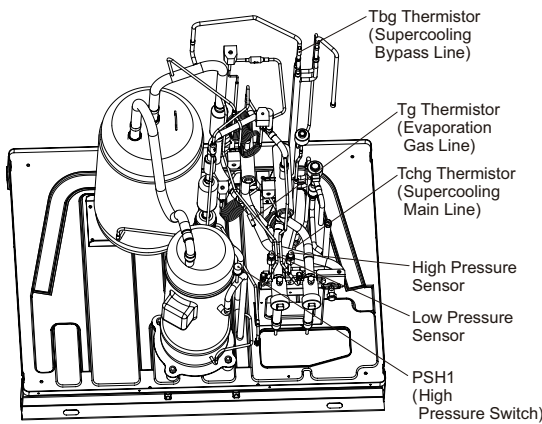
TURN OFF all power source switches.

4.1.15 Removing High Pressure Switch, High Pressure Sensor, Low Pressure Sensor and Thermistor

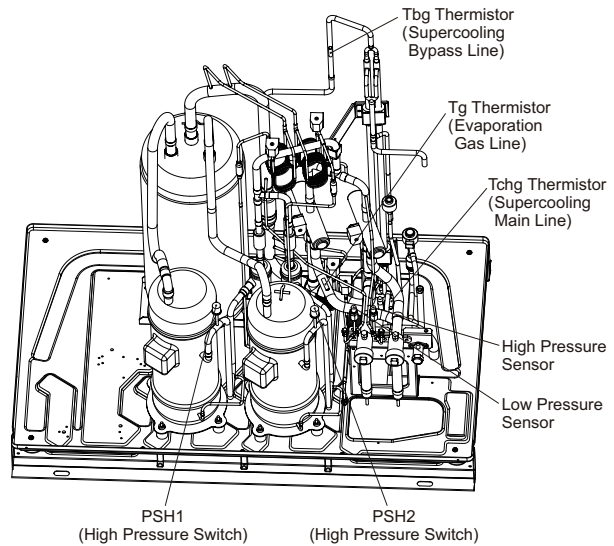
- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) High Pressure Switch (PSH1 and PSH2), High Pressure Sensor, Low Pressure Sensor and Thermistor (Tg, Tchg, Tbg and Te) are secured as shown in the figure below.

Tool	Adjustable Wrench
------	-------------------

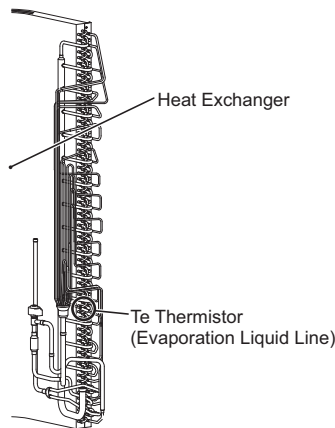
- (H,Y)VAHP072B(3,4)1S, (H,Y)VAHR072B(3,4)1S



- (H,Y)VAHP096, 120B(3,4)1S, (H,Y)VAHR096, 120B(3,4)1S



- All Models



< High Pressure Switch, High/Low Pressure Sensor Position >

! WARNING

TURN OFF all power source switches.

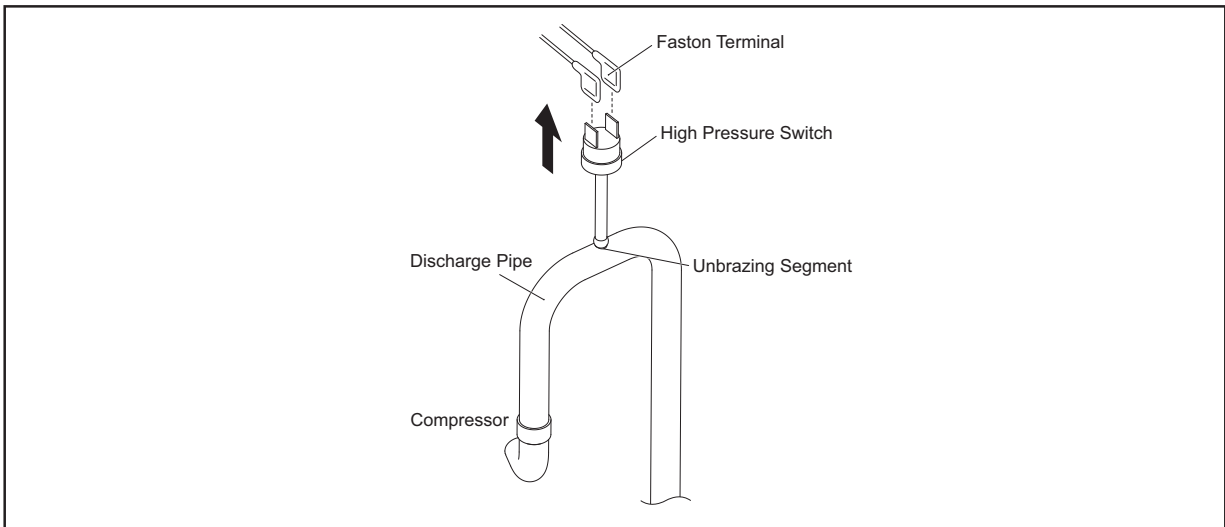
4.1.15.1 Removing High Pressure Switch (PSH1, PSH2)

- (1) Recover refrigerant into proper refrigerant recovery cylinder.
- (2) Disconnect the faston terminals.
- (3) Remove the high pressure switch from the unbrazing segment of the discharge pipe using a torch.

NOTES:

1. If the refrigerant cycle is left for some time after the high pressure switch is removed, moisture and dirt will enter into it. Install a replacement high pressure switch immediately after removing. If it is not possible to do this immediately, seal the hole with tape.
2. Check that the RC cover inner side (aluminum sheet) does not come in contact with the terminals of the high pressure switch.
3. Make sure to secure the insulating sleeve of the faston terminals as shown in the figure. If the terminals of the high pressure switch are exposed and come in contact with the RC cover, the electrical components may be damaged.

Tool	Torch, Adjustable Wrench, Phillips Screwdriver, Pliers
------	--



4.1.15.2 Removing High Pressure Sensor (Pd) and Low Pressure Sensor (Ps)

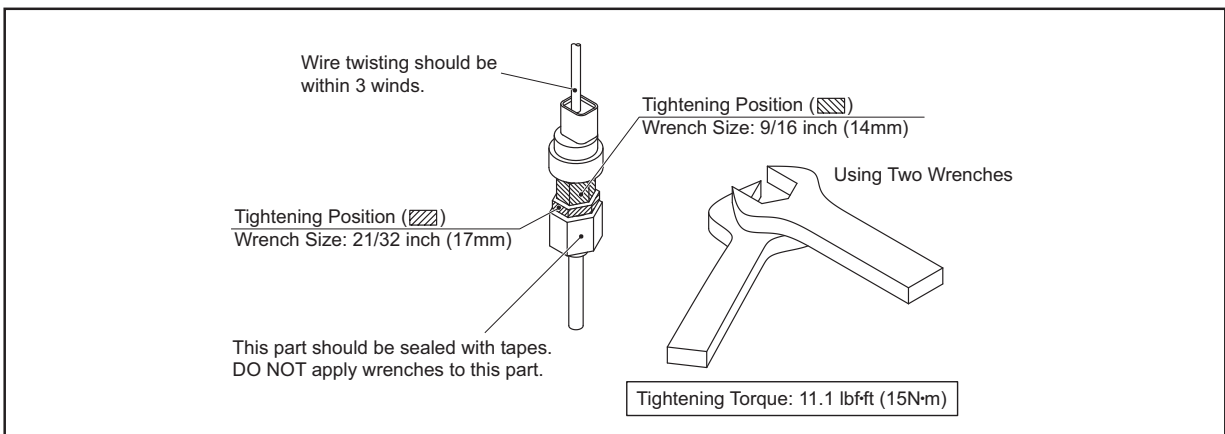
- (1) Remove the connector for the pressure sensor wiring from PCB1.

NOTE:

First, remove the connector or the wiring can be damaged.

- (2) Remove the refrigerant piping for the high pressure sensor or low pressure sensor using two wrenches.

Tool	Adjustable Wrench, Phillips Screwdriver, Pliers
------	---



! WARNING

TURN OFF all power source switches.

4.1.16 Removing Thermistor for Liquid Pipe

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove the electrical box cover according to Section 4.1.4 "Removing Electrical Box Cover".
- (3) Remove the CORK TAPE. (CORK TAPE is also used during reassembly.) Then, remove the thermistor for the liquid pipe by pulling out the thermo clip from the pipe.

NOTE:

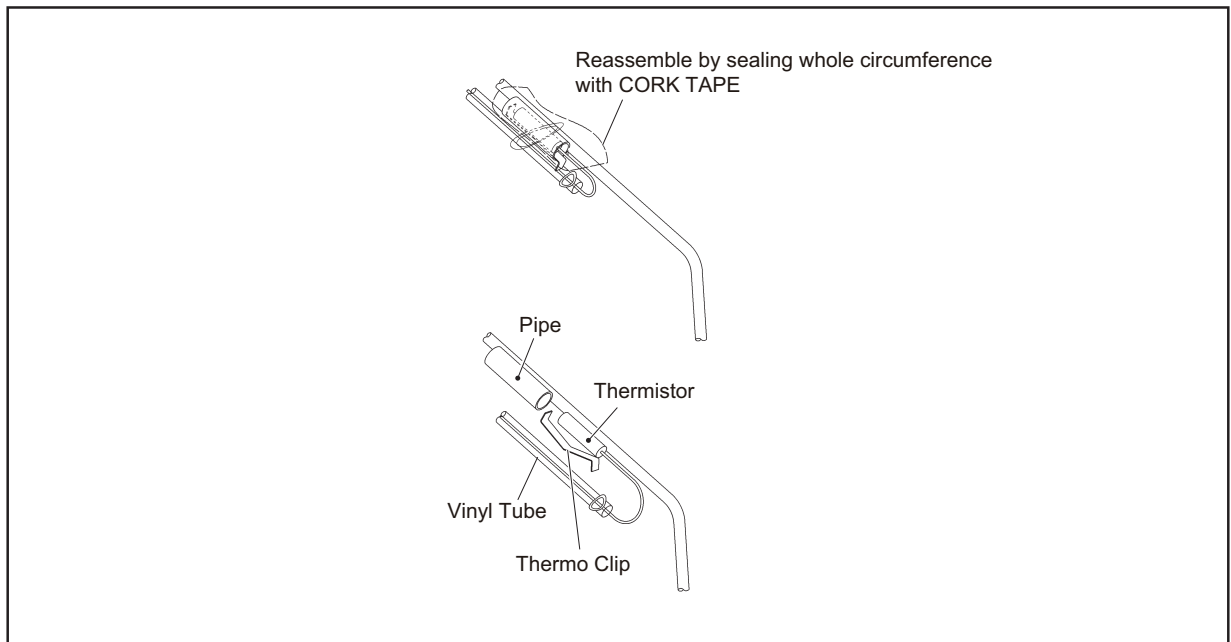
When removing the thermistor for the liquid pipe, take special care not to cause damage to your hands or the thermistor with the valve support securing the stop valve.

- (4) Reassemble the thermistor for the liquid pipe using reverse procedures.

NOTE:

When reassembling the thermistor, secure the thermistor with the vinyl pipe end downward to prevent condensate from entering the pipe.

Tool	Wet Cloth, Torch, Pliers, Phillips Screwdriver, Wire Cutter
------	---



! WARNING

TURN OFF all power source switches.

4.1.17 Removing Thermistor for Ambient Temperature

- (1) Remove the front service cover according to Section 4.1.1 "Removing Front Service Cover".
- (2) Remove the electrical box cover according to Section 4.1.4 "Removing Electrical Box Cover".
- (3) Remove the top cover and upper cover according to Section 4.1.2 "Removing Top Cover and Upper Cover".

NOTE:

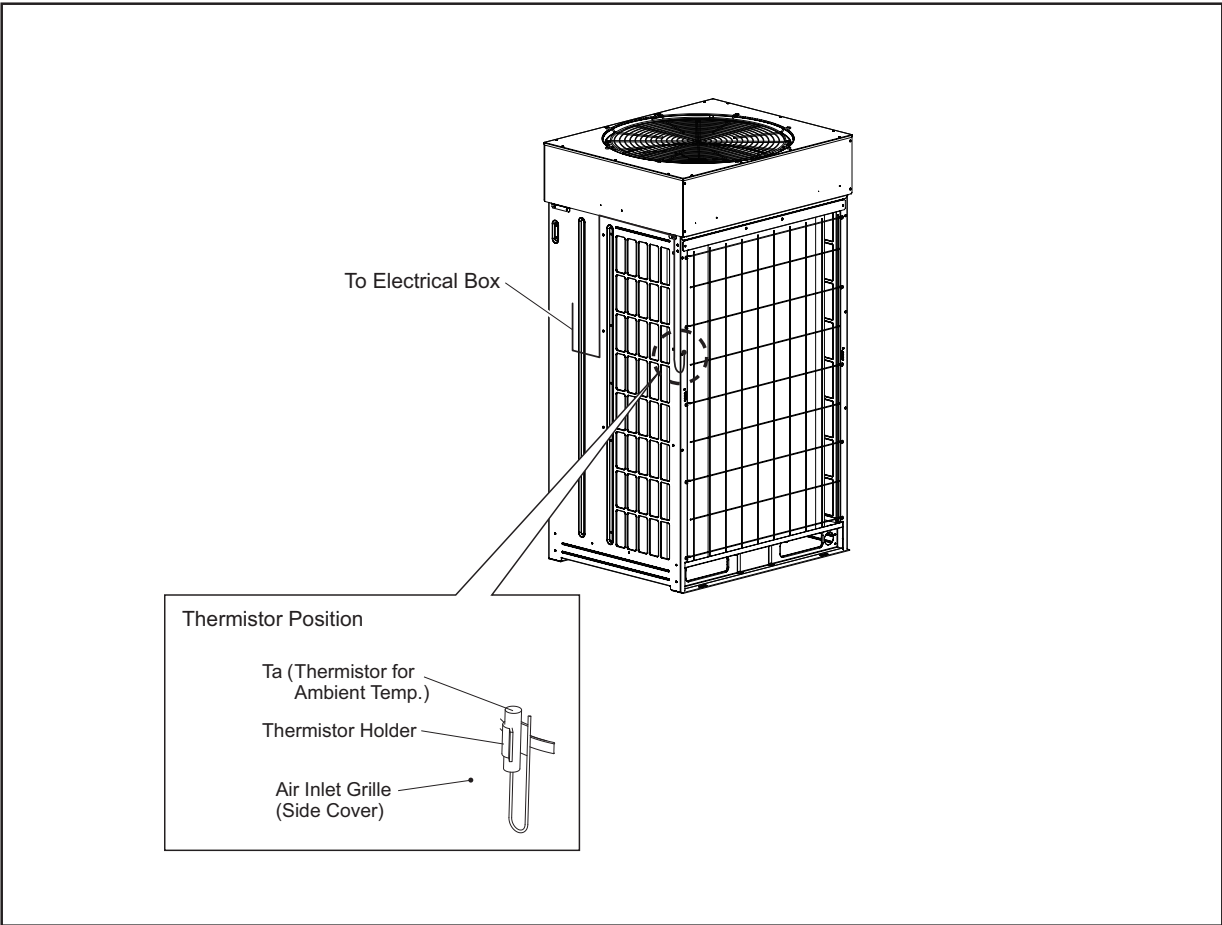
When removing the top cover and upper cover, be careful not to damage the shroud.

- (4) Remove the securing clamps for wiring.
- (5) Reassemble the thermistor for ambient temperature using reverse procedures for removal.

NOTE:

If the upper cover is not secured properly, it may cause upper cover vibration during the outdoor fan operation. Check the upper cover carefully after reassembling.

Tool	Phillips Screwdriver, Wire Cutter
------	-----------------------------------



 **WARNING**

TURN OFF all power source switches.

4.1.18 Removing Other Electrical Components

NOTES:

1. Apply conductive heat transfer paste or silicon grease (Service Part No.: P22760) slightly over the contact surface of the fin when replacing the components of the radiation fin such as transistor module (IPM), diode module (DM) and fan controller (FANM).
2. Match the terminal numbers with the mark band numbers when reassembling. If incorrectly connected, malfunction may occur or the electrical components may be damaged.
3. The U and V-Phases of the power source cables for inverter compressor (MC1) should be passed through the current sensor (CTU and CTV) of the inverter module (PCB2) completely.
Connect the U-Phase of the power source cable with the U-Phase side (CTU), and the V-Phase with the V-Phase side (CTV) of the current sensor. Not doing so may cause equipment malfunction or failure.
4. When securing PCBs or sheet metal for PCBs, protect the electric wiring from being caught on the sheet metal or the electrical components.
5. Make sure to use screws, bushes and collars when securing PCBs for the inverter compressor.
Not doing so may cause equipment malfunction.
6. When replacing the PCB for communication, set the DIP switches the same as before replacing the PCB.
An incorrect setting will cause a malfunction. Refer to the instruction manual attached with servicing the PCB.
7. Do not apply excessive force to the electrical components on the PCB or the PCB itself. It may lead to PCB malfunction.
8. When replacing the fan controller, set the DIP switches the same as before replacing the fan controller.
An incorrect setting will cause a malfunction.

! WARNING

TURN OFF all power source switches.

4.1.18.1 Removing PCB1 and Electrical Components for Electrical Box

< Removing PCB1 >

- (1) Remove all the connectors for wiring at PCB1.
- (2) Hold the middle part of the holder securing PCB1 (Part A in the figure, 11 parts) with a long-nose plier and pull it out to remove.

< Opening PCB1 Securing Plate >

- (1) Remove all the wirings connected with the electrical components.
- (2) Remove two screws at Part B in the figure. Electrical components are available can be checked or replaced from the opening.
- (3) If the securing plate for PCB1 is removed, all the connectors connected with PCB1 should be removed.

< Removing Electrical Components >

- (1) Remove all the wirings connected with the electrical components.
- (2) Remove the screws securing electrical components.

NOTES:

1. The open angle for the PCBs' securing plate should be within 120 degrees. If trying to open wider than 120 degrees, the securing plate will not open due to insufficient electrical wiring length.
2. Do not touch the electrical components on the PCBs.
Do not bend or apply excessive force to a PCB. It will cause a PCB failure.

NOTES:

1. Match the terminal numbers with the mark band numbers when reassembling. If incorrectly connected, a malfunction may occur or the electrical components may be damaged.
2. Protect the cables from being caught on the plate edge or electrical components when closing the PCB securing plate when reassembling.
3. The capacitor is charged with electricity even if the power source is turned OFF.
DO NOT come in contact with the terminals so as to avoid electrical shock. (*)

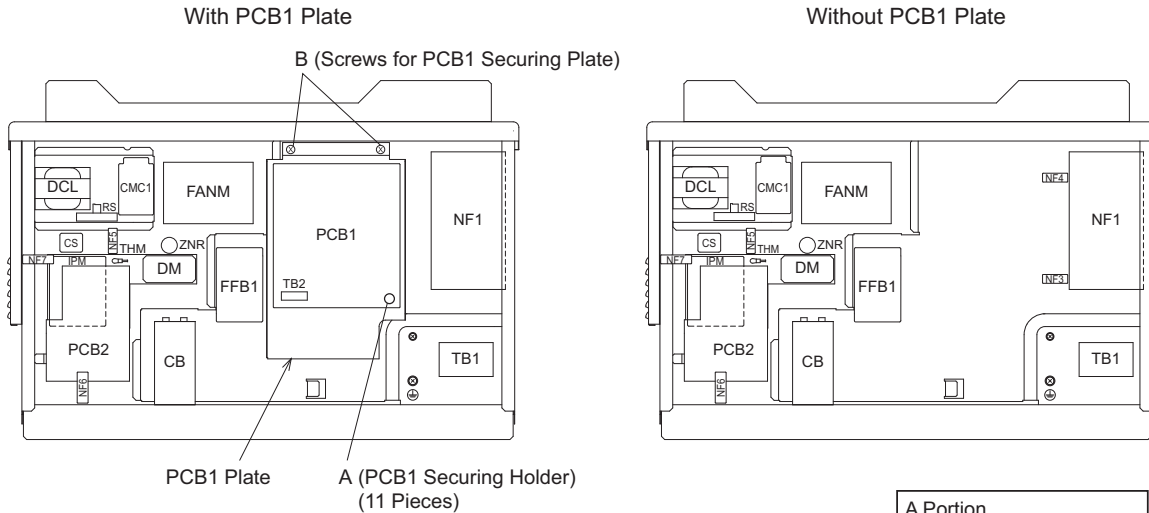
! WARNING

TURN OFF all power source switches.

Tool	Phillips Screwdriver, Long-Nose Pliers, Pliers
------	---

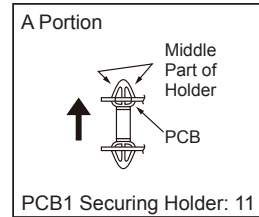
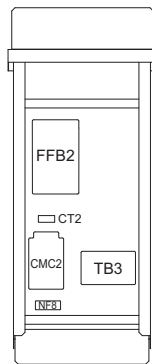
- [208/230V] (H,Y)VAHP***B31S, (H,Y)VAHR***B31S

Interior of Electrical Box 1



Interior of Electrical Box 2

< (H,Y)VAHP096, 120B31S and (H,Y)VAHR096, 120B31S Only >



Item	Part Name	Item	Part Name
CB	Capacitor	MOF1	Motor for Outdoor Fan
CMC1, 2	Contactors for Compressor Motor	NF1, 3~8	Noise Reduction Filter
CS	Capacitor	PCB1	Outdoor Unit PCB (Printed Circuit Board)
CT2	Current Transformer	PCB2	Inverter PCB (Printed Circuit Board)
DCL	Reactor	PSH1, 2	Pressure Switch for Protection
DM	Diode Module	RS	Resistor for Starting
FANM	Fan Module	TB1, 2	Terminal Block
FFB1, 2	Fuse-Free Breaker	THM	Thermistor for Fin Temperature
IPM	Transistor Module	ZNR	Surge Absorber
MC1, 2	Motor for Compressor		

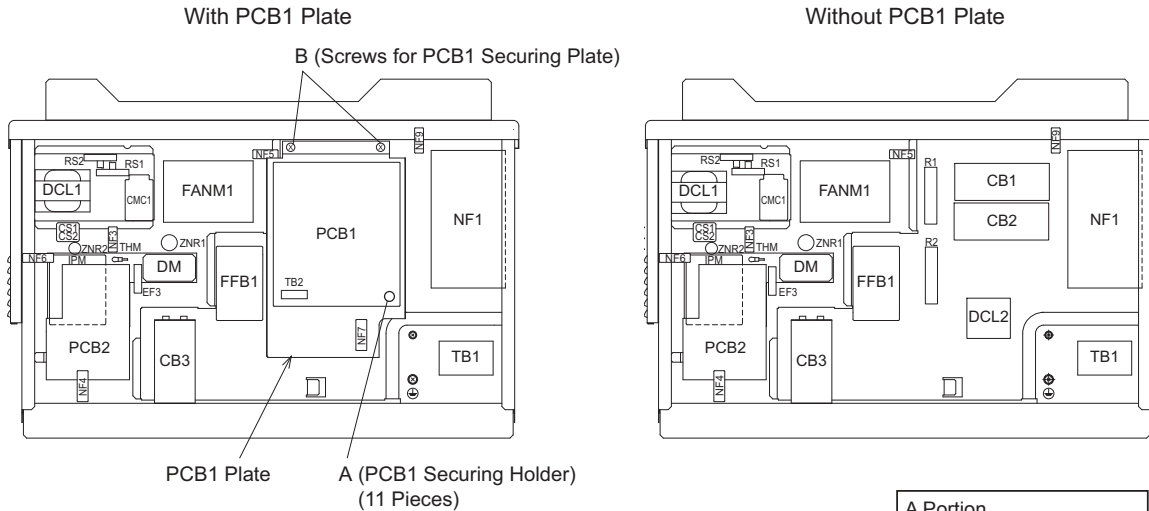
! WARNING

TURN OFF all power source switches.

Tool	Phillips Screwdriver, Long-Nose Pliers, Pliers
------	---

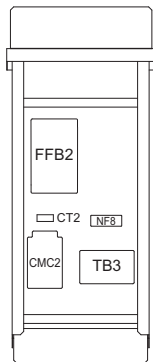
- [460V] (H,Y)VAHP***B41S, (H,Y)VAHR***B41S

Interior of Electrical Box 1

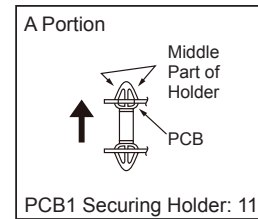
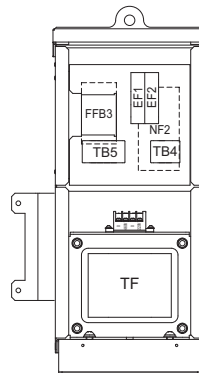


Interior of Electrical Box 2

- < (H,Y)VAHP096, 120B41S and (H,Y)VAHR096, 120B41S Only >



Interior of Transformer Box



Item	Part Name	Item	Part Name
CB1~3	Capacitor	MC1, 2	Motor for Compressor
CMC1, 2	Contactora for Compressor Motor	MOF1	Motor for Outdoor Fan
CS1, 2	Capacitor	NF1~9	Noise Reduction Filter
CT2	Current Transformer	PCB1	Outdoor Unit PCB (Printed Circuit Board)
DCL1, 2	Reactor	PCB2	Inverter PCB (Printed Circuit Board)
DM	Diode Module	RS1, 2	Resistor for Starting
EF1~3	Fuse	TB1~5	Terminal Block
FANM	Fan Module	TF	Transformer
FFB1~3	Fuse-Free Breaker	THM	Thermistor for Fin Temperature
IPM	Transistor Module	ZNR1, 2	Surge Absorber

! WARNING

**Turn OFF all power source switches.
Do not touch any electrical components while LED201 (red) on the Inverter PCB (PCB2) is ON.
Otherwise, an electric shock will occur.**

4.1.18.2 Removing Inverter PCB (PCB2)

- (1) Disconnect all the wirings to the CN2, CN206, PCN301.
- (2) Disconnect the wirings for the transistor module (U, V, W) and C on the Inverter PCB (PCB2). Then, disconnect the wirings for U and V from the current sensor.
- (3) After removing three M3 screws, remove the bushes and collars from the inverter PCB (PCB2). When reassembling the inverter PCB (PCB2), the bushes and collars should be secured correctly.

NOTE:

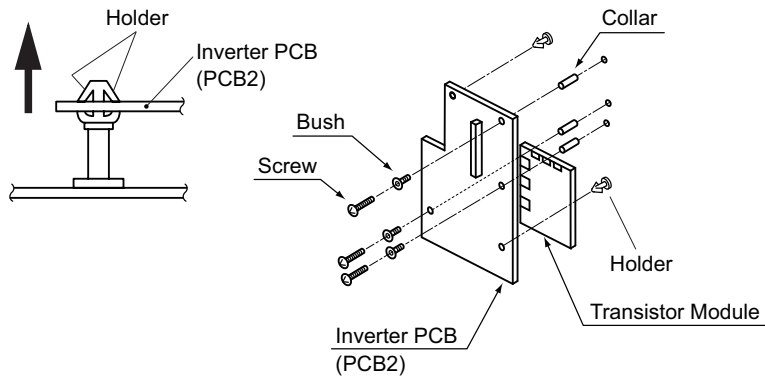
Do not touch any electrical components while the LED201 (red) of the inverter PCB (PCB2) is ON. Otherwise, it may lead to an electrical shock.

NOTES:

1. When reassembling the electrical components, match the terminal numbers with the mark band numbers. If they are incorrectly connected, a malfunction may occur or the electrical components may become damaged.
2. When closing the outdoor unit PCB (PCB1) for reassembly, protect the cables from catching on the plate edges or electrical components.

Tool

Phillips Screwdriver



! WARNING

**Turn OFF all power source switches.
Do not touch any electrical components while the LED201 (red) on the Inverter PCB (PCB2) is ON. Otherwise, an electric shock will occur.**

4.1.18.3 Removing Diode Module and Transistor Module

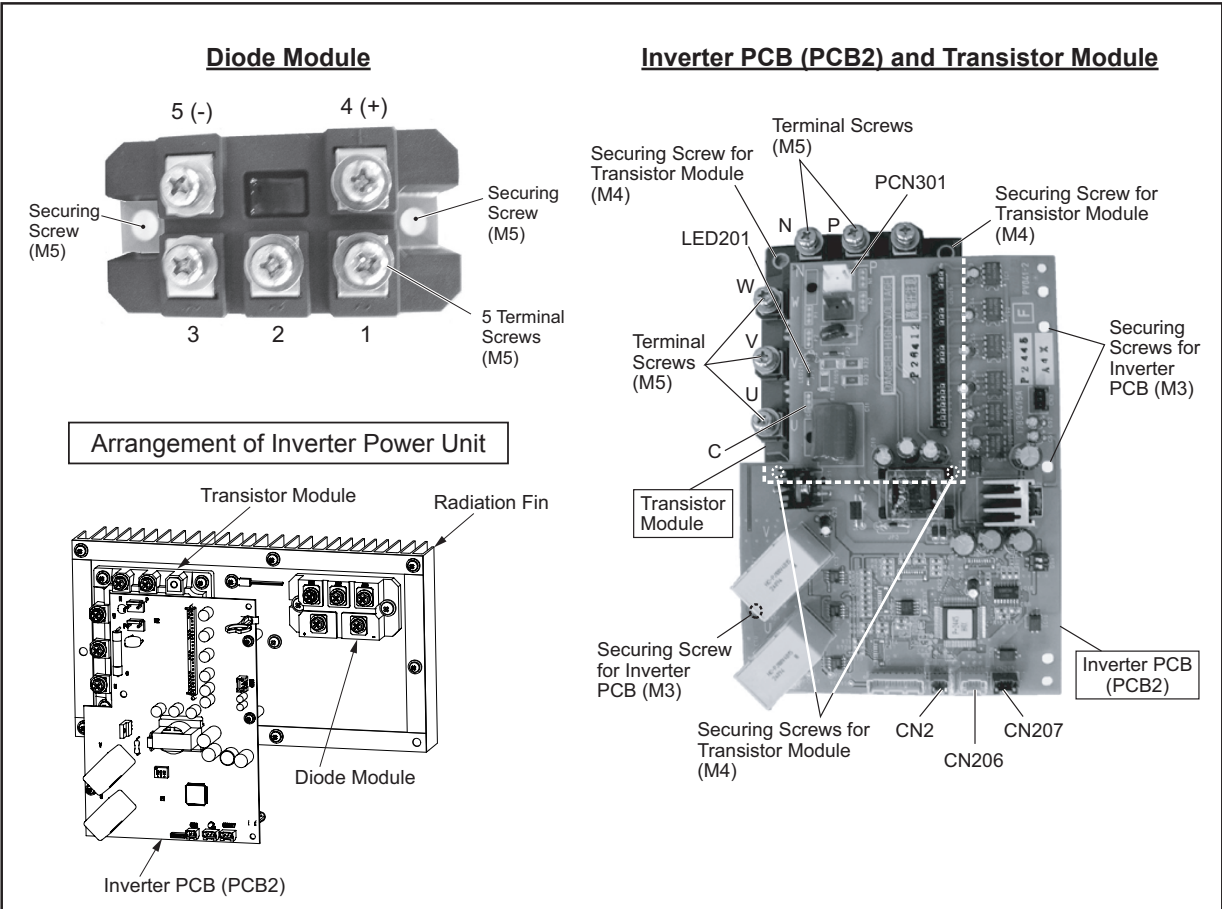
- (1) Disconnect the wirings to the terminals (1) to (5) on the diode module and to terminals P, N, U, V, and W on the transistor module.

- (2) Remove six screws securing the diode module and transistor module. Then, remove the diode module and transistor module.

NOTE:
As for the inverter PCB and the transistor module, the figure below indicates the correct installation positions, with the letters on the inverter PCB on the side.

- NOTES:**
1. When reassembling the electrical components, match terminal numbers with the mark band numbers. If they are incorrectly connected, a malfunction may occur or the electrical components may be damaged.
 2. When closing the outdoor unit PCB (PCB1) securing plate for reassembly, protect the cables from catching on the plate edges or electrical components.
 3. When mounting the diode module and transistor module, apply silicon grease evenly over the whole back side of the diode module and the transistor module. Use silicon grease (Service Part No.: P22760) provided as an accessory.

Tool	Phillips Screwdriver, Long-Nose Pliers
------	--



! WARNING

**Turn OFF all power source switches.
Do not touch any electrical components while LED201 (red) on the Inverter PCB (PCB2) is ON.
Otherwise, an electric shock will occur.**

4.1.18.4 Removing Fan Controller

Before this work, remove the service cover according to Section 4.1.1 “Removing Front Service Cover”. Check to ensure that LED501 (red) of the FANM1 is OFF.

Disconnect all the wirings to the fan controller as shown below.

(1) Disconnect the wirings from the fan controller.

[208/230V] CN206, CN207, R, S, T, U, V, W

[460V] CN206, CN207, R, S, U, V, W, P2, N, DCL1, DCL2

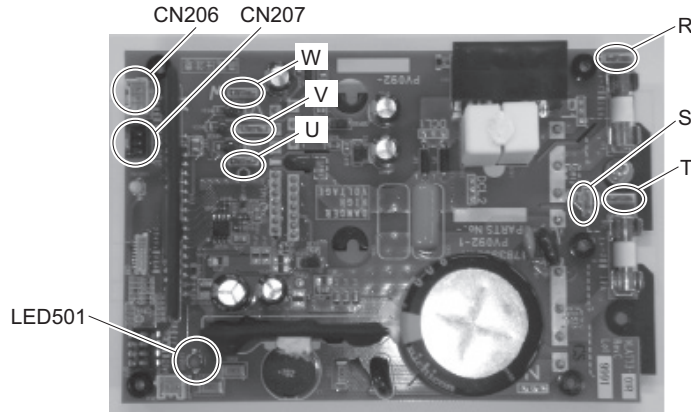
(2) Remove nine screws securing the fan controller so that the fan controller can be removed.

NOTES:

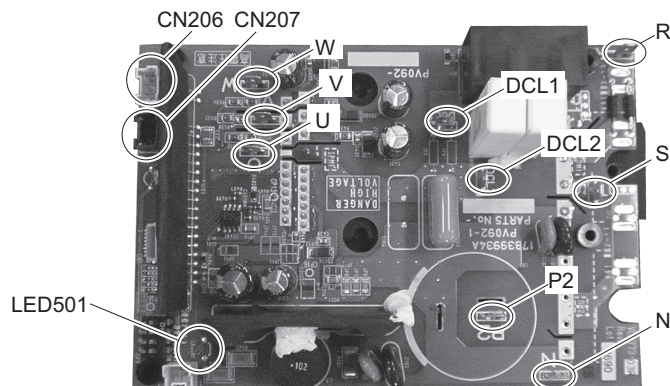
1. Do not apply great force when removing the fan controller, or the soldering may become loosened and a malfunction of the fan controller may occur.
2. Identify and match the terminal numbers with the mark band numbers when reassembling. If incorrectly connected, a malfunction or damage will occur.
3. Check to ensure that the electrical wires will not be caught between the mounting electrical components and the mounting plates when the inverter PCB (PCB2) is re-installed.
4. Apply silicon grease evenly on the whole rear side of the fan controller when installing.
Use silicon grease (Service Part No.: P22760) provided as an accessory.

Tool	Phillips Screwdriver, Long-Nose Pliers
------	--

- [208/230V] (H,Y)VAHP***B31S, (H,Y)VAHR***B31S



- [460V] (H,Y)VAHP***B41S, (H,Y)VAHR***B41S



! WARNING

TURN OFF all power source switches.

(3) Install the electrical box using reverse procedures.

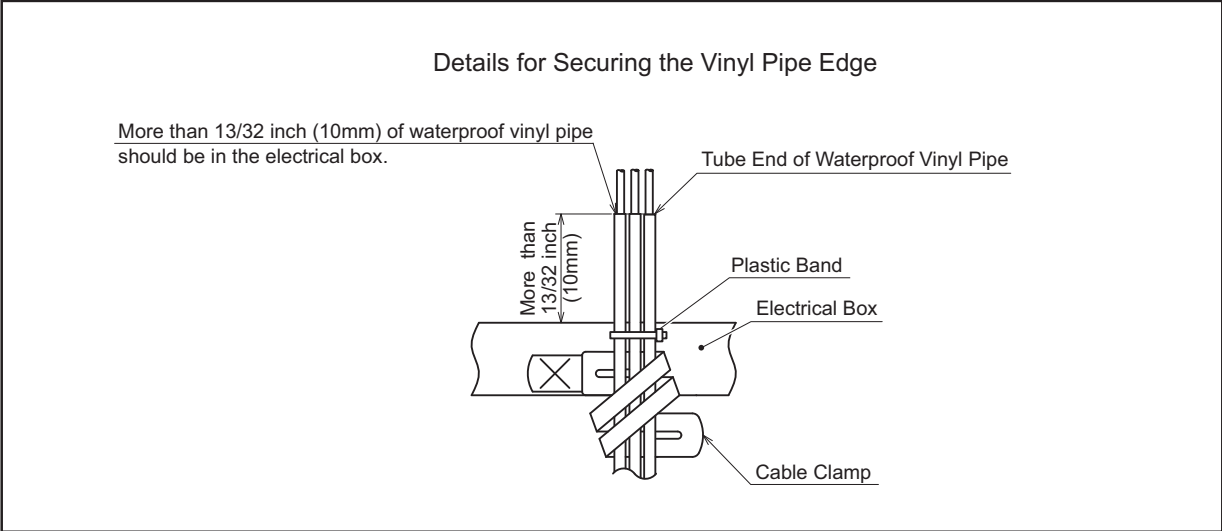
NOTES:

1. Check to ensure that the tube end of the waterproof vinyl pipe and the connectors are in the electrical box. Secure them firmly with a cable clamp when wiring as shown in the figure below.
2. Secure the wiring connecting each electrical part and the electrical box with a plastic band to avoid direct contact with the compressor, piping, and plate edges.
3. Secure the wiring neatly with a cable clamp and make sure that the wiring will not be held down by the electrical box cover. Otherwise, the wiring may be damaged when the cover is closed.
4. Secure the fan motor wiring with a cable clamp as shown in the figure.

NOTES:

1. When reassembling the electrical component, match the terminal numbers with the mark band numbers . If they are incorrectly connected, malfunction may occur or the electrical components may be damaged.
2. Settings of DIP switches differ according to the model. When replacing the outdoor unit PCB, refer to "Field Work Instructions."

Tool	Phillips Screwdriver, Pincher Tool
------	------------------------------------



! WARNING

TURN OFF all power source switches.

4.1.19 Removing Transformer

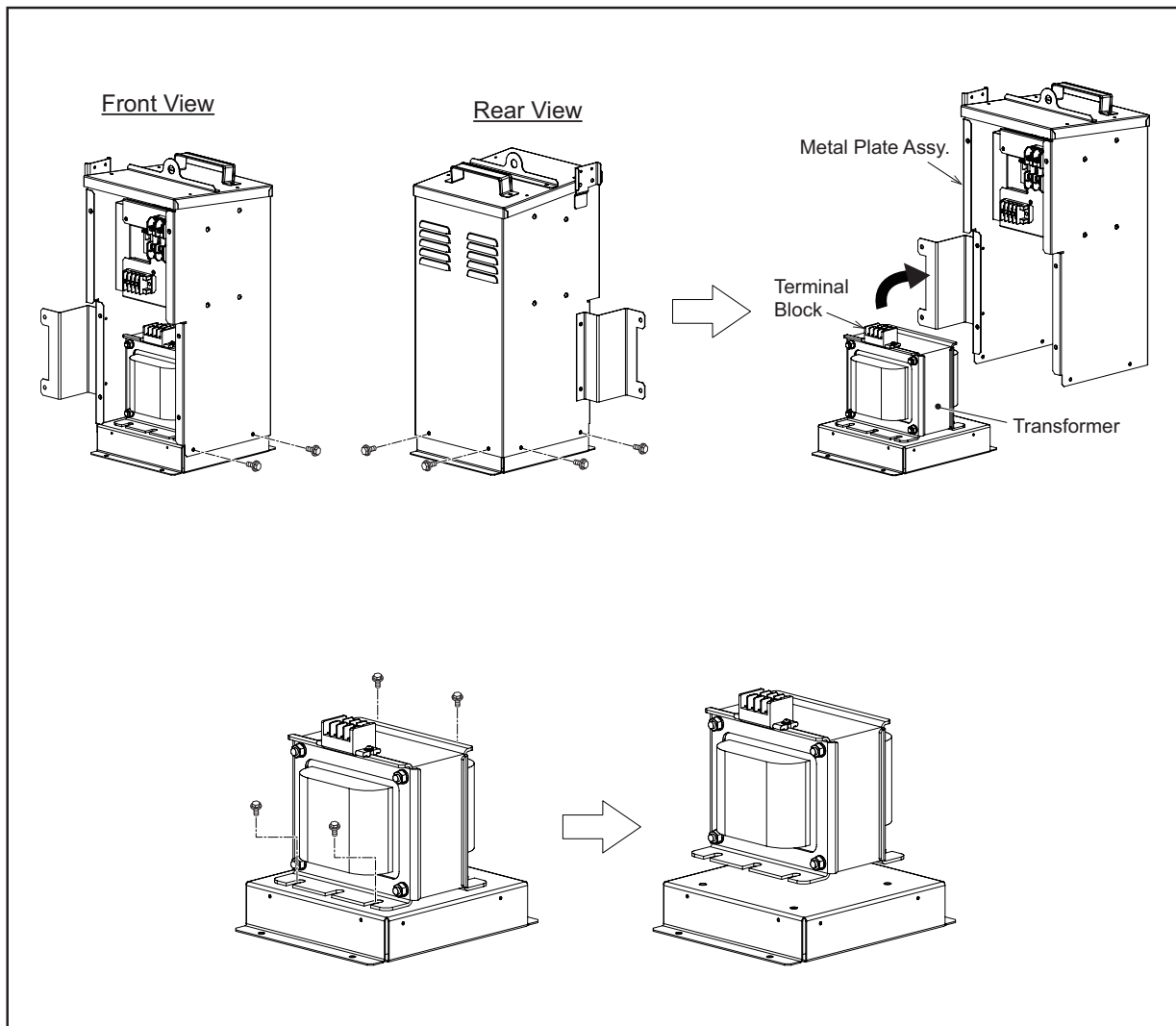
[460V] (H,Y)VAHP***B41S and (H,Y)VAHR***B41S Only

Before this work, remove the transformer box according to Section 4.1.8 "Removing Transformer Box".
Remove the transformer box cover according to Section 4.1.7 "Removing Transformer Box Cover".

- (1) Disconnect all the wirings to the terminal block of transformer.
- (2) Remove six screws securing the metal plates while assembling the transformer box.
- (3) Remove the metal plate assembly from the transformer.
- (4) Remove four screws securing the transformer so the transformer can be removed.

Tool

Phillips Screwdriver



! WARNING

TURN OFF all power source switches.

4.1.20 Removing Components for Change-Over Box

4.1.20.1 Removing Front Service Cover for Electrical Box and Electronic Expansion Valve

- (1) Remove the screws securing the electrical box cover and the electronic expansion valve cover.

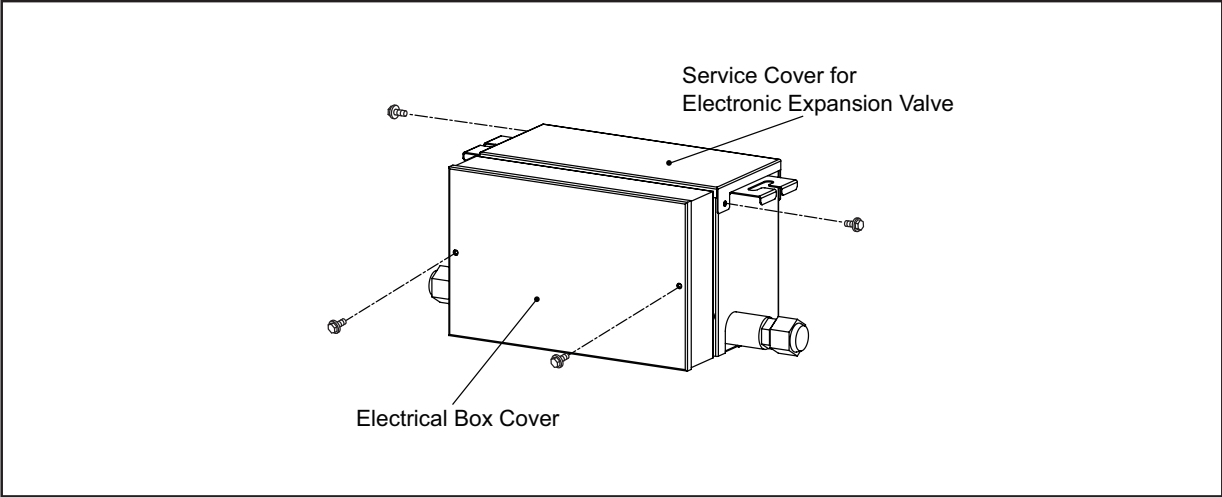
Service Cover for Electrical Box: Two screws

Service Cover for Electronic Expansion Valve: Two screws

NOTE:

When attaching / removing the front service cover, take special care not to be injured by the plate edges.

Tool	Phillips Screwdriver
------	----------------------



! WARNING

TURN OFF all power source switches.

4.1.20.2 Removing Electrical Components

< Removing Change-Over Box PCB >

- (1) Remove all the connectors for wiring connected to the change-over box PCB.
- (2) Remove the communication cables connected to the change-over box PCB. Do not touch the electrical components on the change-over box PCBs during the work. Otherwise, the change-over box PCB may be damaged.
- (3) Hold the convex part of the four holders securing the change-over box PCB with a long-nose pliers and pull it out to remove.

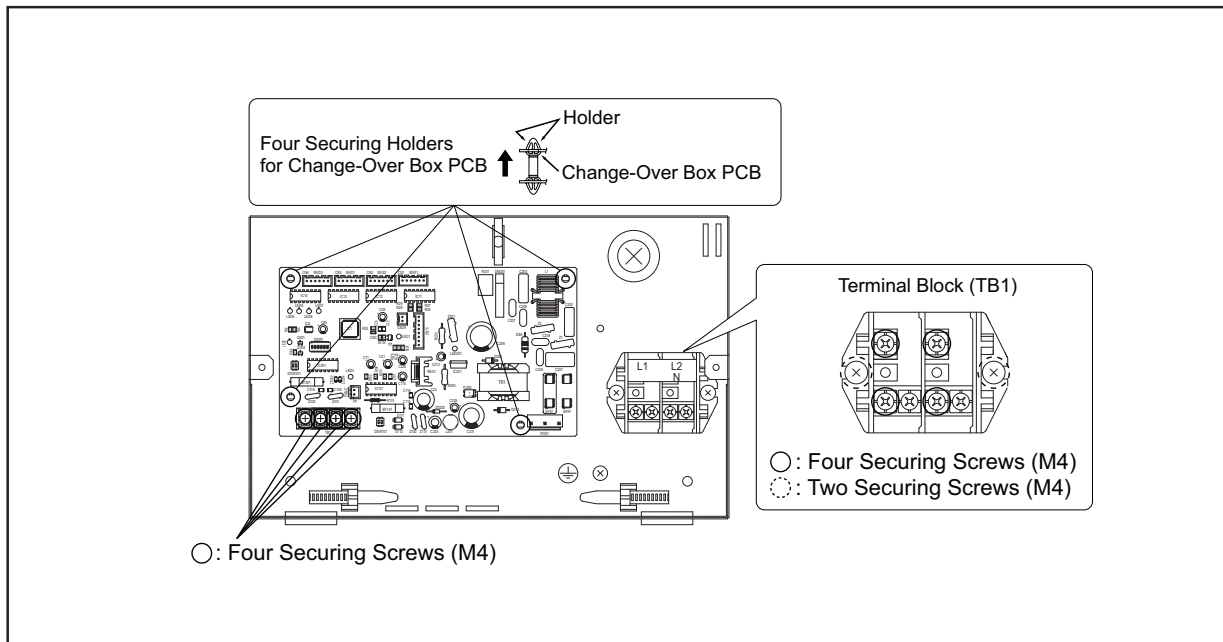
< Removing Electrical Components (Terminal Block for Power Source) >

- (1) Remove all the wirings to the electrical components.
- (2) Remove the screws securing the electrical components.

NOTE:

When reassembling the electrical components, match the terminal numbers with the mark band numbers. Match the colors of the connectors on the change-over box PCB with the colors of the connectors for wiring. If they are incorrectly connected, a malfunction may occur or the electrical components may be damaged.

Tool	Phillips Screwdriver, Long-Nose Pliers, Wire Cutter
------	--



! WARNING

TURN OFF all power source switches.

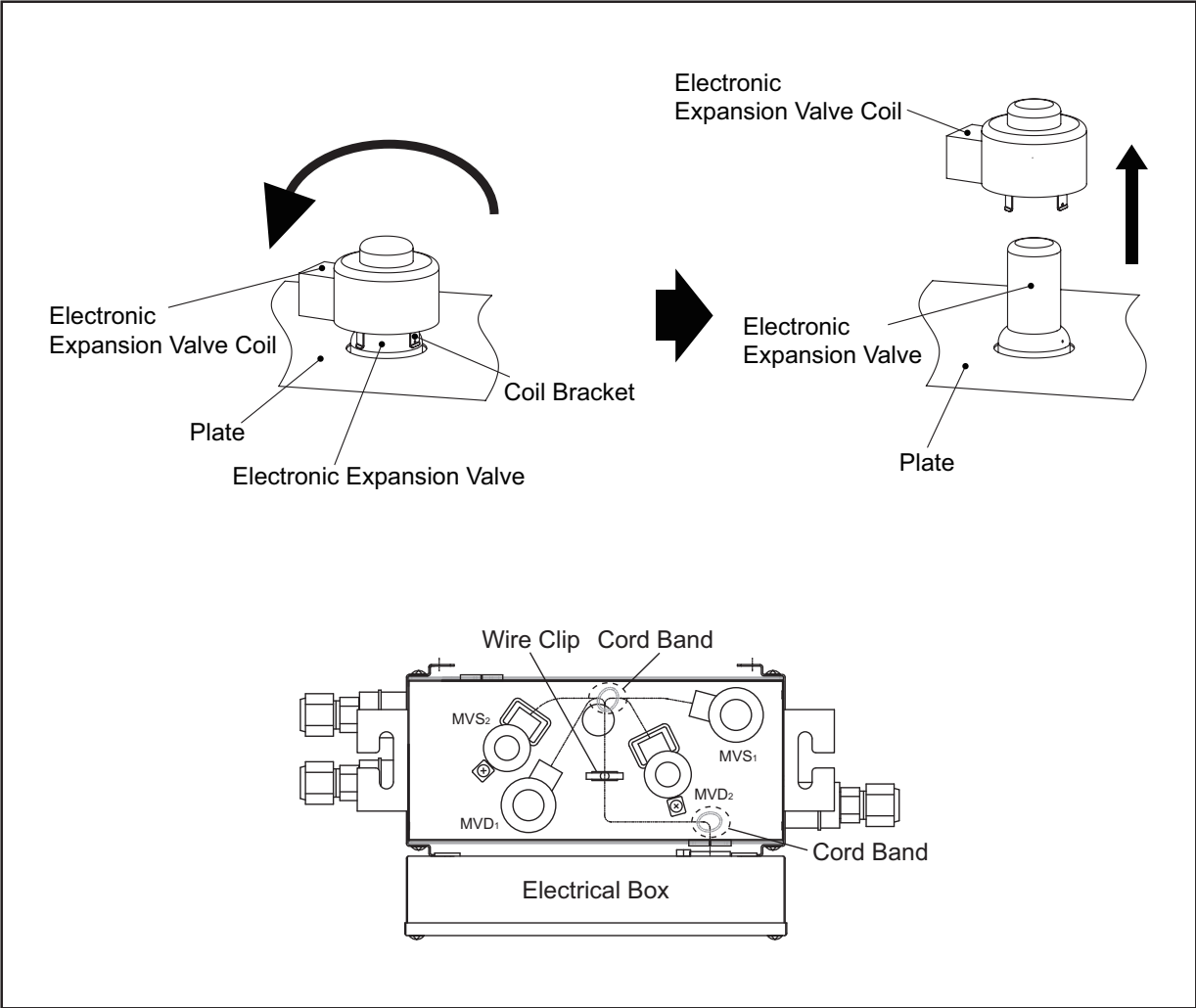
4.1.20.3 Removing Electronic Expansion Valve Coil

- (1) Remove the front service cover according to Section 4.1.20.1 "Removing Front Service Cover for Electrical Box and Electronic Expansion Valve".
- (2) Removing Electronic Expansion Valve (MVD1, MVS1)
 - (a) Turn the electronic expansion valve coil in a counterclockwise direction as shown in the figure below. Remove the electronic expansion valve coil bracket from the electronic expansion valve slot. Then, pull the coil upward and remove it.
 - (b) When replacing the electronic expansion valve coil, turn the coil bracket and press the coil into the electronic expansion valve slot.
- (3) Removing Electronic Expansion Valve (MVD2, MVS2)
 - (a) Remove two screws (M4) securing the electronic expansion valve coil at the circled part in the figure.
 - (b) Then, pull the coil upward and remove it.

NOTE:

When replacing the electronic expansion valve, bind up the wiring with a cable clamp at the two locations indicated in the figure. Make sure to bind up extra wirings and secure them with a wire clip. Not doing so may allow water to enter the electrical box.

Tool	Wire Cutter
------	-------------



MAINTENANCE

(Ducted High Static Type)

4.2 Maintenance of Indoor Unit

⚠ DANGER

Use the specified non-flammable refrigerant for the outdoor unit in the refrigerant system. Do not charge material other than the specified refrigerant into the unit such as hydrocarbon refrigerants (propane), oxygen, flammable gases (acetylene), or poisonous gases when installing, maintaining or transporting. These flammables are extremely dangerous and may cause an explosion, a fire, and injury.

4.2.1 Ducted High Static Type ((H,Y)IDH018 - 048B21S)

⚠ WARNING

TURN OFF all power source switches.

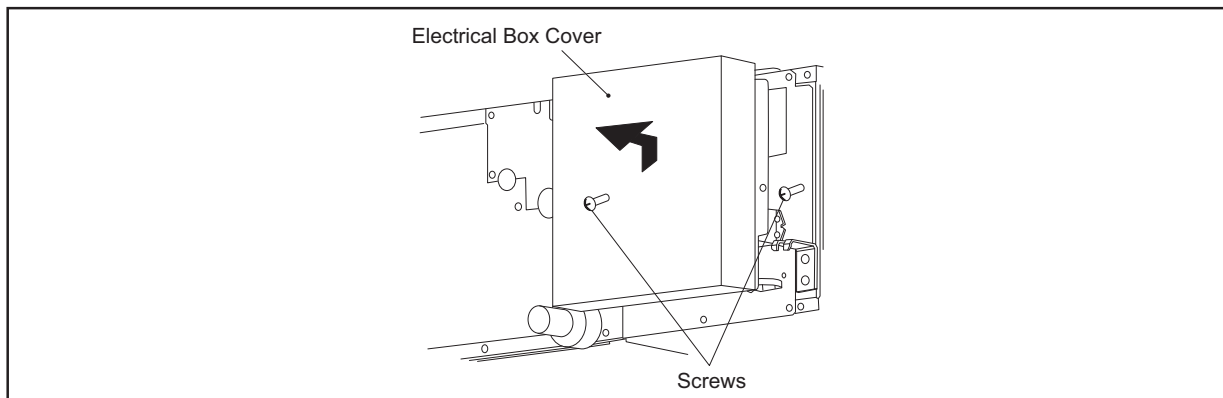
4.2.1.1 Removing Long-Life Filter

The air inlet grilles are field-supplied. How easy it is to access these filters will depend on the installations or location of the equipment. Check it carefully.

4.2.1.2 Removing PCB

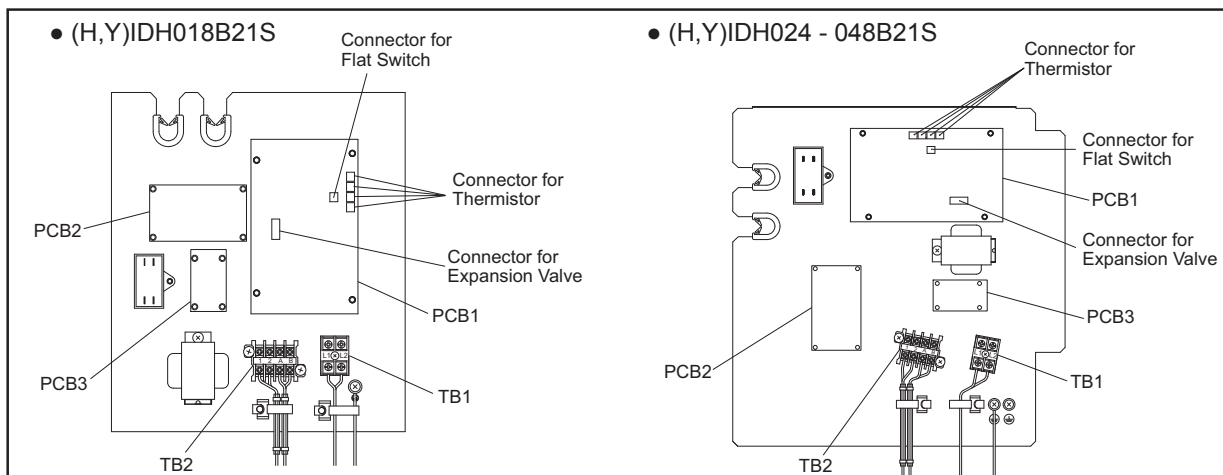
- (1) Loosen two M4 screws securing the electrical box cover and remove the electrical box cover by lifting it upward.

Tool	Phillips Screwdriver
------	----------------------



- (2) There are three PCBs. PCB1 (control PCB) and PCB2 are secured with four PCB holders. Clamp the center of the PCB holders using a long-nose plier and pull out the PCB.

Tool	Phillips Screwdriver, Long-nose Pliers
------	--



ATTENTION:

Do not touch any components on the PCB.

Do not apply excessive force to the PCB or it will cause a malfunction.

! WARNING

TURN OFF all power source switches.

4.2.1.3 Removing Fan and Fan Motor

The fan and the fan motor for (H,Y)IDH018B21S can be removed only from the bottom side.

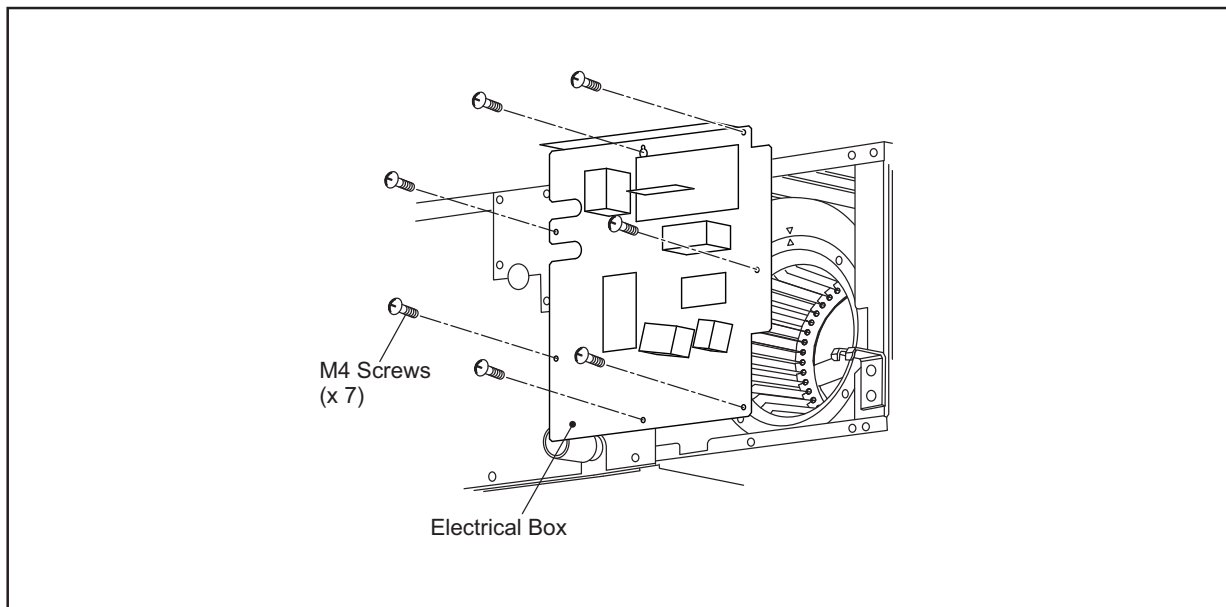
The fan and the fan motor for (H,Y)IDH024 - 048B21S can be removed from the side (electrical box side) and the bottom side.

**A. Removing Fan and Fan Motor from Side (Electrical Box Side) of Unit
(Only for (H,Y)IDH024 - 048B21S) >**

Qty. of Fan Casing and Fan Runner: Each Two / Qty. of Fan Motor: One

- (1) Remove the electrical box cover according to Section 4.2.1.2 "Removing PCB".
- (2) Free the wirings inside of the electrical box.
Disconnect the connector for the float switch electrical wiring. Disconnect the connectors for the expansion valve, the gas pipe thermistor, freeze protection thermistor, air outlet thermistor, and the fan motor from PCB1 and PCB2.
(There are two connectors for the fan motor located on the PCB2 to remove.)
- (3) Remove seven screws securing the electrical box and remove the electrical box.

Tool	Phillips Screwdriver
------	----------------------



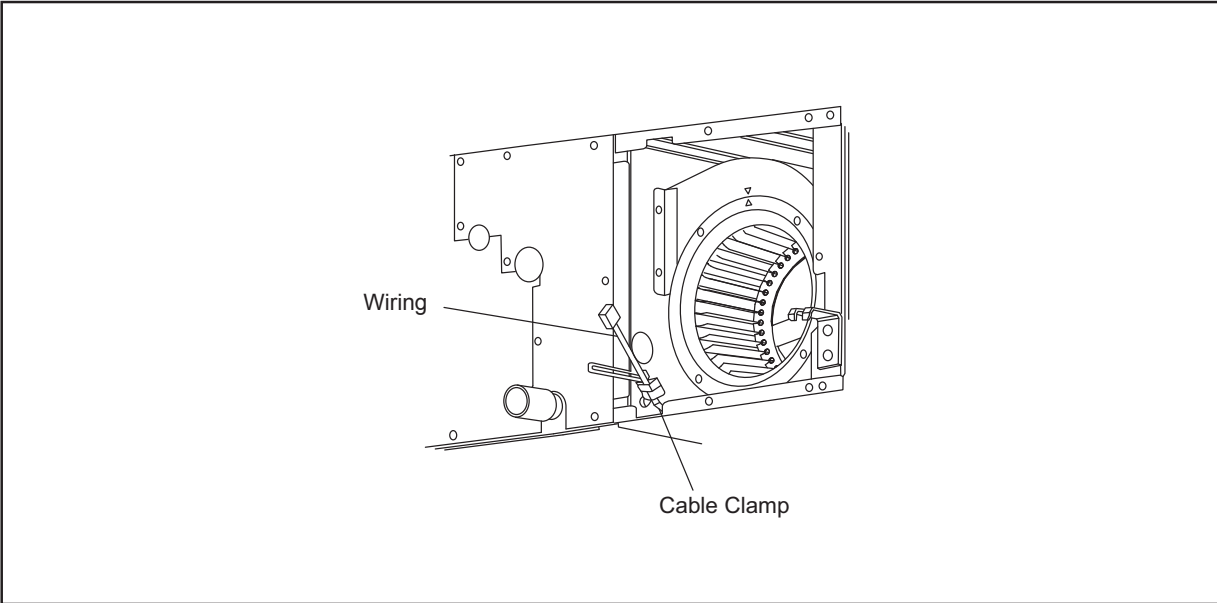
MAINTENANCE

(Ducted High Static Type)

! WARNING

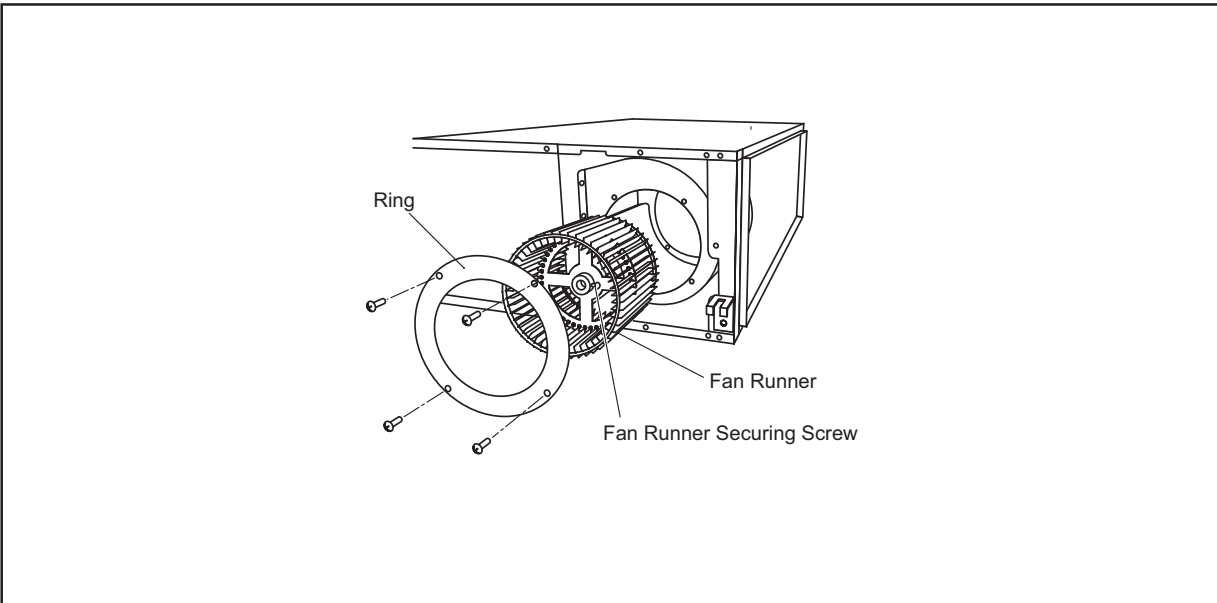
TURN OFF all power source switches.

- (4) After removing the electrical box, the fan motor assembly can be seen.
Remove the wirings secured by the cable clamp on the fan motor securing plate.



- (5) Remove four M4 screws securing the side of the fan casing, and remove the ring of the fan casing.

Tool	Phillips Screwdriver, Adjustable Wrench
------	---



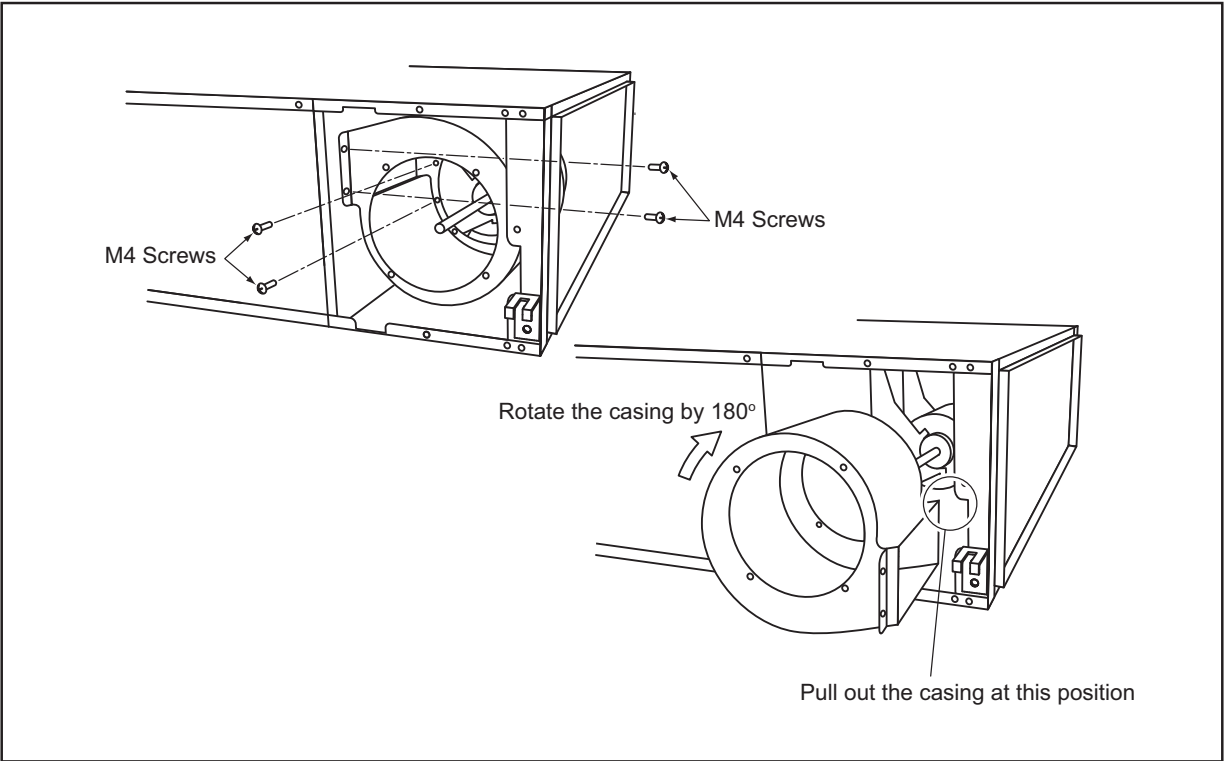
- (6) Loosen the screw securing the fan runner onto the fan motor shaft using the adjustable wrench and pull out the fan runner.

! WARNING

TURN OFF all power source switches.

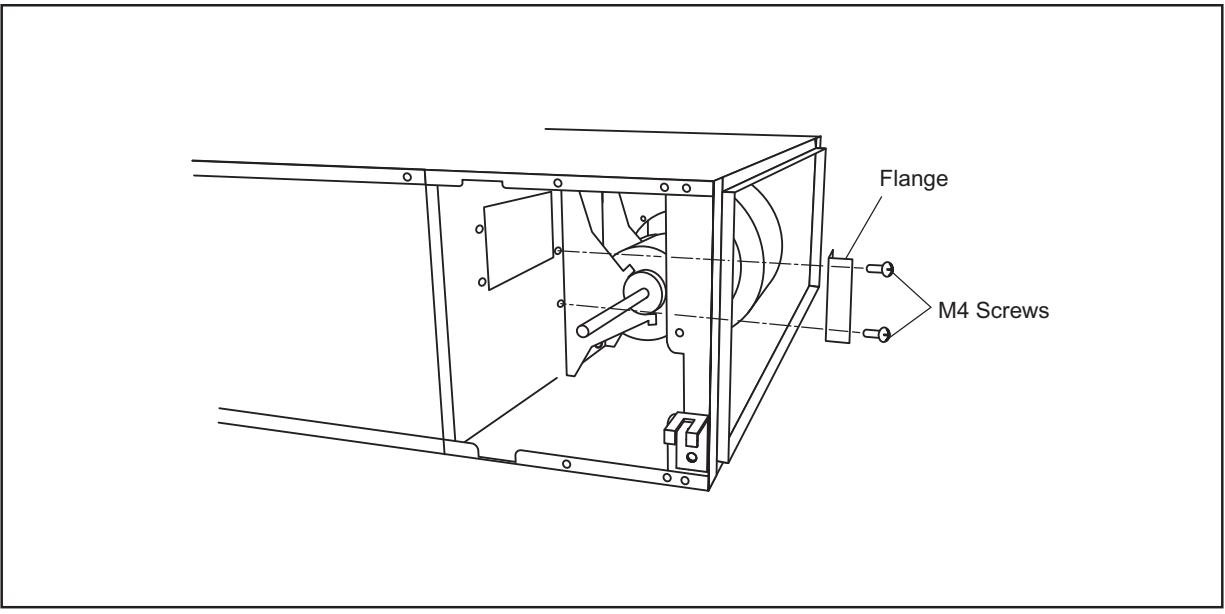
- (7) Remove four screws securing the fan casing onto the motor plate and pull out the fan casing. When pulling out the fan casing, turn the fan casing at an angle of 180°.

Tool	Phillips Screwdriver
------	----------------------



- (8) Remove two M4 screws securing the flange in front of the fan motor and remove the flange.

Tool	Phillips Screwdriver
------	----------------------



MAINTENANCE

(Ducted High Static Type)

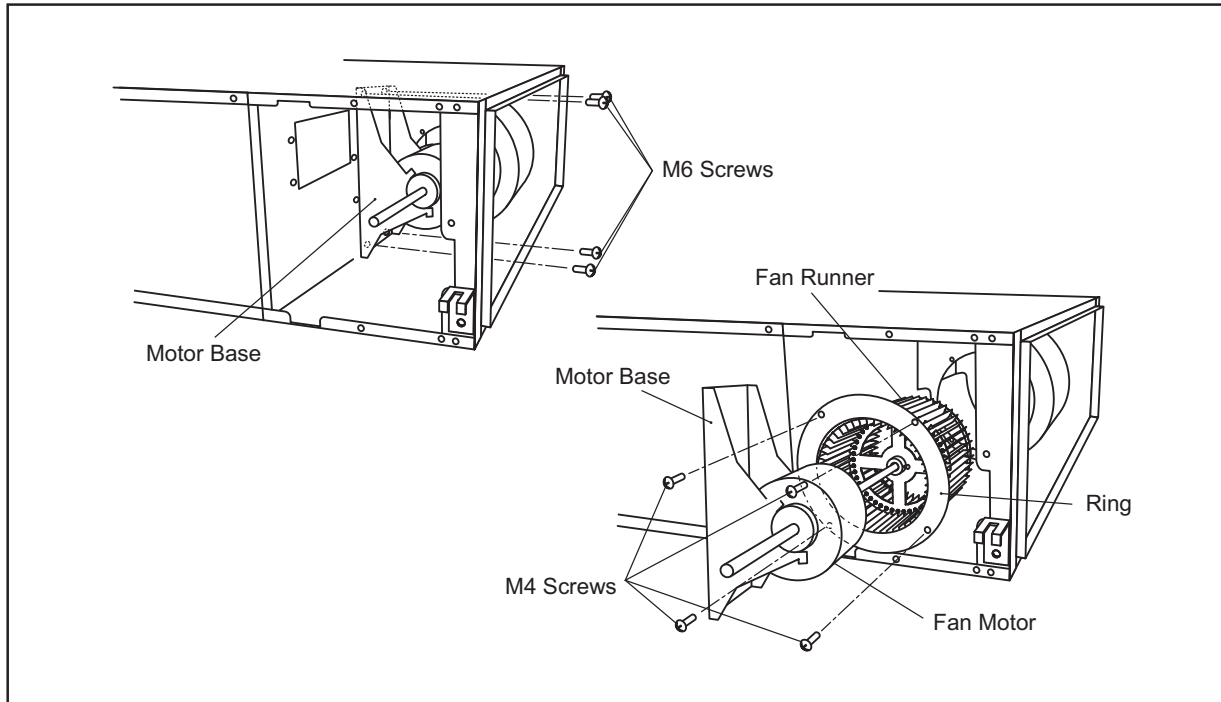
! WARNING

TURN OFF all power source switches.

- (9) Remove two lower M6 screws securing the motor base. Then loosen the upper two M6 screws.
- (10) Remove four M4 screws securing the ring of the fan casing at the rear side of the fan motor. Then remove the motor base, the ring, and the fan runner at the same time.

Tool

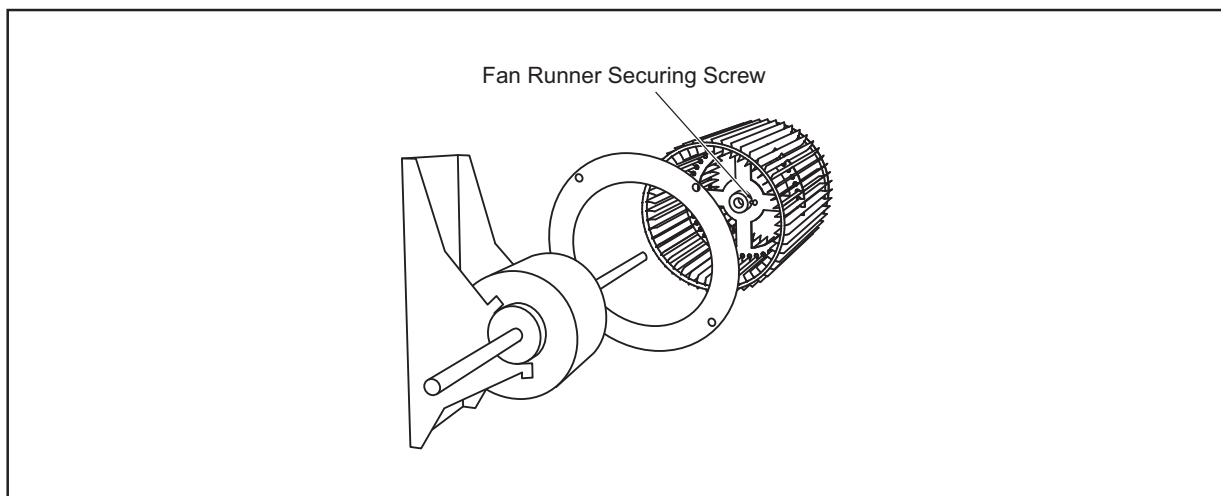
Phillips Screwdriver



- (11) Loosen the screw securing the fan runner onto the fan motor using the adjustable wrench and pull out the fan runner.

Tool

Phillips Screwdriver, Adjustable Wrench



ATTENTION:

The total weight of the motor base, the fan motor, the ring and the fan runner is approximately 33 lbs. (15kg). Perform the above work carefully.

! WARNING

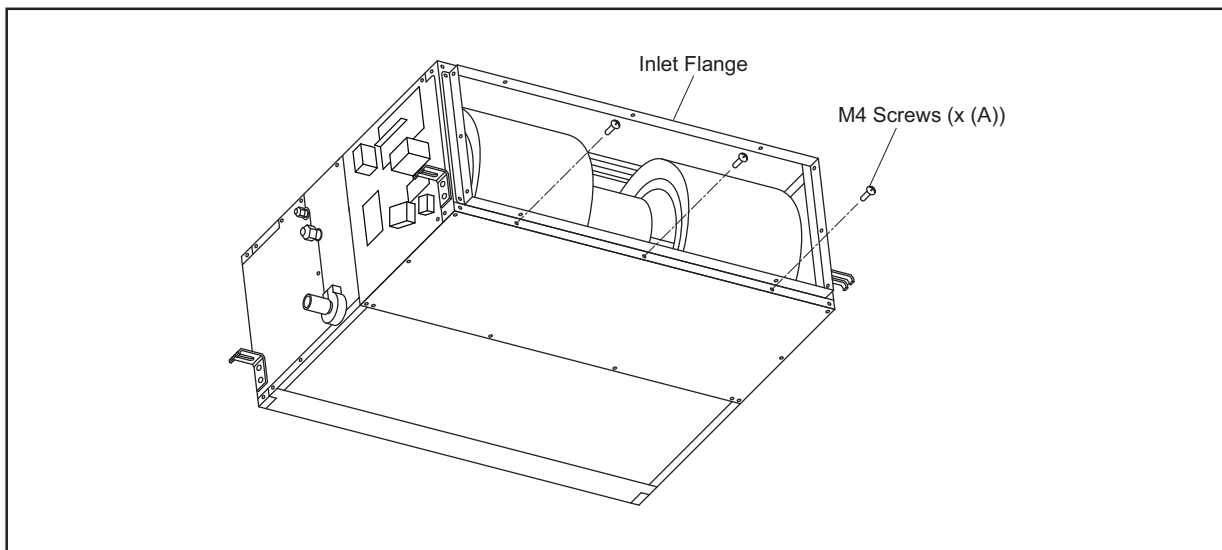
TURN OFF all power source switches.

B. Removing Fan and Fan Motor from Bottom Side (For All Models)

- (1) Remove the electrical box cover according to Section 4.2.1.2 "Removing PCB".
- (2) Disconnect the two connectors for the fan motor located on the PCB2. Then remove the wirings.
- (3) Remove the lower M4 screws securing the inlet flange.

Qty. of Screws (A): One (For (H,Y)IDH018B21S)
 Three (For (H,Y)IDH024 - 030B21S)
 Four (For (H,Y)IDH036, 048B21S)

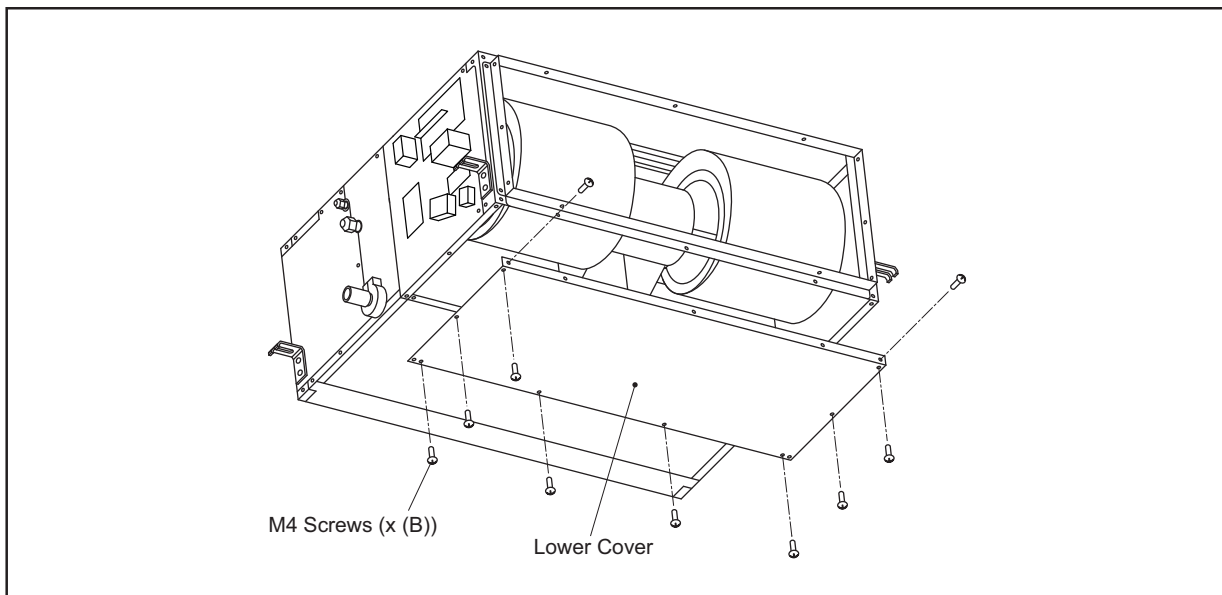
Tool	Phillips Screwdriver
------	----------------------



- (4) Remove the lower M4 screws securing the lower cover at the fan side. Then remove the lower cover.

Qty. of Screws (B): 10 (For (H,Y)IDH018B21S)
 12 (For (H,Y)IDH024 - 048B21S)

Tool	Phillips Screwdriver
------	----------------------



MAINTENANCE

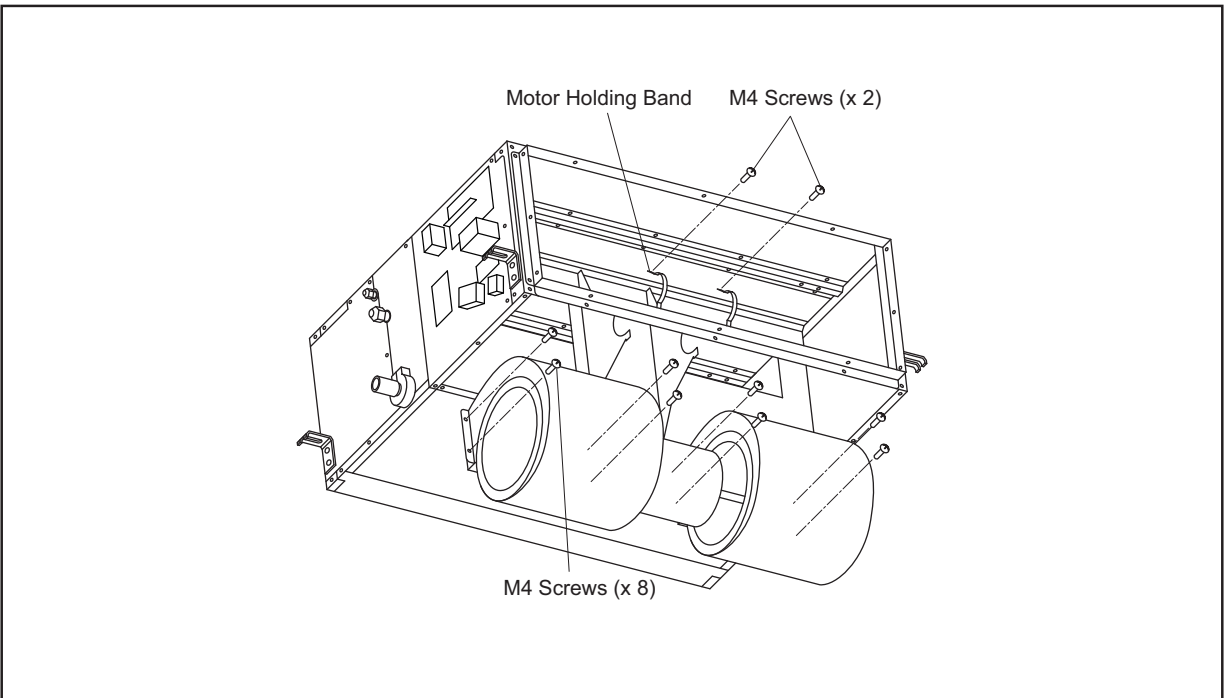
(Ducted High Static Type)

! WARNING

TURN OFF all power source switches.

- (5) After removing the lower cover, the fan assembly can be seen.
Remove the wires for the motor secured by the cable clamp of the fan motor securing plate.
- (6) Remove eight M4 screws securing the fan casings onto the fan securing plate and move the fan casings slightly.
- (7) Remove two M4 screws securing the motor holding bands to the motor base. Then remove the motor, the fan casings and the fan runners at the same time.

Tool	Phillips Screwdriver
------	----------------------



ATTENTION:

The total weight of the fan motor, the fan casings and the fan runners is approximately 33 lbs. (15kg). Perform the above work carefully.

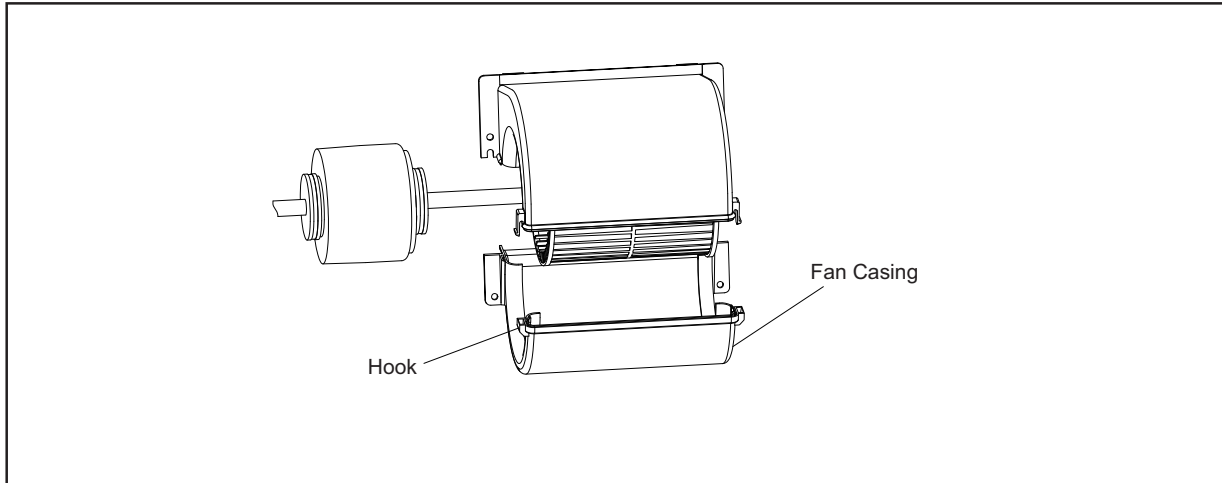
! WARNING

TURN OFF all power source switches.

• **For (H,Y)IDH018B21S**

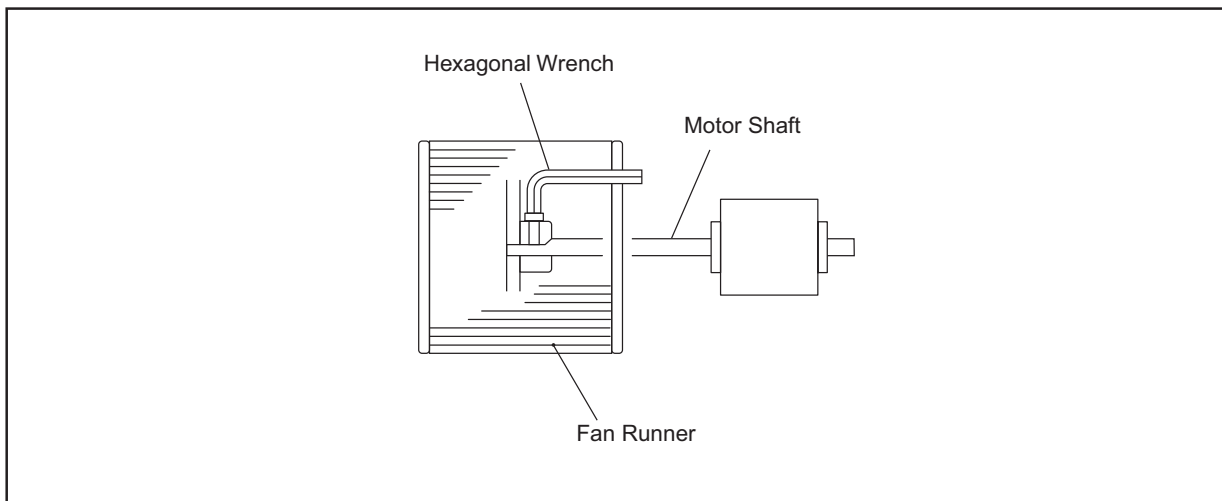
(8) Push the hooks at both sides of the fan casing and remove the lower part of the fan casing.

Tool	None
------	------



(9) Loosen the screws securing the fan motor and the fan runner using the hexagonal wrench (for M6 screw) and pull out to remove the fan runner.

Tool	Hexagonal Wrench
------	------------------



• **For (H,Y)IDH024 - 048B21S**

(8) Remove the fan runner and the motor according to Section 4.2.1.3-A "Removing Fan and Fan Motor from Side (Electrical Box Side) of Unit" - (5) to (11).

MAINTENANCE

(Ducted High Static Type)

! WARNING

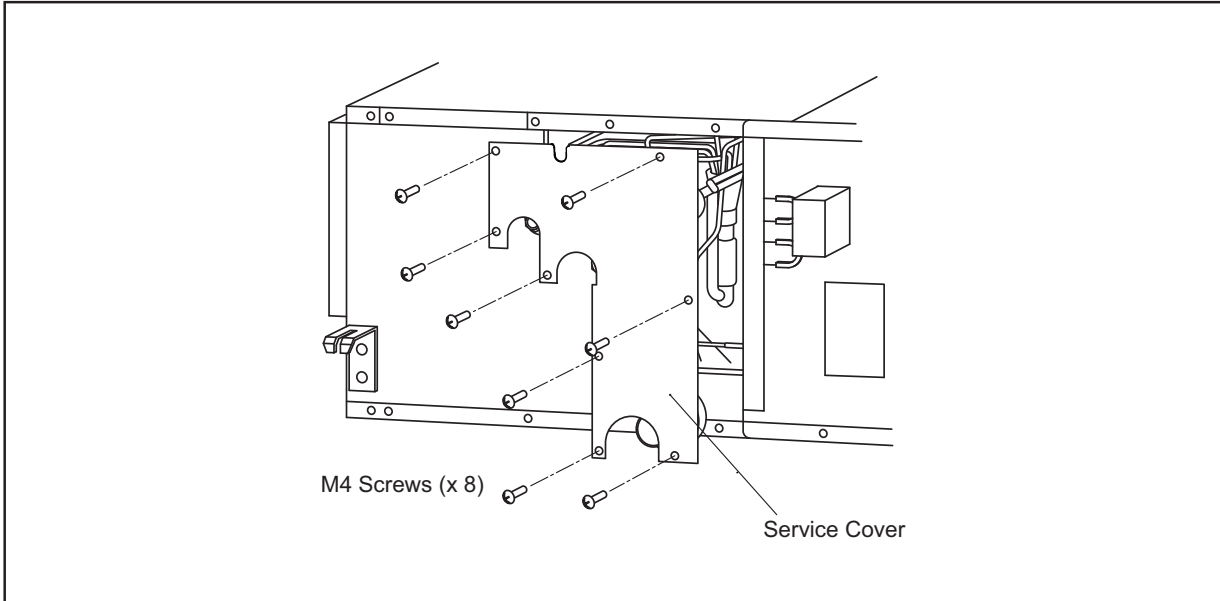
TURN OFF all power source switches.

4.2.1.4 Removing Thermistors for Liquid Pipe and Gas Pipe

- (1) Remove eight M4 screws securing the service cover and remove the service cover.

Tool

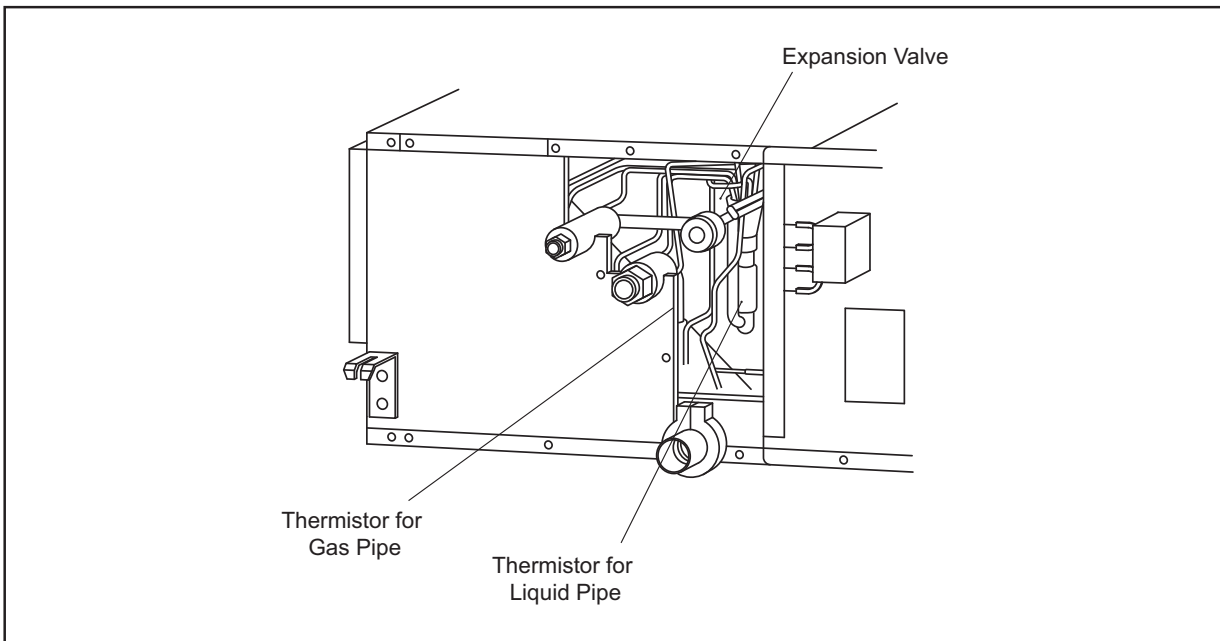
Phillips Screwdriver



- (2) Remove the pipe insulations and the thermistor holder. The thermistors for pipes can be removed.

Tool

Phillips Screwdriver



! WARNING

TURN OFF all power source switches.

4.2.1.5 Removing Electronic Expansion Valve Coil

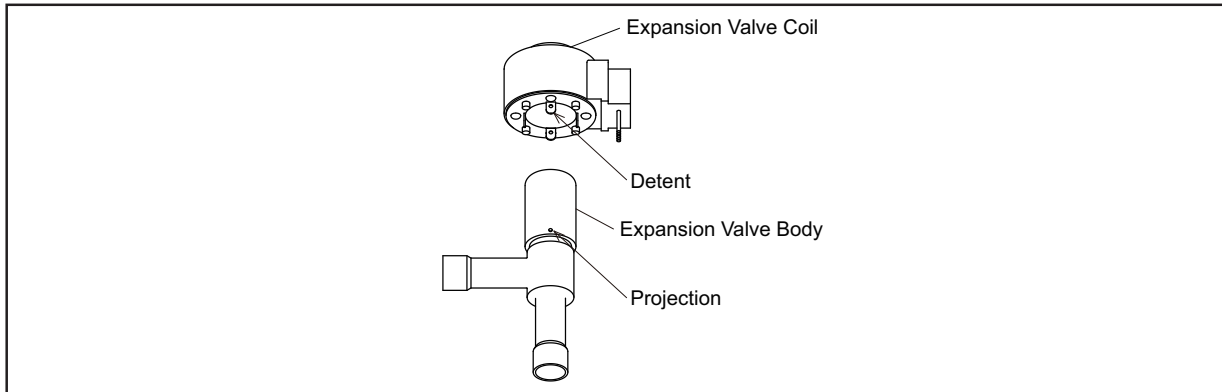
- (1) Remove the service cover according to Section 4.2.1.4 “Removing Thermistors for Liquid Pipe and Gas Pipe”.
- (2) Remove the detents of the expansion valve coil from the projection parts of the valve body by rotating the valve coil. Pull up the valve coil and remove it. At this time, take care not to twist the pipes.
- (3) Insert the new expansion valve coil into the expansion valve body. When inserting the valve coil, secure the projection parts into the detents.

NOTE:

The detents are located 90° apart in a circle and the projections are located 180° apart in a circle. Make sure to fit the projection parts into the detents. The position of rotation direction does not affect the operation. If the valve coil is inserted incorrectly, it may cause malfunction of the valve coil.

- (4) When the replacement is completed, secure the wire for the expansion valve coil near the valve coil with a plastic band. At this time, secure the edge of lead wires for the expansion valve coil to face down.

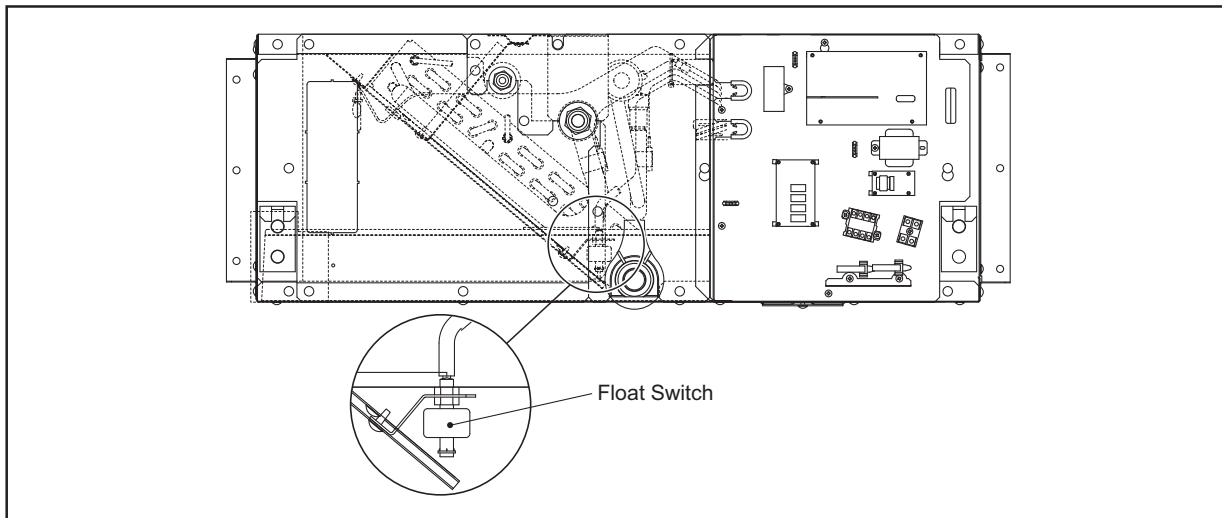
Tool	Phillips Screwdriver
------	----------------------



4.2.1.6 Removing Float Switch

- (1) Remove the service cover according to Section 4.2.1.4 “Removing Thermistors for Liquid Pipe and Gas Pipe”.
- (2) The float switch is secured on the heat exchanger mounting plate. Remove the float switch using two wrenches.

Tool	Phillips Screwdriver, Wrenches
------	--------------------------------



ATTENTION:

**When reassembling, handle the float switch carefully.
 (Tightening Torque: Approx. 0.2lbf-ft (0.3N·m))
 If the float switch is dropped, a malfunction will occur.**

MAINTENANCE

(Ducted High Static Type)

! WARNING

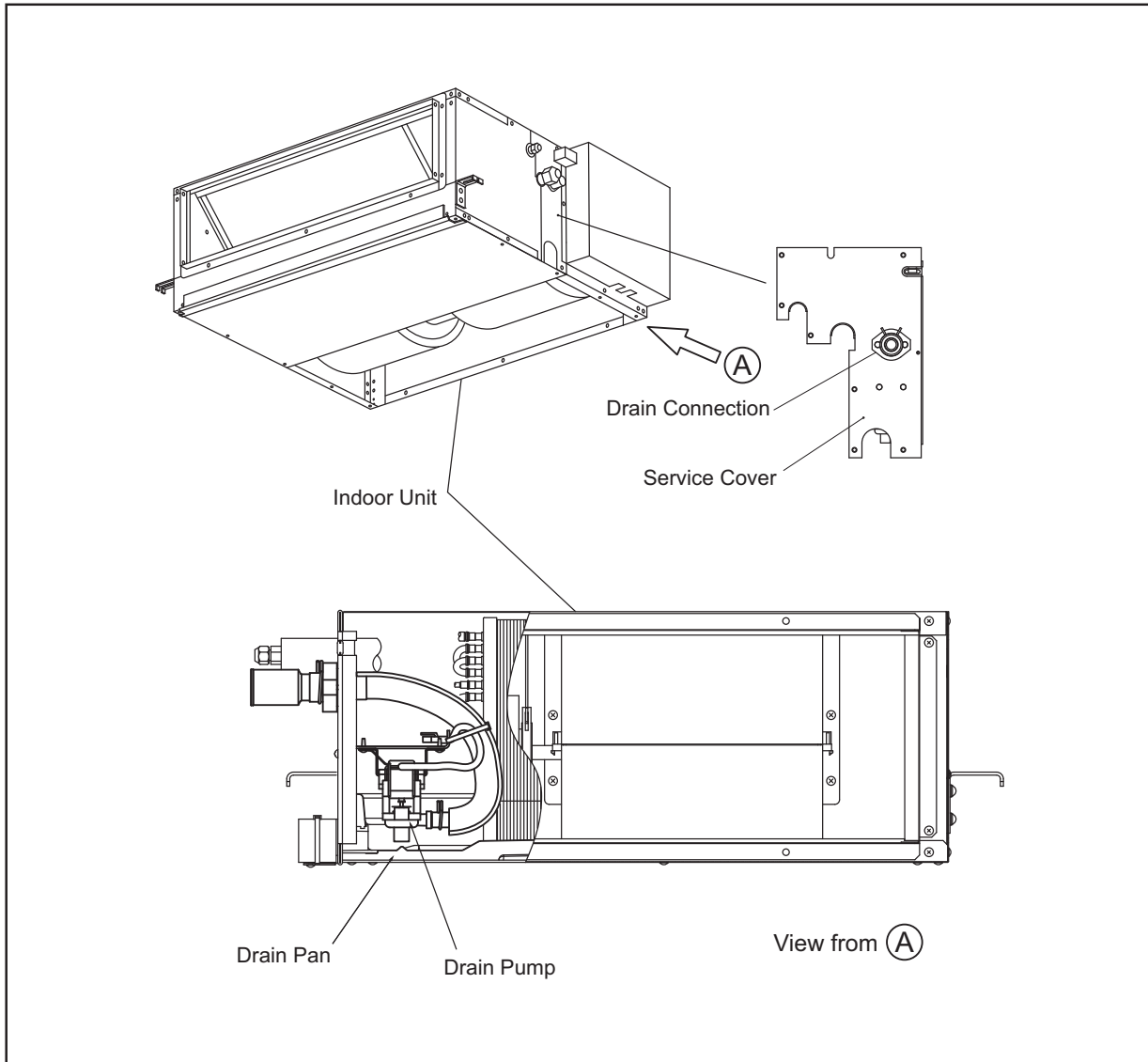
TURN OFF all power source switches.

4.2.1.7 Removing Drain Pump

The drain pump is secured on the service cover. Remove the service cover according to Section 4.2.1.4 (1) "Removing Thermistors for Liquid Pipe and Gas Pipe".

Remove the securing screws and remove the drain pump.

Tool	Phillips Screwdriver, Wrench
------	------------------------------



! WARNING

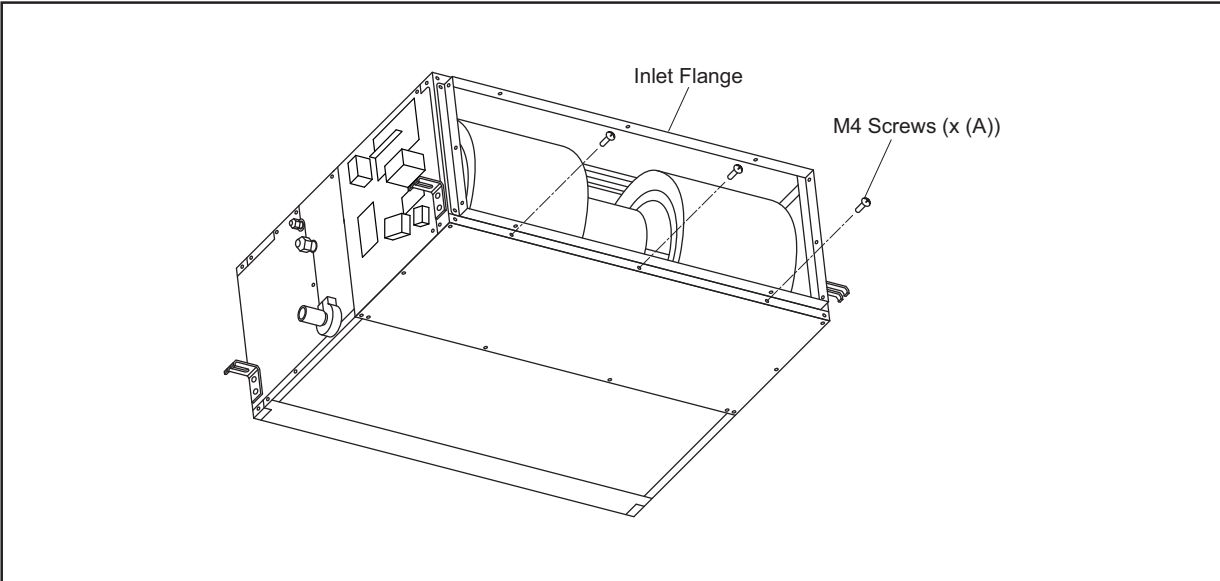
TURN OFF all power source switches.

4.2.1.8 Removing Drain Pan

- (1) Remove the lower M4 screws securing the inlet flange.

Qty. of Screws (A): One (For (H,Y)IDH018B21S)
 Three (For (H,Y)IDH024 - 030B21S)
 Four (For (H,Y)IDH036, 048B21S)

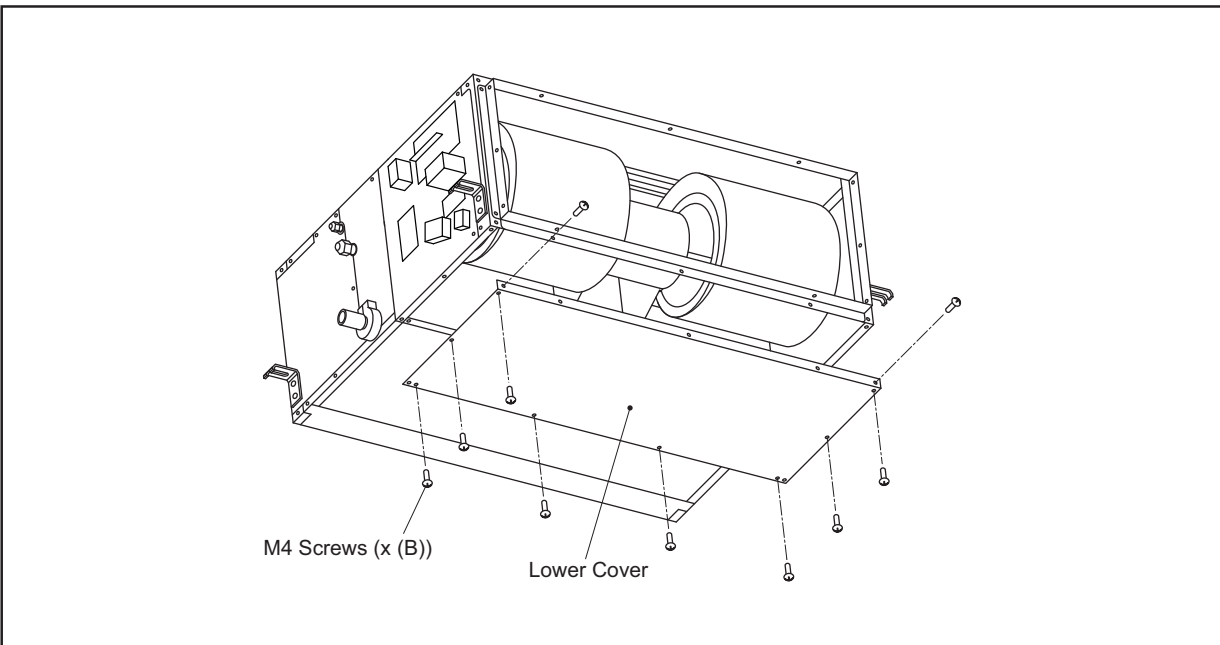
Tool	Phillips Screwdriver
------	----------------------



- (2) Remove the lower M4 screws securing the lower cover at the fan side and remove the lower cover.

Qty. of Screws (B): 10 (For (H,Y)IDH018B21S)
 12 (For (H,Y)IDH024 - 048B21S)

Tool	Phillips Screwdriver
------	----------------------



MAINTENANCE

(Ducted High Static Type)

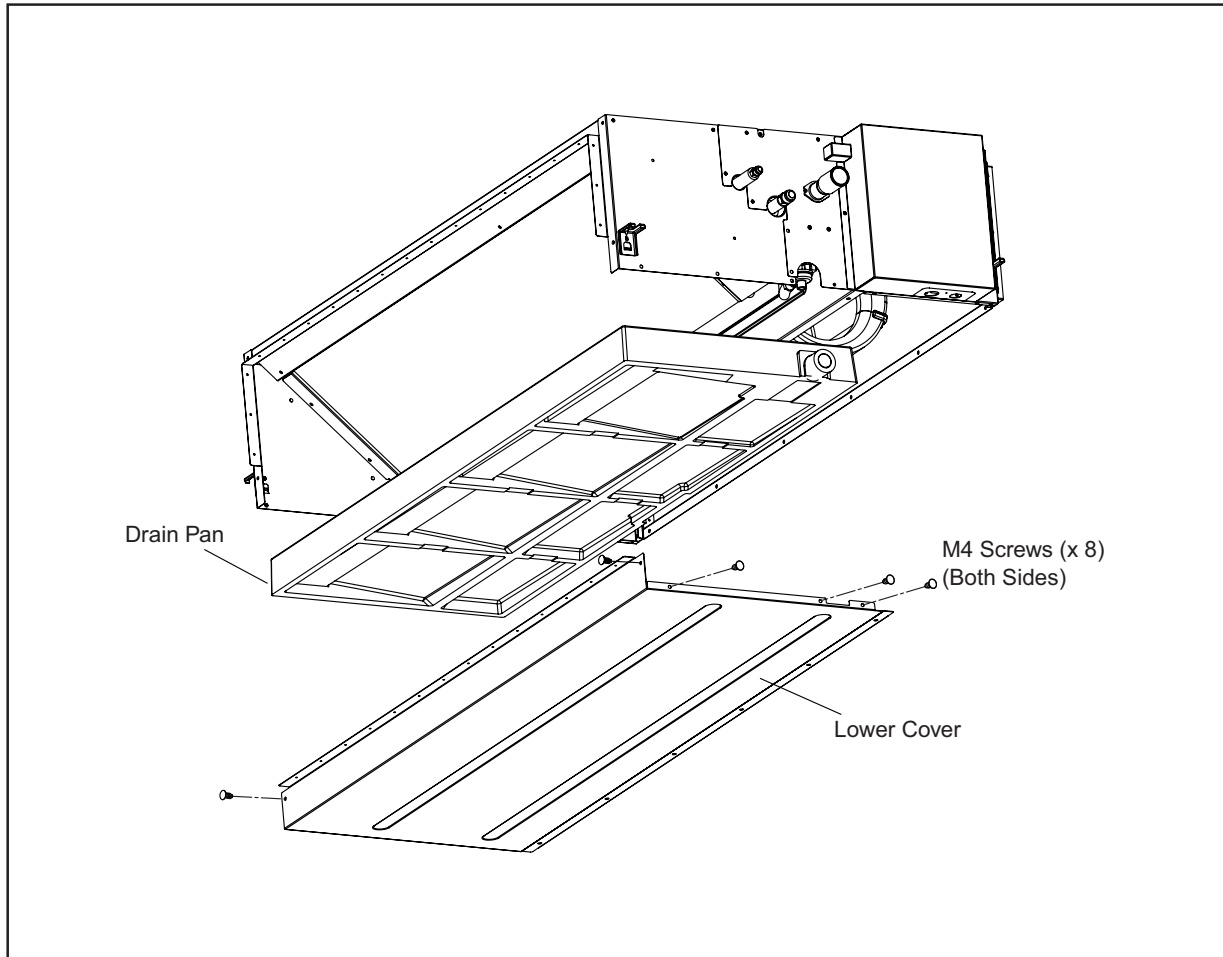
! WARNING

TURN OFF all power source switches.

- For (H,Y)IDH018B21S

- (3) Remove eight lower M4 screws securing the lower cover at the indoor heat exchanger side and remove the lower cover.
- (4) Pull the drain pan down.

Tool	Phillips Screwdriver, Bucket approximately 1.3 gal (5 liters)
------	--



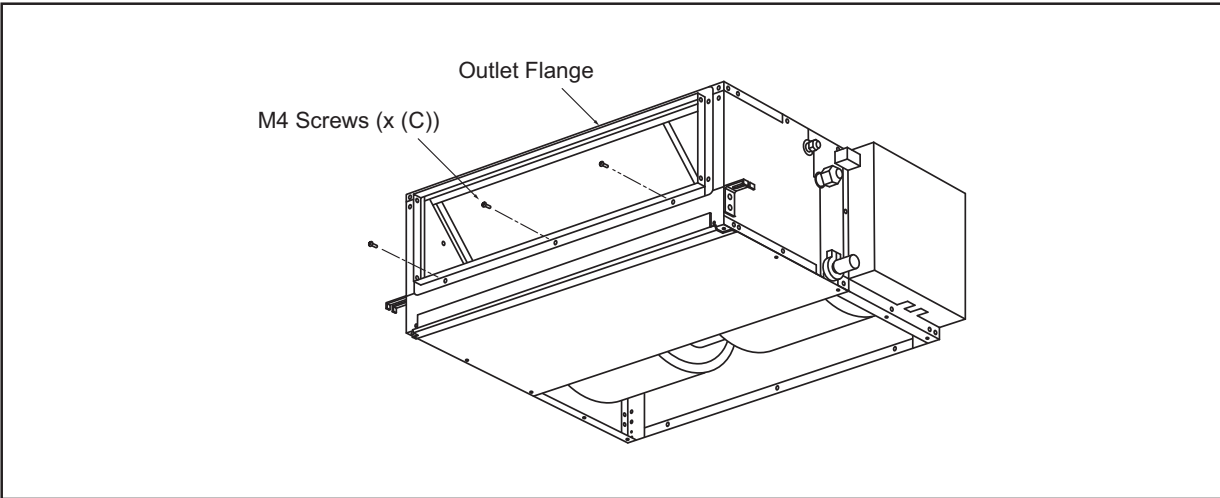
! WARNING

TURN OFF all power source switches.

• For (H,Y)IDH024 - 048B21S

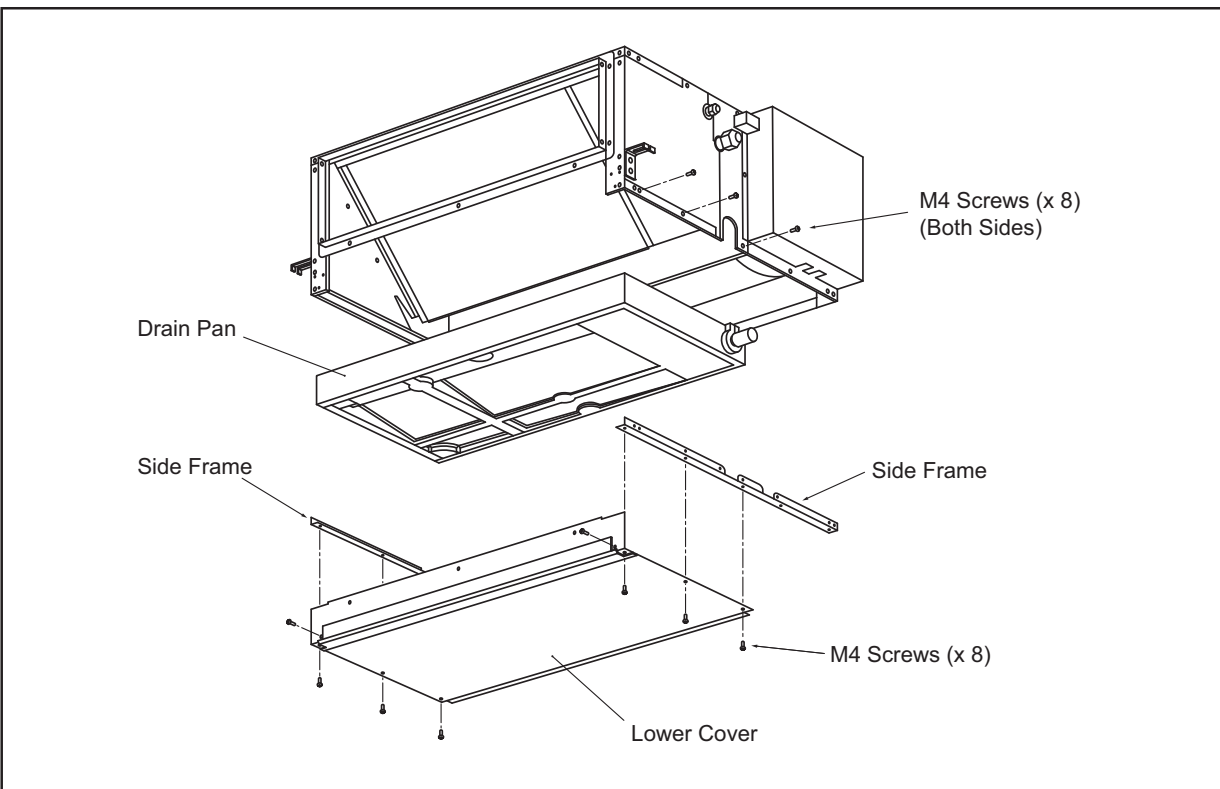
- (3) Remove the lower M4 screws securing the outlet flange.
 Qty. of Screws (C): Three (For (H,Y)IDH018 - 030B21S)
 Four (For (H,Y)IDH036, 048B21S)

Tool	Phillips Screwdriver
------	----------------------



- (4) Remove eight M4 screws securing the lower cover at the indoor heat exchanger side and remove the lower cover.
- (5) Remove M4 screws (eight for each side) securing the side frames at both sides. Then remove the side frames.
- (6) Pull the drain pan down.

Tool	Phillips Screwdriver, Bucket approximately 1.3 gal (5 liters)
------	--



MAINTENANCE

(Ducted Medium Static Type)

! DANGER

Use the specified non-flammable refrigerant for the outdoor unit in the refrigerant system. Do not charge material other than specified refrigerant into the unit such as hydrocarbon refrigerants (propane), oxygen, flammable gases (acetylene), or poisonous gases when installing, maintaining and moving. These flammables are extremely dangerous and may cause an explosion, a fire, and injury.

4.2.2 Ducted Medium Static Type ((H,Y)IDM006 - 048B21S)

! WARNING

TURN OFF all power source switches.

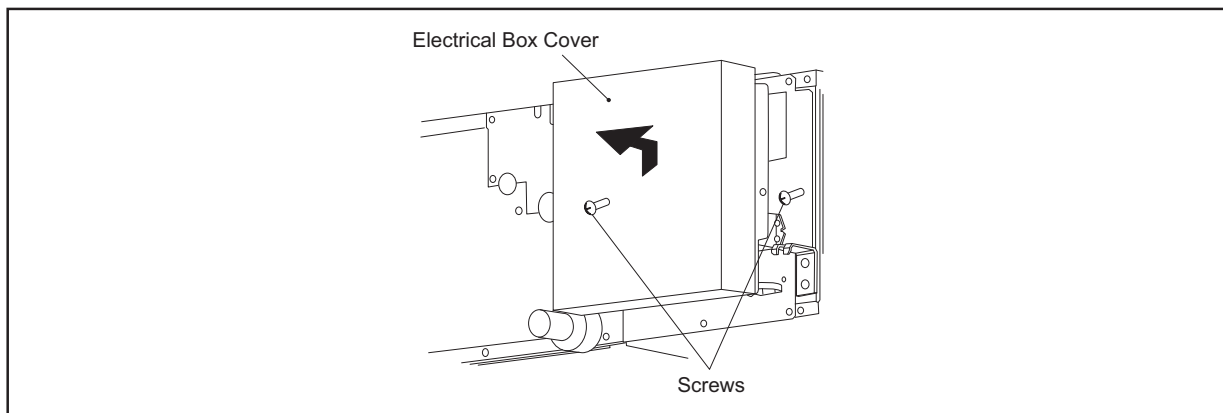
4.2.2.1 Removing Long-Life Filter

The air inlet grilles are field-supplied. How easy it is to access these filters will depend on the installations or location of the equipment. Check it carefully.

4.2.2.2 Removing PCB

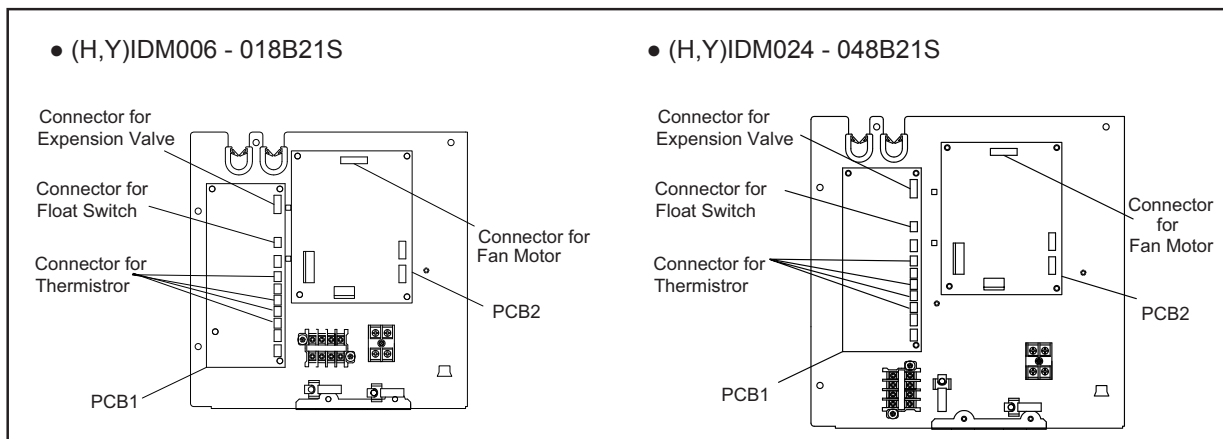
- (1) Loosen two M4 screws securing the electrical box cover and remove the electrical box cover by lifting it up.

Tool	Phillips Screwdriver
------	----------------------



- (2) There are two PCBs. The control PCB is secured with four PCB holders. Clamp the center of the PCB holders using a long-nose plier and pull out the PCB.
- (3) Remove four PCB holders and remove the power supply of the PCB.

Tool	Phillips Screwdriver, Long-nose Pliers
------	--



ATTENTION:

Do not touch any components on the PCB.

Do not apply excessive force to the PCB or it will cause a malfunction.

! WARNING

TURN OFF all power source switches.

4.2.2.3 Removing Fan and Fan Motor

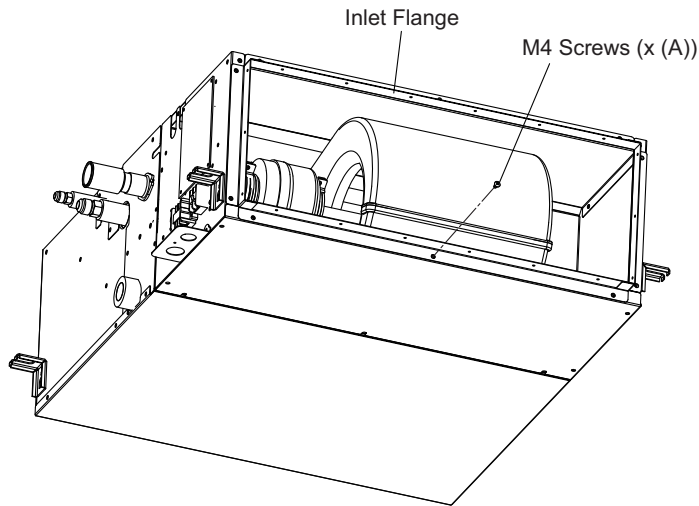
The indoor fan and the fan motor for (H,Y)IDM006 - 48B21S can be removed only from the bottom side.

- (1) Remove the electrical box cover according to Section 4.2.2.2 "Removing PCB".
- (2) Disconnect the connector for the fan motor located on the PCB 2. Then remove the wiring.
- (3) Remove the lower M4 screws securing the inlet flange.

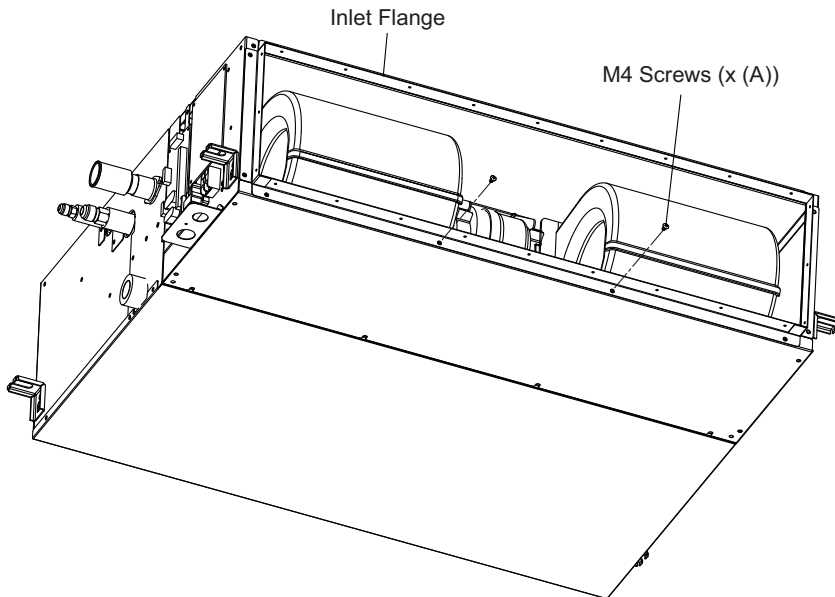
Qty. of Screws (A): One (For (H,Y)IDM006 - 012B21S)
 Two (For (H,Y)IDM015 - 048B21S)

Tool	Phillips Screwdriver
------	----------------------

- (H,Y)IDM006 - 012B21S



- (H,Y)IDM015 - 048B21S



MAINTENANCE

(Ducted Medium Static Type)

! WARNING

TURN OFF all power source switches.

(4) Remove the lower M4 screws securing the lower cover.

Qty. of Screws (B): Seven (For (H,Y)IDM006 - 012B21S)

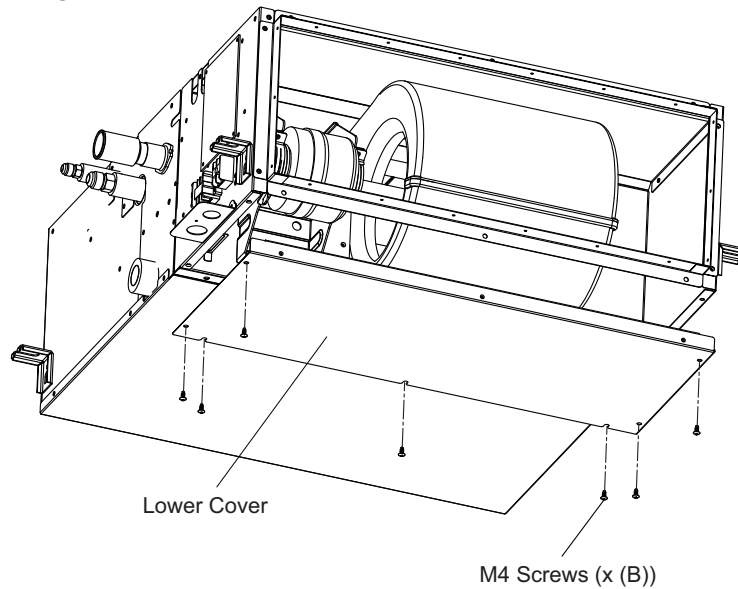
Five (For (H,Y)IDM015 - 018B21S)

Eight (For (H,Y)IDM024 - 030B21S)

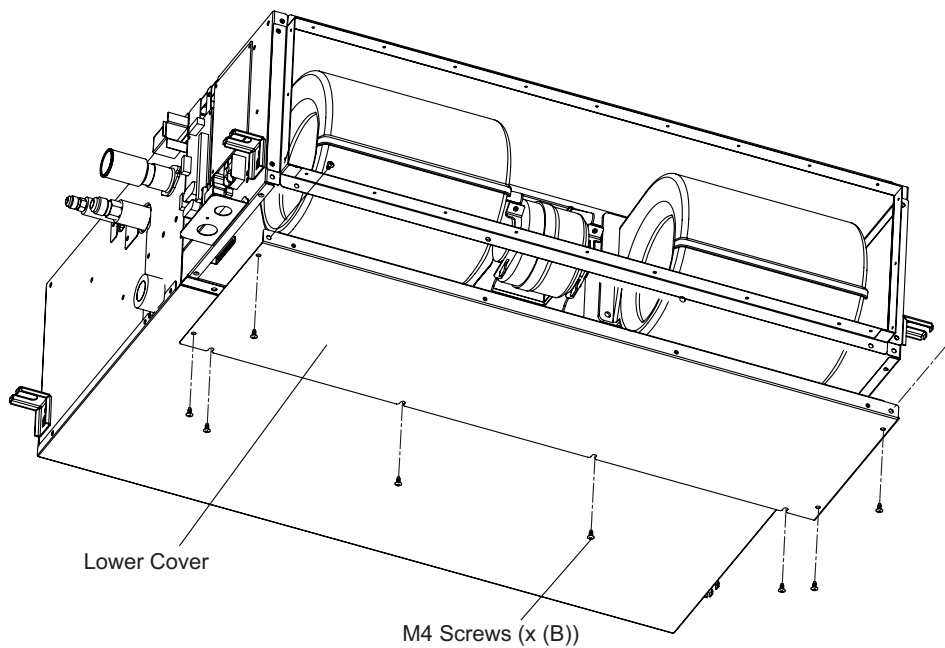
12 (For (H,Y)IDM036 - 048B21S)

Tool	Phillips Screwdriver
------	----------------------

• (H,Y)IDM006 - 012B21S



• (H,Y)IDM015 - 048B21S



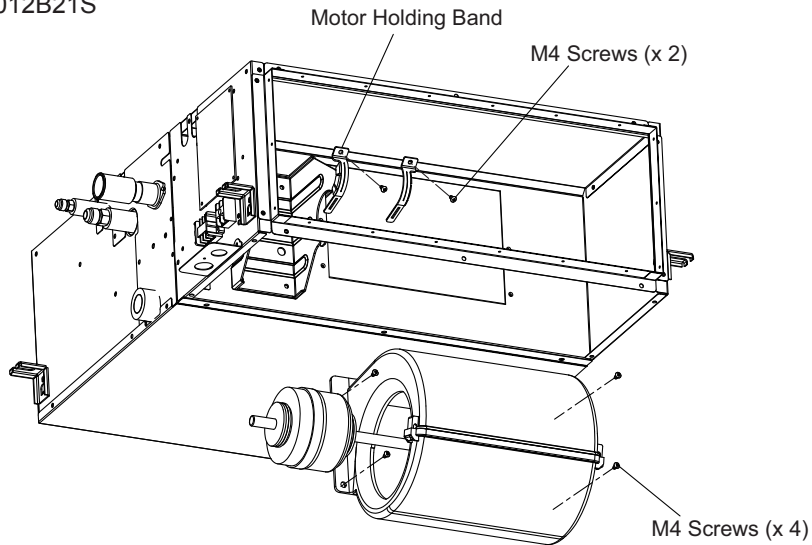
! WARNING

TURN OFF all power source switches.

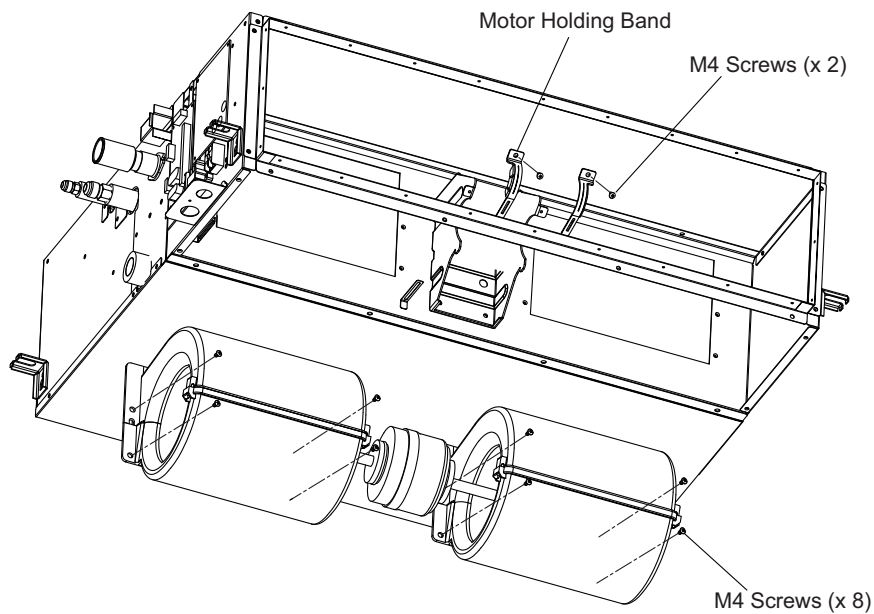
- (5) After removing the lower cover, the fan assembly can be seen.
Remove the wiring for the motor secured by the cable clamp of the fan mounting plate.
- (6) Remove four M4 screws securing each casing onto the fan mounting plate and move the fan casing slightly.
- (7) Remove two M4 screws securing the motor holding bands to the motor base and remove the motor, the fan casings and the fan runner at the same time.

Tool	Phillips Screwdriver
------	----------------------

- (H,Y)IDM006 - 012B21S



- (H,Y)IDM015 - 018B21S



ATTENTION:

The total weight of the fan motor, the fan casing and the fan runners is approximately 33 lbs. (15kg). Perform the above work carefully.

MAINTENANCE

(Ducted Medium Static Type)

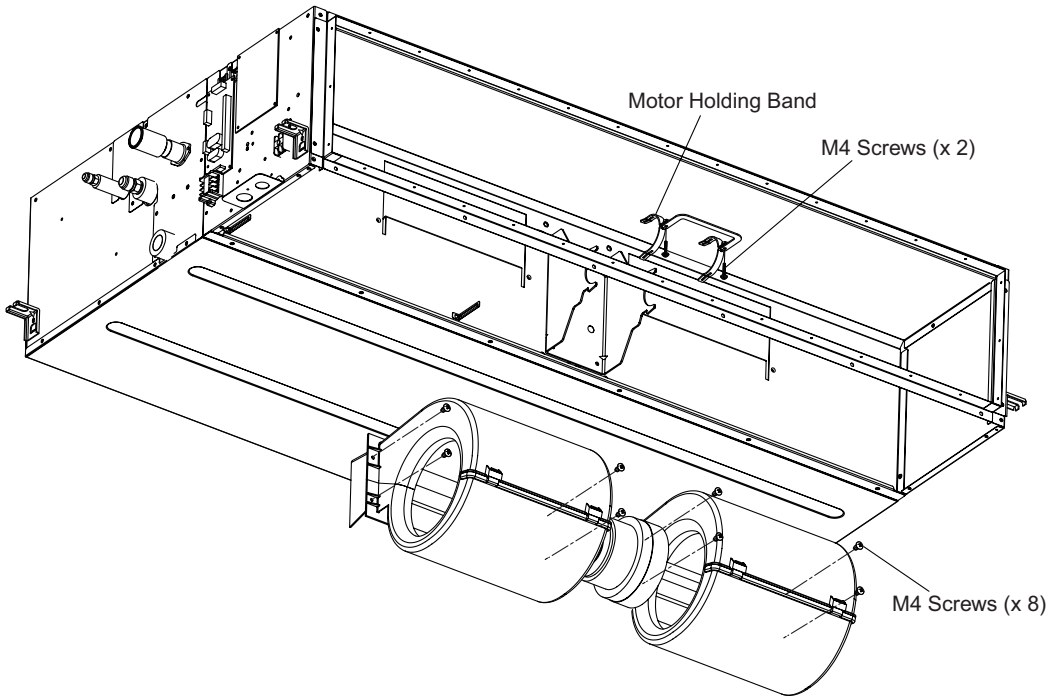
! WARNING

TURN OFF all power source switches.

Tool

Phillips Screwdriver

- (H,Y)IDM024 - 048B21S



ATTENTION:

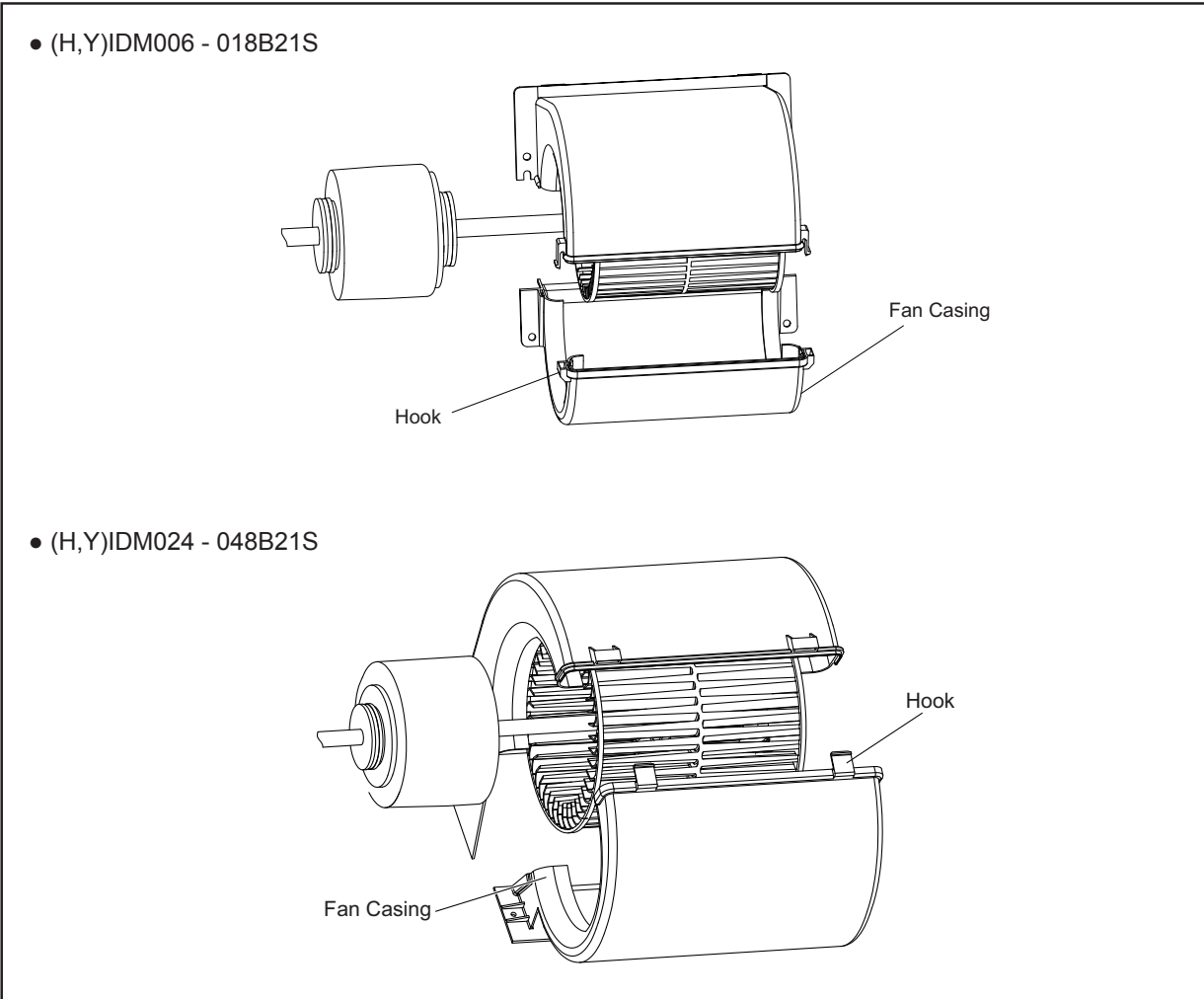
The total weight of the fan motor, the fan casings and the fan runners is approximately 33 lbs. (15kg). Perform the above work carefully.

! WARNING

TURN OFF all power source switches.

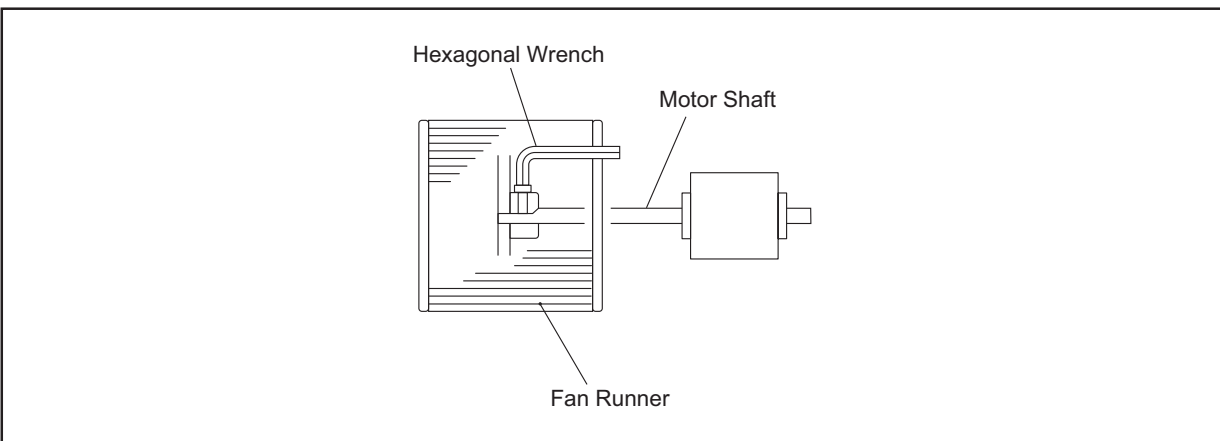
(8) Push the hooks at both sides of the fan casing and remove the lower part of the fan casing.

Tool	None
------	------



(9) Loosen the screws securing the fan motor and the fan runner using the hexagonal wrench (for M6 screw) and pull out to remove the fan runner.

Tool	Hexagonal Wrench
------	------------------



MAINTENANCE

(Ducted Medium Static Type)

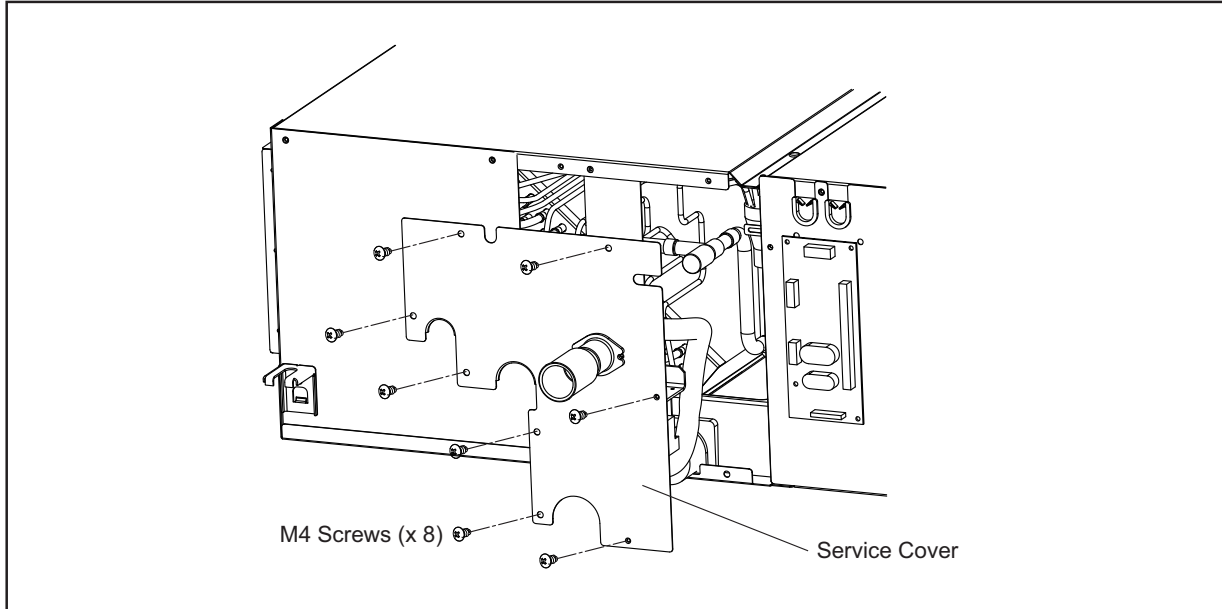
! WARNING

TURN OFF all power source switches.

4.2.2.4 Removing Thermistors for Liquid Pipe and Gas Pipe

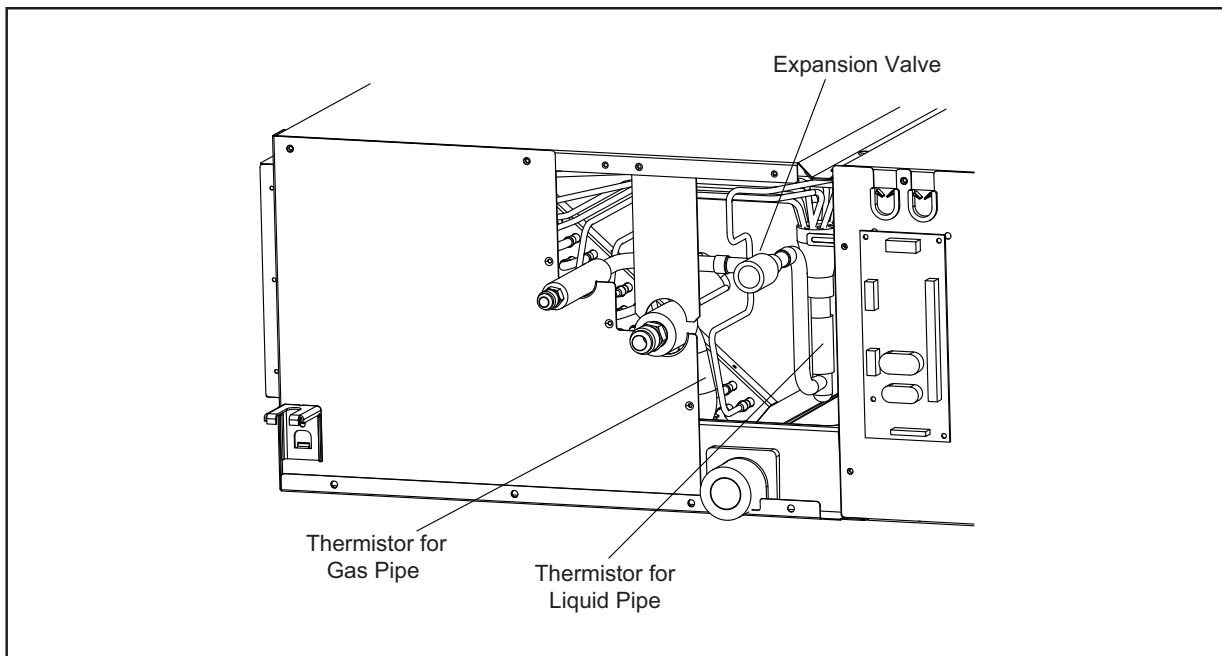
- (1) Remove eight M4 screws securing the service cover and remove the service cover.

Tool	Phillips Screwdriver
------	----------------------



- (2) Remove the cork tape, pipe insulations and the thermistor holder. The thermistors for pipes can be removed.

Tool	Phillips Screwdriver
------	----------------------



! WARNING

TURN OFF all power source switches.

4.2.2.5 Removing Electronic Expansion Valve Coil

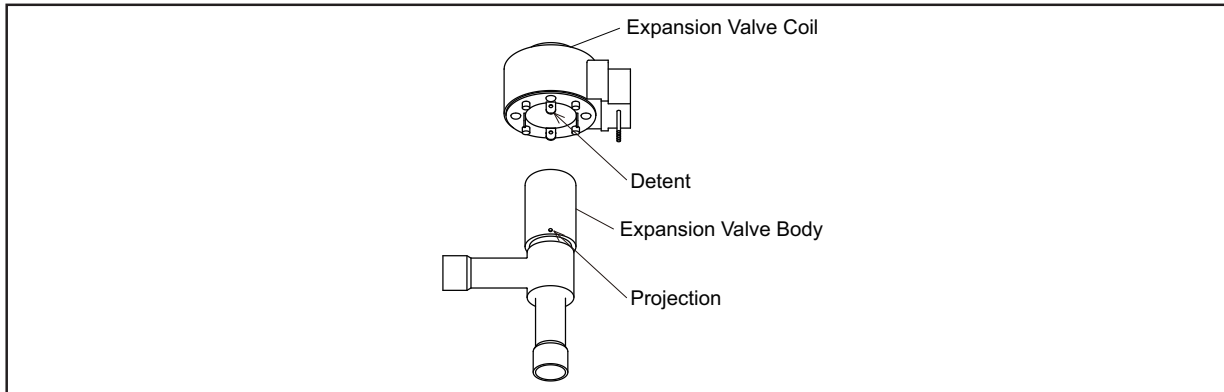
- (1) Remove the service cover according to Section 4.2.2.4 “Removing Thermistors for Liquid Pipe and Gas Pipe”.
- (2) Remove the detents of the expansion valve coil from the projection parts of the valve body by rotating the valve coil. Pull up the valve coil and remove it. At this time, take care not to twist the pipes.
- (3) Insert the new expansion valve coil into the expansion valve body. When inserting the valve coil, secure the projection parts into the detents.

NOTE:

The detents are located 90° apart in a circle and the projections are located 180° apart in a circle. Make sure to fit the projection parts into the detents. The position of rotation direction does not affect the operation. If the valve coil is inserted incorrectly, it may cause malfunction of the valve coil.

- (4) When the replacement is completed, secure the wire for the expansion valve coil near the valve coil with a plastic band. At this time, secure the edge of lead wires for the expansion valve coil to face down.

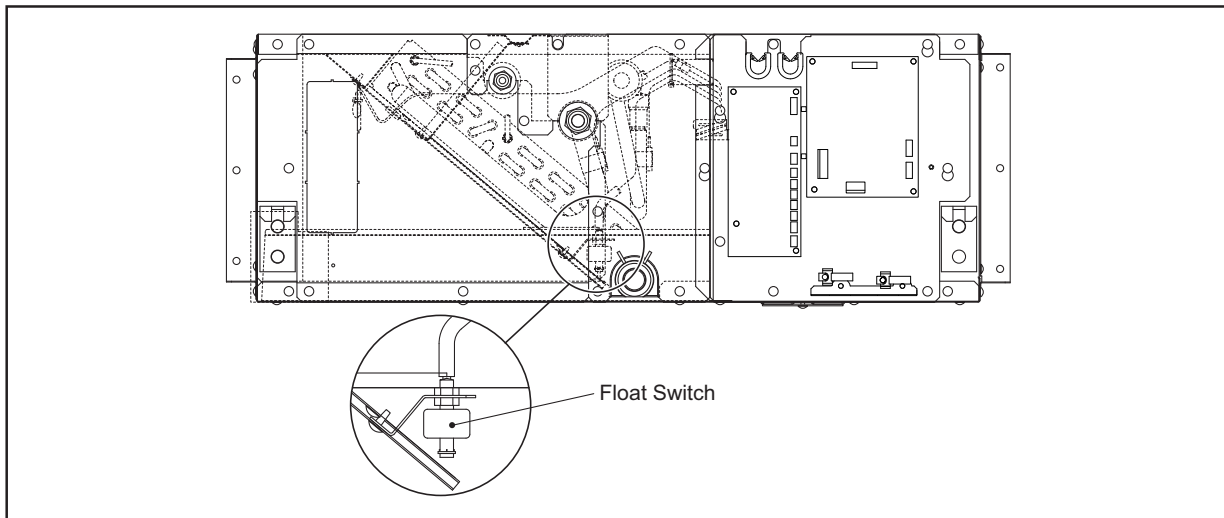
Tool	Phillips Screwdriver
------	----------------------



4.2.2.6 Removing Float Switch

- (1) Remove the service cover according to Section 4.2.2.4 “Removing Thermistors for Liquid Pipe and Gas Pipe”.
- (2) The float switch is secured on the heat exchanger mounting plate. Remove the float switch using two wrenches.

Tool	Phillips Screwdriver, Wrenches
------	--------------------------------



ATTENTION:

**When reassembling, handle the float switch carefully.
 (Tightening Torque: Approx. 0.2lbf-ft (0.3N·m))
 If the float switch is dropped, malfunction will occur.**

MAINTENANCE

(Ducted Medium Static Type)

! WARNING

TURN OFF all power source switches.

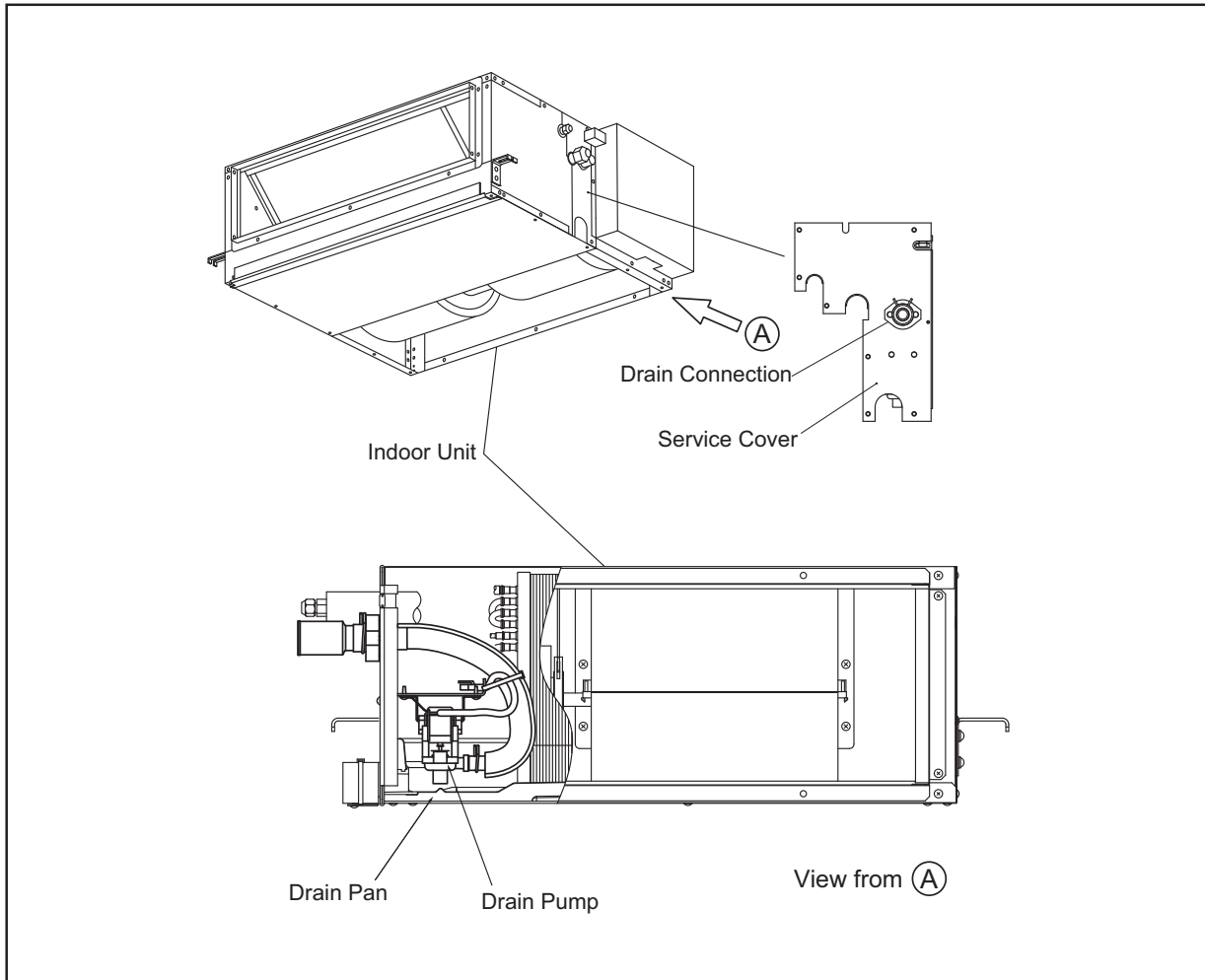
4.2.2.7 Removing Drain Pump

The drain pump is mounted on the service cover. Remove the service cover according to Section 4.2.2.4 (1) "Removing Thermistors for Liquid Pipe and Gas Pipe".

Remove the securing screws and remove the drain pump.

Tool

Phillips Screwdriver, Wrench



! WARNING

TURN OFF all power source switches.

4.2.2.8 Removing Drain Pan

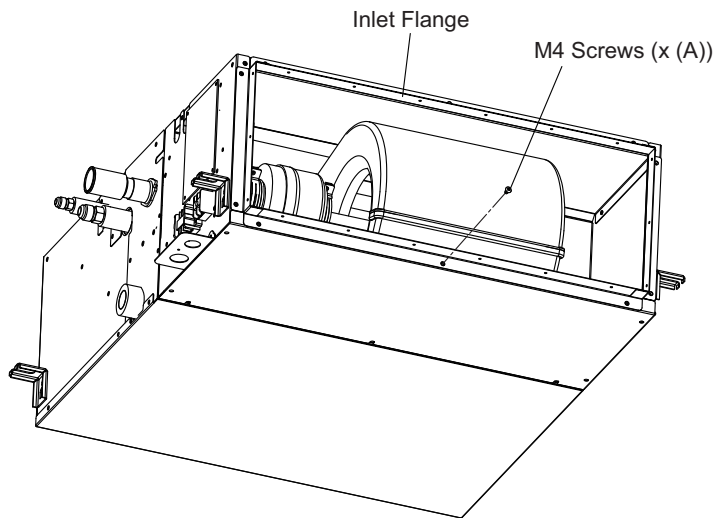
(1) Remove the lower M4 screws securing the inlet flange.

Qty. of Screws (A): One (For (H,Y)IDM006 - 012B21S)

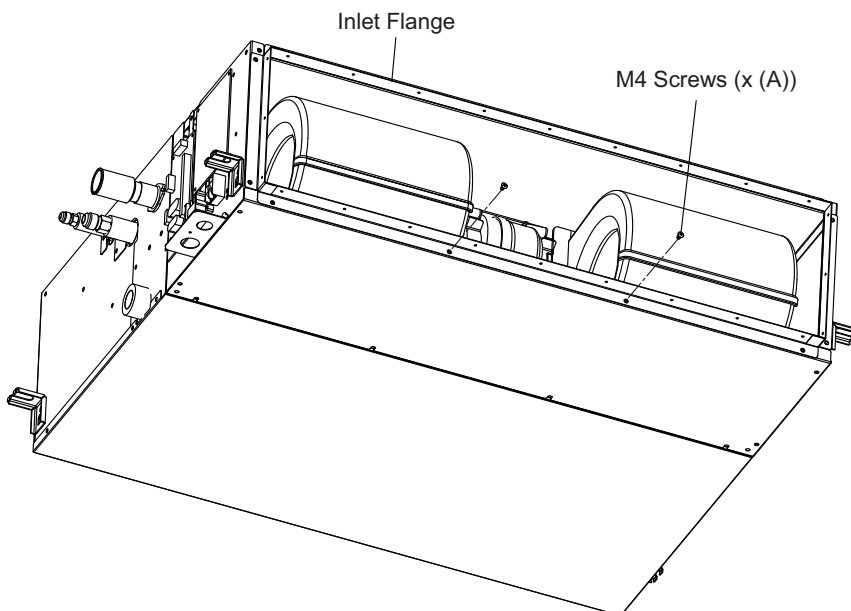
Two (For (H,Y)IDM015 - 048B21S)

Tool	Phillips Screwdriver
------	----------------------

- (H,Y)IDM006 - 012B21S



- (H,Y)IDM015 - 048B21S



MAINTENANCE

(Ducted Medium Static Type)

! WARNING

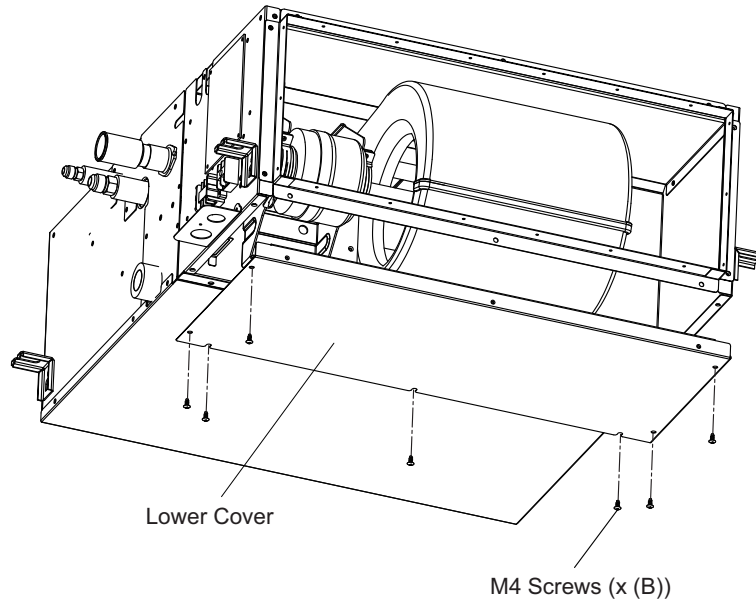
TURN OFF all power source switches.

(2) Remove the lower M4 screws securing the lower cover.

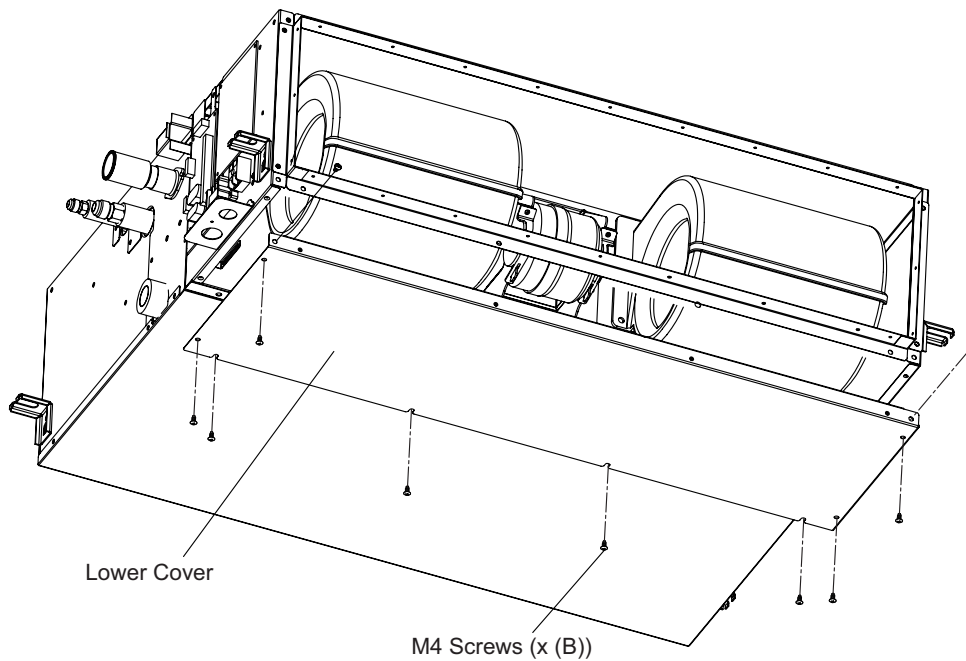
Qty. of Screws (B): Seven (For (H,Y)IDM006 - 012B21S)
Five (For (H,Y)IDM015 - 018B21S)
Eight (For (H,Y)IDM024 - 030B21S)
12 (For (H,Y)IDM036 - 048B21S)

Tool	Phillips Screwdriver
------	----------------------

• (H,Y)IDM006 - 012B21S



• (H,Y)IDM015 - 048B21S



! WARNING

TURN OFF all power source switches.

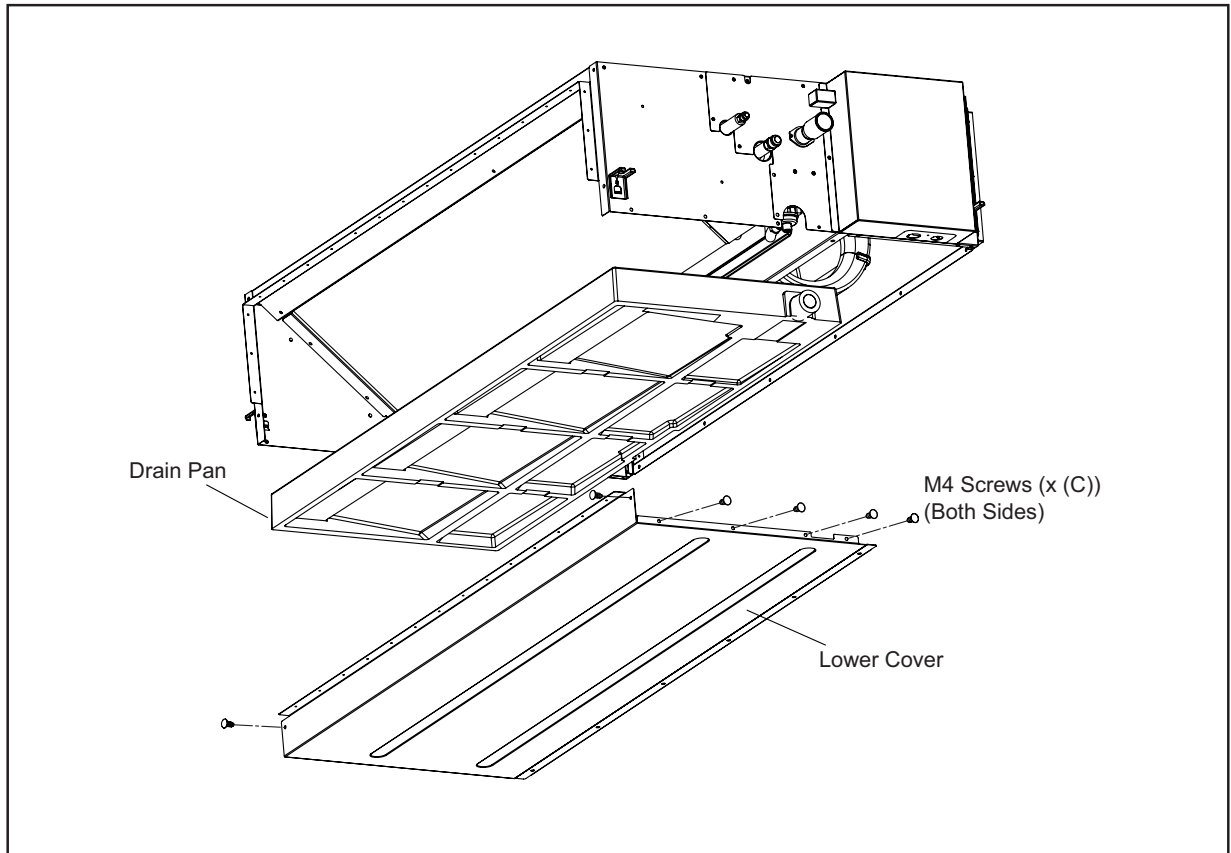
- (3) Remove the lower M4 screws securing the lower cover at the indoor heat exchanger side and remove the lower cover.

Qty. of Screws (C): Eight (For (H,Y)IDM006 - 018B21S)

Nine (For (H,Y)IDM024 - 048B21S)

- (4) Pull the drain pan down.

Tool	Phillips Screwdriver, Bucket approximately 1.3 gal (5 liters)
------	--



MAINTENANCE

(Ducted Slim Static Type)

! DANGER

Use the specified non-flammable refrigerant to the outdoor unit in the refrigerant system. Do not charge material other than specified refrigerant into the unit such as hydrocarbon refrigerants (propane), oxygen, flammable gases (acetylene) or poisonous gases when installing, maintaining or transporting. These flammables are extremely dangerous and may cause an explosion, a fire, and injury.

4.2.3 Ducted Slim Type ((H,Y)IDS006 - 018B21S)

! WARNING

TURN OFF all power source switches.

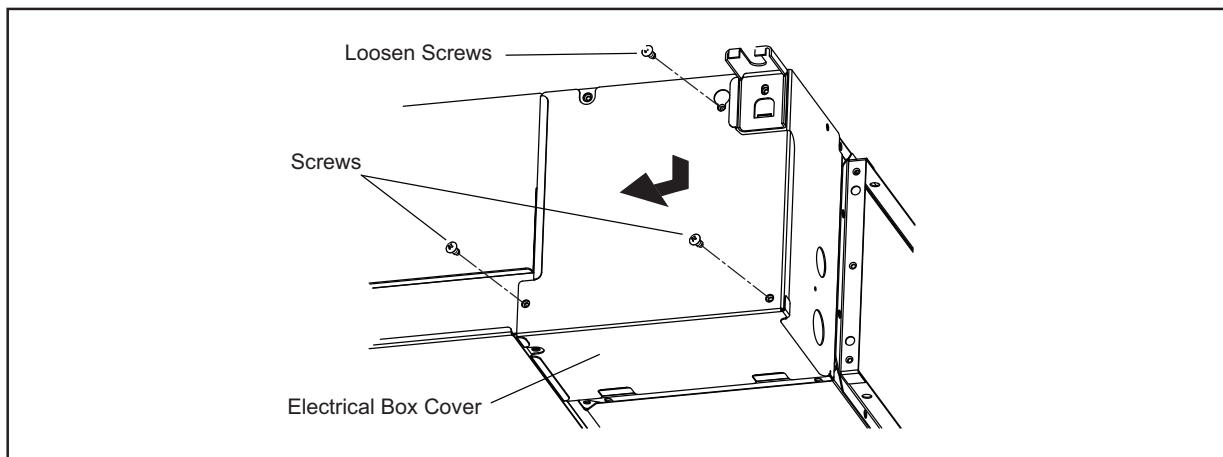
4.2.3.1 Removing Long-Life Filter

The air inlet grilles are field-supplied. How easy it is to access these filters will depend on the installations or location of the equipment. Check it carefully.

4.2.3.2 Removing PCB

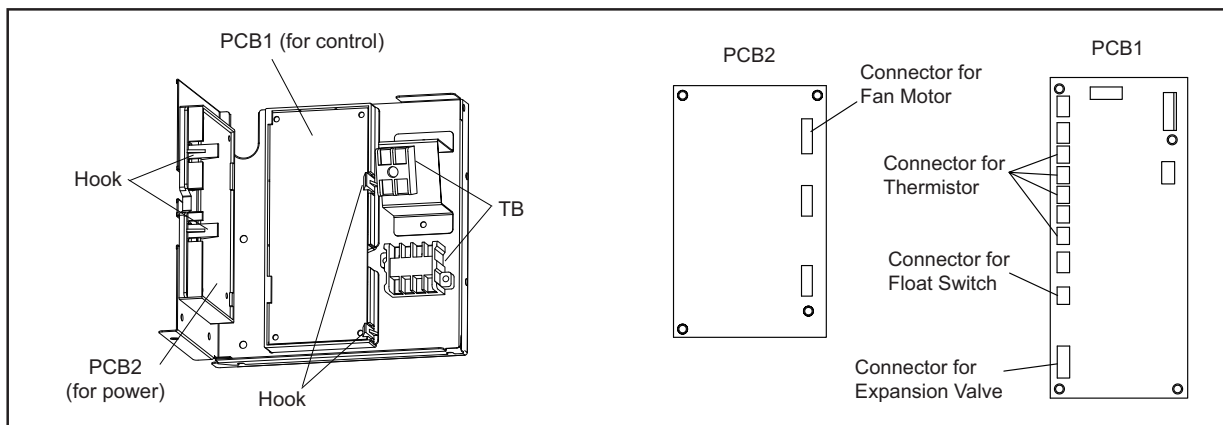
- (1) Loosen one M4 screw and remove two screws securing the electrical cover. Remove the electrical box cover downward.

Tool	Phillips Screwdriver or Wrench
------	--------------------------------



- (2) There are two PCBs. The PCBs are secured with two ABS plates by hooks. Pull the hooks, and then remove both PCBs.

Tool	None
------	------



ATTENTION:

Do not touch any components on the PCB.

Do not apply excessive force to the PCB or it will cause a malfunction.

! WARNING

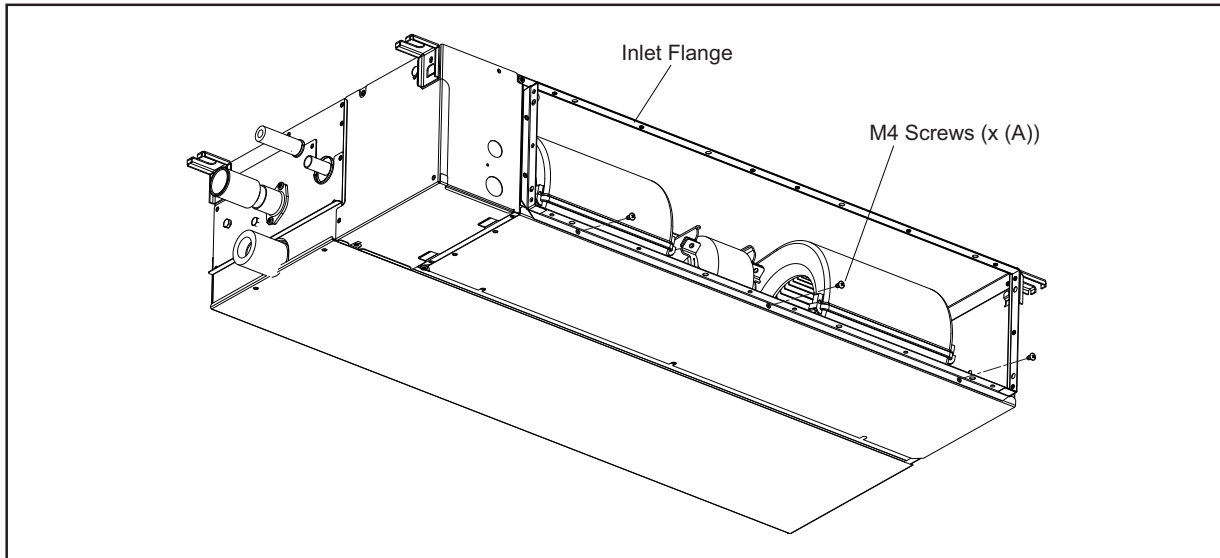
TURN OFF all power source switches.

4.2.3.3 Removing Fan and Fan Motor from Bottom Side (For All Models)

- (1) Remove the electrical box cover according to Section 4.2.3.2. "Removing PCB".
- (2) Disconnect the connector for the fan motor located on the PCB 2. Then remove the wiring.
- (3) Remove the lower M4 screws securing the inlet flange.

Qty. of Screws (A): Three (For (H,Y)IDS006 - 012B21S)
 Four (For (H,Y)IDS015 - 018B21S)

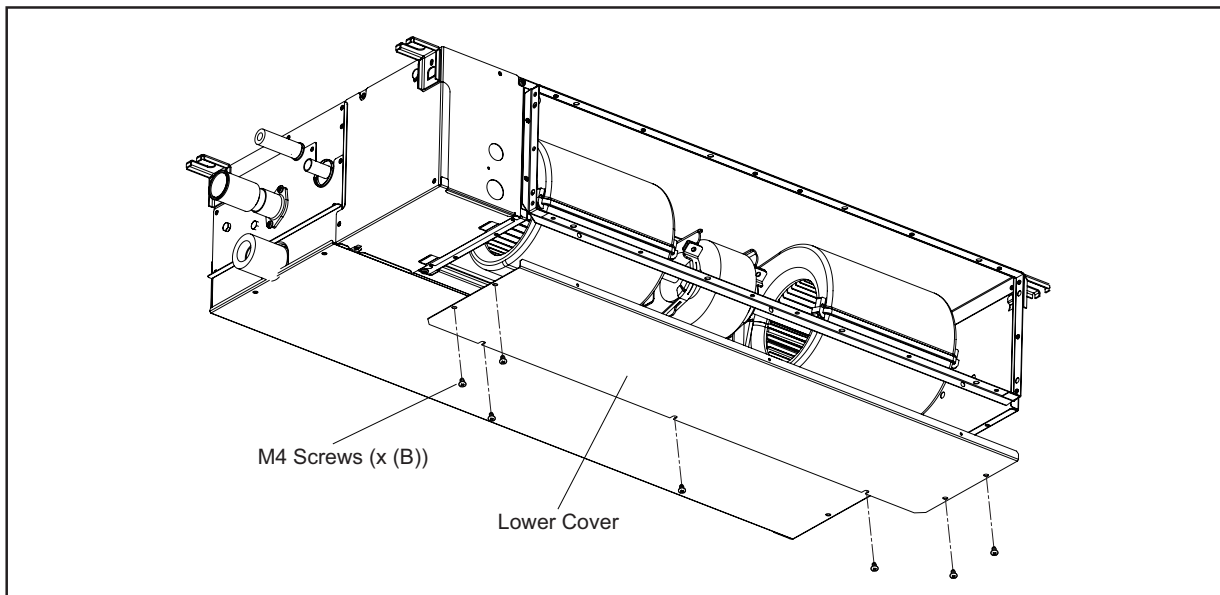
Tool	Phillips Screwdriver
------	----------------------



- (4) Remove the lower M4 screws securing the lower cover at the indoor fan side and remove the lower cover.

Qty. of Screws (B): 7 (For (H,Y)IDS006 - 012B21S)
 8 (For (H,Y)IDS015 - 018B21S)

Tool	Phillips Screwdriver
------	----------------------



MAINTENANCE

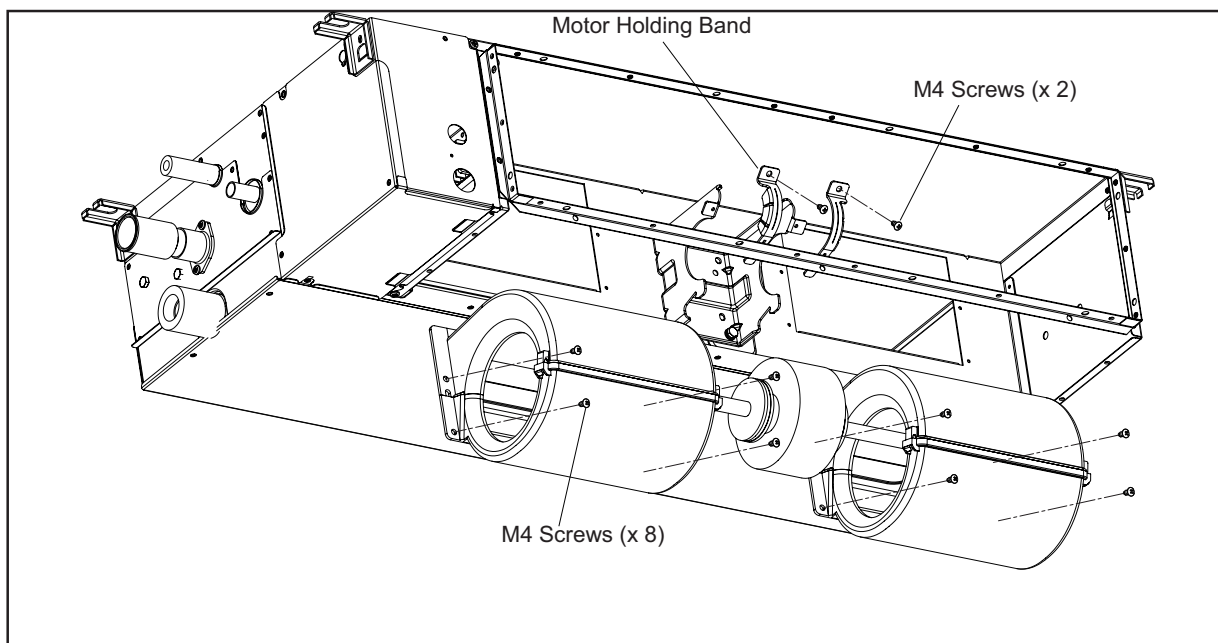
(Ducted Slim Static Type)

! WARNING

TURN OFF all power source switches.

- (5) After removing the lower cover, the fan assembly can be seen.
Remove the wiring for the motor secured by the cable clamp of the fan mounting plate.
- For (H,Y)IDS006 - 012B21S
- (6) Remove eight M4 screws securing the casings onto the fan mounting plate and move the fan casings slightly.
- (7) Remove two M4 screws securing the motor holding bands to the motor base and remove the motor, the fan casings and the fan runners at the same time.

Tool	Phillips Screwdriver
------	----------------------

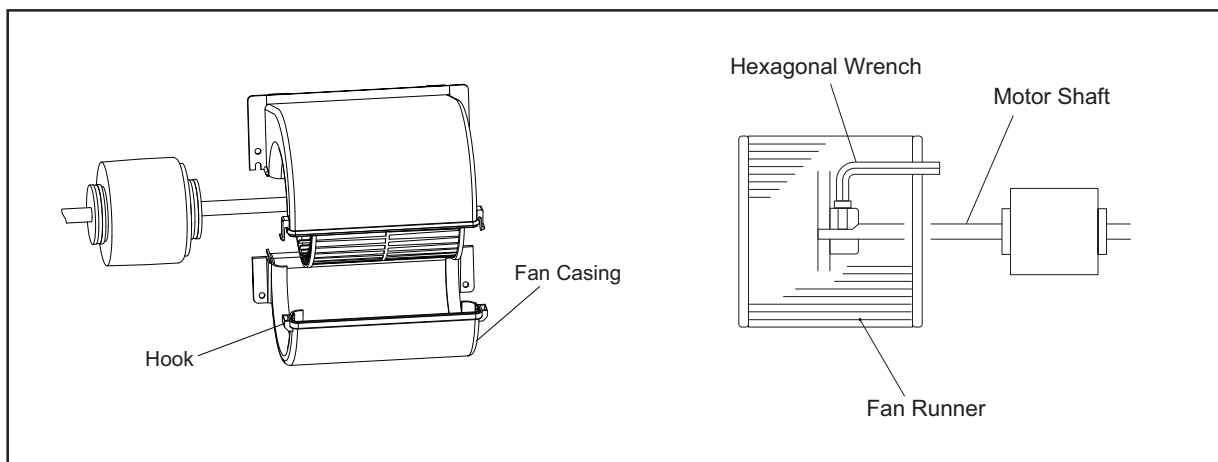


ATTENTION:

The total weight of the fan motor, the fan casings and the fan runners is approximately 33 lbs. (15kg). Perform the above work carefully.

- (8) Push the hooks at both sides of the fan casing and remove the lower part of the fan casing.
- (9) Loosen the screws securing the fan motor and the fan runner using the hexagonal wrench (for M6 screw) and pull out to remove the fan runner.

Tool	Hexagonal Wrench
------	------------------



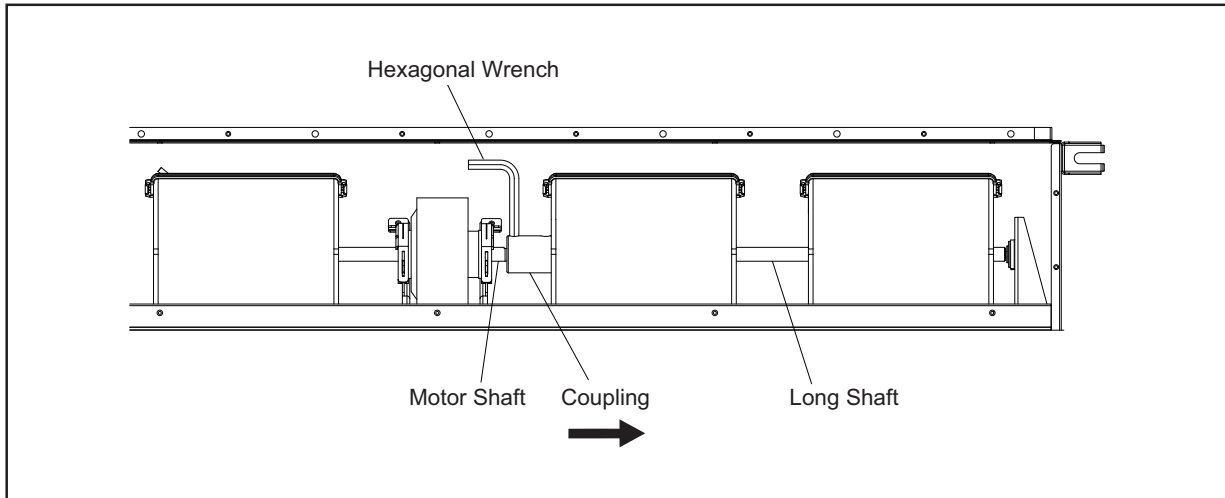
! WARNING

TURN OFF all power source switches.

● For (H,Y)IDS0015 - 018B21S

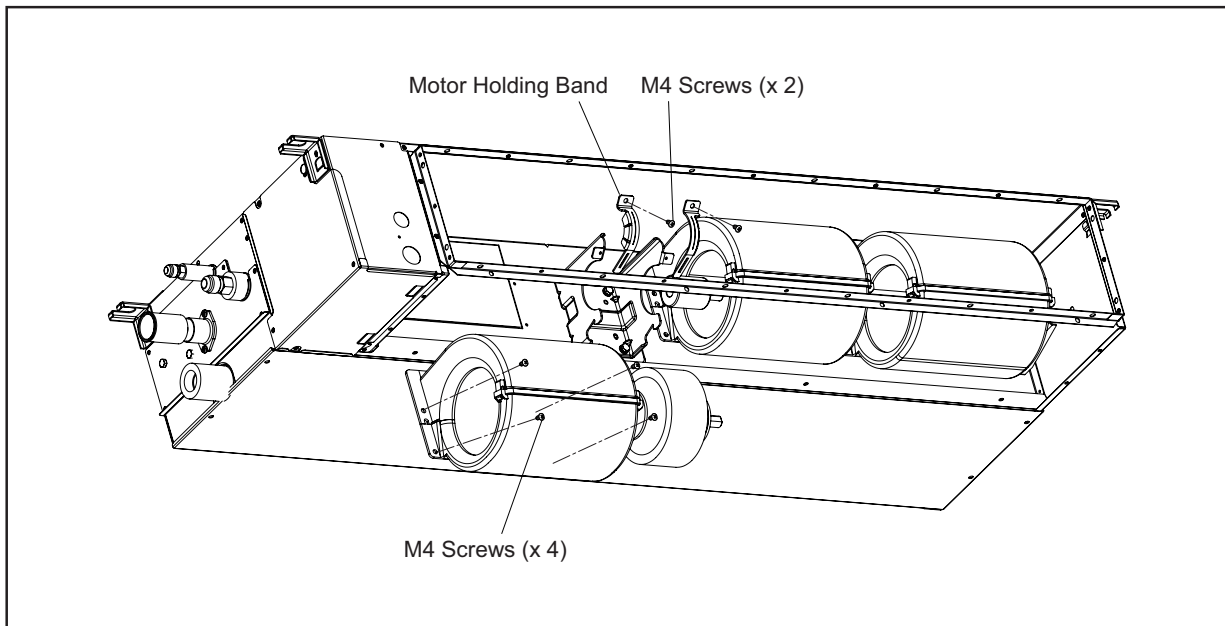
- (6) Loosen two screws on the coupling using the hexagonal wrench (for M6 screw).
Then push the coupling to the right and the fan motor and the long shaft can be separated.

Tool	Hexagonal Wrench
------	------------------



- (7) Remove four M4 screws securing the fan casing onto the fan mounting plate and move the casing slightly.
- (8) Remove two M4 screws securing the motor holding bands to the motor base and remove the motor, the fan casing, and the fan runner at the same time.

Tool	Phillips Screwdriver
------	----------------------



MAINTENANCE

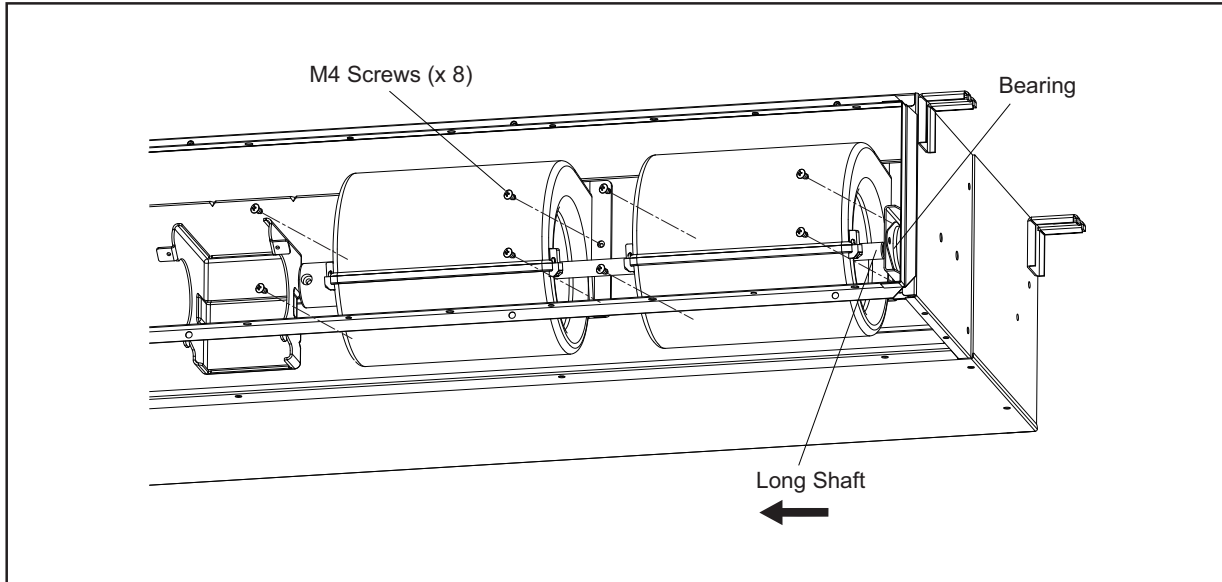
(Ducted Slim Static Type)

! WARNING

TURN OFF all power source switches.

- (9) Push the coupling to the left slightly, then the long shaft, and the bearing can be separated.
- (10) Remove eight M4 screws securing the casings onto the fan mounting plate and move the fan casing slightly.

Tool	Phillips Screwdriver
------	----------------------

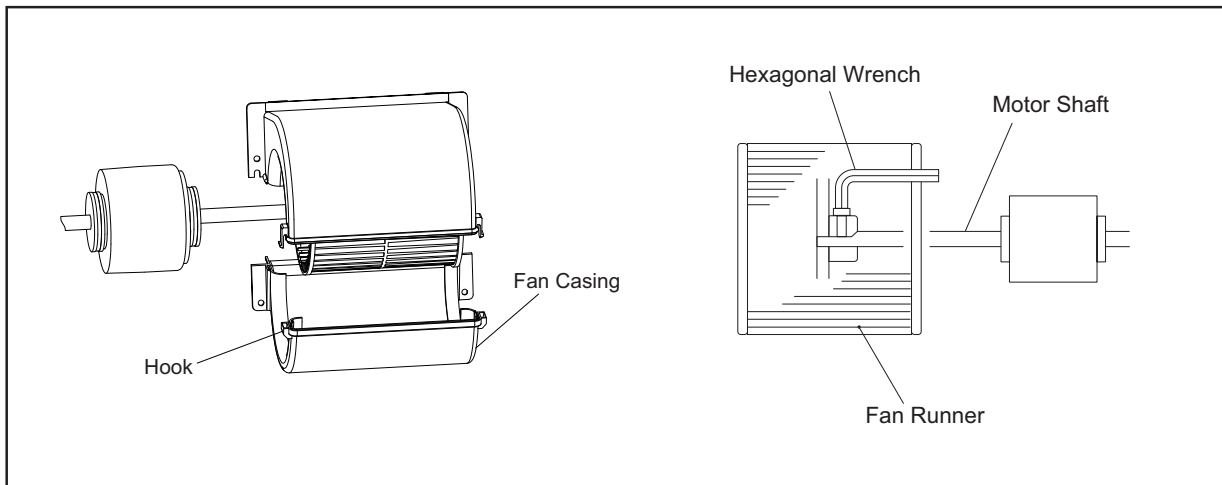


ATTENTION:

The total weight of the fan motor, the fan casings, and the fan runners is approximately 33 lbs. (15kg). Perform the above work carefully.

- (11) Push the hooks at both sides of the fan casing and remove the lower part of the casing.
- (12) Loosen the screws securing the fan motor and the fan runner using the hexagonal wrench (for M6 screw) and pull out to remove the fan runner.

Tool	Hexagonal Wrench
------	------------------



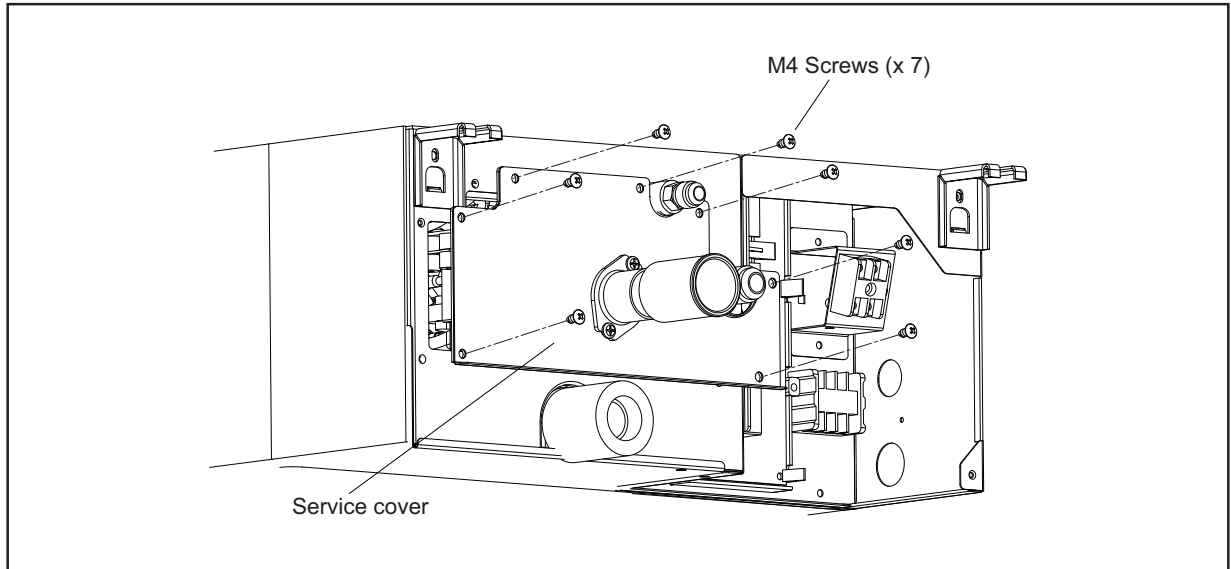
! WARNING

TURN OFF all power source switches.

4.2.3.4 Removing Thermistors for Liquid Pipe and Gas Pipe

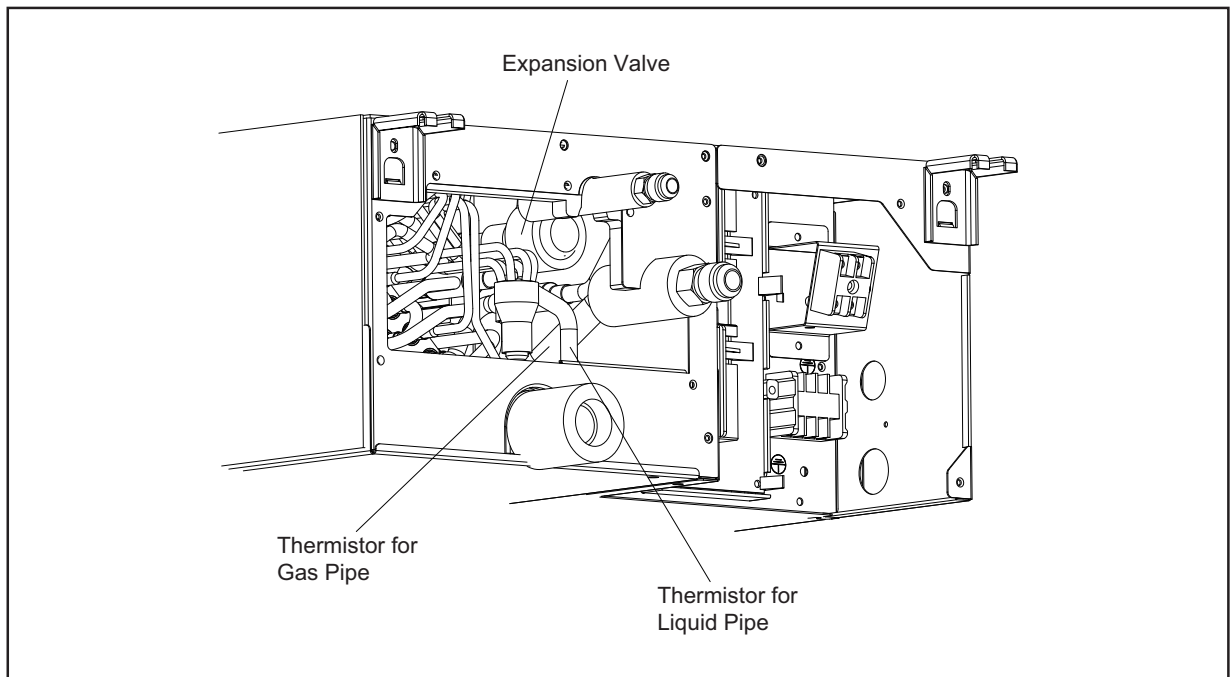
- (1) Remove seven M4 screws securing the service cover and remove the service cover.

Tool	Phillips Screwdriver
------	----------------------



- (2) Remove pipe insulations and the thermistor holder. The thermistors for pipes can be removed.

Tool	Phillips Screwdriver
------	----------------------



! WARNING

TURN OFF all power source switches.

4.2.3.5 Removing Electronic Expansion Valve Coil

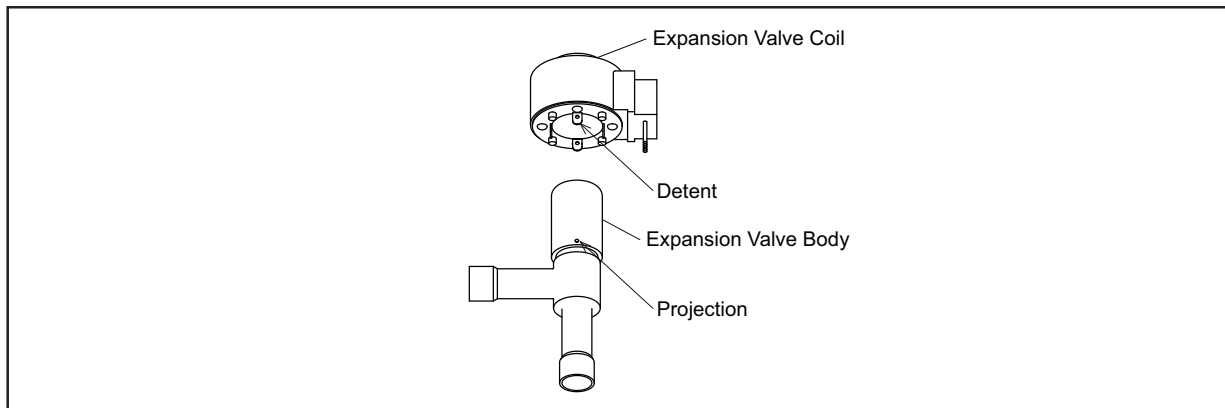
- (1) Remove the service cover according to Section 4.2.3.4 “Removing Thermistors for Liquid Pipe and Gas Pipe”.
- (2) Remove the detents of the expansion valve coil from the projection parts of the valve body by rotating the valve coil. Pull up the valve coil and remove it. At this time, take care not to twist the pipes.
- (3) Insert the new expansion valve coil into the expansion valve body. When inserting the valve coil, secure the projection parts into the detents.

NOTE:

The detents are located 90° apart in a circle and the projections are located 180° apart in a circle. Make sure to fit the projection parts into the detents. The position of rotation direction does not affect the operation. If the valve coil is inserted incorrectly, it may cause malfunction of the valve coil.

- (4) When the replacement is completed, secure the wire for the expansion valve coil near the valve coil with a plastic band. At this time, secure the edge of the lead wires for the expansion valve coil to face down.

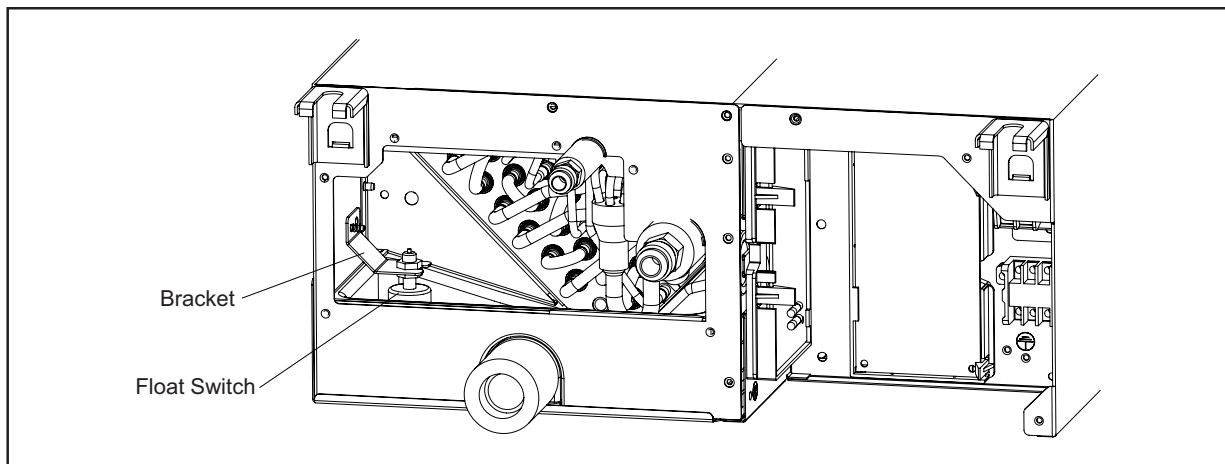
Tool	Phillips Screwdriver
------	----------------------



4.2.3.6 Removing Float Switch

- (1) Remove the service cover according to Section 4.2.3.4 “Removing Thermistors for Liquid Pipe and Gas Pipe”.
- (2) The float switch is secured to the bracket of the float switch. Remove the float switch using two wrenches.

Tool	Phillips Screwdriver, Wrenches
------	--------------------------------



ATTENTION:

**When reassembling, handle the float switch carefully.
 (Tightening Torque: Approx. 0.2lbf·ft (0.3N·m))
 If the float switch is dropped, a malfunction will occur.**

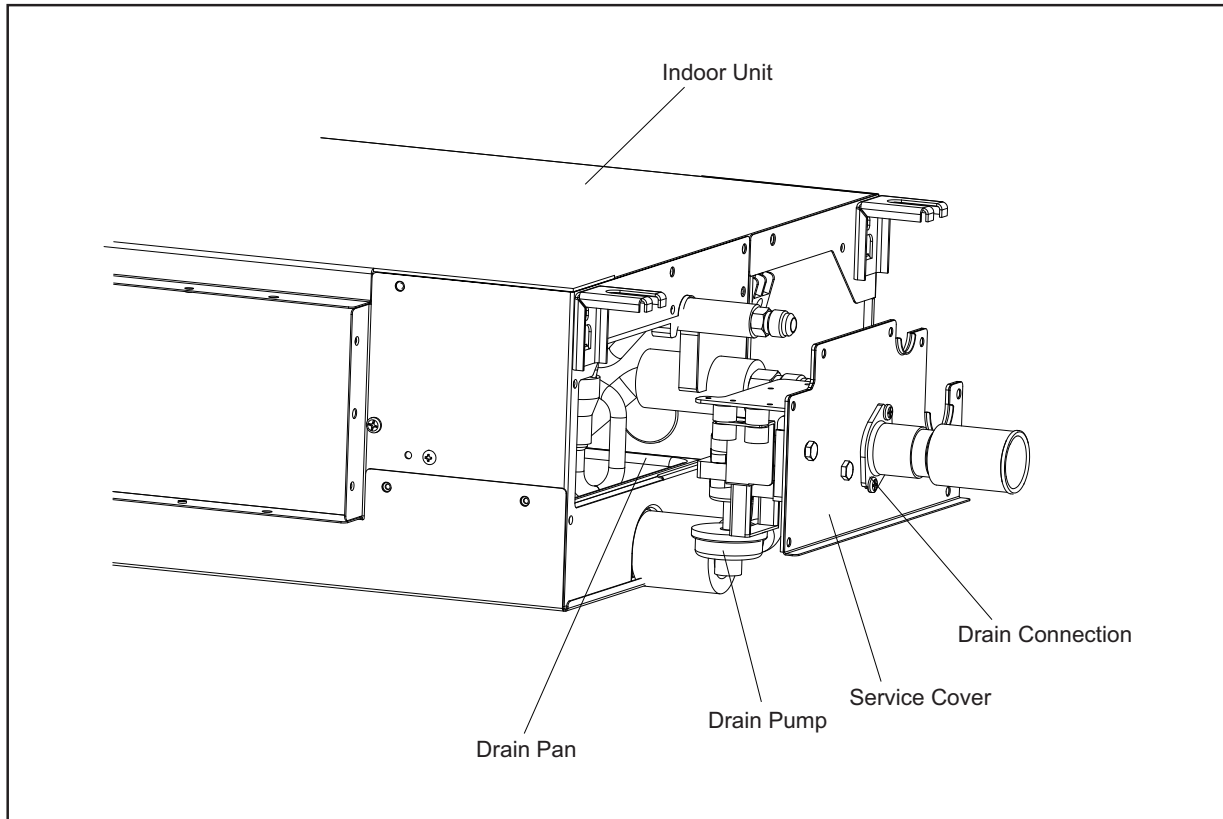
! WARNING**TURN OFF all power source switches.****4.2.3.7 Removing Drain Pump**

The drain pump is mounted on the service cover. Remove the service cover according to Section 4.2.3.4 (1) "Removing Thermistors for Liquid Pipe and Gas Pipe".

Then, remove the securing screws and remove the drain pump.

Tool

Phillips Screwdriver



MAINTENANCE

(Ducted Slim Static Type)

! WARNING

TURN OFF all power source switches.

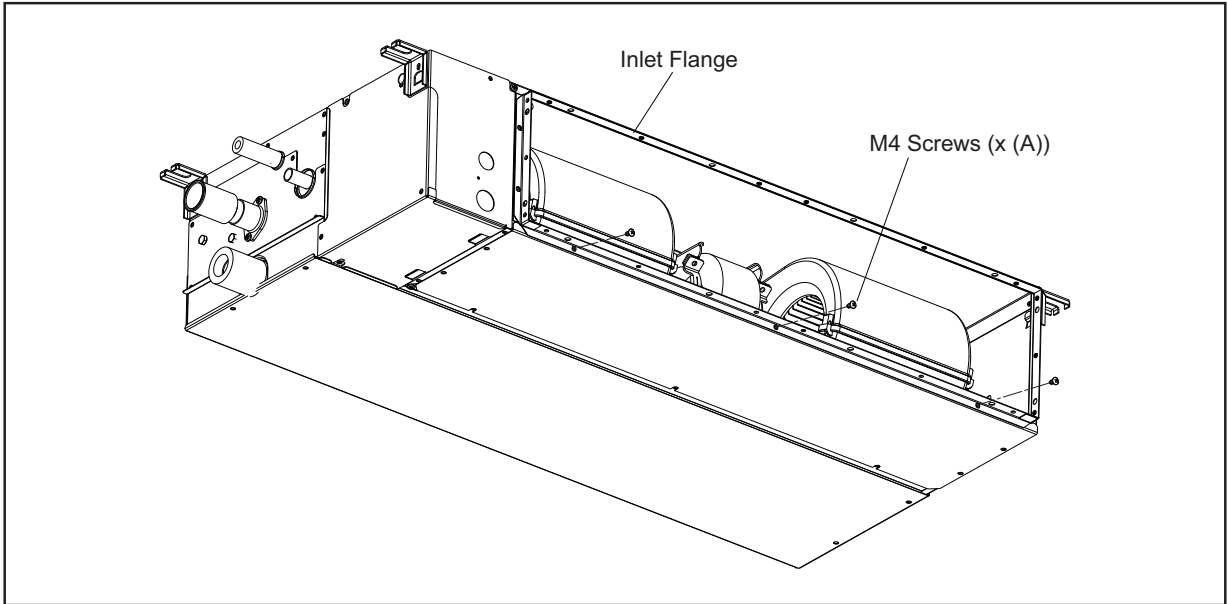
4.2.3.8 Removing Drain Pan

- (1) Remove the lower M4 screws securing the inlet flange.

Qty. of Screws (A): Three (For (H,Y)IDS006 - 012B21S)

Four (For (H,Y)IDS015 - 018B21S)

Tool	Phillips Screwdriver
------	----------------------

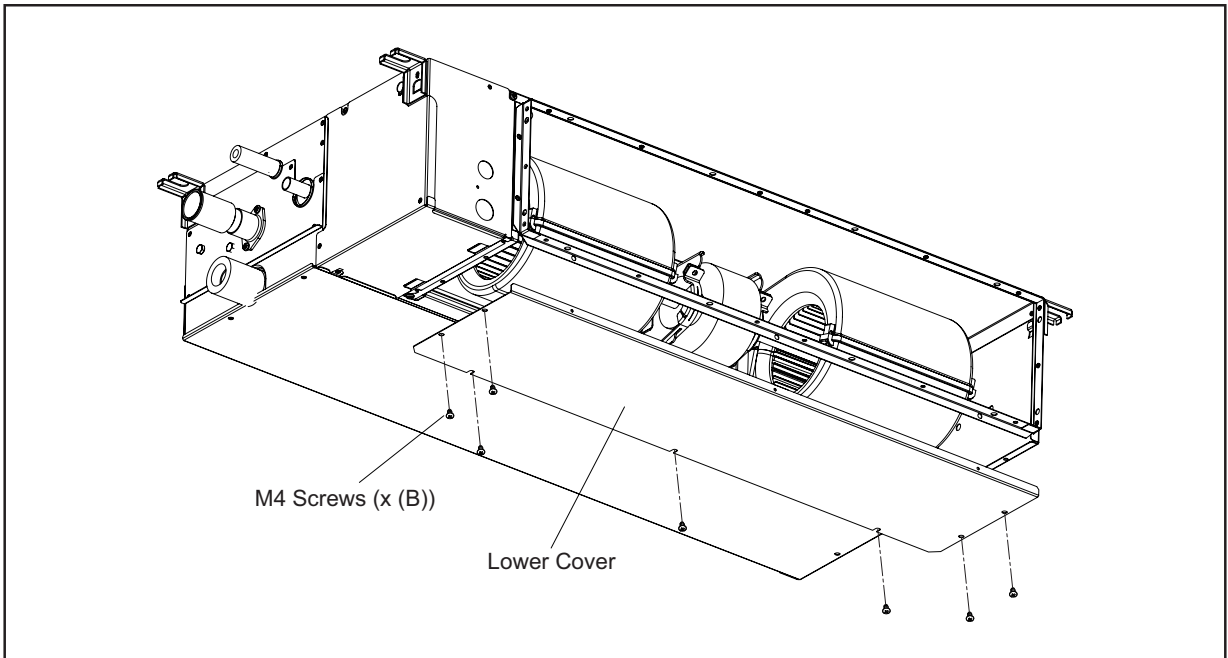


- (2) Remove the lower M4 screws securing the lower cover at the indoor fan side and remove the lower cover.

Qty. of Screws (B): Seven (For (H,Y)IDS006 - 012B21S)

Eight (For (H,Y)IDS015 - 018B21S)

Tool	Phillips Screwdriver
------	----------------------

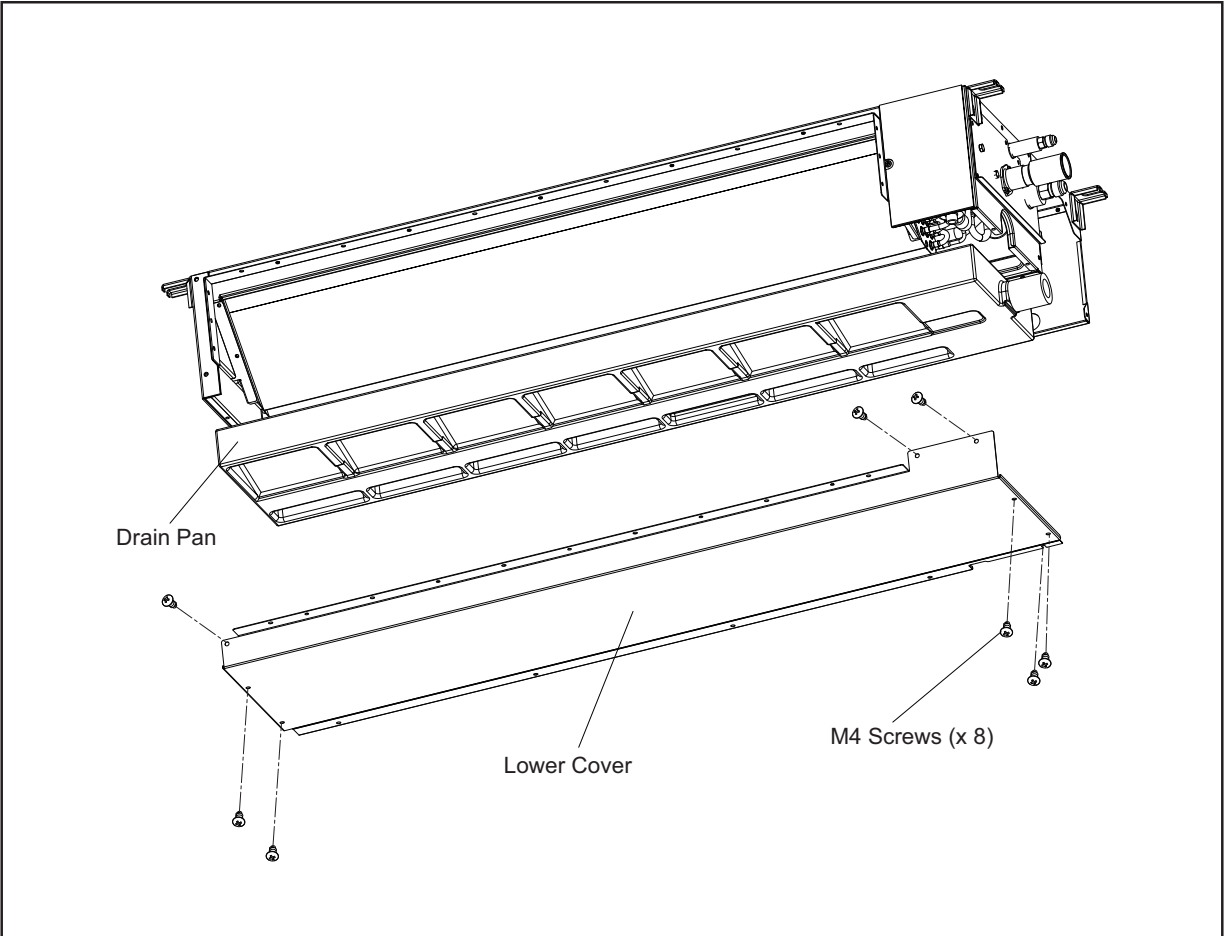


! WARNING

TURN OFF all power source switches.

- (3) Remove eight M4 screws securing the lower cover at the indoor heat exchanger side and remove the lower cover.
- (4) Pull the drain pan down.

Tool	Phillips Screwdriver
------	----------------------



! DANGER

Use the specified non-flammable refrigerant (R410A) to the outdoor unit in the refrigerant system. Do not charge the unit with material other than R410A such as hydrocarbon refrigerants (propane), oxygen, flammable gases (acetylene), or poisonous gases when installing, maintaining or moving the unit. These flammables are extremely dangerous and may cause an explosion, a fire, and injury.

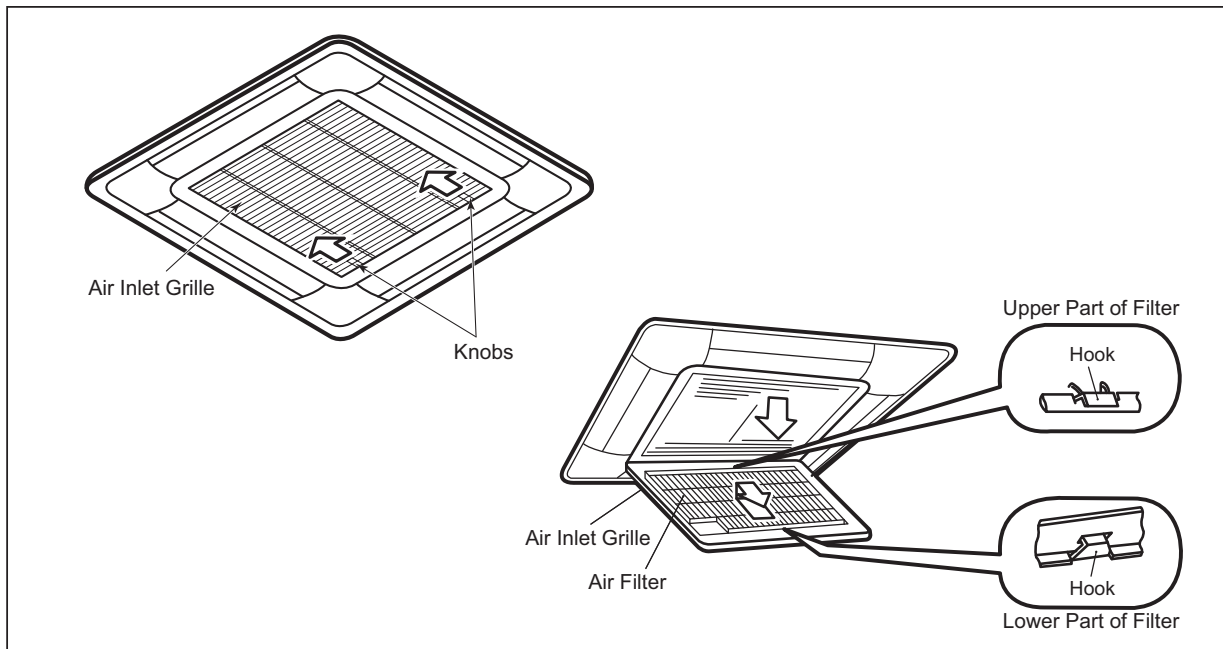
4.2.4 4-Way Cassette Type

! WARNING

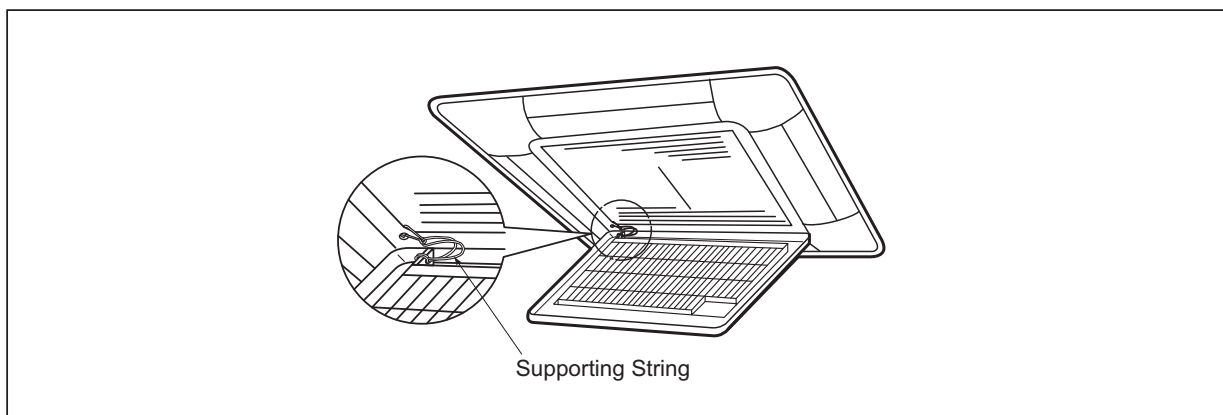
TURN OFF all power source switches.

4.2.4.1 Removing Air Filter and Air Inlet Grille

- (1) The air filter is attached inside the air inlet grille. With your fingers, press and slide both ends of the knobs on the air inlet grille in the direction of the arrow. This opens the air inlet grille.
- (2) Hold the lower side of the air inlet grille to keep it at an angle. Lift up the air filter and release from the hooks on the air inlet grille to remove it.



- (3) Remove the supporting string from the decorative panel. After lifting the air inlet grille, keep it at an angle and draw the air inlet grille forward to remove it.
- (4) When reattaching the air inlet grille, make sure to attach the supporting string to the decorative panel.



! WARNING

TURN OFF all power source switches.

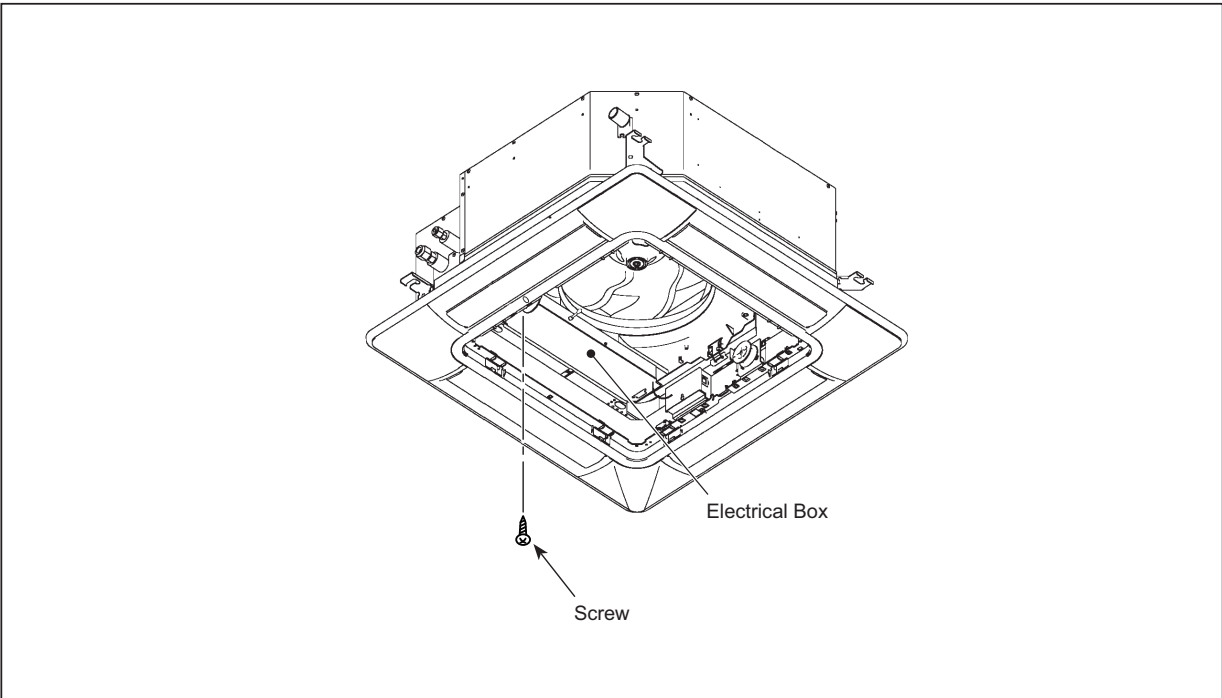
! CAUTION

Be careful not to let the electrical box cover fall.

4.2.4.2 Removing Electrical Box Cover

- (1) The electrical box appears when opening the air inlet grille. Remove the mounting screw for the electrical box cover to open the electrical box.
- (2) The electrical box cover can be hooked onto the electrical box during maintenance.

Tool	Phillips Screwdriver
------	----------------------



MAINTENANCE

(4-Way Cassette Type)

! WARNING

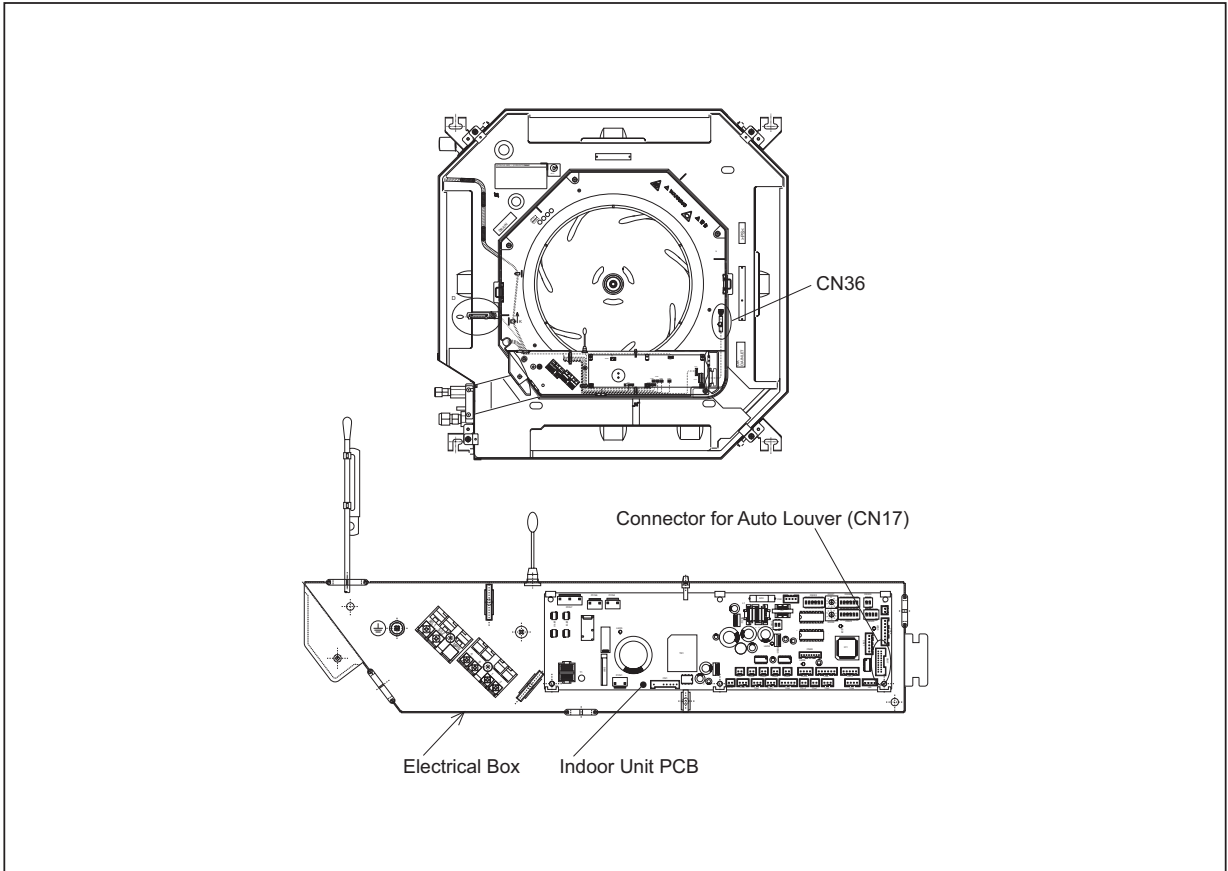
TURN OFF all power source switches.

4.2.4.3 Removing Optional Decorative Panel

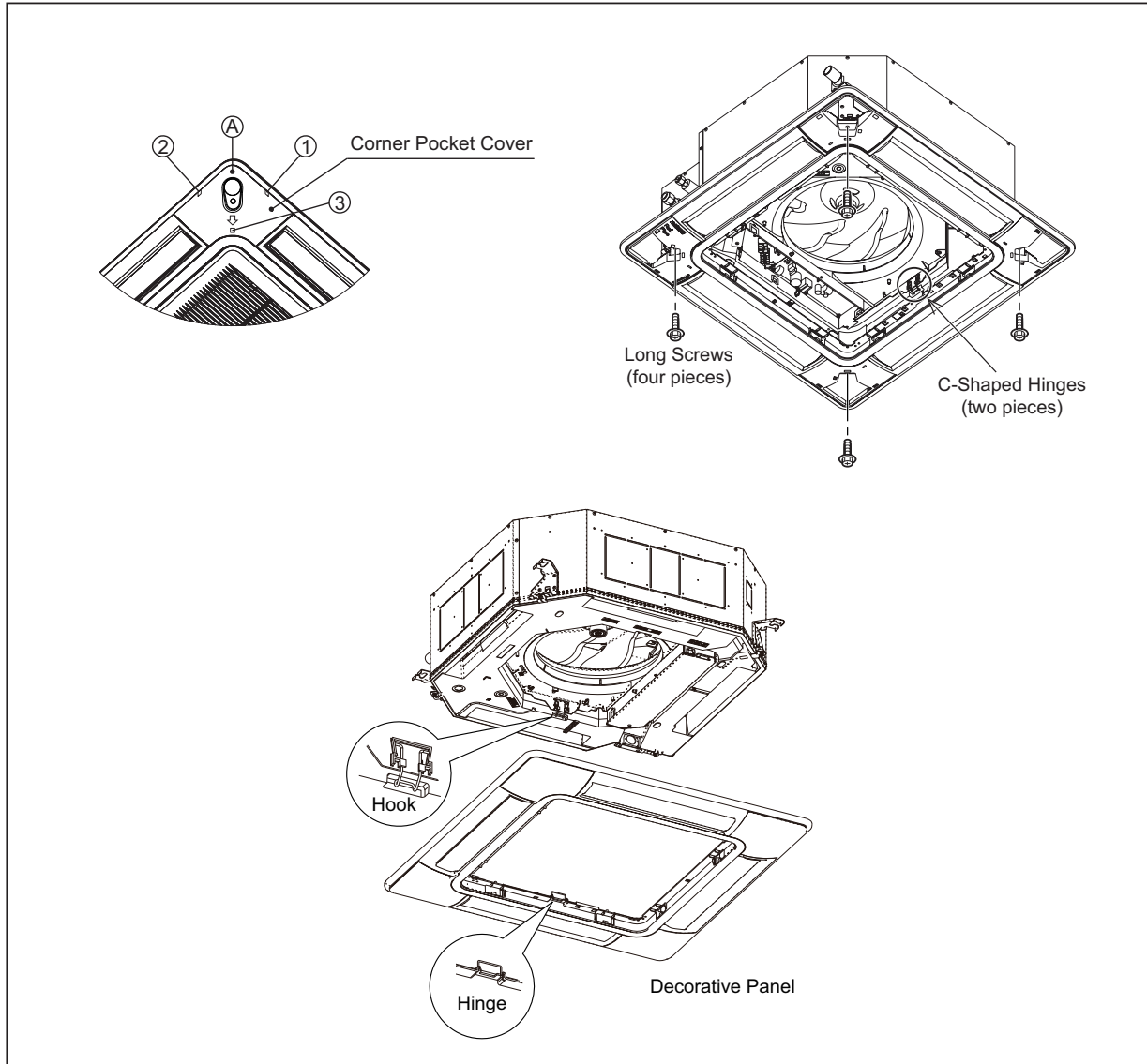
- (1) Open the air inlet grille. Disconnect the connector (CN36) of the decorative panel which is connected to the connector for the auto louver (CN17) on indoor unit PCB.

Tool

Phillips Screwdriver, Screwdriver



- (2) Remove the air inlet grille from the decorative panel.
- (3) Remove all four corner pocket covers from the decorative panel. They can be removed by pulling the (A) part in the direction of the pulling side.
 - * To reattach the corner pocket covers, insert the fastening hooks (1) and (2) into the decorative panel and then insert the fastening hook (3) into the decorative panel.
- (4) Remove four long screws from the decorative panel. Remove them with attention to temporarily hooking the hinges of the decorative panel onto hooks of the unit. Then, remove the decorative panel after unhooking two hinges from the two hooks.



! WARNING

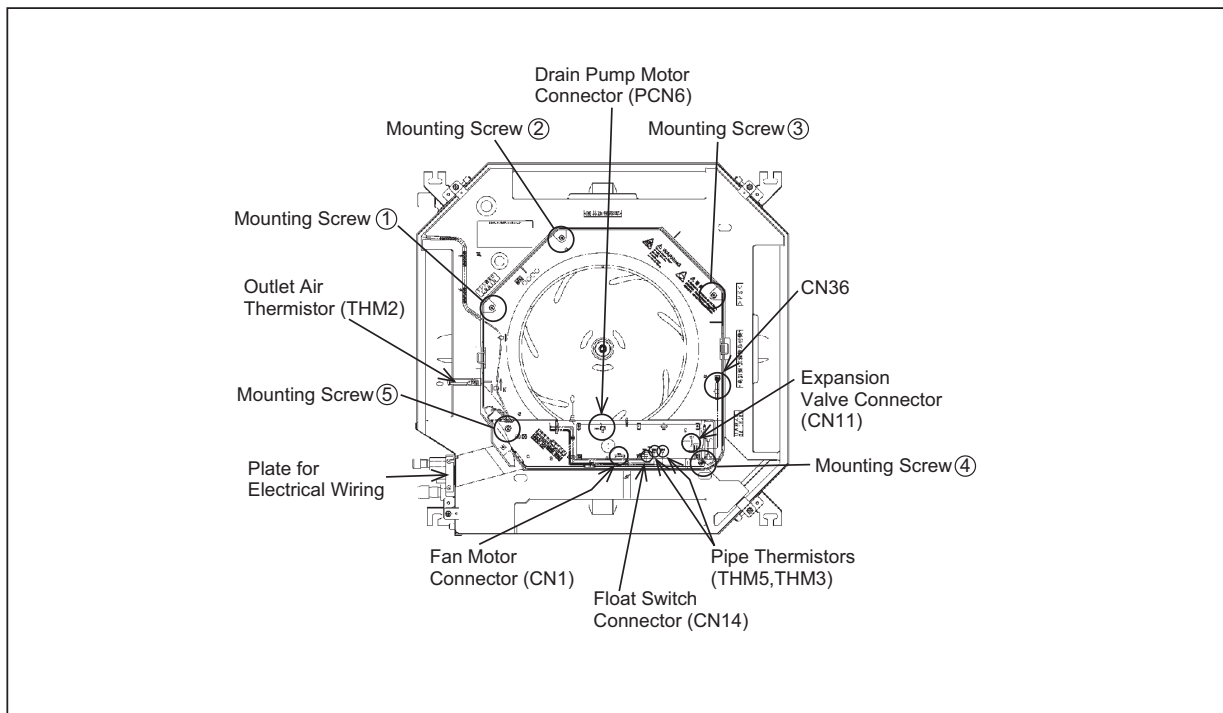
TURN OFF all power source switches.

4.2.4.4 Removing Turbo Fan and Fan Motor

- (1) Remove the air inlet grille and the electrical box cover according to Section 4.2.4.1 "Removing Air Filter and Air Inlet Grille" and Section 4.2.4.2 "Removing Electrical Box Cover".
- (2) Moving Electrical Box
 - (a) Remove the outlet air thermistor (THM2), the drain pump motor connector (PCN6), the float switch connector (CN14), the pipe thermistors (THM5 and THM3), the expansion valve connector (CN11), and the fan motor connector (CN1) from the indoor unit PCB.
 - (b) Remove the mounting screws ④ and ⑤ for the electrical box and remove it from the unit.
- (3) Removing Bell-Mouth

Remove three mounting screws ①, ② and ③ for the bell-mouth which is secured to the drain pan, and remove the bell-mouth.

Tool	Phillips Screwdriver, Adjustable Wrench
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! WARNING

TURN OFF all power source switches.

(4) Removing Turbo Fan and Fan Motor

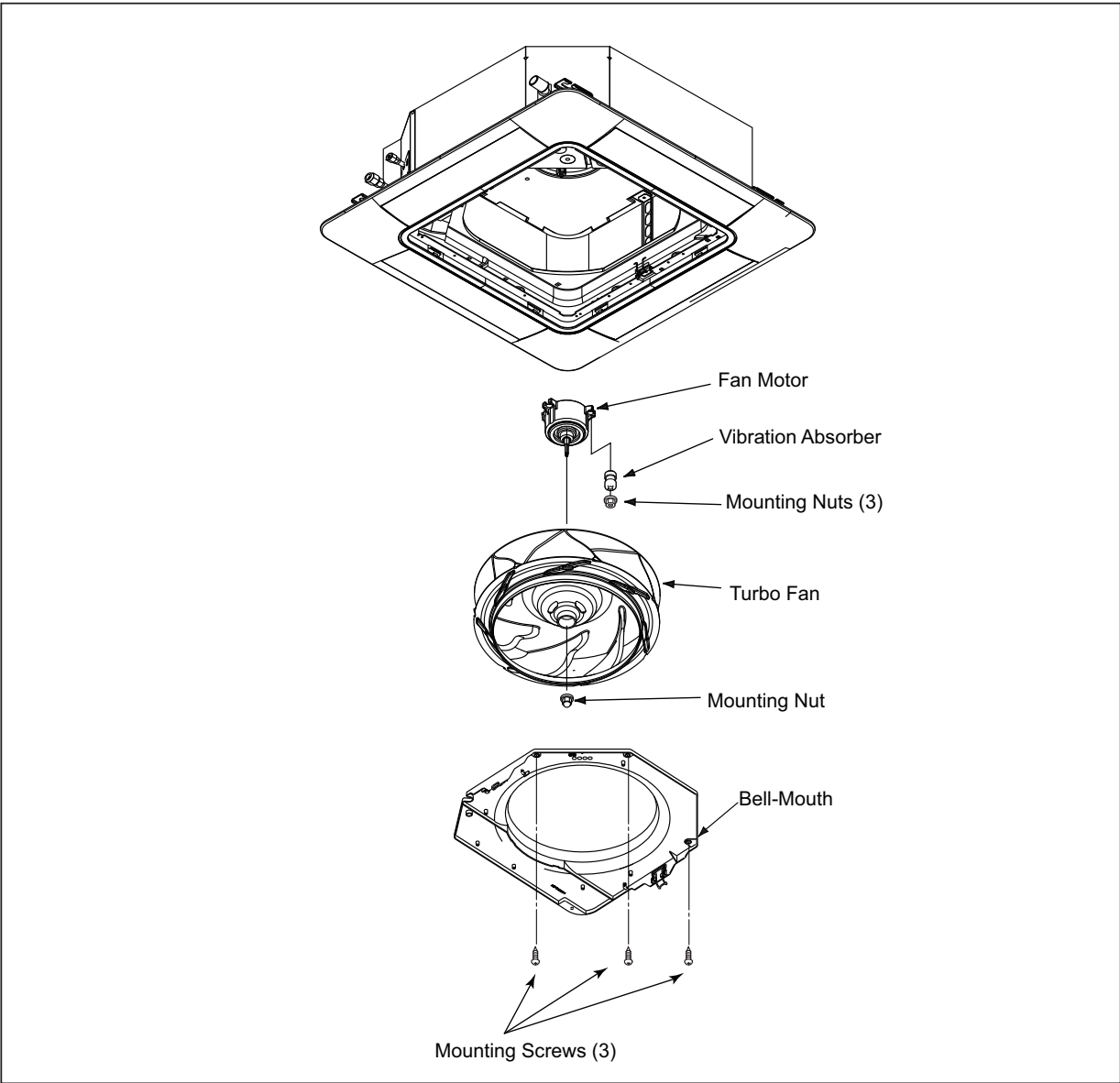
Remove the turbo fan by removing the mounting nut. Remove the fan motor by removing three mounting nuts on the fan motor. (For reassembling, the tightening torque for nuts should be approximately 5.9lbf·ft (8N·m).)

NOTE:

For reassembling, temporarily secure the mounting screws (① to ⑤), and align both the centers of the turbo fan and bell-mouth to match. Tighten them securely after keeping an even clearance between the turbo fan and the bell-mouth. In addition, secure the lead wires for the fan motor, two pipe thermistors, and expansion valve with the cable clamp attached to the partition plate.

(Refer to Section 4.2.4.10 "Removing Thermistors for Liquid Pipe and Gas Pipe".)

Tool	Phillips Screwdriver, Adjustable Wrench
------	---



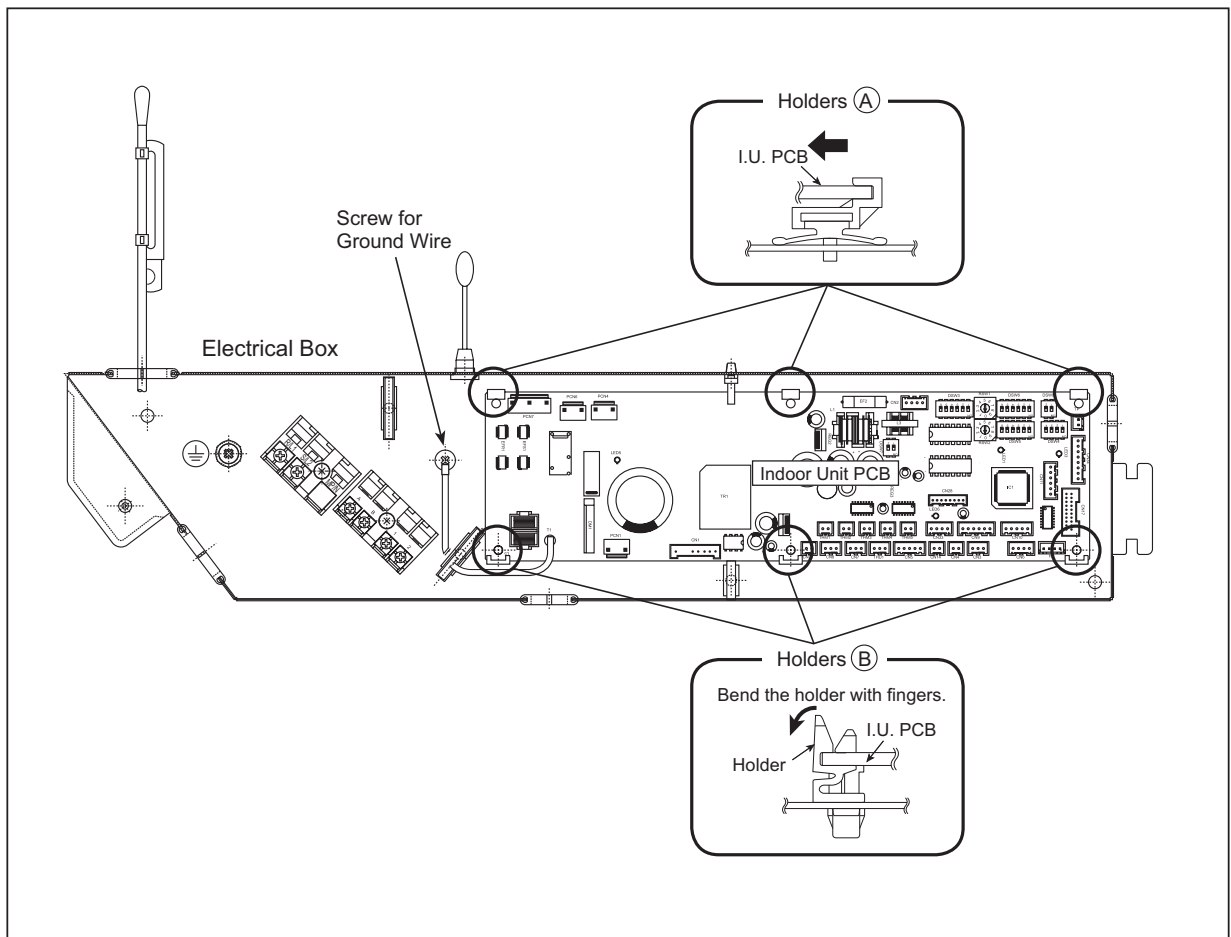
! WARNING

TURN OFF all power source switches.

4.2.4.5 Removing Printed Circuit Board

- (1) Remove the air inlet grille according to Section 4.2.4.1 "Removing Air Filter and Air Inlet Grille".
- (2) Remove the electrical box according to Section 4.2.4.2 "Removing Electrical Box Cover".
- (3) Disconnect all wiring connectors from the indoor unit PCB.
- (4) Remove the screw for the ground wire.
- (5) The indoor unit PCB is secured with six holders. Bend the holders (B) with your fingers to raise the indoor unit PCB. Then, remove the indoor unit PCB from the holders (A) by drawing it in the direction of the arrow as in the figure below.

Tool	Phillips Screwdriver
------	----------------------



NOTES:

1. Do not touch the electrical components on the indoor unit PCB.
2. Do not apply an excessive force to the indoor unit PCB. Otherwise, it may lead to PCB failure.
3. For reassembling, attach connectors to the correct position. If not correct, the indoor unit PCB may be damaged. In addition, securely attach the screw for the ground wire.

! WARNING

TURN OFF all power source switches.

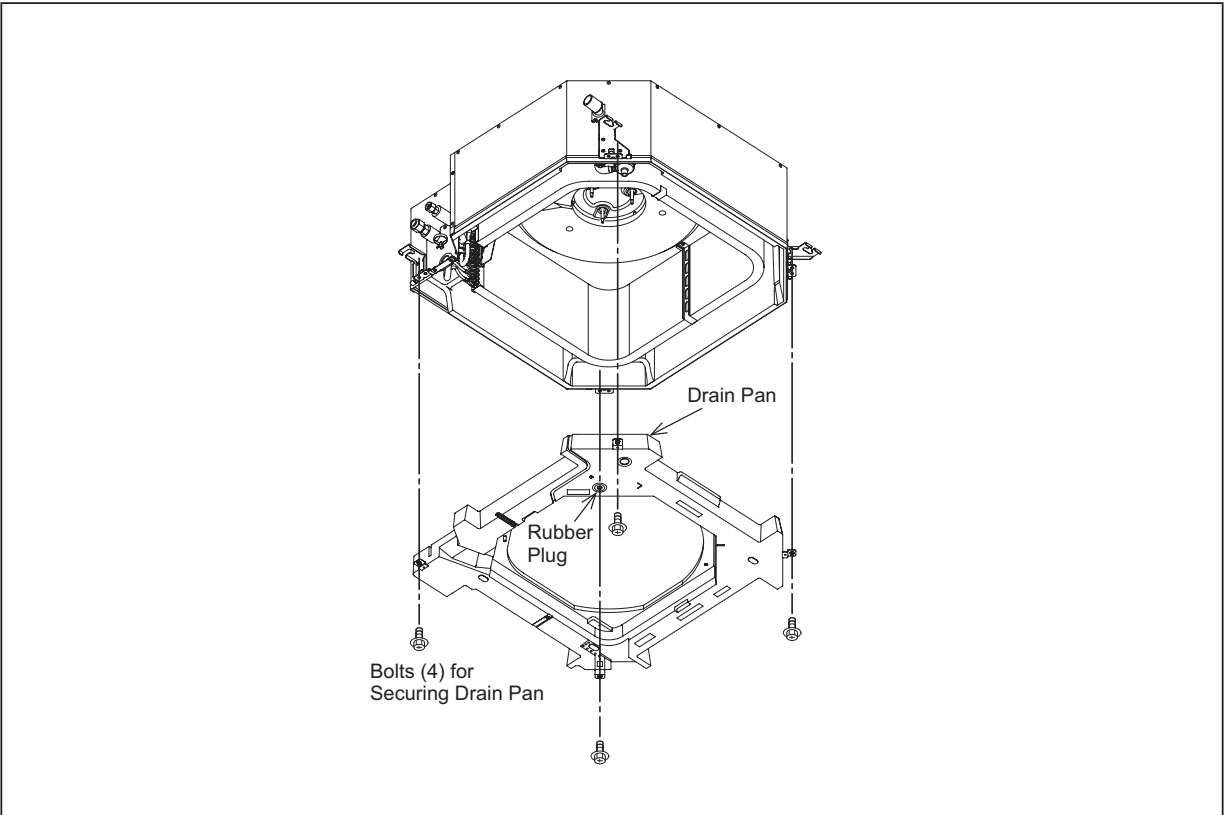
4.2.4.6 Removing Drain Pan

- (1) Remove the decorative panel according to Section 4.2.4.3 "Removing Optional Decorative Panel".
- (2) Remove the electrical box cover according to Section 4.2.4.2 "Removing Electrical Box Cover".
- (3) Remove the electrical box, which requires disconnection of connectors, and the bell-mouth according to Section 4.2.4.4 "Removing Turbo Fan and Fan Motor".
- (4) Draining Water
 Pull out the rubber plug from the drain pan, and drain the water remaining in the drain pan.
 Although silicon sealant is applied around the rubber plug, the rubber plug can be removed by cutting the silicon sealant with a knife. (Take care not to damage the rubber plug with a knife.)
 In addition, check for clogging in the drain hole.
- (5) Removing Drain Pan
 Remove four bolts securing the drain pan. Remove the drain pan.

NOTE:

When reinstalling the rubber plug, wet the rubber plug with water and push it into the drain hole using a Phillips Screwdriver. Seal the rubber plug by applying silicon sealant around the rubber plug.

Tool	Phillips Screwdriver, Bucket (approx. 5 liters)
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MAINTENANCE

(4-Way Cassette Type)

! WARNING

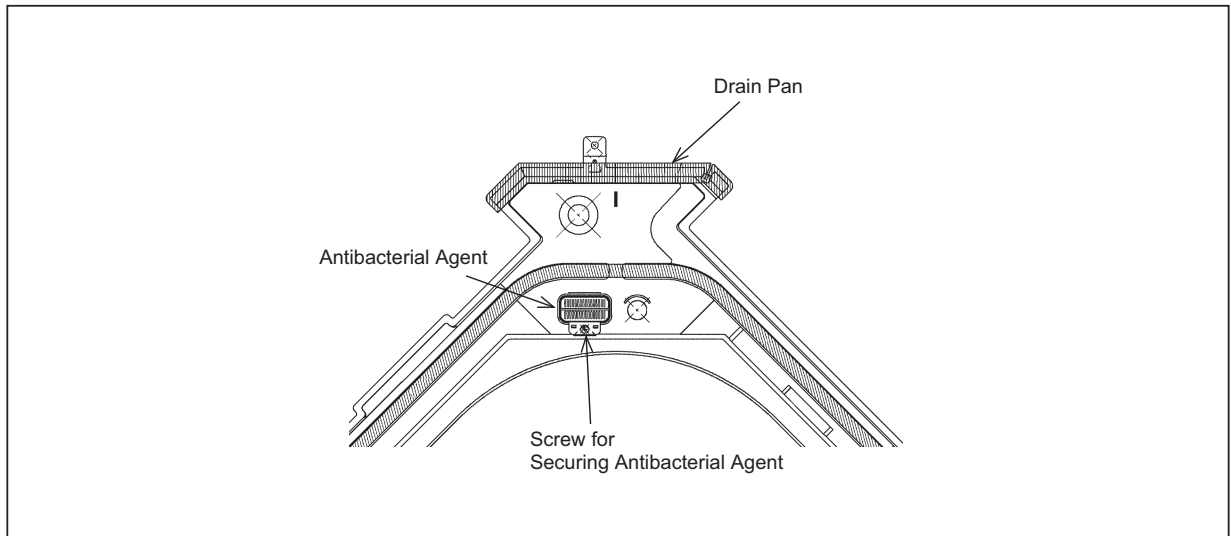
TURN OFF all power source switches.

4.2.4.7 Removing Antibacterial Agent

- (1) Remove the decorative panel according to Section 4.2.4.3 "Removing Optional Decorative Panel".
- (2) Remove the electrical box cover according to Section 4.2.4.2 "Removing Electrical Box Cover".
- (3) Remove the electrical box, which requires disconnection of connectors and the bell-mouth according to Section 4.2.4.4 "Removing Turbo Fan and Fan Motor".
- (4) Remove the drain pan according to Section 4.2.4.6 "Removing Drain Pan".
- (5) Remove the antibacterial agent (cased) secured inside the drain pan by a screw.

Tool

Phillips Screwdriver,
Bucket (approx. 5 liters)



! WARNING

TURN OFF all power source switches.

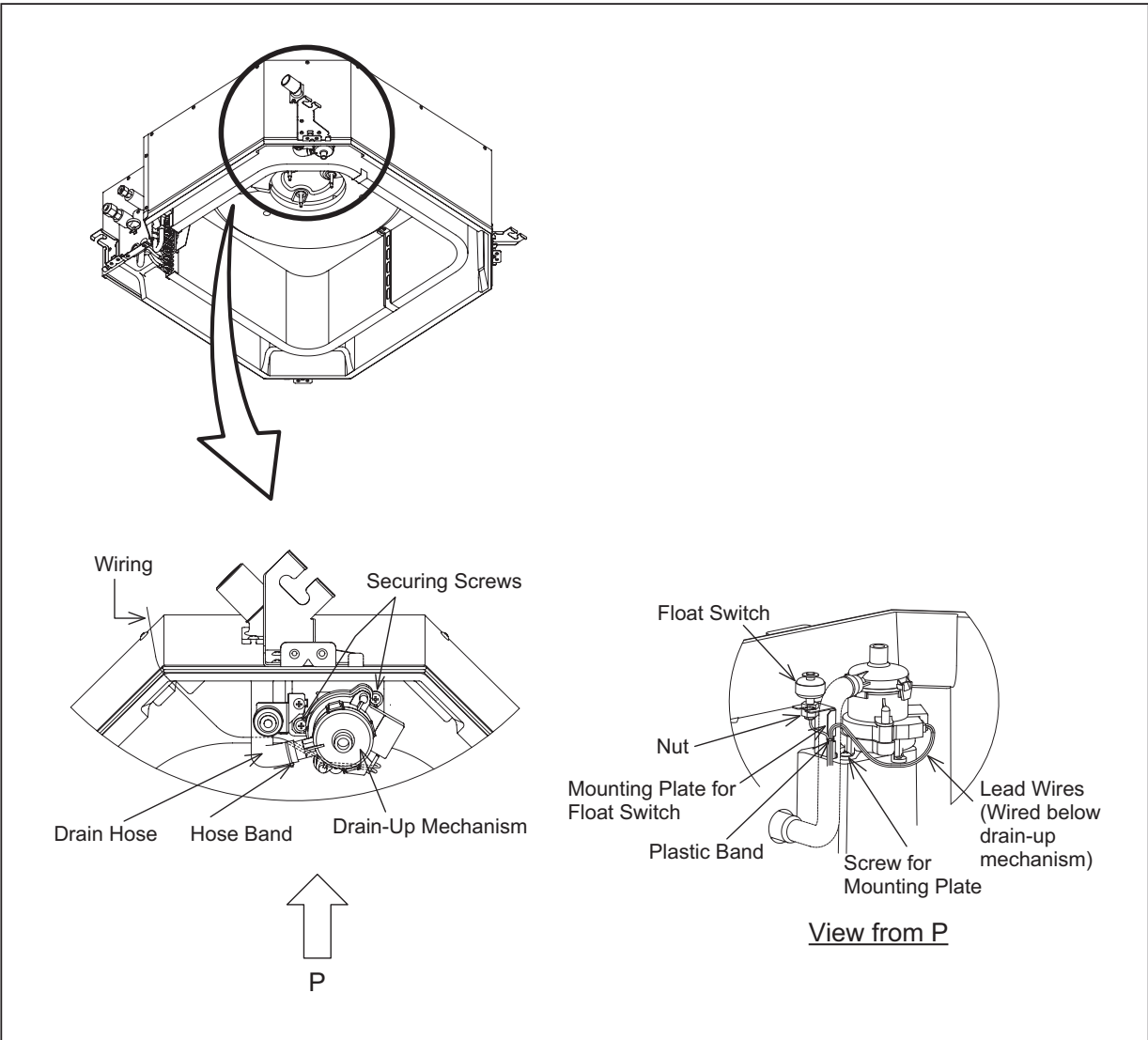
4.2.4.8 Removing Drain-Up Mechanism

- (1) Remove the drain pan according to Section 4.2.4.6 "Removing Drain Pan".
- (2) Remove the insulation which binds together the wires for the float switch and drain-up mechanism.
- (3) Cut the plastic band securing the wires to the mounting plate for the float switch.
- (4) Cut the hose band for the drain hose with a wire cutter, and remove the drain hose from the drain-up mechanism.
- (5) Remove two securing screws for the drain-up mechanism. When removing it, hold it so that it will not fall.
- (6) Remove the drain-up mechanism.

NOTE:

For reassembling, wrap the wires for the float switch and drain-up mechanism together with insulation. Secure them to their original positions. When reinstalling the drain pan, take care not to pull the wires too strongly. Otherwise, the insulation attached to the cabinet may fall off.

Tool	Phillips Screwdriver, Nipper
------	------------------------------



MAINTENANCE

(4-Way Cassette Type)

! WARNING

TURN OFF all power source switches.

4.2.4.9 Removing Float Switch

- (1) Remove the drain pan according to Section 4.2.4.6 "Removing Drain Pan".
- (2) Remove the insulation which attaches the wires of the float switch and drain-up mechanism together.
- (3) Cut the plastic band securing the wires to the mounting plate for the float switch.

(4) Removing Float Switch

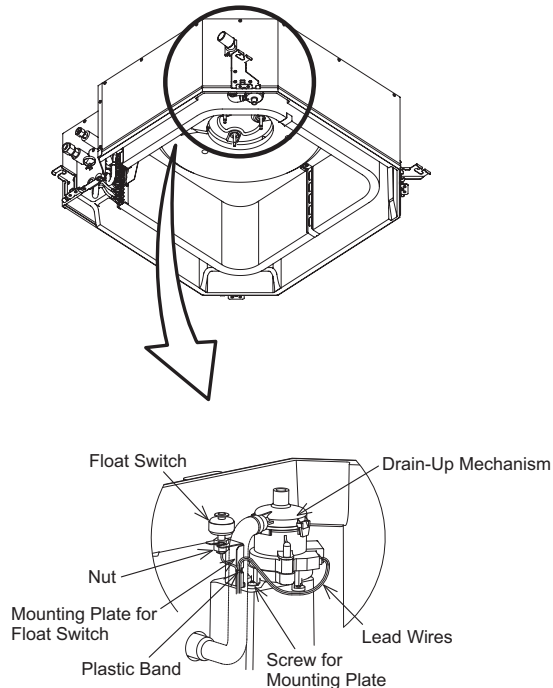
The float switch is installed next to the drain-up mechanism. Remove the float switch by loosening the screw for the mounting plate.

NOTE:

For reassembling, wrap the wires for the float switch and drain-up mechanism together with insulation. Firmly secure them to their original positions. When reattaching the drain pan, take care not to pull the wires too strongly. Otherwise, the insulation attached to the cabinet may fall off.

Tool

Phillips Screwdriver, Nipper



NOTE:

Handle the float switch carefully. If it drops onto a floor, a malfunction may occur. When attaching the float switch, tighten the screw by hand. Do not use a motor-driven screwdriver.

! WARNING

TURN OFF all power source switches.

4.2.4.10 Removing Thermistors for Liquid Pipe and Gas Pipe

- (1) Remove the decorative panel according to Section 4.2.4.3 "Removing Optional Decorative Panel".
- (2) Remove the bell-mouth according to Section 4.2.4.4 "Removing Turbo Fan and Fan Motor".
- (3) Remove the drain pan according to Section 4.2.4.6 "Removing Drain Pan".

(4) Removing Partition Plate

Remove lead wires (for the fan motor, two pipe thermistors, and expansion valve coil) from the cable clamp. Remove six securing screws for the partition plate.

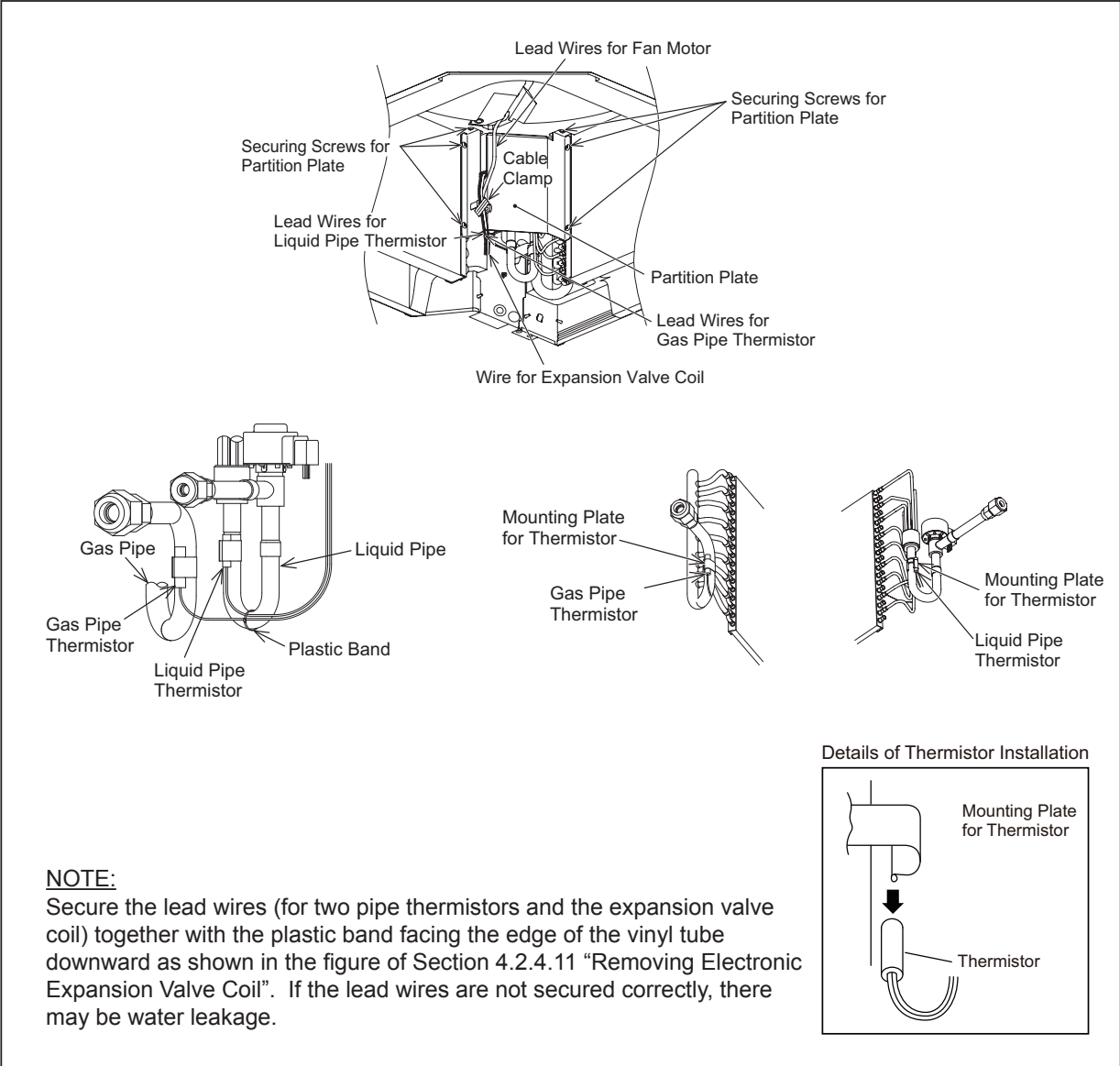
* For reassembling, tie the lead wires (for liquid pipe and gas pipe thermistors) together with the plastic band (field-supplied) to the pipe.

- (5) Remove the mounting plate for the thermistor from the gas pipe, and remove the gas pipe thermistor.

- (6) Remove the mounting plate for the thermistor from the liquid pipe, and remove the liquid pipe thermistor.

* For reassembling, securely tie the lead wires (for the fan motor, two pipe thermistors and the expansion valve coil) together with the cable clamp attached to the partition plate. Attach each thermistor to its original position.

Tool	Wire Cutters, Phillips Screwdriver, Bucket (approx. 5 liters)
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NOTE:

Secure the lead wires (for two pipe thermistors and the expansion valve coil) together with the plastic band facing the edge of the vinyl tube downward as shown in the figure of Section 4.2.4.11 "Removing Electronic Expansion Valve Coil". If the lead wires are not secured correctly, there may be water leakage.

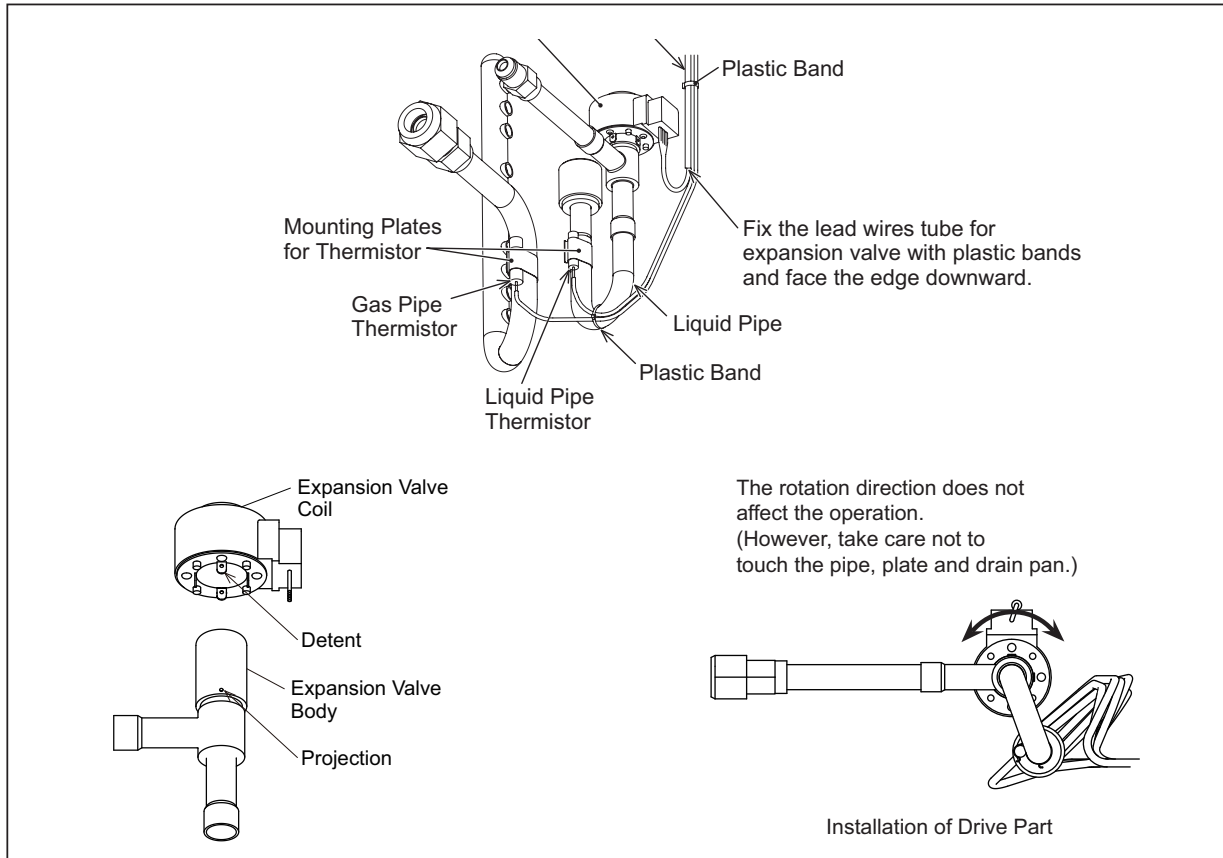
! WARNING

TURN OFF all power source switches.

4.2.4.11 Removing Electronic Expansion Valve Coil

- (1) Remove the decorative panel according to Section 4.2.4.3 "Removing Optional Decorative Panel".
- (2) Remove the bell-mouth according to Section 4.2.4.4 "Removing Turbo Fan and Fan Motor".
- (3) Remove the drain pan according to Section 4.2.4.6 "Removing Drain Pan".
- (4) Remove the partition plate according to Section 4.2.4.10 "Removing Thermistors for Liquid Pipe and Gas Pipe".

Tool	Wire Cutters, Adjustable Wrench
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- (5) Cut the two plastic bands securing the lead wires (for two pipe thermistors and expansion valve coil).
- (6) Remove the detents of the expansion valve coil from the projection parts of the valve body by rotating the valve coil. Pull up the valve coil and remove it. At this time, take care not to twist the pipes.
- (7) Insert the new expansion valve coil for replacement into the expansion valve body. When inserting the valve coil, secure the projection parts into the detents.

NOTE:

The detents are located 90° apart in a circle and the projections are located 180° apart in a circle. Make sure to fit the projection parts into the detents. The rotation direction does not affect the operation. If the valve coil is inserted incorrectly, it may cause malfunction of the valve coil.

- (8) When the replacement is completed, secure the wire for the expansion valve coil near the valve coil with a plastic band. At this time, secure the edge of the lead wires for the expansion valve coil so they face down.
After securing the lead wires, bind the lead wires (for two pipe thermistors and the expansion valve) together with the plastic band.

NOTE:

For reassembling, secure the lead wires (for the fan motor, two pipe thermistors and the expansion valve coil) together with the cable clamp attached to the partition plate.

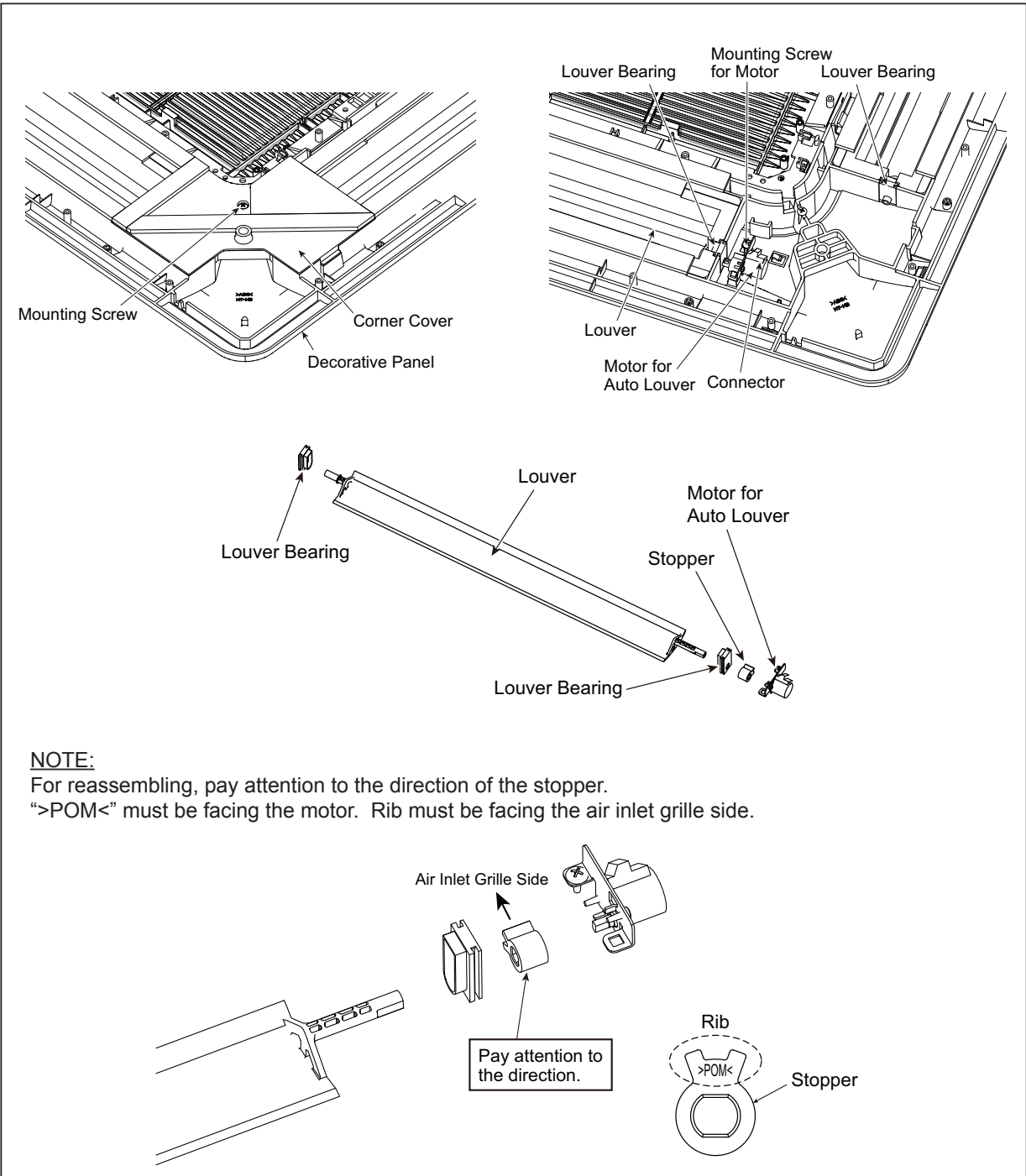
! WARNING

TURN OFF all power source switches.

4.2.4.12 Removing Auto Louver Motors and Louver

- (1) Remove the decorative panel according to Section 4.2.4.3 "Removing Optional Decorative Panel".
- (2) Remove the screws for each corner cover and remove the corner covers.
- (3) Remove the mounting screw for the motors from the decorative panel.
Remove the louvers, louver bearings and motors by pulling them out from the decorative panel.
- (4) Remove the motor, stopper and louver bearing from the louvers.
- (5) Remove the connector from the motors.

Tool	Phillips Screwdriver
------	----------------------



NOTE:
For reassembling, pay attention to the direction of the stopper.
">POM<" must be facing the motor. Rib must be facing the air inlet grille side.

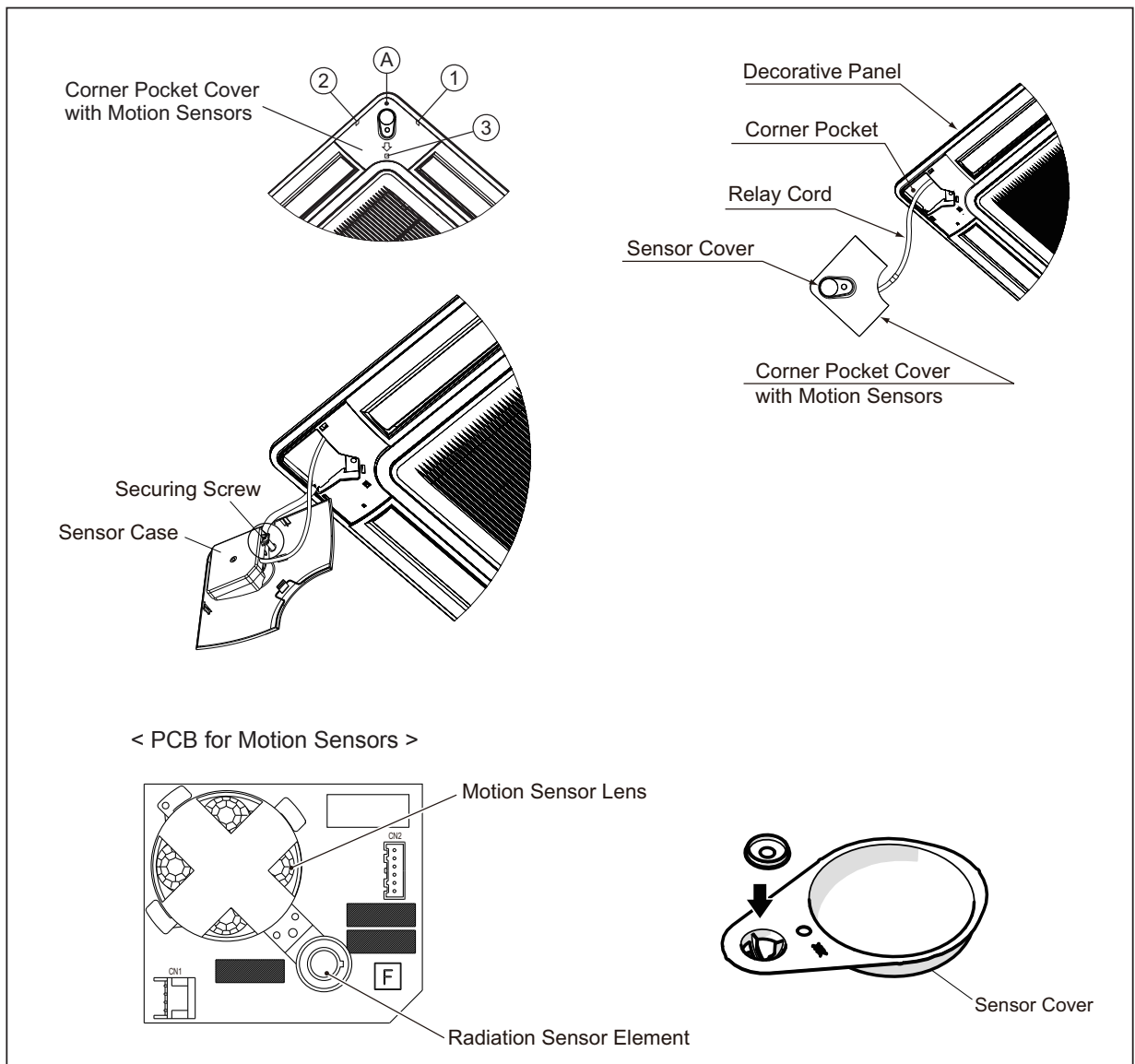
! WARNING

TURN OFF all power source switches.

4.2.4.13 Removing Printed Circuit Board (PCB) for Motion and Radiation Sensors (Optional Part)

- (1) Remove the corner pocket cover with the motion sensors.
It can be removed by pulling the "A" part in the direction of the pulling side.
* To reattach the corner pocket cover, insert the hooks (① and ②) into the decorative panel and then insert the securing hook (③) into the decorative panel.
- (2) Pull out the relay cord from the corner pocket.
- (3) Remove the securing screw for the sensor cover and remove the sensor cover.
- (4) Remove the PCB for the motion sensors and then disconnect the connector (CN1) on the PCB.
* Take care not to drop the sensor cover when removing the PCB. The sensor cover has two parts.

Tool	Phillips Screwdriver
------	----------------------



NOTES:

1. Do not touch the electrical components on the PCB.
2. Do not apply an excessive force to the PCB. Otherwise, it may lead to PCB failure.
3. For reassembling, attach connectors to the correct position. If not correct, the PCB may be damaged.
4. Do not touch the sensor element or lens. Otherwise, it may lead to sensor failure.

! DANGER

Use the specified non-flammable refrigerant (R410A) for the outdoor unit in the refrigerant system. Do not charge the unit with material other than R410A such as hydrocarbon refrigerants (propane), oxygen, flammable gases (acetylene), or poisonous gases when installing, maintaining and moving the unit. These flammables are extremely dangerous and may cause an explosion, fire, and injury.

4.2.5 1-Way Cassette Type

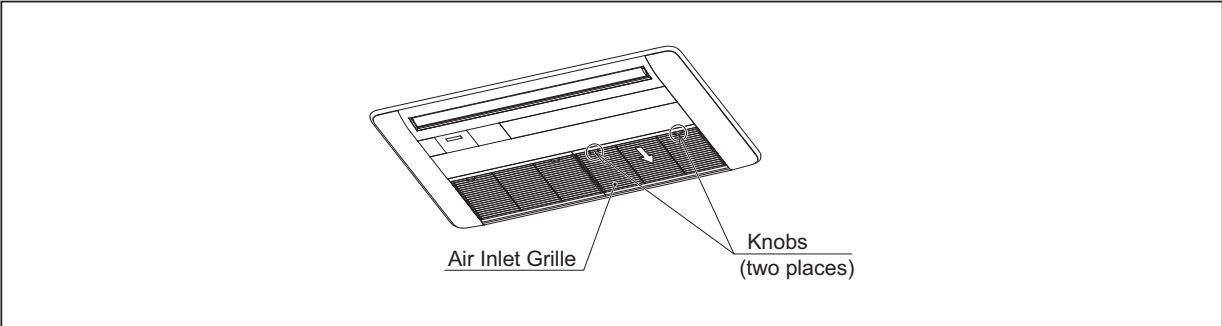
! WARNING

TURN OFF all power source switches.

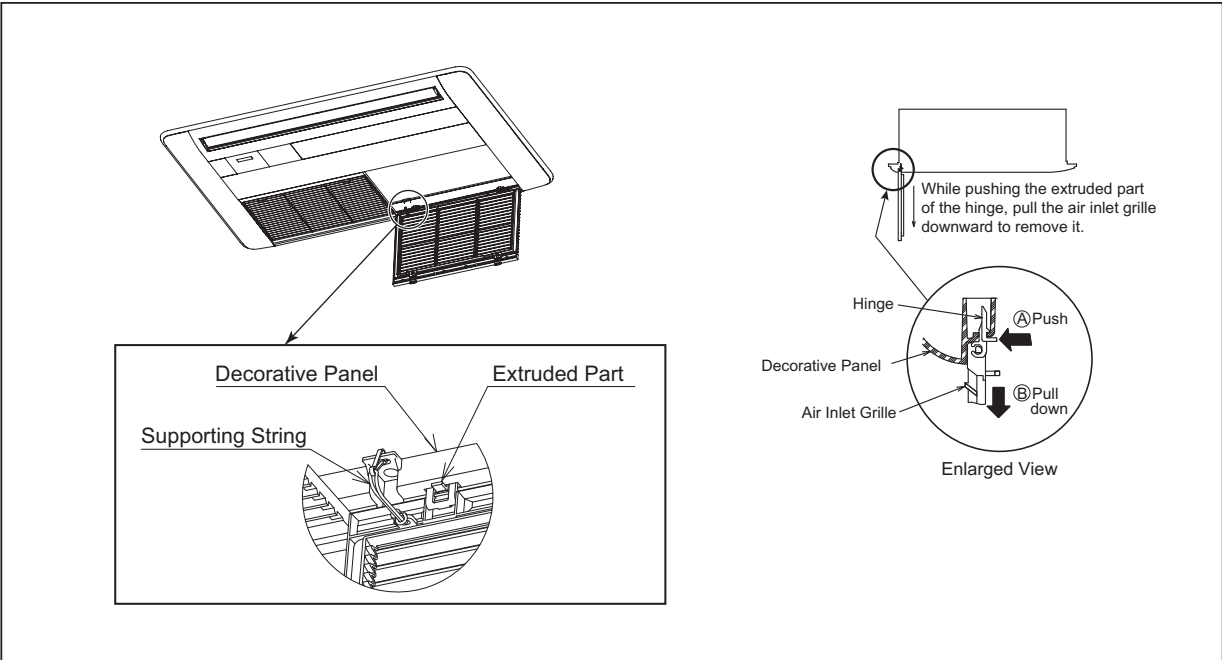
4.2.5.1 Removing Air Filter and Air Inlet Grille

The air filter is attached inside the air inlet grille. Open the air inlet grille and remove the air filter.

- (1) Press and slide the knobs of the air inlet grille in the direction of the arrow with your fingers.
- (2) Then the air inlet grille opens downward.
- (3) Lift up the air filter and release from the latches on the air inlet grille to remove it.



- (3) Remove the supporting string from the decorative panel. While the air inlet grille is open, push the extruded part of the hinge in (A) direction, then pull down the air inlet grille in (B) direction to remove it.
- (4) When reattaching the air inlet grille, make sure to attach the supporting string to the decorative panel.



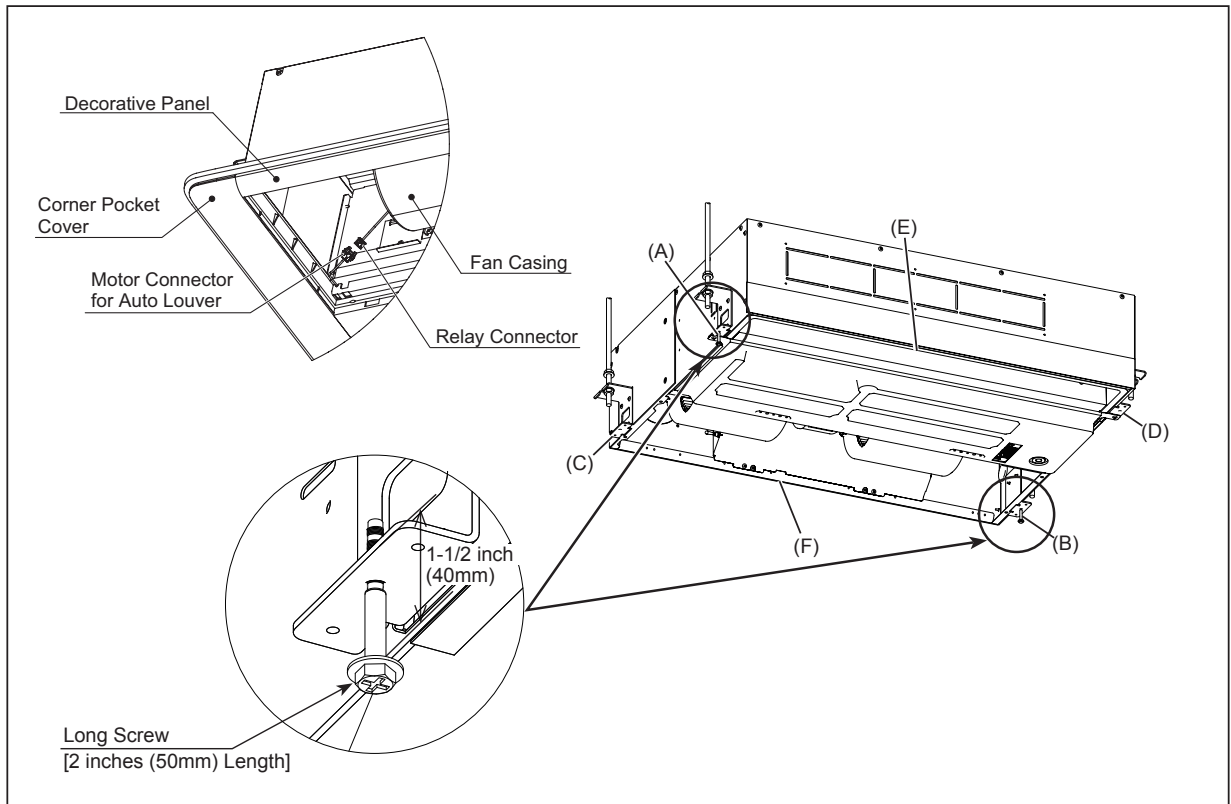
! WARNING

TURN OFF all power source switches.

4.2.5.2 Removing Optional Decorative Panel

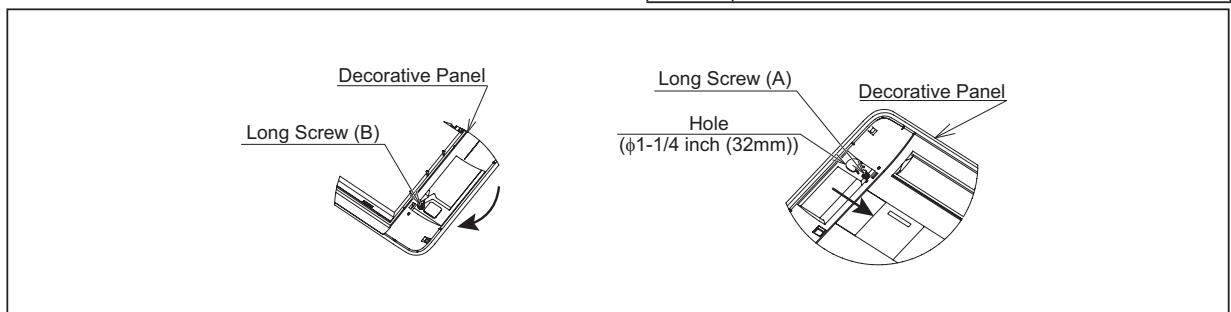
- (1) Remove the air inlet grille according to Section 4.2.5.1 "Removing Air Filter and Air Inlet Grille".
- (2) Disconnect the motor connector for the auto louver wire between the indoor unit electrical box and the decorative panel.
- (3) Remove the two corner pocket covers from the decorative panel.
- (4) Remove the following screws that secure the decorative panel.
The long screws (A) and (B) should not be removed and remain within the nominal length of approximately 1-1/2 inch (40mm). Remove the screws (C), (D), (E) and (F) as shown in the figure below.

Tool	Phillips Screwdriver
------	----------------------



- (5) Rotate the decorative panel toward the direction of the arrow from the screw (B) as shown in the figure below.
- (6) Slide the decorative panel toward the arrow direction from screw (A) and through the hole ϕ 1-1/4 inch (32mm) of the decorative panel. Remove the decorative panel.

Tool	Phillips Screwdriver
------	----------------------



! WARNING

TURN OFF all power source switches.

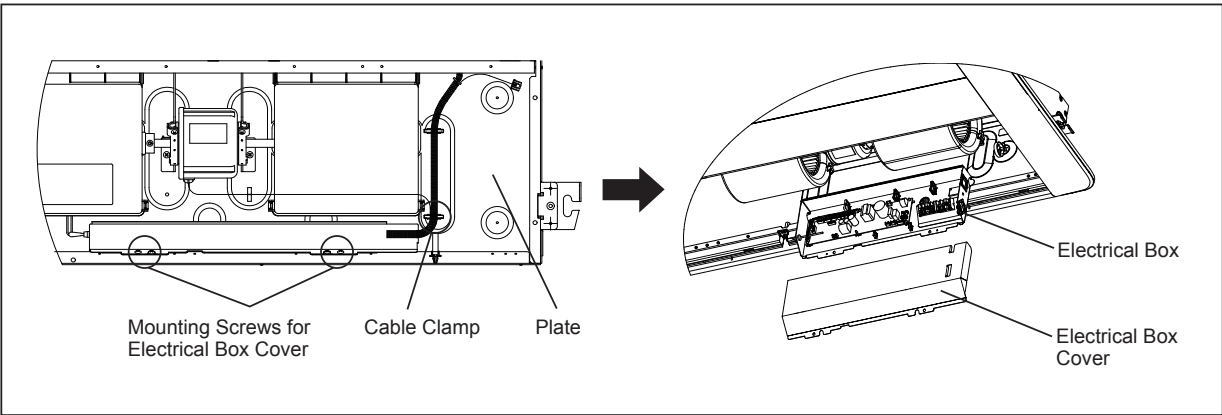
! CAUTION

Be careful not to let the electrical box cover fall.

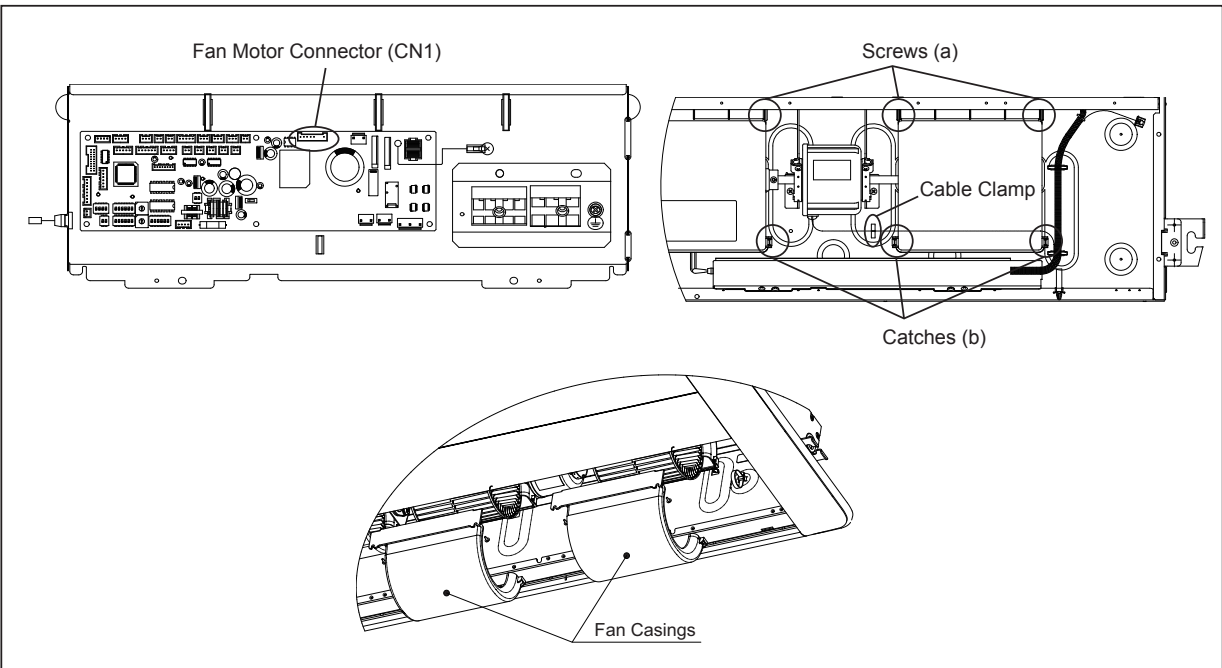
4.2.5.3 Removing Fan Motor

- (1) Open the air inlet grille downward according to Section 4.2.5.1 “Removing Air Filter and Air Inlet Grille”.
- (2) Remove the lead wire from the cable clamp on the plate as shown in the figure below. Then remove two mounting screws for the electrical box cover. Remove two mounting screws for the electrical box and hook the electrical box on the frame at the lower part of the unit. Make sure to hold on to the electrical box while conducting this work to prevent it from falling.

Tool	Phillips Screwdriver, Hexagon Wrench
------	--------------------------------------



- (3) Remove the fan motor connector (CN1) from the indoor unit PCB.
- (4) Remove the lead wires for the fan motor from the cable clamp on the plate.
- (5) Remove two screws (a) from the lower part of each fan casings. Remove the lower part of the fan casings by pushing two catches (b) inward.



MAINTENANCE

(1-Way Cassette Type)

WARNING

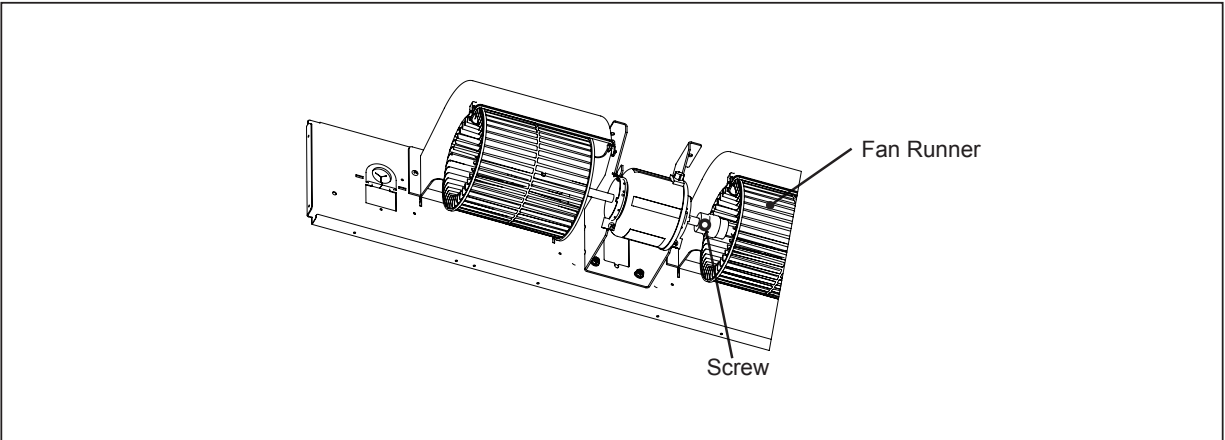
TURN OFF all power source switches.

CAUTION

Be careful not to let the electrical box cover fall.

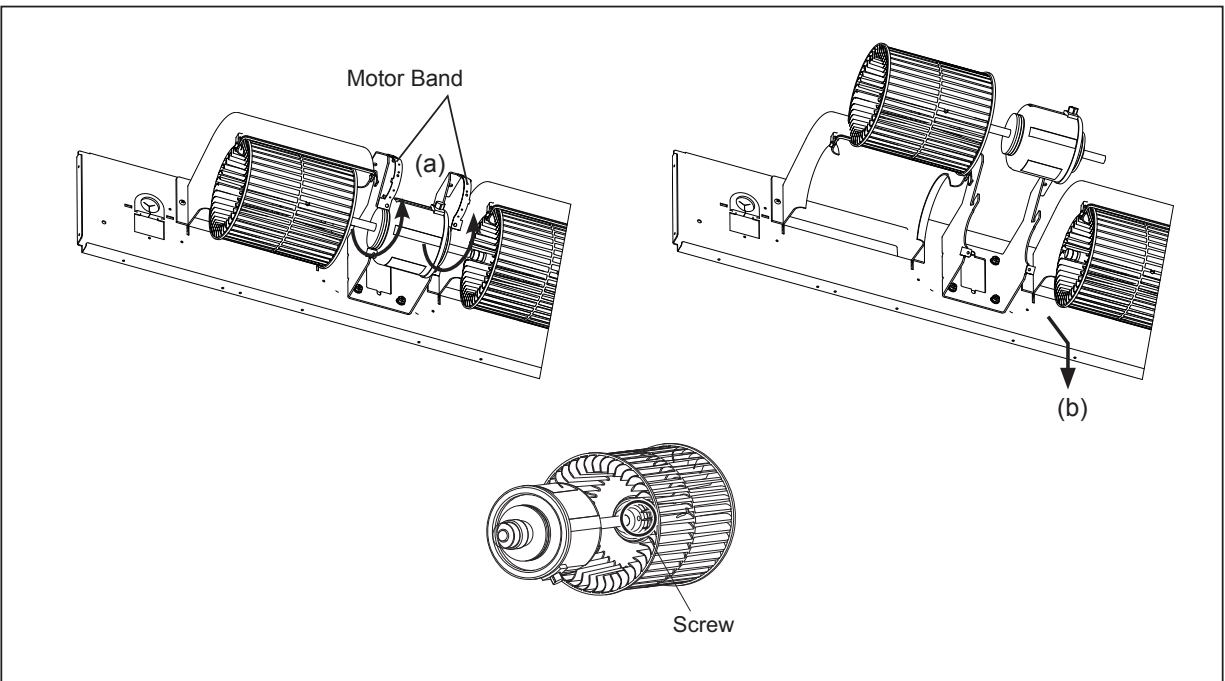
- (6) Remove the securing screw for the fan runner on the right of the fan motor with a hexagonal wrench.

Tool	Phillips Screwdriver, Hexagonal Wrench
------	--



- (7) Remove the two mounting screws for the two motor bands (a) and remove the bands. Remove the fan motor with the fan runner on the left by shifting them in the direction of the arrow (b) with care not to drop them. **This work should be carried out by at least two people.**
- (8) Remove the securing screw for the fan runner with a hexagonal wrench and remove the fan runner from the fan motor.

Tool	Phillips Screwdriver, Hexagonal Wrench
------	--



! WARNING

TURN OFF all power source switches.

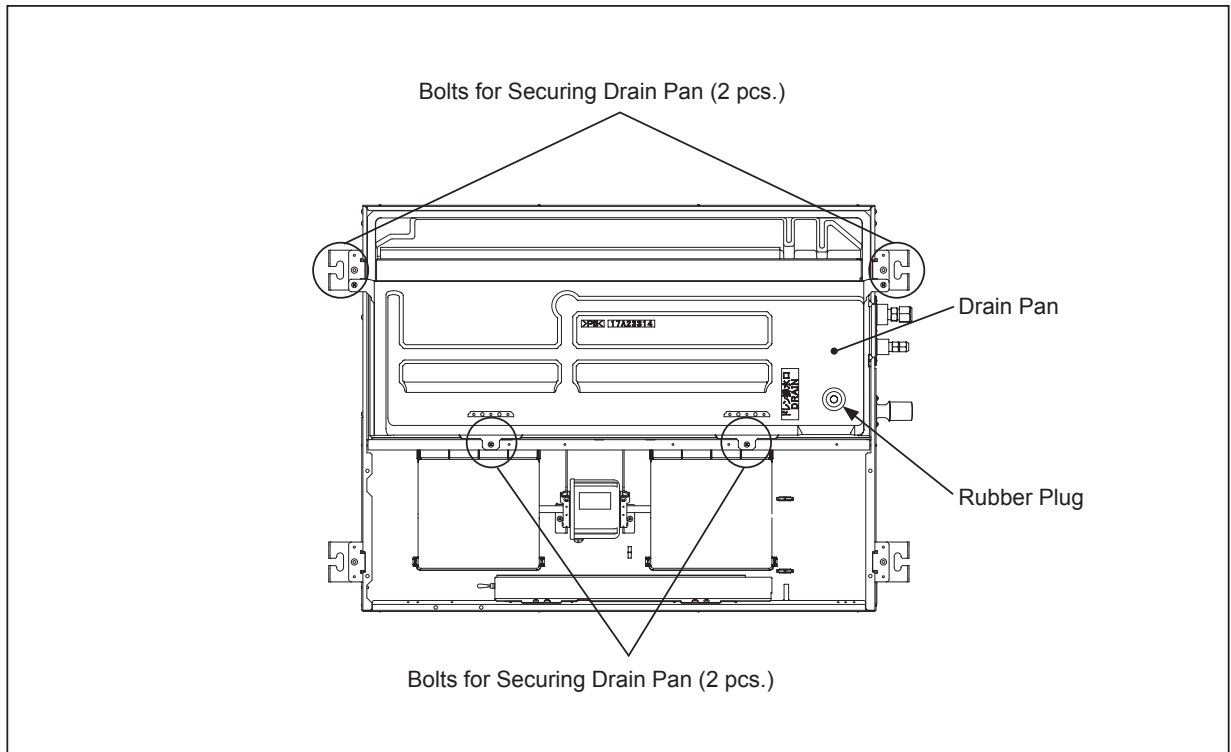
4.2.5.4 Removing Drain Pan

- (1) Remove the decorative panel according to Section 4.2.5.2 "Removing Optional Decorative Panel".
- (2) Draining Water
 Pull out the rubber plug from the drain pan, and drain the water remaining in the drain pan. Although silicon sealant is applied around the rubber plug, the rubber plug can be removed by cutting the silicon sealant with a knife. (Take care not to damage the rubber plug with a knife.) In addition, check that the drain hole is not blocked.
- (3) Removing Drain Pan
 Remove four bolts securing the drain pan. Remove the drain pan.

NOTE:

When reattaching the rubber plug, wet the rubber plug with water and then push it into the drain hole by using a Phillips Screwdriver. Seal the rubber plug by applying silicon sealant around it.

Tool	Phillips Screwdriver, Bucket (approximately 5 liters)
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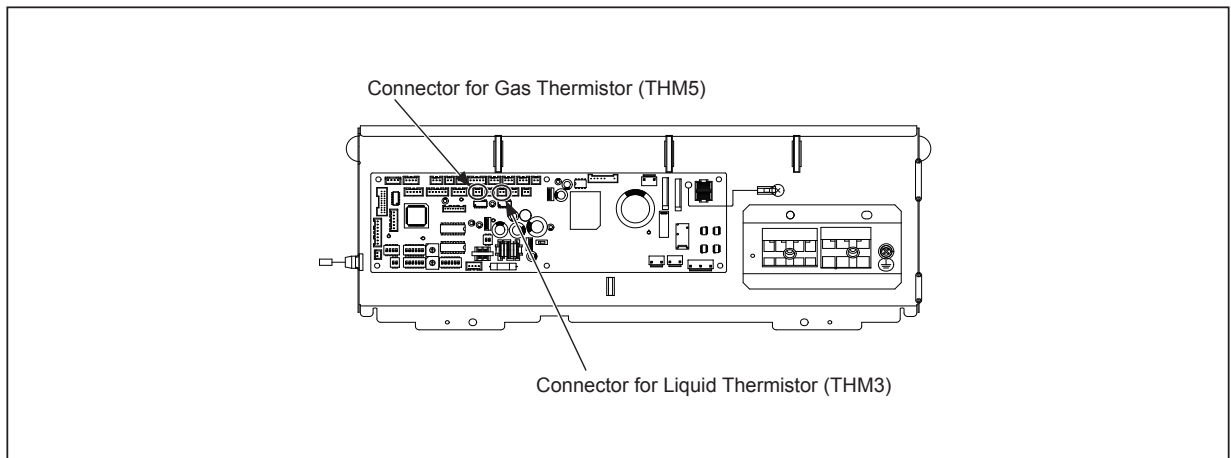
! WARNING

TURN OFF all power source switches.

4.2.5.5 Removing Thermistors for Liquid Pipe and Gas Pipe

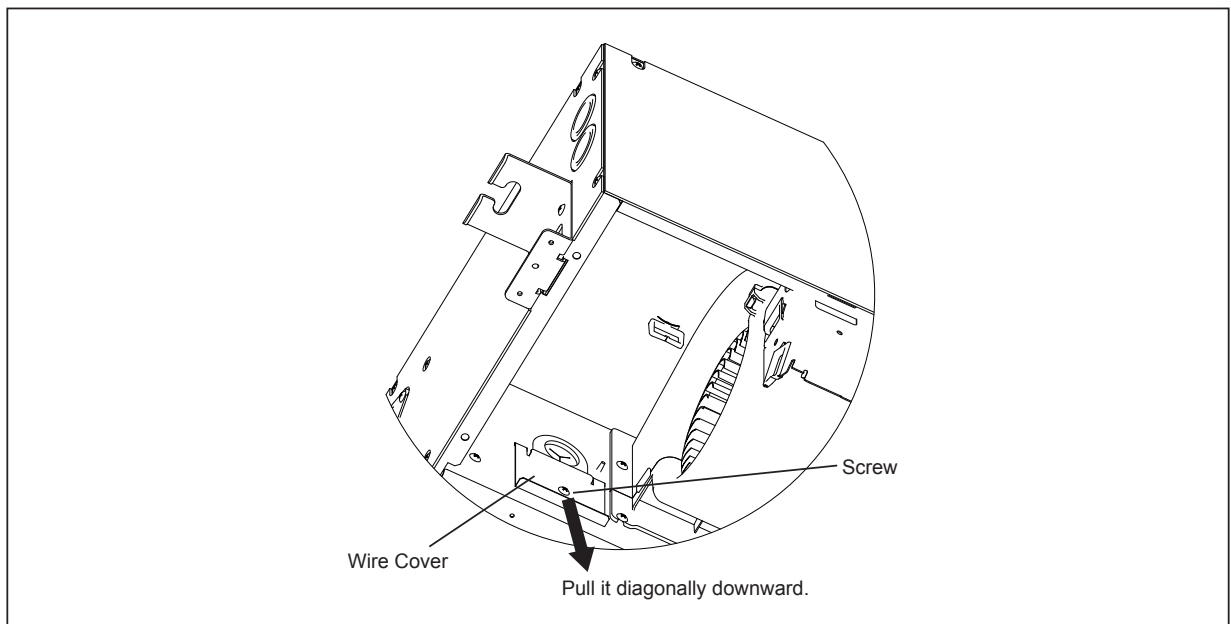
- (1) Open the air inlet grille downward according to Section 4.2.5.1 “Removing Air Filter and Air Inlet Grille”.
- (2) Remove the side covers according to Section 4.2.5.2 “Removing Optional Decorative Panel”.
- (3) Remove the electrical box and hook it on the frame at the lower part of the unit according to Section 4.2.5.3 “Removing Fan Motor”.
- (4) Open the electrical box cover and disconnect the connectors for the gas pipe thermistor (yellow, THM5) and the liquid pipe thermistor (black, THM3) from the indoor unit PCB.

Tool	Phillips Screwdriver, Wrench
------	------------------------------



- (5) Remove the drain pan according to Section 4.2.5.4 “Removing Drain Pan”. Be careful while removing the drain pan because water may have collected in the drain pan.
- (6) Remove the screw for the wire cover and pull the wire cover diagonally downward.

Tool	Phillips Screwdriver, Wrench
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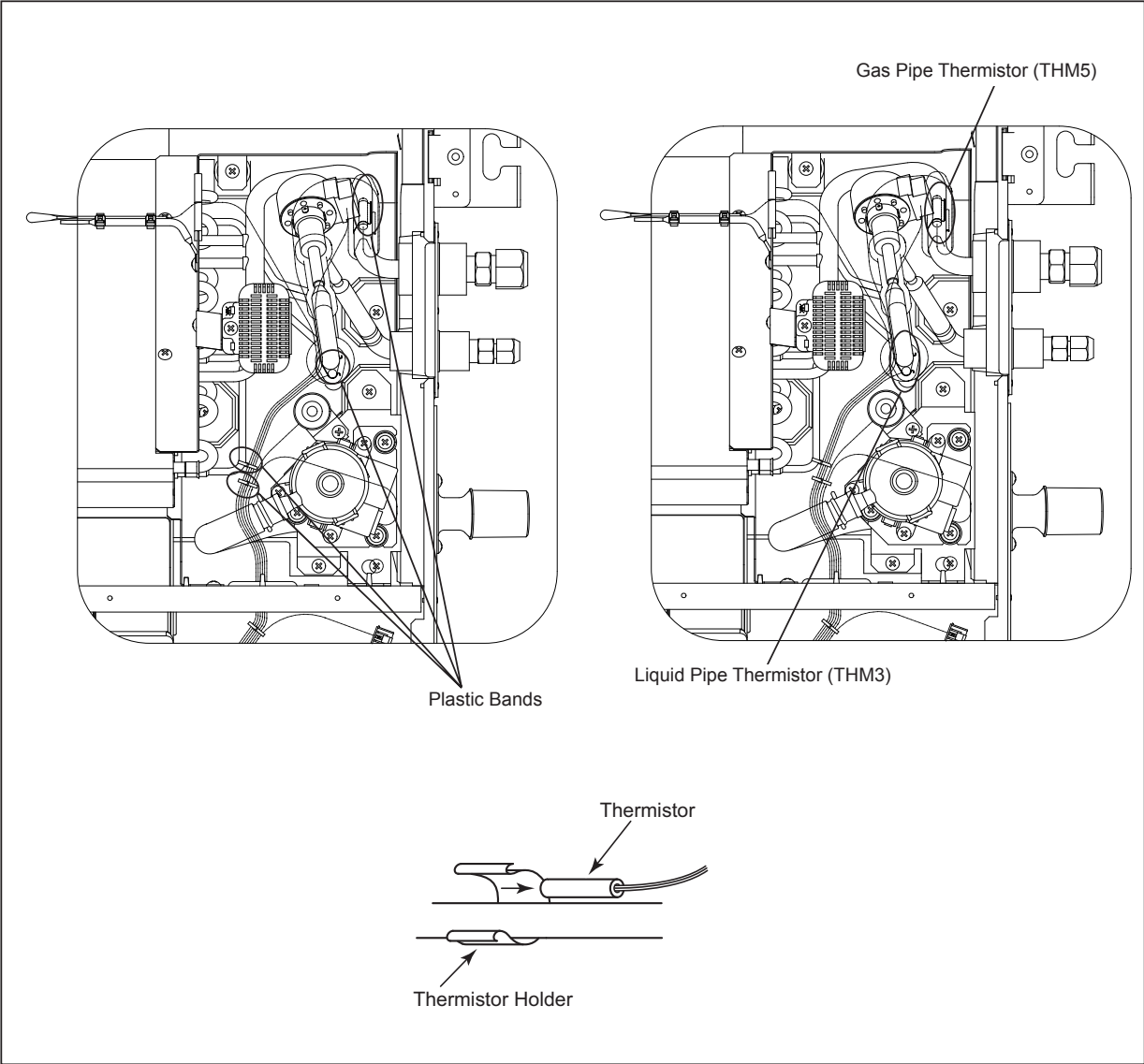


! WARNING

TURN OFF all power source switches.

- (7) Remove four plastic bands tying the lead wires for the thermistors.
- (8) Remove the butyl rubber sheets attached to the thermistors.
- (9) Remove the liquid pipe thermistor (THM3) and the gas pipe thermistor (THM5) from the unit.

Tool	Nipper, Phillips Screwdriver, Wrench
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! CAUTION

Take special care not to be injured by the heat exchanger fins.

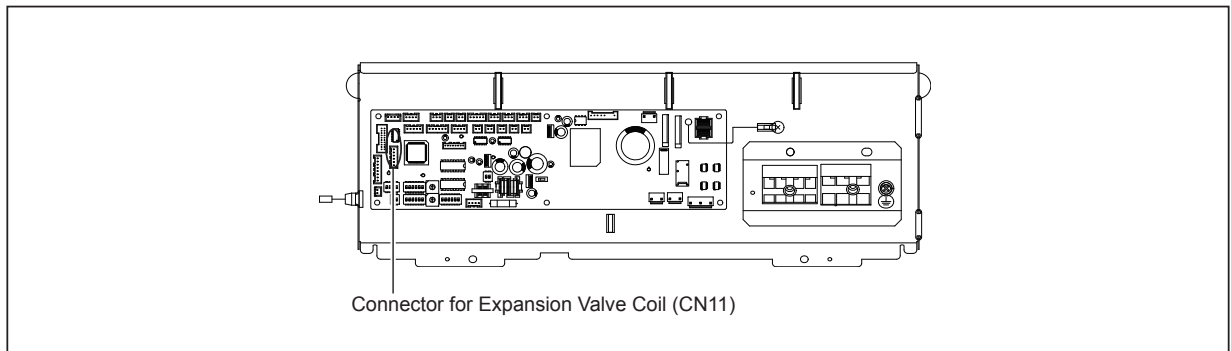
! WARNING

TURN OFF all power source switches.

4.2.5.6 Removing Electronic Expansion Valve Coil

- (1) Remove the decorative panel according to Section 4.2.5.2 "Removing Optional Decorative Panel".
- (2) Remove the drain pan according to Section 4.2.5.4 "Removing Drain Pan". Then the expansion valve can be seen.
- (3) Check the motion of the expansion valve by hand.
- (4) Remove the electrical box and hook it on the frame at the lower part of the unit according to Section 4.2.5.3 "Removing Fan Motor".
- (5) Open the electrical box cover and disconnect the connector (CN11) for the expansion valve coil from the indoor unit PCB.

Tool	Phillips Screwdriver
------	----------------------

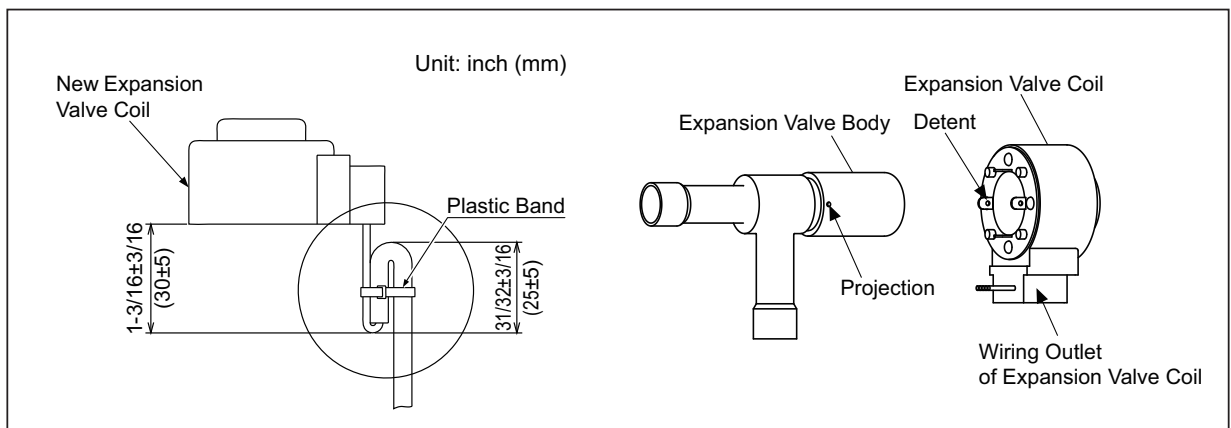


- (6) Remove the wire cover according to Section 4.2.5.5 "Removing Thermistor for Liquid Pipe and Gas Pipe".
- (7) Remove the plastic bands tying lead wires for the thermistors according to Section 4.2.5.5 "Removing Thermistor for Liquid Pipe and Gas Pipe".
- (8) Remove the detents of the expansion valve coil from the projection parts of the valve body by rotating the valve coil. Pull the valve coil forward to remove it.
At this time, take care not to twist the pipes.
- (9) Tie the lead wires of the new expansion valve coil together with a plastic band as shown in the figure below.
- (10) Insert the new expansion valve coil for replacement into the expansion valve body. When inserting the valve coil, secure the projection parts into the detents with the wiring outlet facing down.

NOTE:

The detents are located 90° apart in a circle and the projections are located 180° apart in a circle. Make sure to fit the projection parts into the detents. If the valve coil is inserted incorrectly, it may cause malfunction of the expansion valve coil.

Tool	Phillips Screwdriver
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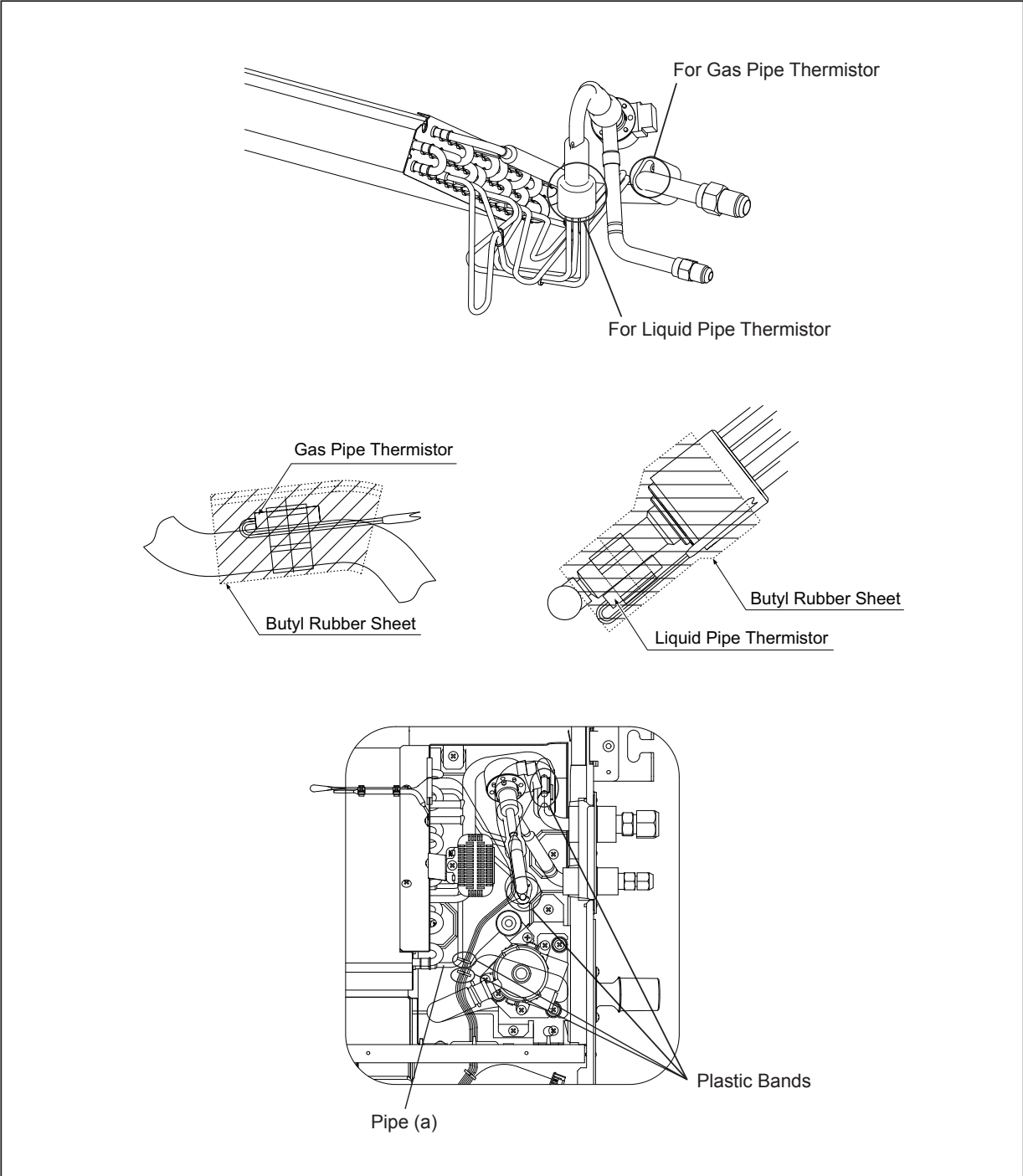
! WARNING

TURN OFF all power source switches.

< NOTES for Mounting Pipe Thermistors and Expansion Valve Coil >

- (1) When mounting the pipe thermistors, pay attention to the outlet direction and position of the lead wires. Seal the thermistors with butyl rubber sheets after mounting them.
- (2) Tie the wires and the pipe thermistors together in four places with plastic bands as shown in the figure below.
- (3) As for the pipe (a), tie at the bending part of the pipe (a) with the plastic band.

Tool	Phillips Screwdriver, Long-nose Pliers
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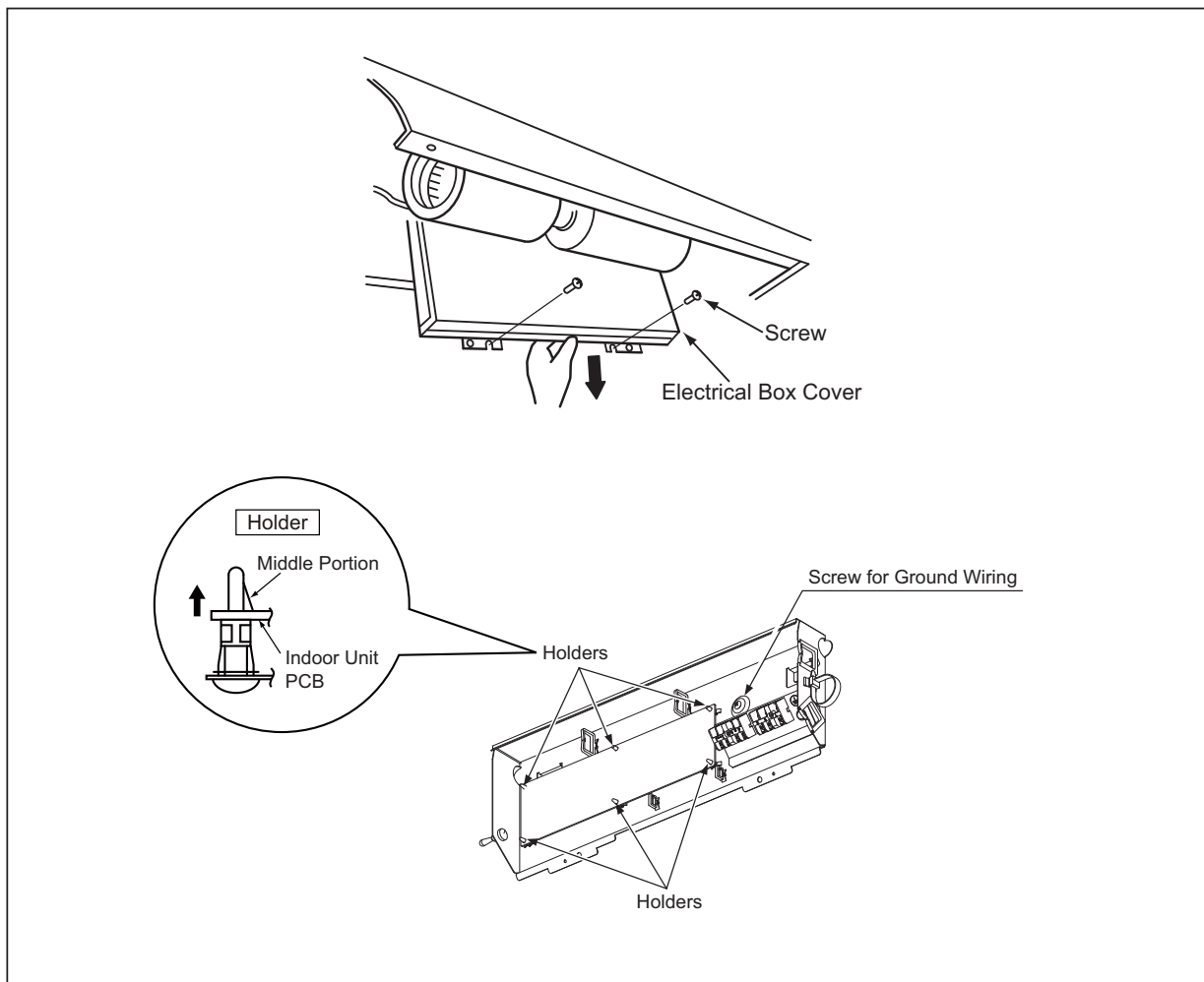
! WARNING

TURN OFF all power source switches.

4.2.5.7 Removing Printed Circuit Board

- (1) Open the air inlet grille downward according to Section 4.2.5.1 “Removing Air Filter and Air Inlet Grille”.
- (2) Remove the electrical box and hook it on the frame at the lower part of the unit according to Section 4.2.5.3 “Removing Fan Motor”.
- (3) Remove two securing screws for the electrical box cover and remove the cover.
- (4) Remove the screw for the ground wiring.
- (5) The indoor unit PCB is secured by six holders. Pinch the middle portion with a long-nose pliers and pull them out.

Tool	Phillips Screwdriver, Long-nose Pliers
------	--



NOTES:

1. Do not touch the electrical components on the indoor unit PCB.
2. Do not apply an excessive force to the PCB. Otherwise, it may lead to PCB failure.
3. For reassembling, attach connectors to the correct position. If not, the indoor unit PCB may be damaged. In addition, securely attach the screw for the ground wiring.

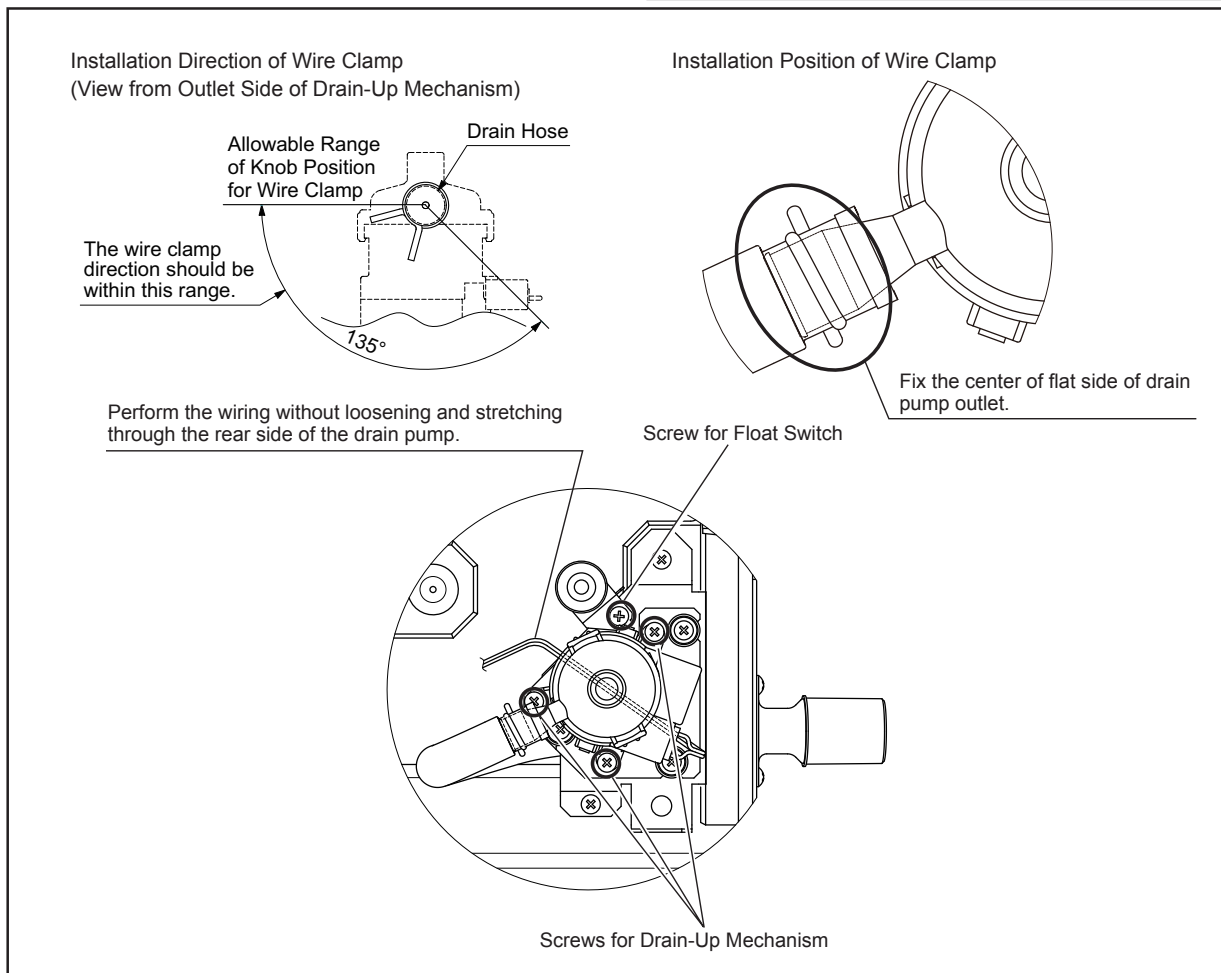
! WARNING

TURN OFF all power source switches.

4.2.5.8 Removing Drain-Up Mechanism and Float Switch

- (1) Remove the decorative panel according to Section 4.2.5.2 "Removing Optional Decorative Panel".
- (2) Remove the drain pan according to Section 4.2.5.4 "Removing Drain Pan".
- (3) Remove the wire clamp for the drain hose and remove the drain hose from the drain-up mechanism. For reassembling, use the position and direction of the wire clamp as shown in the figure below.
- (4) Remove the connector (CN36) for the motor of the drain-up mechanism from the indoor unit PCB.
- (5) Disconnect the wire connector (green) for the float switch inside the electrical box.
- (6) The lead wires for the drain pump and the float switch are secured onto the pipings of the heat exchanger with the plastic bands. Cut the plastic bands and remove the lead wire.
- (7) Remove the wire cover and remove the wire from the rubber bushing.
- (8) Remove the three screws of the mounting plate for the drain-up mechanism.
- (9) Remove the drain-up mechanism.
- (10) Remove the float switch with the mounting plate.

Tool	Phillips Screwdriver
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NOTES:

1. Do not damage the pipes when removing the drain-up mechanism.
2. Do not use a motor-driven screwdriver.
3. Handle the float switch carefully. If it drops onto a floor, a malfunction may occur.

! WARNING**TURN OFF all power source switches.**

4.2.5.9 Removing Auto Louver Motor

- (1) Remove the decorative panel according to Section 4.2.5.2 "Removing Optional Decorative Panel".
- (2) Remove the screw securing the corner cover and open the corner cover.
- (3) Remove the screw and the connector secured to the motor as shown below. Push the stopper below the wire connector and remove the connector.
- (4) Remove the air outlet guide from the decorative panel.

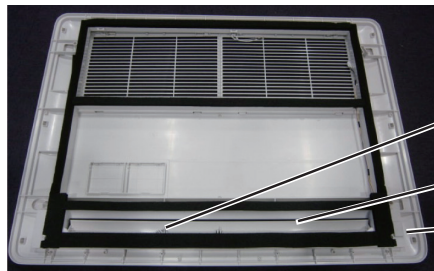
NOTE:

Be careful not to damage the air outlet guide while removing it.

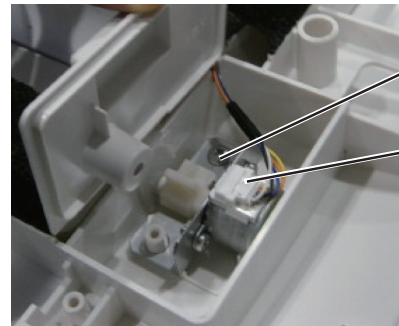
- (5) Rotate the louver vertically and remove the louver and motor.
Remove the two screws securing the motor and remove it.

Tool

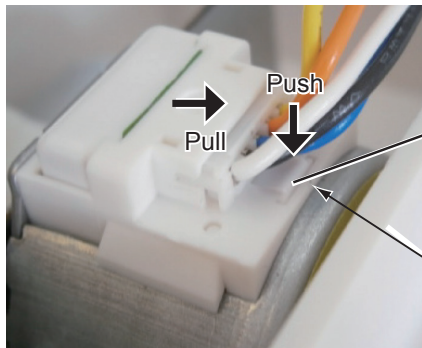
Phillips Screwdriver



Louver
Air Outlet Guide
Corner Cover



Screw
Connector



→ Push
← Pull

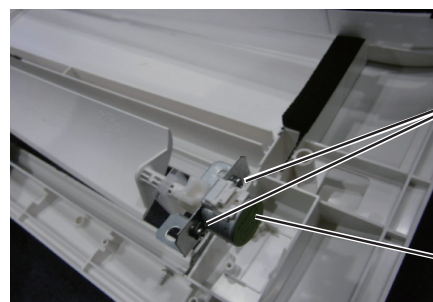
Stopper

Stopper

(View from Side)



Air Outlet Guide



Screws

Motor

⚠ DANGER

Use the specified non-flammable refrigerant (R410A) for the outdoor unit in the refrigerant system. Do not charge the unit with material other than R410A such as hydrocarbon refrigerants (propane), oxygen, flammable gases (acetylene), or poisonous gases when installing, maintaining or moving the unit. These flammables are extremely dangerous and may cause an explosion, a fire, and injury.

4.2.6 Wall Mount Type

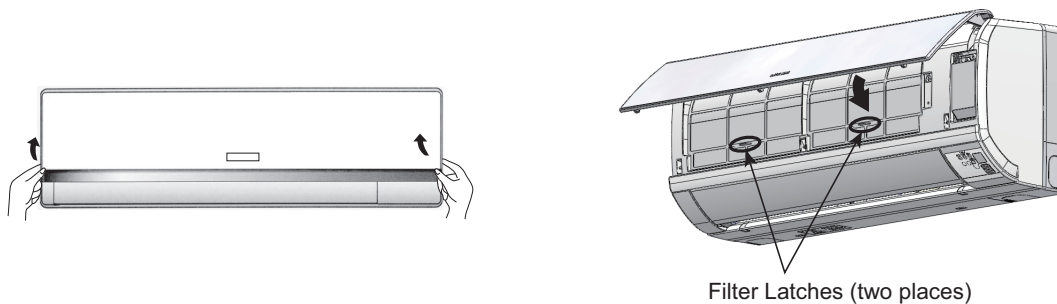
⚠ WARNING

TURN OFF all power source switches.

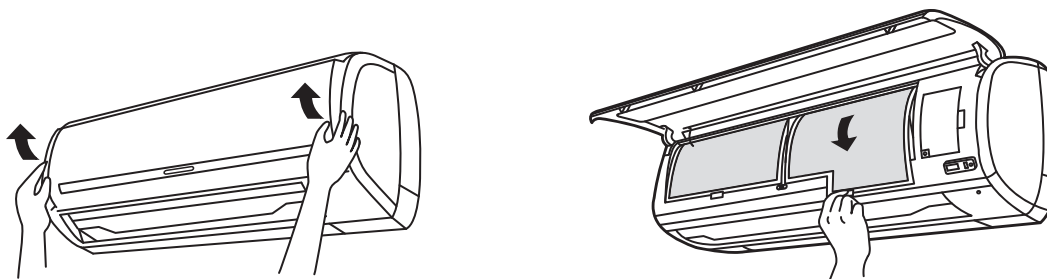
4.2.6.1 Removing Air Filter

Hold both sides of the flat panel and lift it up. Release the two latches and pull the air filter downward to remove it.

< TIWM006B21S - TIWM012B21S >



< TIWM015B21S - TIWM024B21S >



! WARNING

TURN OFF all power source switches.

4.2.6.2 Removing Front Panel

< TIWM006B21S - TIWM012B21S >

- (1) Remove the air filter according to Section 4.2.6.1 "Removing Air Filter."
- (2) Open the flat panel fully and slightly extend the right arm shaft outward to remove it. After the shaft is removed from the front panel, pull the flat panel forward with the right arm shaft slightly extended outward and then remove the flat panel.

NOTE:

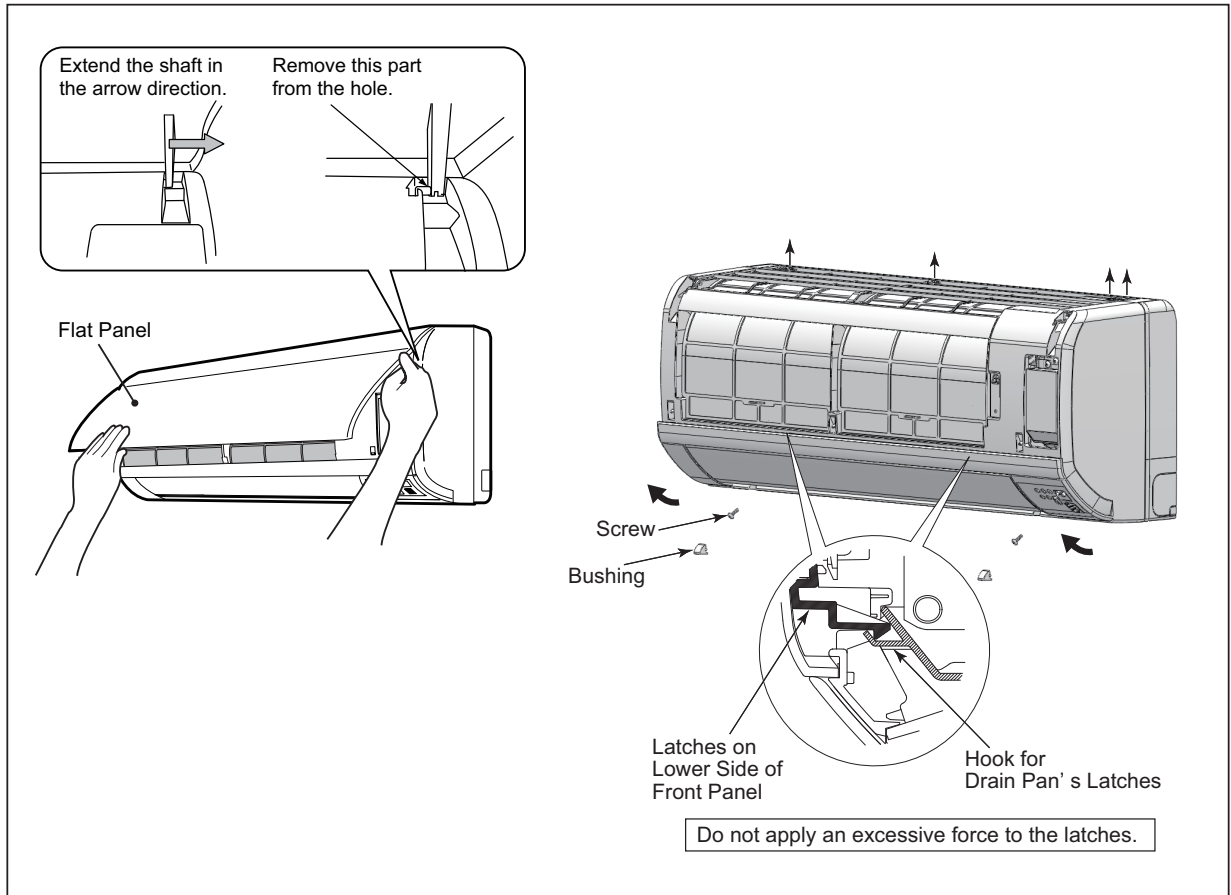
The shaft is coated with lubricant. If it gets in your eyes or comes in contact with skin, wash with water immediately. Also consult a doctor if necessary. Wash your hands thoroughly after handling the shaft.

- (3) Remove two bushings and then two screws. Pull the lower side of the front panel forward to release the latches. Then remove the front panel carefully so that it does not touch the horizontal louver attached to the air outlet.
- (4) Slightly lift the front panel up to release the latches (four places) on the upper side of the unit. Then pull the front panel forward to remove it.

NOTE:

When releasing the latches, a clicking sound is heard. This is a normal sound made when the latches are released.

Tool	Phillips Screwdriver
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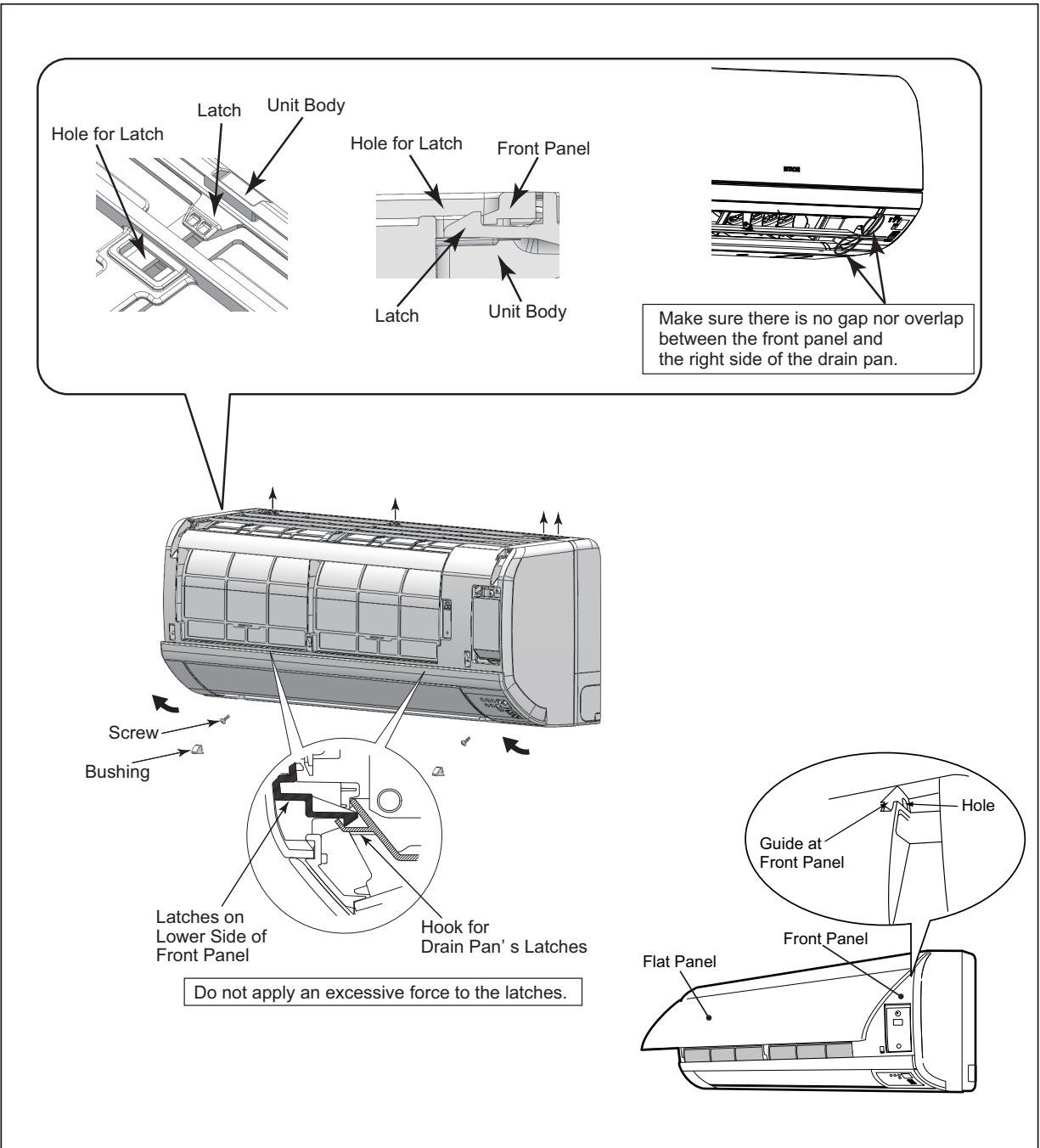
- (5) When reattaching the front panel, first attach the air outlet side of the panel to the unit and then put the latches (four places) on the upper side of the unit into the holes on the panel. Push the lower side of the panel to fasten the latches.

NOTE:

Make sure there is no gap nor overlap between the front panel and the right side of the drain pan. If there is a gap, air leakage and condensation may occur and condensation may drip from the front panel.

- (6) Tighten two screws and attach two bushings. Then attach the air filter.
- (7) Insert the arm shafts on both sides of the flat panel into the holes on the unit body, along the guide of the front panel. After the flat panel is attached properly, close the flat panel.

Tool	Phillips Screwdriver
------	----------------------



MAINTENANCE

(Wall Mount Type)

< TIWM015B21S - TIWM024B21S >

- (1) Remove the air filter according to Section 4.2.6.1 "Removing Air Filter."
- (2) Open the flat panel fully and push the right arm shaft inward to remove it. After the shaft is removed from the front panel, pull the flat panel forward with the right arm shaft slightly pushed inward and then remove the flat panel.

NOTE:

The shaft is coated with lubricant. If it gets in your eyes or comes in contact with skin, wash with water immediately. Also consult a doctor if necessary. Wash your hands thoroughly after handling the shaft.

- (3) Remove three bushings and then three screws. Pull the lower side of the front panel (2 places) forward to release the latches. Use a slotted screwdriver when the latches are difficult to release.

NOTE:

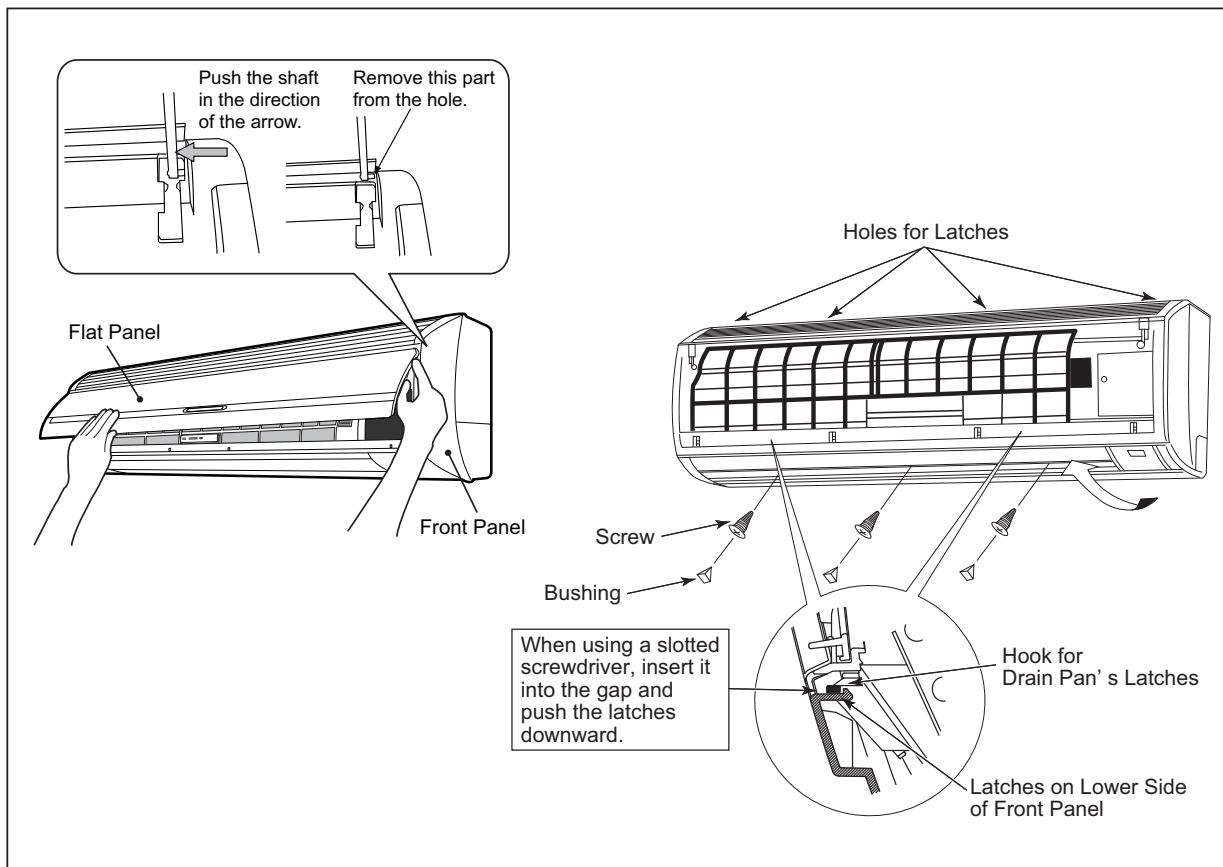
Take special care not to get injured by the heat exchanger fins.

- (4) Remove the front panel carefully so that it does not touch the horizontal louvers attached to the air outlet. Slightly lift the front panel up to release the latches (4 places) on the upper side of the unit. Then pull the front panel forward to remove it.

NOTE:

When releasing the latches, a clicking sound is heard. This is a normal sound made when the latches are released.

Tool	Phillips Screwdriver, Slotted Screwdriver
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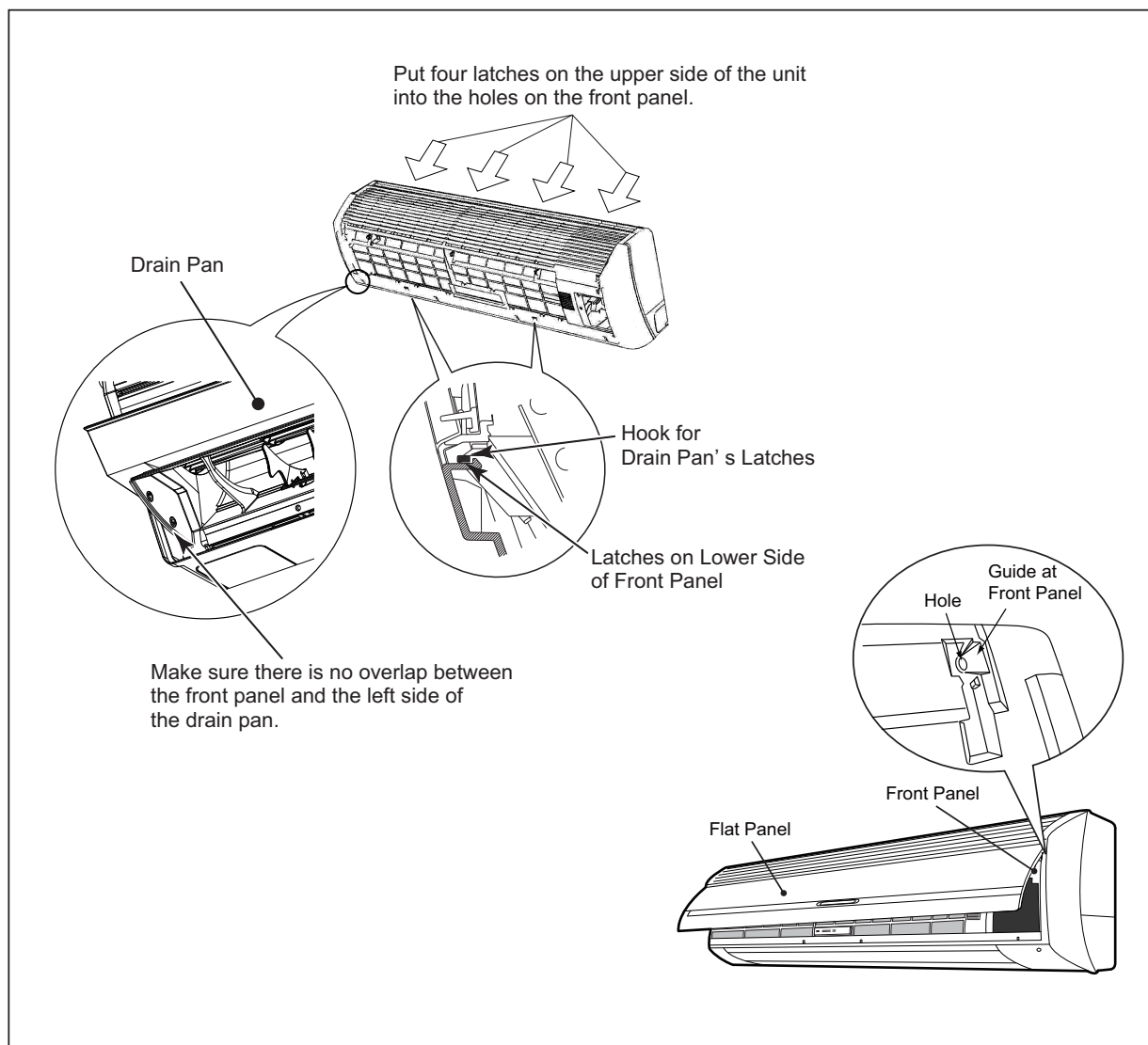
- (5) When reattaching the front panel, be careful that it does not touch the horizontal louvers. While paying attention to both sides of the panel, put the four latches on the upper side of the unit into the holes on the front panel. Then push the lower side of the panel (two places) to fasten the latches.

NOTE:

Make sure the left side of the air outlet does not overlap the drain pan. If there is a gap between the front panel and air outlet, air leakage and condensation may occur and the condensation may drip from the front panel.

- (6) Tighten three screws and attach three bushings. Then attach the air filter, front panel and flat panel.
- (7) Insert completely the arm shafts of the left and right side of the panel into the holes along the guide of the front panel. After the flat panel is attached properly, close the flat panel.

Tool	Phillips Screwdriver, Slotted Screwdriver
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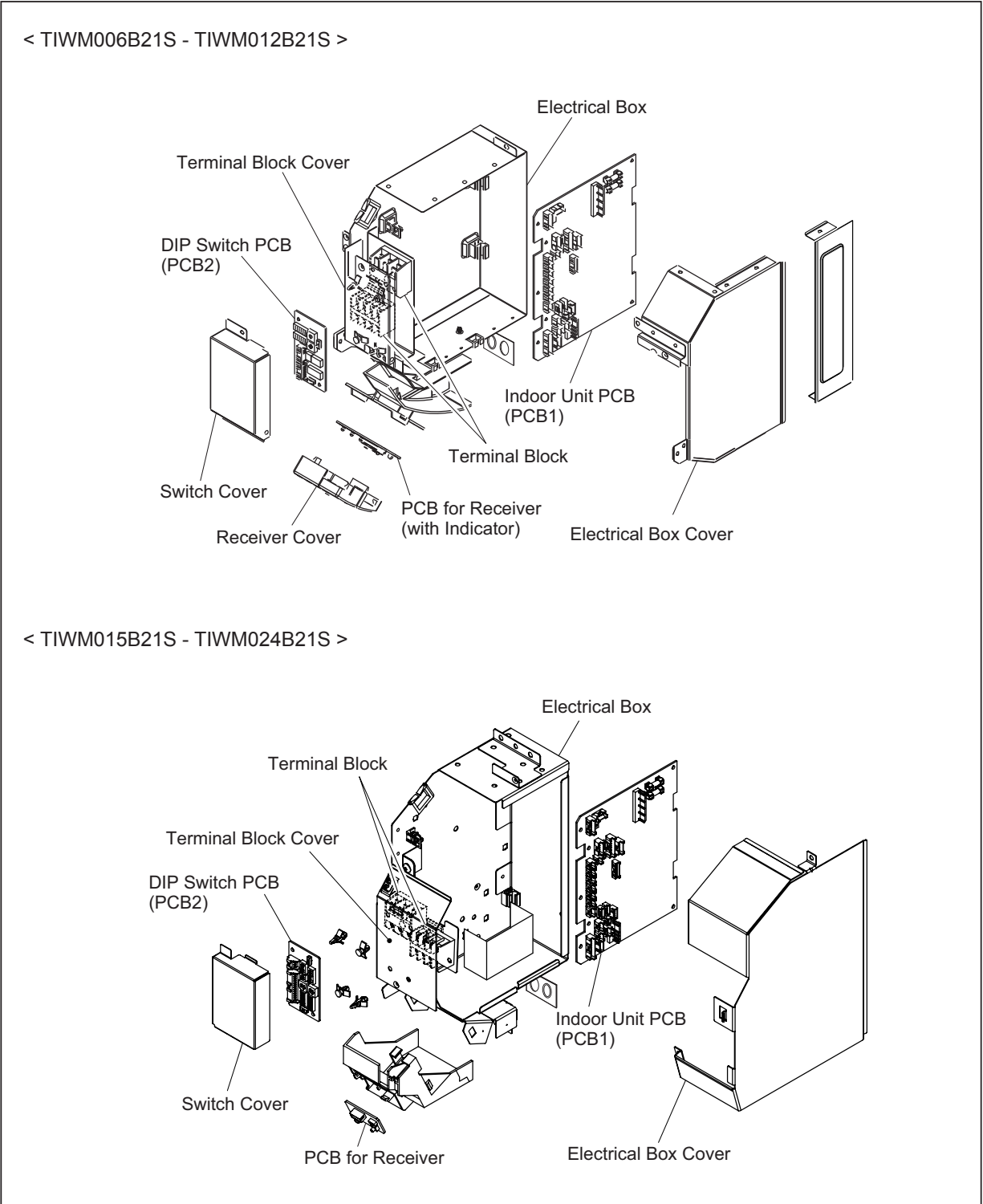


! WARNING

TURN OFF all power source switches.

4.2.6.3 Electrical Box Structure

The electrical box for a wall mount type unit is composed of the following components.



! WARNING

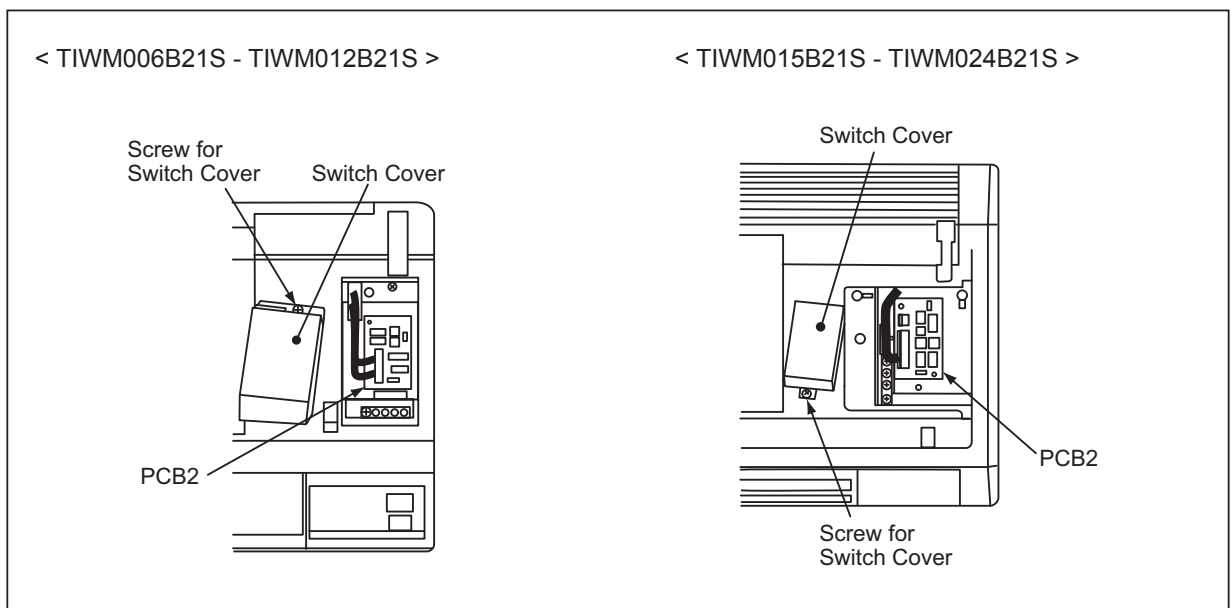
TURN OFF all power source switches.

4.2.6.4 Removing Printed Circuit Board

(1) Replacing DIP Switch PCB (PCB2)

- (a) Remove the flat panel according to Section 4.2.6.2 "Removing Front Panel."
- (b) Remove the screw securing the switch cover to remove it.
- (c) Disconnect the connectors for PCB2.
- (d) Remove the spacers and then the PCB2.
- (e) After the replacement, attach the PCB2 using reverse procedures.

Tool	Phillips Screwdriver, Slotted Screwdriver, Long-nose Pliers
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MAINTENANCE

(Wall Mount Type)

(2) Replacing Control PCB (PCB1)

< TIWM006B21S - TIWM012B21S >

- (a) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box."

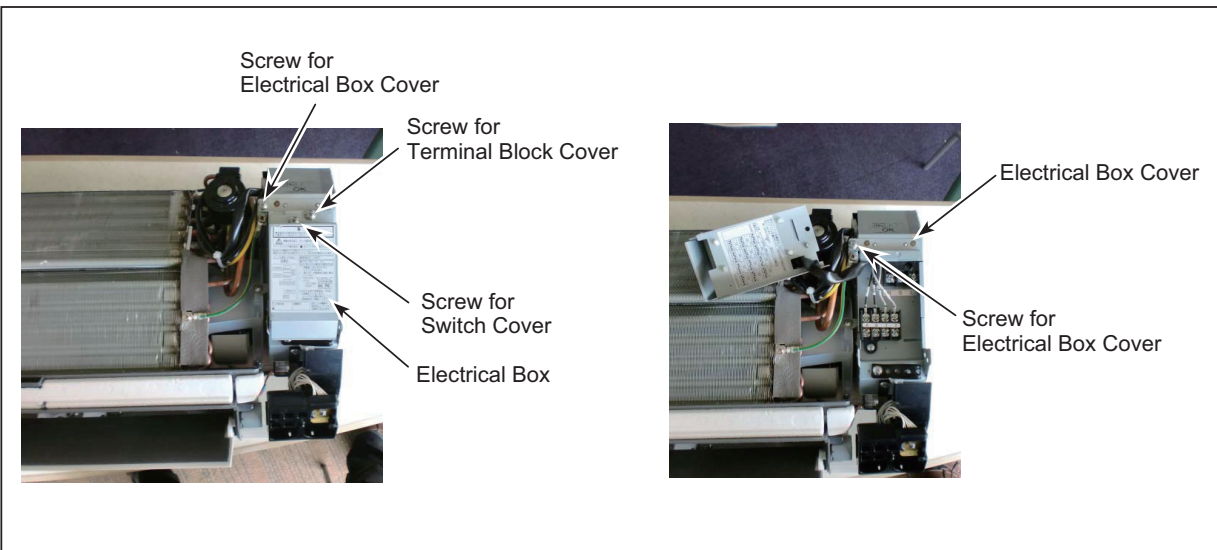
NOTE:

If there is enough service space to the right side of the electrical box, PCB1 can be replaced without removing the electrical box from the unit body.

- (b) Remove the screw securing the terminal block cover to remove it.
(c) Remove the screw securing the electrical box cover located to the right side of the electrical box. Then remove the electrical box cover.
(d) Remove the wirings and connectors on the PCB1 for the freeze protection thermistor, gas pipe thermistor, inlet air thermistor, outlet air thermistor, communication, wired controller, power source, external input/output, auto-louver, PCB for receiver (with indicator), fan motor, and expansion valve coil.

Tool

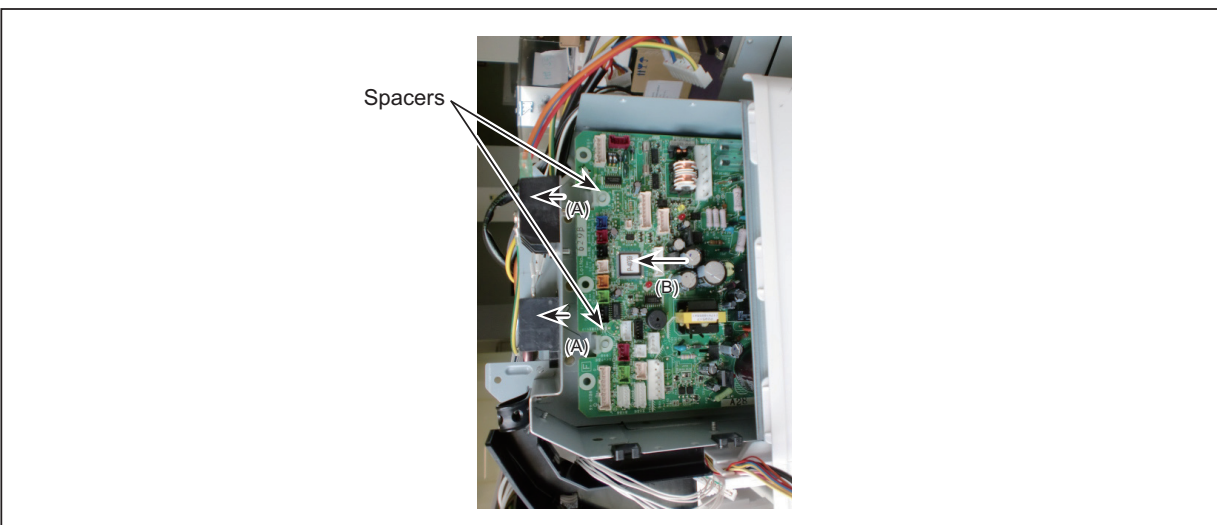
Phillips Screwdriver, Slotted Screwdriver,
Long-nose Pliers



- (e) Remove two spacers in the arrow (A) direction and also remove PCB1 in the arrow (B) direction.
(f) After the replacement, attach them using reverse procedures.

Tool

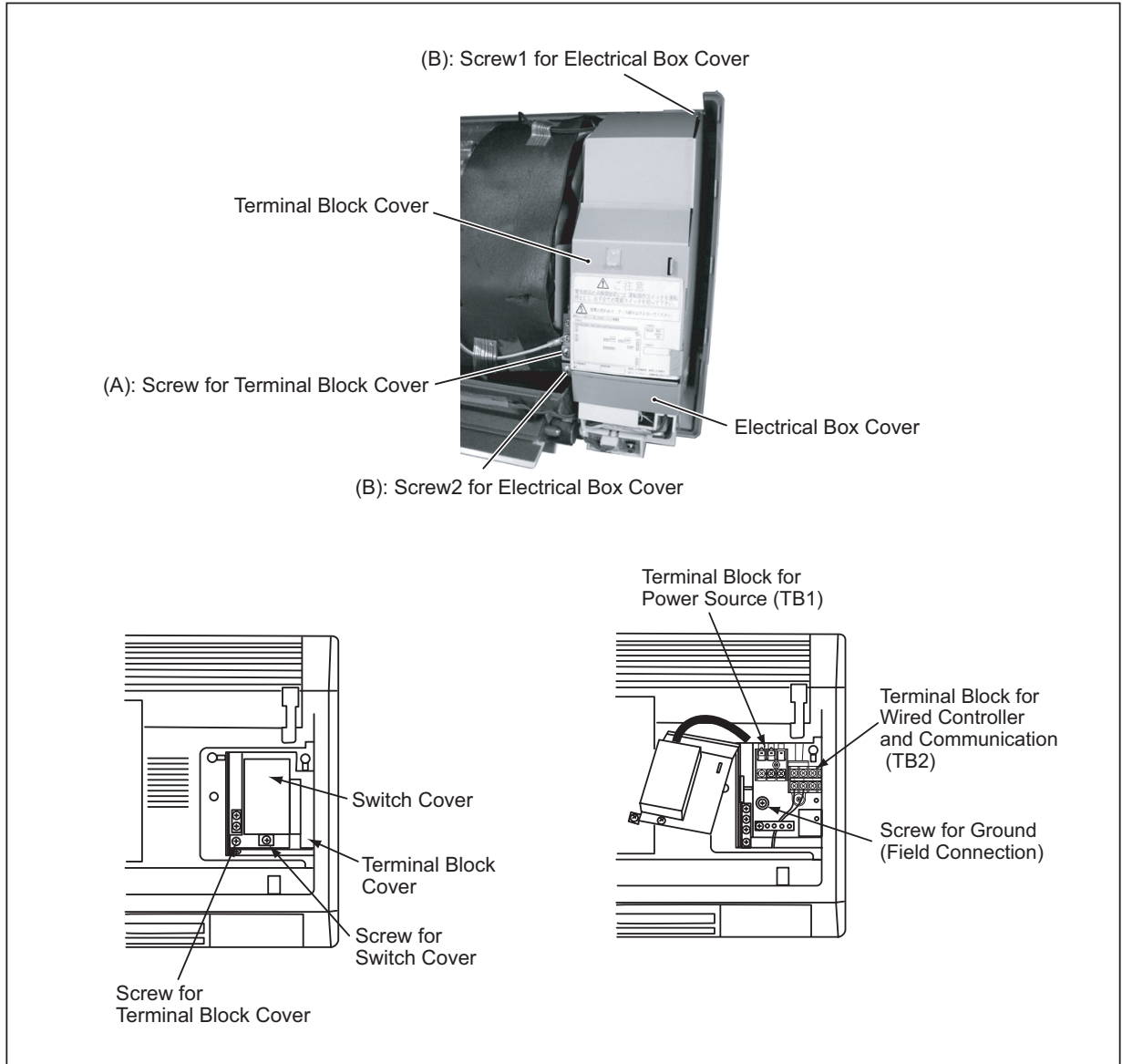
Phillips Screwdriver, Slotted Screwdriver,
Long-nose Pliers



< TIWM015B21S - TIWM024B21S >

- (a) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (b) Remove one screw (A) securing the terminal block cover to remove it. Then, remove two screws (B) securing the electrical box cover to remove it.

Tool	Phillips Screwdriver
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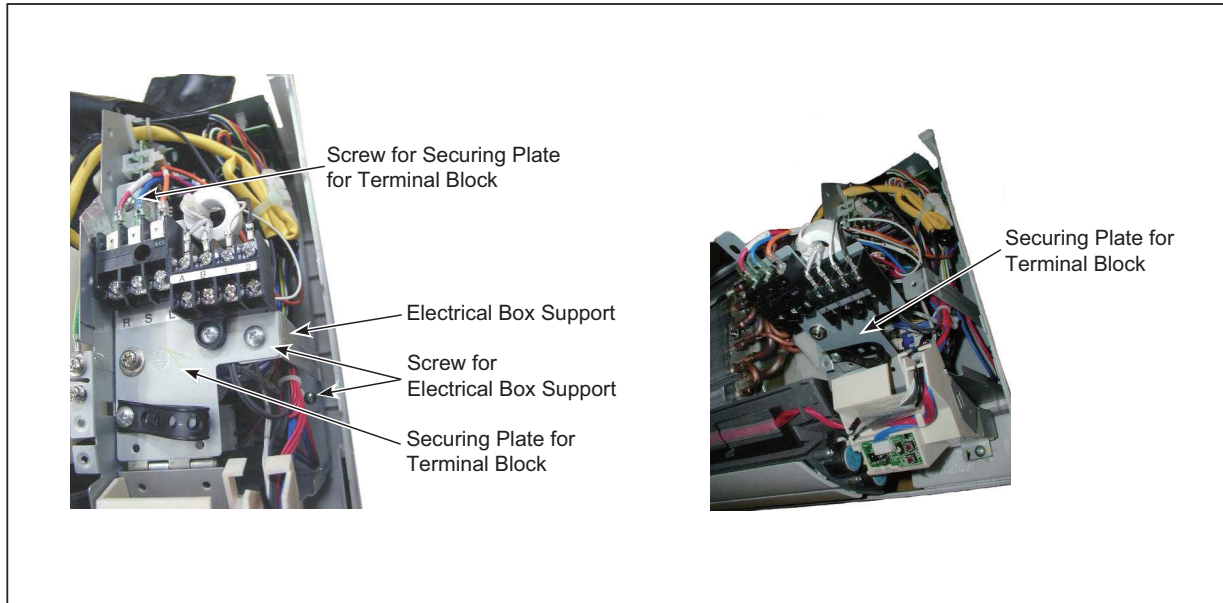


MAINTENANCE

(Wall Mount Type)

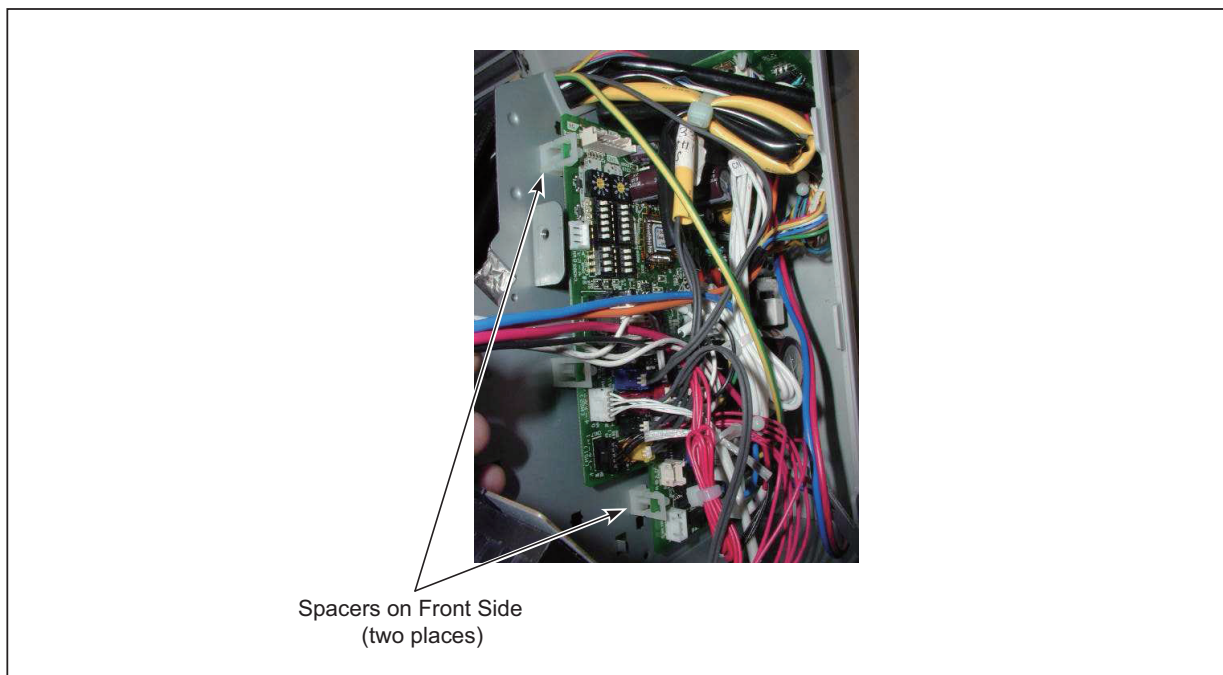
- (c) Remove two screws for the electrical box support to remove it.
- (d) Remove the screw for the securing plate for the terminal block and tilt the board forward.

Tool	Phillips Screwdriver
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- (e) Remove the connectors on PCB1 for freeze protection thermistor, gas pipe thermistor, inlet air thermistor, outlet air thermistor, communication, wired controller, power source, external input/output, auto-louver, PCB for indication, fan motor, PCB for receiver, and expansion valve coil.
- (f) Unhook the spacers (two places) of PCB1 on the front side. Then remove PCB1 from the electrical box.

Tool	Phillips Screwdriver, Long-nose Pliers
------	--



- (g) Insert the new PCB1 for replacement into the grooves of the two spacers on the rear side. Then attach PCB1 to the hooks on the front side to secure it.
- (h) Connect the connectors to the PCB1 and attach the securing plate for the terminal block, the electrical box support, the electrical box cover, and the terminal block cover using reverse procedures.

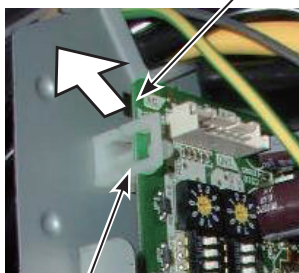
NOTE:

Make sure the wirings do not get caught and all the connectors are connected correctly.

Tool

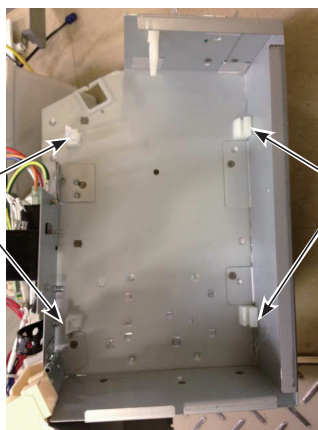
Phillips Screwdriver, Long-nose Pliers

Incline this portion in the direction of the arrow to remove the hooks.



Spacers on Front Side

Spacers on Front Side (two places)



Spacers on Rear Side (two places)

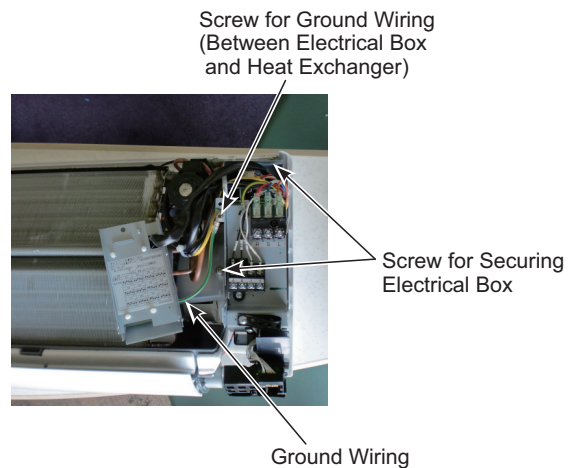
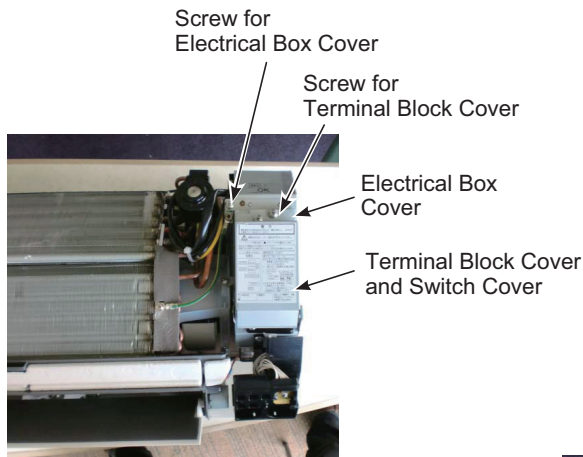
! WARNING**TURN OFF all power source switches.**

4.2.6.5 Removing Electrical Box

< TIWM006B21S - TIWM012B21S >

- (1) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (2) Remove the screw securing the terminal block cover to remove it. Also remove the screw securing the electrical box cover to remove it.
- (3) Then, remove the power source wiring, the communication cable, and the wiring for the wired controller from the terminal block.
- (4) Remove the connectors on PCB1 for the freeze protection thermistor, gas pipe thermistor, inlet air thermistor, outlet thermistor, auto-louver, fan motor and expansion valve coil, and ground wiring.
- (5) Remove the wirings for the freeze protection thermistor, gas pipe thermistor, inlet air thermistor and the expansion valve coil from the wiring outlet at the upper side. Remove the wirings for the outlet air thermistor, auto-louver, and fan motor from the wiring outlet at the lower side.
- (6) Remove two screws securing the electrical box to dismount it from the indoor unit body.

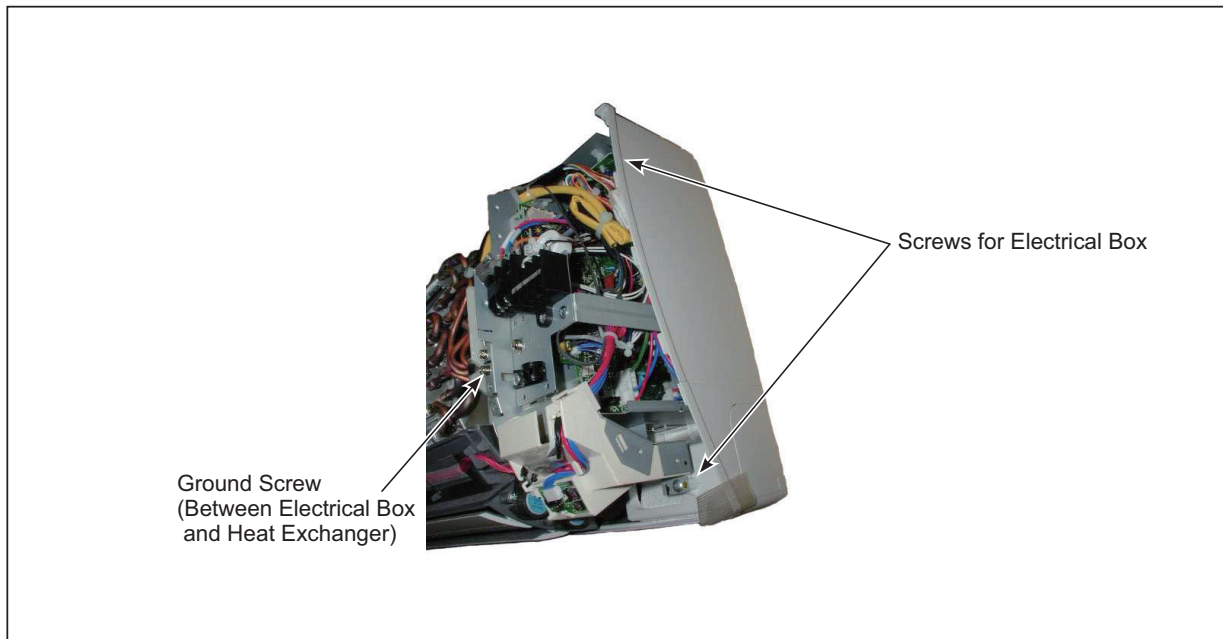
Tool

Phillips Screwdriver, Slotted Screwdriver,
Long-nose Pliers

< TIWM015B21S - TIWM024B21S >

- (1) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (2) Remove the terminal block cover and the electrical box cover according to Section 4.2.6.4 "Removing Printed Circuit Board."
- (3) Then, remove the power source wiring, the communication cable, and the wiring for the wired controller from the terminal block.
- (4) Remove the connectors on the PCB1 for the freeze protection thermistor, gas pipe thermistor, inlet air thermistor, outlet air thermistor, auto-louver, PCB for indication, fan motor, and expansion valve coil.
- (5) Remove the wirings for the freeze protection thermistor, gas pipe thermistor, inlet air thermistor, fan motor and expansion valve coil from the wiring outlet at the upper side. Remove the wirings for the outlet air thermistor, auto-louver, and PCB for indication from the wiring outlet at the lower side.
- (6) Remove two screws securing the electrical box to dismount it from the indoor unit body.
- (7) Remove the ground screw to disconnect the ground wiring between the heat exchanger and the electrical box.
- (8) Before remounting the electrical box, make sure to connect the above disconnected connectors. Then mount the electrical box using reverse procedures.

Tool	Phillips Screwdriver, Slotted Screwdriver
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! WARNING**TURN OFF all power source switches.**

4.2.6.6 Removing AS Motor

< TIWM006B21S - TIWM012B21S >

- (1) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (2) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box."
- (3) Remove two screws securing the AS motor to remove it. Then pull the AS motor outward to remove it from the shaft of the horizontal louver.
- (4) When reattaching the AS motor, insert the shaft of the AS motor into the D-cut portion of the horizontal louver. Then mount the AS motor using reverse procedures.

< TIWM015B21S - TIWM024B21S >

- (1) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (2) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box."
- (3) Remove four screws securing the two AS motors to remove them. Then pull the AS motors outward and remove them from the shaft of the horizontal louver.
- (4) When mounting the AS motors, insert the shafts of the AS motors into the D-cut portions of the horizontal louver. Then mount the AS motors using reverse procedures.

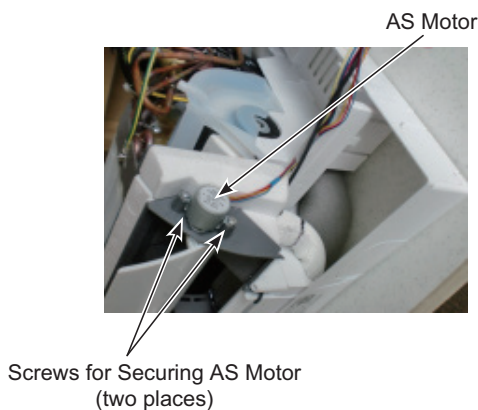
NOTE:

The AS motor with the black cord is for the upper horizontal louver and the AS motor with the white cord is for the lower horizontal louver. Take care not to mount the AS motors in incorrect positions.

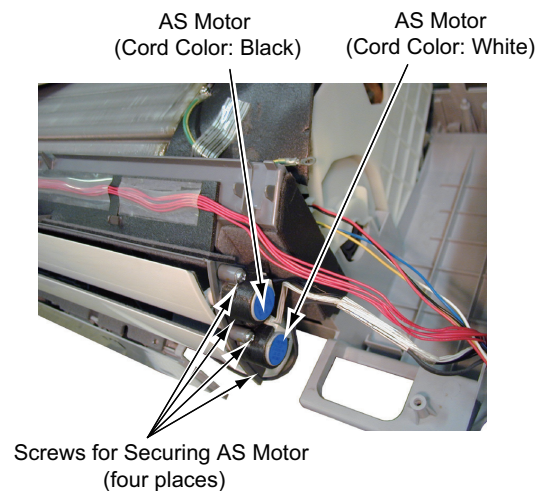
Tool

Phillips Screwdriver

< TIWM006B21S - TIWM012B21S >



< TIWM015B21S - TIWM024B21S >



! WARNING

TURN OFF all power source switches.

4.2.6.7 Removing Drain Pan

Take care when removing the drain pan, as water may have collected in it.

< TIWM006B21S - TIWM012B21S >

Do not remove the horizontal louver. Otherwise, components may be damaged.

- (1) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (2) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box."
- (3) Release the latches securing the drain pan.

TIWM006B21S and TIWM008B21S (3 portions): (A)×1, (B)×1 and (C)×1

TIWM012B21S (4 parts): (A)×2, (B)×1 and (C)×1

Then draw the drain pan in the direction of the arrow in the figure below to remove it.

NOTE:

Before removing the drain pan, check that the drain hose is not attached. If the drain hose is firmly attached, the drain pan cannot be removed.

- (4) When mounting the drain pan, mount it using reverse procedure. Make sure that the latches securing the drain pan, mentioned in procedure (3), are fastened.

Tool	Phillips Screwdriver
------	----------------------

Positions of Securing Latches for Drain Pan
(Example: TIWM012B21S)

Direction for Removing Drain Pan

1. Draw the drain pan forward.
2. Pull the drain pan forward and down.

(A)

Center Pole of Drain Pan
Pull the drain pan forward.
Securing Latch for Drain Pan

(B)

Securing Latch for Drain Pan
Release the latch in the direction of the arrow.

(C)

Securing Latch for Drain Pan
Release the latch in the direction of the arrow.

MAINTENANCE

(Wall Mount Type)

< TIWM015B21S - TIWM024B21S >

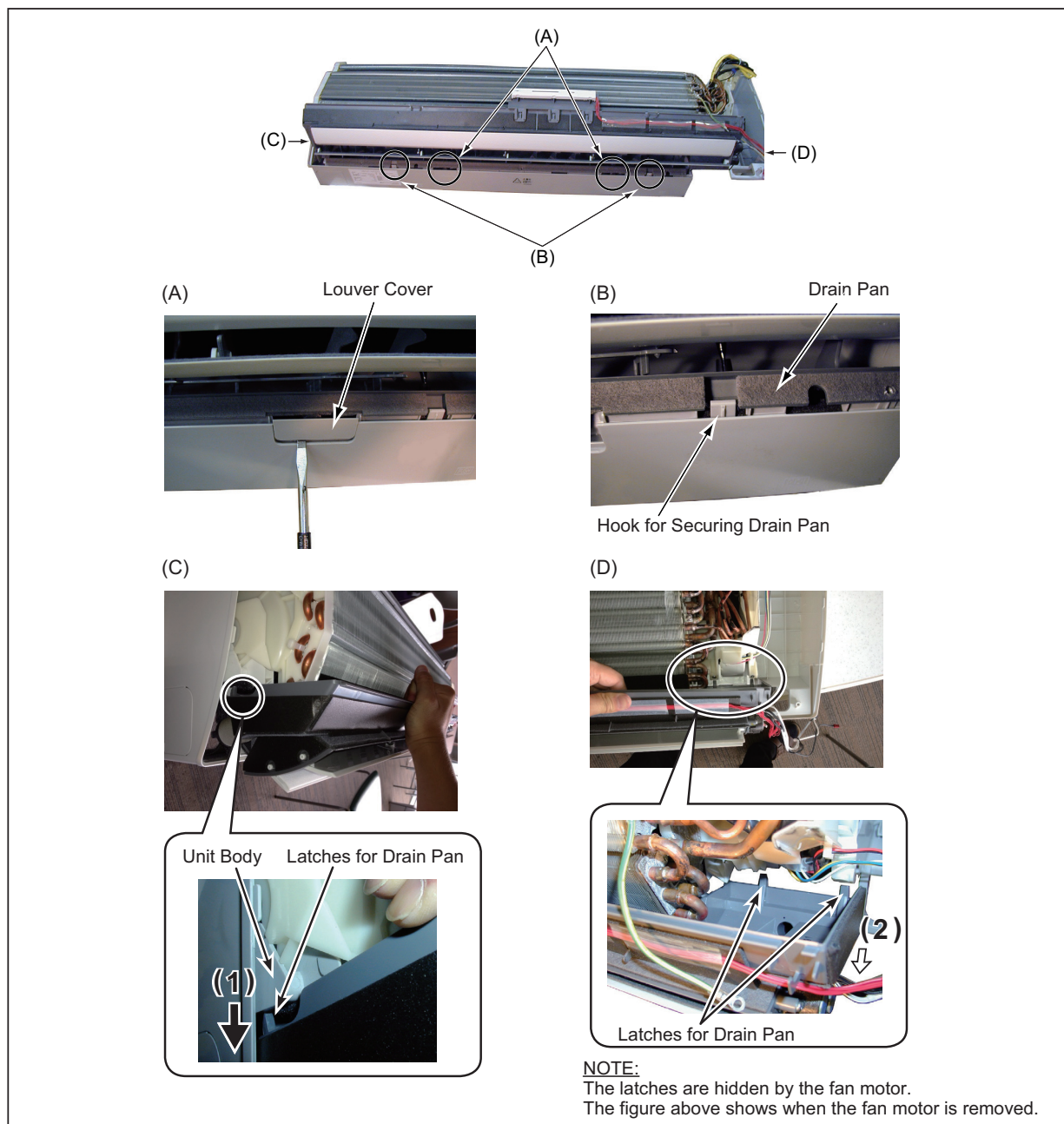
- (1) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (2) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box."
- (3) Remove the louver covers in (A) (two places) attached to the lower part of the cabinet using a slotted screwdriver.
- (4) Remove the two hooks (B) for the drain pan from the unit body.

NOTE:

Before removing the drain pan, check that the drain hose is not attached. If the drain hose is firmly attached, the drain pan cannot be removed.

- (5) Remove three latches at (C) and (D) by following these procedures. Apply force in the arrow (1) direction and release one (1) latch (C) securing the drain pan to the unit body. Then apply force in the arrow (2) direction and release two latches (D). Remove the drain pan.
- (6) When mounting the drain pan, mount it using reverse procedures.

Tool	Phillips Screwdriver, Slotted Screwdriver
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! WARNING

TURN OFF all power source switches.

4.2.6.8 Removing Heat Exchanger

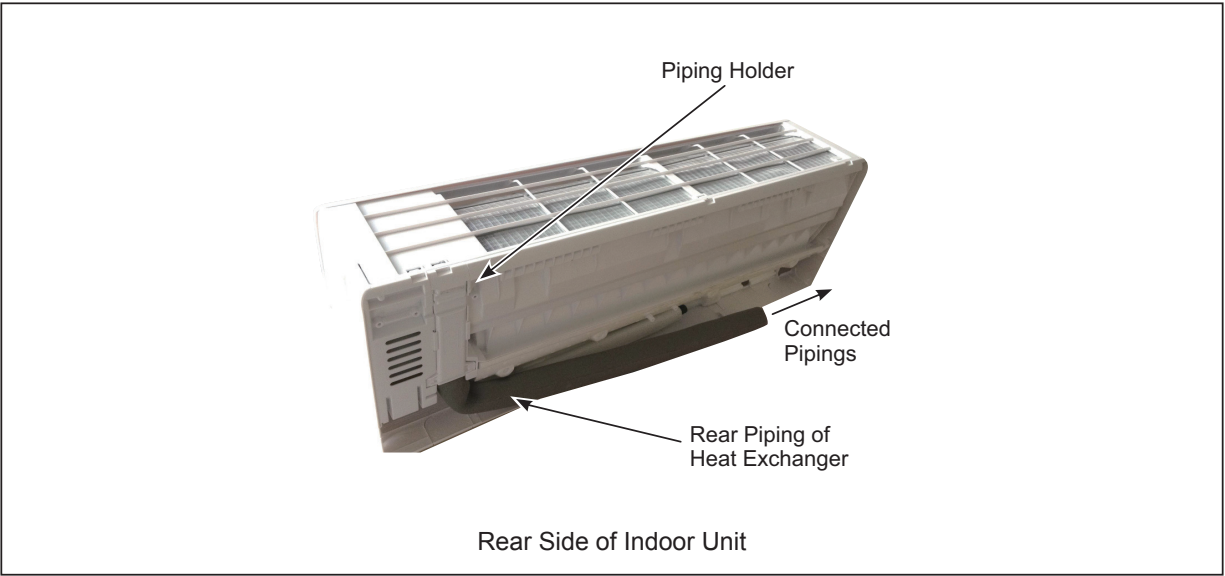
! CAUTION

- Recover the refrigerant from the unit before work. After all the refrigerant is recovered, turn OFF all power source switches.
- Make sure that the unit is not damaged. If there is difficulty in performing the work alone, work should be performed by two people.
- Take special care not to be injured by the heat exchanger fins.

< TIWM006B21S - TIWM012B21S >

- (1) Remove the power supply wiring, the communication cable, and the wiring for the wired controller.
- (2) Push the part indicated by "PUSH" on the underside of the unit to release the latches at the lower part of the unit from the wall mounting plate.
- (3) Remove the flare nuts attached to the rear piping of the heat exchanger to disconnect from the pipings. Then lift the indoor unit up and draw it forward to remove it.
- (4) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (5) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box."
- (6) Remove the drain pan according to Section 4.2.6.7 "Removing Drain Pan."

Tool	Phillips Screwdriver
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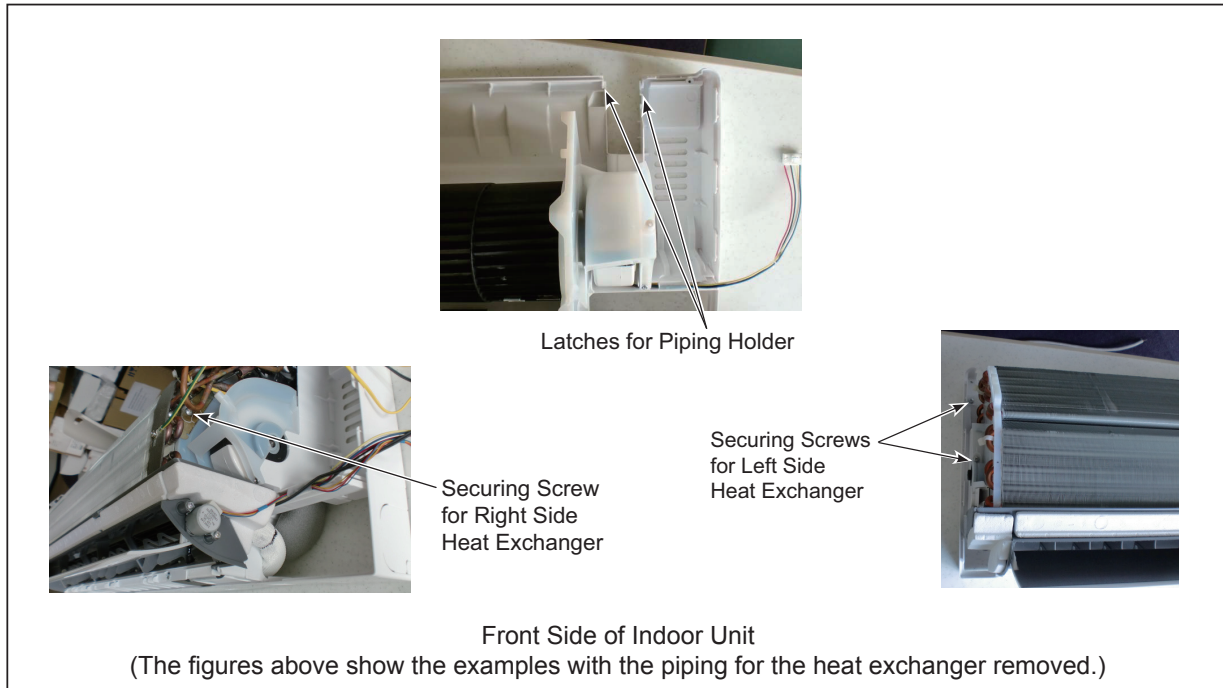


MAINTENANCE

(Wall Mount Type)

- (7) Release two latches on the inner side of the piping holder at the rear side of the unit and remove the piping holder.
- (8) Remove the screw securing the right side of the heat exchanger. Then remove two screws securing the left side of the heat exchanger.

Tool	Phillips Screwdriver
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- (9) Tilt up the rear piping of the heat exchanger at the piping holder approximately 10 degrees in the arrow (A) direction as shown in the figure below.
- (10) Pull out the heat exchanger obliquely upward in the arrow (B) direction. Remove the rear piping from the slotted portion and remove the heat exchanger.

NOTE:

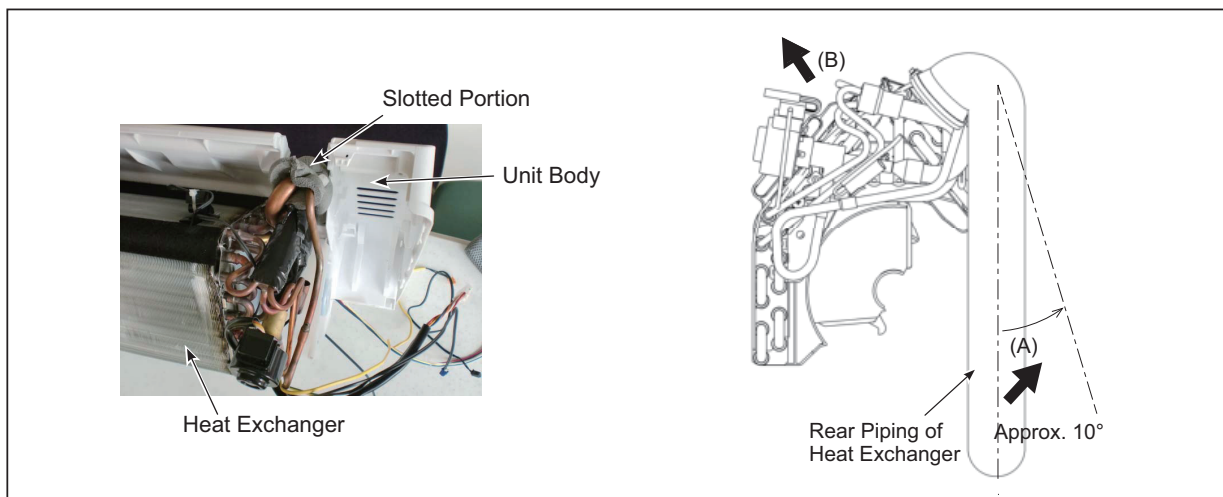
Make sure the heat exchanger and the unit body are not damaged when removing the heat exchanger.

- (11) When mounting the heat exchanger, mount it using reverse procedures.

NOTE:

Before mounting the heat exchanger, check to ensure that there is no clearance between the heat exchanger and the motor clamp in order to prevent condensation to drop.

Tool	Phillips Screwdriver
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< TIWM015B21S - TIWM024B21S >

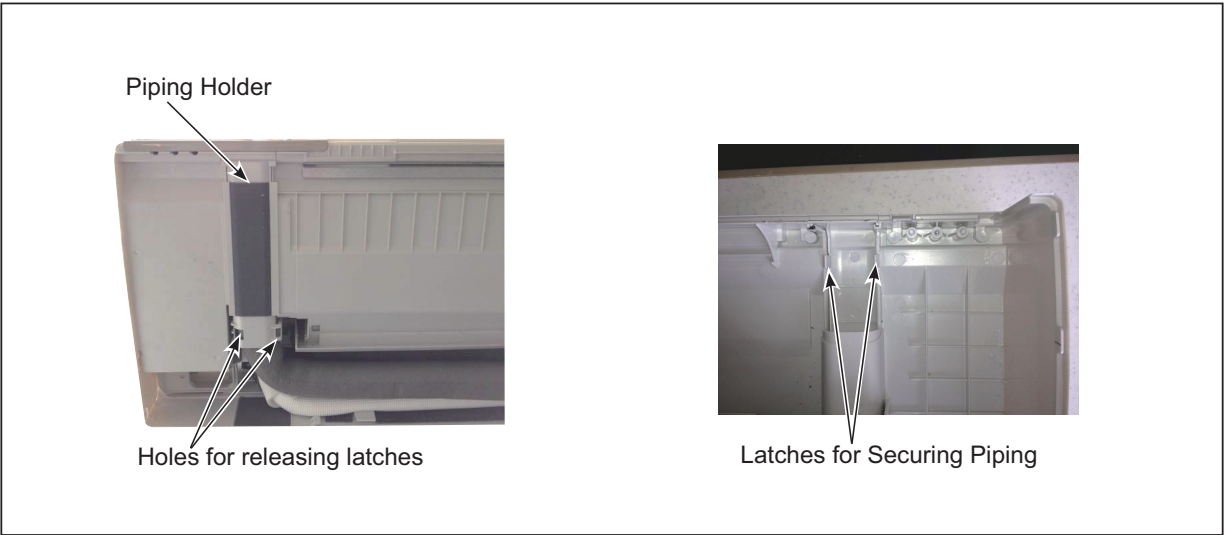
- (1) Remove the power source wiring, the communication cable, and the wiring for the wired controller.
- (2) Push the part indicated by "PUSH" on the underside of the unit to release the latches at the lower part of the unit from the wall mounting plate.
- (3) Remove the flare nuts attached to the rear pipings of the heat exchanger to disconnect from the piping. Then lift the indoor unit up and draw it forward to remove it.
- (4) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (5) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box."
- (6) Remove the drain pan according to Section 4.2.6.7 "Removing Drain Pan."
- (7) Remove three screws securing the support piece attached to the rear side of the indoor unit to remove it.

Tool	Phillips Screwdriver, Slotted Screwdriver
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- (8) Insert a slotted screwdriver into the holes (two places) to release the latches for the piping holder as shown in the figure below.
- (9) Release two latches on the inner side of the piping holder at the rear side of the unit and remove the piping holder.

Tool	Phillips Screwdriver, Slotted Screwdriver
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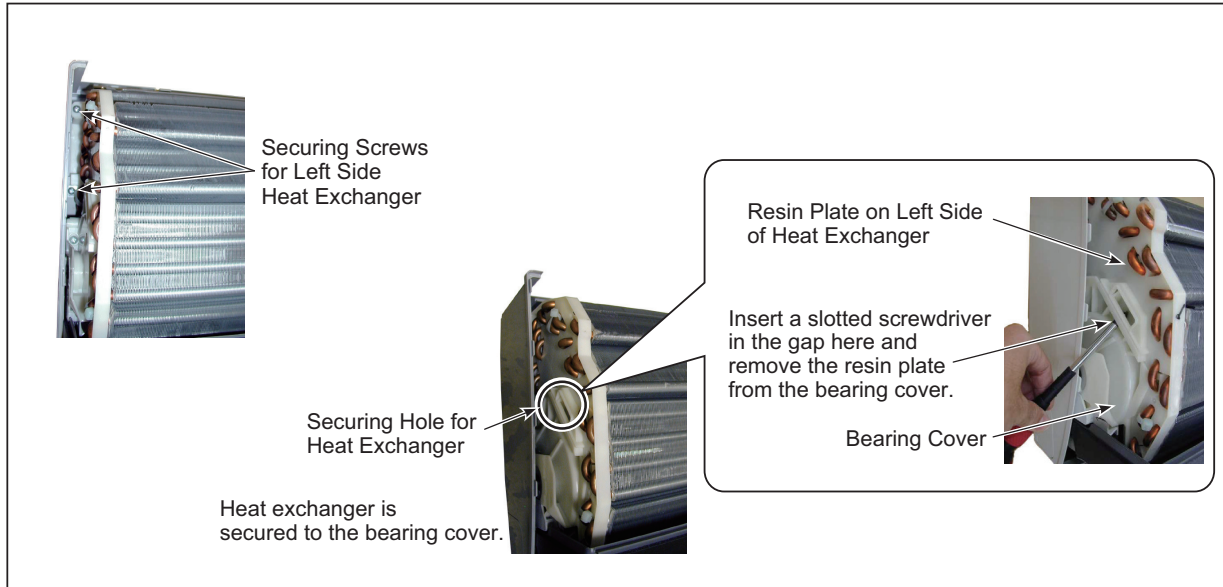


MAINTENANCE

(Wall Mount Type)

- (10) Remove two screws securing the left side of the heat exchanger and remove one hook for the heat exchanger. Then remove the butyl rubber sheet covering the piping between the heat exchanger and the electrical box.
- (11) Remove one screw securing the right side of the heat exchanger.
- (12) Release the resin plate on the left side of the heat exchanger from the bearing cover using a slotted screwdriver.

Tool	Phillips Screwdriver, Slotted Screwdriver
------	---



- (13) Tilt up the rear piping of the heat exchanger at the piping holder approximately 10 degrees in the arrow (A) direction as shown in the figure below.
- (14) Pull out the heat exchanger obliquely upward in the arrow (B) direction. Remove the rear piping from the slotted portion and remove the heat exchanger.

NOTE:

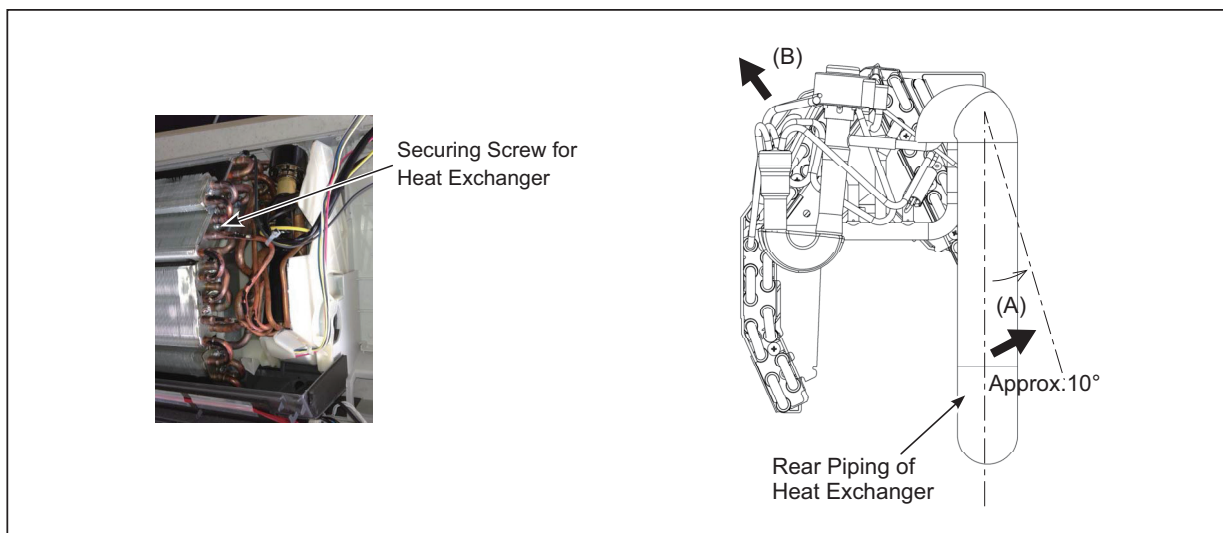
Make sure the heat exchanger and the unit body are not damaged when removing the heat exchanger.

- (15) When mounting the heat exchanger, mount it using reverse procedures.

NOTE:

Before mounting the heat exchanger, check to ensure that there is no clearance between the heat exchanger and the motor clamp in order to prevent condensation to drop.

Tool	Phillips Screwdriver, Slotted Screwdriver
------	---



! WARNING

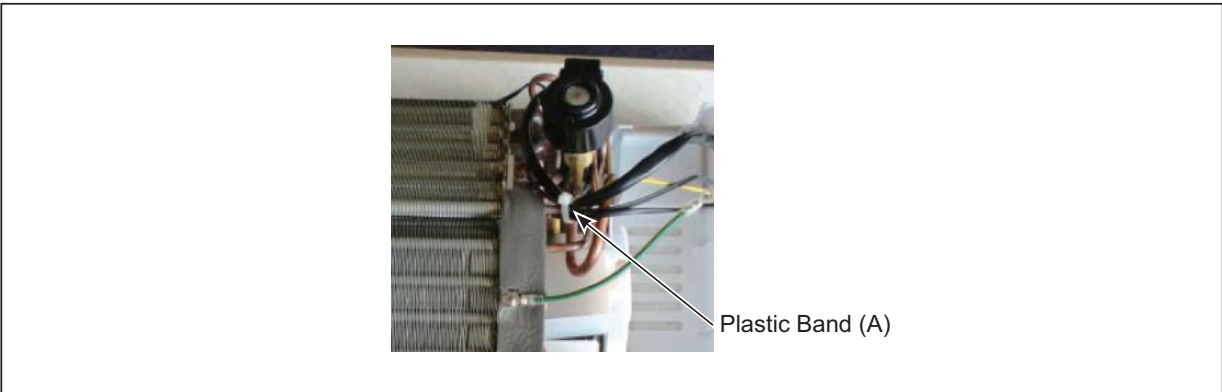
TURN OFF all power source switches.

4.2.6.9 Removing Thermistors for Freeze Protection, Gas Pipe, Outlet Air and Inlet Air

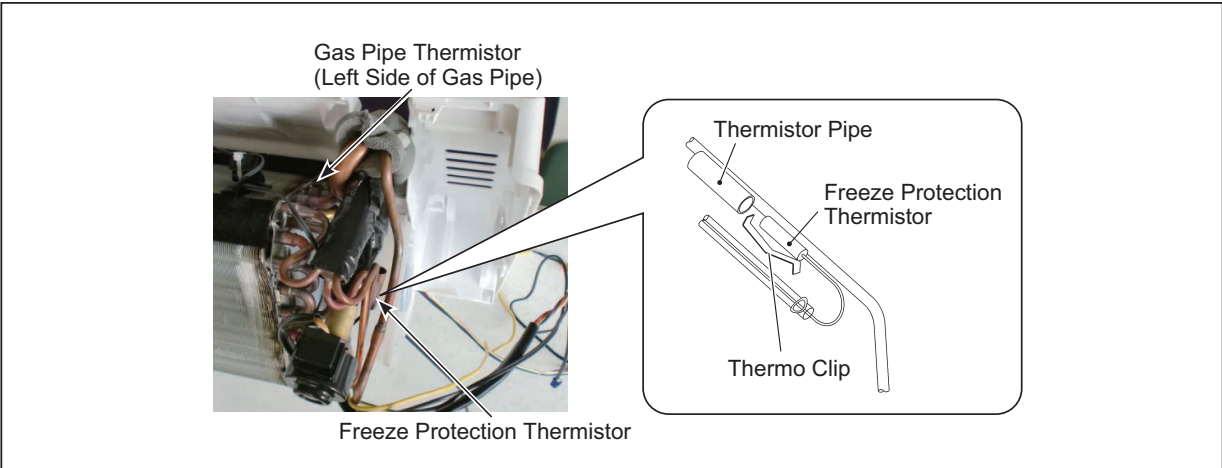
< TIWM006B21S - TIWM012B21S >

- (1) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (2) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box."
- (3) Remove the plastic band (A) that secures each of the thermistors.

Tool	Phillips Screwdriver, Wire Cutter
------	-----------------------------------



- (4) Removing Freeze Protection Thermistor
 - (a) The freeze protection thermistor is secured inside the thermistor pipe, brazed to the liquid pipe, with a thermo clip. Remove the thermistor from the thermo clip.
 - (b) When reinstalling the freeze protection thermistor, attach it using reverse procedures. Insert the thermistor into the thermistor pipe and fix it with the thermo clip.
 - (c) After reinstalling the thermistor, tie the wirings for the expansion valve coil, freeze protection thermistor, gas pipe thermistor, and inlet air thermistor with one plastic band.
- (5) Removing Gas Pipe Thermistor
 - (a) The gas pipe thermistor is secured by the thermistor holder. Remove the thermistor holder from the thermistor. Then, the gas pipe thermistor can be removed.
 - (b) When reattaching the gas pipe thermistor, attach it using reverse procedures. Firmly attach the thermistor to the surface of the piping using the thermistor holder.
 - (c) After reattaching the thermistor, tie the wirings for the expansion valve coil, freeze protection thermistor, gas pipe thermistor, and inlet air thermistor with one plastic band.



MAINTENANCE

(Wall Mount Type)

(6) Removing Inlet Air Thermistor

- (a) The inlet air thermistor is secured with one plastic band (B) to the resin component for securing the thermistor, inserted into the heat exchanger fins. Remove the plastic band to remove the thermistor.
- (b) When reinstalling the inlet air thermistor, attach it to the resin component with the plastic band, using reverse procedures.

Take care during the work so that the thermistor wiring will not come into contact with metal edges of fins or side plates of the heat exchanger.

- (c) After installing the thermistor, tie the wiring for the expansion valve coil, freeze protection thermistor, gas pipe thermistor, and inlet air thermistor with one plastic band.

Tool

Phillips Screwdriver, Wire Cutter

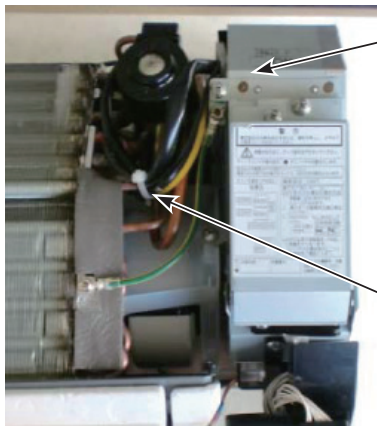
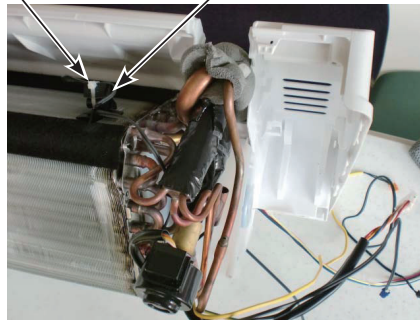
Inlet Air Thermistor

Plastic Band (B)



Plastic Band (B)

Secure the Inlet air thermistor with the plastic band so that the thermistor wire is not loosened.



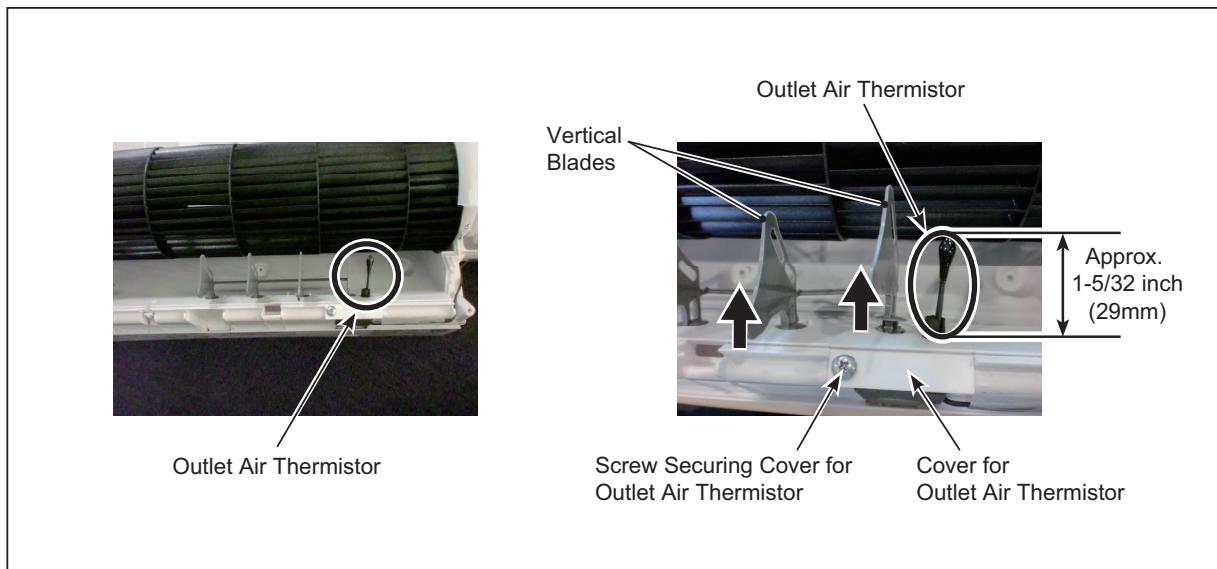
Place the wirings for the thermistors (for inlet air, gas pipe and freeze protection), and the expansion valve coil into the electrical box from the wiring outlet at the upper side.

Secure the wirings for the thermistors (for inlet air, gas pipe and freeze protection), and the expansion valve coil with the plastic band.

(7) Removing Outlet Air Thermistor

- (a) Remove the front panel according to Section 4.2.6.2 “Removing Front Panel.”
- (b) Lift up the front side of the vertical blade in the arrow direction to remove it.
- (c) Remove the screw securing the outlet air thermistor cover to remove it.

Tool	Phillips Screwdriver, Wire Cutter
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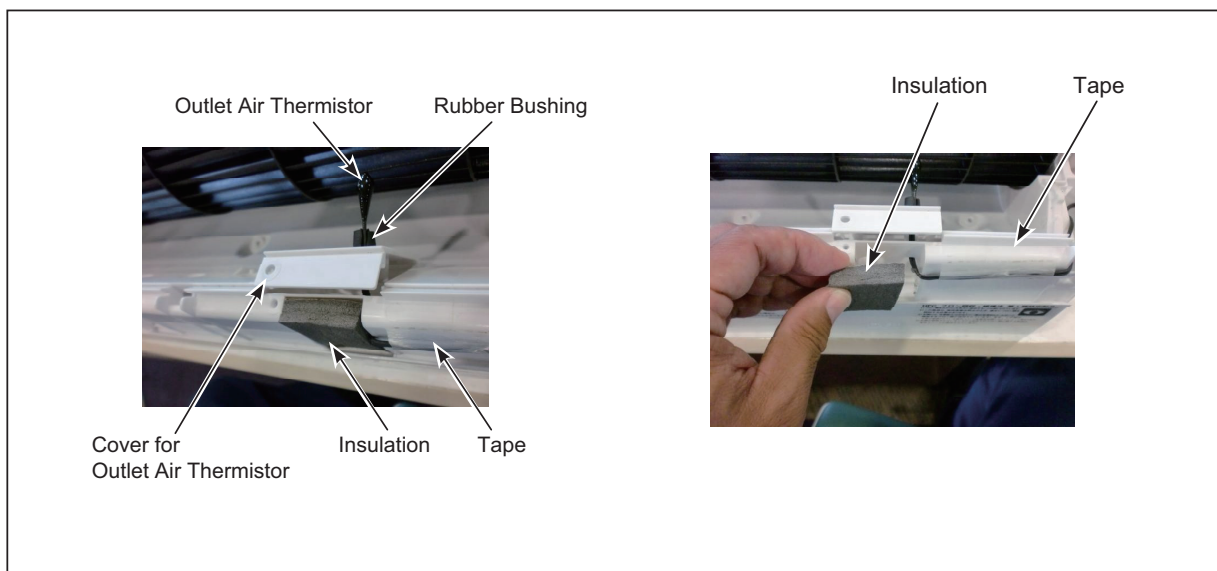


- (d) Remove the insulation, then pull out the rubber bushing to remove the outlet air thermistor.
- (e) Remove the tape securing the thermistor, then remove the thermistor.
- (f) When attaching the outlet air thermistor, attach it using reverse procedures.

NOTES:

1. Make sure the wiring for the thermistor will not get caught in the cover.
2. Make sure there is at least 1-5/32 inch (29mm) from the upper surface of the thermistor cover to the top of the thermistor.

Tool	Phillips Screwdriver, Wire Cutter
------	-----------------------------------



MAINTENANCE

(Wall Mount Type)

< TIWM015B21S - TIWM024B21S >

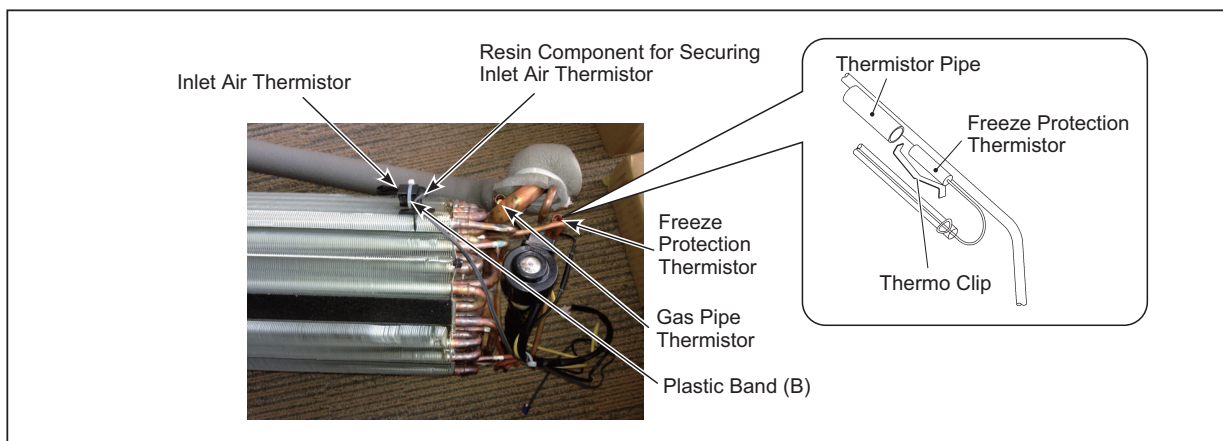
- (1) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel."
- (2) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box."
- (3) Remove the heat exchanger according to Section 4.2.6.8 "Removing Heat Exchanger."
- (4) Remove the plastic band (A) securing each thermistor.

Tool	Phillips Screwdriver, Wire Cutter
------	-----------------------------------



- (5) Removing Freeze Protection Thermistor
 - (a) The freeze protection thermistor is secured inside the thermistor pipe, brazed to the liquid pipe, with a thermo clip. Remove the thermistor from the thermo clip.
 - (b) When reinstalling the freeze protection thermistor, attach it using reverse procedures. Insert the thermistor into the thermistor pipe and secure it with the thermo clip.
 - (c) After reattaching the thermistor, tie the wirings for the expansion valve coil, freeze protection thermistor, gas pipe thermistor, and inlet air thermistor with one plastic band.
- (6) Removing Gas Pipe Thermistor
 - (a) < For TIWM015B21S >
The gas pipe thermistor is secured by the thermistor holder. Remove the thermistor holder from the thermistor. Then, the gas pipe thermistor can be removed.
< For TIWM018B21S and TIWM024B21S >
The gas pipe thermistor is secured inside the thermistor pipe, brazed to the gas pipe, with a thermo clip. Remove the thermistor from the thermo clip. Then, the gas pipe thermistor can be removed.
 - (b) When reattaching the gas pipe thermistor, attach it using reverse procedures.
< For TIWM015B21S >
Firmly attach the thermistor to the surface of the piping using the thermistor holder.
< For TIWM018B21S and TIWM024B21S >
Insert the thermistor into the thermistor pipe and secure it with the thermo clip.
 - (c) After reinstalling the thermistor, tie the wirings for the expansion valve coil, freeze protection thermistor, gas pipe thermistor, and inlet air thermistor with one plastic band.

Tool	Phillips Screwdriver, Wire Cutter
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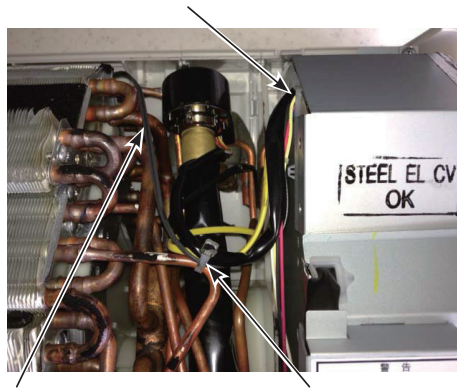


(7) Removing Inlet Air Thermistor

- (a) The inlet air thermistor is secured with one plastic band (B) to the resin component for securing the thermistor, inserted into the sub heat exchanger fins. Remove the plastic band to remove the thermistor.
- (b) When reinstalling the inlet air thermistor, attach it to the resin component with the plastic band, using reverse procedures.
Take care during the work so that the thermistor wiring will not come into contact with metal edges of fins or side plates of the heat exchanger.
- (c) After reinstalling the thermistor, tie the wirings for the expansion valve coil, freeze protection thermistor, gas pipe thermistor and suction air thermistor with one plastic band.

Tool	Phillips Screwdriver, Wire Cutter
------	-----------------------------------

Place the wiring for the thermistors (for inlet air, gas pipe and freeze protection), and the expansion valve coil into the electrical box from the wiring outlet at the upper side.



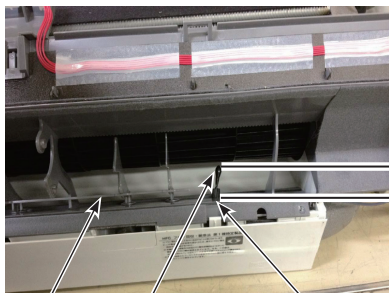
Secure the inlet air thermistor with the plastic band so that the thermistor wire is not loosened.

Secure the wirings for the thermistors (for inlet air, gas pipe and freeze protection), and the expansion valve coil with the plastic band.

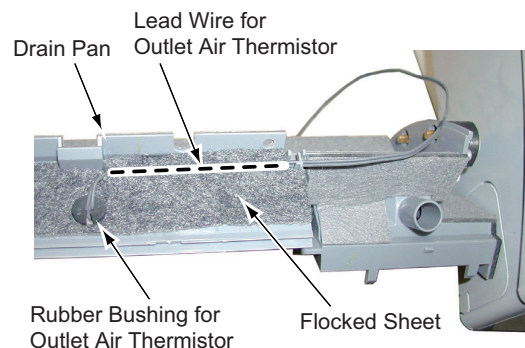
(8) Removing Outlet Air Thermistor

- (a) Remove the drain pan according to Section 4.2.6.7 “Removing Drain Pan.”
- (b) Remove the rubber bushing and the flocked sheet securing the outlet air thermistor from the back side of the drain pan. Then pull out the rubber bushing from the drain pan.
- (c) When reattaching the outlet air thermistor, attach the rubber bushing and secure the thermistor with the flocked sheet using reverse procedures.

Tool	Phillips Screwdriver, Wire Cutter
------	-----------------------------------



Drain Pan Outlet Air Thermistor Rubber Bushing for Outlet Air Thermistor



Make sure there is approx. 1-5/32 inch (29mm) from the drain pan to the top of the thermistor.

MAINTENANCE

(Wall Mount Type)

! WARNING

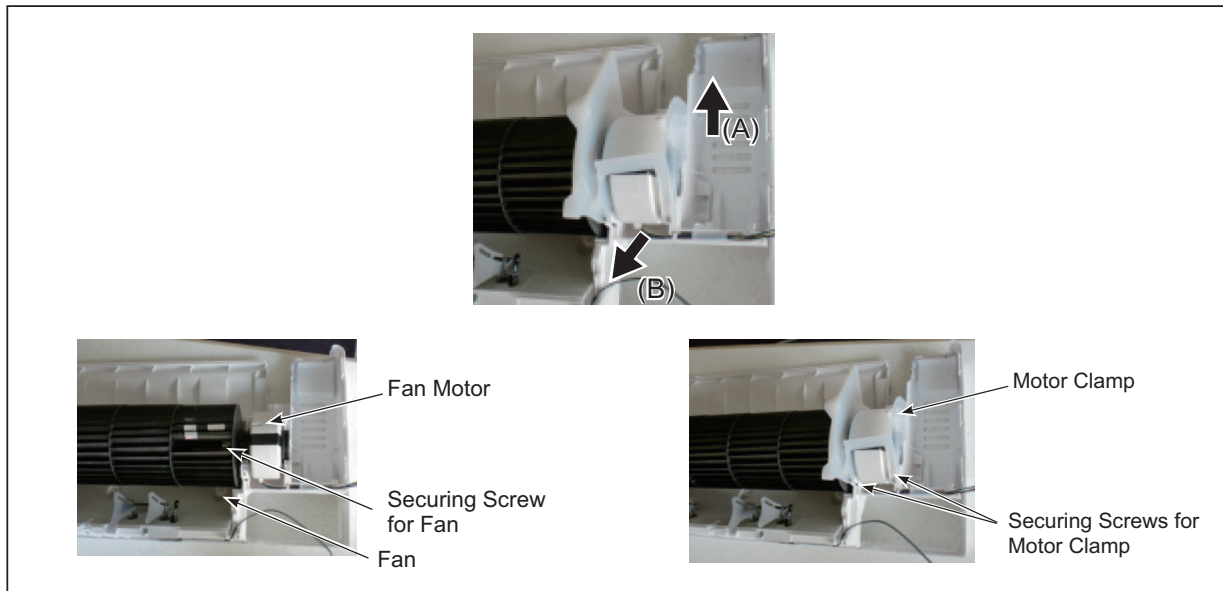
TURN OFF all power source switches.

4.2.6.10 Removing Fan and Fan Motor

< TIWM006B21S - TIWM012B21S >

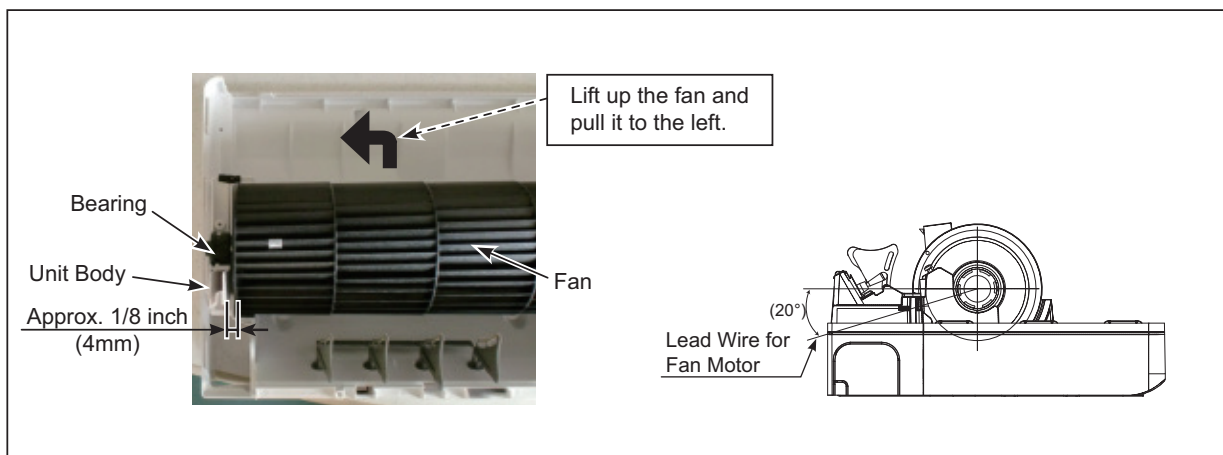
- (1) Remove the heat exchanger according to Section 4.2.6.8 "Removing Heat Exchanger."
- (2) Remove two screws securing the motor clamp to remove it. By lifting up the motor clamp in the arrow (A) direction, pull it out in the arrow (B) direction.
- (3) Then loosen one screw that secures the fan and the motor shaft.

Tool	Phillips Screwdriver, Slotted Screwdriver
------	---



- (4) Hold the fan and lift up the bearing side slightly. Then pull out the fan in the arrow direction to remove the fan from the motor as shown in the figure below.
- (5) When installing the fan motor and fan, install them using reverse procedures. There should be approximately 1/8 inch (4mm) clearance between the left side of the fan and the unit body.
- (6) The lead wire for the fan motor should be pulled out as shown in the figure below.

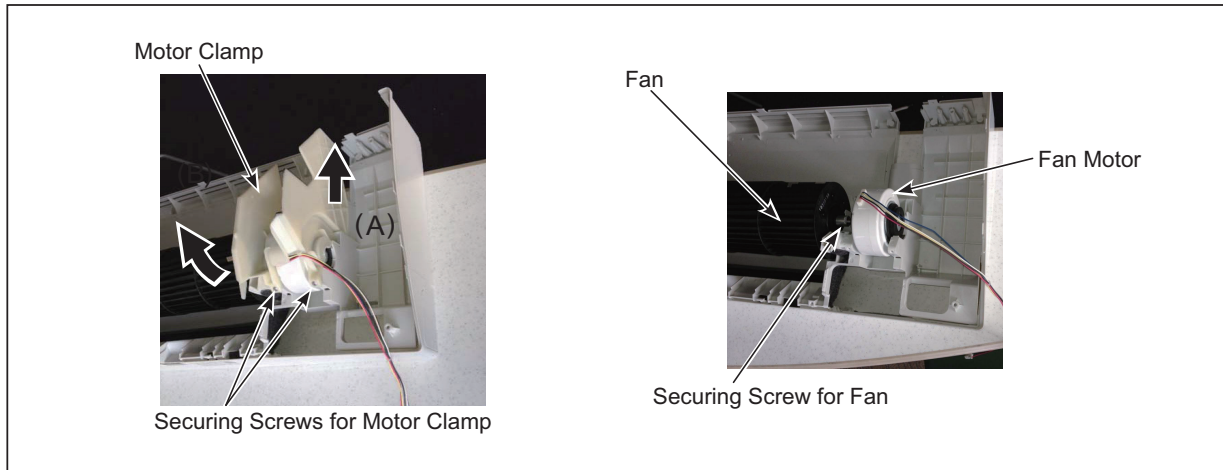
Tool	Phillips Screwdriver, Slotted Screwdriver
------	---



< TIWM015B21S - TIWM024B21S >

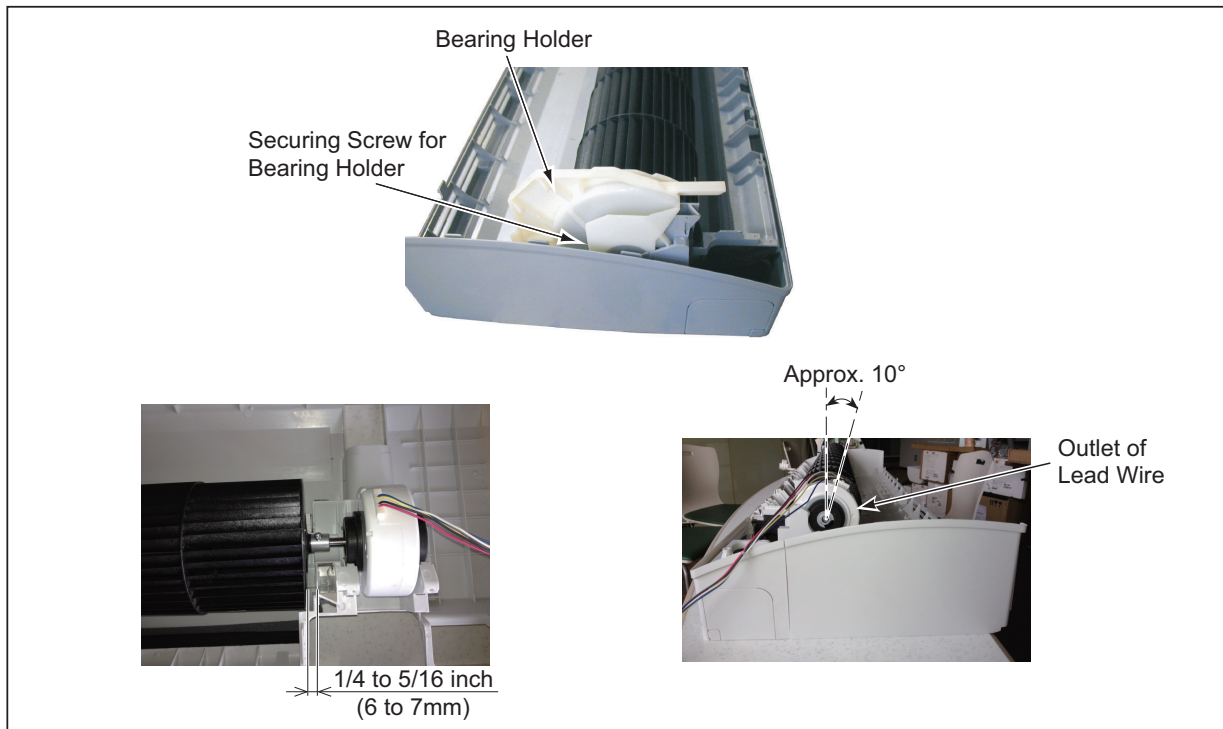
- (1) Remove the heat exchanger according to Section 4.2.6.8 "Removing Heat Exchanger."
- (2) Remove two screws securing the motor clamp. By lifting up the motor clamp in the arrow (A) direction, pull it out in the arrow (B) direction.
- (3) Then loosen one screw securing the fan and the motor shaft.

Tool	Phillips Screwdriver, Slotted Screwdriver
------	---



- (4) Remove one screw securing the bearing holder to remove it.
- (5) Hold the fan and lift up the bearing side slightly. Then pull out the fan to the left to remove it from the motor.
- (6) When installing the fan motor and fan, install them using reverse procedures. There should be 1/4 to 5/16 inch (6 to 7mm) clearance between the right side of the fan and the unit body.
- (7) The lead wire for the fan motor should be pulled out in the direction of the outlet of the lead wire and the unit body.

Tool	Phillips Screwdriver, Slotted Screwdriver
------	---



! WARNING

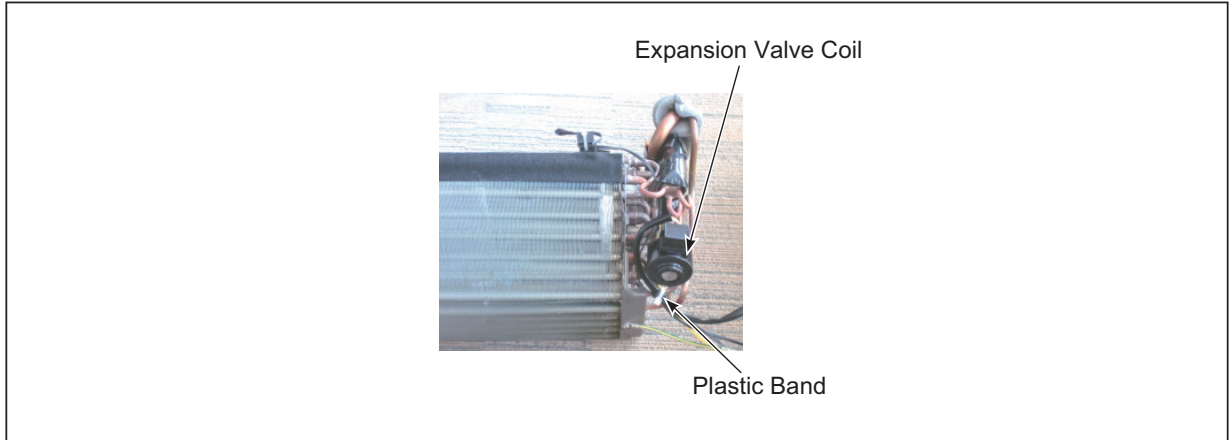
TURN OFF all power source switches.

4.2.6.11 Removing Expansion Valve Coil

< TIWM006B21S - TIWM012B21S >

- (1) Remove the plastic band that ties the wiring for the expansion valve coil.

Tool	Phillips Screwdriver
------	----------------------



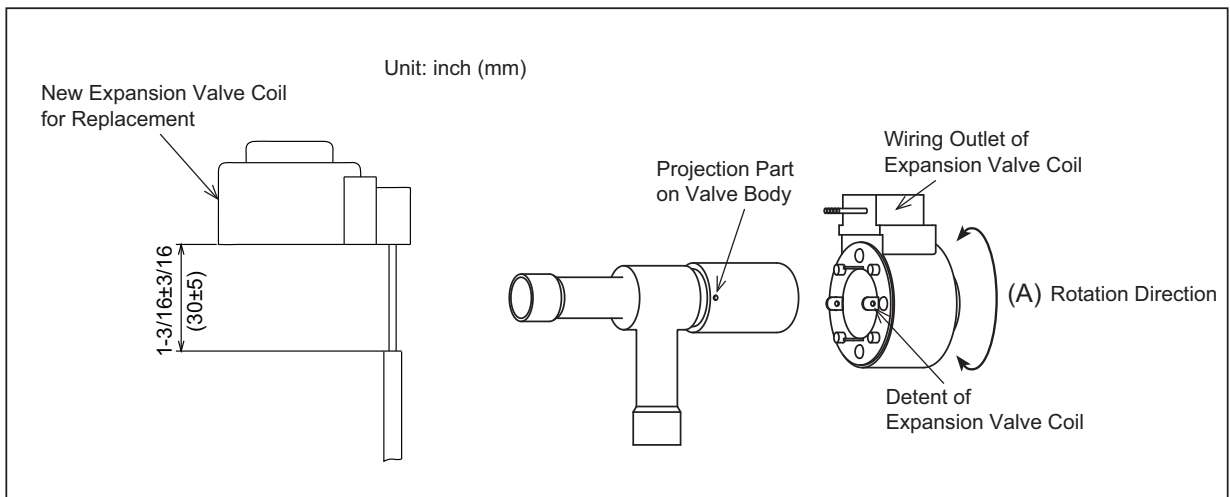
- (2) Remove the detents of the expansion valve coil from the projection parts of the valve body by rotating the valve coil in the arrow (A) direction shown in the figure below. Pull the valve coil forward to remove it. At this time, take care not to twist the pipes.
- (3) Insert the new expansion valve coil for replacement into the expansion valve body. When inserting the valve coil, secure the projection parts into the detents with the wiring outlet facing up.

NOTE:

The detents are located 90° apart in a circle and the projections are located 180° apart in a circle. Make sure to fit the projection parts into the detents. If the valve coil is inserted incorrectly, it may cause malfunction of the expansion valve coil.

- (4) After the work, tie the wirings for the expansion valve coil, the freeze protection thermistor, gas pipe thermistor, and inlet air thermistor with one plastic band.

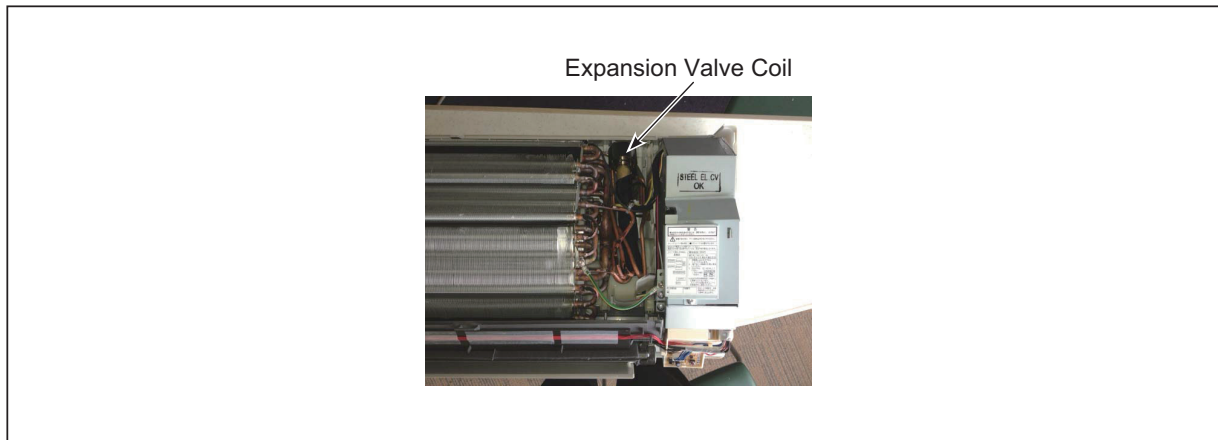
Tool	Phillips Screwdriver
------	----------------------



< TIWM015B21S - TIWM024B21S >

- (1) The piping of the heat exchanger, the expansion valve, and the inlet/outlet piping of the expansion valve are protected by butyl rubber sheets. Remove the butyl rubber sheets covering the piping, the expansion valve coil, and the expansion valve body.

Tool	Phillips Screwdriver
------	----------------------



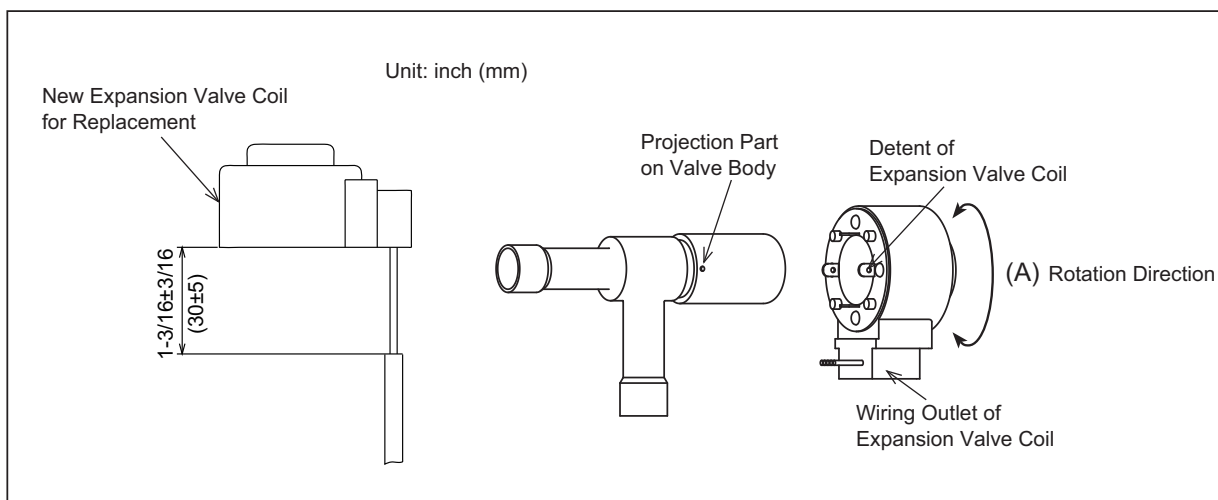
- (2) Remove the detents of the expansion valve coil from the projection parts of the valve body by rotating the valve coil in the arrow (A) direction shown in the figure below. Pull up the valve coil to remove it. At this time, take care not to twist the pipes.
- (3) Insert the new expansion valve coil for replacement into the expansion valve body. When inserting the valve coil, fix the projection parts into the detents with the wiring outlet facing down.

NOTE:

The detents are located 90° apart in a circle and the projections are located 180° apart in a circle. Make sure to fit the projection parts into the detents. If the valve coil is inserted incorrectly, it may cause malfunction of the expansion valve coil.

- (4) After the work, protect the expansion valve coil with butyl rubber sheets and install the heat exchanger using reverse procedures.

Tool	Phillips Screwdriver
------	----------------------



! WARNING**TURN OFF all power source switches.**

4.2.6.12 Removing Horizontal Louver

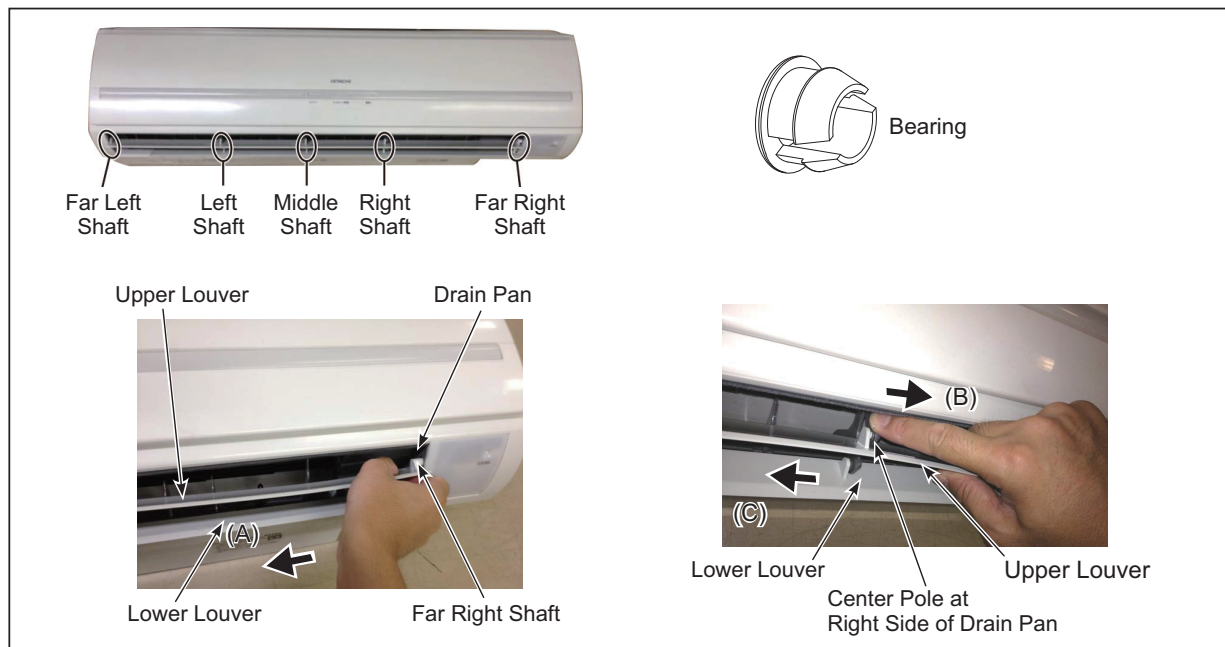
< TIWM006B21S - TIWM012B21S >

Do not remove only the horizontal louver. Otherwise, it may lead to component failure. Replace the entire drain pan.

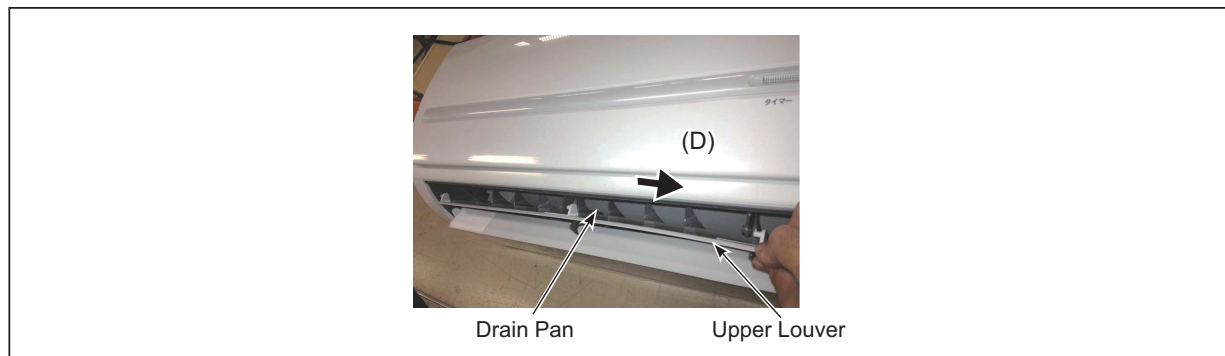
< TIWM015B21S - TIWM024B21S >

Do not lose the bearings for the shafts at the right, middle, left and far left.

- (1) Open the upper and lower horizontal louvers slightly.
- (2) Slightly bend the upper horizontal louver and pull it in the arrow (A) direction to remove the far right shaft from the drain pan.
- (3) By slightly bending the center pole at the right side of the drain pan in the arrow (B) direction, pull the upper horizontal louver in the arrow (C) direction to remove the right shaft from the drain pan.



- (4) Pull out the upper horizontal louver in the arrow (D) direction to remove it.



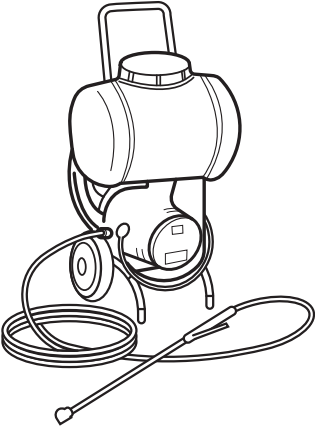
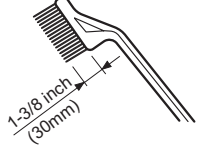
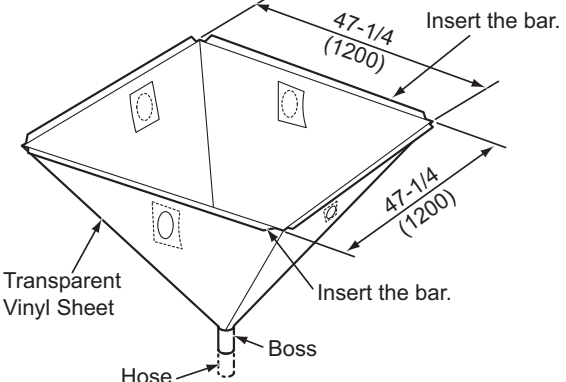
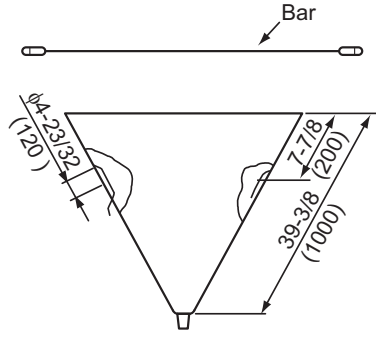
- (5) Remove the lower horizontal louver using the same procedures as the upper horizontal louver.
- (6) When reinstalling the horizontal louvers, install the louvers using reverse procedures.

NOTE:

When installing the horizontal louvers, insert the D-cut portions at the far right shafts of the louvers into the AS motor shafts.

4.2.7 Cleaning Indoor Unit Heat Exchanger

4.2.7.1 Required Tools for Cleaning (for All Indoor Units)

No.	Remark	No.	Tool	Remark
1	Cleaning Water Pump A water pump equipped with a tank is recommended. 	2	Water Tank Clean Water	Approx. 18 liters
		3	Nozzle	Attached with Water Pump
		4	Brush (non-metal)	If the heat exchanger is heavily clogged with dust, remove it with this brush. The length of brush should be 1 to 1-3/8 inch (25 to 35mm). 
		5	Hose for Drain Pan	Select a hose according to site requirements.
		6	Bucket	Approx. 5 liters (Qty: 2)
		7	Phillips Screwdriver	Qty: 1
		8	Nipper	Qty: 1
		9	Adjustable Wrench	Qty: 1
		10	Megohm Tester	500V
		11	Cleaning Agent	Select a neutral type cleaning agent.
		12	Spray	To spray cleaning water.
		13	Adhesive Tape	To tape the vinyl sheet to protect the room from cleaning water.
		14	Rope	3 ft 7 in. (1m), four pieces
		15	Vinyl Sheet	Select a vinyl sheet with 1/6 inch (0.5mm) thickness.
		16	Gloves	
		17	Cleaning Water Collector or Equivalent	<div style="text-align: right;">Unit: inch (mm)</div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>Example:</p>  </div> <div style="text-align: center;">  <p>Inner Side of $\phi 4-23/32$ (120) hole should be covered with felt sheet to insert the spray nozzle.</p> </div> </div>

MAINTENANCE

(Cleaning Indoor Unit Heat Exchanger)

! WARNING**TURN OFF all power source switches.**

4.2.7.2 4-Way Cassette Model

Spread a vinyl sheet over the floor to protect property from cleaning water before performing this work.

No.	Procedure	Tool
1	Remove the optional decorative panel according to Section 4.2.4.3 "Removing Optional Decorative Panel".	Phillips Screwdriver
2	Remove the electrical box after opening the electrical box cover and disconnecting the connectors between the indoor and outdoor units and other connectors according to Section 4.2.4.2 "Removing Electrical Box Cover".	Phillips Screwdriver
3	Remove the bell-mouth and fan according to Section 4.2.4.4 "Removing Turbo Fan and Fan Motor".	Phillips Screwdriver Adjustable Wrench
4	Remove the drain pan according to Section 4.2.4.6 "Removing Drain Pan".	Phillips Screwdriver
5	Remove the float switch according to Section 4.2.4.9 "Removing Float Switch".	Phillips Screwdriver
6	Remove the drain-up mechanism according to Section 4.2.4.8 "Removing Drain-Up Mechanism".	Phillips Screwdriver

NOTES:

Remove the drain pan after removing drain water from the drain pan.

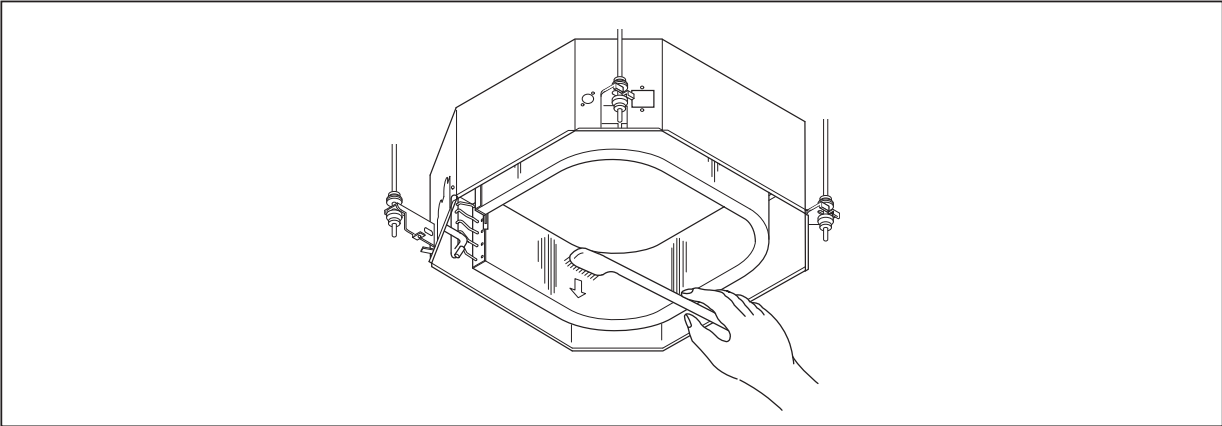
1. Remove water from the drain pan after pulling out the rubber plug. Check to ensure that water flows smoothly through the hole by poking it with a pencil.
2. Insert the rubber plug into the hole after the above check.
3. Remove the drain pan after removing the four securing screws. Carefully remove the drain pan since water may remain at the bottom of the drain pan.
4. Clean and dry the drain pan after removing it. Carefully handle the drain pan so as not to damage it.

! WARNING

TURN OFF all power source switches.

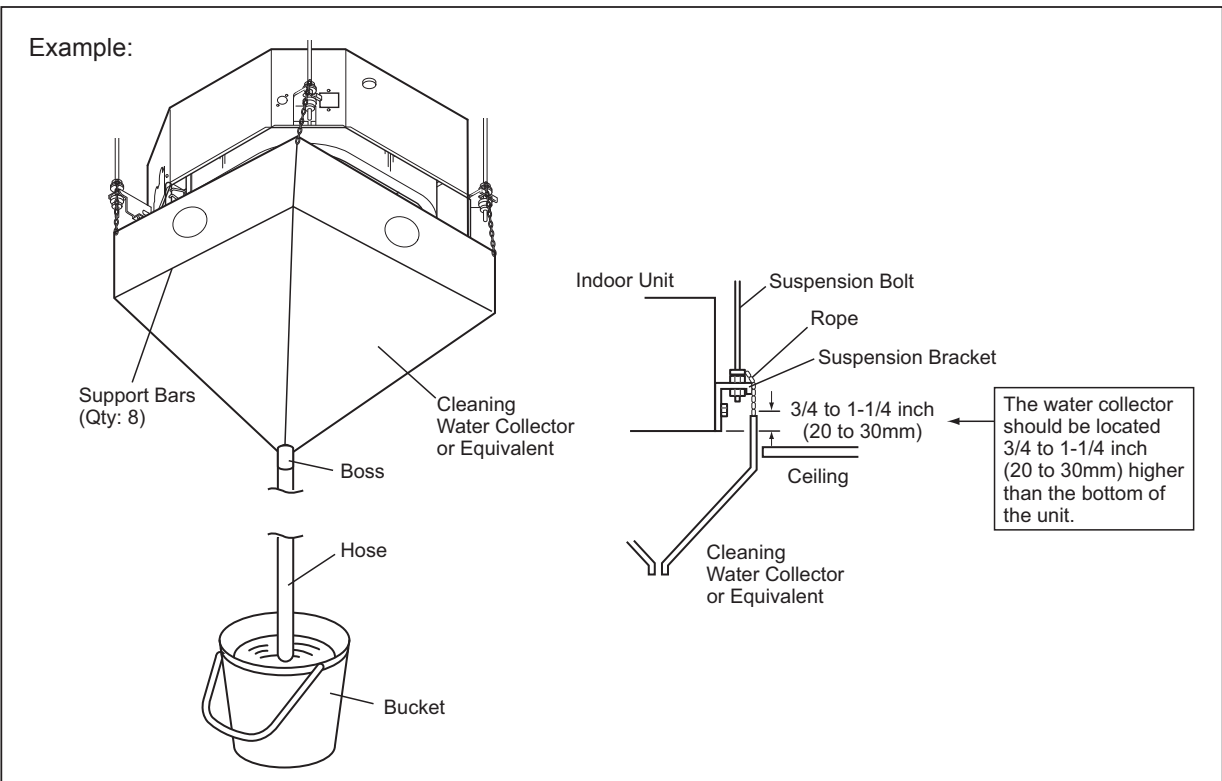
- (1) Brush off the dust on the inner surface of the heat exchanger in a downward motion using a brush. Collect all dust in a bucket or cardboard box.

Tool	Brush, Bucket (or Cardboard Box)
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- (2) Attach a vinyl sheet by using adhesive tape around the heat exchanger so that cleaning water will not be splashed over the insulation surface and drain pump. Seal the gap between vinyl sheets using adhesive tape.
- (3) Attach ropes to each suspension bracket.
- (4) Put the bars through the holes of the cleaning water collector.
- (5) Attach the ropes to the four bars of the cleaning water collector and suspend the cleaning water collector as shown in the figure below.
- (6) Connect a hose to the boss and put the end of the hose in a bucket.

Tool	Knife, Bucket
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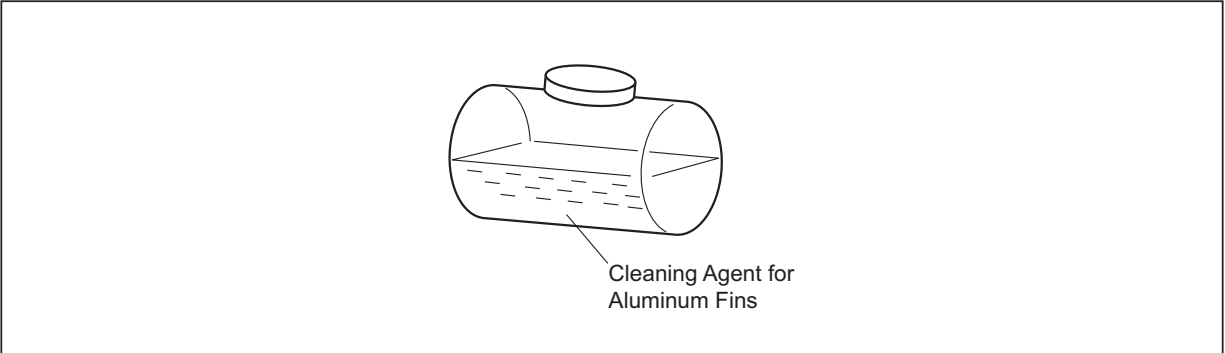
MAINTENANCE

(Cleaning Indoor Unit Heat Exchanger)

! WARNING

TURN OFF all power source switches.

- (7) Place approximately three gallons (15 liters) of neutral cleaning agent for aluminum fins in a supply tank.

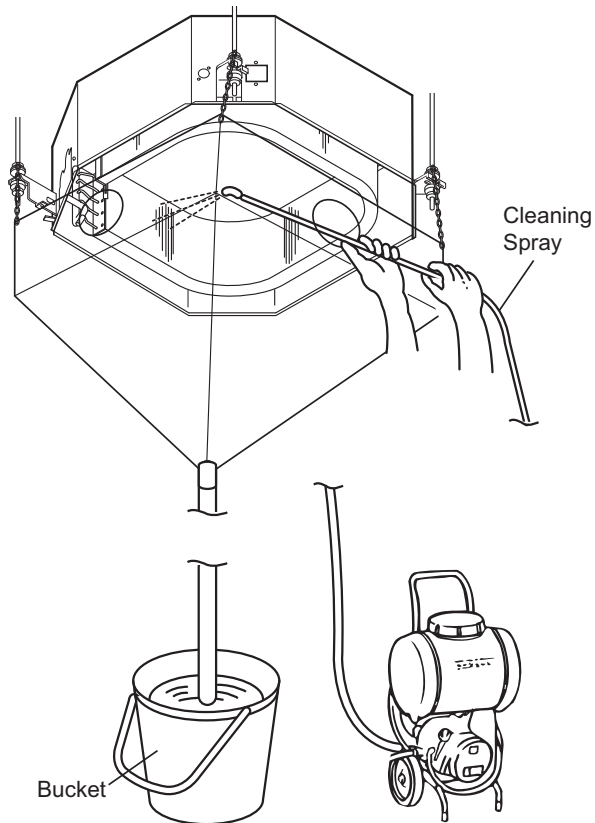


- (8) Insert the spray nozzle through the hole of the cleaning water collector. Operate the water pump and clean the heat exchanger. After cleaning, spray clean water to remove the cleaning water. Adjust the pressure of the water pump so the fins are not damaged.

Tool

Clean Water, Neutral Cleaning Agent,
Water Pump, Cleaning Spray

Example:



NOTES:

1. If the cleaning water remains on the fins, they will be corroded.
2. Adjust the pressure of the pump at 36 to 71 psi (2.5 to 5.0 kg/cm²) so the fins are not damaged.

! WARNING

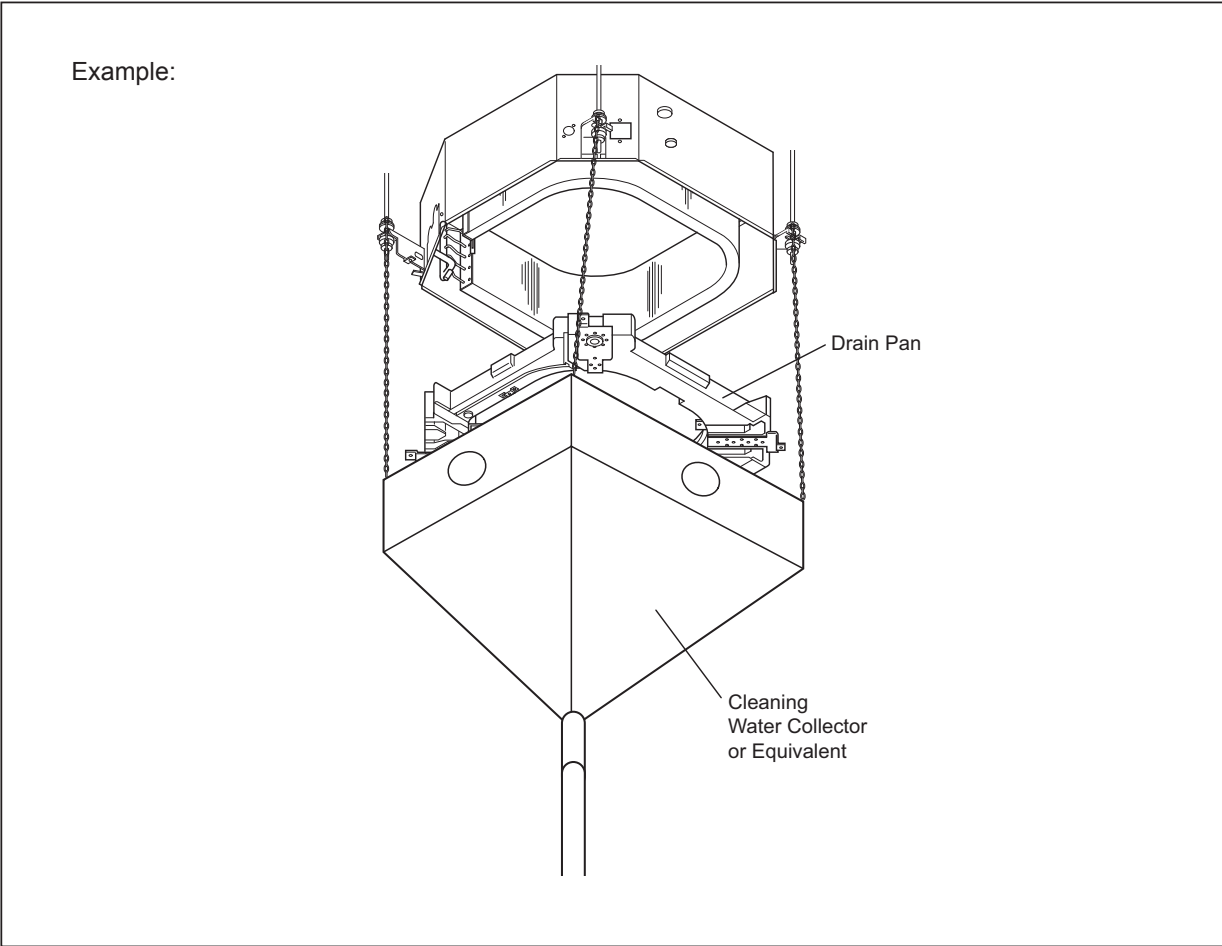
TURN OFF all power source switches.

- (9) After cleaning, install the drain pan by extending the rope downwards.

NOTE:

When the cleaning water collector is removed, wipe off any water droplets on the indoor unit.

Tool	Phillips Screwdriver
------	----------------------



- (10) Check the insulation of the drain pump with a megohm-meter. Check to ensure that the insulation is greater than 1 MΩ when 500V is applied.

- (11) Reconnect wirings.

- (12) Neutralization Treatment after Cleaning

The cleaning agent specified in Section 4.2.7.1 is a neutral type. However, the cleaning water after use may no longer be neutral. Collect all cleaning water and make necessary neutralization treatment for the cleaning water.

MAINTENANCE

(Cleaning Indoor Unit Heat Exchanger)

! WARNING**TURN OFF all power source switches.**

4.2.7.3 1-Way Cassette Model

Spread a vinyl sheet over the floor to protect property from cleaning water before performing this work.

No.	Procedure	Tool
1	Remove the optional decorative panel according to Section 4.2.5.2 "Removing Optional Decorative Panel".	Phillips Screwdriver
2	Remove the fan according to Section 4.2.5.3 "Removing Fan Motor".	Phillips Screwdriver Adjustable Wrench
3	Remove the drain pan according to Section 4.2.5.4 "Removing Drain Pan".	Phillips Screwdriver
4	Remove the drain-up mechanism and float switch according to Section 4.2.5.8 "Removing Drain-Up Mechanism and Float Switch".	Phillips Screwdriver

NOTES:

Remove the drain pan after removing water from the drain pan.

1. Remove water from the drain pan after pulling out the rubber plug. Check to ensure that water flows smoothly through the hole by poking it with a pencil.
2. Insert the rubber plug into the hole after the above check.
3. Remove the drain pan after removing the four securing screws. Carefully remove the drain pan, since water may remain at the bottom of the drain pan.
4. Clean and dry the drain pan after removing it. Carefully handle the drain pan so as not to damage it.

! WARNING

TURN OFF all power source switches.

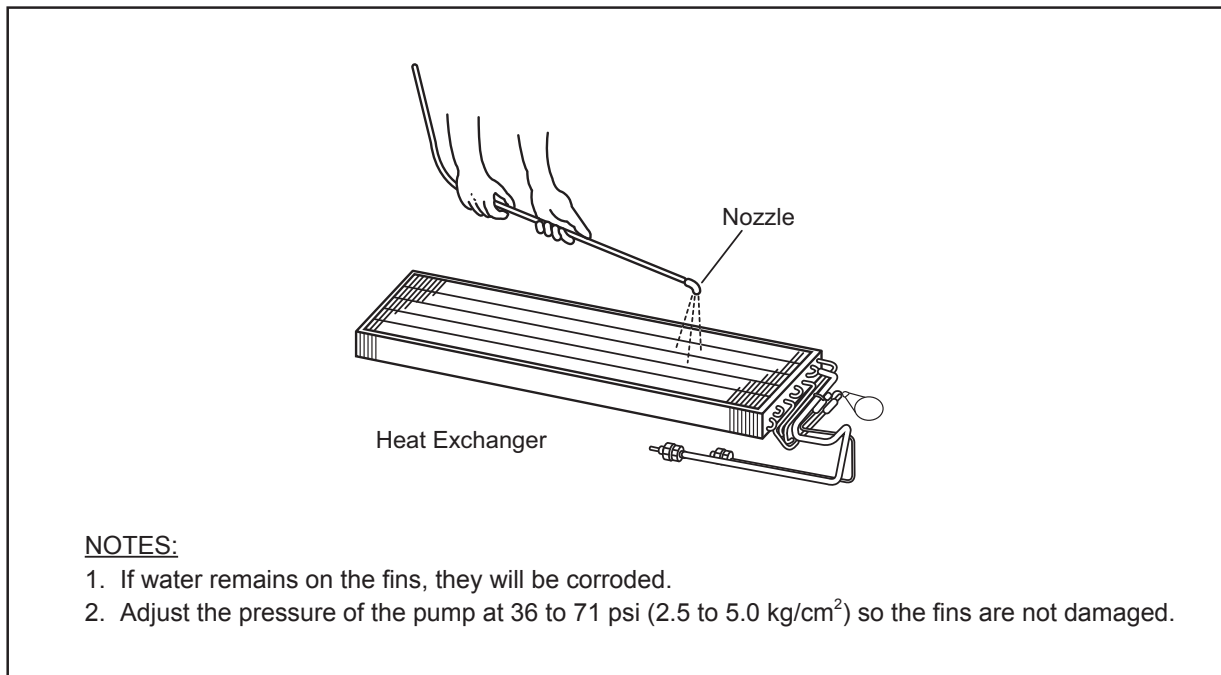
4.2.7.4 Wall Mount Model

Spread a vinyl sheet over the floor to protect property from cleaning water before performing this work.

- (1) Remove each part according to Section 4.2.6 "Wall Mount Type".
- (2) Remove the front panel according to Section 4.2.6.2 "Removing Front Panel".
- (3) Remove the electrical box according to Section 4.2.6.5 "Removing Electrical Box".
- (4) Remove the drain pan according to Section 4.2.6.7 "Removing Drain Pan".
- (5) Remove the heat exchanger according to Section 4.2.6.8 "Removing Heat Exchanger".
- (6) Cleaning
 - (a) Remove dust with a brush.
 - (b) Cover the electrical components with a vinyl sheet to protect them from splashing cleaning water.
 - (c) If a cleaning agent is used, clean the heat exchanger with clean water completely.
 - (d) Adjust the pressure of the pump so the fins are not damaged.
- (7) Neutralization Treatment after Cleaning

The cleaning agent specified in Section 4.2.7.1 is a neutral type. However, the cleaning water after use may no longer be neutral. Recover all cleaning water and make necessary neutralization treatment for the cleaning water.

Tool	Neutral Cleaning Water, Clean Water, Pump, Spray
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MAINTENANCE

(Main Parts)

4.3 Main Parts

4.3.1 for Outdoor Unit

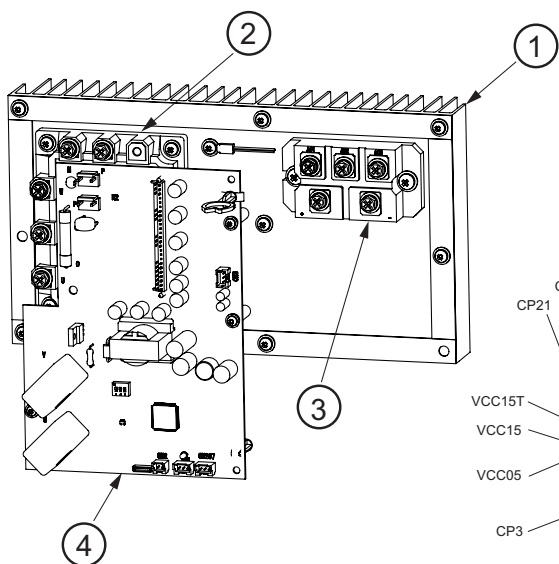
4.3.1.1 Inverter

● Specifications of Inverter

Applicable Model	(H,Y)VAHP072B31S (H,Y)VAHP096B31S (H,Y)VAHP120B31S (H,Y)VAHR072B31S (H,Y)VAHR096B31S (H,Y)VAHR120B31S	(H,Y)VAHP072B41S (H,Y)VAHP096B41S (H,Y)VAHP120B41S (H,Y)VAHR072B41S (H,Y)VAHR096B41S (H,Y)VAHR120B41S
Applicable Power Source	208-230V, 3PH, 60Hz	460V, 3PH, 60Hz
Output Voltage (Maximum)	208/230V	460V
Output Current (Maximum)	45A	23.5A
Inverter PCB		
Fan Controller	7A	7A
Control Method	Vector PWM Control	
Range Output Frequency	15 - 100Hz	
Inverter PCB		
Fan Controller	0 - 70Hz	
Accuracy of Frequency	0.01Hz	
Output / Characteristics	<p>Conditions: 1. Power Source Voltage AC 208V, 460V 2. Non-Loading (Free Output)</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p>(208V)</p> </div> <div style="text-align: center;"> <p>(460V)</p> </div> </div> <p>NOTE: Characteristics are fluctuated by the current minimize control.</p>	
Soft Start Stop	0.125Hz/S, 0.25Hz/S, 0.5Hz/S, 1Hz/S, 3Hz/S (5 Steps)	
Protection Function	<p>Excessive High or Low Voltage for Inverter</p> <p>In Case of 208-230V Excessive Low Voltage at a DC Voltage is Lower than 196V Excessive High Voltage at a DC Voltage is Higher than 376V</p> <p>In Case of 460V Excessive Low Voltage at a DC Voltage is Lower than 456V Excessive High Voltage at a DC Voltage is Higher than 752V</p>	
Abnormality of Current Sensor	<p>Stoppage at a current of compressor smaller than 1.5A</p> <p>Cause of Abnormality: Failure of Current Sensor Failure of Transistor Module Failure of Compressor Disconnected Wiring</p>	

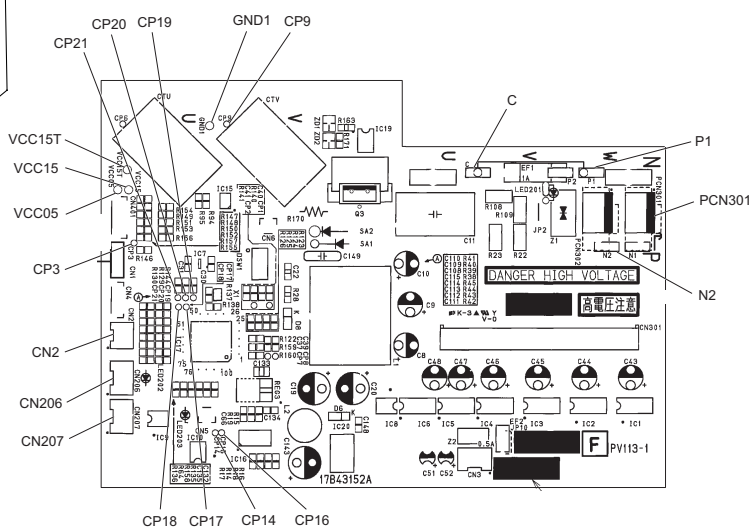
<p>Protection Function Overcurrent Protection for Inverter</p>	<p>(1) Short-Circuit Trip of Arm } Internal Protection (2) Instantaneous Overcurrent Trip } Transistor Module (IPM) (3) Instantaneous Overcurrent Trip When detecting current is more than rated current of Transistor Module, overcurrent is detected. (4) Electronic Thermal Trip When the current detected by current sensor exceeds 105% of the rated current continuously for 30 seconds or for 3 minutes in total during a 10-minute period, overcurrent is detected.</p>
<p>Protection of Transistor Module (IPM)</p>	<p>Transistor module (IPM) has four protection functions for self-protection.</p> <p>(1) Some of the output terminals between "U" and "V", "V" and "W", "W" and "U" have a short-circuit. (2) Running current reaches the maximum rated current. (3) Abnormal temperature is measured by internal thermistor. (4) Control voltage decreases abnormally.</p>
<p>Overload Control</p>	<p>Overload control at a current greater than (Rated Current x 105%). Overload control release at a current smaller than (Rated Current x 88%).</p>
<p>Fin Temperature Increase</p>	<p>The unit is stopped when the IPM temperature is higher than 90°C.</p>
<p>Earth Detection</p>	<p>The unit is stopped when the compressor is earthing.</p>

● Arrangement of Inverter Power Unit



No.	Parts Name
1	Radiation Fin
2	Transistor Module
3	Diode Module
4	Inverter PCB

<Detail of ④ Inverter PCB (PCB2: PV113)>



(Main Parts)

● Protective Function

(1) Excessive High or Low Voltage for Inverter

(a) Level of Detection

① In case of 280-230V, 60Hz.

When the voltage of direct current is greater than 376V, abnormalities are detected.

When the voltage of direct current is smaller than 196V, abnormalities are detected.

② In case of 460V/60Hz

When the voltage of direct current is greater than 752V, abnormalities are detected.

When the voltage of direct current is smaller than 456V, abnormalities are detected.

(b) Function

When abnormalities are detected, the inverter compressor is stopped and transmit the signal code of stoppage cause to outdoor unit PCB.

(c) Cancellation of Protection Function

Transmission signal about stoppage cause is canceled when remote control switch is off or main power source is cut off.

(2) Abnormality of Current Sensor

(a) Level of Detection

① When the compressor operating frequency is between 15Hz and 18Hz after compressor is started, one of the effective value of running current at each phase is less than 1.5A (including 1.5A).

② The wave height value of running current for the phase positioning is less than 5A before the compressor is started (at completing the phase positioning).

(b) Function

When abnormalities are detected, the inverter compressor is stopped, and transmit the signal code of stoppage cause to outdoor unit PCB.

(c) Cancellation of Protection Function

Transmission signal about stoppage cause is canceled when remote control switch is off or main power source is cut off.

(3) Overcurrent Protection for Inverter

(a) Level of Detection

① When the compressor current detected by current sensor exceeds the rated current of transistor module (IPM), overcurrent is detected. (Instantaneous Overcurrent)

② When the current detected by current sensor exceeds 105% of the rated current continuously for 30 seconds or for 3 minutes in total during a 10-minute period, overcurrent is detected. (Electric Thermal Relay)

(b) Function

When abnormalities are detected, the inverter compressor is stopped and transmit the signal code of stoppage cause to outdoor unit PCB.

(c) Cancellation of Protection Function

Transmission signal about stoppage cause is canceled when remote control switch is off or main power source is cut off.

(4) Protection of Transistor Module (IPM)

(a) Level of Detection

① When some of the output terminals between "U" and "V", "V" and "W", "W" and "U" of transistor module (IPM) are short-circuited, an abnormality is detected.

② When the running current of transistor module (IPM) reaches the maximum rated current, an abnormality is detected.

③ When abnormal increase in temperature is measured by thermistor with internal transistor module (IPM), an abnormality is detected.

④ When the control voltage of transistor module (IPM) abnormally decreases, an abnormality is detected.

(b) Function

When abnormalities are detected, the inverter compressor is stopped and the signal code of stoppage cause is transmitted to outdoor unit PCB.

(c) Cancellation of Protection Function

Transmission signal about stoppage cause is canceled when remote control switch is off or main power source is cut off.

(5) Fin Temperature Increase

(a) Level of Detection

When the temperature of internal thermistor exceeds 90°C, an abnormality is detected.

(b) Function

When abnormalities are detected, the inverter compressor is stopped and the signal code of stoppage cause is transmitted to outdoor unit PCB.

(c) Cancellation of Protection Function

Transmission signal about stoppage cause is canceled when remote control switch is off or main power source is cut off.

(6) Earth Detection

(a) Level of Detection

① When the terminal U, V, W and earth of the compressor are short-circuited before compressor activation, abnormalities are detected.

② When the output terminals (U, V, W) of transistor module (IPM) are short-circuited, abnormalities are detected.

(b) Function

When abnormalities are detected, the inverter compressor is stopped and the signal code of stoppage cause is transmitted to outdoor unit PCB.

(c) Cancellation of Protection Function

Transmission signal about stoppage cause is canceled when remote control switch is off or main power source is cut off.

● Overload Protection Control

(a) Level of Detection

When the output current exceeds 105% of the maximum output current, an abnormality is detected.

(b) Function

An overload signal is transmitted to the outdoor unit PCB when output current exceeds 105% of the maximum output current, and the frequency decreases.

For 10 seconds after the output current decreases lower than 88% of the rated current, the compressor maximum frequency is limited to the specified value.

However, if the frequency order is smaller than the maximum value, the operation is performed according to the order.

(c) Cancellation of Protection Function

After the operation described in the above item (b) is performed for 10 seconds, this control is canceled.

MAINTENANCE

(Main Parts)

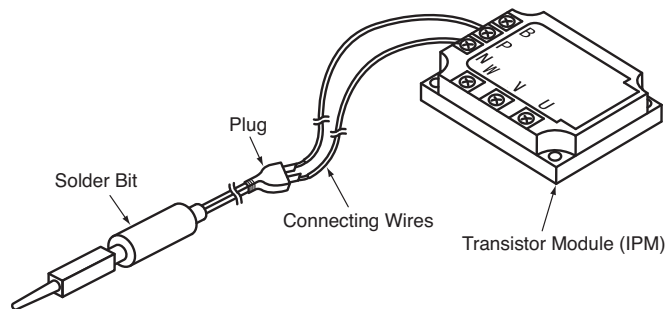
- High Voltage Discharge Work for Replacing Parts

CAUTION

Perform this high voltage discharge work to avoid an electric shock.

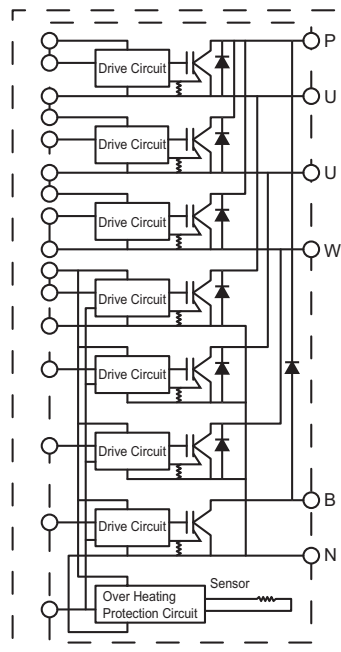
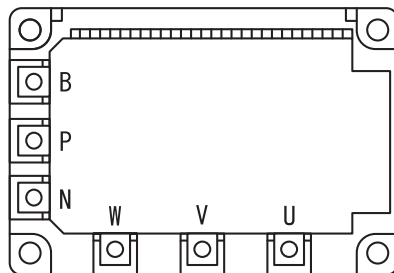
< Procedures >

- Turn OFF the main switches and wait for three minutes. Check to ensure that no high voltage exists. If LED201 is ON after start-up and LED201 is OFF after turning OFF power source, the voltage will decrease to DC50V or less.
- Connect connecting wires to an electrical solder bit.
- Connect the wires to terminals, P and N on IPM. ⇒ Discharging is started, resulting in hot solder bit. Take special care to avoid short circuit between terminal P and N.
- Wait for two or three minutes and measure the voltage again. Check to ensure that no voltage is charged.



(1) Checking Method of Transistor Module (IPM)

Outer Appearance and Internal Circuit of Transistor Module

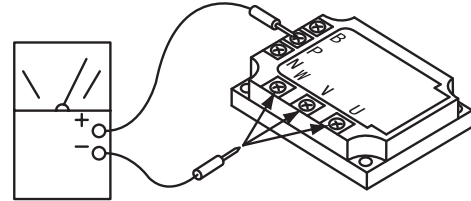


Remove all the terminals of the transistor module before checking. If procedures (a) to (d) are performed and the results are satisfactory, the transistor module is normal. Measure it under 1kΩ range of a tester.

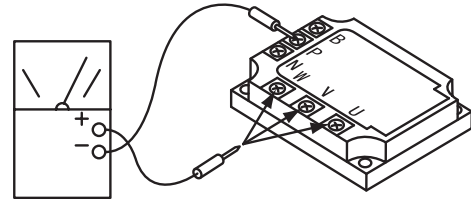
NOTICE

Do not use a digital tester.

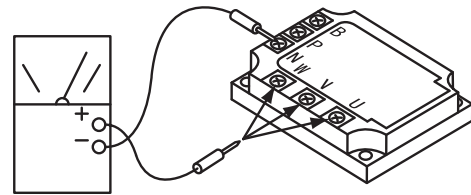
- (a) By touching the + side of the tester to the P terminal of transistor module and the - side of tester to U, V and W of transistor module, measure the resistance. If all the resistances are from 1 to 5kΩ, it is normal.



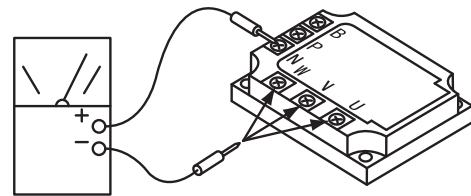
- (b) By touching the - side of the tester to the P terminal of transistor module and the + side of tester to U, V and W of transistor module, measure the resistance. If all the resistances are greater than 100kΩ, it is normal.



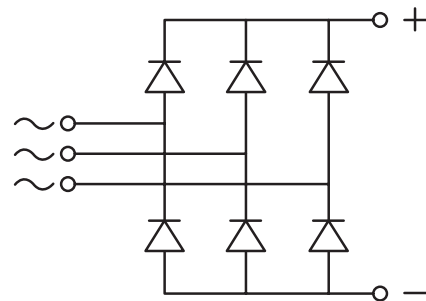
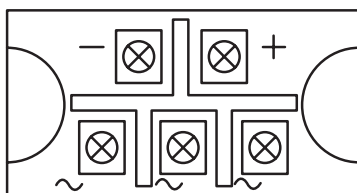
- (c) By touching the - side of the tester to the N terminal of transistor module and the + side of tester to U, V and W of transistor module, measure the resistance. If all the resistances are from 1 to 5kΩ, it is normal.



- (d) By touching the + side of the tester to the N terminal of transistor module and the - side of tester to U, V and W of transistor module, measure the resistance. If all the resistances are greater than 100kΩ, it is normal.



(2) Checking Method of Diode Module (DM)
Outer Appearance and Internal Circuit of Diode Module



MAINTENANCE

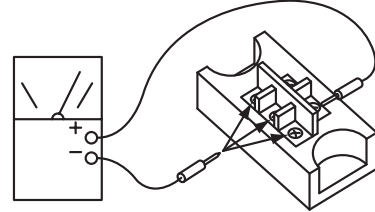
(Main Parts)

If procedures (a) to (d) are performed and the results are satisfactory, the diode module is normal. Measure it under 1k Ω range of a tester.

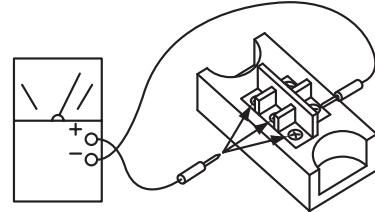
NOTICE

Do not use a digital tester.

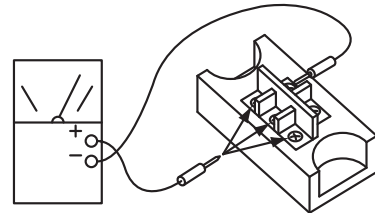
- (a) By touching the + side of the tester to the + terminal of diode module and the - side of tester to the ~ terminals (3 NOs.) of the diode module, measure the resistance. If all the resistances are from 5 to 50k Ω , it is normal.



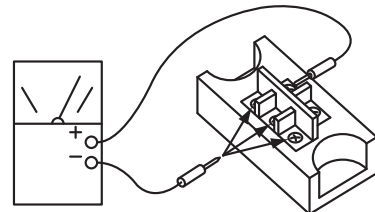
- (b) By touching the - side of the tester to the + terminal of diode module and the + side of tester to the ~ terminals (3 NOs.) of the diode module, measure the resistance. If all the resistances are greater than 500k Ω , it is normal.



- (c) By touching the - side of the tester to the - terminal of diode module and the + side of tester to the ~ terminals (3 NOs.) of the diode module, measure the resistance. If all the resistances are from 5 to 50k Ω , it is normal.



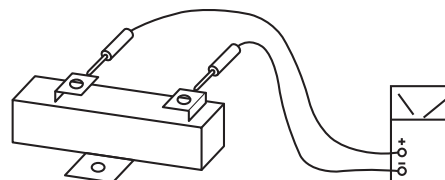
- (d) By touching the + side of the tester to the - terminal of diode module and the - side of tester to the ~ terminals (3 NOs.) of the diode module, measure the resistance. If all the resistances are greater than 500k Ω , it is normal.



(3) Checking Method of Resistor

Measure the resistance of both ends of resistor as shown in the figure.
If the resistance is $\infty\Omega$, it is abnormal.

Resistance		208/230V	460V
For Inverter	RS	0.5k Ω	-
	RS1	-	0.5k Ω
	RS2	-	0.5k Ω
	R1	-	9.7k Ω
	R2	-	12.0k Ω

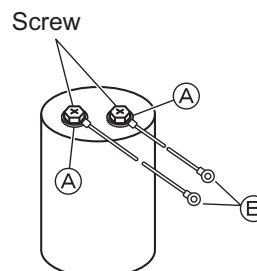


(4) Checking Method of Capacitor

- (a) Check that the screws are connected tightly.
- (b) Check that the capacitor is not tarnished or expanded.

* When checking the capacitor, disconnect the terminals (B).
Do not disconnect the terminals (A).

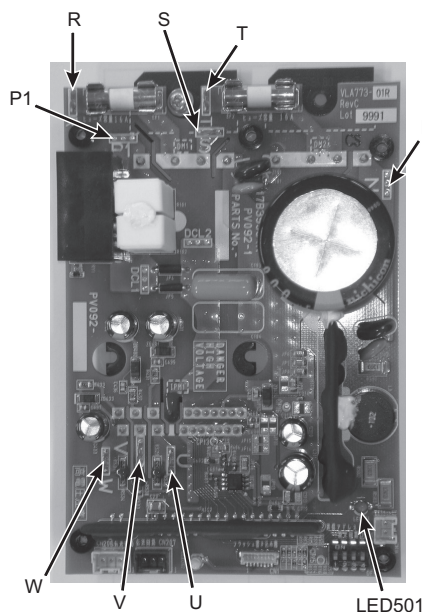
Capacitance	208/230V/60Hz	460V/60Hz
For Inverter	4700 μ F	4700 μ F
For Fan Controller	-	2700 μ F



(5) Checking of Fan Controller

- (a) Turn OFF the power source before this work.
Also ensure that LED501 (red) on the fan controller is turned OFF.
If LED501 is turned ON, an electrical shock may occur because of residual voltage over DC 50V
- (b) Disconnect all the wirings connected to the fan controller.
Measure the resistance between terminals using a tester. (Do not use a digital tester.)
When measuring the resistance, check the color of the tester probe and the terminals to be measured as shown in the table below.

Tester Probe Red (+) - Black (-)	Resistance Range
P1 - R P1 - S P1 - T R - N S - N T - N P1 - U P1 - V P1 - W U - N V - N W - N	1 k Ω and over
R - P1 S - P1 T - P1 N - R N - S N - T U - P1 V - P1 W - P1 N - U N - V N - W	Resistance will gradually increase once after it is between 1700 k Ω to 1900 k Ω . (*)



(*) Measure the resistance of each terminal at intervals of 30 seconds or longer.

< DSW Initial Setting >

DSW1			
1	2	3	4
OFF	OFF	OFF	OFF

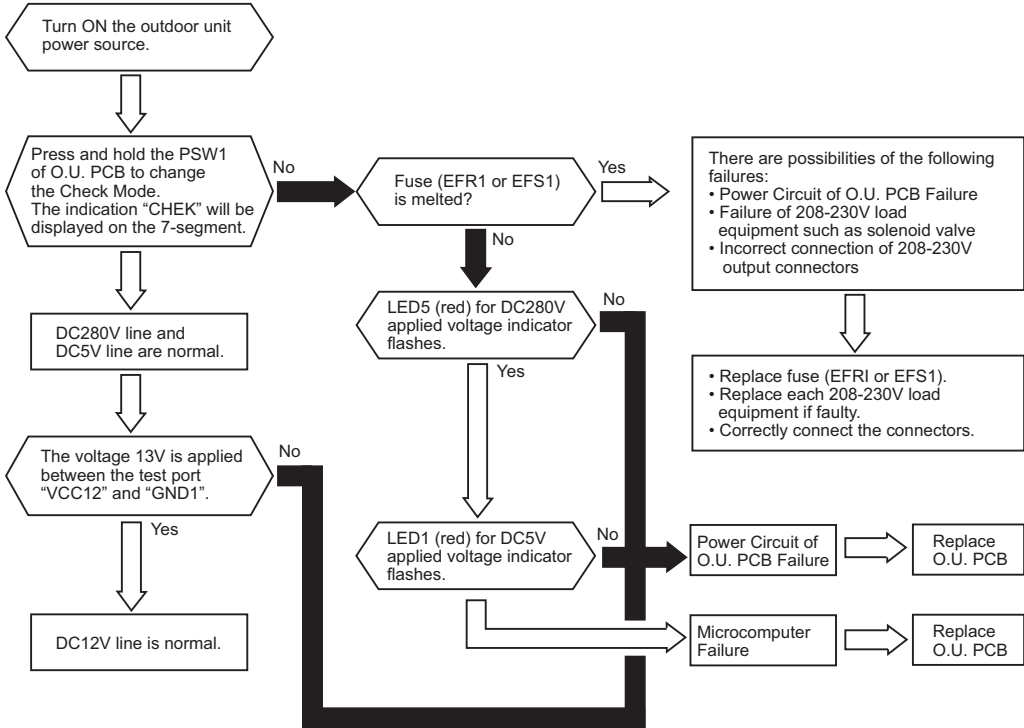
Do not change the DSW setting from the original setting. Abnormal communication and fan controller failure may occur if the setting is changed.

MAINTENANCE

(Main Parts)

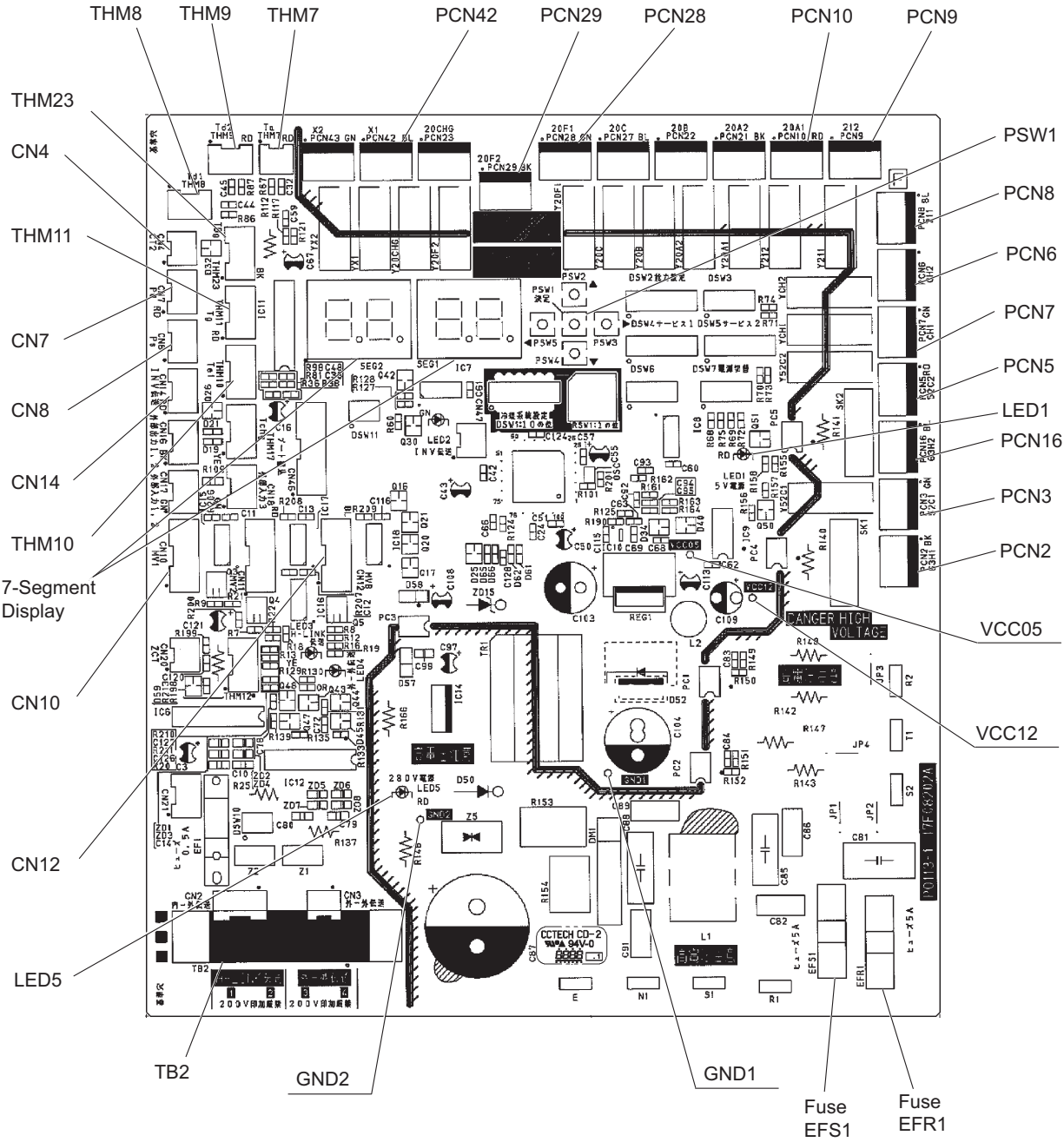
4.3.1.2 Printed Circuit Board

• Checking Procedures for Outdoor Unit PCB



● PCB1 (PO113)

Arrangement of Connectors and Check Points.



MAINTENANCE

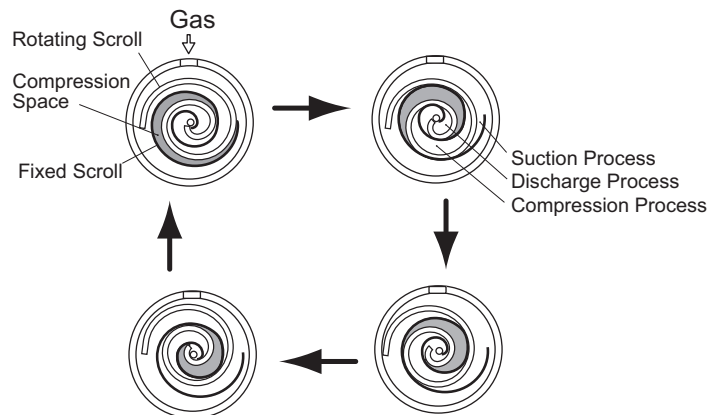
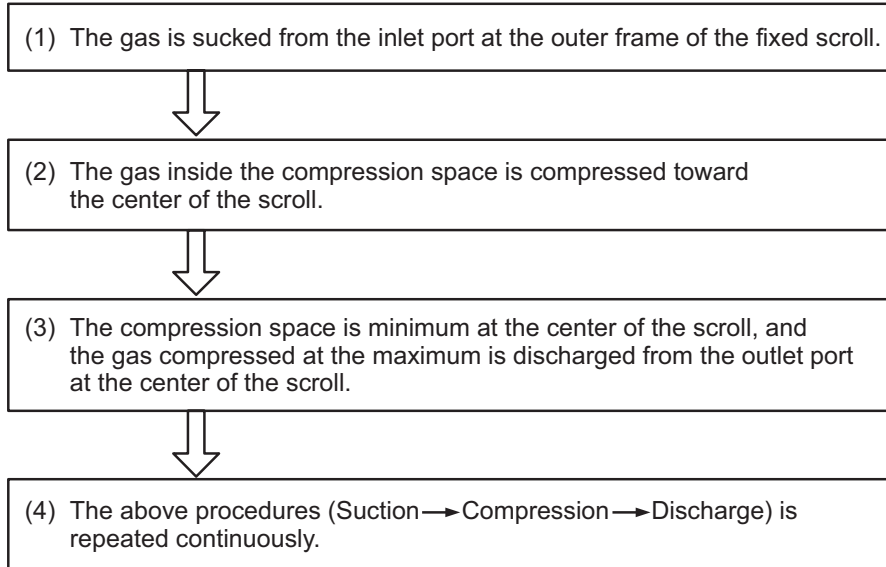
(Main Parts)

4.3.1.3 Scroll Compressor

- Reliable Mechanism for Low Vibration and Low Sound

- (1) The rotating direction is definite.
- (2) The pressure inside of the chamber is high pressure, and the surface temperature of the chamber is 140°F (60°C) to 230°F (110°C).

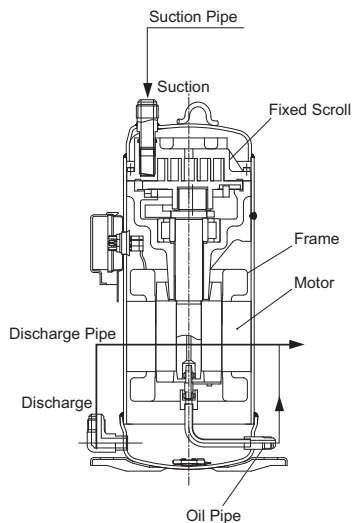
- Principle of Compression



● Structure

The compressor has the structure for oil supply from the outer oil separator.

The inside of the oil separator is at high pressure, and the surface temperature of the oil separator is as high (140°F (60°C) to 230°F (110°C)) as the compressor.



● Compressor Type

Model	Inverter Compressor	Fixed Speed Compressor	Total
(H,Y)VAHP072B31S (H,Y)VAHP072B41S (H,Y)VAHR072B31S (H,Y)VAHR072B41S	DA65PHD x1	-	1
(H,Y)VAHP096B31S (H,Y)VAHP120B31S (H,Y)VAHR096B31S (H,Y)VAHR120B31S	DA65PHD x1	E655DH x1	2
(H,Y)VAHP096B41S (H,Y)VAHP120B41S (H,Y)VAHR096B41S (H,Y)VAHR120B41S	DA65PHD x1	DA65PHC x1	2

NOTE:

Seen from the front side of the unit, the one compressor at the left is the inverter compressor and the other compressor is the constant speed type.

● Checking of Compressor Motor

Name of Parts	Model	Resistance (Ω)
Compressor Motor (for Inverter Compressor)	DA65PHD	0.094 (200V/60Hz) at 167°F(75°C) 0.320 (460V/60Hz) at 167°F(75°C)
Compressor Motor (for Fixed Speed Compressor)	E655DH	0.735 (208-230V/60Hz) at 167°F(75°C)
	DA65PHC	2.907 (460V/60Hz) at 167°F(75°C)

MAINTENANCE

(Main Parts)

- Checking of Compressor

CHECK LIST ON COMPRESSOR

CLIENT: _____

MODEL: _____

DATE: _____

Serial No.: _____

Production Date: _____

Checker: _____

No.	Check Item	Check Method	Result	Remarks
1	Are THM8 and THM9 correctly connected? THM8 and THM9: Discharge Gas Thermistor	(1) Are wires of each thermistor correctly connected by viewing? (2) Check to ensure that 7-segment indication of Td1 is higher than Td2 when No.1 comp. is operating. Td1: Temperature of THM8 Td2: Temperature of THM9		
2	Are thermistor, THM8 and THM9 disconnected?	(1) Check to ensure that thermistor on the top of comp. is correctly installed. (2) Check to ensure that actually measured temp. are greatly different from the indication (Td1, Td2) during check mode.		
3	Are connectors for current sensor correctly connected?	(1) Check to ensure that 7-segment indication A1 and A2 are 0 during compressor stopping. (2) Check to ensure that indication A1 and A2 are not 0 during compressor running. (However, A2 is 0 during stopping of No.2 comp.)		
4	Is current sensor faulty?			
5	Is current sensing part on inverter PCB faulty?			
6	Is the direction of current sensor (CTU, CTV) reverse?	Check the direction ⇒ by viewing.		
7	Are power source wires, U and V inserted correctly into current sensor?	Check to ensure that wires are correctly inserted.		
8	Are expansion valves (MV1 and MVB) correctly connected?	Check to ensure that MV1 to CN10 and MVB to CN12 are correctly connected.		
9	Are expansion valve coils (MV1 and MVB) correctly installed?	Check to ensure that each coil is correctly installed on the valve.		
10	Are the refrigeration system and electrical wiring system incorrectly connected?	Check to ensure that refrigerant is flowing into indoor units by operating one system only from the outdoor unit.		
11	Is opening of expansion valve completely closed (locked)?	Check the following using the check mode of outdoor units. (1) Liquid Pipe Temp. (TL) < Air Intake Temp. (Ti) during Cooling Operation (2) Liquid Pipe Temp. (TL) > Air Intake Temp. (Ti) during Heating Operation		
12	Is opening of expansion valve fully opened (locked)?	Check to ensure that liquid pipe temp. is lower than air intake temp. of stopped indoor unit when the other indoor units are operating under cooling operation.		
13	Are the contacts for comp. magnetic switch CMC1 and CMC2 faulty?	Check the surface of each contact.		
14	Is there any voltage abnormality among L1-L2, L2-L3 and L3-L1?	Check to ensure that voltage imbalance is smaller than 3%. Please note that power source voltage must be within 208/230V or 460V±10%.		
15	Is the comp. oil acidified during compressor motor burning?	Check to ensure that the oil color is not black.		

*See additional information on the next page.

Additional Information for “CHECK LIST ON COMPRESSOR”

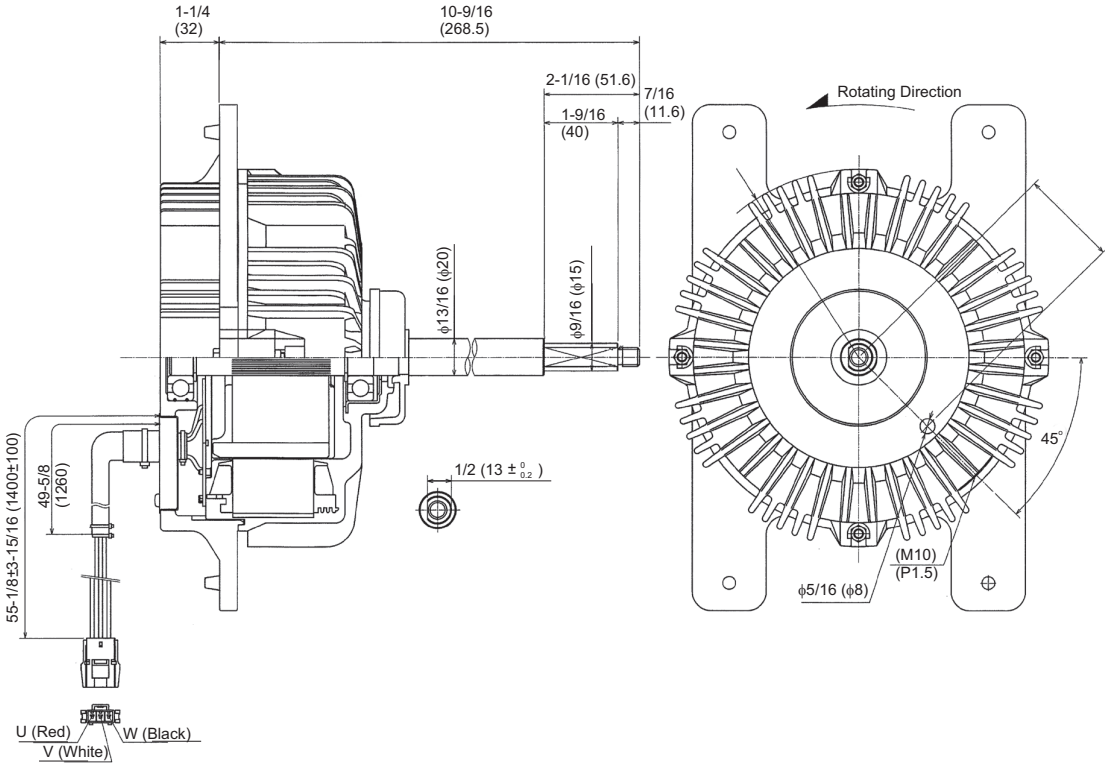
Check Item	Additional Information (Mechanism of Compressor Failure)
1, 2	The liquid refrigerant return volume to the compressor is controlled by the discharge gas temperature Td1 when only No.1 compressor is operating. If Td1 and Td2 are reversely connected, the liquid refrigerant return volume will become smaller by detecting the temperatures even if the actual discharge gas temperature is high. Therefore, this abnormal overheating operation will result in insulation failure of the motor winding.
3, 4, 5	Overcurrent control (operating frequency control) is performed by detecting current by the current sensor. In this case, winding insulation failure will occur, since control is not available in spite of actually high current.
6, 7	The current sensor checks phase and adjusts output electrical wave in addition to the above mentioned items. If fault occurs, the output electrical wave becomes unstable giving stress to the motor winding, resulting in winding insulation failure.
8, 9	During a cooling operation, Pd is controlled by fan revolution of outdoor unit, and Td and SH are controlled by MV of each indoor unit. During a heating operation, Td and SH are controlled by MV1. If expansion valves are incorrectly connected, correct control is not available, resulting in compressor seizure depending on liquid refrigerant returning conditions or motor winding insulation failure depending on overheating conditions.
10	If the refrigeration system and electrical system are incorrectly connected, abnormally low suction pressure operation is maintained or abnormally high discharge pressure operation is maintained, resulting in giving stress to the compressor, since their correct control is not available.
11	Ditto.
12	The compressor may be locked due to the liquid return operation during the cooling operation.
13	If the contacting resistance increases, voltage imbalance among each phase will cause abnormal overcurrent.
14	In this case, overcurrent will occur, efficiency will decrease or the motor winding will be excessively heated.
15	In this case, it will result in motor burning or compressor seizure.

MAINTENANCE

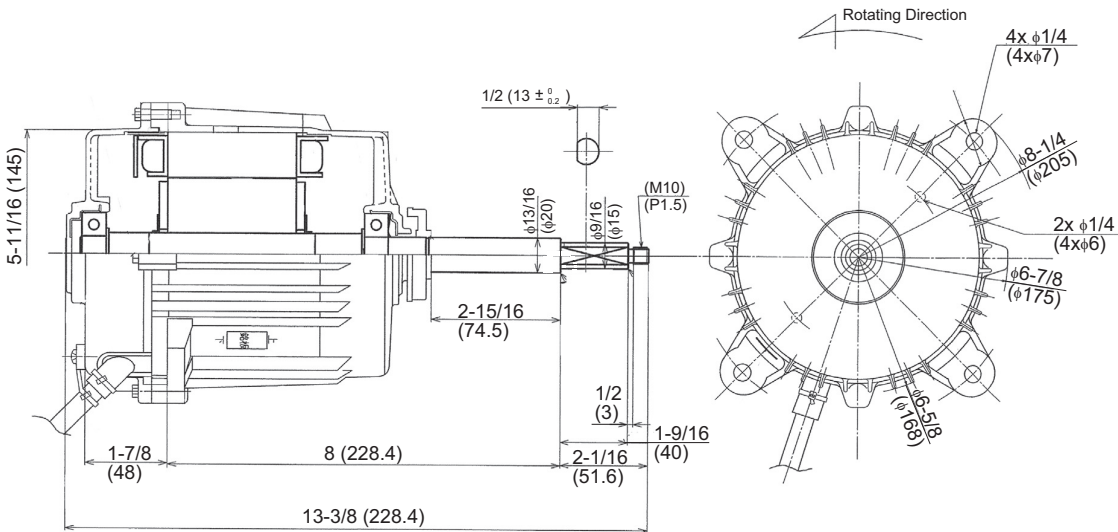
(Main Parts)

4.3.1.4 Fan Motor

- for (H,Y)VAH(P,R)072B31(41)S



- for (H,Y)VAH(P,R)096B31(41)S, and (H,Y)VAH(P,R)120B31(41)S

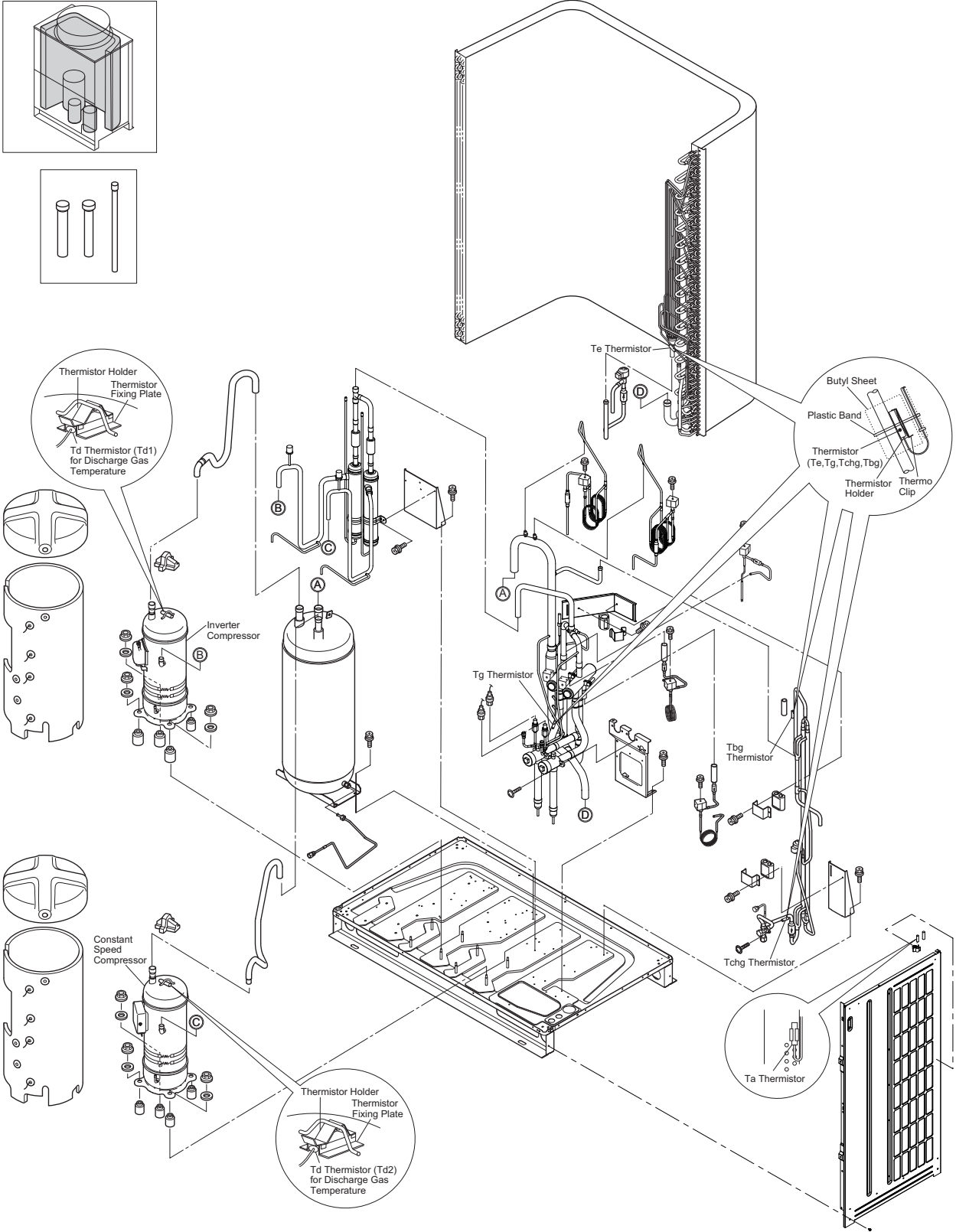


Name of Parts	Model	Electrical Wiring Diagram	Wiring No.	Resistance (Ω)
DC Fan Motor for Outdoor Unit (H,Y)VAH(P,R)072B31(41)S	DMSBA8PQH 750W		White-Black Black-Red Red-White	2.58±0.3 at 68°F(20°C)
DC Fan Motor for Outdoor Unit (H,Y)VAH(P,R)096B31(41)S (H,Y)VAH(P,R)120B31(41)S	ECW8802AHS 1200W		White-Black Black-Red Red-White	0.794±5% at 68°F(20°C)

4.3.1.5 Thermistor

(1) Position of Thermistor

< Example > (H,Y)VAH(P,R)096B31S, (H,Y)VAH(P,R)120B31S
(H,Y)VAH(P,R)096B41S, (H,Y)VAH(P,R)120B41S

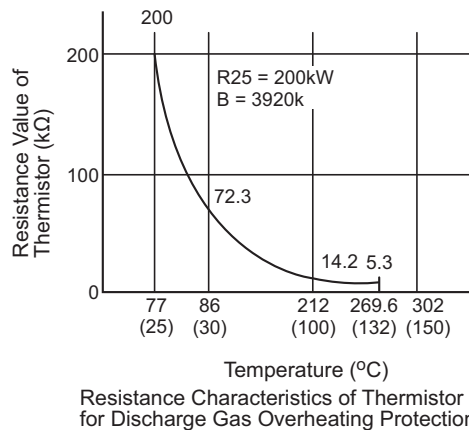


MAINTENANCE

(Main Parts)

(2) Thermistor for Upper Part Temperature of Compressor

- a. A thermistor for the upper part temperature of the compressor is installed to prevent discharge gas from overheating. If discharge gas temperature increases excessively, lubricating oil deterioration occurs and lubricating properties deteriorate, resulting in short compressor life.
- b. If discharge gas temperature increases excessively, compressor temperature increases. At the worst, compressor motor winding will be burnt out.
- c. When the upper part temperature of compressor increases during heating operation, the unit is controlled according to the following method.
 - An electronic expansion valve of outdoor units is (are) opened to return the liquid refrigerant to the compressor through the accumulator, decreasing compressor temperature.
 - If the compressor upper part temperature increases exceeding 270°F (132°C) even if an electronic expansion valve opens, the compressor is stopped, in order to protect the compressor. In cooling operation, the above function is also available.
- d. If compressor upper part temperature increases excessively, the protection control is activated and the compressor is stopped according to the following method.



Operation	Upper Part Temperature of Compressor	Defecting Period
Cooling	Over 270°F (132°C)	10 minutes (Continuously)
	Over 284°F (140°C)	5 seconds (Continuously)
Heating	Over 270°F (132°C)	10 minutes (Continuously)
	Over 284°F (140°C)	5 seconds (Continuously)
Defrosting	Over 270°F (132°C)	5 seconds (Continuously)

(3) Thermistor for Outdoor Ambient Temperature

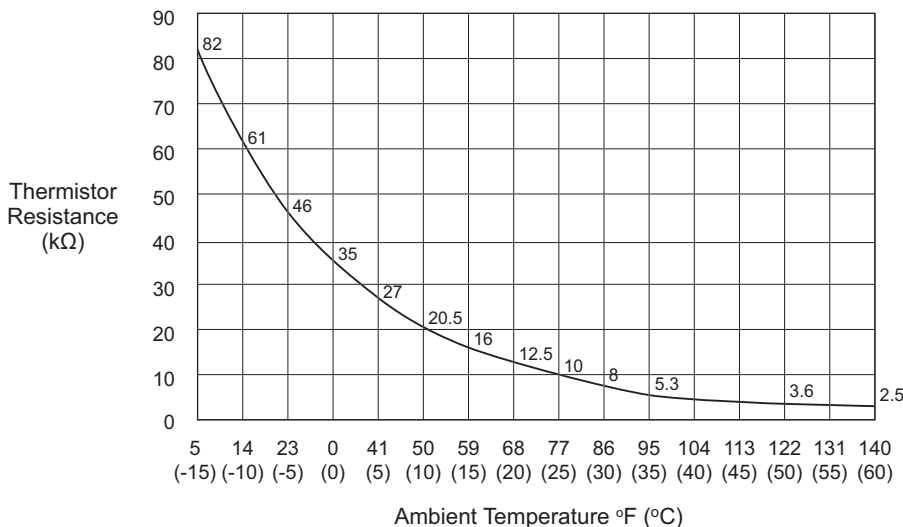
The thermistor resistance characteristics are shown in the figure below.

(4) Thermistor for Evaporating Temperature of Outdoor Unit in Heating Operation (For Defrosting)

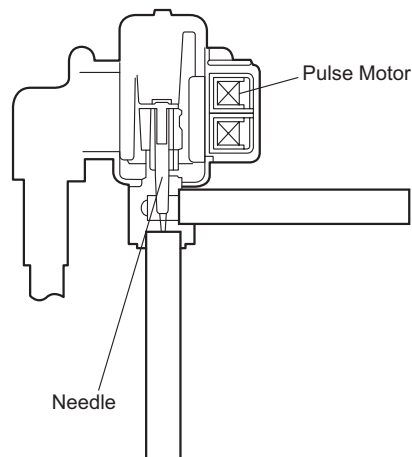
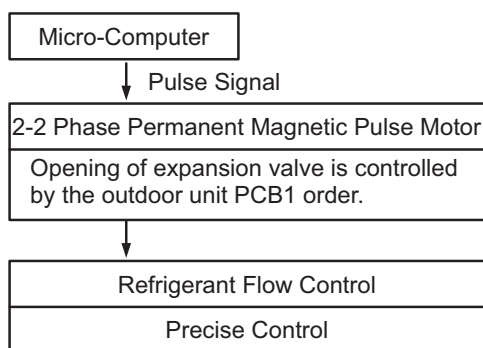
The characteristics for the thermistor are the same as those of outdoor ambient temperature thermistor shown in the figure below.

(5) Thermistor for Super Cooling Bypass and Main Line Temperature of Outdoor Unit

The characteristics for the thermistor are the same as those of outdoor ambient temperature thermistor shown in the figure below.



4.3.1.6 Electronic Expansion Valve



• Specifications for MV1

Model	PAM-BBOYGHS-1
Working Temperature Range	-22°F to 158°F (-30°C to 70°C)
Refrigerant Used	R410A
Insulation Resistance	Min. 100MΩ (at 500VDC Megger)
Withstand Voltage	500VAC for 1 Minute or 600VAC for 1 Second
Rated Voltage	DC12V±1.2V
Drive Condition	100 - 200 PPS 2-2 Phase Excitation
Coil Resistance	100Ω (at 68°F (20°C))
Insulation Class	Class E

Wiring Diagram, Drive Circuit and Activation Mode

Phase	1	2	3	4
φ1	ON	OFF	OFF	ON
φ2	ON	ON	OFF	OFF
φ3	OFF	ON	ON	OFF
φ4	OFF	OFF	ON	ON

OPEN: 4 → 3 → 2 → 1 → 4
CLOSE: 1 → 2 → 3 → 4 → 1

< Checking Method >
Measure the coil resistances between Red (common) and each phase.
The measured resistance value is normal if approximately 100Ω (*).
(*): Ambient Temperature 68°F (20°C)

MAINTENANCE

(Main Parts)

- Specifications for MVB

Model	Body: UKV25-D26, Motor for EXPV: UKV-A035
Working Temperature Range	-22°F to 158°F (-30°C to 70°C)
Refrigerant Used	R410A
Insulation Resistance	Min. 100MΩ (at 500VDC Megger)
Withstand Voltage	1800VAC for 1 Second
Rated Voltage	DC12V±1.2V
Drive Condition	83±5 PPS 1-2 Phase Excitation
Coil Resistance	46±3Ω (at 68°F (20°C))
Insulation Class	Class E

Wiring Diagram,
Drive Circuit and
Activation Mode

Order of Excitation (1-2 Phase Excitation)

Connector No.	Color of Lead Wire	Phase
1	Gray	Common (+)
2	-	-
3	Orange	A
4	Black	B
5	Yellow	Ā
6	Red	B̄

< Checking Method >
 Measure the coil resistances between connector No.1 (common) and each phase.
 The measured resistance value is normal if approximately 46Ω (*).
 (*): Ambient Temperature 68°F (20°C))

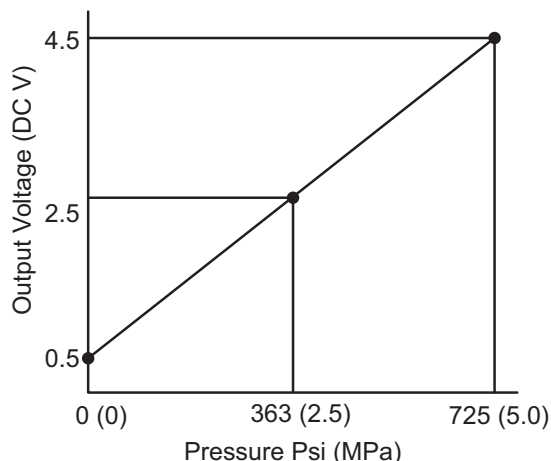
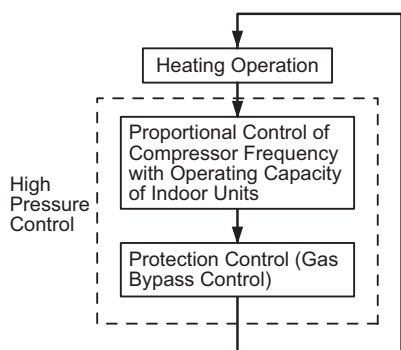
- Checking Method of Electronic Expansion Valve

Outdoor Unit Electronic Expansion Valve	
Locked (Fully Closed)	It is abnormal if the liquid pipe pressure does not increase during cooling operation
Locked (Slightly Open)	It is abnormal if the liquid pipe pressure does not increase and the outlet temperature of the expansion valve decreases after the cooling operation is started.
Locked (Fully Open)	It is abnormal under the following conditions. After heating operation for more than 30 min., the discharge gas temperature of compressor is not 50°F(10°C) higher than the condensing temperature and there is no other fault such as excessive charge of refrigerant.

4.3.1.7 Pressure Sensor

(1) High Pressure Control

The high pressure during heating operation is detected by a high pressure sensor, and compressor frequencies are controlled by the proportional controlling method with operating capacity of indoor units (or PID Control for Compressor Frequency) so that the high pressure is controlled in an appropriate range. The output of the high pressure sensor during heating operation performs protective control; gas by-pass control.

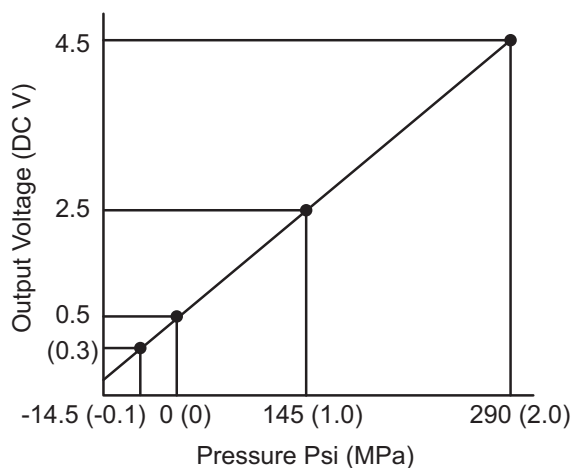
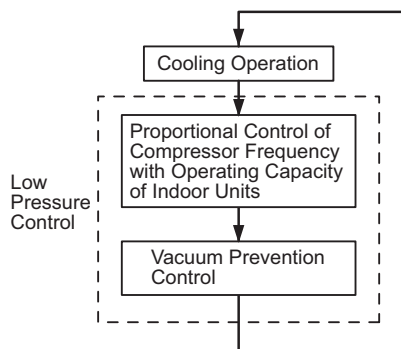


Output Characteristics of High Pressure Sensor

(2) Low Pressure Control

The suction pressure during cooling operation is detected by a low pressure sensor, and compressor frequencies are controlled by the proportional controlling method with operating capacity of indoor units (or PID Control for Compressor Frequency) so that the suction pressure is controlled in an appropriate range.

If the suction pressure is excessively low, the cooling can be insufficient and parts composing the refrigeration cycle can be damaged. For this reason, if the output of the low pressure sensor indicates vacuum and the value is maintained for 12 minutes or longer, the compressor is stopped for the purpose of protection.



Output Characteristics of Low Pressure Sensor

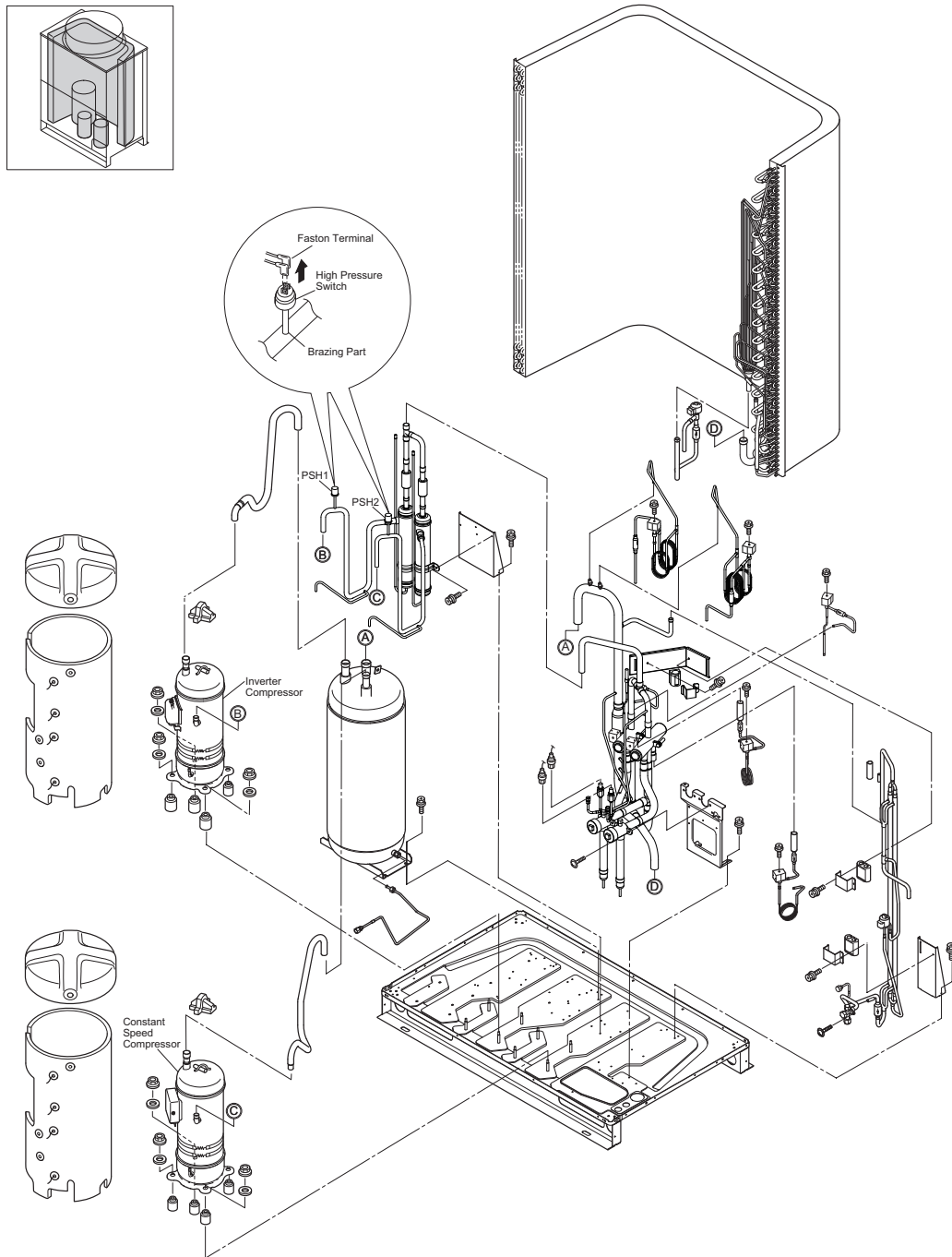
MAINTENANCE

(Main Parts)

4.3.1.8 High Pressure Protection Device

If the discharge pressure is excessively high, the compressor and the component parts of the refrigeration cycle can be damaged. Therefore, in case that the discharge pressure is higher than 4.15MPa (R410A), the protection control is activated and the compressor is stopped.

< Example > (H,Y)VAH(P,R)096B31S, (H,Y)VAH(P,R)120B31S
(H,Y)VAH(P,R)096B41S, (H,Y)VAH(P,R)120B41S



4.3.1.9 Electrical Coil Parts

Name of Parts	Model		Resistance (Ω)
Solenoid Valve for Gas Bypass	SR10PA		1,250 at 68°F(20°C)
Reversing Valve	Coil	STF-H01AQ3004UAA1	-
	Body for RVR1	STF-H04U4 ((H,Y) VAH(P,R)072B(3.4)IS) STF-H07U12 ((H,Y) VAH(P,R)096 and120B (3.4)IS)	
	Body for RVR2	STF-H07U12	

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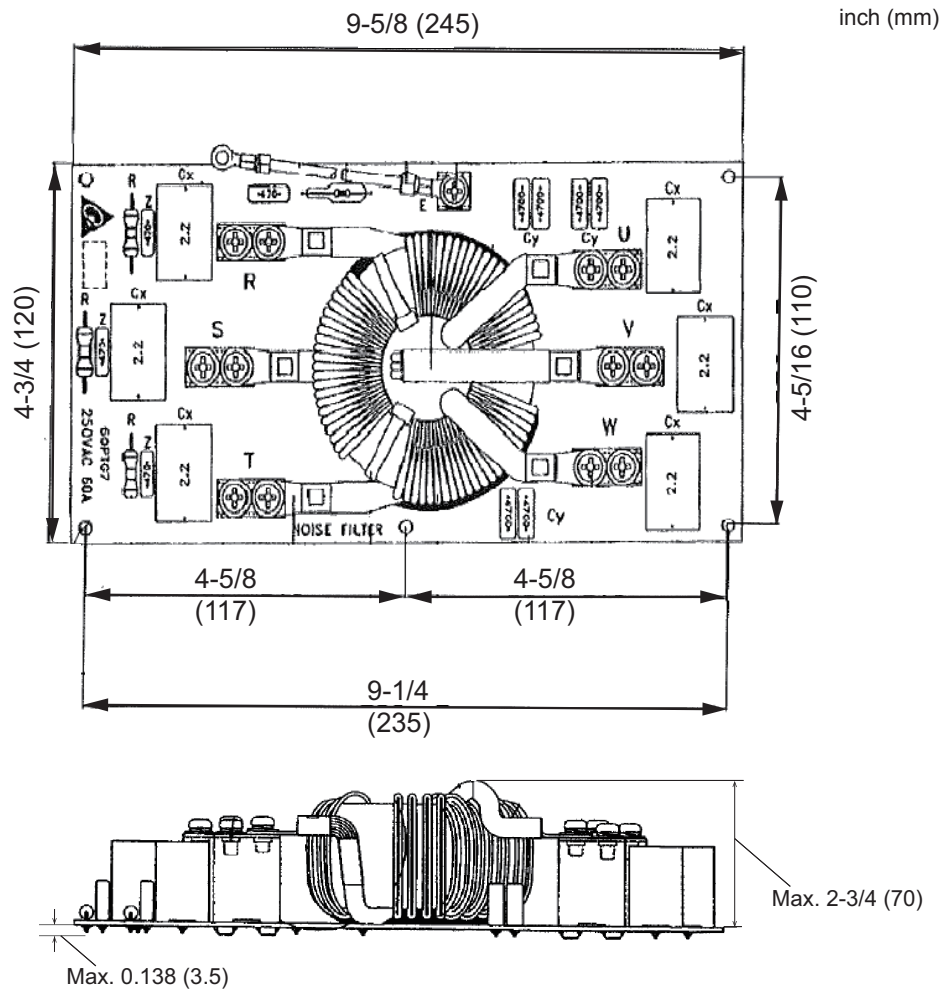
(Main Parts)

4.3.1.10 Noise Filter (NF1, NF2)

The noise filter decreases the leakage of noise made by the inverter to the power supply side. Terminals indicated with "LOAD" are connected to the inverter side and terminals indicated with "LINE" to the power supply side.

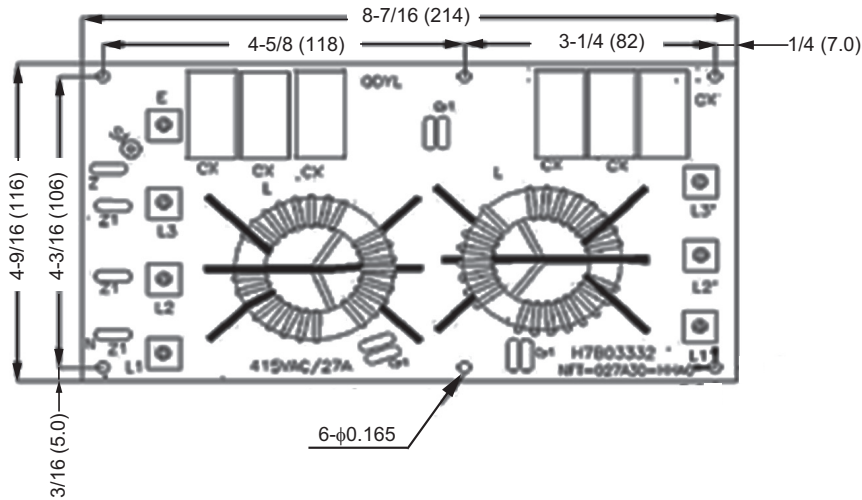
(1) Noise Filter (208/230V 60Hz; NF1)

Items	Specifications
Model	EFFQ-60TT-01
Rated Current	AC250V 60A
Permissible Temperature Range	-13°F (-25°C) to 185°F (85°C)
Circuit Diagram	



(2) Noise Filter (460V 60Hz; NF1)

Items	Specifications
Model	NFT-027A30-HHAO
Rated Current	AC 460V 27A
Permissible Temperature Range	-13°F (-25°C) to 149°F (65°C)
Circuit Diagram	

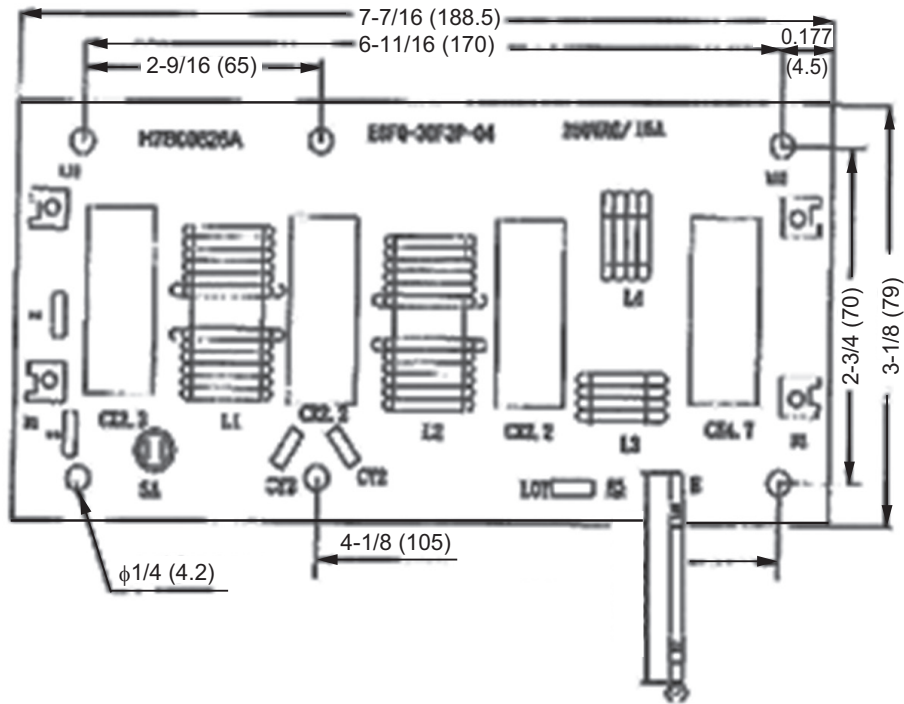


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(Main Parts)

(3) Noise Filter (460V 60Hz; NF2)

Items	Specifications
Model	ESFQ-30F3P-04
Rated Current	AC220V 15A
Permissible Temperature Range	-13°F (-25°C) to 140°F (60°C)
Circuit Diagram	

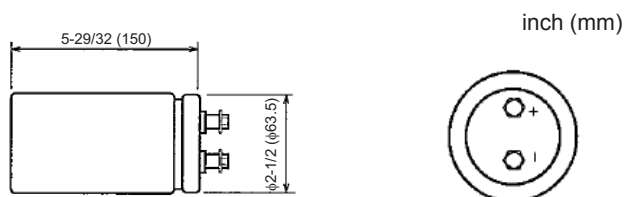


4.3.1.11 Capacitor (CB, CB1, CB2, CB3)

This part is used for changing the alternative current to the direct current for the inverter.

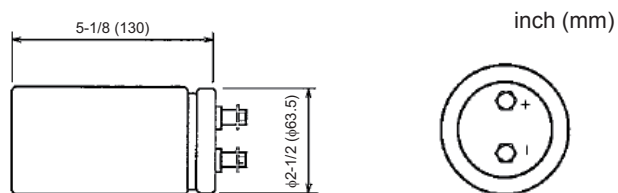
(1) Capacitor for Inverter (208/230V 60Hz; CB) (460V 60Hz; CB1, CB2)

Items	Specifications
Model	LNx2W472MSEaHE
Capacity of Static Electricity	4700 μ F
Rated Voltage	450V
Permissible Temperature Range	-13°F (-25°C) to 185°F (85°C)



(2) Capacitor for Fan Controller (460V 60Hz; CB3)

Items	Specifications
Model	ELXR451LGC272MDD0M, LNT2W272MSEaHE
Capacity of Static Electricity	2700 μ F
Rated Voltage	450V
Permissible Temperature Range	-13°F (-25°C) to 221°F (105°C)



(3) Checking Method of Capacitor

Refer to Section 4.3.1.1 "Inverter / • High Voltage Discharge Work for Replacing Parts (4)"

MAINTENANCE

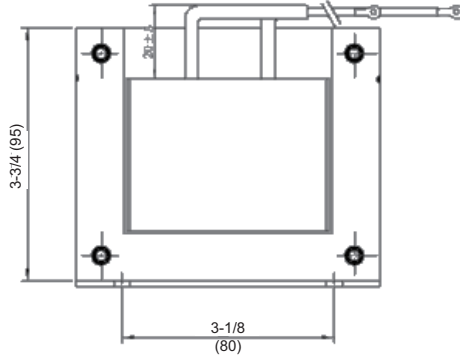
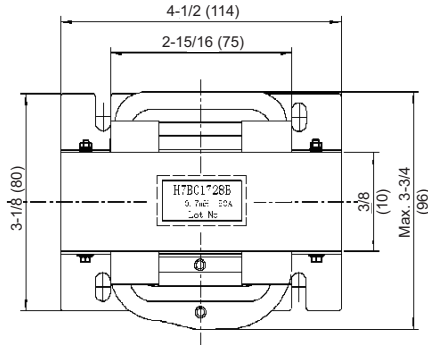
(Main Parts)

4.3.1.12 Reactor (DCL, DCL1, DCL2)

This part is used for changing the alternative current to the direct current for the inverter.

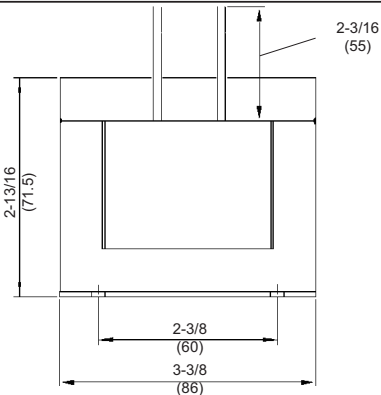
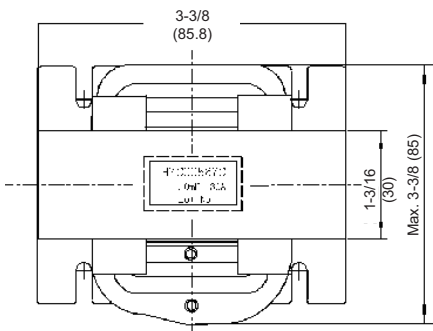
(1) Reactor for Inverter (208/230V 60Hz; DCL)

Items	Specifications
Character	0.7mH±10% (1KHz)
Rated Current	50A
Direct Current Resistance	11.2m Ω±20% (77°F (25°C))
Permissible Temperature Range	Max. 230°F (110°C)



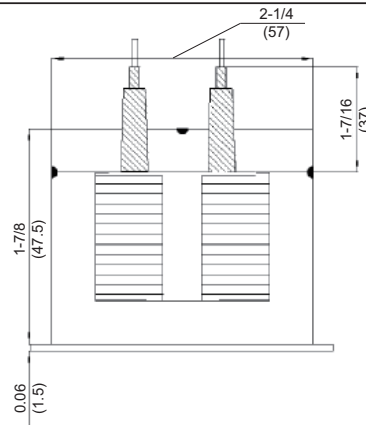
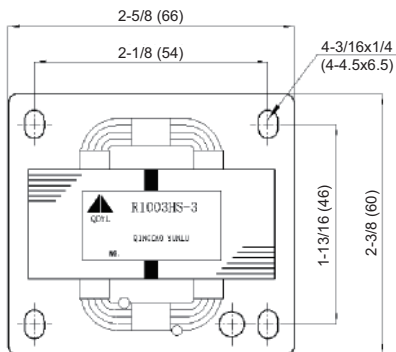
(2) Reactor for Inverter (460V 60Hz; DCL1)

Items	Specifications
Character	1.0mH ± 10% (1KHz)
Rated Current	30A
Direct Current Resistance	22.8m Ω 20% (77°F (25°C))
Permissible Temperature Range	Max. 230°F (110°C)



(3) Reactor for Fan Controller

Items	Specifications
Character	3.0mH ± 10% (1KHz)
Rated Current	10A
Direct Current Resistance	Max. 104m Ω (68°F (20°C))
Permissible Temperature Range	Max. 158°F (70°C)

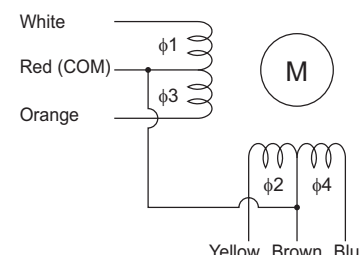
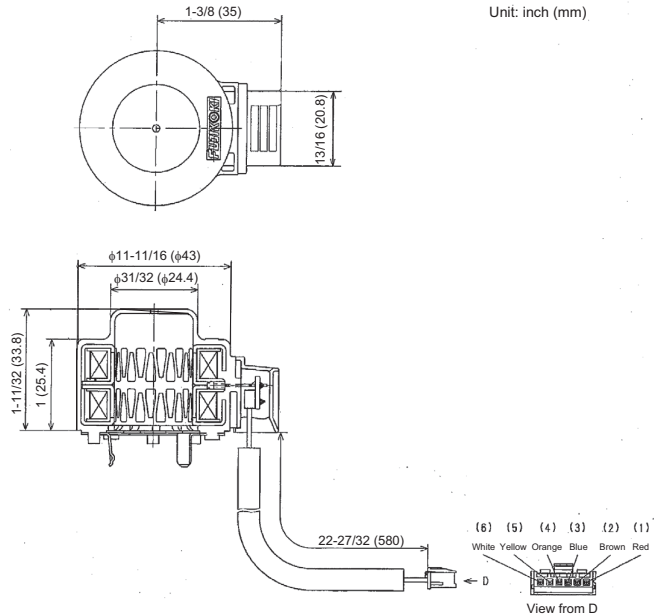


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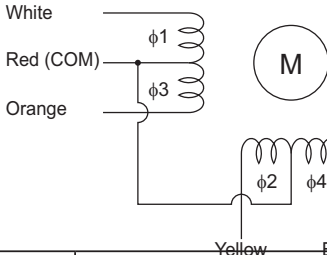
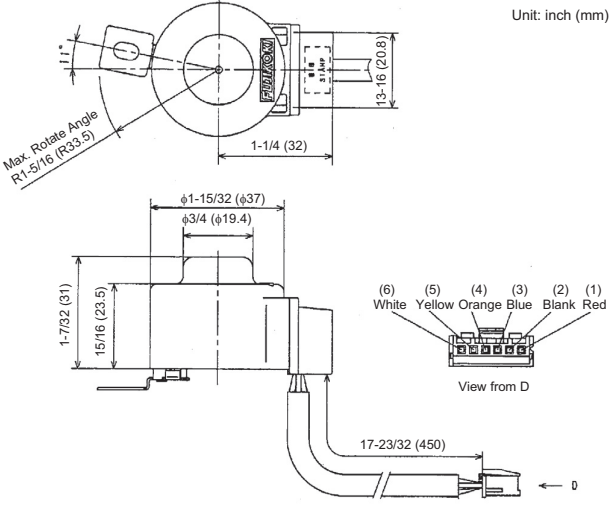
(Main Parts)

4.3.2.2 Electronic Expansion Valve

• Specifications for MVD1 and MVS1

Model	HAM-MD12HS-3																																																										
Working Temperature Range	-22°F to 158°F (-30°C to 70°C)																																																										
Refrigerant Used	R410A																																																										
Insulation Resistance	Min. 100MΩ (at 500VDC Megger)																																																										
Withstand Voltage	600VAC for 1 Second (with Break Amperage of 1mA)																																																										
Operating Voltage	DC12V±10%																																																										
Driving Current	260mA/phase (at 12VDC 68°F (20°C))																																																										
Coil Resistance	46Ω±4Ω/phase (at 68°F (20°C))																																																										
Insulation Class	Class E																																																										
Wiring Diagram, Drive Circuit and Activation Mode	 <table border="1"> <thead> <tr> <th rowspan="2">Phase No.</th> <th rowspan="2">Lead Wire Color</th> <th colspan="8">Switching Mode</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>φ1</td> <td>White</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>φ2</td> <td>Yellow</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>φ3</td> <td>Orange</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>φ4</td> <td>Blue</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table> <p> [Movement Mode] OPEN: 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 CLOSE: 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1 </p> <p> < Checking Method > Measure the coil resistances between Red (common) and each phase. The measured resistance value is normal if approximately 46Ω (*). (*): Ambient Temperature 68°F (20°C) </p>	Phase No.	Lead Wire Color	Switching Mode								1	2	3	4	5	6	7	8	φ1	White	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	φ2	Yellow	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	φ3	Orange	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	φ4	Blue	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
Phase No.	Lead Wire Color			Switching Mode																																																							
		1	2	3	4	5	6	7	8																																																		
φ1	White	ON	ON	OFF	OFF	OFF	OFF	OFF	ON																																																		
φ2	Yellow	OFF	ON	ON	ON	OFF	OFF	OFF	OFF																																																		
φ3	Orange	OFF	OFF	OFF	ON	ON	ON	OFF	OFF																																																		
φ4	Blue	OFF	OFF	OFF	OFF	OFF	ON	ON	ON																																																		
Appearance	 <p>Unit: inch (mm)</p>																																																										

• Specifications for MVD2 and MVS2

Model	CAM-MD12HS-9																																																										
Working Temperature Range	-22°F to 158°F (-30°C to 70°C)																																																										
Refrigerant Used	R410A																																																										
Insulation Resistance	Min. 100MΩ (at 500VDC Megger)																																																										
Withstand Voltage	500VAC for 1 Minute or 600VAC for 1 Second (with Break Amperage of 1mA)																																																										
Operating Voltage	DC12V±15%																																																										
Driving Current	260mA/phase (at 12VDC 68°F (20°C))																																																										
Coil Resistance	46Ω±4Ω/phase (at 68°F (20°C))																																																										
Insulation Class	Class E																																																										
Wiring Diagram, Drive Circuit and Activation Mode	 <table border="1"> <thead> <tr> <th rowspan="2">Phase No.</th> <th rowspan="2">Lead Wire Color</th> <th colspan="8">Switching Mode</th> </tr> <tr> <th>1</th> <th>2</th> <th>3</th> <th>4</th> <th>5</th> <th>6</th> <th>7</th> <th>8</th> </tr> </thead> <tbody> <tr> <td>φ1</td> <td>White</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>φ2</td> <td>Yellow</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>φ3</td> <td>Orange</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>φ4</td> <td>Blue</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table> <p>[Movement Mode] OPEN: 1 → 2 → 3 → 4 → 5 → 6 → 7 → 8 CLOSE: 8 → 7 → 6 → 5 → 4 → 3 → 2 → 1</p> <p>< Checking Method > Measure the coil resistances between Red (common) and each phase. The measured resistance value is normal if approximately 46Ω *). (*): Ambient Temperature 68°F (20°C)</p>	Phase No.	Lead Wire Color	Switching Mode								1	2	3	4	5	6	7	8	φ1	White	ON	ON	OFF	OFF	OFF	OFF	OFF	ON	φ2	Yellow	OFF	ON	ON	ON	OFF	OFF	OFF	OFF	φ3	Orange	OFF	OFF	OFF	ON	ON	ON	OFF	OFF	φ4	Blue	OFF	OFF	OFF	OFF	OFF	ON	ON	ON
Phase No.	Lead Wire Color			Switching Mode																																																							
		1	2	3	4	5	6	7	8																																																		
φ1	White	ON	ON	OFF	OFF	OFF	OFF	OFF	ON																																																		
φ2	Yellow	OFF	ON	ON	ON	OFF	OFF	OFF	OFF																																																		
φ3	Orange	OFF	OFF	OFF	ON	ON	ON	OFF	OFF																																																		
φ4	Blue	OFF	OFF	OFF	OFF	OFF	ON	ON	ON																																																		
Appearance	 <p>Unit: inch (mm)</p>																																																										

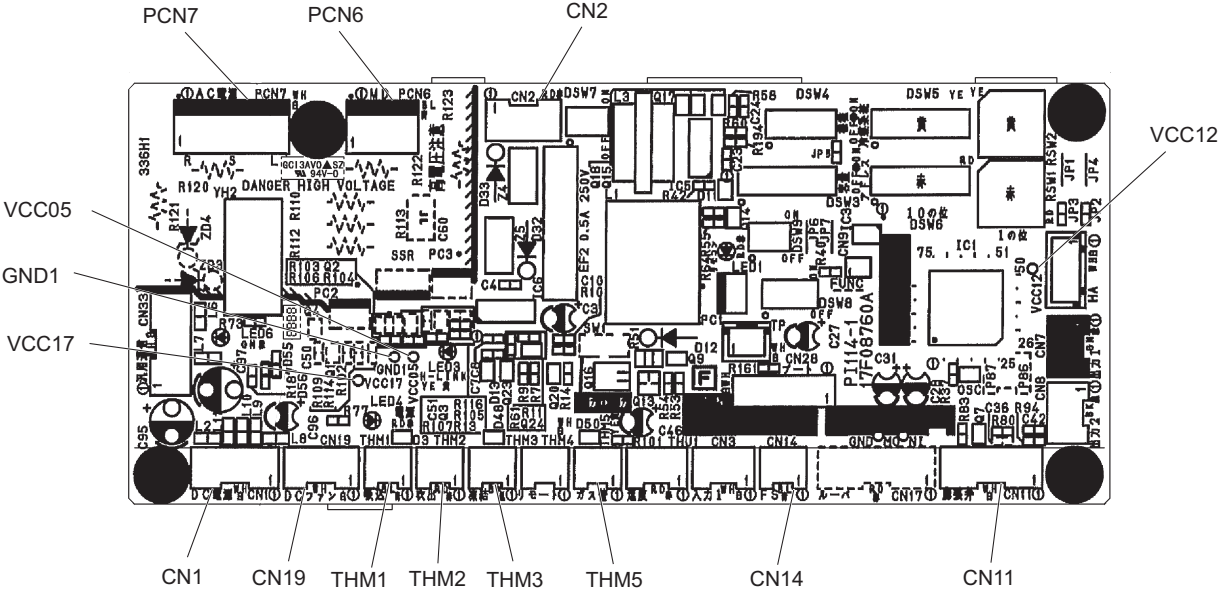
• Checking Method of Electronic Expansion Valve
 Refer to Section 4.3.1.6 “Electronic Expansion Valve”

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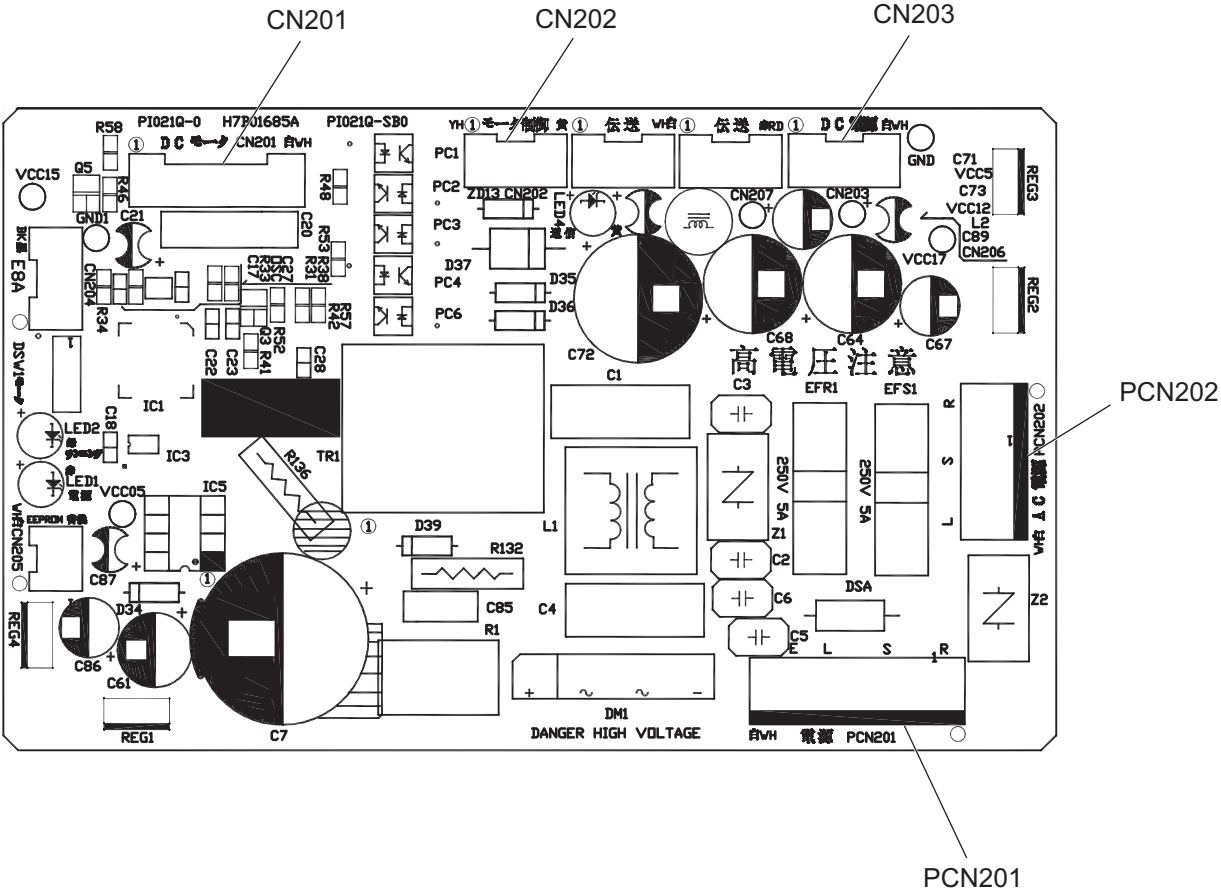
(Main Parts)

- Ducted Slim

Arrangement of Connectors and Check Points for PCB1 (PI114)

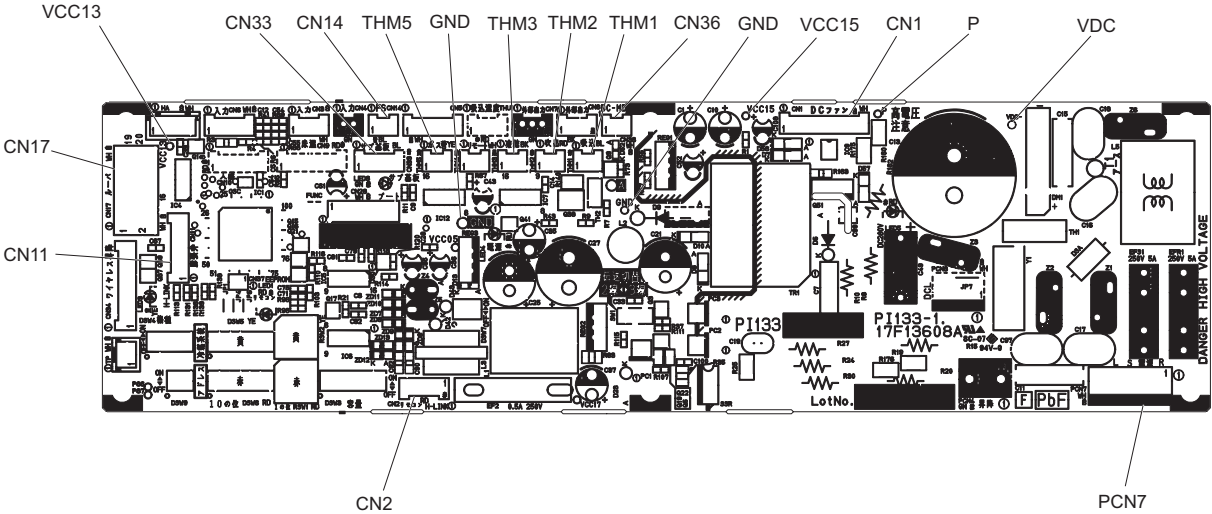


Arrangement of Connectors and Check Points for PCB2 (PI021Q)



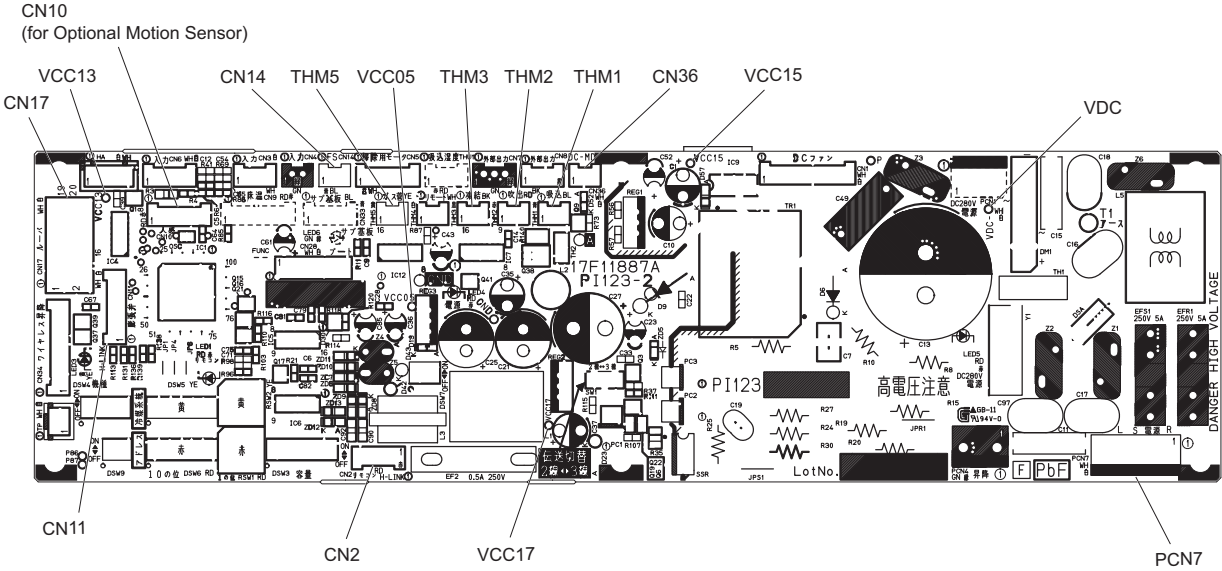
(2) 4-Way Cassette Type

Arrangement of Connectors and Check Points for PCB1 (PI133)



(3) 1-Way Cassette Type

Arrangement of Connectors and Check Points for PCB1 (PI123)

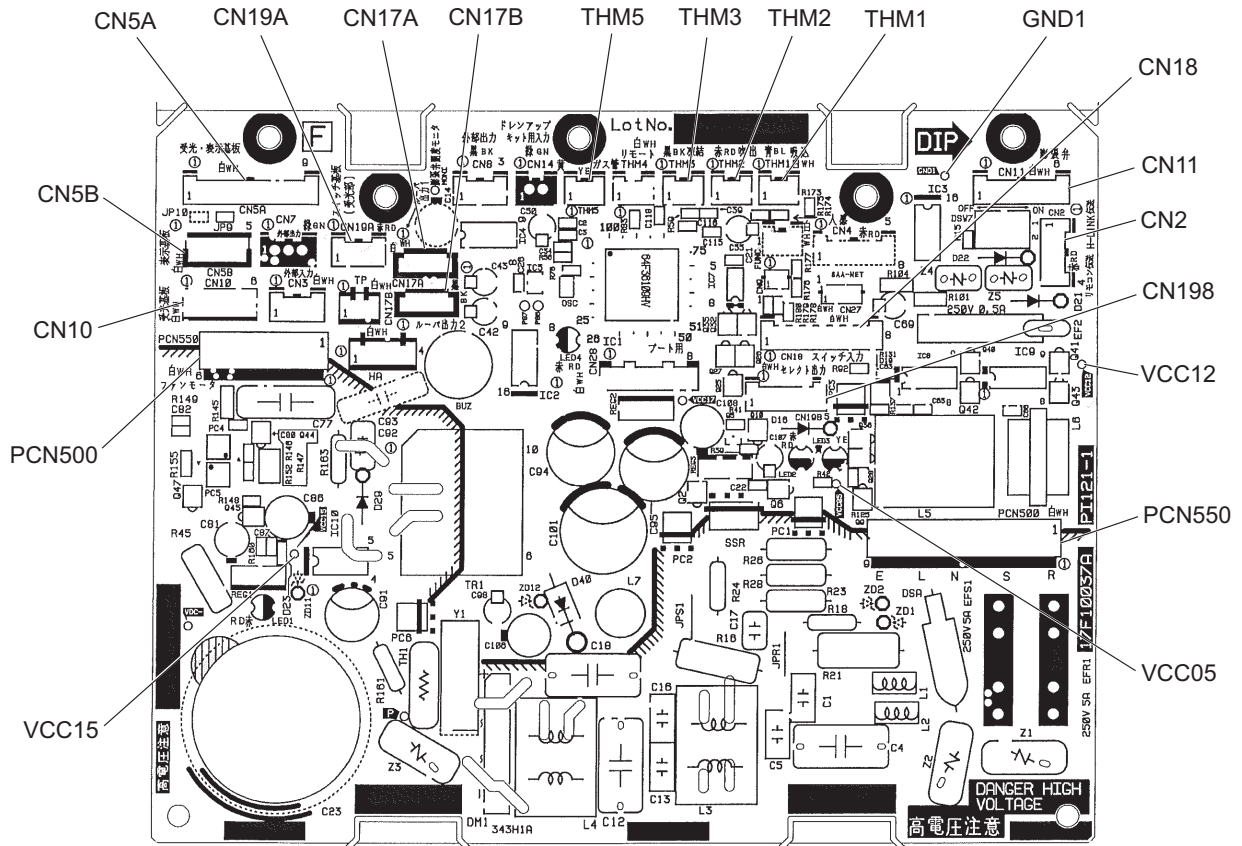


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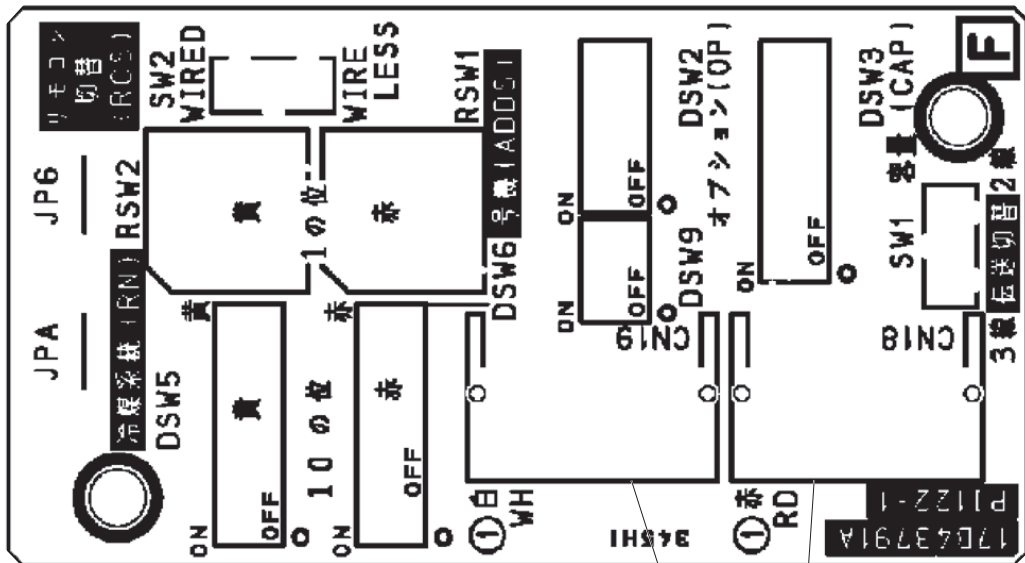
(Main Parts)

(4) Wall Mount Type

Arrangement of Connectors and Check Points for PCB1 (PI121)



Arrangement of Connectors and Check Points for PCB2 (PI122)



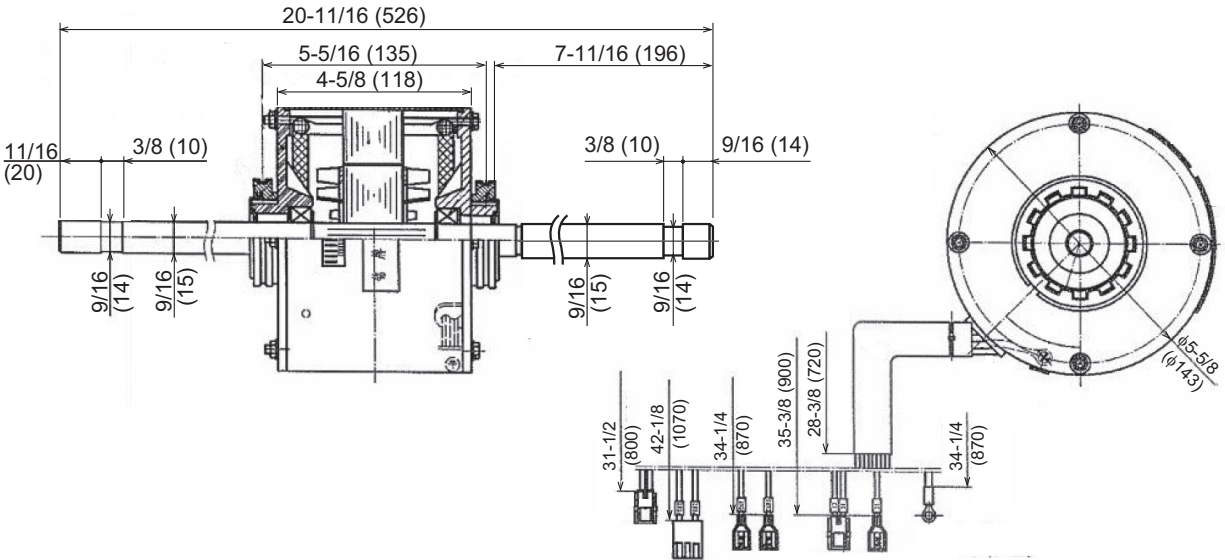
CN19

CN18

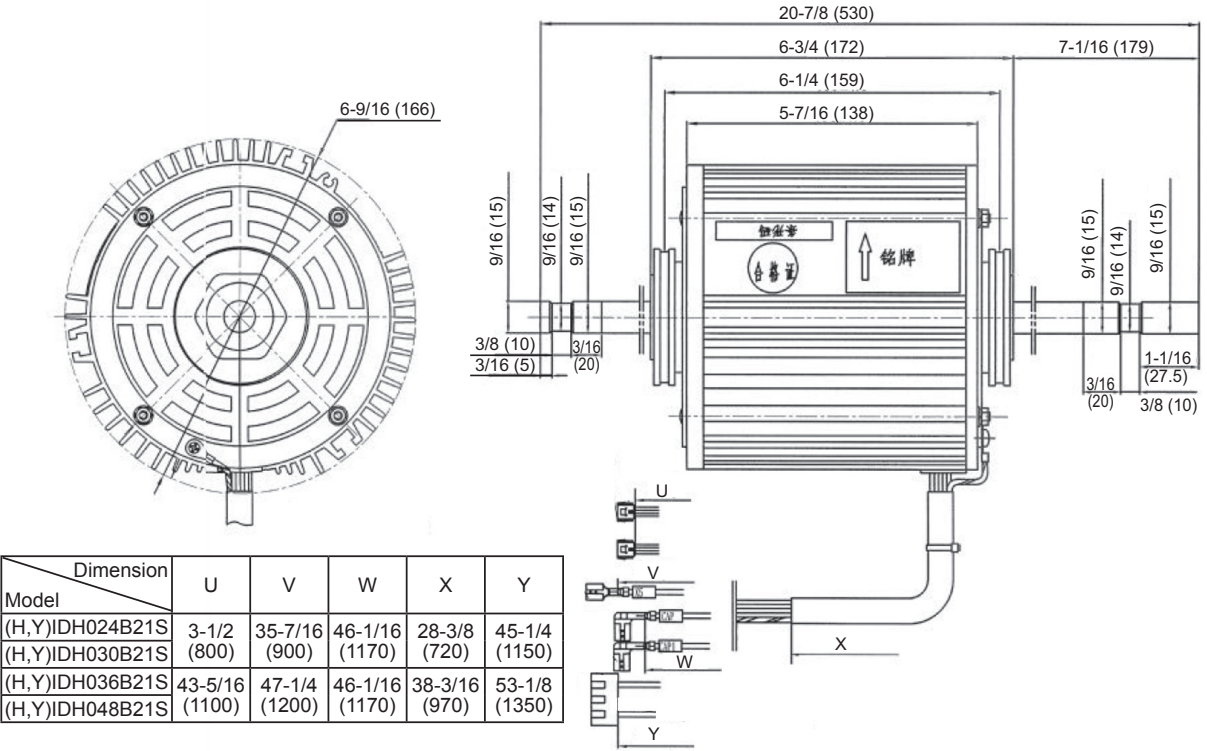
4.3.3.2 Fan Motor

(1) Ducted Type

- Ducted High Static (Model: (H,Y)IDH018B21S)



- Ducted High Static (Model: (H,Y)IDH024~048B21S)

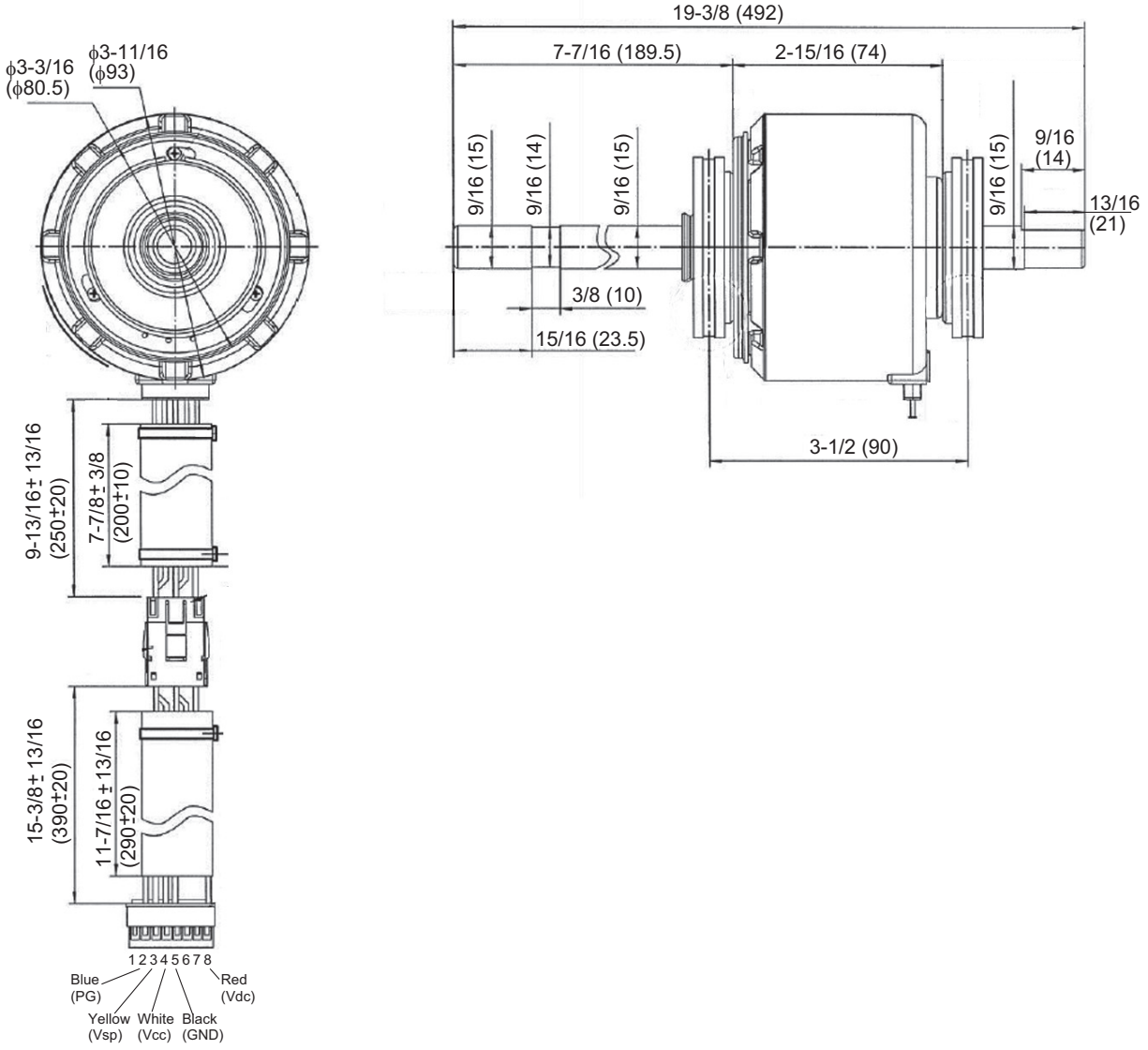


Dimension \ Model	U	V	W	X	Y
(H,Y)IDH024B21S	3-1/2	35-7/16	46-1/16	28-3/8	45-1/4
(H,Y)IDH030B21S	(800)	(900)	(1170)	(720)	(1150)
(H,Y)IDH036B21S	43-5/16	47-1/4	46-1/16	38-3/16	53-1/8
(H,Y)IDH048B21S	(1100)	(1200)	(1170)	(970)	(1350)

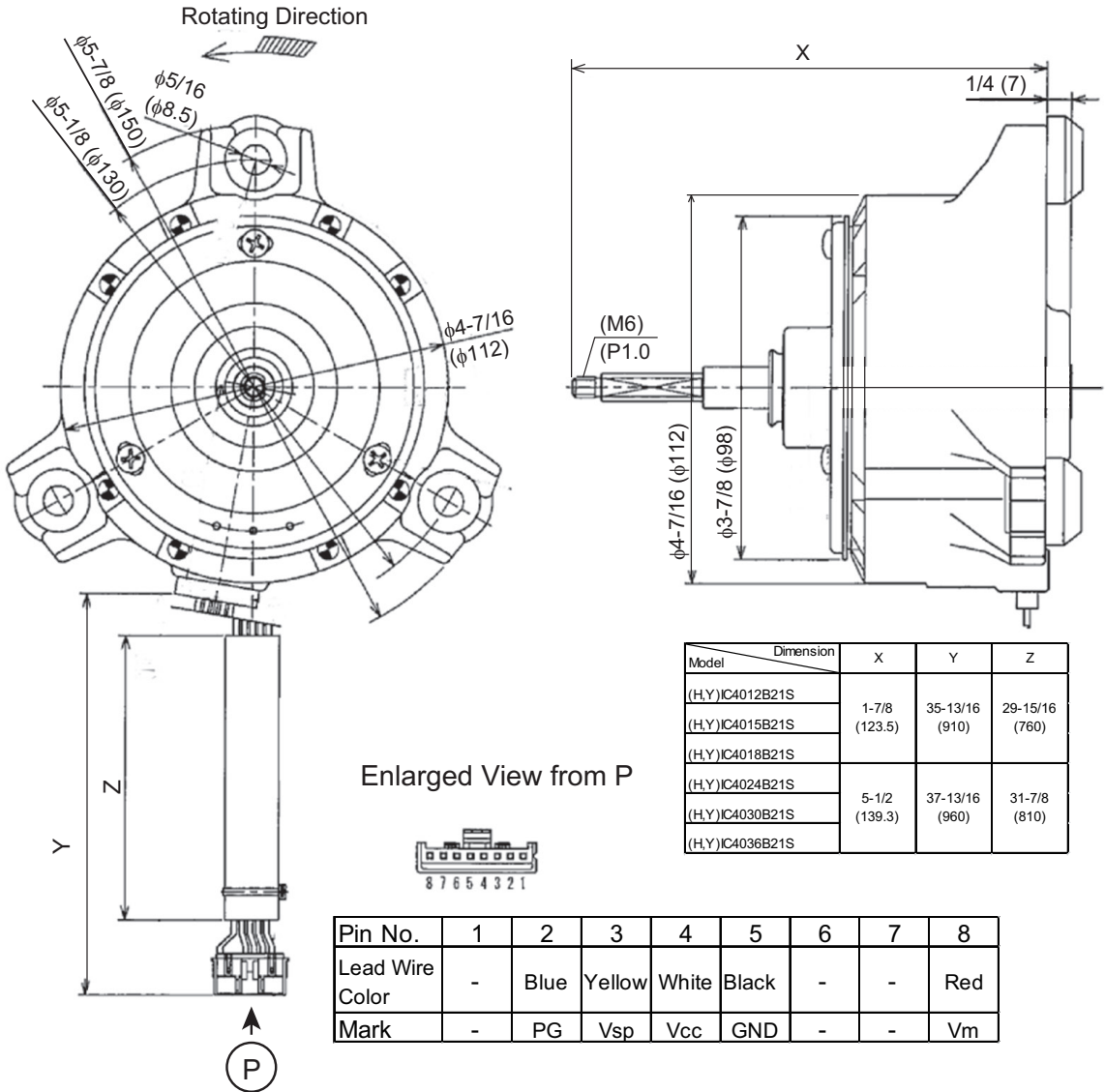
MAINTENANCE

(Main Parts)

- Ducted Slim (Model: (H,Y)IDS015,018B21S)



(2) 4-Way Cassette Type



Model	Dimension		
	X	Y	Z
(H,Y)IC4012B21S	1-7/8	35-13/16	29-15/16
(H,Y)IC4015B21S	(123.5)	(910)	(760)
(H,Y)IC4018B21S			
(H,Y)IC4024B21S	5-1/2	37-13/16	31-7/8
(H,Y)IC4030B21S	(139.3)	(960)	(810)
(H,Y)IC4036B21S			

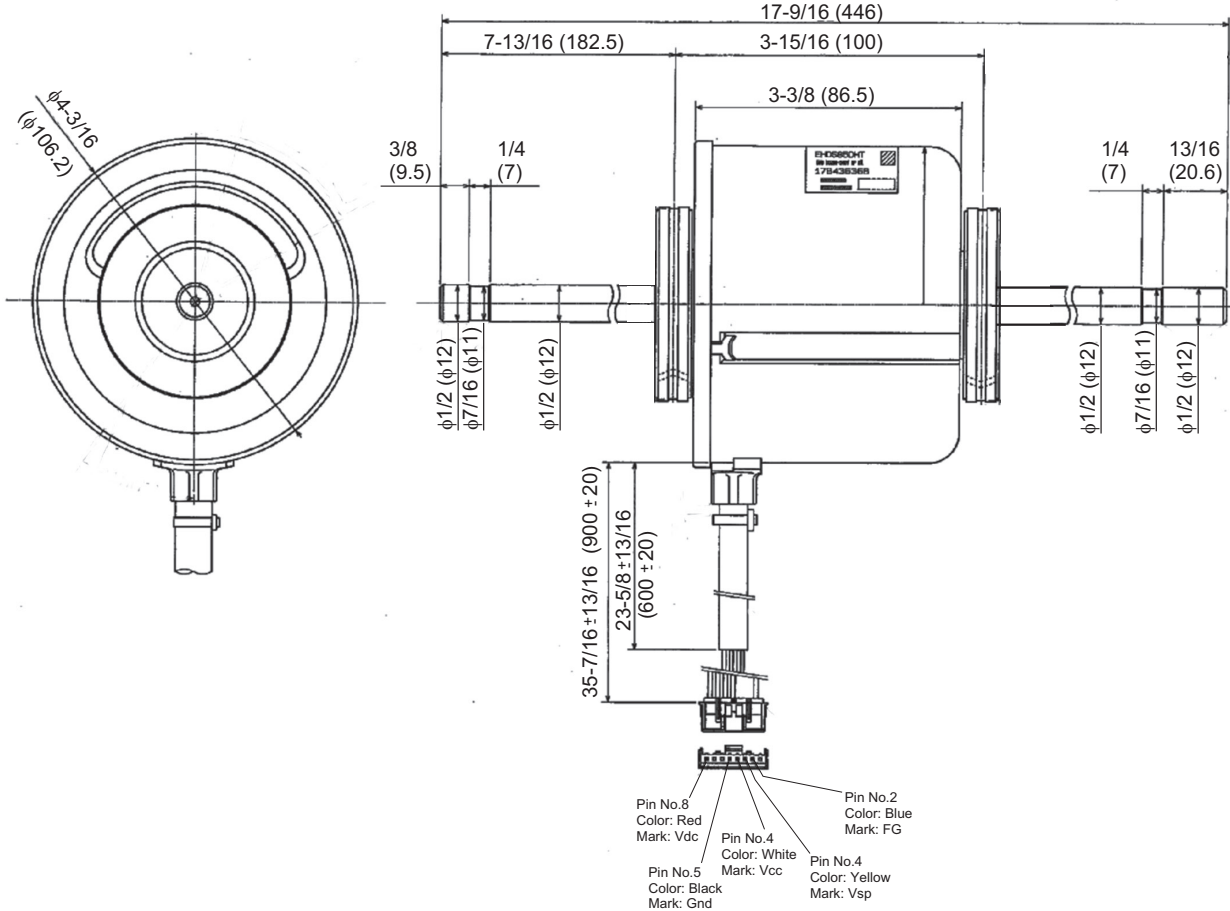
Enlarged View from P

Pin No.	1	2	3	4	5	6	7	8
Lead Wire Color	-	Blue	Yellow	White	Black	-	-	Red
Mark	-	PG	Vsp	Vcc	GND	-	-	Vm

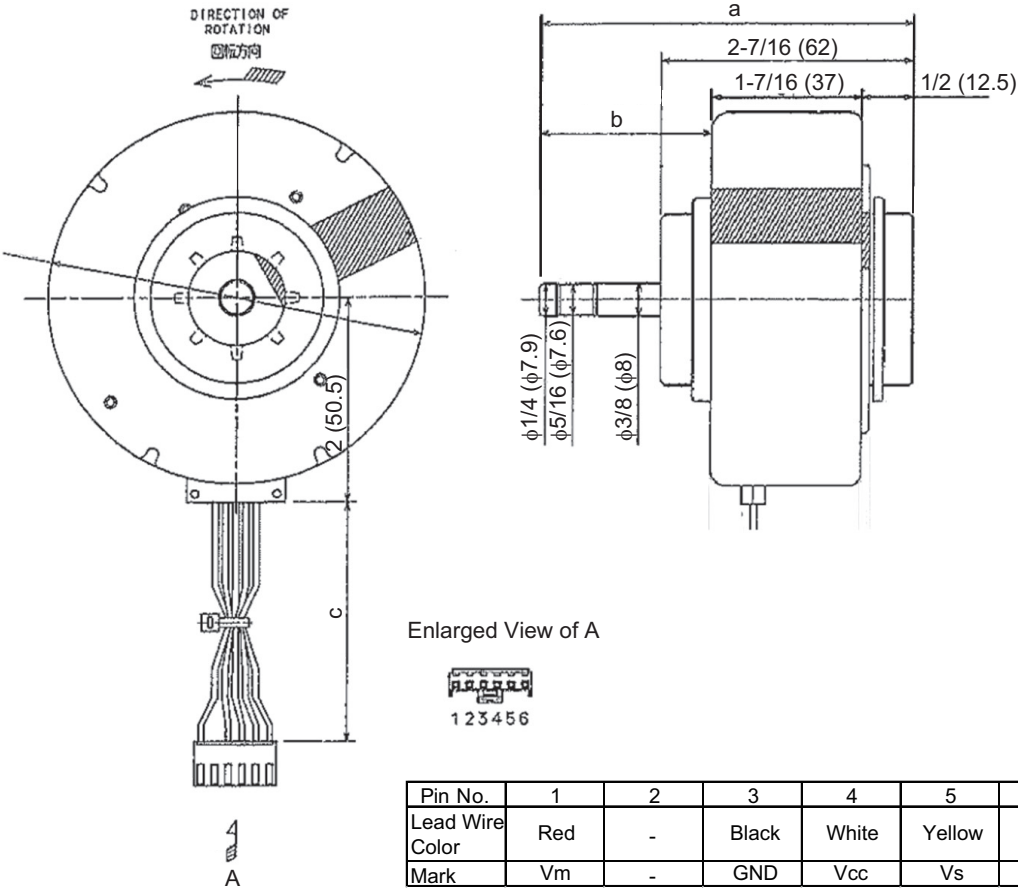
MAINTENANCE

(Main Parts)

(3) For 1-Way Cassette Type



(4) Wall Mount Type



Enlarged View of A

Pin No.	1	2	3	4	5	6
Lead Wire Color	Red	-	Black	White	Yellow	Blue
Mark	Vm	-	GND	Vcc	Vs	PG

Unit: inch (mm)

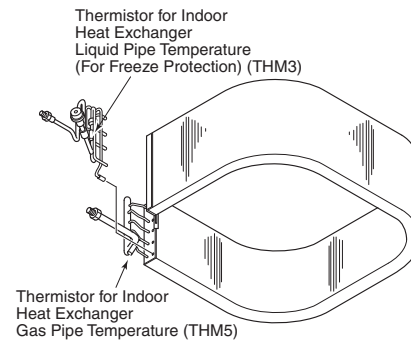
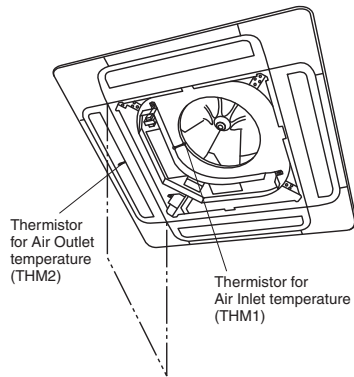
Dimension	a	b	c
TIWM006B21S	3-11/16 (93)	1-11/16 (43.5)	13-3/8 (340)
TIWM008B21S			
TIWM012B21S			
TIWM015B21S			
TIWM018B21S			
TIWM024B21S	3-5/8 (91.3)	1-5/8 (41.8)	22-13/16 (590)

MAINTENANCE

(Main Parts)

4.3.3.3 Thermistor

(1) Position of Thermistor (In Case of 4-Way Cassette Type)



(2) Thermistor for Indoor Suction Air Temperature (For Room Temperature Control)

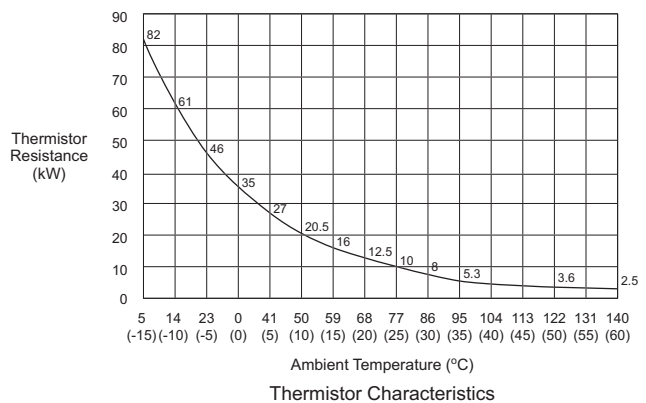
The room temperature is controlled by the thermistor for indoor suction air temperature detecting the temperature at the suction air inlet of the indoor unit.

The setting temperature is indicated on the L.C.D. of the wired controller switch by number.

Adjust the setting temperature for prevention from excessive cooling and heating. It is recommended to set the temperature as follows;

Economical Cooling Operation: 81°F (27°C) to 84°F (29°C) / Economical Heating Operation: 64°F (18°C) to 68°F (20°C)

The resistance characteristics of thermistor is shown in the above figure.



ATTENTION:

The thermo-off value of the indoor unit air inlet thermistor is set at the temperature higher than the value indicated on the wired controller switch by 7°F (4°C) and the maximum is 86°F (30°C), because the suction air temperature during heating operation has a tendency to become higher than that of the occupied zone, intending comfortable heating operation.

(3) Thermistor for Indoor Discharge Air Temperature (For Discharge Air Temperature Control)

The thermistor for indoor discharge air temperature is utilized for the control of prevention from cold air discharge in heating operation, etc.

The resistance characteristics of thermistor is shown in the above figure.

When the temperature of the heat exchanger is below 32°F (0°C), thermostat is turned OFF automatically and over 57°F (14°C), thermostat is turned ON again.

Prevention from freezing onto the heat exchanger in COOL and DRY operation.

(4) Thermistor for Liquid Pipe Temperature of Indoor Heat Exchanger

The resistance characteristics of thermistor is shown in the above figure.

When the temperature of the heat exchanger is below 32°F (0°C), thermostat is turned OFF automatically and over 57°F (14°C), thermostat is turned ON again.

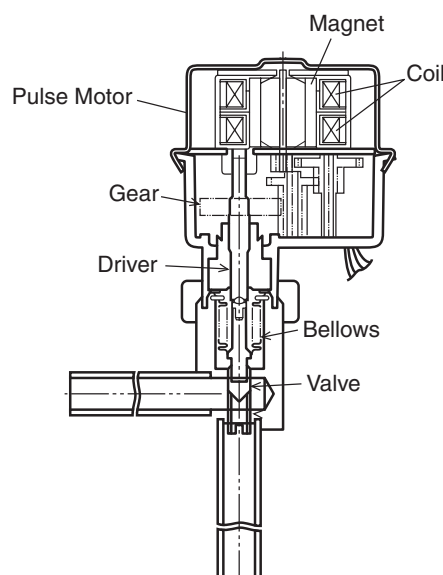
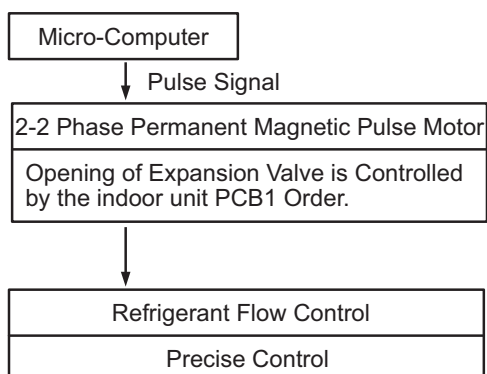
Prevention from freezing onto the heat exchanger in COOL and DRY operation.

(5) Thermistor for Gas Pipe Temperature of Indoor Heat Exchanger

The evaporating temperature in heating operation is detected.

The resistance characteristics of thermistor is shown in the above figure.

4.3.3.4 Electronic Expansion Valve



* Electronic Expansion Valve

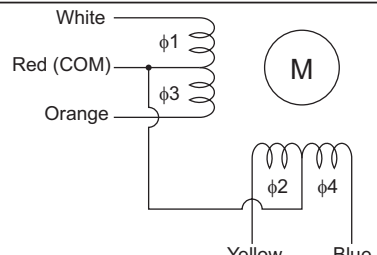
The following electronic expansion valves are adopted to each indoor unit.

Indoor Unit	Applicable Model	Expansion Valve Body	Motor for EXPV
Ducted High Static	(H,Y)IDH018B21S	PAM-B80YGHS-1	PAM-MD12HS-5
	(H,Y)IDH024B21S		
	(H,Y)IDH030B21S		
	(H,Y)IDH036B21S	PAM-BA0YGHS-1	
	(H,Y)IDH048B21S		
Ducted Medium Static	(H,Y>IDM006B21S	PAM-B40YGHS-1	PAM-MD12HS-5
	(H,Y>IDM008B21S		
	(H,Y>IDM012B21S		
	(H,Y>IDM015B21S	PAM-B80YGHS-1	
	(H,Y>IDM018B21S		
	(H,Y>IDM024B21S		
	(H,Y>IDM030B21S	PAM-BA0YGHS-1	
	(H,Y>IDM036B21S		
	(H,Y>IDM048B21S		
Ducted Slim	(H,Y)IDS006B21S	PAM-B40YGHS-1	PAM-MD12HS-5
	(H,Y)IDS008B21S		
	(H,Y)IDS012B21S		
	(H,Y)IDS015B21S	PAM-B80YGHS-1	
	(H,Y)IDS018B21S		
4-Way Cassette	(H,Y)IC4012B21S	PAM-B40YGHS-1	PAM-MD12HS-4
	(H,Y)IC4015B21S		
	(H,Y)IC4018B21S	PAM-B80YGHS-1	
	(H,Y)IC4024B21S		
	(H,Y)IC4030B21S	PAM-BA0YGHS-1	
	(H,Y)IC4036B21S		
1-Way Cassette	(H,Y)IC1006B21S	PAM-B40YGHS-1	PAM-MD12HS-14
	(H,Y)IC1008B21S		
	(H,Y)IC1012B21S		
	(H,Y)IC1015B21S		
Wall Mount	TIWM006B21S	PAM-B40YGHS-1	PAM-MD12HS-11
	TIWM008B21S		
	TIWM012B21S		
	TIWM015B21S	PAM-B80YGHS-1	
	TIWM018B21S		
	TIWM024B21S		

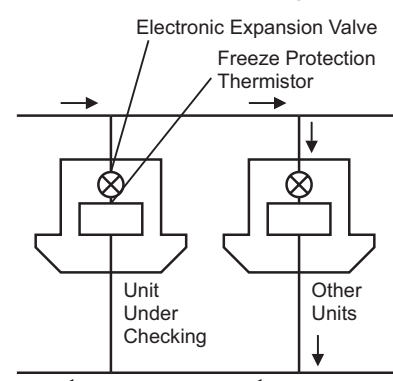
MAINTENANCE

(Main Parts)

- Specifications

Working Temperature Range	-22°F to 158°F (-30°C to 70°C)																									
Refrigerant Used	R410A																									
Insulation Resistance	Min. 100MΩ (at 500VDC Megger)																									
Withstand Voltage	500VAC for 1 Minute or 600VAC for 1 Second																									
Rated Voltage	DC12V±1.2V																									
Drive Condition	100 - 200 PPS 2-2 Phase Excitation																									
Coil Resistance	150±15Ω (68°F (20°C))																									
Insulation Class	Class E																									
Wiring Diagram, Drive Circuit and Activation Mode	 <table border="1" style="margin: 10px auto; border-collapse: collapse;"> <thead> <tr> <th>Phase</th> <th>1</th> <th>2</th> <th>3</th> <th>4</th> </tr> </thead> <tbody> <tr> <td>φ1</td> <td>ON</td> <td>OFF</td> <td>OFF</td> <td>ON</td> </tr> <tr> <td>φ2</td> <td>ON</td> <td>ON</td> <td>OFF</td> <td>OFF</td> </tr> <tr> <td>φ3</td> <td>OFF</td> <td>ON</td> <td>ON</td> <td>OFF</td> </tr> <tr> <td>φ4</td> <td>OFF</td> <td>OFF</td> <td>ON</td> <td>ON</td> </tr> </tbody> </table> <p style="margin: 5px auto;"> OPEN: 4 → 3 → 2 → 1 → 4 CLOSE: 1 → 2 → 3 → 4 → 1 </p> <p style="margin: 10px auto;"> Checking Method Measure coil resistances between Red (common) and each phase. The measured resistance value is normal if approximately 150 Ω. *) (*) Ambient Temperature 68°F (20°C) </p>	Phase	1	2	3	4	φ1	ON	OFF	OFF	ON	φ2	ON	ON	OFF	OFF	φ3	OFF	ON	ON	OFF	φ4	OFF	OFF	ON	ON
Phase	1	2	3	4																						
φ1	ON	OFF	OFF	ON																						
φ2	ON	ON	OFF	OFF																						
φ3	OFF	ON	ON	OFF																						
φ4	OFF	OFF	ON	ON																						

- Checking Method of Electronic Expansion Valve for Indoor Unit

Indoor Unit Electronic Expansion Valve	
Locked (Fully Closed)	Check for the liquid pipe temperature during heating operation. It is abnormal if the temperature does not increase.
Locked (Slightly Open)	It is abnormal under the following conditions. The temperature of freeze protection thermistor becomes lower than the suction air temperature when the unit being checked is stopped and the other units are in cooling operation.
Locked (Fully Open)	

5. External Input/Output and Function Setting

5.1 DIP Switch Settings of Outdoor Unit

TURN OFF all power sources before setting.

Without turning OFF the power sources, the switches will not work and the settings will be invalid.

(However, DSW4-No.1, 2, 4, 6, DSW7-No.4 and push switches can be operated when the power source is ON.)

The “■” mark indicates the positions of DIP switches.

• **Initial Setting**

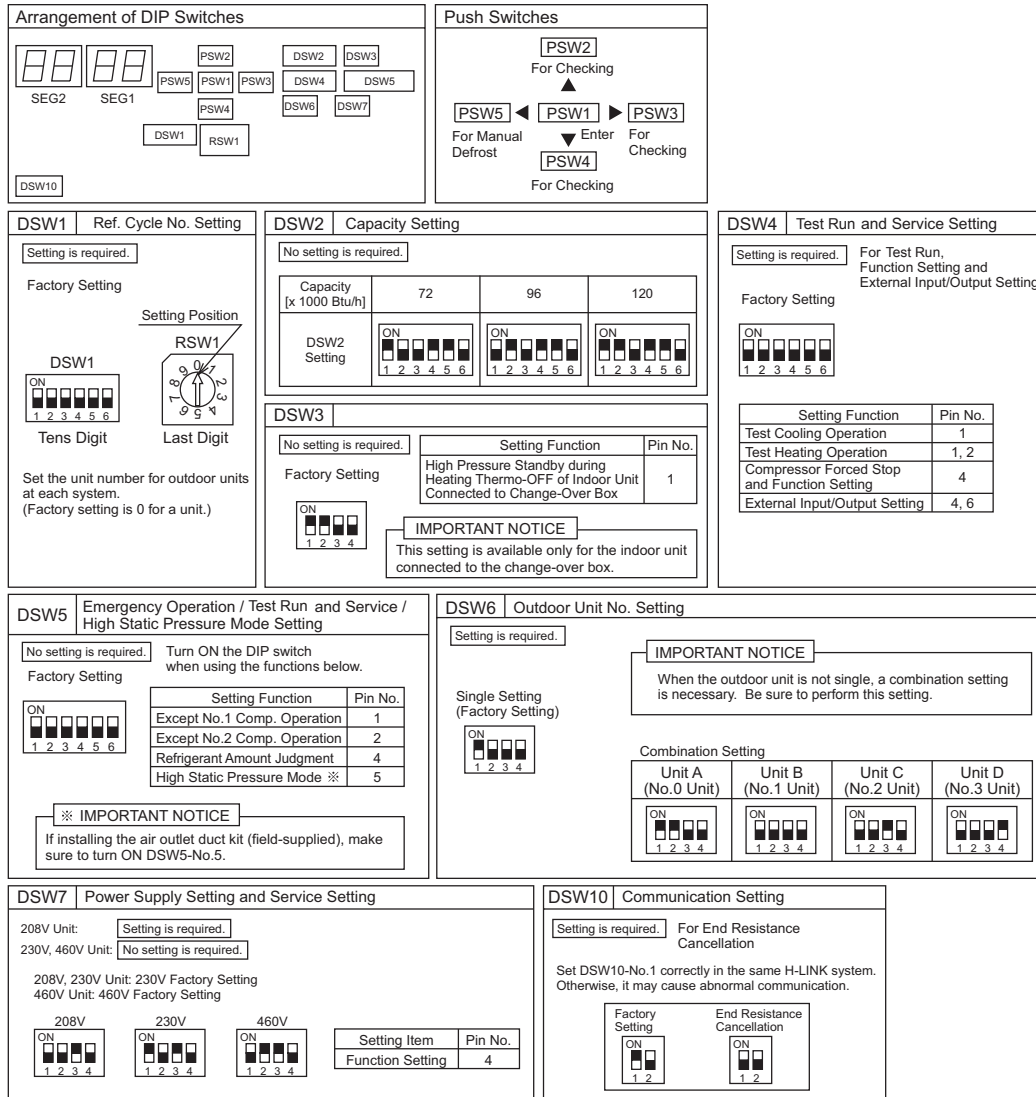


Fig. 5.1 DSW Setting

NOTE:

Thermo-ON: The outdoor unit and some indoor units are running.

Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

5.2 High Static Pressure Setting (DSW5-No.5: ON)

Turn ON the DSW5-No.5 pin for the high static pressure setting.

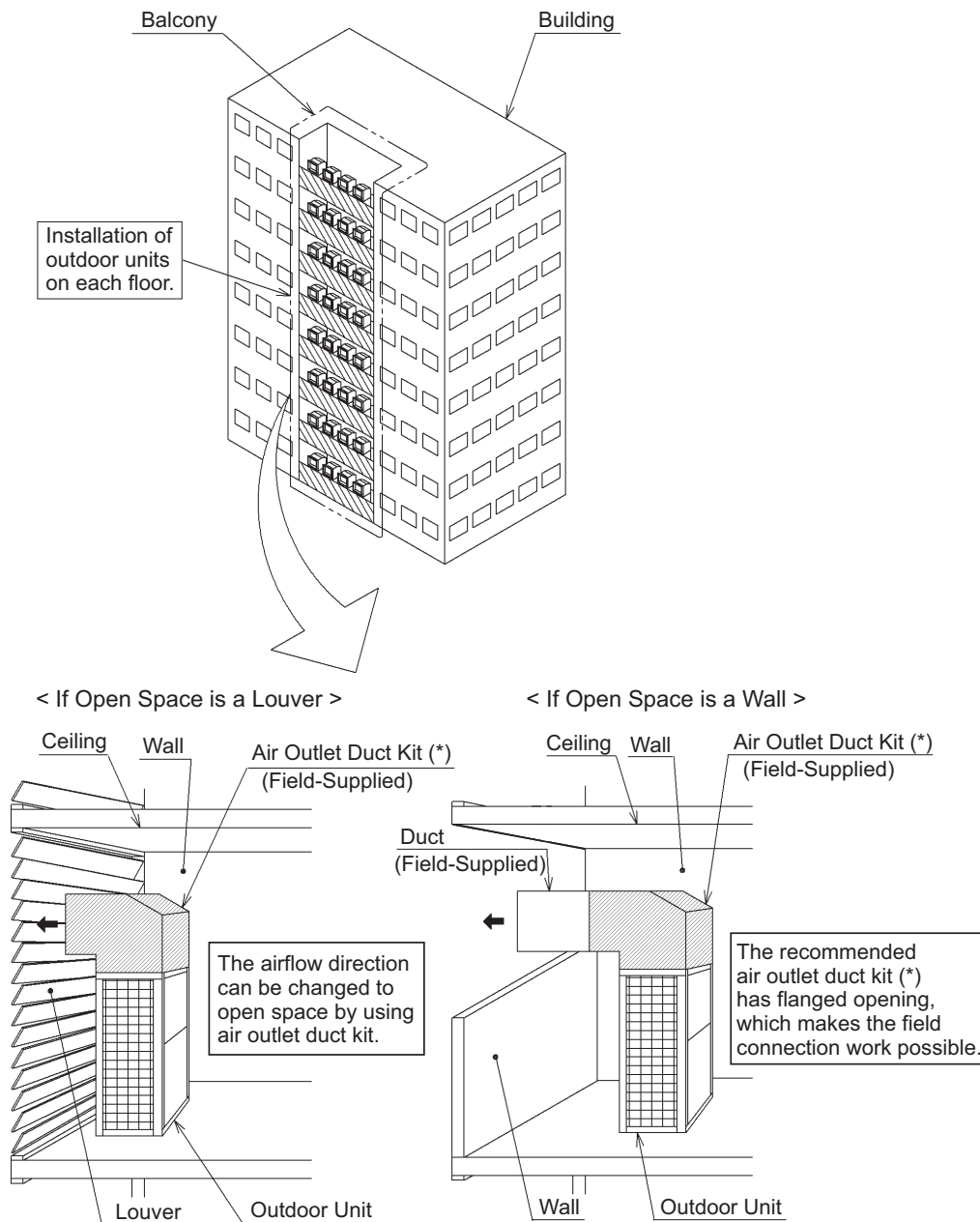
This setting is required when adopting the field-supplied outlet duct in the field.

This setting enables high static pressure operation up to a maximum of 0.24 in.W.G. (60Pa).

When the outdoor unit is installed in spaces such as a balcony or a floor where an external static pressure is required to secure a louver or a duct, this setting should be used.

NOTES:

- 1.If there is a combination of outdoor units, set this function for all the outdoor units.
- 2.While the unit operates in high static pressure mode, the operation sound value increases by 3dB from the nominal value.

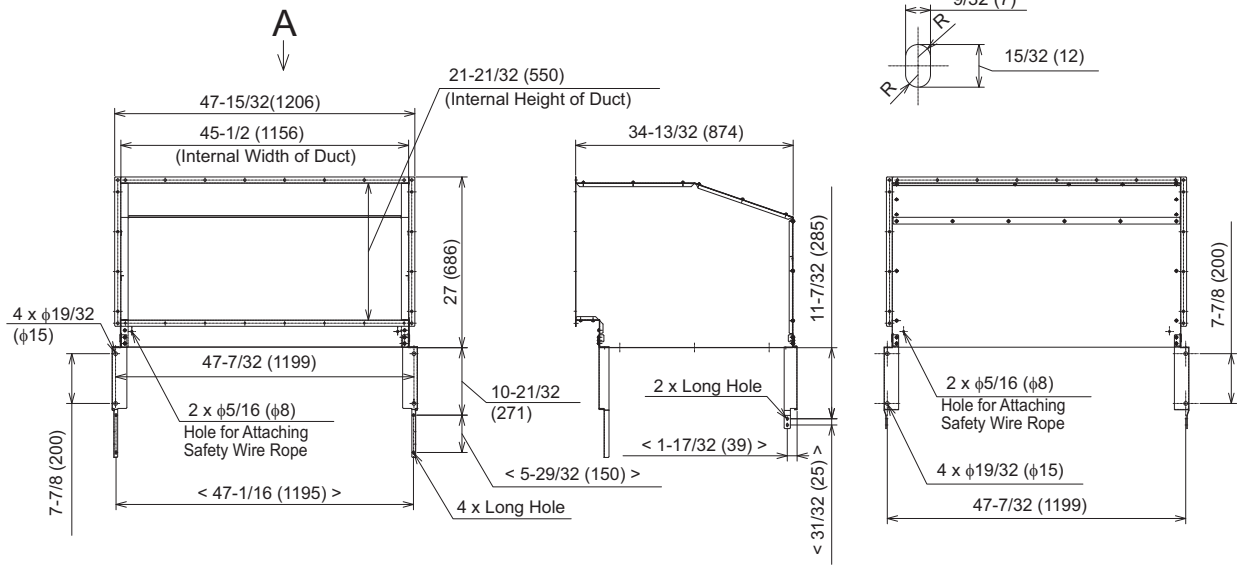


NOTE:

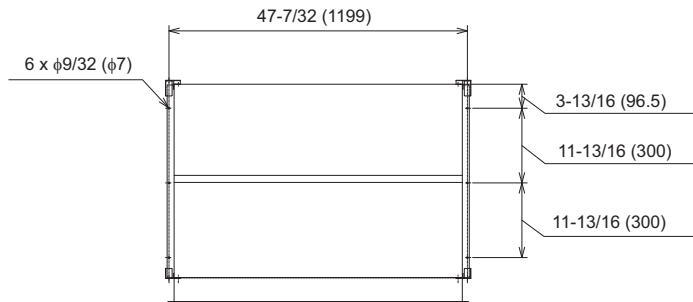
When installing the duct (field-supplied), make sure not to flow the outlet airflow of the outdoor unit into the air inlet of the outdoor unit. If not, the operation range will be limited due to increasing high pressure in the cooling operation or decreasing low pressure in the heating operation resulting in a malfunction of the unit.

- For (H,Y)VAHR096-120B(3,4)1S, (H,Y)VAHP096-120B(3,4)1S

Dimensional Drawing

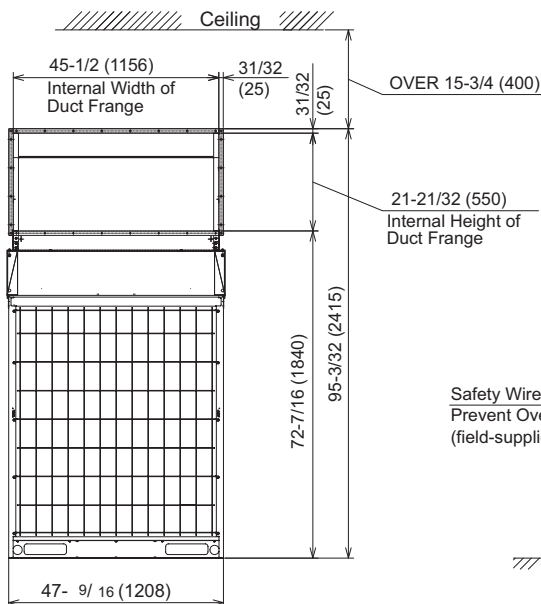


< A View >

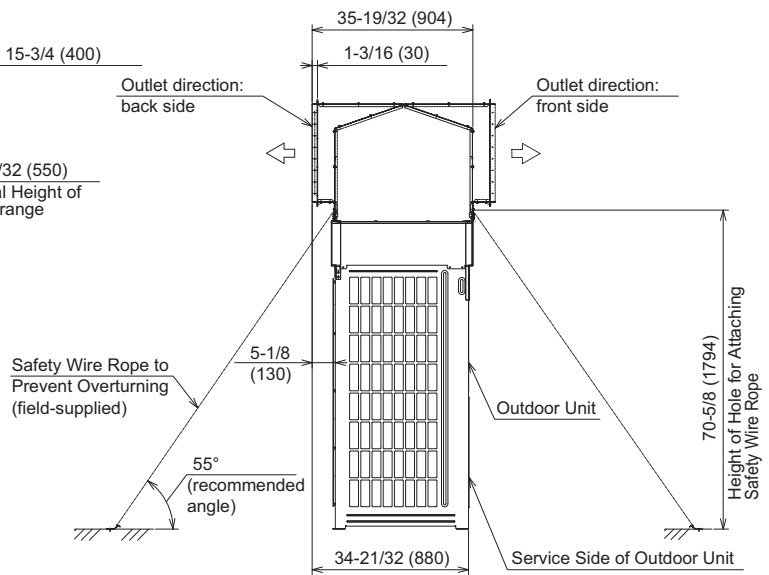


Installation Appearance

< Back Side View >



< Left Side View >



5.3 External Input/Output and Function Setting Mode for Outdoor Unit

- **Setting Method**
 Setting DSW4 on the outdoor unit Printed Circuit Board (PCB) is required for “External Input and Output Setting” and “Function Setting”. As for a combination of outdoor units, this must be set from DSW4 in outdoor unit A. (Setting from DSW4 in outdoor units B, C and D is invalid.)

< Transition Method >

[External Input/Output Setting]

■ Start of Setting

Turn ON DSW4-No.4.
Turn ON DSW4-No.6.



External Input/ Output Setting Mode
"IO S F"



■ Exit Setting Mode

Turn OFF DSW4-No.6 during indicated
External Input/ Output Setting Mode.
Turn OFF DSW4-No.4.

[Function Setting]

■ Start of Setting

Turn ON DSW4-No.4.
Turn ON DSW7-No.4.

Function Setting Mode
"Func"

■ Exit Setting Mode

Turn OFF DSW7-No.4 during indicated
Function Setting Mode.
Turn OFF DSW4-No.4.

After setting, confirm DSW4 setting is the same as the factory setting,
and DSW7 setting is correct.

5.3.1 External Input and Output Settings

On the outdoor unit Printed Circuit Board (PCB), there are three input terminals (CN17, CN18 as shown below) to receive external signals and two output terminals (CN16) to send signals out. Control functions shown in these tables are available when setting input and output terminals.

< Input >

Control Function No.	Setting Function for Input
1	Fixing Heating Operation Mode
2	Fixing Cooling Operation Mode
3	Demand Stoppage
4	Outdoor Fan Motor Start/Stop
5	Forced Stoppage
6	Demand Current Control 40%
7	Demand Current Control 60%
8	Demand Current Control 70%
9	Demand Current Control 80%
10	Demand Current Control 100%
11	Low Noise Setting 1
12	Low Noise Setting 2
13	Low Noise Setting 3
0	No Setting

< Output >

Control Function No.	Setting Function for Output
1	Operation Signal
2	Alarm Signal
3	Compressor ON Signal
4	Defrosting Signal
0	No Setting

The following functions have been already set at the factory.

< Input Terminal >

Input Terminal Name	Connector (Pin No.)	Setting Function	Control Function No.
Input 1	CN17 (1-2)	Fixed Heating Operation Mode	1
Input 2	CN17 (2-3)	Fixed Cooling Operation Mode	2
Input 3 (*)	CN18 (1-2)	Demand Stoppage	3

<Output Terminal>

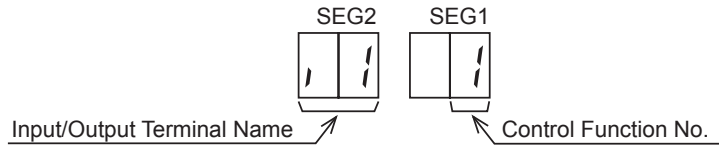
Output Terminal Name	Connector (Pin No.)	Setting Function	Control Function No.
Output 1	CN16 (1-2)	Operation Signal	1
Output 2	CN16 (1-3)	Alarm Signal	2

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

- Settings for External Input and Output

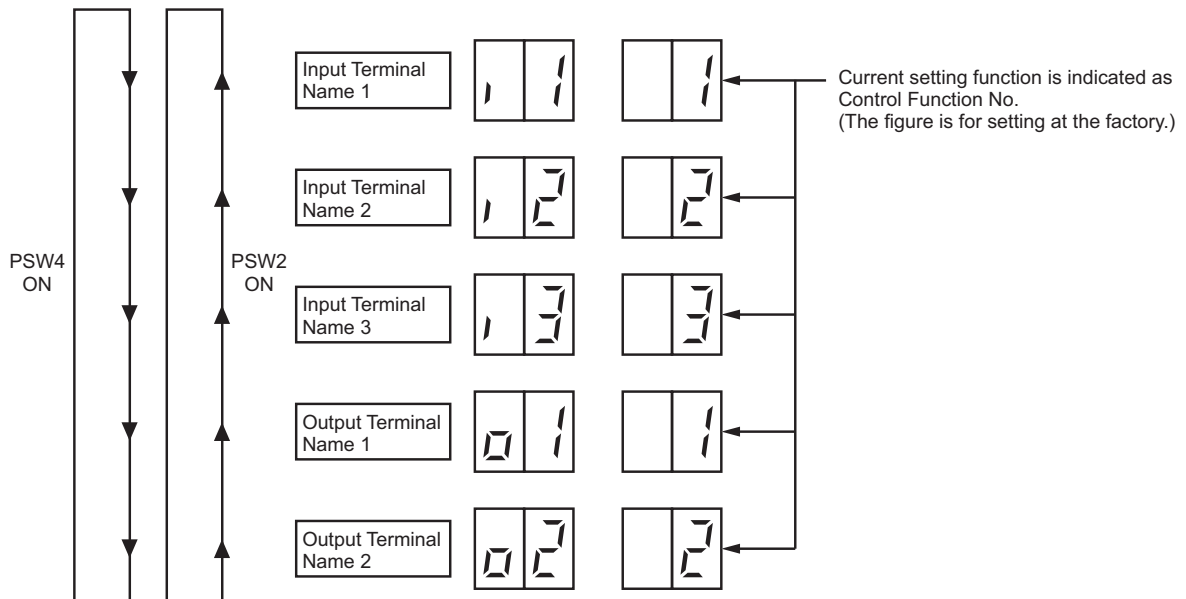
If an alternative setting is required at a site, perform the following procedures.
For a combination of outdoor units, perform the setting for outdoor unit A.

- By selecting "External Input and Output Setting", the following appears on the 7-segment display.
(The setting should be performed during an outdoor unit stoppage. Also, set DSW4-No.4 of the outdoor unit PCB to the "ON" side before performing the setting in order to prevent the compressor activation.)

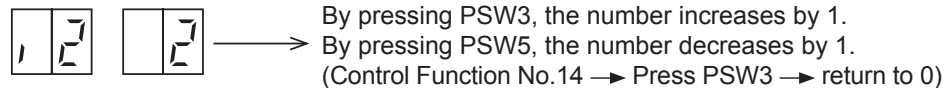


This display indicates Control Function No. 1 (Fixed Heating Operation Mode) is set at input 1.

- By pressing PSW2 or PSW4, the input/output terminal name is changed.
The following shows the display changes when PSW2 or PSW4 is pushed.



- After selecting the Input/Output Terminal Name, press PSW3 or PSW5, and then choose the Control Function No.



- After selecting the Control Function No., turn OFF DSW4-No.6. The display will be back to the normal operation. The selected data is stored in the outdoor unit PCB and the "External Input and Output Setting" is completed. The stored data is maintained even when the power source is cut OFF. Refer to Table 5.1 below for the details for the electrical wiring connection and the required parts.

• External Input Function Setting

The following signals can be received by the outdoor unit PCB. Refer to Table 5.1 below for the required main parts.

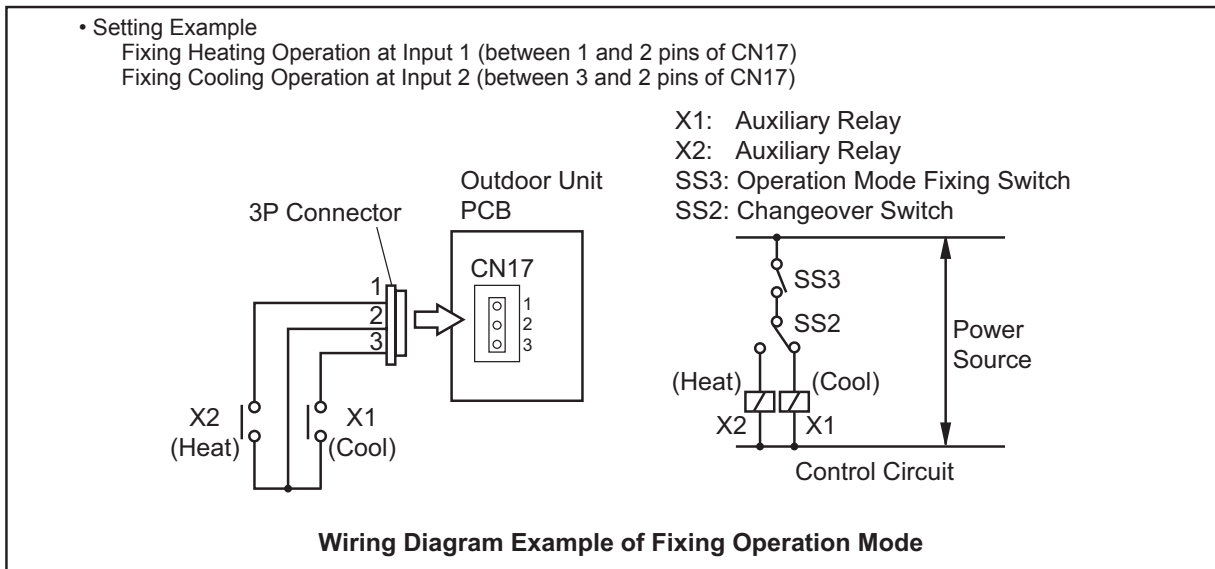
(1) **Input Fixing Heating Operation Mode (Control Function No.1),**
Input Fixing Cooling Operation Mode (Control Function No.2)

When the input terminals for the setting operation mode on the outdoor unit PCB are short-circuited, the operation mode can be set at the cooling or heating mode.

Short Circuit between Terminals 1 and 2 of CN17: Fixed Heating Operation Mode

Short Circuit between Terminals 2 and 3 of CN17: Fixed Cooling Operation Mode

During this set heating (or cooling) mode, no cooling (or heating) operation is possible. The indoor units under the cooling or dry operation (or heating operation) will be changed to the Thermo-OFF condition during this mode, and stoppage code No. "20" is given.



(2) **Input Demand Stoppage (Control Function No.3)**

When the input terminals for Demand Stoppage on the outdoor unit PCB are short-circuited while running, the compressor(s) is stopped. (In this case, the indoor unit(s) is put under Thermo-OFF condition. Cooling operation: Air-flow setting, Heating operation: Lo setting)

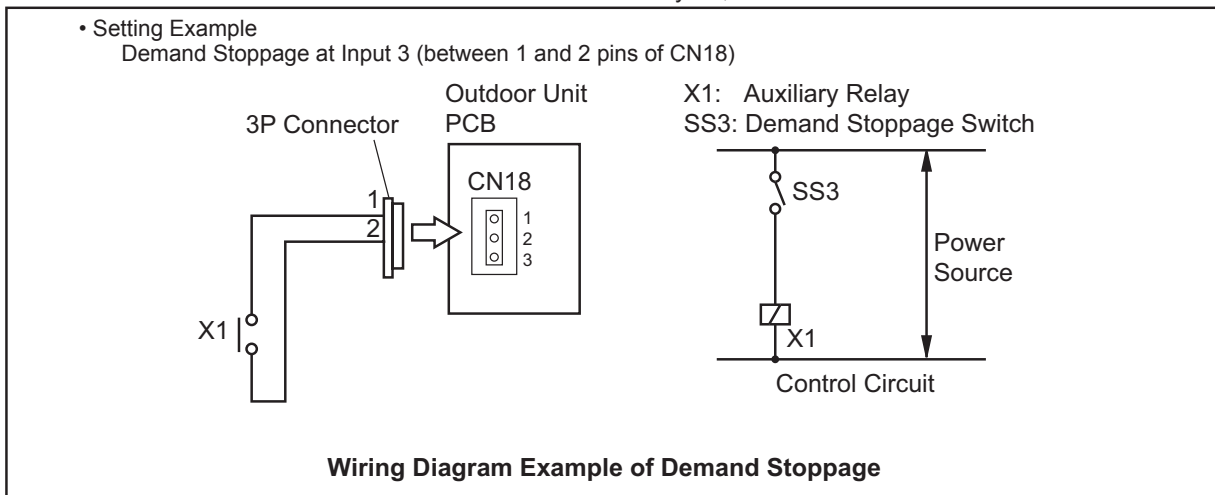
The stoppage code No. "10" is given. In this case, if the input terminals are opened, operation is resumed.

NOTE:

When demand control (ON/OFF) is performed, it is recommended that the control (ON/OFF) time is set appropriately according to the heat load. Also, set the demand control time approximately once in 15 minutes at the minimum in consideration for saving energy.

*Thermo-ON: The outdoor unit and some indoor units are running.

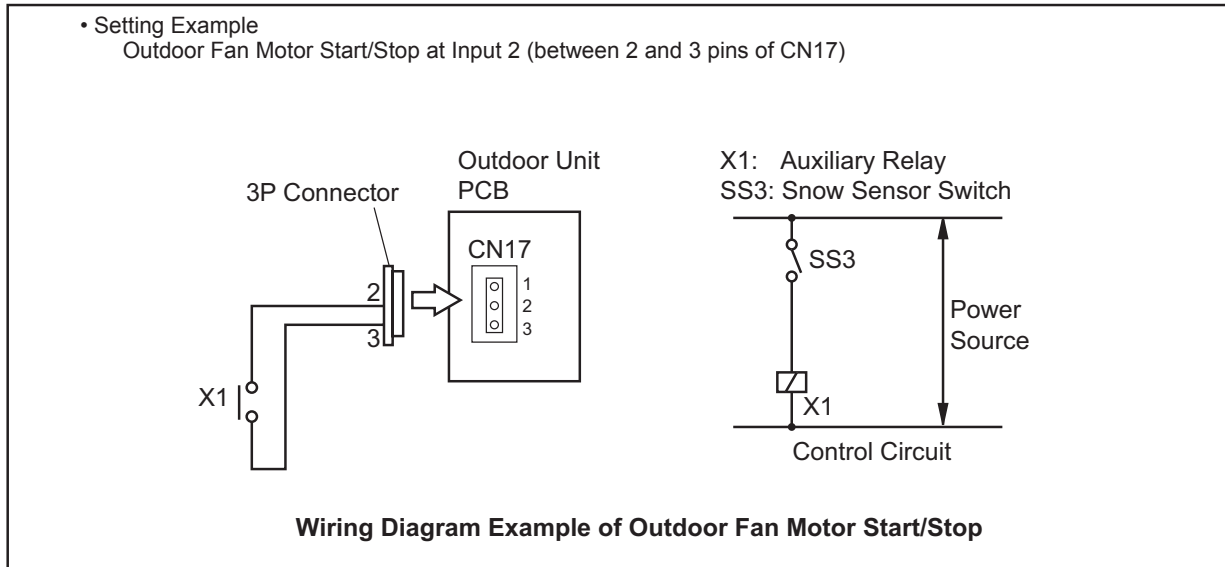
Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.



(3) [Input] Outdoor Fan Motor Start/Stop (Control Function No.4)

This is an auxiliary function to protect the outdoor unit from snow. When the input terminals for Outdoor Fan Motor Start/Stop on the outdoor unit PCB are short-circuited during the compressor stoppage, all the outdoor fan motors start operating. If the compressor restarts operating, the outdoor fan motors will be restored to normal operation. If the input terminals of Outdoor Fan Motor Start/Stop are opened during the outdoor fan motor operation following the short circuit of these terminals, the outdoor fan motor will stop. This function is possible only during the compressor stoppage (during Switch-OFF or Thermo-OFF of the Switch-ON). Therefore, this function will not be possible even if the input signal is sent during the normal cooling or heating operation.

An example of basic wiring when the Outdoor Fan Motor Start/Stop (Input 2) is set to 2 and 3 pins of CN17 by an external signal is shown below.



NOTES:

1. This is an auxiliary function to protect the unit from snow. In snowy regions, make sure to protect the unit with a snow-prevention roof, fence (field-supplied) or snow protection hood (optional). Otherwise, abnormal vibrations because of an imbalanced propeller fan will be caused.
2. If the fan motor or fan controller fail during this function, stop all the outdoor fans to suspend this function. Check the alarm code and deal properly with the failure next time the compressor is operated.
3. When setting the snow sensor switch for Outdoor Fan Motor Start/Stop, make sure that the continuous operating time is 30 seconds or more. Also Outdoor Fan Motor Start/Stop intervals shall be at least 10 minutes. Otherwise, malfunction of the outdoor fan motors will be caused by frequent starts and stops.

! WARNING

Because of this setting, the outdoor fan can operate even while the outdoor unit (compressor) stops. Display a notice to that effect on a readily visible part of the unit body, in order to avoid injuries caused by an unintended outdoor fan operation.

*Switch-ON: Some indoor units are running or staying.
Switch-OFF: All indoor units are stopped.

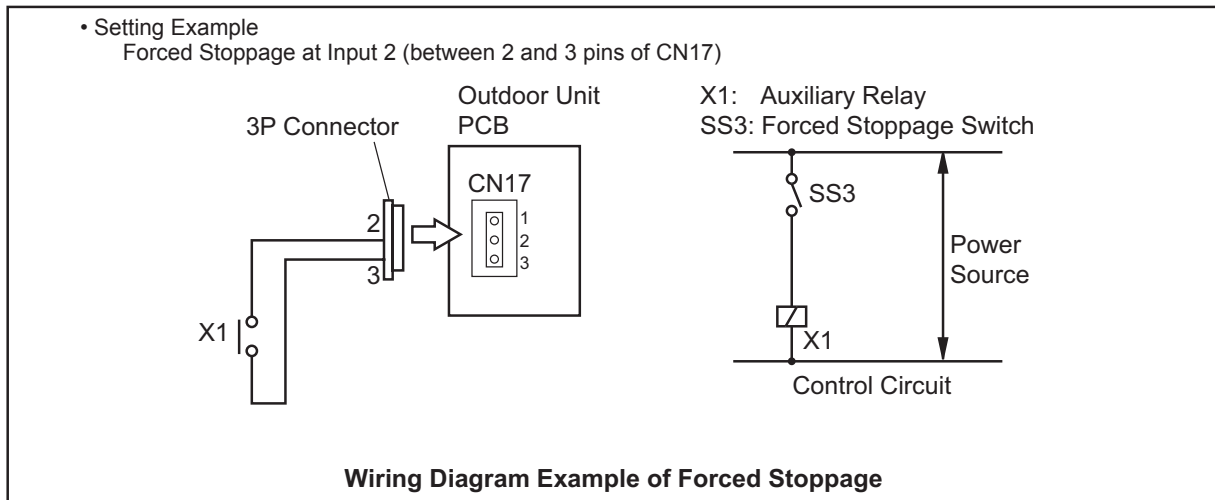
(4) Input Forced Stoppage (Control Function No.5)

When the input terminals for Forced Stoppage on the outdoor unit PCB are short-circuited while running, the compressors and the indoor fan motors are stopped. The stoppage code No. "10" is given. In this case, if the input terminals are opened, operation is resumed.

NOTE:

When demand control (ON/OFF) is performed, it is recommended that the control (ON/OFF) time is set appropriately according to the heat load. Also, set the demand control time approximately once in 15 minutes at the minimum in consideration for saving energy.

*Thermo-ON: The outdoor unit and some indoor units are running.
Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.



(5) Input Demand Current Control 40, 60, 70, 80, 100% (Control Function No.6 to 10)

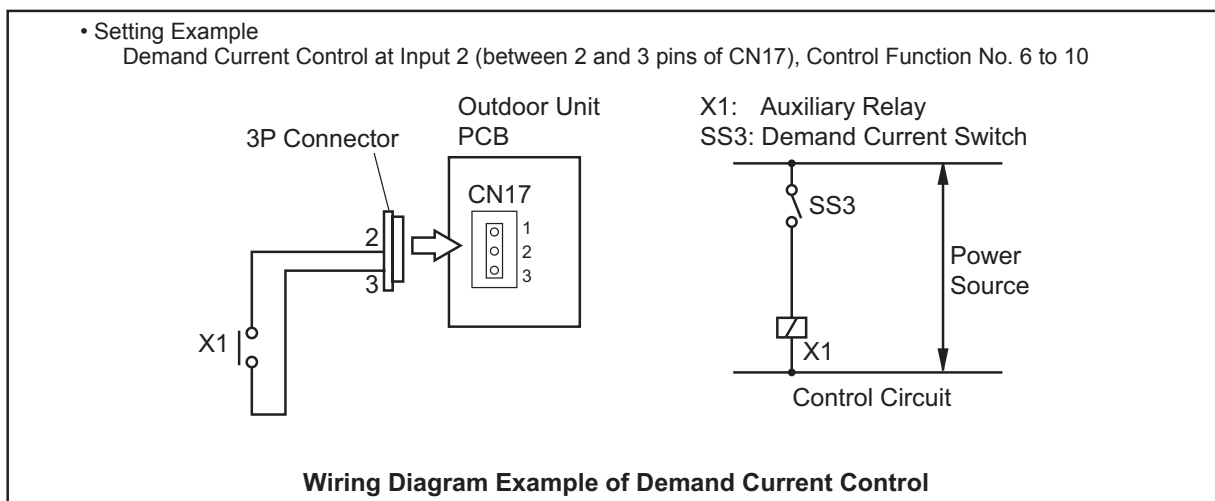
When the input terminals for Demand Current Control on the outdoor unit PCB are short-circuited, the compressor frequency is controlled so that the maximum limit of the outdoor running current is set to 100%, 80%, 70%, 60% or 40% of the reference power consumption.

If the outdoor unit running current exceeds the maximum limit for twenty minutes, the indoor unit is put under Thermo-OFF condition. In this case, the stoppage code No. "10" is given. When the input terminal is opened during the demand current control, its control is released.

Outdoor Unit Capacity [MBH]	Reference Power Consumption [KW]
072	10.5
096	12.5
120	14.0

NOTE:

Thermo-ON: The outdoor unit and some indoor units are running.
Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.



< NOTE >

1. The Demand Current Control (%) is value criterion. The value used for this control is calculated from the current, and therefore is different from the value indicated by a wattmeter. If it is required that the maximum power consumption is managed precisely, a field-supplied demand controller should be used.
2. The actual value may temporarily be higher than the indicated value (by 40% to 100%) depending on the operating control conditions such as protection control.

(6) [Input] Low Noise Setting 1, 2, 3 (Control Function No.11 to 13)

When the input terminals for Low Noise Setting on the outdoor unit PCB are short-circuited, the compressor frequency and outdoor fan rotation frequency are controlled and the operating sound of the outdoor unit will be as shown in the table below.

The operating sound can be set by selecting the Control Function No.

NOTE:

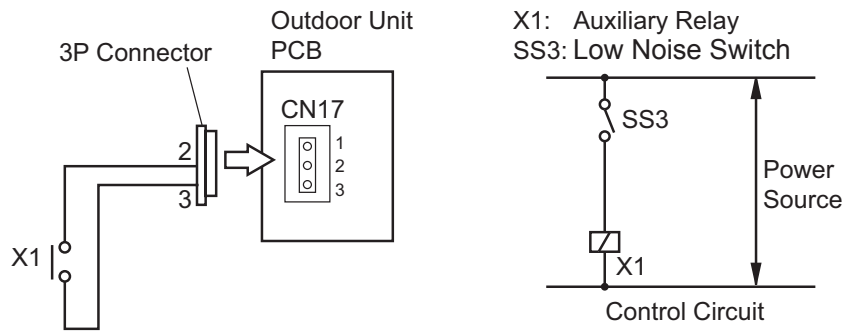
- (a) The outdoor unit capacity will decrease because the compressor frequency and outdoor fan motor frequency forcibly decrease. The operating range will also be restricted.
- (b) In some cases, the operating sound may be temporarily higher than the value in the table below (targeted value).
- (c) If Low Noise Setting is always required without input signal, refer to Section 5.3.2 (7) “Low Noise Setting”

< Control Function No. for Low Noise Setting and Operating Sound/Outdoor Unit Capacity >

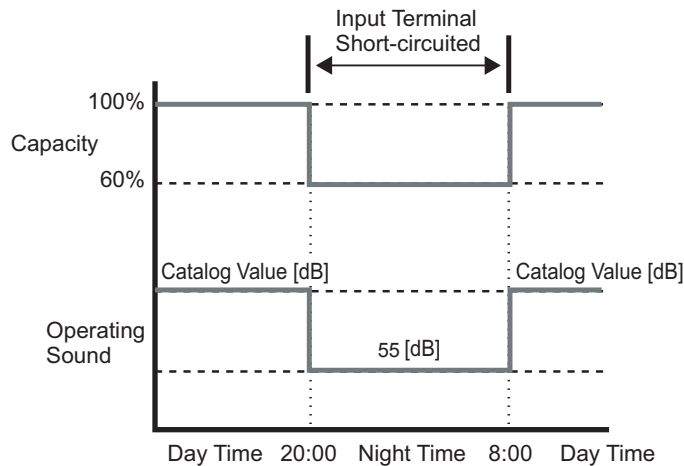
Control Function No.	Operating Sound (Targeted Value)	Outdoor Unit Capacity (Specification Ratio)
No Setting	Catalog Value	100%
11 (Low Noise Setting 1)	58	80%
12 (Low Noise Setting 2)	55	60%
13 (Low Noise Setting 3)	52	40%

• Setting Example

Low Noise Setting at Input 2 (between 2 and 3 pins of CN17), Control Function No. 12



Wiring Diagram Example of Low Noise Setting



[Example] “Low Noise Setting 2” during Night Only

Table 5.1 Specifications of Required Main Parts

Parts		Specifications	Remarks
Auxiliary Relay (X1, X2)		Mini-Power Relay, (Model: MY1F or MY2F) made by OMRON	208V/230V
Change-Over Switch (SS2, SS3)		Manual Switch	208V/230V
3 Pin Connector Cord		Model: PCC-1A (Connected to JST Connector, XARP-3)	Five Cords with Connectors as One Set
Electric Wiring (Inside of Unit)	Low Volt.	AWG22	lower than 24V
	208/230V	AWG18-20	
Electric Wiring (Outside of Unit)	Low Volt.	AWG18-20	lower than 24V
	208/230V	AWG14	

NOTES:

1. Make the wiring to the terminals as short as possible.
2. Do not run the wirings too closely to the high voltage cable. Keep at least 12 in. (30cm) between the wiring and the high voltage cable. (Crossing cables is okay.)
If it is necessary to run the wirings closer than 12 in. (30cm) to the high voltage cable, insert the low voltage cable(s) into a metal tube and ground it at one end. If sealed wirings are used at the low voltage wiring side, ground it at one end of the shielded wirings.
3. The maximum length should be within 230 ft. (70m).

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

- External Output Function Setting

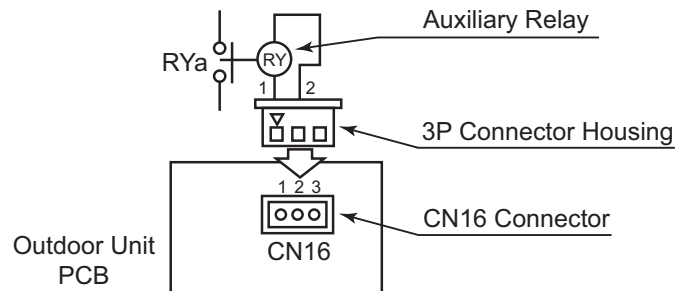
The following signals can be picked up from the outdoor unit PCB.
Refer to Table 5.2 for the required auxiliary relay.

(1) **Output** Operation Signal (Control Function No.1)

This function is utilized to receive the operation signal.

Auxiliary relay contacting (RYa) is closed during the operation. The operation signal will be sent to output terminals when the indoor units are operating. (Even when one indoor unit is operating, the signal will be sent.) This function can be used for circulator or humidifier operation.

- Setting Example
Operation Signal at Output 1 (between 1 and 2 pins of CN16)



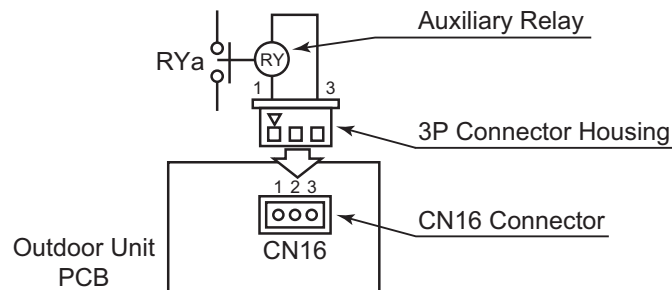
Wiring Diagram Example of Operation Signal

(2) **Output** Alarm Signal (Control Function No.2)

This function is utilized to receive the alarm signal.

Auxiliary relay contacting (RYa) is closed when the alarm occurs. The alarm signal will be sent to output terminals when the alarm occurs from the indoor units. (The signal will be sent even when the alarm occurs from one indoor unit.)

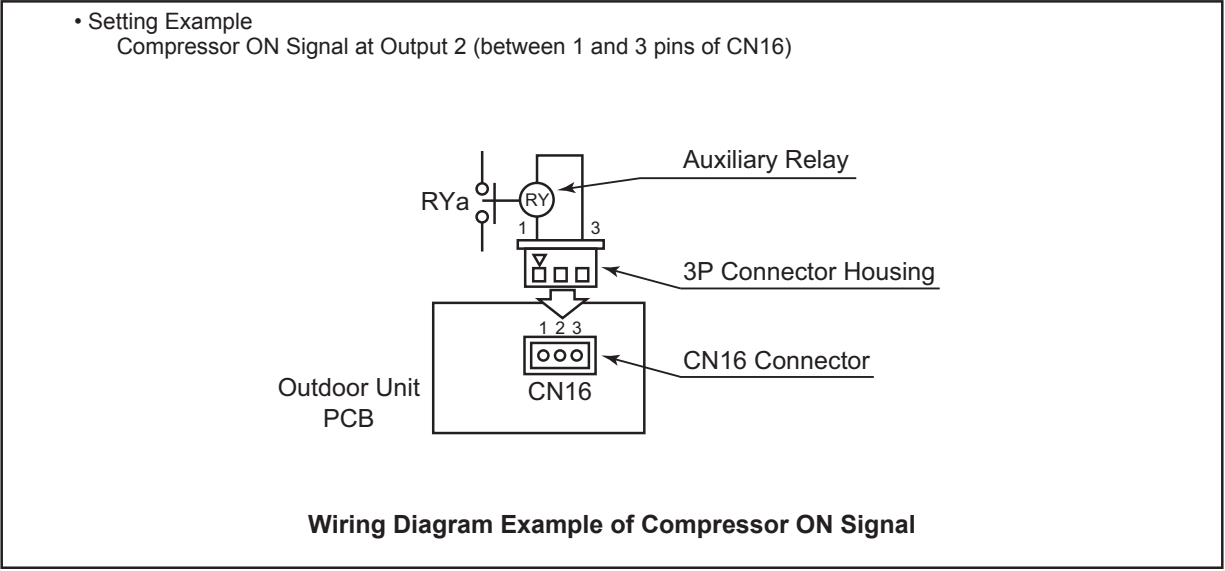
- Setting Example
Alarm Signal at Output 2 (between 1 and 3 pins of CN16)



Wiring Diagram Example of Alarm Signal

(3) Output Compressor ON Signal (Control Function No.3)

This function is utilized to receive the compressor operation signal.
Auxiliary relay contacting (RYa) is closed during the compressor operation.



(4) Output Defrosting Signal (Control Function No.4)

This function is utilized to receive the defrosting signal.
Auxiliary relay contacting (RYa) is closed during the defrosting.

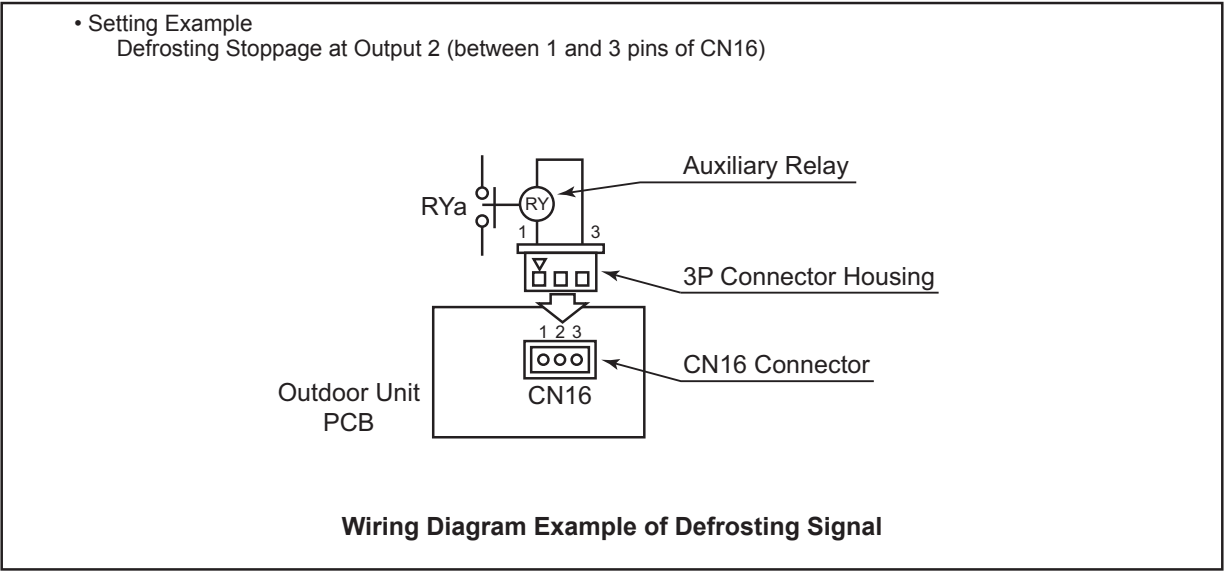


Table 5.2 Specifications of Required Auxiliary Relay

Parts	Specifications
Auxiliary Relay *	High-Power Relay, LY2F DC12V made by OMRON

* Do not use the relay with diode built-in.
* Refer to Table 5.1 above for the connector parts.

5.3.2 Function Setting

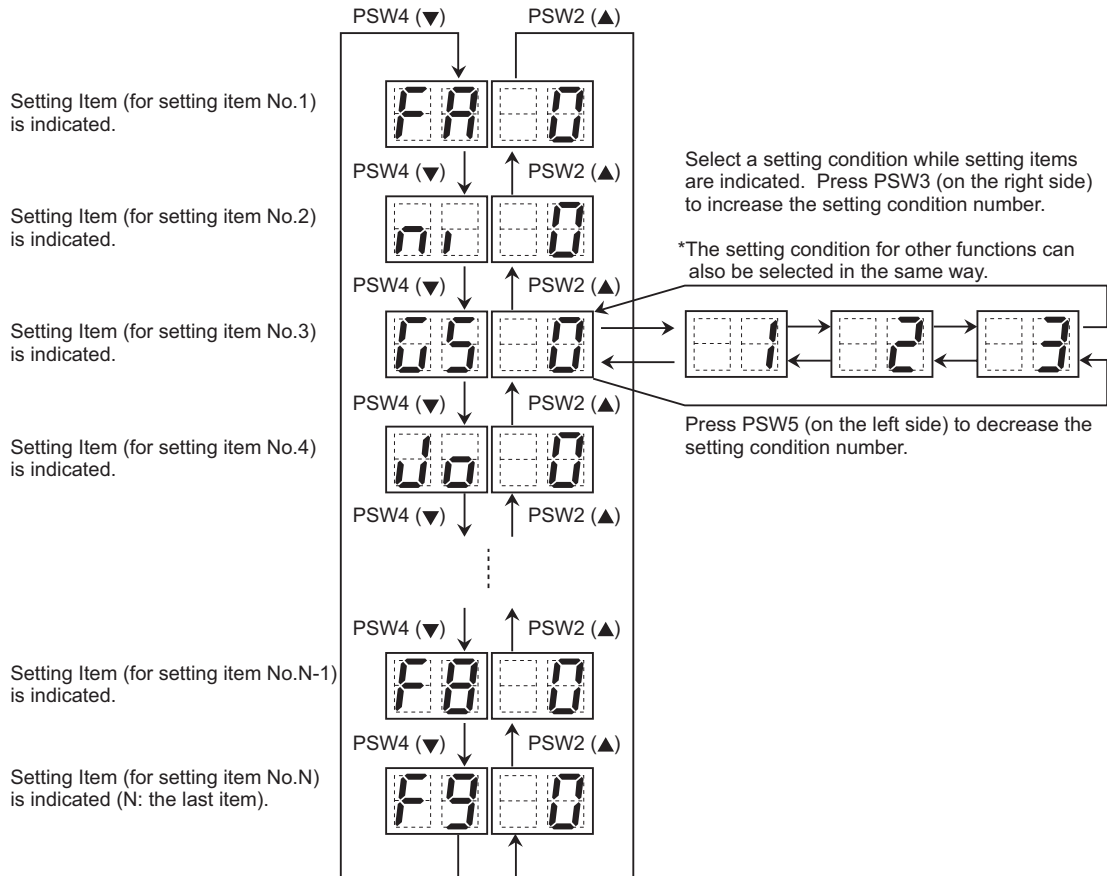
- Refer to Section 5.3 “• Setting Method” for mode transition functions.

NOTE:

The setting should be performed during the outdoor unit stoppage.

For a combination of outdoor units, set it to outdoor unit A. (The setting cannot be performed to outdoor units B, C, and D.) Outdoor unit A is the unit to which the communication cable between the outdoor unit and indoor unit is connected.

Set DSW4-No.4 of the outdoor unit PCB to the “ON” side before performing the setting in order to prevent the compressor activation.



< Exit Setting Mode >

- Turn OFF DSW7-No.4 during indicated Function Setting Mode.
- Turn OFF DSW4-No.4.

5.3.2.1 Function Setting Item

No.	Setting Item	7-Segment Display		Contents
		SEG2	SEG1	
1	Circulator Function at Heating Thermo-OFF	FR	00	No setting
			01	Indoor fan forced ON and OFF (2 min. ON / 6 min. OFF)
			02	Indoor fan forced ON and OFF (2 min. ON / 13 min. OFF)
			03	Indoor fan forced ON and OFF (2 min. ON / 28 min. OFF)
			04	Indoor fan stop
2	Night Shift (Low Noise)	ni	00	No Setting
			01	Setting of night shift 1
			02	Setting of night shift 2
3	Cancellation of Outdoor Ambient Temperature Limit	CS	00	No setting
			01	For heating
			02	For cooling
			03	For cooling/heating
4	Defrost for Cold Area (Change of Defrost Condition)	Jo	00	No setting
			01	Defrost for cold area
5	SLo (Fan Speed) Defrost Setting	bJ	00	Indoor fan stop when heating operation is activated/during defrost operation
			01	Indoor fan SLo operation during defrost operation
			02	Indoor fan SLo operation when heating operation is activated
			03	Indoor fan SLo operation when heating operation is activated/ during defrost operation
			04	Indoor fan SLo operation when heating operation is activated (including Start Up after Defrost)
6	Cancellation of Hot Start	Hr	00	Hot start control is available
			01	Cancellation of hot start
7	Priority Capacity Mode	nU	00	No setting
			01	Change of frequency maximum limit value
			02	Change of current limit value
			03	Change of frequency maximum limit value and current limit value
8	Compressor Frequency Control Target Value for Cooling	Hc	00	Initial setting (Ps evaporation temperature targeted value 46°F (8°C))
			01	Targeted value 36°F (2°C)
			02	Targeted value 38°F (3°C)
			03	Targeted value 40°F (4°C)
			04	Targeted value 41°F (5°C)
			05	Targeted value 42°F (6°C)
			06	Targeted value 44°F (7°C)
			07	Targeted value 48°F (9°C)
			08	Targeted value 50°F (10°C)
			09	Targeted value 52°F (11°C)
			10	Targeted value 54°F (12°C)
			11	Targeted value 56°F (13°C)
			12	Targeted value 58°F (14°C)
9	Compressor Frequency Control Target Value for Heating	Hh	00	Initial setting (Pd targeted value 413psi (2.85MPa))
			01	Targeted value 392psi (2.70MPa)
			02	Targeted value 399psi (2.75MPa)
			03	Targeted value 406psi (2.80MPa)
			04	Targeted value 409psi (2.82MPa)
			05	Targeted value 418psi (2.88MPa)
			06	Targeted value 421psi (2.90MPa)
			07	Targeted value 428psi (2.95MPa)
10	Indoor Expansion Valve Control Target Value for Cooling	SC	00	Initial setting (SH targeted value +9°F (+5°C))
			01	SH Targeted value +13°F (+7°C)
			02	SH Targeted value +11°F (+6°C)
			03	SH Targeted value +7°F (+4°C)
			04	SH Targeted value +5°F (+3°C)
11	Indoor Expansion Valve Control Target Value for Heating	SH	00	Initial setting (SC targeted value +9°F (+5°C))
			01	SC Targeted value +20°F (+11°C)
			02	SC Targeted value +15°F (+8°C)
			03	SC Targeted value +3°F (+2°C)
			04	SC Targeted value -2°F (-1°C)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Setting Item	7-Segment Display		Contents
		SEG2	SEG1	
12	Indoor Expansion Valve Opening Change for Stoppage Indoor Unit in Heating Mode	5 _i	00	Initial setting (stoppage unit expansion valve opening) 006-015MBH: 100~200 pulse, 018MBH or over: 200~300 pulse
			01	Expansion valve opening: 150~325 pulse
			02	Expansion valve opening 006-015MBH: 175 pulse, 018MBH or over: 300 pulse
			03	Expansion valve opening 006-015MBH: 100 pulse, 018MBH or over: 150 pulse
			04	Expansion valve opening 006-015MBH: 90 pulse, 018MBH or over: 100 pulse
13	Indoor Expansion Valve Opening Change for Thermo-OFF Indoor Unit in Heating Mode	5 _o	00	Thermo-OFF unit expansion valve opening (150~325 pulse)
			01	Expansion valve opening 006-015MBH: 175 pulse, 018MBH or over: 300 pulse
			02	Expansion valve opening 006-015MBH: 100 pulse, 018MBH or over: 150 pulse
			03	Expansion valve opening: 40pls
14	Indoor Expansion Valve Initial Opening of Thermo-ON Indoor Unit in Heating Mode	c _i	00	Initial setting (300~650 pulse)
			01	2000 pulse
			02	1400 pulse
			03	1000 pulse
			04	600 pulse
15	Indoor Expansion Valve Initial Opening for Cooling	c _b	00	Initial setting
			01	Cooling operation initial opening -2%
			02	Cooling operation initial opening +1%
			03	Cooling operation initial opening +3%
16	Indoor Expansion Valve Initial Opening for Heating	c _h	00	Initial setting
			01	Heating operation initial opening -2%
			02	Heating operation initial opening +1%
			03	Heating operation initial opening +3%
			04	Heating operation initial opening +5%
17	Low Noise Setting (Sound Reduction Function, cooling/heating operation range will be restricted.)	d _b	00	Initial setting
			01	Reduction Outdoor Fan Rotation 65%
			02	Reduction Outdoor Fan Rotation 50%
			03	Reduction Outdoor Fan Rotation 45%
			04	Reduction Compressor Frequency 80%
			05	Reduction Compressor Frequency 60%
			06	Reduction Compressor Frequency 40%
			07	Reduction Outdoor Fan Rotation 65%/ Compressor Frequency 80%
			08	Reduction Outdoor Fan Rotation 50%/ Compressor Frequency 60%
09	Reduction Outdoor Fan Rotation 45%/ Compressor Frequency 40%			
18	Demand Function Setting	d _E	00	No demand control
			01	Demand control 40%
			02	Demand control 60%
			03	Demand control 70%
			04	Demand control 80%
19	Wave Function Setting	u _E	00	No wave function
			01	Minimum limit 40%
			02	Minimum limit 60%
			03	Minimum limit 70%
20	Protection of Decrease in Outlet Temperature for Cooling	F _b	00	Initial setting
			01	Outlet temperature ≥ 50°F (10°C)
			02	Outlet temperature ≥ 54°F (12°C)
21	Outlet Air Temperature Control for DOAS	F _r	00	Initial setting
			01	Restrain capacity control
			02	Outlet air temperature control
22	Adjustment of Fan Rotation (To avoid a whining sound for the multiple installation.)	F _o	00	Initial setting
			01	Change of fan rotation -15rpm
			02	Change of fan rotation -30rpm

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Setting Item	7-Segment Display		Contents
		SEG2	SEG1	
23	Not Prepared	L7	00	-
24	Thermo-OFF Setting for Outdoor Unit After Defrosting Operation	d5	00	No setting
			01	Thermo-OFF stoppage setting for outdoor unit after defrosting operation
25	Not Prepared	F1	00	-
26	Crankcase Heater Control during Stoppage	F2	00	Not Available
			01	Stoppage for 20 days
			02	Stoppage for 15 days
			03	Stoppage for 10 days
			04	Stoppage for 5 days
			05	Stoppage for 3 days
27	Not Prepared	F3	00	-
28	Intermittent Operation of Outdoor Fan Motor	F4	00	No intermittent operation
			01	Set outdoor temperature ≤ 38°F (3°C)
			02	Set outdoor temperature ≤ 32°F (0°C)
			03	Set outdoor temperature ≤ 34°F (1°C)
			04	Set outdoor temperature ≤ 36°F (2°C)
			05	Set outdoor temperature ≤ 40°F (4°C)
29	Indoor Heat Exchanger SH Target Value Control for Cooling (Only for 4-Way Cassette Type)	F5	00	Initial setting (SH target value +9°F (+5°C))
			01	SH target value +7°F (+4°C)
			02	SH target value +5°F (+3°C)
			03	SH target value +3°F (+2°C)
			04	SH target value +2°F (+1°C)
30	Indoor Expansion Valve Opening Limit during Heating SW-OFF	F6	00	Initial setting (stoppage unit expansion valve opening) 006-015MBH: 90 pulse/ 018MBH or over: 90pulse
			01	Expansion valve opening 150~325 pulse
			02	Expansion valve opening 006-015MBH: 175 pulse/ 018MBH or over: 300 pulse
			03	Expansion valve opening 006-015MBH: 100 pulse/ 018MBH or over: 150 pulse
			04	Expansion valve opening 006-015MBH: 90 pulse/ 018MBH or over: 100 pulse
31	Invalid Capacity Control by Compressor for Cooling	F7	00	Initial setting (valid)
			01	Invalid
32	Forced Defrosting after Enforced Stoppage during Defrosting Cycle	F8	00	Initial setting (valid)
			01	Invalid
33	Not Prepared	F9	00	-

NOTE:

Contact your distributor or contractor for details on items "8," "16," "24," "26," "29," "30" and "32."

5.3.2.2 Description of Function Setting Item

(1) Circulator Function at Heating Thermo-OFF (Function Setting "FA")

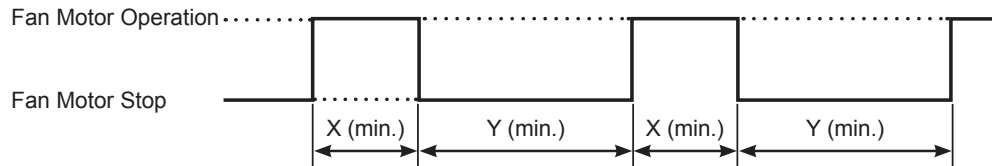
Press "PSW3" and select the setting conditions "0 to 4" in Circulator Function at Heating Thermo-OFF "FF".

Normally, the fan speed is changed to "LOW" at heating Thermo-OFF. (It is possible for the room temperature to be too high at the heating Thermo-OFF.) However, the indoor fan motor is operated at "LOW" and stopped repeatedly by setting this function.

NOTE:

When the compressor is stopped, the indoor fan motor operates at "LOW" speed continuously.

The action when the indoor fan motor operates at the circulator function is indicated as follows.



Contents of Function Setting Item "FA"

	"FA" Setting Condition				
	0	1	2	3	4
Indoor Fan Motor "LOW" Operation Time X (min.)	(Continuous Operation)	2	2	2	0
Indoor Fan Motor Stop Time Y (min.)	0	6	13	28	Stopped

NOTE:

If using function setting No. 2 to 4, install the remote sensor (THM-R2A: Optional).

Because the time period of stopping the indoor fan becomes longer, the detected value of the inlet air thermistor for the indoor unit becomes high, and it may take time to Thermo-ON.

*In this section, Thermo-ON/Thermo-OFF mean for the indoor unit.

Thermo-ON: The indoor unit is running.

Thermo-OFF: The indoor unit stays on, but doesn't run.

(2) Night Shift (Low Noise) (Function Setting “ni”)

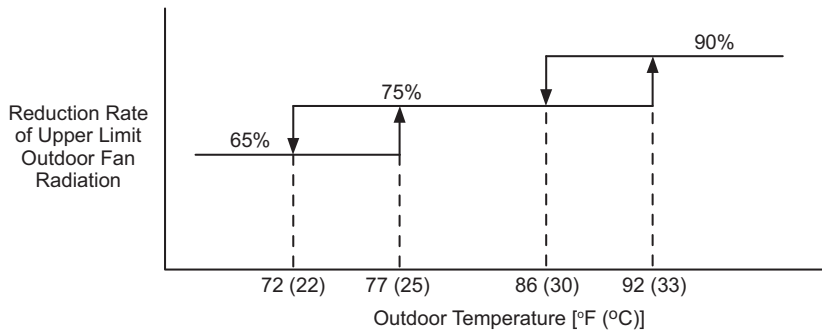
Press “PSW3” and select the setting condition “1” or “2” for the Night Shift (Low Noise) “ni”. Then, this function can be set. “ni”=1 reduces the upper limit of the outdoor fan rotation and the compressor frequency as shown below in any operation. “ni”=2 is adapted only for cooling operation. In heating operation, “ni”=2 is same as “ni”=0.

The Night Shift operation should be used if the capacity has the margin to be allowed for the capacity decrease and the low sound operation is required especially in the nighttime.

< Night Shift >

“ni” Setting Condition	Operation	Reduction Rate of Maximum			
		Outdoor Fan Rotation		Compressor Frequency	
		Cooling (Including Dry Operation)	Except for Cooling	Cooling (Including Dry Operation)	Except for Cooling
0	No Effect (Default Setting)	Not Changed (=100%)	Not Changed (=100%)	Not Changed (=100%)	Not Changed (=100%)
1	Night Shift1	Shown as below	Shown as below	60%	60%
2	Night Shift2 (only for Cooling)	Shown as below	Not Changed	60%	Not Changed

at Cooling Operation

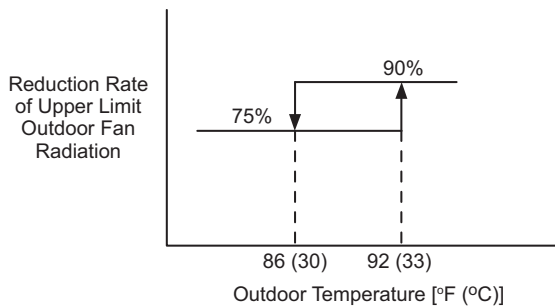


at Heating Operation

Reduction Rate of Upper Limit Outdoor Fan Radiation

 = 75%

at Heat Recovery Operation



NOTE:

Reduction rates are approximate, these may change slightly depending on the outdoor unit model.

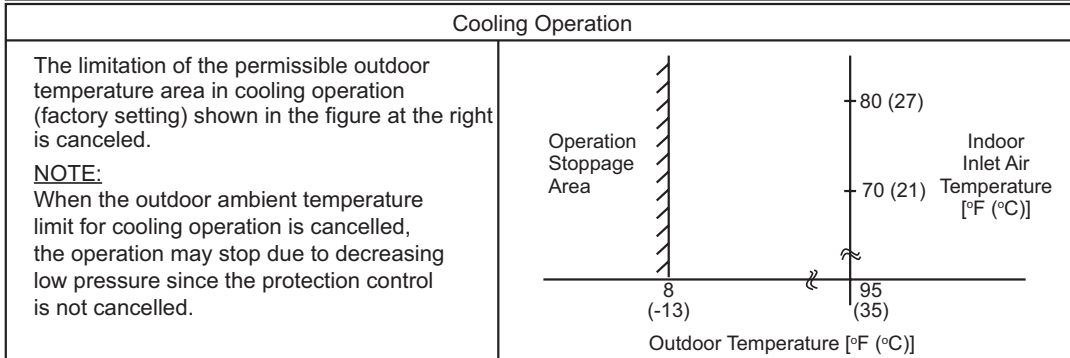
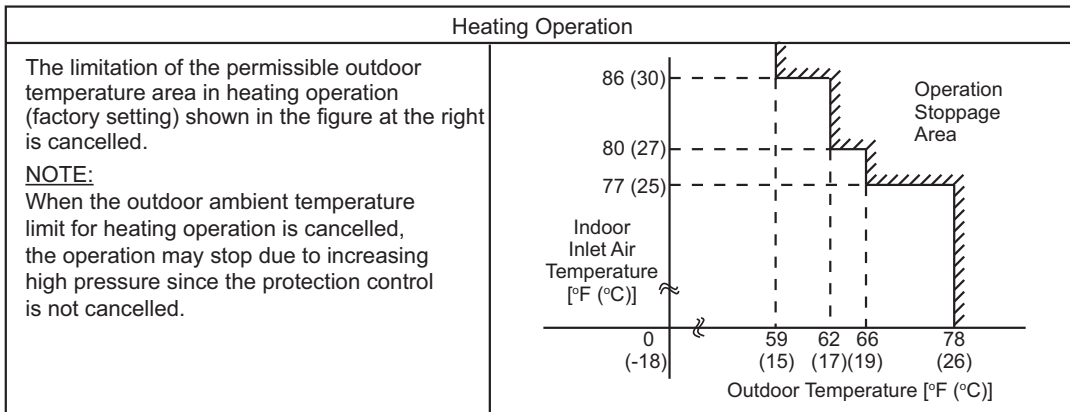
EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

(3) Cancellation of Outdoor Ambient Temperature Limit (Function Setting "GS")

Press "PSW3" and select the setting condition "0" to "3" for Cancellation of Outdoor Ambient Temperature limit " $\square \square$ ". Then, this function can be set.

The heating operation is continued even under a high outdoor temperature or the cooling operation is continued even under a low temperature.

"GS" Setting Condition	Operation Mode for Cancellation
0	Not Available (Default Setting)
1	Heating
2	Cooling
3	Heating/Cooling



NOTE:

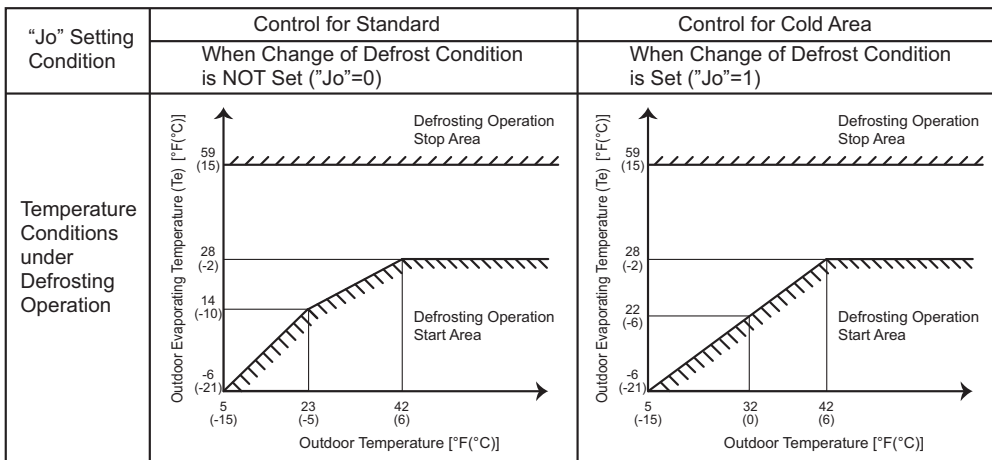
If this function is set and the outdoor unit operates in the operation stoppage area shown in the above figure for a long time, some alarm codes by abnormal operation may occur and the outdoor unit may be damaged since outdoor ambient temperature limit control is cancelled.

If the alarm codes occur frequently, contact your distributor or contractor.

(4) Defrost for Cold Area (Change of Defrost Condition) (Function Setting "Jo")

Press "PSW3" and select the setting condition "1" at Defrost for Cold Area " $\square \square$ ".

This function changes the defrost condition as shown below.



(5) SLo Defrost Setting (Function Setting “bJ”)

Press “PSW3” and select the setting condition “0” to “4” at SLo Defrost Setting “ \overline{bJ} ”.

Indoor fan operation is stopped during the defrost operation, after the defrost operation and at the start of the heating operation. However, this function allows indoor fan to operate at SLo speed during the defrost operation, after the defrost operation or at the start of the heating operation.

“bJ” Setting Condition	Indoor Fan Operation		
	at Start of Compressor Operation in Heating Operation	During Defrost Operation	After Defrost Operation
0	STOP	STOP	STOP
1	STOP	SLo Speed	SLo Speed
2	SLo Speed*	STOP	STOP
3	SLo Speed*	SLo Speed	SLo Speed
4	SLo Speed*	STOP	SLo Speed

NOTE:

The indoor fan may operate at other speed depending on outlet air temperature of the indoor unit.

(6) Capacity-Focused Mode Setting (Function Setting “nU”)

If the unit capacity seems insufficient during the normal operation, press “PSW3” and select the setting condition “0” to “3” Capacity-Focused Mode Setting “ \overline{nU} ”. By setting this function, the target frequency and current limit of the compressor are set higher.

NOTE:

Do not use setting conditions “2” and “3” unless the power supply wiring is sufficient ampacity, because the target frequency and current limit of the compressor during the operation are set higher.

“nU” Setting Condition	Compressor Frequency and Current Operation
0	Not Available (Default Setting)
1	Compressor Frequency Limit is Set Higher
2	Current Limit is Set Higher
3	Compressor Frequency Limit and Current Limit are Set Higher

(7) Low Noise Setting (Function Setting “db”)

Press “PSW3” and select the setting condition “0” to “9” at the Low Noise Setting “ \overline{db} ” to reduce the upper limit of the compressor frequency and the outdoor fan rotation.

NOTES:

1. By setting this function, the compressor frequency and the outdoor fan motor rotation frequency are forcibly reduced and so the outdoor unit capacity decreases and the unit operation range is limited.
2. Reduction rates are approximate, these may change slightly depending on the outdoor unit model.
3. The Low Noise Setting “db”=7,8,9 are same operation as Low Noise Setting 1,2,3 by External Input Function Setting.

“db” Setting Condition	Reduction Rate of Upper Limit	
	Compressor Frequency	Outdoor Fan Rotation
0	Not Changed (100%)	Not Changed (100%)
1	Not Changed	65%
2	Not Changed	50%
3	Not Changed	45%
4	80%	Not Changed
5	60%	Not Changed
6	40%	Not Changed
7	80%	65%
8	60%	50%
9	40%	45%

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

(8) Demand Function Setting (Function Setting “dE”)

Press “PSW3” and select the setting condition “0” to “5”, so that Demand Function Setting “ dE ” can be set. This function is available by setting to “1” for the demand current control without inputting the signal to the external input terminal on the outdoor unit PCB. The table below shows the limit of the operating current for this function.

NOTE:

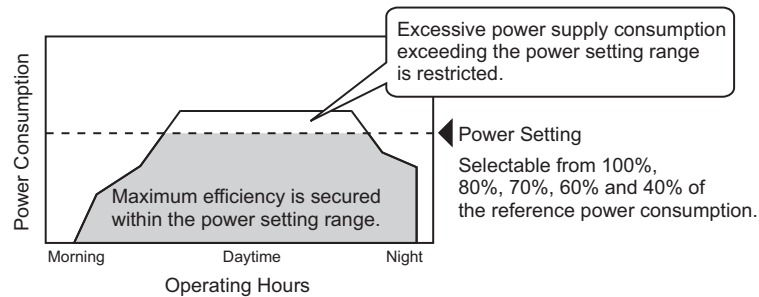
If the outdoor unit running current exceeds the maximum limit for twenty minutes, the indoor unit is put under Thermo-OFF condition. In this case, the stoppage code No. “10” is given.

If Demand Current Control by External Input Function is set and the external input signal is available, this function is not performed during Demand Current Control by External Input Function is performed.

“dE” Setting Condition	Demand Running Current Control
0	Not Available (Default Setting)
1	40%
2	60%
3	70%
4	80%
5	100%

- Demand Control

Adopting self-demand function, which drastically decreases power consumption, has largely improved energy saving.



Outdoor Unit Capacity [MBH]	Reference Power Consumption [KW]
072	10.5
096	12.5
120	14.0

< NOTES for Facility >

1. The demand current control (%) is value criterion. The value used for this control is calculated from the current, and therefore is different from the value indicated by a wattmeter. If it is required that the maximum power consumption is managed precisely, a field-supplied demand controller should be used.
2. The actual value may temporarily be higher than the indicated value shown above depending on the operating control conditions such as protection control.

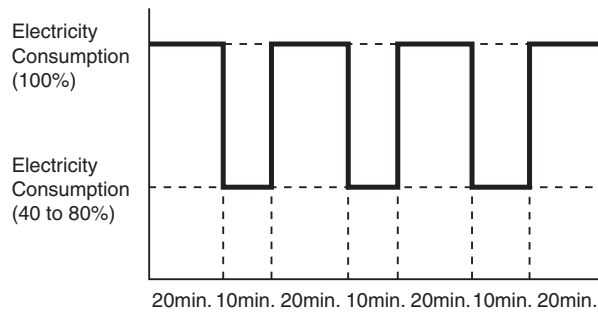
(9) Wave Function Setting (Function Setting "UE")

Press "PSW3" and select the setting condition "0" to "4", so that Wave Function Setting "UE" can be set. While this function is activated, the maximum limit of running current is changed from 40% to 80% as shown in the figure.

NOTE:

If Demand Current Control by External Input Function is set and the external input signal is available, this function is not performed during Demand Current Control by External Input Function is performed.

"UE" Setting Condition	Running Current Lower Limit Setting
0	Not Available (Default Setting)
1	40%
2	60%
3	70%
4	80%



NOTE:

The current limit value is targeted value. The actual current value may temporarily be higher than the value shown in the table above depending on the operating control condition.

When the scheduled operation of "Demand Function Setting" is set from the central controller, refer to Section 1.4 Control Device 1.4.4~1.4.8 and the "Installation and Maintenance Manual" for the central controller.

(10) Protection of Decrease in Outlet Temperature for Cooling (Function Setting "Fb")

Press "PSW3" and select the setting condition "0" to "3" at Protection of Decrease in Outlet Temperature for Cooling "Fb", can be set. When the indoor unit outlet air temperature falls at cooling operation, the compressor frequency forcibly decreases to prevent a drop in outlet air temperature. If the outlet temperature decreases and the temperature is less than the Thermo-OFF condition even after the compressor frequency decreases, the indoor unit becomes Thermo-OFF condition.

(When Thermo-OFF is activated under this condition, the operation will be restarted after three minutes.)

*In this section, Thermo-ON/Thermo-OFF mean for the indoor unit.

Thermo-ON: The indoor unit is running.

Thermo-OFF: The indoor unit stays on, but doesn't run.

"Fb" Setting Condition	Outlet Temperature	
	Target Value	at Thermo-OFF
0	-	-
1	50°F (10°C)	44°F (7°C)
2	54°F (12°C)	48°F (9°C)
3	58°F (14°C)	52°F (11°C)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

(11) Adjustment of Fan Rotation (Function Setting “Fo”)

Press “PSW3” and select the setting condition “0” to “2” at Adjustment of Fan Rotation “ F_{\square} ”, so Adjustment of Fan Rotation can be set. If the outdoor unit fans make a whining sound in an instance of multiple installations, set this function to the relevant outdoor units.

Setting Condition	Adjustment of Fan Rotation
0	Not Available (Default Setting)
1	-15 rpm
2	-30 rpm

NOTE:

- In DSW4-No.5=ON of the sub outlet unit, this function is not available in spite of function setting of the main outdoor unit.
- By setting this function, the outdoor fan rotation is slightly reduced, so the outdoor unit capacity may decrease and the operation range may be limited.

(12) Intermittent Operation of Outdoor Fan Motor (Function Setting “F4”)

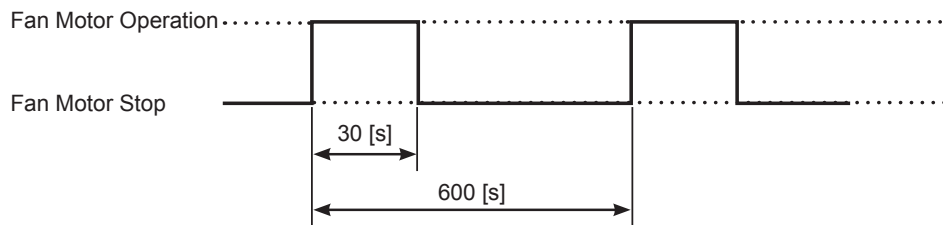
Press “PSW3” and set Intermittent Operation of Outdoor Fan Motor “ F_{\square} ” (auxiliary function) to protect the outdoor fan motor from snow.

Set this function to the PCB of the outdoor unit set as the main outdoor unit.

When the outdoor temperature (selectable from 38°F (3°C), 32°F (0°C), 34°F (1°C), 36°F (2°C), 40°F (4°C) and 41°F (5°C)) reaches the temperature setpoint, all the outdoor fan motors start intermitted operation.

When the outdoor temperature is at least +9°F (+5°C) higher than the temperature setpoint, the outdoor fan motors stop operating.

If the compressor restarts operating, the outdoor fan motors will be restored to normal operation.



NOTES:

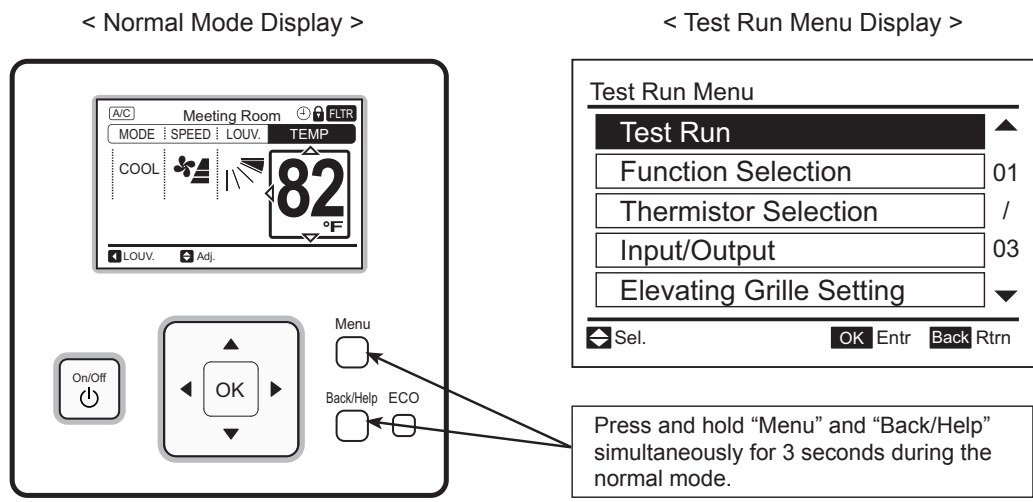
1. This is an auxiliary function to protect the unit from snow. In snowy regions, make sure to protect the unit with a snow-prevention roof, fence (field-supplied) or snow protection hood (optional). Otherwise, abnormal vibrations because of an imbalanced propeller fan will be caused.
2. If the fan motor or fan controller fail during the outdoor fan motor start/stop operation, stop all the outdoor fans to suspend the operation. Check the alarm code and deal properly with the failure next time the compressor is operated.

! WARNING

Because of this setting, the outdoor fan can operate even while the outdoor unit (compressor) stops. Display a notice to that effect on a readily visible part of the unit body, in order to avoid injuries caused by an unintended outdoor fan operation.

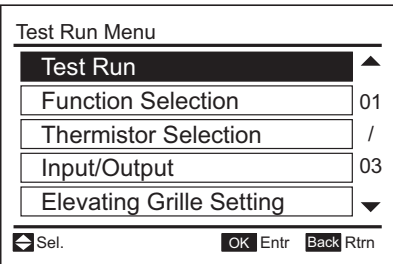
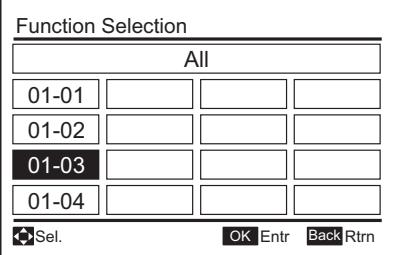
5.4 External Input/Output and Function Setting Mode for Indoor Unit

- Setting Method from Wired Controller
The function selection and the input/output setting can be set from the test run menu.



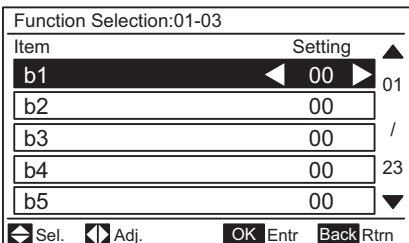
EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

• Function Selection and Input/Output Setting

<p>1. Press and hold "Menu" and "Back/Help" simultaneously for at least three seconds during the normal mode (when unit is not operated). The Test Run menu will be displayed.</p>	 <p>Test Run Menu</p> <ul style="list-style-type: none"> Test Run ▲ Function Selection 01 Thermistor Selection / Input/Output 03 Elevating Grille Setting ▼ <p>◀ Sel. OK Entr Back Rtrn</p>																
<p>2. Select "Function Selection" or "Input/Output" from the Test Run menu and press "OK".</p>	 <p>Function Selection</p> <p>All</p> <table border="1"> <tr><td>01-01</td><td></td><td></td><td></td></tr> <tr><td>01-02</td><td></td><td></td><td></td></tr> <tr><td>01-03</td><td></td><td></td><td></td></tr> <tr><td>01-04</td><td></td><td></td><td></td></tr> </table> <p>◀ Sel. OK Entr Back Rtrn</p>	01-01				01-02				01-03				01-04			
01-01																	
01-02																	
01-03																	
01-04																	

Function Selection

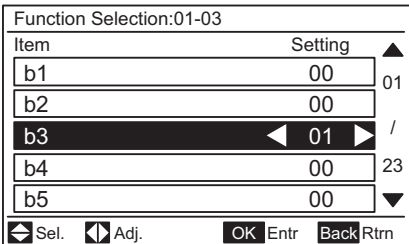
4. Press "△ ▽" and select the item.



Item	Setting	
b1	◀ 00 ▶	01
b2	00	/
b3	00	23
b4	00	
b5	00	

◀ Sel. ▶ Adj. OK Entr Back Rtrn

5. Press "◀ ▶" and change the setting.

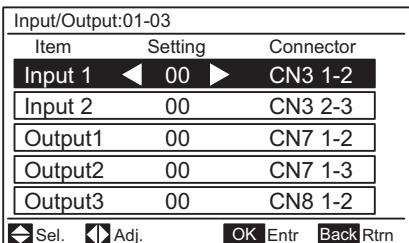


Item	Setting	
b1	00	01
b2	00	/
b3	◀ 01 ▶	23
b4	00	
b5	00	

◀ Sel. ▶ Adj. OK Entr Back Rtrn

Input/Output Setting

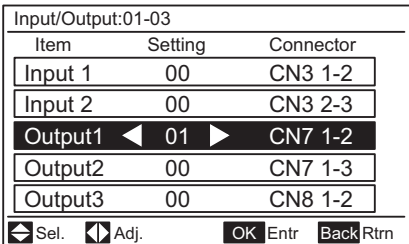
4. Press "△ ▽" and select the item.



Item	Setting	Connector
Input 1	◀ 00 ▶	CN3 1-2
Input 2	00	CN3 2-3
Output1	00	CN7 1-2
Output2	00	CN7 1-3
Output3	00	CN8 1-2

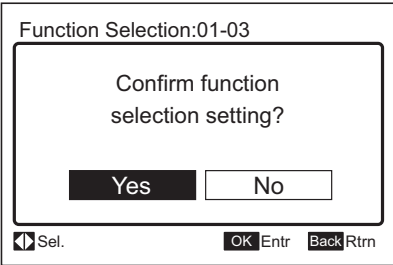
◀ Sel. ▶ Adj. OK Entr Back Rtrn

5. Press "◀ ▶" and change the setting.



Item	Setting	Connector
Input 1	00	CN3 1-2
Input 2	00	CN3 2-3
Output1	◀ 01 ▶	CN7 1-2
Output2	00	CN7 1-3
Output3	00	CN8 1-2

◀ Sel. ▶ Adj. OK Entr Back Rtrn

<p>6. Press "OK" so that the confirmation screen will be displayed.</p>	 <p>Function Selection:01-03</p> <p>Confirm function selection setting?</p> <p>Yes No</p> <p>◀ Sel. OK Entr Back Rtrn</p> <p>(Figure for Function Selection)</p>
<p>7. Select "Yes" and press "OK". The Test Run menu will be displayed after the setting is confirmed. If "No" is selected, the screen will return to "4".</p>	
<p>8. Press "Back/Help" on the Test Run menu to return to the normal mode.</p>	

To set other units, press "Back/Help" at "4" and "5" so that the screen will return to "3".
(If the number of an indoor unit connected with the controller is "1", the screen will return to "1".)

5.4.1 External Input and Output Settings

On the Indoor Unit Printed Circuit Board (PCB), there are two input terminals (CN3) to receive external signals and three output terminals (CN7, CN8) to send signals out. Functions shown in these tables are available when setting input and output terminals.

< Input and Output Number Display and Connectors >

Input Number Display Input/Output Indication	Port	Factory Setting		Setting
		Setting Item	Indication	
Input 1	CN3 1-2	Remote ON/OFF 1 (Level)	03	
Input 2	CN3 2-3	Prohibiting Remote Control after Manual Stoppage	06	
Output 1	CN7 1-2	Operation	01	
Output 2	CN7 1-3	Alarm	02	
Output 3	CN8 1-2	Thermo-ON for Heating	06	

< Input and Output Settings and Display Codes >

Code Indicated	Input	Output
00	Not set	Not set
01	Room Thermostat (for Cooling)	Operation
02	Room Thermostat (for Heating)	Alarm
03	Remote ON/OFF 1 (Level)	Cooling
04	Remote ON/OFF 2 (Operation)	Thermo-ON for Cooling
05	Remote ON/OFF 2 (Stoppage)	Heating
06	Forbidding Remote Control after Manual Stoppage	Thermo-ON for Heating
07	Remote Cooling / Heating Change	Total Heat Exchanger

NOTES:

1. Change the optional setting after waiting at least three minutes elapsed time after start-up.
2. Do not set the elevating grille for the total heat exchanger.
3. Record the setting conditions for each input and output in the "Setting" column of the table.

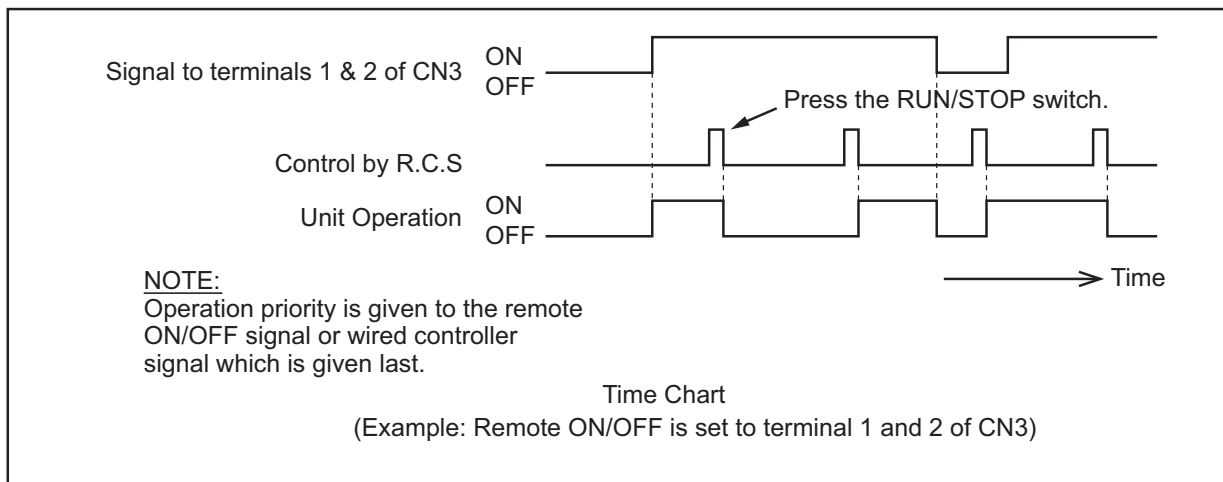
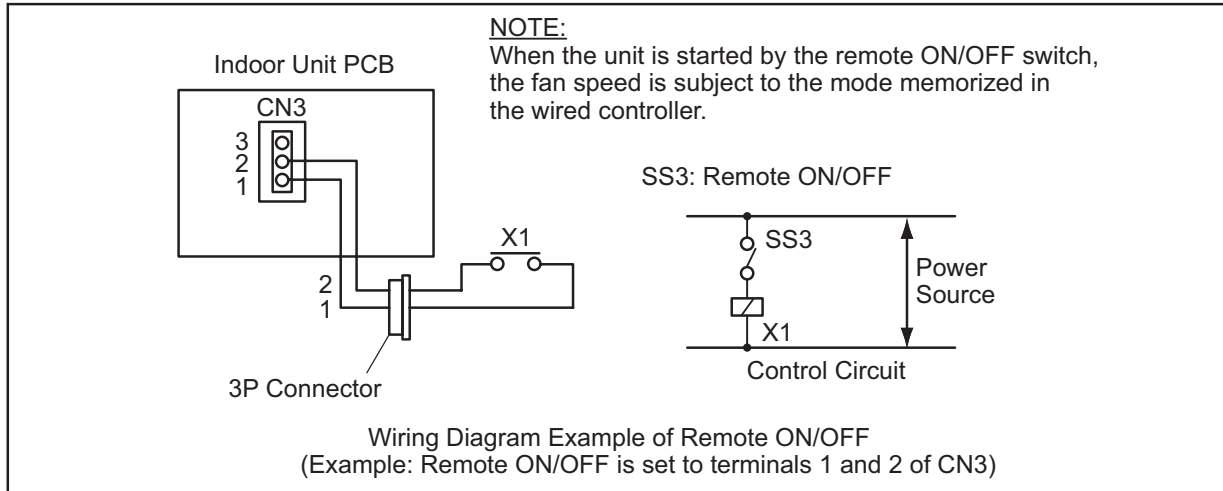
EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

5.4.1.1 Remote Control ON/OFF Function

This function provides a control to stop and start the system automatically from a remote place. Four methods are available by using each signal from a building management system.

(1) Remote ON/OFF 1 (Level Signal Input) [Input Setting: Code (03)]

This is an ON/OFF function from a remote place by using level signals (ON/OFF). An example of basic wiring and time chart are shown below.

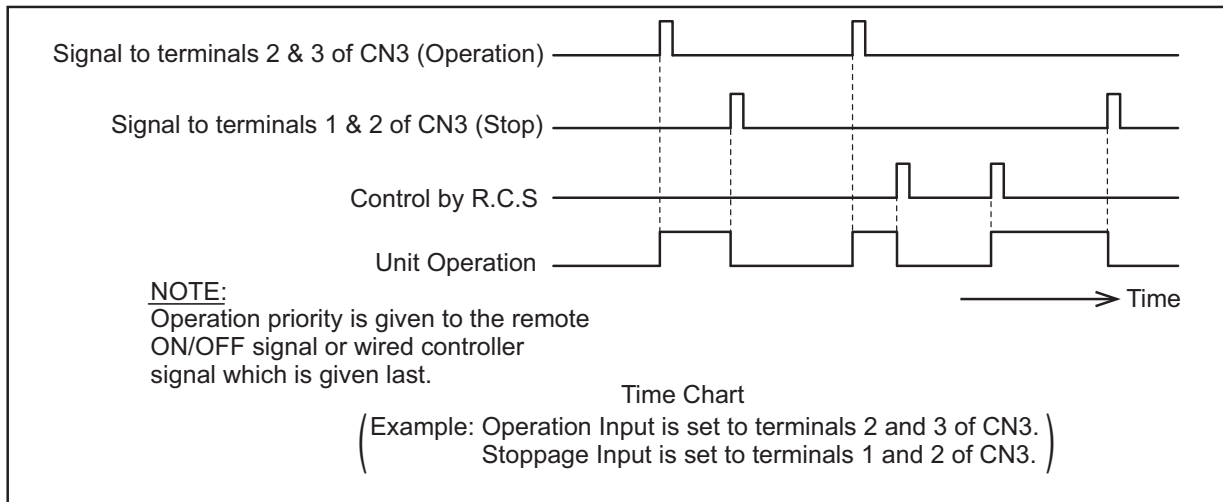
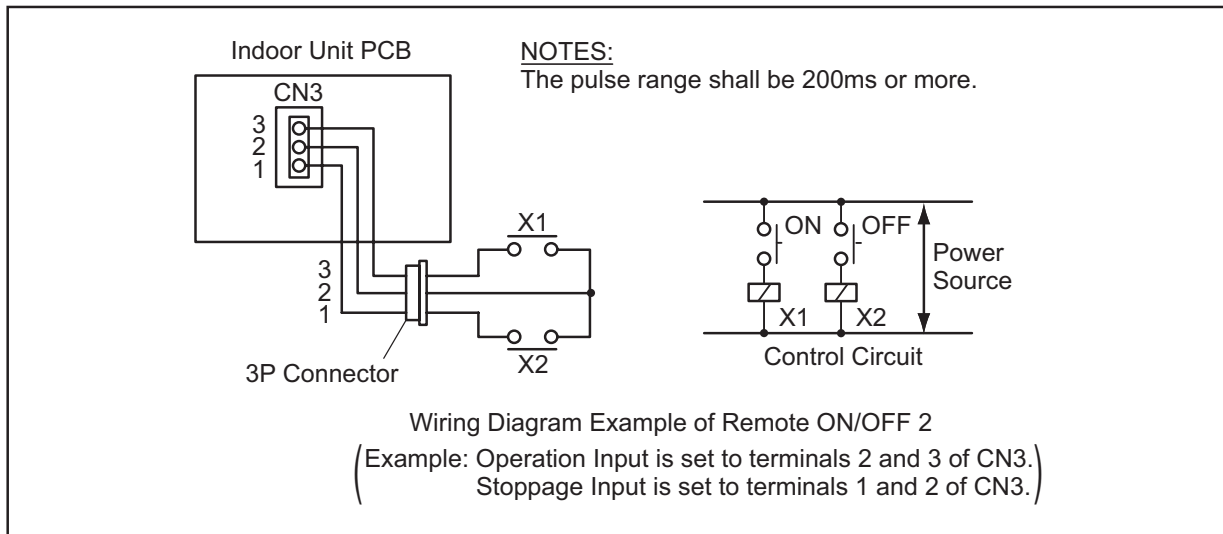


NOTES:

1. Picking up signal within 10 seconds after power supply is turned ON is not available due to initialization of the components.
Do not change the signal (RUN/STOP) in this period.
2. Wired Controller is required for this function.
3. If multiple indoor units are connected to the same transition wiring for wired controller, input the signal to any of these indoor units.
4. When the transition wiring is not used in the twin, triple and quad combinations for simultaneous operation, input the signal to the main indoor unit.

(2) Remote ON/OFF 2 (Pulse Signal Input) [Input Setting: Code (04)]

This is an ON/OFF function from a remote place by using pulse signals. An example of basic wiring and time chart are shown below.



NOTES:

1. Picking up signal within 10 seconds after power supply is turned ON is not available due to initialization of the components.
Do not change the signal (RUN/STOP) in this period.
2. Wired Controller is required for this function.
3. If multiple indoor units are connected to the same transition wiring for wired controller, input the signal to any of these indoor units.
4. When the transition wiring is not used in the twin, triple and quad combinations for simultaneous operation, input the signal to the main indoor unit.

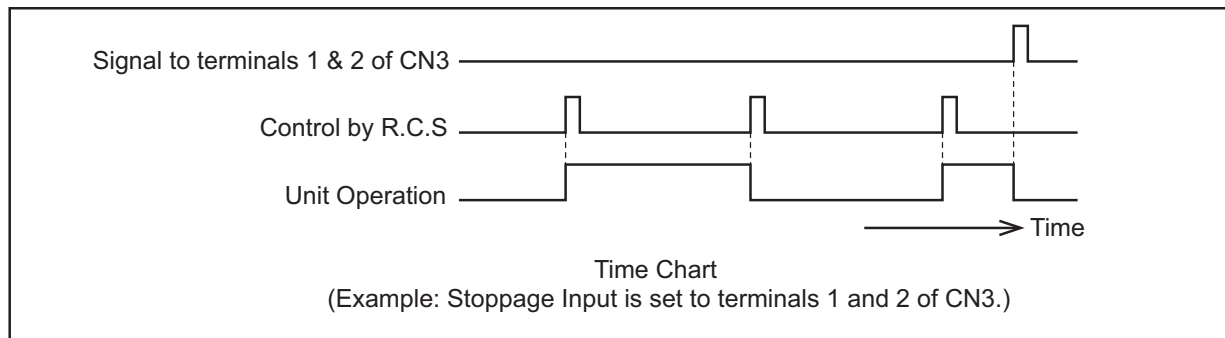
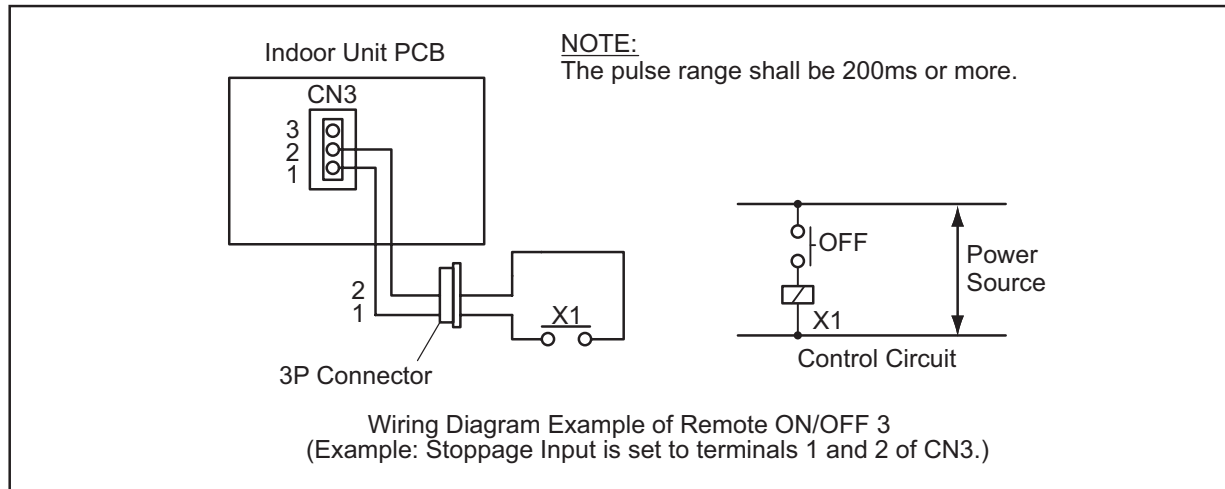
EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

(3) Remote ON/OFF 3 (Pulse Signal Input) [Input Setting: Code (05)]

The setting for Remote ON/OFF 3 shall be the same as that for Remote ON/OFF 2. By using the signal from a building management system, the air conditioners can be stopped.

If a signal is input during the stoppage of the air conditioner, the air conditioner remains unchanged.

An example of basic wiring and time chart are shown below.

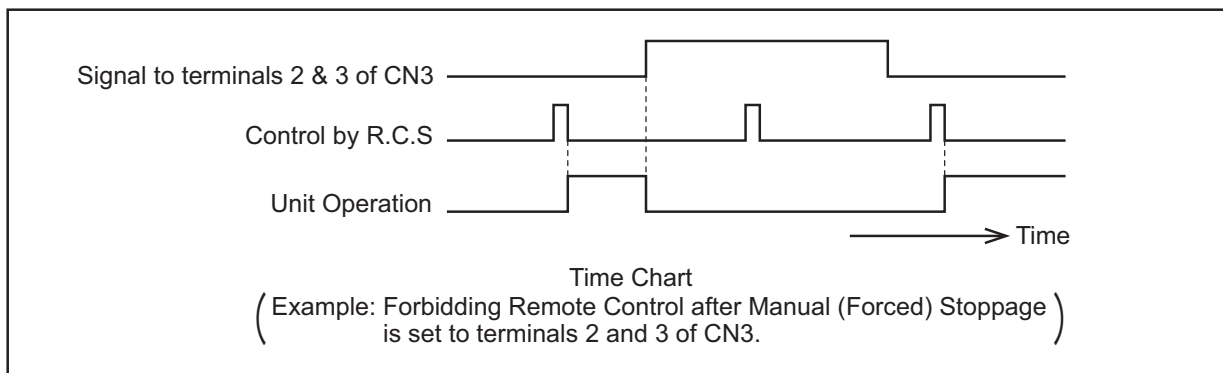
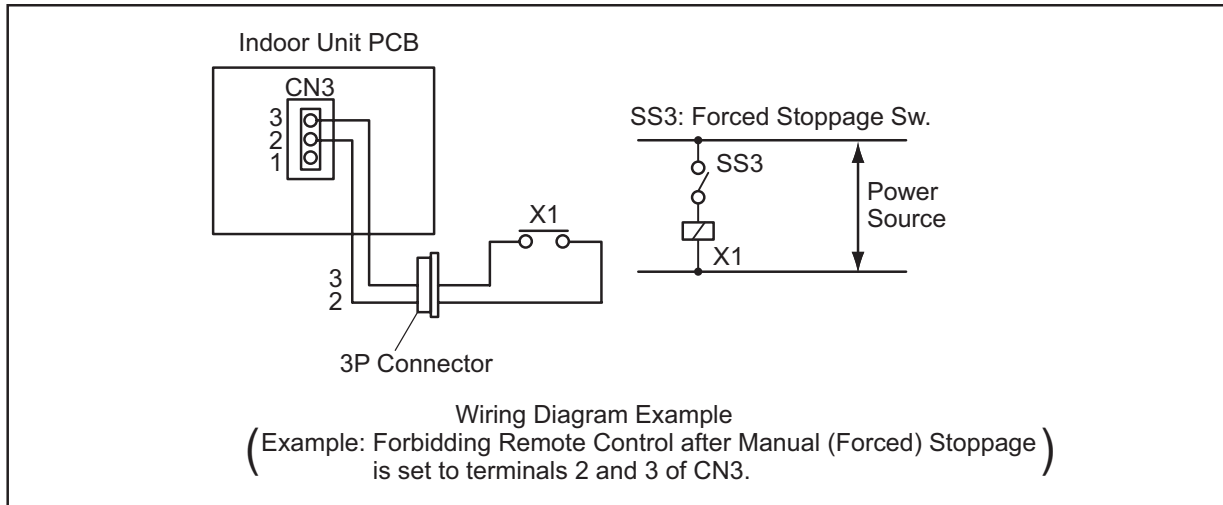


NOTES:

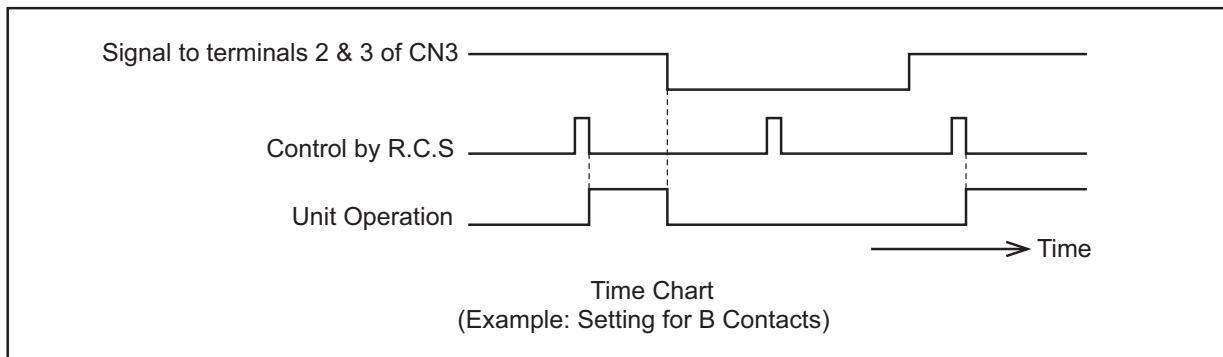
1. Picking up signal within 10 seconds after power supply is turned ON is not available due to initialization of the components.
Do not change the signal (RUN/STOP) in this period.
2. Wired Controller is required for this function.
3. If multiple indoor units are connected to the same transition wiring for wired controller, input the signal to any of these indoor units.
4. When the transition wiring is not used in the twin, triple and quad combinations for simultaneous operation, input the signal to the main indoor unit.

(4) Forbidding Remote Control after Manual (Forced) Stoppage (Level Signal Input)
 [Input Setting: Code (06)]

By using the signal from a building management system, the air conditioners can be stopped and the individual commands from the wired controller are canceled. An example of basic wiring and time chart are shown below.



This function can be used for B contacts if using “Selection of Forced Stoppage Logic” in the section 5.4.2.1 “Function Selection Item.” An example of basic wiring and time chart are shown below.



NOTES:

1. Picking up signal within 10 seconds after power supply is turned ON is not available due to initializing of components.
 Do not change the signal (RUN/STOP) in this period.
2. Wired Controller is required for this function.
3. The following ON/OFF functions are not available after the manual (forced) stoppage because commands from the wired controller is cancelled.
 - a. ON/OFF function from a remote place
 - b. ON/OFF function by the centralized controller while the wireless wired controller is used.

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

Table 5.1 Specifications on Required Components for (1) to (4) Functions

Component		Manufacturer or Specifications	Remarks
Auxiliary Relay (X1, X2)		OMRON Mini Power Relay Model: MY1F/2F or Equivalent	Voltage 220V
Changeover Switch (SS2, SS3)		Manual Type	
3P Connector Cord		Optional Part PCC-1A (Connectable to JST Connector XARP-3), 12V	Five Cords with Connectors as One Set
Cord (Indoor)	Low Voltage	AWG22 (0.3mm ²)	less than 12V
	220V Class	AWG20 or AWG18 (0.5 to 0.75mm ²)	
Cord (Outdoor)	Low Voltage	AWG20 or AWG18 (0.5 to 0.75mm ²)	less than 12V
	220V Class	AWG14 (2mm ²)	

NOTE:

1. Make the wires CN3 as short as possible. Do not install the wires along the 220V power line. Install them more than 12 in. (30cm) away from each other. (Intersecting them is acceptable.)
If the wires are installed along the power line, comply with the following points to prevent noise.
 - a. Pass either of the low voltage wire and 220V power line through a metal conduit tube and ground one end.
 - b. Use a shielded wire for a low voltage wire and ground one end.
The maximum wiring length is 230 ft. (70m).

2. When using this function, it is recommended that safety devices such as an electric leakage breaker or smoke detector, etc. be used because this is unattended function.

5.4.1.2 Power Supply ON/OFF 1 (Automatic Operation When Power Supply Is ON)

This function is utilized to run/stop the unit by turning ON/OFF the power supply. When this function is utilized in the condition that there is no person to operate the unit, monitor the system for disaster prevention. When using this function, refer to operation for Wired Controller item (30) "Power Supply ON/OFF (Automatic Operation When Power Supply Is ON) (d1)" for the setting.

NOTE:

1. The unit will be stopped even when the power supply is turned ON/OFF due to power failure. If power failure occurs during the stoppage of the unit, the operation is restarted after the power supply is restored.
2. Wired Controller is required for this function.
3. When the transition wiring is not used in the twin, triple and quad combinations for simultaneous operation, set this function only to the main indoor unit.

5.4.1.3 Power Supply ON/OFF 2 (Restarting Function After Power Failure)

This function is utilized to restart the unit operation automatically when the power supply is restored after the power failure over 2 seconds. In case of the power failure for 2 seconds or less, the standard unit memorize all the operation mode and restarts the operation automatically. (The compressor restarts operation after 3 minutes guard in addition to power failure time for up to 2 seconds.)

When this function is utilized in the condition that there is no person to operate the unit, monitor the system for disaster prevention.

NOTE:

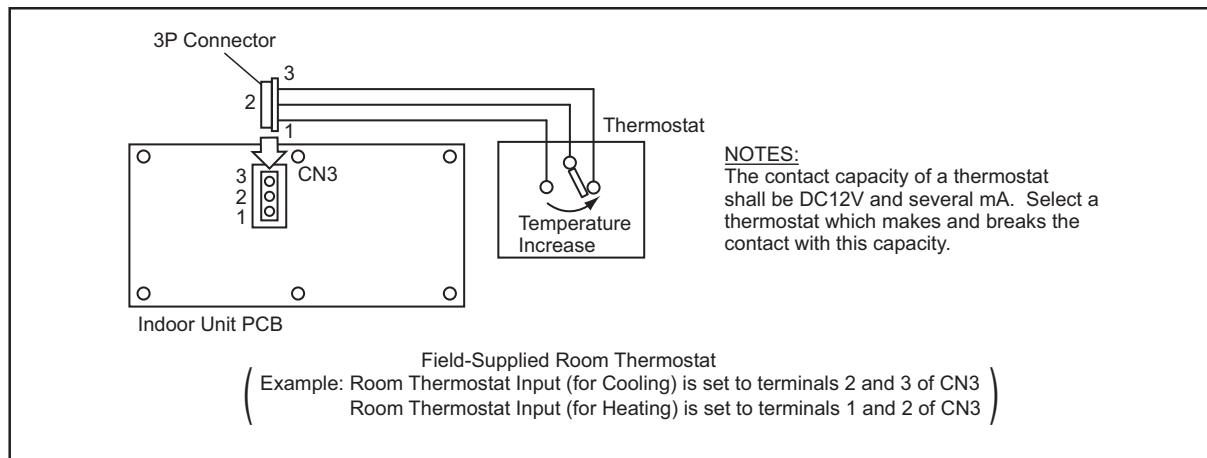
1. If power failure occurs during the stoppage of the unit, the unit remains stopped after the power supply is restored.
2. Wired Controller is required to be connected for setting this function.
3. When the transition wiring is not used in the twin, triple and quad combinations for simultaneous operation, set this function only to the main indoor unit.

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

5.4.1.4 Control by Field-Supplied Room Thermostat

[Input Setting: Code (01) (for Cooling), Code (02) (for Heating)]

In the case that a field-supplied room thermostat is used instead of the inlet thermistor of the indoor unit in order to run/stop the compressor, connect wires as shown below.



Operation

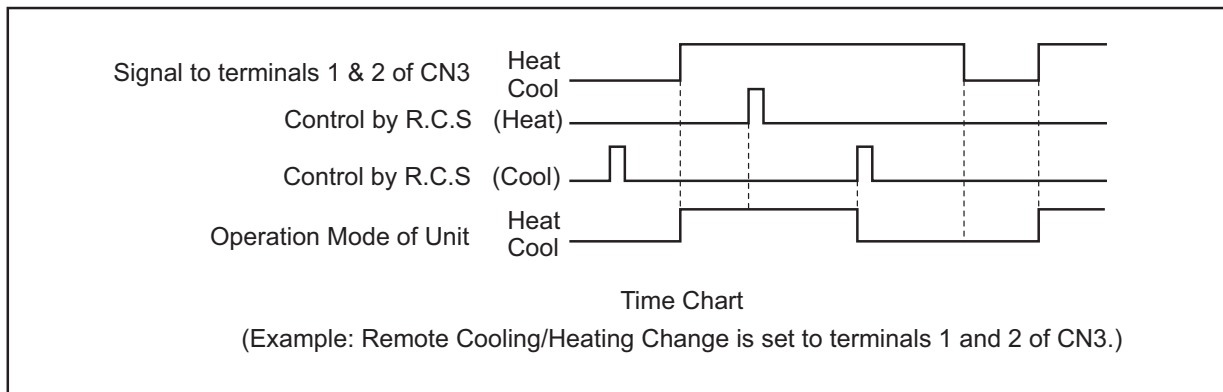
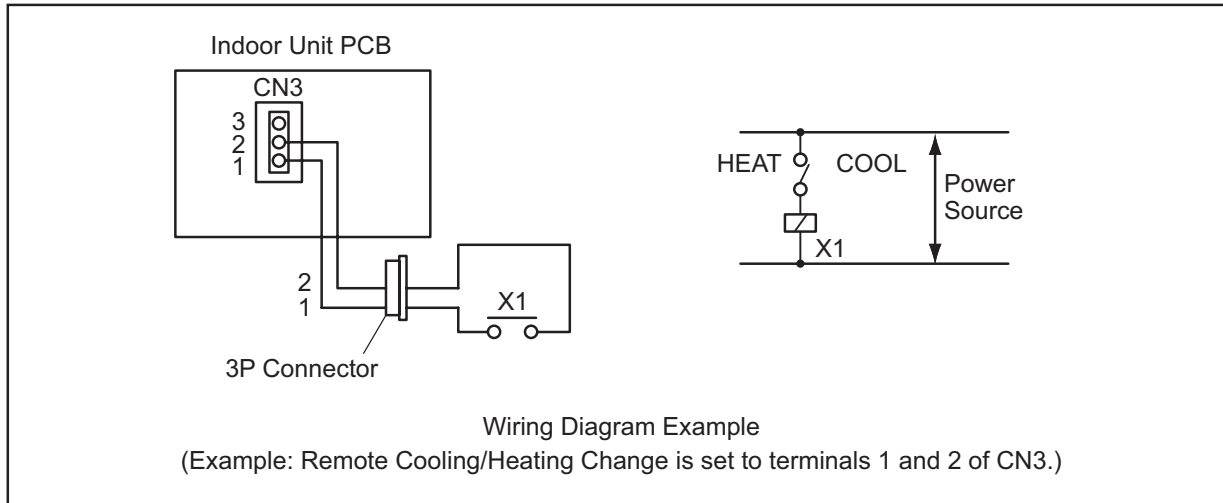
- Cooling Operation: Compressor is ON by closing terminals 2 and 3 of CN3
Compressor is OFF by opening terminals 2 and 3 of CN3
- Heating Operation: Compressor is ON by closing terminals 1 and 2 of CN3
Compressor is OFF by opening terminals 1 and 2 of CN3

NOTE:

1. Make the wires CN3 as short as possible. Do not install the wires along the 220V power line. Install them more than 12 in. (30cm) away from each other. (Intersecting them is acceptable.)
If the wires are installed along the power line, comply with the following points to prevent noise.
 - a. Pass either of the low voltage wire and 220V power line through a metal tube and ground one end.
 - b. Use a shielded wire for a low voltage wire and ground one end.The maximum wiring length is 230 ft. (70m).
2. When using this function, it is recommended that safety devices such as an electric leakage breaker or smoke detector, etc. be used because this is unattended function.
3. For a thermostat, do not use a thermostat which uses mercury for switch, because chattering is likely to occur at ON/OFF.
4. Use a thermostat with a differential of 27°F (1.5°C) or more.
5. Comply with the following points. If not, a high-voltage circuit breaker will be activated or the unit will repeat ON/OFF operation.
 - a. Install a thermostat where air inlet temperature can be detected correctly.
 - b. Install a thermostat where suction air from the unit does not blow directly against it.
6. When using a room thermostat, set each room thermostat (for cooling and heating) correctly. If either of them is set incorrectly, the other room thermostat does not operate.

5.4.1.5 Remote Cooling/Heating Change [Input Setting: Code (07)]

The cooling or heating operation mode can be changed by giving a contact signal from the outside to the unit. Set this function to CN3 with a wired controller according to the section 5.4.2.1 “Function Selection Item.” This function detects ON to OFF transition and OFF to ON transition. Of the commands by this signal and a wired controller, the command given later is preferentially executed. An example of basic wiring and time chart are shown below.



NOTES:

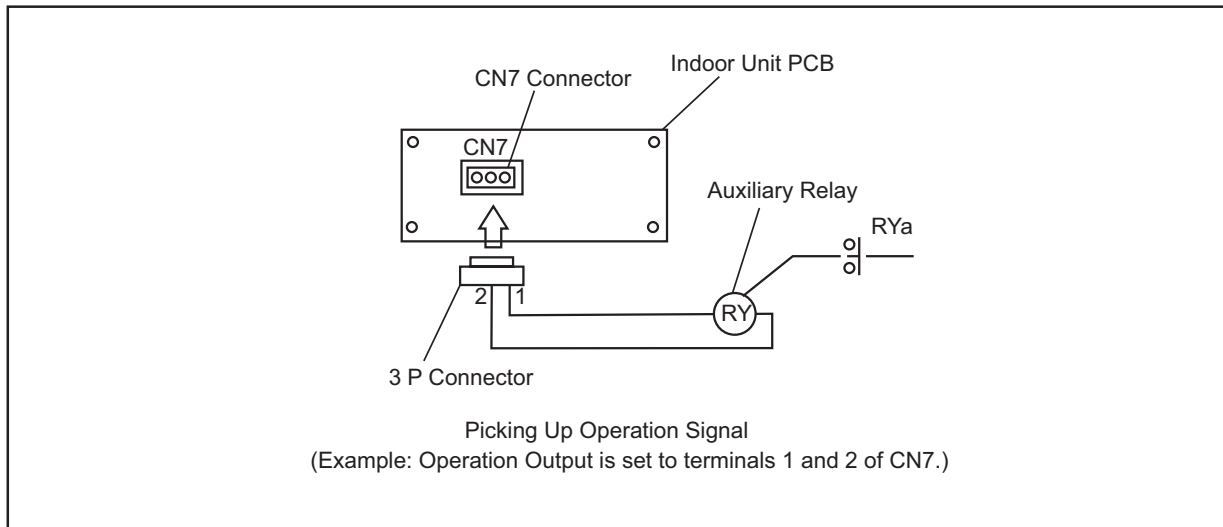
1. Wired Controller is required for this function.
2. Refer to the table 5.1 for details of the required components.
3. If multiple indoor units are connected to the same transition wiring for wired controller, input the signal to any of these indoor units.
4. When the transition wiring is not used in the twin, triple and quad combinations for simultaneous operation, set this function only to the main indoor unit.

5.4.1.6 Picking Up Operation Signal

Up to 3 of the following 7 signals can be picked up by setting this function to CN7 and CN8 according to the following figures. Make sure to use a field-supplied remote control adopter PSC-5RA for picking up signals. The wiring length shall be 230 ft. (70m) or less. The setting for picking up signals (1), (2) and (4) are already set before shipment.

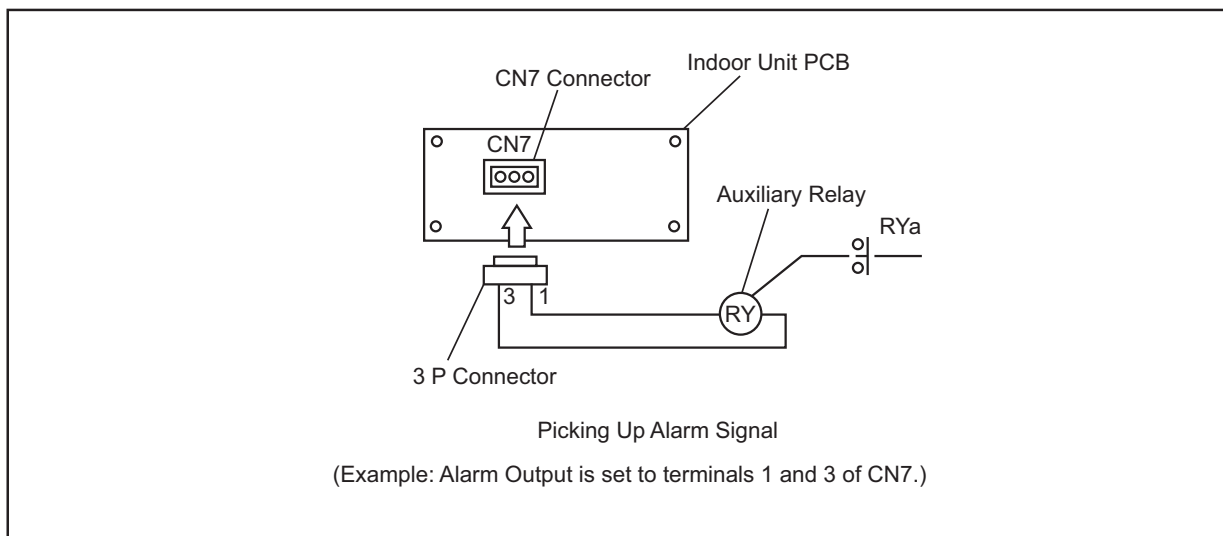
(1) Picking Up Operation Signal [Output Setting: Code (01)]

This function is utilized to pick up operation signal that has nothing to do with the compressor stoppage by a thermistor. An example of basic wiring and time chart are shown below. The contact of the auxiliary relay "RYa" is closed when this operation signal is given. This function enables the signal check during remote control operation and an interlock of the fan for air inlet, etc.. The contact of the auxiliary relay "RYa" is opened while the protection devices are activated.



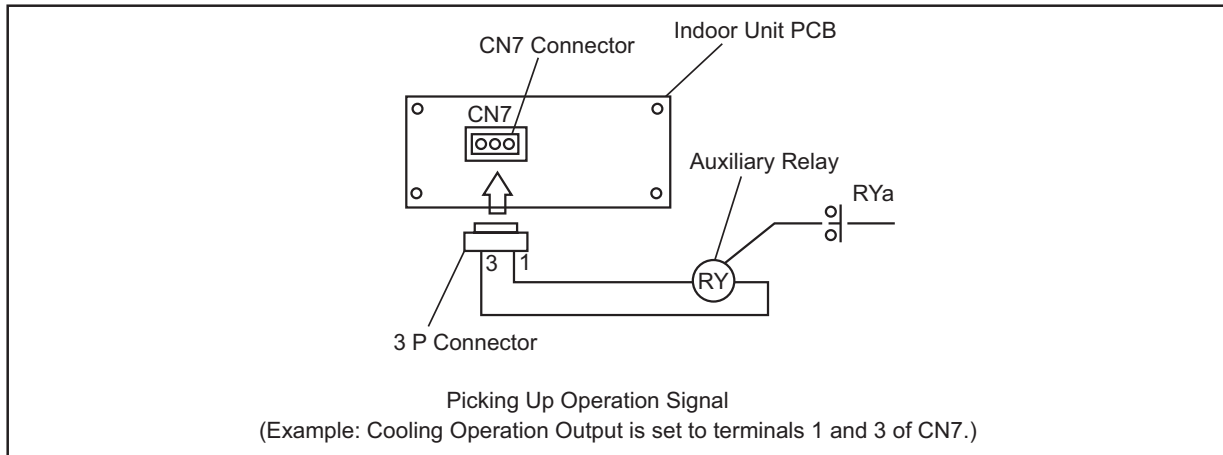
(2) Picking Up Alarm Signal [Output Setting: Code (02)]

This signal is utilized to pick up alarm signal while safety devices are activated. However, this function is not available for abnormal transmission of the wired controller. An example of basic wiring and time chart are shown below. The contact of the auxiliary relay "RYa" is closed while the protection devices are activated.



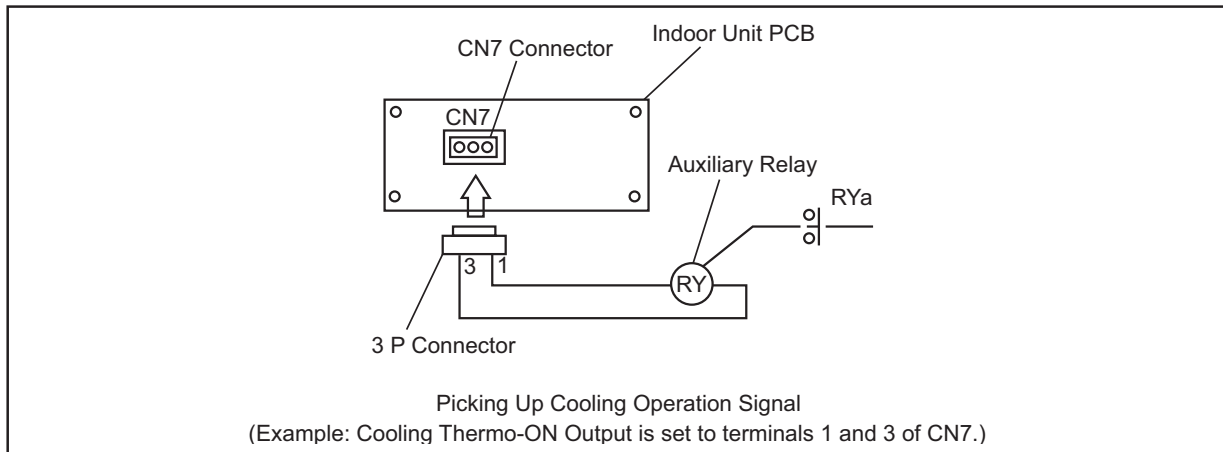
(3) Picking Up Cooling Operation Signal [Output Setting: Code (03)]

This function is utilized to pick up cooling operation signal that has nothing to do with the compressor stoppage by a thermistor . An example of basic wiring and time chart are shown below. The contact of the auxiliary relay “RYa” is closed when this operation signal is given.



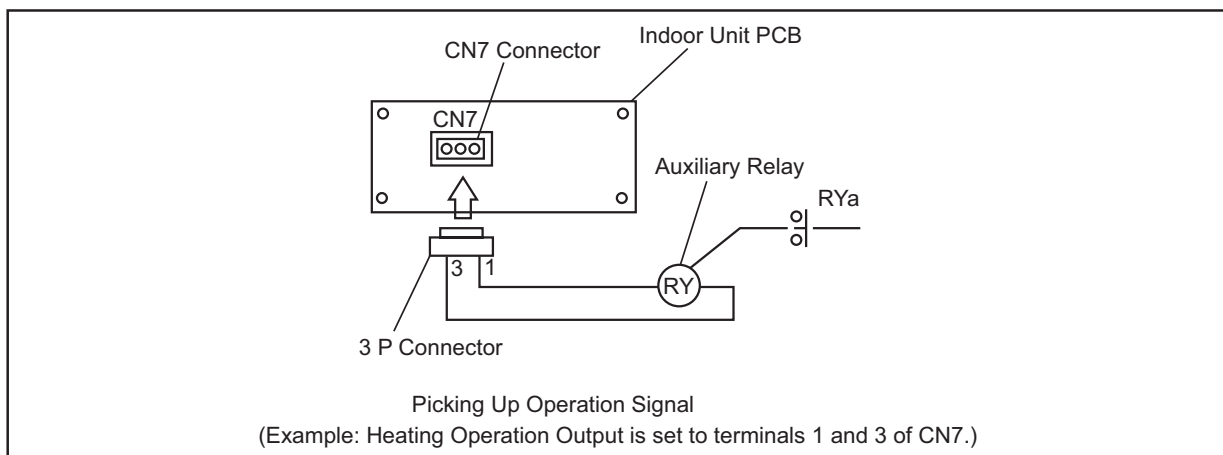
(4) Picking Up Cooling Thermo-ON Signal [Output Setting: Code (04)]

This function is utilized to pick up thermo-ON signal during the cooling operation. An example of basic wiring and time chart are shown below. The contact of the auxiliary relay “RYa” is closed during thermo-ON in cooling operation.



(5) Picking Up Heating Operation Signal [Output Setting: Code (05)]

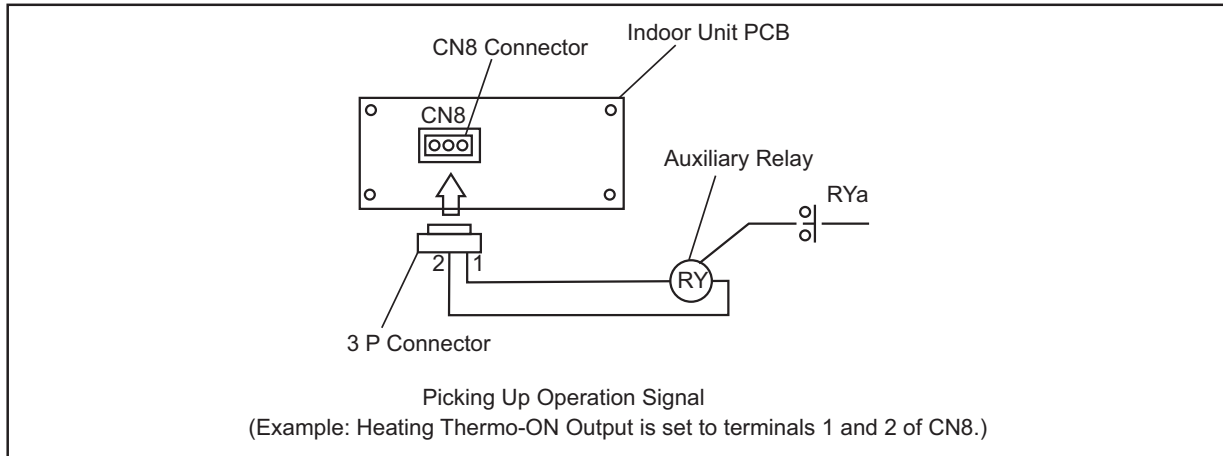
This function is utilized to pick up heating operation signal that has nothing to do with the compressor stoppage by a thermistor . An example of basic wiring and time chart are shown below. The contact of the auxiliary relay “RYa” is closed when this operation signal is given.



EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

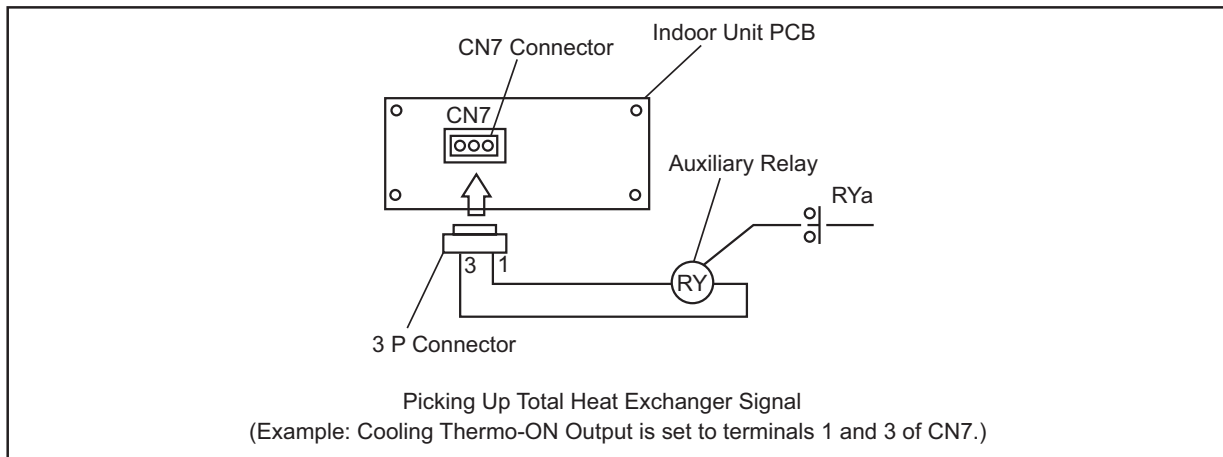
(6) Picking Up Heating Thermo-ON Signal [Output Setting: Code (06)]

This function is utilized to pick up thermo-ON signal during the heating operation. An example of basic wiring and time chart are shown below. The contact of the auxiliary relay “RYa” is closed during thermo-ON in heating operation. Use this function for operation of a circulator or a humidifier.



(7) Picking Up Total Heat Exchanger Signal [Output Setting: Code (07)]

This function is utilized to pick up total heat exchanger signal during the ventilation mode selected with a wired controller. An example of basic wiring and time chart are shown below.



NOTE:

These are examples using general-purpose relay.

5.4.2 Function Setting

5.4.2.1 Function Selection Item

● for Ducted Type

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
1	b1	Cancellation of Heating Temperature Compensation due to Uneven Heat Load	○	00 01 02 03 04	Standard (Set Temp. +7°F (+4°C)) Removal (Set Temp.) Set Temp. +3°F (+2°C) (*1) Set Temp. +5°F (+3°C) Set Temp. +2°F (+1°C)
2	b2	Circulator Function during Heating Thermo-OFF	○	00 01	Not Available Available
3	b3	Not Prepared	-	-	Not Used (Use as 00 conditions)
4	b4	Change of Filter Cleaning Time	-	00 01 02 03 04	Standard 1,200 hrs (Factory-Setting) 100 hrs 1,200 hrs 2,500 hrs No Indication
5	b5	Fixing of Operation Mode	×	00 01	Standard Fixed
6	b6	Fixing of Setting Temperature	×	00 01	Standard Fixed
7	b7	Fixing of Operation as Exclusive Cooling Unit	×	00 01	Standard Fixed
8	b8	Automatic COOL/HEAT Operation	×	00 01	Not Available Available
9	b9	Fixing of Fan Speed	×	00 01	Standard Fixed
10	bA	Not Prepared	-	-	Not Used
11	bb	Cooling Temperature Compensation due to Uneven Heat Load	×	00 01 02	Standard (No Compensation) Set Temp. -2°F (-1°C) Set Temp. -3°F (-2°C)
12	bC	Not Prepared	-	-	Not Used (Use as 00 conditions)
13	bd	Not Prepared	-	-	Not Used (Use as 00 conditions)
14	bE	Not Prepared	-	-	Not Used (Use as 00 conditions)
15	C1	Not Prepared	-	-	Not Used (Use as 00 conditions)
16	C2	Not Prepared	-	-	Not Used
17	C3	Not Prepared	-	-	Not Used
18	C4	Not Prepared	-	-	Not Used
19	C5	Hi Speed (Except for Hi Speed during Heating Thermo-OFF)	○	00 01 02	Not Available Hi Speed 1 Hi Speed 2
20	C6	Hi Speed during Heating Thermo-OFF	○	00 01	Not Available Available
21	C7	Canceling of Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Standard Cancellation
22	C8	Thermistor of Wired Controller (*6)	○	00 01 02 00 01 02	< If Wired Controller Thermistor is Selected > Not Available Control by Thermistor of Wired Controller Control by Average Value of Indoor Suction Thermistor and Thermistor of Wired Controller < If Remote Sensor is Selected > Control by Average Value of Indoor Suction Thermistor and Remote Sensor Control by Remote Sensor Same as "00"
23	C9	Not Prepared	-	-	Not Used
24	CA	Not Prepared	-	-	Not Used
25	Cb	Selection of Forced Stoppage Logic	×	00 01	Forced Stoppage Input: A Contact Forced Stoppage Input: B Contact
26	CC	Not Prepared	-	-	Not Used (Use as 00 conditions)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	
27	Cd	Not Prepared	-	-	Not Used (Use as 00 conditions)	
28	CE	Not Prepared	-	-	Not Used (Use as 00 conditions)	
29	CF	Change of Louver Swing Angle	○	00 01 02	Standard (7-Step Operation) Cold Draft Prevention (5 Steps: lower 2 steps cut off) High Ceiling (higher 2 steps cut off)	
30	d1	Power Supply ON/OFF 1	○	00 01	Not Available Available	
31	d2	Not Prepared	-	-	Not Used	
32	d3	Power Supply ON/OFF 2	○	00 01	Not Available Available	
33	d4	Prevention for Cooling Discharge Air Temp. Decrease	○	00 01	Not Available Available	
34	d5	Prevention for Heating Discharge Air Temp. Decrease	Ducted High	-	-	Not Used
			Ducted Medium Slim	○	00 01	Not Available Available
35	d6	Not Prepared	-	-	Not Used (Use as 00 conditions)	
36	d7	Not Prepared	-	-	Not Used	
37	E1	Not Prepared	-	-	Not Used (Use as 00 conditions)	
38	E2	Not Prepared	-	-	Not Used (Use as 00 conditions)	
39	E3	Not Prepared	-	-	Not Used (Use as 00 conditions)	
40	E4	Not Prepared	-	-	Not Used (Use as 00 conditions)	
41	E5	Not Prepared	-	-	Not Used (Use as 00 conditions)	
42	E6	Indoor Fan Operation Time After Cooling Operation Stoppage	○	00 01 02	Not Available 60 min. 120 min.	
43	E7	Not Prepared	-	-	Not Used (Use as 00 conditions)	
44	E8	Fan Operation Control during Heating Thermo-OFF	○	00 01	Not Available (LOW) SLOW	
45	E9	Not Prepared	-	-	Not Used (Use as 00 conditions)	
46	EA	Not Prepared	-	-	Not Used (Use as 00 conditions)	
47	Eb	Fan Operation Control during Cooling Thermo-OFF	○	00 01 02	Not Available LOW SLOW	
48	EC	Forced Thermo-ON Stoppage during Cooling	○	00 01	Not Available Available	
49	Ed	Not Prepared	-	-	Not Used (Use as 00 conditions)	
50	EE	Automatic Fan Speed Control	○	00 01	Not Available Available	
51	EF	Automatic Fan Speed Control (High 2)	Ducted High	-	-	Not Used
			Ducted Medium Slim	○	00 01	Not Available Available
52	F0	Not Prepared	-	-	Not Used	

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
53	F1	Automatic OFF Timer Setting * Do not set the functions "0C"~"0F" when 2 (two) wired controllers are used in the same controller group	×	00 01 02 • • 23 24 0A 0B 0C 0D 0E 0F	No Function OFF Timer by 1 hr OFF Timer by 2 hrs • • OFF Timer by 23 hrs OFF Timer by 24 hrs OFF Timer by 30 min. OFF Timer by 90 min. OFF Timer by 40 min. OFF Timer by 45 min. OFF Timer by 50 min. OFF Timer by 55 min. } Do not set them when two wired controllers are used.
54	F2	Wired Controller Main-Sub Setting	×	00 01	Main Sub
55	F3	Automatic Reset of Setting Temperature (*2)	×	00 01	Not Available Available
56	F4	Automatic Reset Time	×	00 01 02 03	30 min. (Factory-Setting) 15 min. 60 min. 90 min.
57	F5	Automatic Reset Temperature for Cooling (*3)	×	66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) (Factory-Setting) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)
58	F6	Automatic Reset Temperature for Heating (*4)	×	62 (17) 64 (18) 66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	62°F (17°C) 64°F (18°C) 66°F (19°C) 68°F (20°C) 70°F (21°C) (Factory-Setting) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)
59	F7	Operation Stoppage Prevention by Wired Controller Operational Error (*5)	×	00 01	Not Available Available
60	F8	Lock Function for Operation Mode Selection	×	00 01	Not Available Available (Factory-Setting)
61	F9	Lock Function for Temperature Setting	×	00 01	Not Available Available (Factory-Setting)
62	FA	Lock Function for Fan Speed Selection	×	00 01	Not Available Available (Factory-Setting)
63	Fb	Lock Function for Swing Louver Operation	×	00 01	Not Available Available (Factory-Setting)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
64	FC	Cooling Lower Limit for Setting Temperature (*3)	×	00	66°F (19°C)
				01	68°F (20°C)
				02	70°F (21°C)
				03	72°F (22°C)
				04	74°F (23°C)
				05	76°F (24°C)
				06	77°F (25°C)
				07	78°F (26°C)
				08	80°F (27°C)
				09	82°F (28°C)
				10	84°F (29°C)
65	Fd	Heating Upper Limit for Setting Temperature (*4)	×	00	86°F (30°C)
				01	84°F (29°C)
				02	82°F (28°C)
				03	80°F (27°C)
				04	78°F (26°C)
				05	77°F (25°C)
				06	76°F (24°C)
				07	74°F (23°C)
				08	72°F (22°C)
				09	70°F (21°C)
				10	68°F (20°C)
				11	66°F (19°C)
				12	64°F (18°C)
66	FE	Not Prepared	-	-	Not Used (Use as 00 conditions)
67	FF	Not Prepared	-	-	Not Used (Use as 00 conditions)
68	H1	Not Prepared	-	-	Not Used (Use as 00 conditions)
69	H2	Indication of Hot Start	×	00	Indication
				01	No Indication
70	H3	Not Prepared	-	-	Not Used (Use as 00 conditions)
71	H4	Not Prepared	-	-	Not Used (Use as 00 conditions)
72	J1	Not Prepared	-	-	Not Used (Use as 00 conditions)
73	J2	Not Prepared	-	-	Not Used
74	J3	Run Indicator Color	×	00	Green
				01	Red
75	J4	Not Prepared	-	-	Not Used (Use as 00 conditions)
76	J5	Not Prepared	-	-	Not Used (Use as 00 conditions)
77	J6	Not Prepared	-	-	Not Used (Use as 00 conditions)
78	J7	Not Prepared	-	-	Not Used (Use as 00 conditions)
79	J8	Eco-operation (*7)	×	00	Not Available
				01	Available
80	J9	Not Prepared	-	-	Not Used (Use as 00 conditions)
81	JA	Not Prepared	-	-	Not Used (Use as 00 conditions)
82	Jb	Not Prepared	-	-	Not Used (Use as 00 conditions)
83	K1	Not Prepared	-	-	Not Used (Use as 00 conditions)
84	K2	Not Prepared	-	-	Not Used (Use as 00 conditions)
85	K3	Not Prepared	-	-	Not Used (Use as 00 conditions)
86	K4	Not Prepared	-	-	Not Used (Use as 00 conditions)
87	K5	Not Prepared	-	-	Not Used (Use as 00 conditions)
88	K6	Not Prepared	-	-	Not Used (Use as 00 conditions)
89	K7	Not Prepared	-	-	Not Used (Use as 00 conditions)
90	K8	Not Prepared	-	-	Not Used (Use as 00 conditions)
91	K9	Not Prepared	-	-	Not Used (Use as 00 conditions)
92	KA	Not Prepared	-	-	Not Used (Use as 00 conditions)
93	L1	Not Prepared	-	-	Not Used (Use as 00 conditions)
94	L2	Not Prepared	-	-	Not Used (Use as 00 conditions)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents	
95	L3	Not Prepared	-	-	Not Used (Use as 00 conditions)	
96	L4	Fan Speed during Energy-Saving Forced Thermo-OFF	Ducted High	-	-	Not Used (Use as 00 conditions)
			Ducted Medium Slim	○	00 01	Not Available Available
97	L5	Not Prepared	-	-	Not Used (Use as 00 conditions)	
98	L6	Not Prepared	-	-	Not Used (Use as 00 conditions)	
99	L7	Not Prepared	-	-	Not Used (Use as 00 conditions)	
100	L8	Not Prepared	-	-	Not Used (Use as 00 conditions)	
101	L9	Not Prepared	-	-	Not Used (Use as 00 conditions)	
102	LA	Not Prepared	-	-	Not Used (Use as 00 conditions)	
103	Lb	Not Prepared	-	-	Not Used (Use as 00 conditions)	
104	P1	Setting Temperature	×	00 01	Every 1°F (0.5°C) Every 2°F (1°C)	
105	P2	Not Prepared	-	-	Not Used (Use as 00 conditions)	
106	P3	Thermistor Selection	×	00 01 02 03	Inlet Air Thermistor Outlet Air Thermistor Thermistor of Wired Controller Remote Sensor	
107	P4	Display of Thermistor Temperature	×	00 01	Not Available Available	
108	P5	Display during Setting Temperature	×	00 01	Dispalyed Undispalyed	
109	P6	ECO Button Operation	×	00 01	Available Not Available	
110	P7	Menu Screen Transition Prohibited	×	00 01	Not Available Available	
111	P8	Not Prepared	-	-	Not Used (Use as 00 conditions)	
112	P9	Not Prepared	-	-	Not Used (Use as 00 conditions)	
113	PA	Not Prepared	-	-	Not Used (Use as 00 conditions)	
114	Pb	Not Prepared	-	-	Not Used (Use as 00 conditions)	
115	PC	Not Prepared	-	-	Not Used (Use as 00 conditions)	

- *1): The "02" setting may not be available according to the type of indoor unit.
- *2): In case that the set temperature is changed and the temperature is kept for a specific time set by "F4", it automatically changes to the temperature set by "F5" or "F6." (In case that the set temperature of "F5" and "F6" is out of range, the upper or lower limit temperature is applied.)
- *3): Applicable to fan, cooling and dry operation modes.
- *4): Applicable to heating operation mode.
- *5): Operation is stopped by pressing the "⏻" (On/Off) button for 3 seconds.
- *6): The sensor value at "C8" will be indicated. When the thermistor for wired controller is used, the average value of the thermistor for wired controller and the thermistor for indoor inlet will be indicated.
- *7): When the unit is restarted by the wired controller, the temperature automatically changes to the setting temperature of "F5" or "F6".

NOTES:

1. After at least 3 minutes from the power ON, change the optional setting.
2. When changing "CF" setting ("Change of Louver Swing Angle"), restore the power supply or make the louver swing a couple of times in the auto swing mode to validate the setting.
3. The optional settings are different according to the indoor and outdoor unit models.
Check to ensure that the unit has the optional setting or not.
4. Record the setting conditions for each optional setting in the "Setting" column of the table.
5. The above optional functions with "X" mark at the individual setting can change the condition only when "All Rooms" is set.

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

- for 4-Way Cassette Type and 1-Way Cassette Type

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
1	b1	Cancellation of Heating Temperature Compensation due to Uneven Heat Load	○	00 01 02 03 04	Standard (Set Temp. +7°F (+4°C)) Removal (Set Temp.) Set Temp. +3°F (+2°C) (*1) Set Temp. +5°F (+3°C) Set Temp. +2°F (+1°C)
2	b2	Circulator Function during Heating Thermo-OFF	○	00 01	Not Available Available
3	b3	Not Prepared	-	-	Not Used (Use as 00 conditions)
4	b4	Change of Filter Cleaning Time	-	00 01 02 03 04	Standard 1,200 hrs (Factory-Setting) 100 hrs 1,200 hrs 2,500 hrs No Indication
5	b5	Fixing of Operation Mode	×	00 01	Standard Fixed
6	b6	Fixing of Setting Temperature	×	00 01	Standard Fixed
7	b7	Fixing of Operation as Exclusive Cooling Unit	×	00 01	Standard Fixed
8	b8	Automatic COOL/HEAT Operation	×	00 01	Not Available Available
9	b9	Fixing of Fan Speed	×	00 01	Standard Fixed
10	bA	Not Prepared	-	-	Not Used
11	bb	Cooling Temperature Compensation due to Uneven Heat Load	×	00 01 02	Standard (No Compensation) Set Temp. -2°F (-1°C) Set Temp. -3°F (-2°C)
12	bC	Not Prepared	-	-	Not Used (Use as 00 conditions)
13	bd	Not Prepared	-	-	Not Used (Use as 00 conditions)
14	bE	Not Prepared	-	-	Not Used (Use as 00 conditions)
15	C1	Not Prepared	-	-	Not Used (Use as 00 conditions)
16	C2	Not Prepared	-	-	Not Used
17	C3	Not Prepared	-	-	Not Used
18	C4	Not Prepared	-	-	Not Used
19	C5	Hi Speed (Except for Hi Speed during Heating Thermo-OFF)	○	00 01 02	Not Available Hi Speed 1 Hi Speed 2
20	C6	Hi Speed during Heating Thermo-OFF	○	00 01	Not Available Available
21	C7	Canceling of Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Standard Cancellation
22	C8	Thermistor of Wired Controller (*6)	○	00 01 02 00 01 02	< If Wired Controller Thermistor is Selected > Not Available Control by Thermistor of Wired Controller Control by Average Value of Indoor Suction Thermistor and Thermistor of Wired Controller < If Remote Sensor is Selected > Control by Average Value of Indoor Suction Thermistor and Remote Sensor Control by Remote Sensor Same as "00"
23	C9	Not Prepared	-	-	Not Used
24	CA	Not Prepared	-	-	Not Used
25	Cb	Selection of Forced Stoppage Logic	×	00 01	Forced Stoppage Input: A Contact Forced Stoppage Input: B Contact
26	CC	Not Prepared	-	-	Not Used (Use as 00 conditions)
27	Cd	Not Prepared	-	-	Not Used (Use as 00 conditions)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
28	CE	Not Prepared	-	-	Not Used (Use as 00 conditions)
29	CF	Change of Louver Swing Angle	○	00 01 02	Standard (7-Step Operation) Cold Draft Prevention (5 Steps: lower 2 steps cut off) High Ceiling (higher 2 steps cut off)
30	d1	Power Supply ON/OFF 1	○	00 01	Not Available Available
31	d2	Not Prepared	-	-	Not Used
32	d3	Power Supply ON/OFF 2	○	00 01	Not Available Available
33	d4	Not Prepared	-	-	Not Used (Use as 00 conditions)
34	d5	Prevention for Heating Discharge Air Temp. Decrease	○	00 01	Not Available Available
35	d6	Not Prepared	-	-	Not Used (Use as 00 conditions)
36	d7	Not Prepared	-	-	Not Used
37	E1	Not Prepared	-	-	Not Used (Use as 00 conditions)
38	E2	Not Prepared	-	-	Not Used (Use as 00 conditions)
39	E3	Not Prepared	-	-	Not Used (Use as 00 conditions)
40	E4	Not Prepared	-	-	Not Used (Use as 00 conditions)
41	E5	Not Prepared	-	-	Not Used (Use as 00 conditions)
42	E6	Indoor Fan Operation Time After Cooling Operation Stoppage	○	00 01 02	Not Available 60 min. 120 min.
43	E7	Not Prepared	-	-	Not Used (Use as 00 conditions)
44	E8	Fan Operation Control during Heating Thermo-OFF	○	00 01	Not Available (LOW) SLOW
45	E9	Not Prepared	-	-	Not Used (Use as 00 conditions)
46	EA	Not Prepared	-	-	Not Used (Use as 00 conditions)
47	Eb	Fan Operation Control during Cooling Thermo-OFF	○	00 01 02	Not Available LOW SLOW
48	EC	Forced Thermo-ON Stoppage during Cooling	○	00 01	Not Available Available
49	Ed	Not Prepared	-	-	Not Used (Use as 00 conditions)
50	EE	Automatic Fan Speed Control	○	00 01	Not Available Available
51	EF	Automatic Fan Speed Control (High 2)	○	00 01	Not Available Available
52	F0	Not Prepared	-	-	Not Used
53	F1	Automatic OFF Timer Setting * Do not set the functions "0C"~"0F" when 2 (two) wired controllers are used in the same controller group.	×	00 01 02 • • 23 24 0A 0B 0C 0D 0E 0F	No Function OFF Timer by 1 hr OFF Timer by 2 hrs OFF Timer by 23 hrs OFF Timer by 24 hrs OFF Timer by 30 min. OFF Timer by 90 min. OFF Timer by 40 min. OFF Timer by 45 min. OFF Timer by 50 min. OFF Timer by 55 min. } Do not set them when two wired controllers are used.
54	F2	Wired Controller Main-Sub Setting	×	00 01	Main Sub
55	F3	Automatic Reset of Setting Temperature (*2)	×	00 01	Not Available Available
56	F4	Automatic Reset Time	×	00 01 02 03	30 min. (Factory-Setting) 15 min. 60 min. 90 min.

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
57	F5	Automatic Reset Temperature for Cooling (*3)	×	66 (19)	66°F (19°C)
				68 (20)	68°F (20°C)
				70 (21)	70°F (21°C)
				72 (22)	72°F (22°C)
				74 (23)	74°F (23°C)
				76 (24)	76°F (24°C)
				77 (25)	77°F (25°C) (Factory-Setting)
				78 (26)	78°F (26°C)
				80 (27)	80°F (27°C)
				82 (28)	82°F (28°C)
				84 (29)	84°F (29°C)
86 (30)	86°F (30°C)				
58	F6	Automatic Reset Temperature for Heating (*4)	×	62 (17)	62°F (17°C)
				64 (18)	64°F (18°C)
				66 (19)	66°F (19°C)
				68 (20)	68°F (20°C)
				70 (21)	70°F (21°C) (Factory-Setting)
				72 (22)	72°F (22°C)
				74 (23)	74°F (23°C)
				76 (24)	76°F (24°C)
				77 (25)	77°F (25°C)
				78 (26)	78°F (26°C)
				80 (27)	80°F (27°C)
82 (28)	82°F (28°C)				
84 (29)	84°F (29°C)				
86 (30)	86°F (30°C)				
59	F7	Operation Stoppage Prevention by Wired Controller Operational Error (*5)	×	00 01	Not Available Available
60	F8	Lock Function for Operation Mode Selection	×	00 01	Not Available Available (Factory-Setting)
61	F9	Lock Function for Temperature Setting	×	00 01	Not Available Available (Factory-Setting)
62	FA	Lock Function for Fan Speed Selection	×	00 01	Not Available Available (Factory-Setting)
63	Fb	Lock Function for Swing Louver Operation	×	00 01	Not Available Available (Factory-Setting)
64	FC	Cooling Lower Limit for Setting Temperature (*3)	×	00	66°F (19°C)
				01	68°F (20°C)
				02	70°F (21°C)
				03	72°F (22°C)
				04	74°F (23°C)
				05	76°F (24°C)
				06	77°F (25°C)
				07	78°F (26°C)
				08	80°F (27°C)
				09	82°F (28°C)
				10	84°F (29°C)
65	Fd	Heating Upper Limit for Setting Temperature (*4)	×	00	86°F (30°C)
				01	84°F (29°C)
				02	82°F (28°C)
				03	80°F (27°C)
				04	78°F (26°C)
				05	77°F (25°C)
				06	76°F (24°C)
				07	74°F (23°C)
				08	72°F (22°C)
				09	70°F (21°C)
				10	68°F (20°C)
				11	66°F (19°C)
				12	64°F (18°C)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
66	FE	Not Prepared	-	-	Not Used (Use as 00 conditions)
67	FF	Not Prepared	-	-	Not Used (Use as 00 conditions)
68	H1	Not Prepared	-	-	Not Used (Use as 00 conditions)
69	H2	Indication of Hot Start	×	00 01	Indication No Indication
70	H3	Not Prepared	-	-	Not Used (Use as 00 conditions)
71	H4	Not Prepared	-	-	Not Used (Use as 00 conditions)
72	J1	Not Prepared	-	-	Not Used (Use as 00 conditions)
73	J2	Not Prepared	-	-	Not Used
74	J3	Run Indicator Color	×	00 01	Green Red
75	J4	Not Prepared	-	-	Not Used (Use as 00 conditions)
76	J5	Not Prepared	-	-	Not Used (Use as 00 conditions)
77	J6	Not Prepared	-	-	Not Used (Use as 00 conditions)
78	J7	Not Prepared	-	-	Not Used (Use as 00 conditions)
79	J8	Eco-operation (*7)	×	00 01	Not Available Available
80	J9	Not Prepared	-	-	Not Used (Use as 00 conditions)
81	JA	Not Prepared	-	-	Not Used (Use as 00 conditions)
82	Jb	Not Prepared	-	-	Not Used (Use as 00 conditions)
83	K1	Not Prepared	-	-	Not Used (Use as 00 conditions)
84	K2	Not Prepared	-	-	Not Used (Use as 00 conditions)
85	K3	Not Prepared	-	-	Not Used (Use as 00 conditions)
86	K4	Not Prepared	-	-	Not Used (Use as 00 conditions)
87	K5	Motion Sensor Detection Level	○	00 01 02	Standard High Low
88	K6	Operation Setting during Thermistor of Wired Controller or Remote Sensor	○	00 01 02 03	ALL COOL/DRY HEAT ALL
89	K7	Radiation Temperature Correction	○	00 01 02	Standard Upward (+3°F (+2°C)) Downward (-3°F (-2°C))
90	K8	Control of Dew Condensation Prevention	○	00 01	Not Available Available
91	K9	Not Prepared	-	-	Not Used (Use as 00 conditions)
92	KA	Not Prepared	-	-	Not Used (Use as 00 conditions)
93	L1	Motion Sensor Installation Position	○	00 01 02 03	A (Factory-Setting) B Not Available D
94	L2	Not Prepared	-	-	Not Used (Use as 00 conditions)
95	L3	Louver Setting during Energy-Saving Forced Thermo-OFF	○	00 01 02 03	Recive Air: Low (Standard) Recive Air: Medium Recive Air: High Not Available
96	L4	Fan Speed during Energy-Saving Forced Thermo-OFF	○	00 01	Not Available (Standard) Available
97	L5	Louver Swing Operation Energy-Saving Forced Thermo-OFF	○	00 01	Not Available Available
98	L6	Not Prepared	-	-	Not Used (Use as 00 conditions)
99	L7	Not Prepared	-	-	Not Used (Use as 00 conditions)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
100	L8	Not Prepared	-	-	Not Used (Use as 00 conditions)
101	L9	Not Prepared	-	-	Not Used (Use as 00 conditions)
102	LA	Not Prepared	-	-	Not Used (Use as 00 conditions)
103	Lb	Not Prepared	-	-	Not Used (Use as 00 conditions)
104	P1	Setting Temperature	×	00 01	Every 1°F (0.5°C) Every 2°F (1°C)
105	P2	Not Prepared	-	-	Not Used (Use as 00 conditions)
106	P3	Thermistor Selection	×	00 01 02 03	Inlet Air Thermistor Outlet Air Thermistor Thermistor of Wired Controller Remote Sensor
107	P4	Display of Thermistor Temperature	×	00 01	Not Available Available
108	P5	Display during Setting Temperature	×	00 01	Dispalyed Undispalyed
109	P6	ECO Button Operation	×	00 01	Available Not Available
110	P7	Menu Screen Transition Prohibited	×	00 01	Not Available Available
111	P8	Not Prepared	-	-	Not Used (Use as 00 conditions)
112	P9	Not Prepared	-	-	Not Used (Use as 00 conditions)
113	PA	Not Prepared	-	-	Not Used (Use as 00 conditions)
114	Pb	Not Prepared	-	-	Not Used (Use as 00 conditions)
115	PC	Not Prepared	-	-	Not Used (Use as 00 conditions)

- *1): The "02" setting may not be available according to the type of indoor unit.
- *2): In case that the set temperature is changed and the temperature is kept for a specific time set by "F4", it automatically changes to the temperature set by "F5" or "F6." (In case that the set temperature of "F5" and "F6" is out of range, the upper or lower limit temperature is applied.)
- *3): Applicable to fan, cooling and dry operation modes.
- *4): Applicable to heating operation mode.
- *5): Operation is stopped by pressing the "⏻" (On/Off) button for 3 seconds.
- *6): The sensor value at "C8" will be indicated. When the thermistor for wired controller is used, the average value of the thermistor for wired controller and the thermistor for indoor inlet will be indicated.
- *7): When the unit is restarted by the wired controller, the temperature automatically changes to the setting temperature of "F5" or "F6".

NOTES:

1. After at least 3 minutes from the power ON, change the optional setting.
2. When changing "CF" setting ("Change of Louver Swing Angle"), restore the power supply or make the louver swing a couple of times in the auto swing mode to validate the setting.
3. The optional settings are different according to the indoor and outdoor unit models. Check to ensure that the unit has the optional setting or not.
4. Record the setting conditions for each optional setting in the "Setting" column of the table.
5. The above optional functions with "X" mark at the individual setting can change the condition only when "All Rooms" is set.

● for Wall Mount Type

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
1	b1	Cancellation of Heating Temperature Compensation due to Uneven Heat Load	○	00 01 02 03 04	Standard (Set Temp. +7°F (+4°C)) Removal (Set Temp.) Set Temp. +3°F (+2°C) (*1) Set Temp. +5°F (+3°C) Set Temp. +2°F (+1°C)
2	b2	Circulator Function during Heating Thermo-OFF	○	00 01	Not Available Available
3	b3	Not Prepared	-	-	Not Used (Use as 00 conditions)
4	b4	Change of Filter Cleaning Time	-	00 01 02 03 04	Standard 1,200 hrs (Factory-Setting) 100 hrs 1,200 hrs 2,500 hrs No Indication
5	b5	Fixing of Operation Mode	×	00 01	Standard Fixed
6	b6	Fixing of Setting Temperature	×	00 01	Standard Fixed
7	b7	Fixing of Operation as Exclusive Cooling Unit	×	00 01	Standard Fixed
8	b8	Automatic COOL/HEAT Operation	×	00 01	Not Available Available
9	b9	Fixing of Fan Speed	×	00 01	Standard Fixed
10	bA	Not Prepared	-	-	Not Used
11	bb	Cooling Temperature Compensation due to Uneven Heat Load	×	00 01 02	Standard (No Compensation) Set Temp. -2°F (-1°C) Set Temp. -3°F (-2°C)
12	bC	Not Prepared	-	-	Not Used (Use as 00 conditions)
13	bd	Not Prepared	-	-	Not Used (Use as 00 conditions)
14	bE	Not Prepared	-	-	Not Used (Use as 00 conditions)
15	C1	Not Prepared	-	-	Not Used (Use as 00 conditions)
16	C2	Not Prepared	-	-	Not Used
17	C3	Not Prepared	-	-	Not Used
18	C4	Not Prepared	-	-	Not Used
19	C5	Hi Speed (Except for Hi Speed during Heating Thermo-OFF)	○	00 01 02	Not Available Hi Speed 1 Hi Speed 2
20	C6	Hi Speed during Heating Thermo-OFF	○	00 01	Not Available Available
21	C7	Canceling of Enforced 3 Minutes Minimum Operation Time of Compressor	○	00 01	Standard Cancelation
22	C8	Thermistor of Wired Controller (*6)	○	00 01 02 00 01 02	< If Wired Controller Thermistor is Selected > Not Available Control by Thermistor of Wired Controller Control by Average Value of Indoor Suction Thermistor and Thermistor of Wired Controller < If Remote Sensor is Selected > Control by Average Value of Indoor Suction Thermistor and Remote Sensor Control by Remote Sensor Same as "00"
23	C9	Not Prepared	-	-	Not Used
24	CA	Not Prepared	-	-	Not Used
25	Cb	Selection of Forced Stoppage Logic	×	00 01	Forced Stoppage Input: A Contact Forced Stoppage Input: B Contact
26	CC	Not Prepared	-	-	Not Used (Use as 00 conditions)
27	Cd	Not Prepared	-	-	Not Used (Use as 00 conditions)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
28	CE	Not Prepared	-	-	Not Used (Use as 00 conditions)
29	CF	Change of Louver Swing Angle	○	00 01 02	Standard (7-Step Operation) Cold Draft Prevention (5 Steps: lower 2 steps cut off) High Ceiling (higher 2 steps cut off)
30	d1	Power Supply ON/OFF 1	○	00 01	Not Available Available
31	d2	Not Prepared	-	-	Not Used
32	d3	Power Supply ON/OFF 2	○	00 01	Not Available Available
33	d4	Prevention for Cooling Discharge Air Temp. Decrease	○	00 01	Not Available Available
34	d5	Prevention for Heating Discharge Air Temp. Decrease	○	00 01	Not Available Available
35	d6	Not Prepared	-	-	Not Used (Use as 00 conditions)
36	d7	Not Prepared	-	-	Not Used
37	E1	Not Prepared	-	-	Not Used (Use as 00 conditions)
38	E2	Not Prepared	-	-	Not Used (Use as 00 conditions)
39	E3	Not Prepared	-	-	Not Used (Use as 00 conditions)
40	E4	Not Prepared	-	-	Not Used (Use as 00 conditions)
41	E5	Not Prepared	-	-	Not Used (Use as 00 conditions)
42	E6	Indoor Fan Operation Time After Cooling Operation Stoppage	○	00 01 02	Not Available 60 min. 120 min.
43	E7	Not Prepared	-	-	Not Used (Use as 00 conditions)
44	E8	Fan Operation Control during Heating Thermo-OFF	○	00 01	Not Available (LOW) SLOW
45	E9	Not Prepared	-	-	Not Used (Use as 00 conditions)
46	EA	Not Prepared	-	-	Not Used (Use as 00 conditions)
47	Eb	Fan Operation Control during Cooling Thermo-OFF	○	00 01 02	Not Available LOW SLOW
48	EC	Forced Thermo-ON Stoppage during Cooling	○	00 01	Not Available Available
49	Ed	Not Prepared	-	-	Not Used (Use as 00 conditions)
50	EE	Automatic Fan Speed Control	○	00 01	Not Available Available
51	EF	Automatic Fan Speed Control (High 2)	○	00 01	Not Available Available
52	F0	Not Prepared	-	-	Not Used
53	F1	Automatic OFF Timer Setting * Do not set the functions "0C"~"0F" when 2 (two) wired controllers are used in the same controller group.	×	00 01 02 . . 23 24 0A 0B 0C 0D 0E 0F	No Function OFF Timer by 1 hr OFF Timer by 2 hrs . . OFF Timer by 23 hrs OFF Timer by 24 hrs OFF Timer by 30 min. OFF Timer by 90 min. OFF Timer by 40 min. OFF Timer by 45 min. OFF Timer by 50 min. OFF Timer by 55 min. } Do not set them when two wired controllers are used.
54	F2	Wired Controller Main-Sub Setting	×	00 01	Main Sub
55	F3	Automatic Reset of Setting Temperature (*2)	×	00 01	Not Available Available

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
56	F4	Automatic Reset Time	×	00 01 02 03	30 min. (Factory-Setting) 15 min. 60 min. 90 min.
57	F5	Automatic Reset Temperature for Cooling (*3)	×	66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) (Factory-Setting) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)
58	F6	Automatic Reset Temperature for Heating (*4)	×	62 (17) 64 (18) 66 (19) 68 (20) 70 (21) 72 (22) 74 (23) 76 (24) 77 (25) 78 (26) 80 (27) 82 (28) 84 (29) 86 (30)	62°F (17°C) 64°F (18°C) 66°F (19°C) 68°F (20°C) 70°F (21°C) (Factory-Setting) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C) 86°F (30°C)
59	F7	Operation Stoppage Prevention by Wired Controller Operational Error (*5)	×	00 01	Not Available Available
60	F8	Lock Function for Operation Mode Selection	×	00 01	Not Available Available (Factory-Setting)
61	F9	Lock Function for Temperature Setting	×	00 01	Not Available Available (Factory-Setting)
62	FA	Lock Function for Fan Speed Selection	×	00 01	Not Available Available (Factory-Setting)
63	Fb	Lock Function for Swing Louver Operation	×	00 01	Not Available Available (Factory-Setting)
64	FC	Cooling Lower Limit for Setting Temperature (*3)	×	00 01 02 03 04 05 06 07 08 09 10	66°F (19°C) 68°F (20°C) 70°F (21°C) 72°F (22°C) 74°F (23°C) 76°F (24°C) 77°F (25°C) 78°F (26°C) 80°F (27°C) 82°F (28°C) 84°F (29°C)
65	Fd	Heating Upper Limit for Setting Temperature (*4)	×	00 01 02 03 04 05 06 07 08 09 10 11 12	86°F (30°C) 84°F (29°C) 82°F (28°C) 80°F (27°C) 78°F (26°C) 77°F (25°C) 76°F (24°C) 74°F (23°C) 72°F (22°C) 70°F (21°C) 68°F (20°C) 66°F (19°C) 64°F (18°C)

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
66	FE	Not Prepared	-	-	Not Used (Use as 00 conditions)
67	FF	Not Prepared	-	-	Not Used (Use as 00 conditions)
68	H1	Not Prepared	-	-	Not Used (Use as 00 conditions)
69	H2	Indication of Hot Start	×	00 01	Indication No Indication
70	H3	Not Prepared	-	-	Not Used (Use as 00 conditions)
71	H4	Not Prepared	-	-	Not Used (Use as 00 conditions)
72	J1	Not Prepared	-	-	Not Used (Use as 00 conditions)
73	J2	Not Prepared	-	-	Not Used
74	J3	Run Indicator Color	×	00 01	Green Red
75	J4	Not Prepared	-	-	Not Used (Use as 00 conditions)
76	J5	Not Prepared	-	-	Not Used (Use as 00 conditions)
77	J6	Not Prepared	-	-	Not Used (Use as 00 conditions)
78	J7	Not Prepared	-	-	Not Used (Use as 00 conditions)
79	J8	Eco-operation (*7)	×	00 01	Not Available Available
80	J9	Not Prepared	-	-	Not Used (Use as 00 conditions)
81	JA	Not Prepared	-	-	Not Used (Use as 00 conditions)
82	Jb	Not Prepared	-	-	Not Used (Use as 00 conditions)
83	K1	Not Prepared	-	-	Not Used (Use as 00 conditions)
84	K2	Not Prepared	-	-	Not Used (Use as 00 conditions)
85	K3	Not Prepared	-	-	Not Used (Use as 00 conditions)
86	K4	Not Prepared	-	-	Not Used (Use as 00 conditions)
87	K5	Not Prepared	-	-	Not Used (Use as 00 conditions)
88	K6	Not Prepared	-	-	Not Used (Use as 00 conditions)
89	K7	Not Prepared	-	-	Not Used (Use as 00 conditions)
90	K8	Not Prepared	-	-	Not Used (Use as 00 conditions)
91	K9	Not Prepared	-	-	Not Used (Use as 00 conditions)
92	KA	Not Prepared	-	-	Not Used (Use as 00 conditions)
93	L1	Not Prepared	-	-	Not Used (Use as 00 conditions)
94	L2	Not Prepared	-	-	Not Used (Use as 00 conditions)
95	L3	Louver Setting During Energy-Saving Forced Thermo-OFF	○	00 01 02 03	Receive Air: Low (Standard) Receive Air: Medium Receive Air: High Not Available
96	L4	Fan Speed during Energy-Saving Forced Thermo-OFF	○	00 01	Not Available (Standard) Available
97	L5	Louver Swing Operation Energy-Saving Forced Thermo-OFF	○	00 01	Not Available Available
98	L6	Not Prepared	-	-	Not Used (Use as 00 conditions)
99	L7	Not Prepared	-	-	Not Used (Use as 00 conditions)
100	L8	Not Prepared	-	-	Not Used (Use as 00 conditions)
101	L9	Not Prepared	-	-	Not Used (Use as 00 conditions)
102	LA	Not Prepared	-	-	Not Used (Use as 00 conditions)
103	Lb	Not Prepared	-	-	Not Used (Use as 00 conditions)
104	P1	Setting Temperature	×	00 01	Every 1°F (0.5°C) Every 2°F (1°C)
105	P2	Not Prepared	-	-	Not Used (Use as 00 conditions)
106	P3	Thermistor Selection	×	00 01 02 03	Inlet Air Thermistor Outlet Air Thermistor Thermistor of Wired Controller Remote Sensor
107	P4	Display of Thermistor Temperature	×	00 01	Not Available Available

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

No.	Items	Optional Function	Individual Setting	Setting Condition	Contents
108	P5	Display during Setting Temperature	✕	00 01	Dispalyed Undispalyed
109	P6	ECO Button Operation	✕	00 01	Available Not Available
110	P7	Menu Screen Transition Prohibited	✕	00 01	Not Available Available
111	P8	Not Prepared	-	-	Not Used (Use as 00 conditions)
112	P9	Not Prepared	-	-	Not Used (Use as 00 conditions)
113	PA	Not Prepared	-	-	Not Used (Use as 00 conditions)
114	Pb	Not Prepared	-	-	Not Used (Use as 00 conditions)
115	PC	Not Prepared	-	-	Not Used (Use as 00 conditions)

- *1): The "02" setting may not be available according to the type of indoor unit.
- *2): In case that the set temperature is changed and the temperature is kept for a specific time set by "F4", it automatically changes to the temperature set by "F5" or "F6." (In case that the set temperature of "F5" and "F6" is out of range, the upper or lower limit temperature is applied.)
- *3): Applicable to fan, cooling and dry operation modes.
- *4): Applicable to heating operation mode.
- *5): Operation is stopped by pressing the "⏻" (On/Off) button for 3 seconds.
- *6): The sensor value at "C8" will be indicated. When the thermistor for wired controller is used, the average value of the thermistor for wired controller and the thermistor for indoor inlet will be indicated.
- *7): When the unit is restarted by the wired controller, the temperature automatically changes to the setting temperature of "F5" or "F6".

NOTES:

1. After at least 3 minutes from the power ON, change the optional setting.
2. When changing "CF" setting ("Change of Louver Swing Angle"), restore the power supply or make the louver swing a couple of times in the auto swing mode to validate the setting.
3. The optional settings are different according to the indoor and outdoor unit models.
Check to ensure that the unit has the optional setting or not.
4. Record the setting conditions for each optional setting in the "Setting" column of the table.
5. The above optional functions with "X" mark at the individual setting can change the condition only when "All Rooms" is set.

5.4.2.2 Description of Function Selection Item

(1) Cancellation of Heating Temperature Compensation (due to Uneven Heat Load) (b1)

This function is utilized when the setting temperature of the wired controller and the inlet air temperature of the indoor unit are required to be equal.

This is useful when the inlet air thermistor is removed to the outside of the indoor unit.

Setting Temperature for Room Temperature Control during Heating

Setting Condition	Actual Control Temperature
00 (Standard)	Wired Controller Setting Temperature (Indicated Value) +7°F (+4°C)
01	Wired Controller Setting Temperature (Indicated Value)
02	Wired Controller Setting Temperature (Indicated Value) +3°F (+2°C)
03	Wired Controller Setting Temperature (Indicated Value) +5°F (+3°C)
04	Wired Controller Setting Temperature (Indicated Value) +2°F (+1°C)

NOTE:

The maximum setting temperature after correction is as follows.

Inverter Multi Unit: 94°F (34°C)

(2) Circulator Function during Heating Thermo-OFF (b2)

In the standard factory setting, the air flow volume changes to “LOW” automatically to prevent a cold draft during heating Thermo-OFF.

Therefore, the air flow might not be distributed uniformly in the room depending on the installation place of the air conditioner or room structure. In such case, it is recommended to utilize this function. The function keeps the air flow volume during Thermo-OFF at the same level as during Thermo-ON. The air flow in the room is kept at the same level as during Thermo-ON and so the room temperature will be uniformly-distributed. If using the air conditioner with auto swing function, the auto swing function will be activated even during heating Thermo-OFF.

NOTE:

The temperature sensibility and demands for air flow distribution differ depending on the person. It is therefore recommended to discuss these matters with customers thoroughly and then to install the unit accordingly.

(3) Not Prepared (b3)

(4) Change of Filter Cleaning Time (b4)

The period before filter sign indication is set according to indoor unit model before shipment.

The filter sign (“FLTR” on wired controller) is indicated according to the filter cleaning time (Factory Setting). However, this filter cleaning time can be changed depending on the condition of the filter as shown in the table below.

Period for Filter Sign Indication	Approx. 1,200 hrs.	Approx. 100 hrs.	Approx. 1,200 hrs.	Approx. 2,500 hrs.	No Indication
Liquid Crystal Display on Wired Controller	00 (Factory Setting)	01	02	03	04

NOTE:

While “Control by External Input” is valid, the filter sign will be “No Indication” if the external input is disconnected.

(5) Fixing of Operation Mode (b5)

This function is utilized when the operation mode is not required to be changed.

When this function is valid, the set operation mode cannot be changed by the wired controller.

(6) Fixing of Setting Temperature (b6)

This function is utilized when setting temperature is not required to be changed.

When this function is valid, the setting temperature cannot be changed by the wired controller.

(7) Fixing of Operation as Exclusive Cooling Unit (b7)

This function is utilized when exclusive cooling operation is required.

This function invalidates the heating operation and the automatic COOL/HEAT operation, as the operation of exclusive cooling unit.

(8) Automatic COOL/HEAT Operation (b8)

This function is utilized to change cooling and heating operation automatically (the same operation mode for indoor units in the same refrigerant cycle).

This function is invalid when the outdoor unit is cooling-only model or the function of "Fixing of Operation as Exclusive Cooling Unit" is valid.

(9) Fixing of Fan Speed (b9)

This function is utilized to fix the fan speed.

When this function is valid, the fan speed can not be changed by the wired controller.

(10) Not Prepared (bA)

(11) Cooling Temperature Compensation (due to Uneven Heat Load) (bb)

This function is utilized to provide the longer cooling operation time than the standard.

When this function is valid, Thermo-ON/OFF is controlled under the lower temperature conditions than the setting temperature (the indicated value) of the wired controller.

Setting Temperature for Room Temperature Control during Cooling

Setting Condition	Actual Control Temperature
00 (Standard)	Wired Controller Setting Temperature (Indicated Value)
01	Wired Controller Setting Temperature (Indicated Value) -2°F (-1°C)
02	Wired Controller Setting Temperature (Indicated Value) -3°F (-2°C)

NOTE:

The minimum setting temperature after correction is 66°F (19°C).

(12) Not Prepared (bC)

(13) Not Prepared (bd)

(14) Not Prepared (bE)

(15) Not Prepared (C1)

(16) Not Prepared (C2)

(17) Not Prepared (C3)

(18) Not Prepared (C4)

(19) Hi Speed (Except for Hi Speed during Heating Thermo-OFF) (C5)

This function is utilized to increase the fan speed for the sufficient air flow volume. It is recommended to use when the air flow volume is decreased by using the optional high ceiling installation or etc.

(20) Hi Speed during Heating Thermo-OFF (C6)

This function is utilized to increase the fan speed during heating Thermo-OFF with the function (19). (The fan speed does not increase during heating Thermo-OFF even if the function (19) is valid.)

(21) Canceling of Enforced 3 Minutes Minimum Operation Time of Compressor (C7)

The compressor operation is kept minimum 3 minutes when operation is started by the "Enforce 3 Minutes Minimum Operation Time of Compressor". This function is utilized to cancel the function "Enforced 3 Minutes Minimum Operation Time of Compressor" (Enforced 3 Minutes Compressor Guard).

NOTE:

The compressor operation is stopped immediately as following conditions.

- The protection device is activated.
- The operation stop button is pressed.

(22) Thermistor of Wired Controller (C8)

This function is utilized to control the unit by the built-in thermistor of the wired controller (wired controller thermistor) instead of the inlet air thermistor.

Set this function at "01" or "02" when utilizing this function.

However, even if this function is set at "01" or "02", the detecting temperature is abnormal due to the failure of the thermistor of the wired controller, etc., the control is changed to the inlet air thermistor of the indoor unit automatically.

The option part Remote Sensor (THM-R2A) will control the unit when it connected.

Selected Thermistor	Setting	Controlled Indoor Temp.
Thermistor of Wired Controller	00	Indoor Suction Thermistor
	01	Thermistor of Wired Controller
	02	Average Value of Indoor Suction Thermistor and Thermistor of Wired Controller
Remote Sensor	00	Average Value of Indoor Suction Thermistor and Thermistor of Wired Controller
	01	Remote Sensor
	02	Same as 00



(23) Not Prepared (C9)

(24) Not Prepared (CA)

(25) Selection of Forced Stoppage Logic (Cb)

This function is utilized to select the logic of the contact for forced stoppage signal input.

The setting condition and the logic of the contact are as shown below.

Setting Condition	Logic of Contact	Sequence	Activation	
			Contact "Open"	Contact "Close"
00	A Contact		Normal	Forced Stoppage
01	B Contact		Forced Stoppage	Normal

(26) Not Prepared (CC)

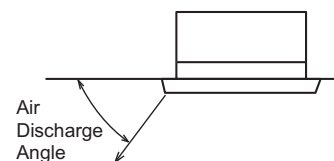
(27) Not Prepared (Cd)

(28) Not Prepared (CE)

(29) Change of Louver Swing Angle (CF)

This function is utilized to the change louver swing angle.

Setting Condition	Louver Swing Angle (Air Discharge Angle)	Purpose
00	7 Steps	Standard Operation
01	Lower 2 Steps are Cut	Draft Prevention
02	Higher 2 Steps are Cut	For High Ceiling



NOTE:

When changing the setting, turn OFF the power supply or allow the louver to make one complete swing fully in the auto swing mode to validate the setting.

(30) Power Supply ON/OFF 1 (Automatic Operation when Power Supply Is ON) (d1)

This function is utilized to run/stop the unit by turning ON/OFF the power supply.

When this function is utilized in the condition that there is no person to operate the unit, monitor the system for disaster prevention.

NOTE:

The unit will be stopped even when the power supply is turned ON/OFF due to power failure. If power failure occurs during the stoppage of the unit, the operation is restarted after the power supply is restored.

(31) Not Prepared (d2)

(32) Power Supply ON/OFF 2 (Restarting Function After Power Failure) (d3)

This function is utilized to restart the unit operation automatically when the power supply is restored after the power failure over 2 seconds. In case of the power failure for 2 seconds or less, the standard unit memorize all the operation mode and restarts the operation automatically. (The compressor restarts operation after 3 minutes guard in addition to power failure time for up to 2 seconds.)

When this function is utilized in the condition that there is no person to operate the unit, monitor the system for disaster prevention.

NOTES:

1. If power failure occurs during the stoppage of the unit, the unit remains stopped after the power supply is restored.
2. When the compressor does not reach the fixed temperature, the system may not restart automatically after turning on the power supply by hot-start control.

*Hot-start Control: The control program that does not operate the compressor even after the power is turned ON if the compressor does not reach the fixed temperature.

(33) Prevention for Cooling Discharge Air Temperature Decrease (d4)...(for Ducted Type and Wall Mounted Type)

This function is utilized to prevent discharge air temperature decrease during the cooling operation by controlling Thermo-ON/OFF according to the discharge air temperature.

- Thermo-ON:
COOL/DRY operations continue for 3 minutes when discharge air temperature at 52°F (11°C) or lower.
- Thermo-OFF:
The room temperature reaches the setting temperature when discharge air temperature at 56°F (13°C) or higher.

(33) Not Prepared (d4)...(for 4-Way Cassette Type and 1-Way Cassette Type)

(34) Not Prepared (d5)...(for Ducted High Static Type)

(34) Prevention for Heating Discharge Air Temperature Decrease (d5)...(Except for Ducted High Static Type)

This function is utilized to prevent discharge air temperature decrease during the heating operation by making the actual fan speed lower than the speed indicated on the wired controller.

- for Ducted Medium Static Type and Slim Type

	Large	← Fan Speed →	Small
Indications on Wired Controller	HIGH2	HIGH	LOW
Actual Fan Speed	HIGH	LOW	LOW

- for 4-Way Cassette Type, 1-Way Cassette Type and Wall Type

	Large	← Fan Speed →	Small
Indications on Wired Controller	HIGH2	HIGH	LOW
Actual Fan Speed	HIGH	MED	LOW

NOTE:

The above table shows when the optional function setting “Hi Speed” is set as standard (00) by the wired controller.

(35) Not Prepared (d6)

(36) Not Prepared (d7)

(37) Not Prepared (E1)

(38) Not Prepared (E2)

(39) Not Prepared (E3)

(40) Not Prepared (E4)

(41) Not Prepared (E5)

(42) Indoor Fan Operation Time After Cooling Operation Stoppage (E6)

This function is utilized to prevent dew condensation at cooling operation stoppage by "SLOW" indoor fan operation to dry. This is effective to prevent mildew or abnormal odor. "SLOW" operation (for 60 minutes or 120 minutes by setting) continues even when the cooling operation is stopped.

(43) Not Prepared (E7)

(44) Fan Operation Control during Heating Thermo-OFF (E8)

This function is utilized to prevent the perception of cold draft by reducing the indoor fan speed during heating Thermo-OFF.

Setting Condition	Fan Operation during Thermo-OFF
00	LOW
01	SLOW

(45) Not Prepared (E9)

(46) Not Prepared (EA)

(47) Fan Operation Control during Cooling Thermo-OFF (Eb)

This function is utilized to prevent diffusion of odor and high humidity by reducing the indoor fan speed during cooling Thermo-OFF.

Setting Condition	Fan Operation during Thermo-OFF
00	Operation at Set Fan Speed
01	LOW
02	SLOW

(48) Forced Thermo-ON Stoppage during Cooling (EC)

This function is utilized to stop the operation by forced thermo-ON when cooling operation is stopped. This is effective to prevent abnormal odor because the heat exchanger is kept in the clean condition such as the heat exchanger rinsed with drain water.

(49) Not Prepared (Ed)

(50) Not Prepared (EE) (Only for Ducted High Static Type)

(50) Automatic Fan Speed Control (EE)

This function is utilized to economize the operation. The air flow volume is automatically adjusted when the room temperature is near the setting temperature.

(51) Not Prepared (EF)...(for Ducted High Static Type)

(51) Automatic Fan Speed Control (Corresponding to HIGH2)(EF)...(Except for Ducted High Static Type)

This function is utilized to increase the maximum fan speed to "HIGH2" setting condition when the maximum fan speed remain "HIGH" by the function (50) "Automatic Fan Speed Control"

The fan speed setting (EE/EF) by Wired Controller are shown below.

Function Selection EF Function	Function Selection EE Setting	Wired Controller Setting				
		AUTO	HIGH2	HIGH	MED	LOW
00	00	HIGH - LOW	HIGH2	HIGH	MED	LOW
00	01	HIGH - LOW	HIGH2 - LOW	HIGH - LOW	MID - LOW	LOW
01	00	HIGH2 - LOW	HIGH2	HIGH	MED	LOW
01	01	HIGH2 - LOW	HIGH2 - LOW	HIGH - LOW	MED - LOW	LOW

(52) Not Prepared (F0)

(53) Automatic OFF Timer Setting (F1)

This function is utilized to set the OFF timer function automatically when the unit is operated by the wired controller. During the operation with the automatic OFF timer setting function, the cancellation of the OFF timer and the changing of the setting period for OFF timer can not be performed.

However, the OFF timer function is canceled when the unit is stopped. When the unit is operated again after stoppage, the setting period for OFF timer is set by the optional setting.

The setting condition and the setting period for OFF timer are shown below.

< Example for CIW01 >

Setting Condition	Setting Period for OFF Timer
00	Invalid
01	1 hour
02	2 hours
⋮	⋮
23	23 hours
24	24 hours
0A	30 minutes
0B	90 minutes
0C	40 minutes
0D	45 minutes
0E	50 minutes
0F	55 minutes

NOTES:

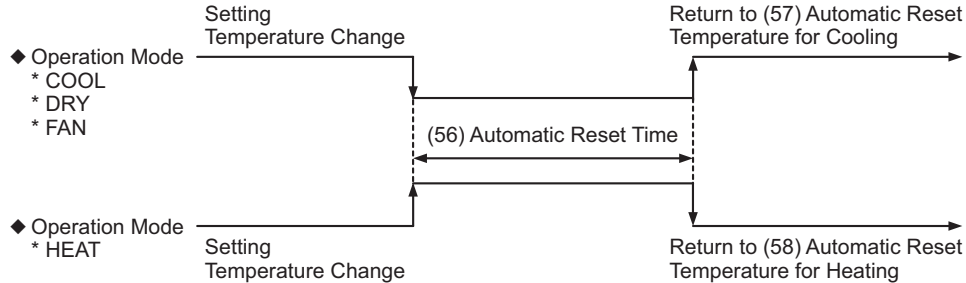
1. This function is not available when the unit is controlled by the centralized controller, the remote control connecting with Central Controllers.
2. The range of setting period for OFF timer differs depending on the wired controller model.

(54) Remote Control Main-Sub Setting (F2)

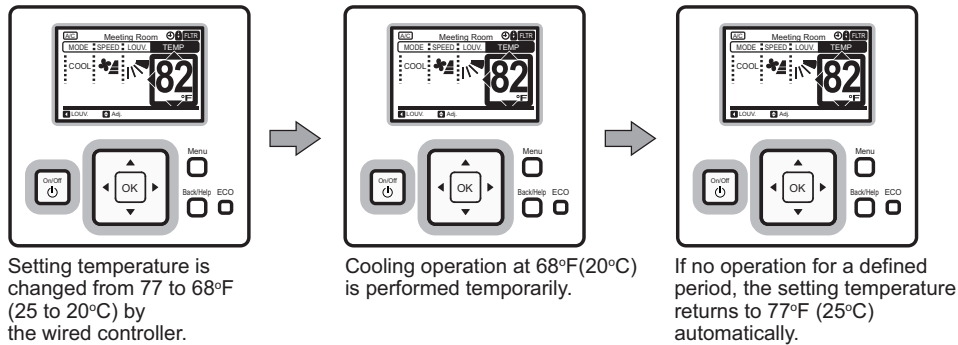
This function is utilized when two wired controller are installed in one system. Set one wired controller to main "00", the other wired controller to sub "01".

(55) Automatic Reset of Setting Temperature (F3)

This function is utilized to economize the operation. When this function is valid, in the case that the set temperature is not changed for certain period of time by the function (56) “Automatic Reset Time (F4)”, the set temperature automatically returns to (57/58) “Automatic Reset Temperature for Cooling/ Heating (F5/F6)” as following conditions. It is effective to optimize the setting temperature and provide energy saving. However, the setting temperature is not automatically reset in the case that “Automatic COOL/HEAT Operation” mode, or “Prohibiting Operation by Wired Controller” is set by the centralized controller.



<Example> Automatic Reset Temperature for Cooling is 77°F (25°C)



(56) Automatic Reset Time (F4)

This function is utilized to set the automatic reset time with the set temperature. The setting conditions and automatic reset time are as follows:

Setting Condition	Automatic Reset Time of Setting Temperature
00	30 minutes (Factory-Setting)
01	15 minutes
02	60 minutes
03	90 minutes

(57) Automatic Reset Temperature for Cooling (F5)

This function is utilized to set the automatic reset temperature for FAN/COOL/DRY operation. The setting conditions and the automatic reset temperature for cooling are as follows:

Setting Condition	Setting Temperature for Automatic Reset
66 (19)	66°F (19°C)
68 (20)	68°F (20°C)
70 (21)	70°F (21°C)
72 (22)	72°F (22°C)
74 (23)	74°F (23°C)
76 (24)	76°F (24°C)
77 (25)	77°F (25°C) (Factory-Setting)
78 (26)	78°F (26°C)
80 (27)	80°F (27°C)
82 (28)	82°F (28°C)
84 (29)	84°F (29°C)
86 (30)	86°F (30°C)


(58) Automatic Reset Temperature for Heating (F6)

This function is utilized to set the automatic reset temperature for HEAT operation.

The setting conditions and the automatic reset temperature for heating are as follows:

Setting Condition	Setting Temperature for Automatic Reset
62 (17)	62°F (17°C)
64 (18)	64°F (18°C)
66 (19)	66°F (19°C)
68 (20)	68°F (20°C)
70 (21)	70°F (21°C) (Factory-Setting)
72 (22)	72°F (22°C)
74 (23)	74°F (23°C)
76 (24)	76°F (24°C)
77 (25)	77°F (25°C)
78 (26)	78°F (26°C)
80 (27)	80°F (27°C)
82 (28)	82°F (28°C)
84 (29)	84°F (29°C)
86 (30)	86°F (30°C)

(59) Operation Stoppage Prevention by Wired Controller Operational Error (F7)

This function is utilized to prevent the careless operational stoppage caused by wired controller operational error. When this function is valid, the operation is stopped by pressing “” (ON/OFF) button on the wired controller for more than 3 seconds. However, the operation method is not changed.






Operation Lock (60) to (63)

Four operation lock functions are available as shown below.

These functions are utilized to restrict each switch operation from the wired controller.

When these functions are valid, the operation is prevented from operational error or tampering.

All operation lock functions are valid (“01” setting) before shipment.

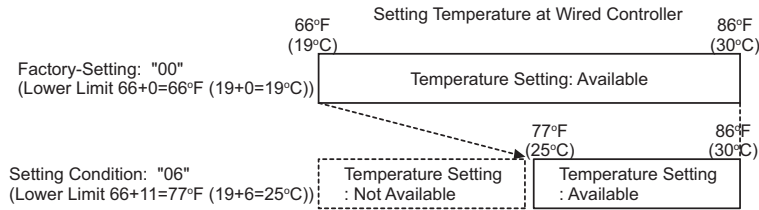
Each switch operation becomes unavailable by pressing “” and “Back/Help” (return) buttons simultaneously for more than 3 seconds when these functions are set as “01”. The indication “” (operation lock indicator) is indicated on the wired controller. If “” and “Back/Help” (return) switches are pressed simultaneously for more than 3 seconds during “” (operation lock indicator) is indicated, “” indication is turned OFF and each switch operation is available. These functions are to restrict the operations of the wired controller only. If operation is preformed from the centralized controller, the command from the centralized controller is adopted.

(60) Lock Function for Operation Mode Selection (F8)**(61) Lock Function for Temperature Setting (F9)****(62) Lock Function for Fan Speed Selection (FA)****(63) Lock Function for Swing Louver Operation (Fb)**

(64) Cooling Lower Limit for Setting Temperature (FC)

This function is utilized to limit the lowest setting temperature for FAN/COOL/DRY operations. When this function is valid, it provides the appropriate cooling operation and energy saving. The setting conditions and the minimum setting temperature for cooling are as follows:

<Example>



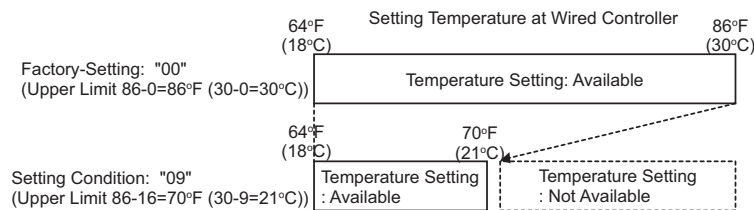
Setting Condition	Details	Minimum Setting Temperature (FAN/COOL/DRY) *
00	Standard Value	66°F (19°C)
01	Lower Limit +2°F (Lower Limit +1°C)	68°F (20°C)
02	Lower Limit +4°F (Lower Limit +2°C)	70°F (21°C)
03	Lower Limit +6°F (Lower Limit +3°C)	72°F (22°C)
04	Lower Limit +8°F (Lower Limit +4°C)	74°F (23°C)
05	Lower Limit +10°F (Lower Limit +5°C)	76°F (24°C)
06	Lower Limit +11°F (Lower Limit +6°C)	77°F (25°C)
07	Lower Limit +12°F (Lower Limit +7°C)	78°F (26°C)
08	Lower Limit +14°F (Lower Limit +8°C)	80°F (27°C)
09	Lower Limit +16°F (Lower Limit +9°C)	82°F (28°C)
10	Lower Limit +18°F (Lower Limit +10°C)	84°F (29°C)

* In case of Standard Unit

(65) Heating Upper Limit for Setting Temperature (Fd)

This function is utilized to limit the highest setting temperature for HEAT operation. When this function is valid, it provides the appropriate heating operation and energy saving. The setting conditions and the heating upper limit for the setting temperature are as follows:

<Example>



Setting Condition	Details	Setting Temperature Upper Limit (HEAT) *
00	Standard Value	86°F (30°C)
01	Upper Limit -2°F (Upper Limit -1°C)	84°F (29°C)
02	Upper Limit -4°F (Upper Limit -2°C)	82°F (28°C)
03	Upper Limit -6°F (Upper Limit -3°C)	80°F (27°C)
04	Upper Limit -8°F (Upper Limit -4°C)	78°F (26°C)
05	Upper Limit -9°F (Upper Limit -5°C)	77°F (25°C)
06	Upper Limit -10°F (Upper Limit -6°C)	76°F (24°C)
07	Upper Limit -12°F (Upper Limit -7°C)	74°F (23°C)
08	Upper Limit -14°F (Upper Limit -8°C)	72°F (22°C)
09	Upper Limit -16°F (Upper Limit -9°C)	70°F (21°C)
10	Upper Limit -18°F (Upper Limit -10°C)	68°F (20°C)
11	Upper Limit -20°F (Upper Limit -11°C)	66°F (19°C)
12	Upper Limit -22°F (Upper Limit -12°C)	64°F (18°C)

* In case of Standard Unit

(66) Not Prepared (FE)

(67) Not Prepared (FF)

(68) Not Prepared (H1)

(69) Indication of Hot Start (H2)

When this function is set as “No Indication” (01), “HOT-ST” is not indicated on the wired controller.

(70) Not Prepared (H3)

(71) Not Prepared (H4)

(72) Not Prepared (J1)

(73) Not Prepared (J2)

(74) Run Indicator Color (J3)

This function is utilized to set the run indicator color.

Setting Conditions	Color
00	Green
01	Red

NOTE:

The red run indicator is flashing during the alarm.

(75) Not Prepared (J4)

(76) Not Prepared (J5)

(77) Not Prepared (J6)

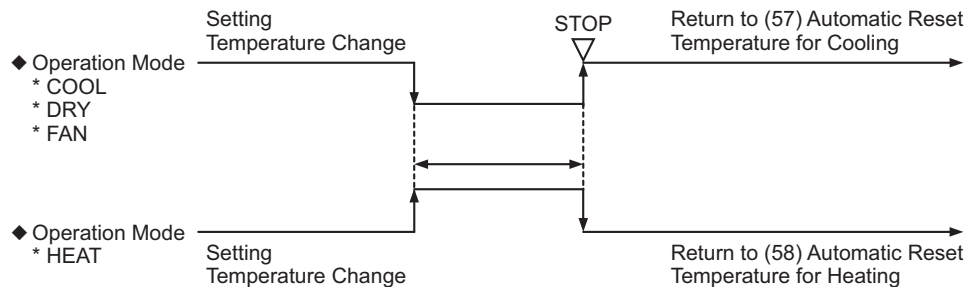
(78) Not Prepared (J7)

(79) Eco-operation (J8)

This function is utilized to effectively optimize the setting temperature and provide energy saving.

When the setting temperature is changed during the air conditioning operation and while the operation is started/stopped by ON/OFF button on the wired controller, the set temperature automatically returns to (57/58) “Automatic Reset Temperature for Cooling/Heating (F5/F6)” as in the following figure.

However, the setting temperature is not automatically reset in the case that “Automatic COOL/HEAT Operation” mode, or “Prohibiting Operation by Wired Controller” is set by the centralized controller.



EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

(80) Not Prepared (J9)

(81) Not Prepared (JA)

(82) Not Prepared (Jb)

(83) Not Prepared (K1)

(84) Not Prepared (K2)

(85) Not Prepared (K3)

(86) Not Prepared (K4)

(87) Not Prepared (K5)...(for Ducted Type and Wall Mounted Type)

(87) Motion Sensor Detection Level (K5)...(for 4-Way Cassette Type and 1-Way Cassette Type)

This function is utilized to determine the amount of human activity depending on the reaction rate as in the following table.

When "HIGH" (01) is set, the threshold of the amount of human activity is smaller than the standard.

As the result, the detection level of human sensor becomes higher sensitivity.

When "LOW" (02) is set, the threshold of the amount of human activity is larger than the standard.

As a result, the detection level of human sensor becomes lower.

Setting Conditions Amount of Human Activity	00 (Factory Setting)	01	02
	Standard	High Sensitive	Low Sensitive
Extra Large	$80\% \leq \text{Reaction Rate}$	$60\% \leq \text{Reaction Rate}$	$80\% \leq \text{Reaction Rate}$
Large	$30\% \leq \text{Reaction Rate} < 80\%$	$20\% \leq \text{Reaction Rate} < 60\%$	$40\% \leq \text{Reaction Rate} < 80\%$
Small	$3\% < \text{Reaction Rate} < 30\%$	$3\% < \text{Reaction Rate} < 20\%$	$3\% < \text{Reaction Rate} < 40\%$
No Available	$\text{Reaction Rate} \leq 3\%$	$\text{Reaction Rate} \leq 3\%$	$\text{Reaction Rate} \leq 20\%$

(88) Not Prepared (K6)...(for Ducted Type and Wall Mounted Type)

(88) Operation Setting during Thermistor of Wired Controller or Remote Sensor (K6)...(for 4-Way Cassette Type and 1-Way Cassette Type)

This function is utilized to change the function "Thermistor of Wired Controller / Remote Sensor (C8)" according to operation mode.

Setting Condition	Operation Mode
00	ALL
01	COOL / DRY
02	HEAT
03	same as "00"

NOTE:

All modes are available during automatic Cool/Heat operation mode

(89) Not Prepared (K7)...(for Ducted Type and Wall Mounted Type)

(89) Radiation Temperature Correction (K7)...(for 4-Way Cassette Type and 1-Way Cassette Type)

This function is utilized to correct the radiation temperature detected higher/lower than actual radiation temperature depending on the environment.

Setting Condition	Operation Mode
00 (Standard)	$0^{\circ}\text{F} (0^{\circ}\text{C})$
01 (Upward)	$+3^{\circ}\text{F} (+2^{\circ}\text{C})$
02 (Downward)	$-3^{\circ}\text{F} (-2^{\circ}\text{C})$

(90) Not Prepared (K8)...(for Ducted Type and Wall Mounted Type)

(90) Control of Dew Condensation Prevention (K8)...(for 4-Way Cassette Type and 1-Way Cassette Type)

Condensation may occur around air outlet during COOL / DRY operation with horizontal air flow and downward air flow for long time period.

This function is utilized to prevent condensation by moving the louver swing angle to the third step automatically for 30 minutes in every 1 hour.

(91) Not Prepared (K9)

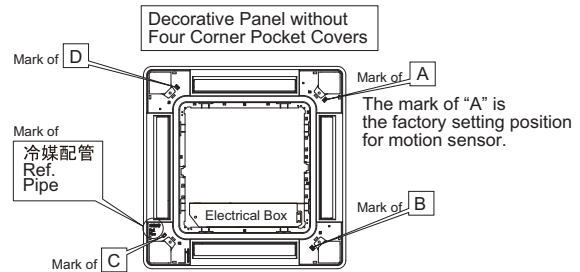
(92) Not Prepared (KA)

(93) Not Prepared (L1)...(for Ducted Type and Wall Mounted Type)

(93) Motion Sensor Installation Position (L1)...(for 4-Way Cassette Type and 1-Way Cassette Type)

This function is utilized to select the installation position of the cover for corner pocket with motion sensor and radiation temperature sensor by wired controller.

Setting Condition	Installation Position
00	A (Factory-Setting)
01	B
02	- (Not Available)
03	D



(94) Not Prepared (L2)

(95) Not Prepared (L3)...(for Ducted Type and Wall Mounted Type)

(95) Louver Setting During (L3)...(for 4-Way Cassette Type and 1-Way Cassette Type)

Setting Condition	Energy-Saving Force Thermo-OFF
00 (Receive Air: LOW)	Louver stay in downward air flow position during Auto Swing Mode
01 (Receive Air: MED)	Louver stay in downward air flow position longer than "00" during Auto Swing Mode
02 (Receive Air: HIGH)	Louver is fixed at the 7th step of downward air flow
03 (Not Available)	Cancel the louver operation

(96) Not Prepared (L4)...(for Ducted High Static Type)

(96) Fan Speed During Energy-Saving Forced Thermo-OFF (L4)...(Except for Ducted High Static Type)

This function is utilized to increase the fan speed to prevent the deterioration of comfortableness due to force thermo-OFF for energy saving during cooling operation.

Setting Condition	Air Volume During Force Thermo-OFF			
Air Flow Volume	HIGH2	HIGH	MED	LOW
00 (Standard)	HIGH2	HIGH	MED	LOW
01 (Hi Speed)	HIGH2	HIGH2	HIGH	MED

(97) Louver Swing Operation During Energy-Saving Thermo-OFF (L5)

This function is set at "01", the function "L3" setting will be available.

(98) Not Prepared (L6)

(99) Not Prepared (L7)

(100) Not Prepared (L8)

(101) Not Prepared (L9)

(102) Not Prepared (LA)

(103) Not Prepared (Lb)

(104) Setting Temperature (P1)

This function is utilized to provide setting temperature for every 1°F (0.5°C) at "00" and every 2°F (1°C) at "01".

Control differential of thermistor also take the temperature for every 1°F (0.5°C) at "00" and every 2°F (1°C) at "01".

(105) Not Prepared (P2)

(106) Thermistor Selection (P3)

This function is utilized to select the thermistor with function (107).

Setting Condition	Thermistor (Sensor)
00	Inlet Air Thermistor
01	Outlet Air Thermistor
02	Thermistor of Remote Control
03	Remote Sensor

(107) Display of Temperature (P4)

This function is utilized to display the temperature of the sensor selected at (106).

(108) Setting Temperature Display when Fan Operation (P5)

This function is utilized to undisplay the setting temperature during fan mode operation.

(109) ECO Button Operation (P6)

This function is prohibiting "ECO" button operation by setting at "01"

EXTERNAL INPUT/OUTPUT AND FUNCTION SETTING

(110) Thermistor Display (P7)

This function is utilized to invalidate the menu button.

(111) Not Prepared (P8)

(112) Not Prepared (P9)

(113) Not Prepared (PA)

(114) Not Prepared (Pb)

(115) Not Prepared (PC)

5.5 Power Saving Functions from Wired Controller

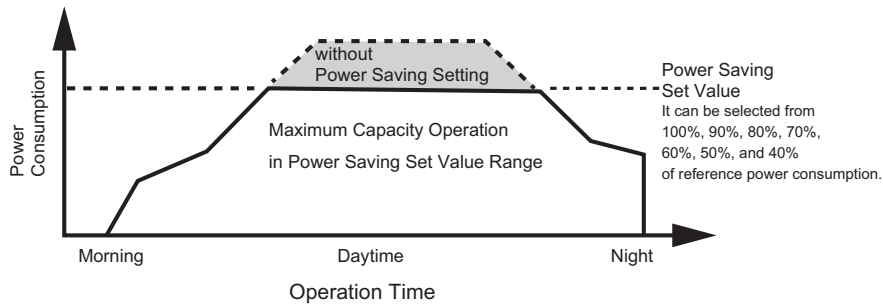
The power saving functions are available from the wired controller COW01 as follows.

5.5.1 Outdoor Unit Capacity Control

The demand function setting can be controlled from wired controller. Select from “Peak Cut Control” and “Moderate Control” according to the situation.

< “Peak Cut Control” Function >

The peak cut control reduces the power consumption range when it exceeds the value of the power saving setting.



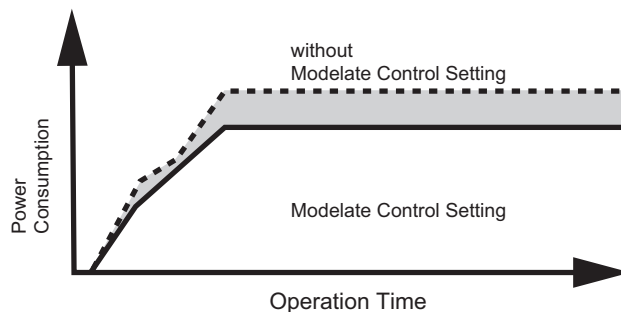
Outdoor Unit Capacity [MBH]	Reference Power Consumption [KW]
072	10.5
096	12.5
120	14.0

NOTES:

1. The power set value (%) is just a criterion. The power set value for this function is different from the actual power value in precision. Use the demand controller (option) when it is necessary to manage the maximum power correctly.
2. The cooling capacity will be decreased according to the power saving setting value for the reducing of compressor motor revolution.
3. The actual electrical power consumption may be higher than the value displayed on the screen under certain operating condition such as protective control.
4. This function is used to inhibit power consumption of the operating. Do not use it for minimize the capacity of current and the voltage for the power circuit, power source wiring, GFCI, transformer, etc. It may cause actuation of interrupter and equipment fault.

< “Moderate Control” Function >

The moderate control moderate the air conditioning capacity not to exceeds the value of the power saving setting.

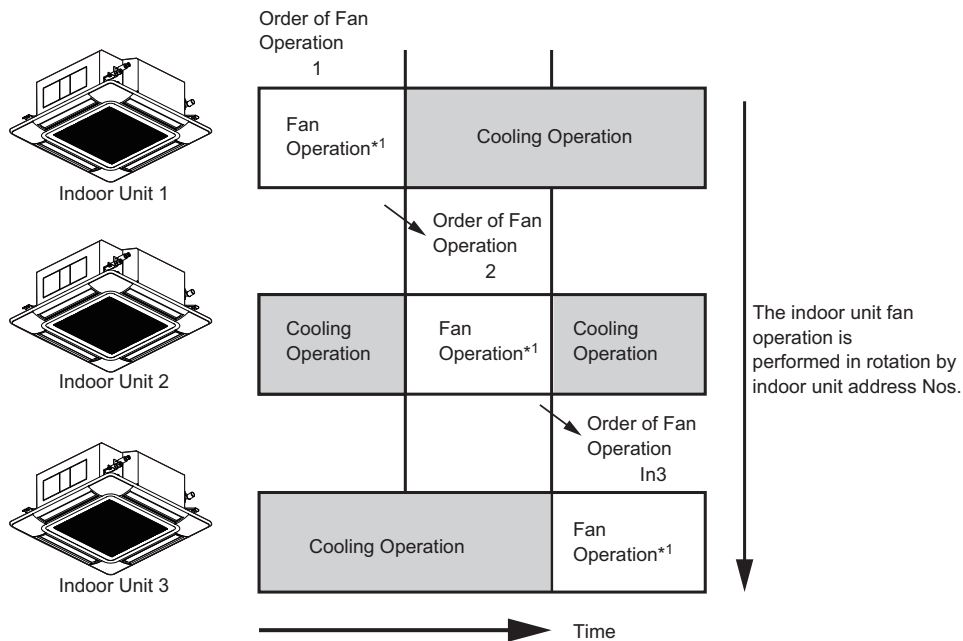


NOTES:

1. The moderate control setting value can be set from 40% to 100% of regular capacity by every 10%.
2. The setting value is just a criterion. It might be different according to the actual service condition and operating condition.

5.5.2 Rotation Control Function

The rotation control switches multiple indoor unit operating mode to FAN mode (Thermo-OFF) in order one by one.

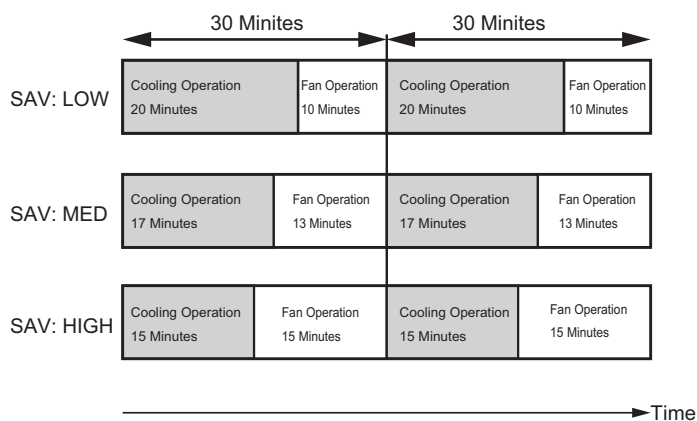


NOTES:

1. The fan mode time can be selected in the interval of three minutes, five minutes and ten minutes.
2. It is possible to change the rotation assigned number according to the minimum differential between the setting temperature and indoor temperature.

5.5.3 Intermittent Control Function

The intermittent control repeats Cooling/Heating and Fan (Thermo-OFF) mode in fixed intervals.

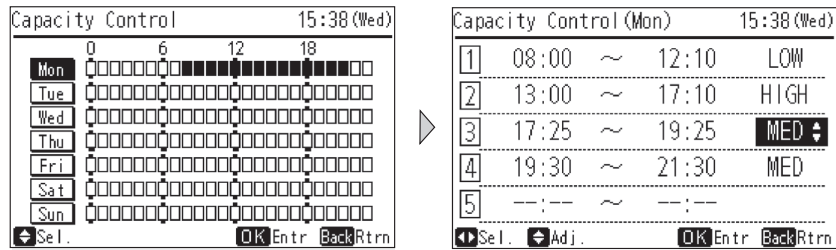


NOTE:

The fan mode will be repeated in the interval of five minutes (SAV: LOW), ten minutes (SAV: MED) and fifteen minutes (SAV: HIGH) during heating operation.

5.5.4 Power Saving Schedule Function

The power saving schedule function is utilized to set the power saving schedule on indoor unit capacity control and intermittent control up to five settings a day each day of the week.



The display of Noise Reduction Schedule is the same.

5.5.5 Operation Noise Reduction Schedule Function

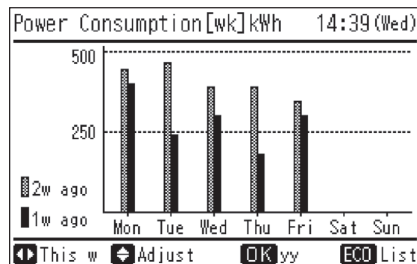
The operation noise reduction schedule function is utilized to set the operation noise reduction schedule up to five settings a day each day of the week.

NOTE:

The operation noise reduction setting may decrease the Cooling/Heating capacity.

5.5.6 Power Consumption Display Function

This function displays the power consumption of the outdoor unit compressor. The value of each displayed in Graph/List format is one day, one week and one year. The display period of consumption comparison can be selected from one day before/Today to 1 year ago/This year.



NOTE:

The power consumption for outdoor unit compressor will be displayed.

5.5.7 Power Saving Guide

Press "ECO" button then the power saving guide will be displayed to support the setting. Easy access to the confirmation and setting screen from the current setting status screen.

6. Field Work Instructions

FIELD WORK INSTRUCTIONS

Refer to Section 2 “Troubleshooting” when dealing with problems or difficulties.
If you cannot solve the problem, contact your distributor or contractor.

6.1 Caution for Refrigerant Leakage

In the room where the indoor unit is installed, the refrigerant gas should be controlled so as not to exceed the concentration limit in case of refrigerant leakage.

The incombustible and non-toxic refrigerant R410A is used in this unit. If by any chance the refrigerant gas leaks and fills the room, asphyxiation may occur.

The VRF series of the outdoor unit is a multi-type air conditioner connecting multiple indoor units with long distance piping. Accordingly, the refrigerant charging quantity is larger than for a general individual unit.

Before the indoor unit installation, confirm that the room can hold a lower refrigerant concentration than the critical concentration.

The refrigerant concentration is calculated according to the following formula:

$$\frac{\text{Total Refrigerant Quantity in System [lb (kg)]}}{\text{Room Space for each Indoor Unit [ft}^3 \text{ (m}^3\text{)]}} \leq \text{Critical Concentration [lb/ft}^3 \text{ (kg/m}^3\text{)]}$$

↑

*0.026lb/ft³
(0.42kg/m³)

* This value is a case of ISO 5149. The critical concentration should be decided according to local, state and national building and safety codes and regulations.

6.2 Modifications of Charging Refrigerants Other than Those Specified by Johnson Controls

DANGER

Johnson Controls' air conditioners are designed and manufactured based on using specified refrigerants. The applicable refrigerants are specified for each unit's models.

Using any refrigerants besides the specified refrigerants may cause mechanical problems, malfunction, and failure, and **in the worst case, it endangers safety seriously and may cause a fire or an explosion.**

Therefore, **Do not charge non-specified refrigerants or any of the following in the refrigerant system of a unit.**

- * **Hydrocarbon Refrigerants such as Propane**
- * **Oxygen, or Flammable Gases such as Acetylene**
- * **Poisonous Gases**

The types of refrigerants are indicated in the Installation and Maintenance Manuals, Engineering Manuals, Service Manuals, and the specification label for each unit. **Be aware that Johnson Controls does not take any responsibility for unit failure, malfunction, or any accidents caused by charging non-specified refrigerants or others as noted above.**

6.3 Maintenance Work

(1) For Outdoor Unit and Indoor Unit

(a) Fan and Fan Motor

- Lubrication - All fan motors are pre-lubricated and sealed at the factory. Therefore, no lubricating maintenance is required.
- Sound and Vibration - Inspect for abnormal sounds or vibration.
- Rotation - Check that the fan rotates counterclockwise and inspect the rotating speed.
- Insulation - Inspect for electrical insulation resistance.

(b) Heat Exchanger

- Clogging - Inspect for any accumulated dirt and dust and remove any at regular intervals. As for an outdoor unit, other obstacles such as growing grass and pieces of paper, which might intercept air flow, should also be removed.

(c) Piping Connection

- Leakage - Inspect for refrigerant leakage at piping connections.

(d) Cabinet

- Stain and Lubricant - Inspect for any stain or lubricant and remove it, if any.
- Securing Screw - Inspect for loose or missing screws and secure or replace as required.
- Insulation - Inspect for peeling thermal insulation material on the cabinet and repair it, if any.

(e) Electrical Equipment

- Activation - Inspect for abnormal activation of the magnetic contactor, auxiliary relay, or printed circuit board (PCB).
- Line Condition - Pay attention to working voltage, amperage and phase balance. Inspect for faulty contact caused by loosened terminal connections, oxidized contacts, foreign matter, and other items. Inspect for electrical insulation resistance.

(f) Control and Protective Devices

- Setting - Do not readjust the setting in the field.

(2) For Outdoor Unit Only

(a) Compressor

- Sound and Vibration - Inspect for abnormal sounds or vibration.
- Activation - Check that the voltage drop of the power supply line is within 16% at start and within 2% during operation.

(b) Reversing Valve

- Activation - Inspect for any abnormal activating sound.

(c) Strainer

- Clogging - Check that there is no temperature difference between the ends.

(d) Ground Wiring

- Ground Line - Inspect for continuity to the earth ground.

(e) Crankcase Heater

- Activation - Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.

(3) For Indoor Unit Only

(a) Air Filter

- Cleaning - Inspect for, and remove, any accumulated dirt and dust and remove according to the "Engineering Manual".

(b) Drain Pan, Condensate Mechanism and Condensate Pipe

- Drain Line - Inspect and clean the condensate line at least twice a year.
- Drain-Up Mechanism - Inspect for activation of drain-up mechanism.

(c) Float Switch

- Activation - Inspect for activation of float switch.

6.4 Service and Maintenance Record by 7-Segment Display

Customer's Name _____

DATE: _____ - _____ - _____

Outdoor Unit Model (Serial No. _____)	(Serial No. _____)	(Serial No. _____)
(1) Operation Mode		
(2) Test Run Start Time		
(3) Data Collect Start Time		
(4) Read Out Data from 7-Segment in Outdoor Unit		
Protection Control Code		
Operating Capacity		
Outdoor Total Connecting Capacity	oCP	
Outdoor Connecting Quantity	oAA	
Indoor Total Connecting Capacity	iCP	
Indoor Connecting Quantity	iAA	
Refrigerant System Address	GA	
Indoor Operating Capacity	oP	
Total Frequency	Hz	
Accumulated Operation Time of Unit	UJ	
Outdoor Unit Information		
Outdoor Capacity	CA	
Outdoor Microcomputer Output	SC	52C1 52C2 CH1 CH2 20A1 20A2 211 212 52C1 52C2 CH1 CH2 20A1 20A2 211 212
		FAN 20B 20C 20F1 20F2 20CHG X1 X2 FAN 20B 20C 20F1 20F2 20CHG X1 X2
Inverter Frequency	H1	
Compressor Running Quantity	CC	
Outdoor Fan Step	Fo	
Outdoor Expansion Valve Opening	E1	
	Eb	
Discharge Pressure	Pd	
Suction Pressure	Ps	
Outdoor Temperature	To	
Discharge Gas Temperature	Td1	
	Td2	
Heat Exchanger Liquid Temperature	TE	
Heat Exchanger Gas Temperature	TG	
Automatic Refrigerant Charge Temperature	TCH	
Gas Bypass Temperature	TbG	
Inverter Fin Temperature	TFi	
Fan Controller Temperature	TFF	
Compressor Running Current	A1	
	A2	
Fan Running Current	AF	
Accumulated Operation Time of Compressor	UJ1	
	UJ2	
Accumulated Operation Time of Compressor (Available for Timer Reset)	cU1	
	cU2	
Inverter Stoppage Cause Code	iT	
Fan Controller Stoppage Cause Code	FT	
Indoor Unit Information		
Indoor Capacity	CA	
Indoor Expansion Valve Opening	iE	
Heat Exchanger Liquid Temperature	TL	
Heat Exchanger Gas Temperature	TG	
Intake Air Temperature	Ti	
Outlet Air Temperature	To	
Indoor Unit Stoppage Cause Code	d1	

Mark	Description of Mark	Parts Mark in Wiring Diagram	Mark	Description of Mark	Parts Mark in Wiring Diagram
52C1	Contact of Relay (Y52C1) on O.U. PCB for Inverter Compressor	CMC1	FAN	-	-
52C2	Contact of Relay (Y52C2) on O.U. PCB for Constant Speed Compressor	CMC2	20B	-	-
			20C	-	-
			20F1	Contact of Relay (Y20F1) on O.U. PCB for Solenoid Valve	SVF1
CH1	Contact of Relay (YCH1) on O.U. PCB for Crankcase Heater	CH1	20F2	Contact of Relay (Y20F2) on O.U. PCB for Solenoid Valve	SVF2
CH2	Contact of Relay (YCH2) on O.U. PCB for Crankcase Heater	CH2	20CHG	-	-
20A1	Contact of Relay (Y20A1) on O.U. PCB for Solenoid Valve	SVA	X1	Contact of Relay (YX1) on O.U. PCB for Solenoid Valve	SVG
20A2	-	-	X2	-	-
211	Contact of Relay (Y211) on O.U. PCB for Reversing Valve	RVR1			
212	Contact of Relay (Y212) on O.U. PCB for Reversing Valve	RVR2			

*PCB = Printed Circuit Board

FIELD WORK INSTRUCTIONS

6.5 Service and Maintenance Record by Wired Controller

Data Sheet for Checking by Remote Control Switch

Time				:	:	:	:	:
I.U. Model								
I.U. Serial No.								
I.U. No. / Alarm Code								
		Check Mode 1	Check Mode 2	1 • 2	1 • 2	1 • 2	1 • 2	1 • 2
B Temp. Indication								
	Set Temp.	b1	--					
	Inlet Air Temp.	b2	g1					
	Discharge Air Temp.	b3	g2					
	Liquid Pipe Temp.	b4	g3					
	Remote Thermistor Temp.	b5	--					
	Outdoor Air Temp.	b6	g4					
	Gas Pipe Temp.	b7	g5					
	Evaporating Temp. at Heating	b8	g6					
	Control Information	b9	g7					
	Comp. Top Temp.	bA	g8					
	Thermo Temp. of Remote Control Switch	bb	--					
	Control Information	bC	--					
C Micro-Computer State Indication								
	I.U. Micro-Computer	C1	--					
	O.U. Micro-Computer	C2	--					
D Stopping Cause State Indication								
	Stopping Cause State Indication	d1	--					
E Alarm Occurrence								
	Times of Abnormality	E1	--					
	Times of Power Failure	E2	--					
	Times of Abnormal Transmitting	E3	--					
	Times of Inverter Tripping	E4	--					
F Automatic Louver State								
	Louver Sensor State	F1	--					
H Pressure, Frequency State Indication								
	Discharge Pressure	H1	g9					
	Suction Pressure	H2	gA					
	Control Information	H3	gb					
	Operating Frequency	H4	gC					
J I.U. Capacity Indication								
	I.U. Capacity	J1	--					
	O.U. Code	J2	--					
	Refrigerant Cycle Number	J3	--					
	Refrigerant Cycle Number	J4	--					
L Opening of Expansion Valve								
	I.U. Expansion Valve	L1	gd					
	O.U. Expansion Valve 1	L2	gE					
	O.U. Expansion Valve 2	L3	--					
	O.U. Expansion Valve B	L4	--					

P	Compressor Condition Indication (Reference)							
	Comp. Current	P1	gF					
	Accumulated Operation Time of Comp.	P2	--					
g	Sensor Condition Indication							
	Motion Sensor Response Rate	g1	--					
	Radiation Sensor Temp.	g2	--					
	Motion Sensor1 Response Rate	g3	--					
	Motion Sensor2 Response Rate	g4	--					
	Motion Sensor3 Response Rate	g5	--					
	Motion Sensor4 Response Rate	g6	--					
	Correcting Set Temp.	g7	--					

Client: _____
 Installation Date: _____
 System No.: _____
 Date Checked: _____
 Checked by: _____

Result	

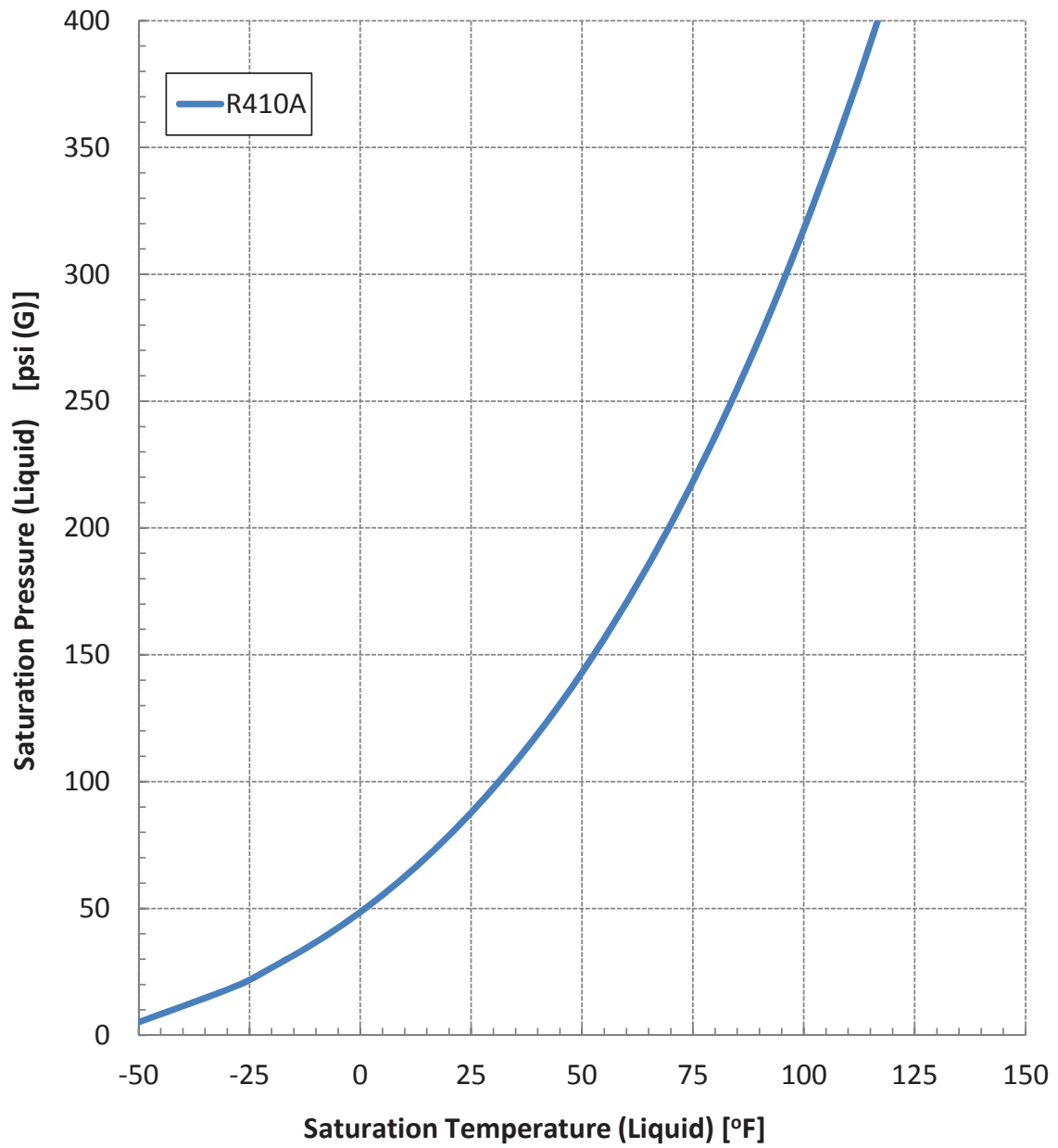
FIELD WORK INSTRUCTIONS

6.6 Service and Maintenance Record

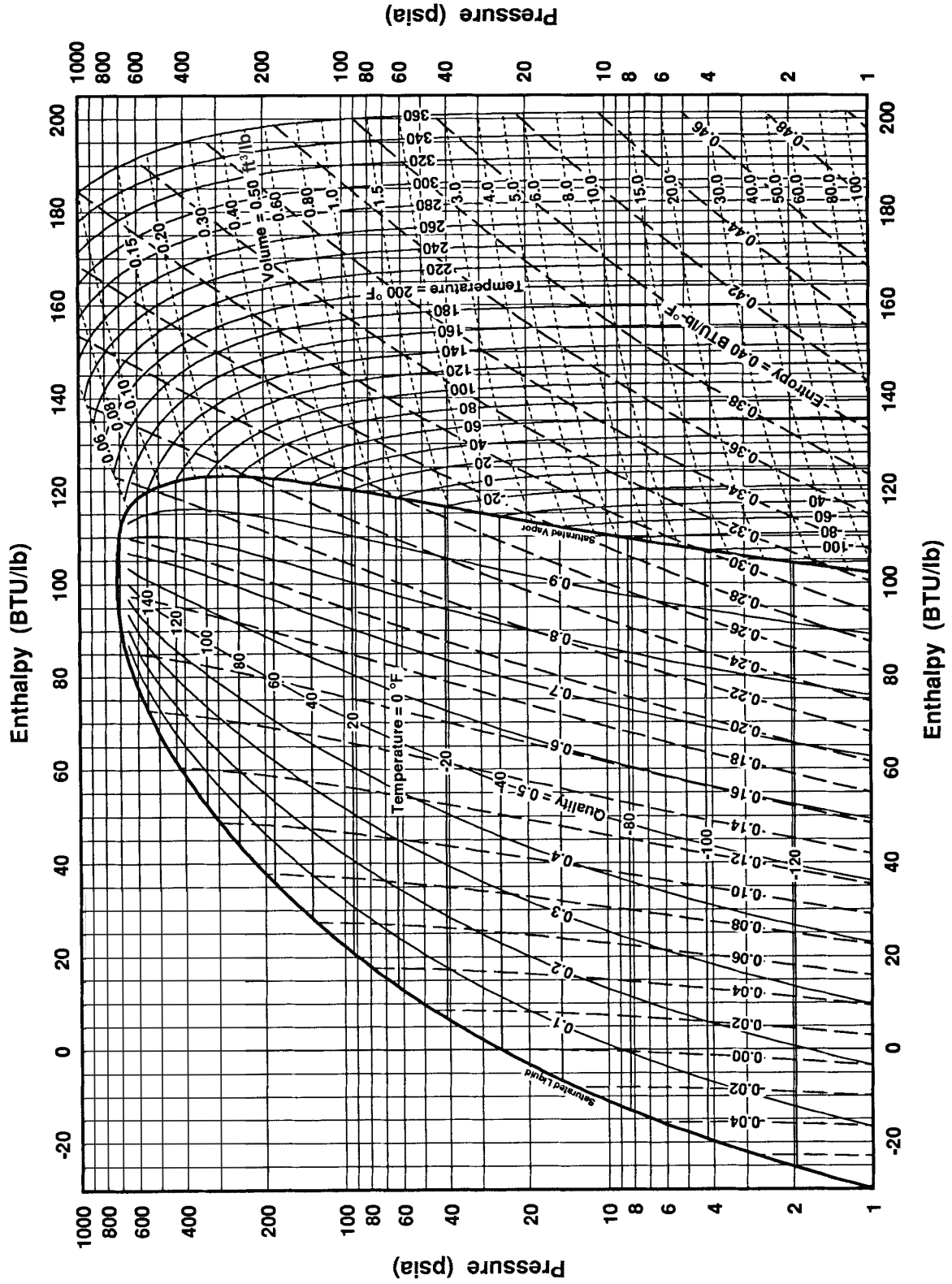
Service and Maintenance Record

No.	Check Item	Action	Judgment
1	Is service space sufficient?		YES or NO
2	Short Circuit of Discharged Air?		YES or NO
3	Any Heat Influence?		YES or NO
4	Is ground wiring connected?		YES or NO
5	Refrigeration Piping		GOOD or NOT GOOD
6	Fixing of Units		GOOD or NOT GOOD
7	Any Damage on External or Internal Surface?		YES or NO
8	Checking of Screws and Bolts	Tighten them if they are loosened.	TIGHTENED or NOT TIGHTENED
9	Tightening of Terminal Screws	Tighten all terminal screws with a Phillips screwdriver.	TIGHTENED or NOT TIGHTENED
10	Are compressor terminals tightly fixed?	Check all compressor terminals are tightly fixed.	GOOD or NOT GOOD
11	Insulation Resistance	Measure insulation resistance with insulation resistance-meter. Comp. and Fan Motor: greater than 3MΩ Others: greater than 3MΩ	GOOD or NOT GOOD
12	Does drain water smoothly flow?	Check for smooth flow by pouring water.	GOOD or NOT GOOD
13	Check for leakage at compressor.	Check for any leakage.	GOOD or NOT GOOD
14	Check for leakage at outdoor heat exchanger.	ditto	GOOD or NOT GOOD
15	Check for leakage at indoor heat exchanger.	ditto	GOOD or NOT GOOD
16	Check for leakage at reversing valve.	ditto	GOOD or NOT GOOD
17	Check for leakage at check valve.	ditto	GOOD or NOT GOOD
18	Check for leakage at accumulator.	ditto	GOOD or NOT GOOD
19	Check for leakage at strainer.	ditto	GOOD or NOT GOOD
20	Check for leakage at electronic expansion valve.	ditto	GOOD or NOT GOOD
21	Check for leakage at piping.	ditto	GOOD or NOT GOOD
22	Check direction of fans.	by Viewing or Airflow Volume	GOOD or NOT GOOD
23	Voltage among each phase.	Check the voltage is within the specified range.	GOOD or NOT GOOD
24	Vibration and Sound	Check fan, compressor, piping.	GOOD or NOT GOOD
25	Activation of Each Operation Mode	Check activation of COOL, HEAT, STOP and TEMP. switches.	GOOD or NOT GOOD
26	High Pressure Cut-out Switch	Check actual activation value.	GOOD or NOT GOOD
27	Check activation of drain-up mechanism.	Check it during cooling operation.	GOOD or NOT GOOD
28	Indoor Inlet Air Temp. (DB/WB)		°F DB/ °F WB
29	Indoor Outlet Air Temp. (DB/WB)		°F DB/ °F WB
30	Outdoor Inlet Air Temp. (DB/WB)		°F DB/ °F WB
31	Outdoor Outlet Air Temp. (DB/WB)		°F DB/ °F WB
32	High Pressure Switch		psi(G)
33	Low Pressure Switch		psi(G)
34	Operating Voltage		V
35	Operating Current		A
36	Instruction for Cleaning of Air Filter to Client		DONE or NOT YET
37	Instruction for Cleaning Method to Client		DONE or NOT YET
38	Instruction for Operation to Client		DONE or NOT YET

6.7 Saturation Curve for Refrigerant



6.8 Mollier Chart for R410A

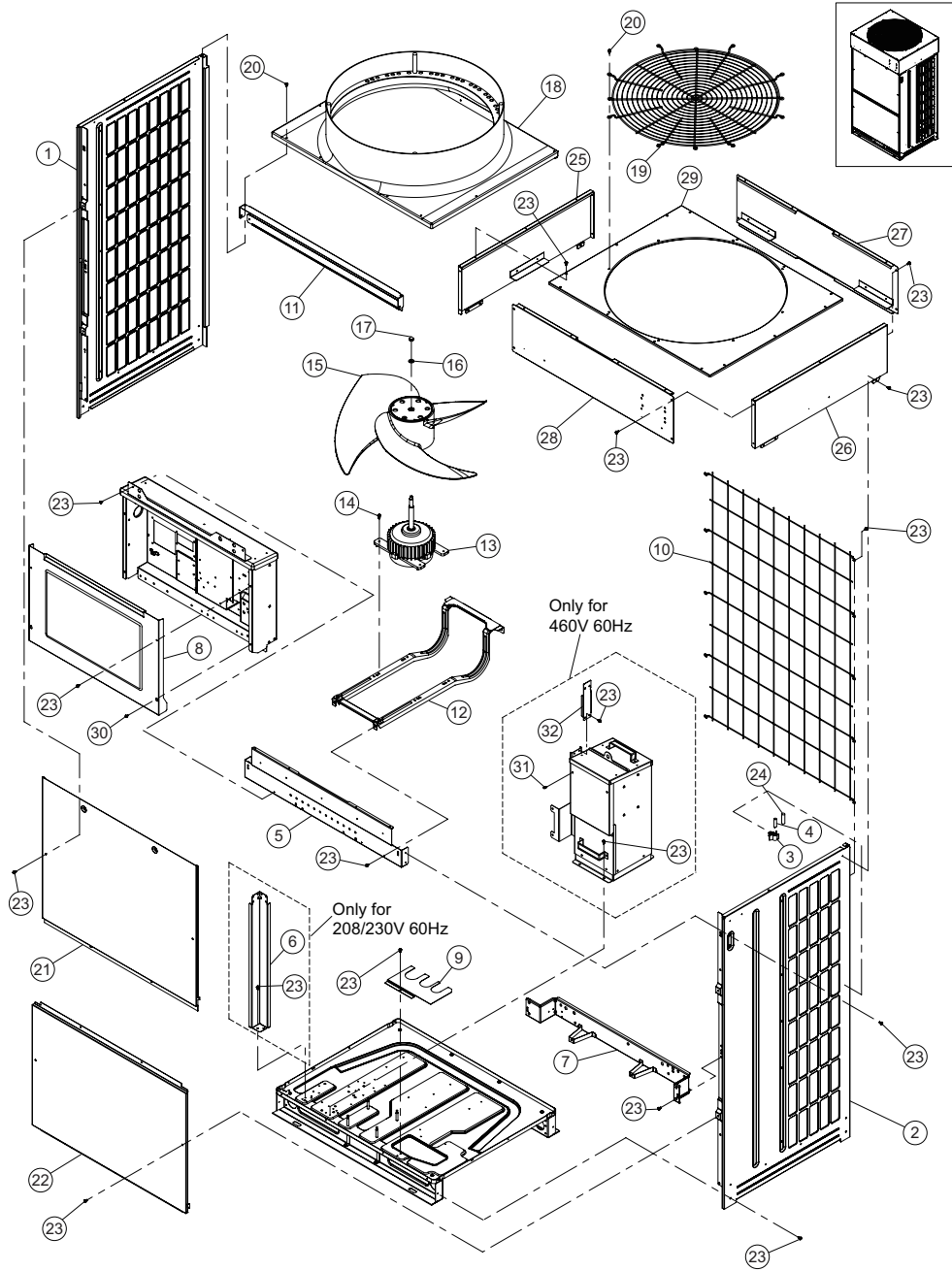


7. Service Parts List

LOCATION OF SERVICE PARTS IN THE UNIT

< Cabinet and Fan >

MODEL: (H,Y)VAH(P,R)072B31S
(H,Y)VAH(P,R)072B41S



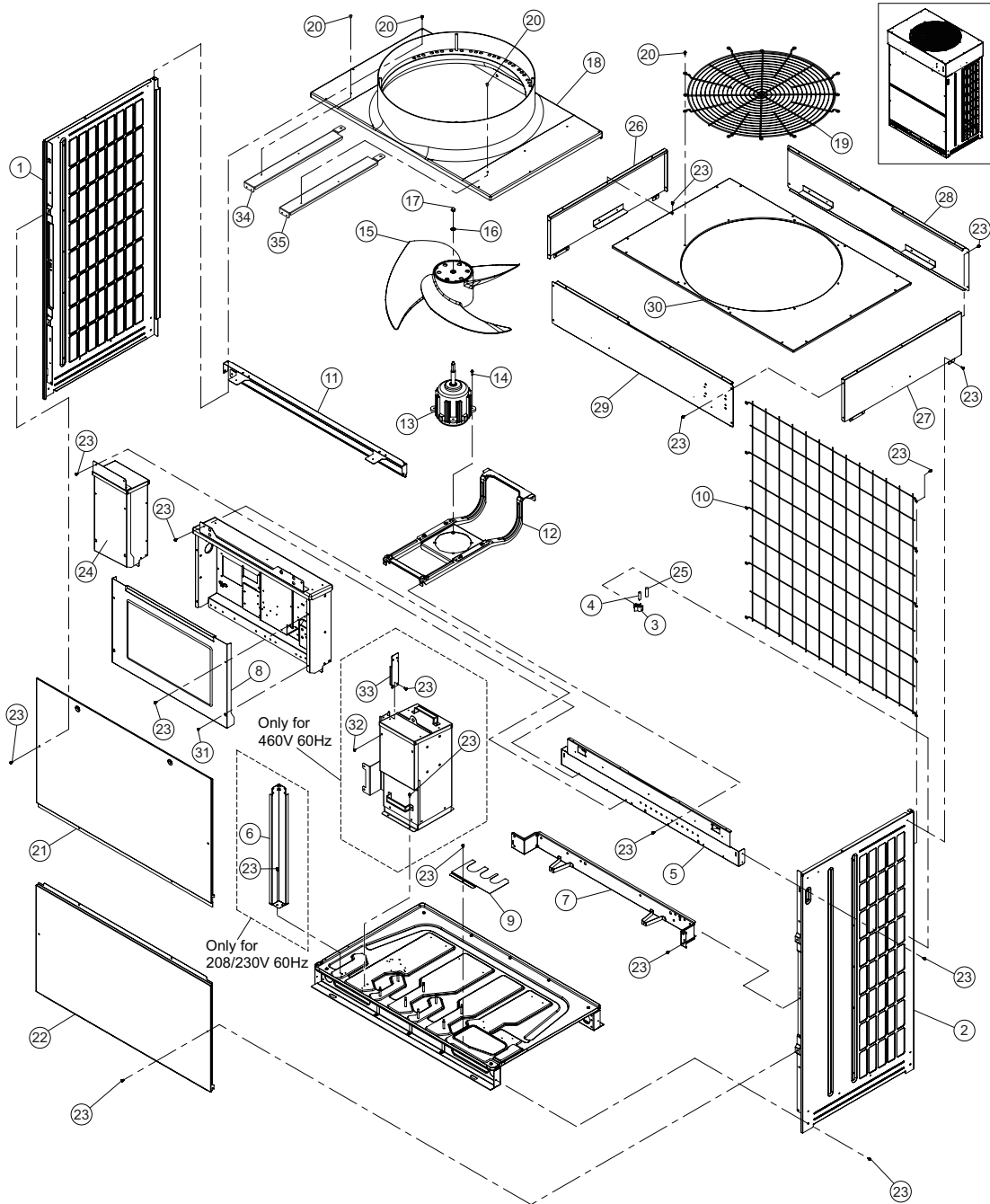
A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

< Cabinet and Fan >

MODEL: (H,Y)VAH(P,R)096B31S
 (H,Y)VAH(P,R)120B31S
 (H,Y)VAH(P,R)096B41S
 (H,Y)VAH(P,R)120B41S



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

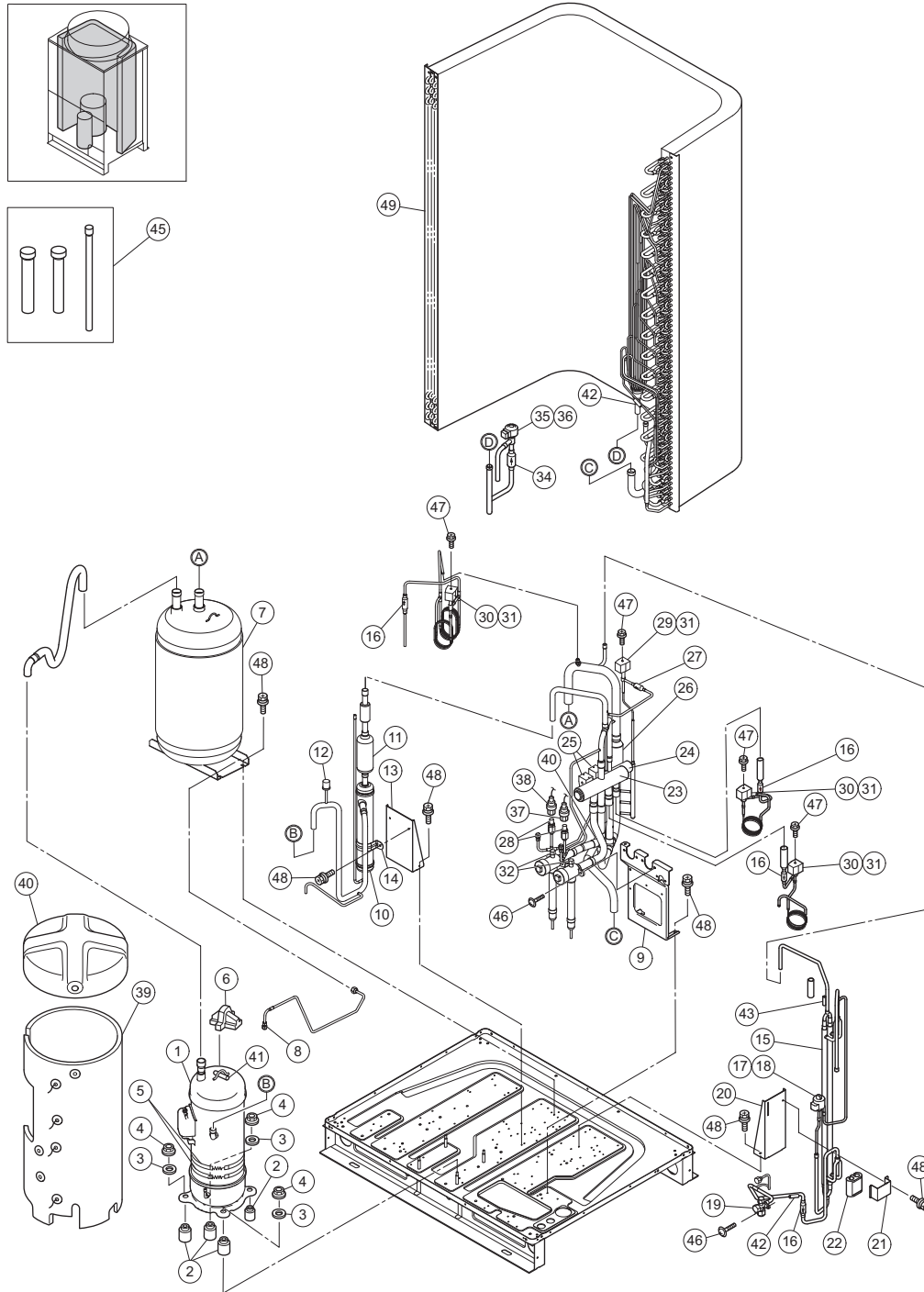
SERVICE PARTS LIST

No.	Part Name	Replacement Part		Remarks	Voltage	
		Draw. No.	Part No.		208/230V 60Hz	460V 60Hz
					Qty Per Unit	
					(H,Y)VAHP072B31S (H,Y)VAHR072B31S	(H,Y)VAHP072B41S (H,Y)VAHR072B41S
1	Compressor	17F16543A	06955100	MC1: DA65PHD-A1YC2	1	
		17F15396A	06955104	MC1: DA65PHD-D3Y2		1
2	Vibration Absorber	H17D21147B	-		4	4
3	Vibration Absorber	H17D21207A	-		3	3
4	Nut	H17D49475A	-		3	3
5	Crankcase Heater	H7D02452A	QU078001	CH1: 40.8W, Belt Heater	2	2
6	Rubber Cap	H17B29767A	QU032001		1	1
7	Accumulator	H7B02591A	QU089001		1	1
8	Check Joint	H7C00441A	QU028001		1	1
9	Valve Stay	H17F09346A	-		1	1
10	Oil Separator	H7C03052A	QU055001		1	1
11	Check Valve	H7C01709A	QU042001		1	1
12	Pressure Switch	H7C03969A	QU001001	PSH1: Shanghai Junle, H20PS	1	1
13	Oil Separator Stay	H17H06171A	-		1	1
14	Saddle	H7D02638A	-		1	1
15	Double Tube	H17F05849C	QU041002		1	1
16	Strainer	H17D55178A	QU030001		4	4
17	Expansion Valve	17C78465A	P26007	MVB: Saginomiya, UKV-25D26	1	1
18	EXPV. Coil	17C78180C	P27606	MVB: Saginomiya, UKV-A035	1	1
19	Stop Valve	H7C00434A	QU027003	3/8 (Liquid)	1	1
20	Plate Stay	H17H06172A	-		1	1
21	Stopper	H17E25685A	-		1	1
22	Rubber Seat	H17H10681A	-		1	1
23	Reversing Valve	H7C03986A	QU081003	RVR1: Saginomiya, STF-H07U12	1	1
24	Reversing Valve	H7C03985A	QU081002	RVR2: Saginomiya, STF-H04U4	1	1
25	Coil	H7C03987B	QU081001	RVR1, 2: Saginomiya, STF-H01AQ3004UAA1	2	2
26	Strainer	H17G15764A	QU030002		1	1
27	Strainer	H17G62701A	QU030005		1	1
28	Check Joint	H7C00441A	QU028001		2	2
29	Solenoid Valve	17C64849A	P24511	SVA: Nichiden Kougyou, SR10PA	1	1
30	Solenoid Valve	17C77098A	P25246	SVF, SVG: Nichiden Kougyou, SR10D	3	3
31	Coil	17C76434B	P30572	SVA, SVF, SVG: Nichiden Kougyou, SR10PA	4	4
32	Stop Valve	H17F09233A	QU027001	7/8 (Gas)	2	2
33	Strainer	H17G62700A	QU030004		1	1
34	Expansion Valve	17F07288A	P29262	MV1: Fujikoki, PAM-BBOYGHS-1	1	1
35	EXPV. Coil	17F07287A	P29263	MV1: Fujikoki, PAM-MD12HS-7	1	1
36	Pressure Sensor	17B35964A	P26013	PD: Saginomiya, NSK-BD050F-102	1	1
37	Pressure Sensor	17B35965A	P26014	PS: Saginomiya, NSK-BD020F-102	1	1
38	Sound Proof Cover	H7C03542A	QU032004		1	1
39	Sound Proof Cover	H17C59825B	QU032002		1	1
40	Thermistor	H7B00030B	QU015015	THM11: for Piping (Tg)	1	1
41	Thermistor	H7B00029A	QU015009	THM8: for Compressor (Td1)	1	1
42	Thermistor	H7B00030C	QU015011	THM17, 10: for Piping (Te, Tchg)	2	2
43	Thermistor	H7B00030A	QU015010	THM23: for Piping (Tbg)	1	1
44	Protective Tube	06SY0800	-	Thermistor Protection Tube (33ft (10m))	1	1
45	Accessory Pipe Assy	H17H07081L	-		1	1
46	Special Screw	17D30320F	P25673	SUS, M6	6	6
47	Bolt	H17E19003B	-	for Coil	4	4
48	SUS Screw	17G84611A	P25678	SUS, M5	18	18
49	Heat Exchanger	H17B43508A	-		1	1

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)VAH(P,R)072B31S
(H,Y)VAH(P,R)072B41S

< Refrigerant System >



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

SERVICE PARTS LIST

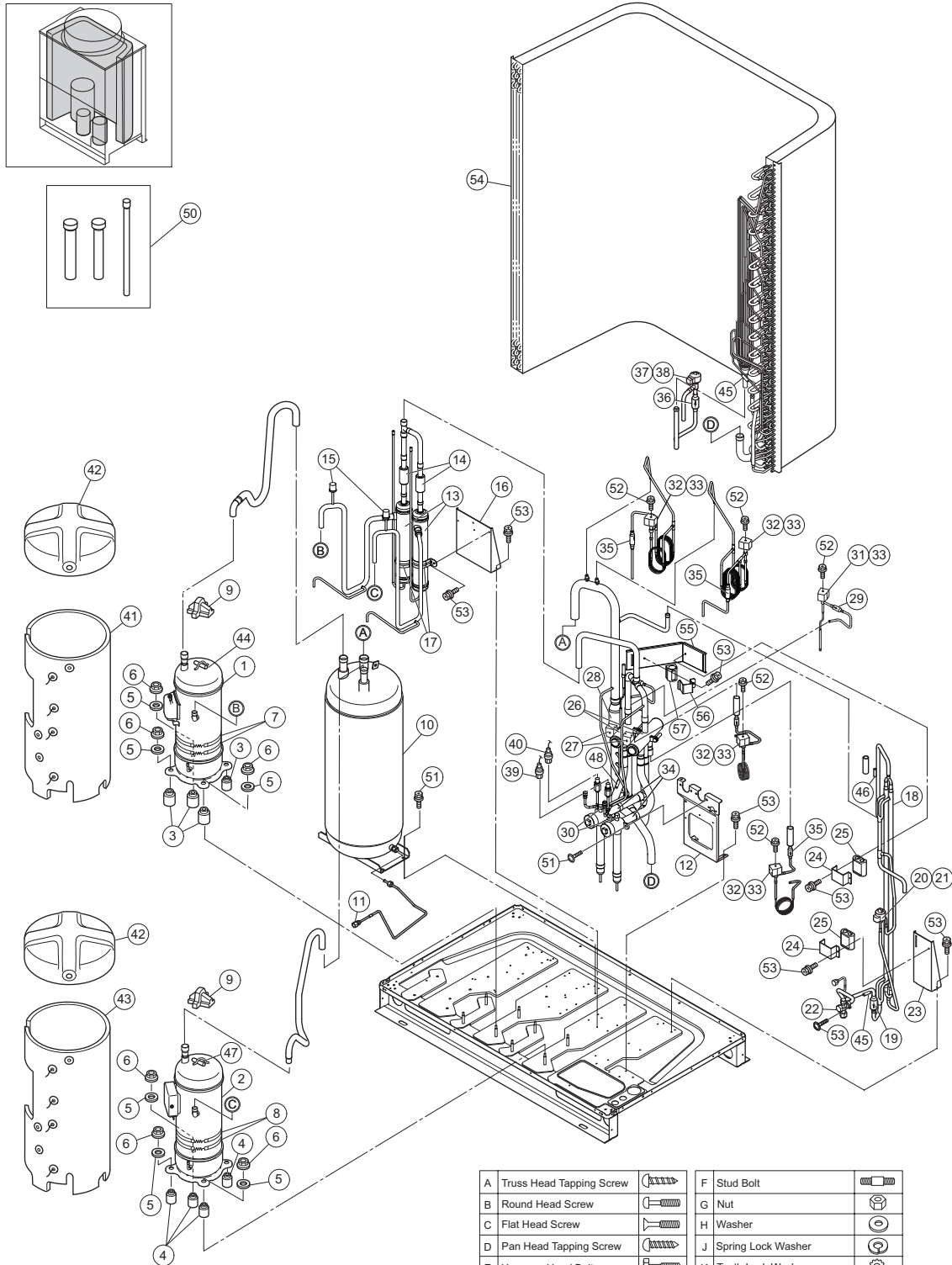
No.	Part Name	Replacement Part		Remarks	Voltage			
		Draw. No.	Part No.		208/230V 60Hz		460V 60Hz	
					Q'ty Per Unit			
					(H,YYVAHP096B31S (H,YYVAHR096B31S	(H,YYVAHP120B31S (H,YYVAHR120B31S	(H,YYVAHP096B41S (H,YYVAHR096B41S	(H,YYVAHP120B41S (H,YYVAHR120B41S
1	Compressor	17F16543A	06955100	MC1: DA65PHD-A1YC2	1	1		
		17F15396A	06955104	MC1: DA65PHD-D3Y2			1	1
2	Compressor	2HA28477A	09954129	MC2: E655DH-65H2Y	1	1		
		17F15397A	06956105	MC2: DA65PHC-D3Y2			1	1
3	Vibration Absorber	H17D21147B	-		4	4	4	4
4	Vibration Absorber	H17D49474A	-		4	4	4	4
5	Vibration Absorber	H17D21207A	-		6	6	6	6
6	Nut	H17D49475A	-		6	6	6	6
7	Crankcase Heater	H7D02452A	QU078001	CH1: 40.8W, Belt Heater	2	2	2	2
8	Crankcase Heater	H7D02452B	QU078002	CH2: 40.8W, Belt Heater	2	2	2	2
9	Rubber Cap	H17B29767A	QU032001		2	2	2	2
10	Accumulator	H7B03328A	QU089002		1	1	1	1
11	Check Joint	H7C00441A	QU028001		1	1	1	1
12	Valve Stay	H17F09346A	-		1	1	1	1
13	Oil Separator	H7C03052A	QU055001		2	2	2	2
14	Check Valve	H7C01709A	QU042001		2	2	2	2
15	Pressure Switch	H7C03969A	QU001001	PSH1, 2: Shanghai Junle, H20PS	2	2	2	2
16	Oil Separator Stay	H17H06170A	-		1	1	1	1
17	Saddle	H7D02638A	-		2	2	2	2
18	Double Tube	H17F05849A	QU041001		1	1	1	1
19	Strainer	H17G62700A	QU030004		1	1	1	1
20	Expansion Valve	17C78465A	P26007	MVB: Saginomiya, UKV-25D26	1	1	1	1
21	EXPV. Coil	17C78180C	P27606	MVB: Saginomiya, UKV-A035	1	1	1	1
22	Stop Valve	H7C00435A	QU027004	1/2 (Liquid)	1	1	1	1
23	Plate Stay	H17H06172A	-		1	1	1	1
24	Stopper	H17E25685A	-		2	2	2	2
25	Rubber Seat	H17H10681A	-		2	2	2	2
26	Reversing Valve	H7C03986A	QU081003	RVR1, 2: Saginomiya, STF-H07U12	2	2	2	2
27	Coil	H7C03987B	QU081001	RVR1, 2: Saginomiya, STF-H01AQ3004UAA1	2	2	2	2
28	Strainer	H17G15764B	QU030003		1	1	1	1
29	Strainer	H17G62701A	QU030005		1	1	1	1
30	Check Joint	H7C00441A	QU028001		2	2	2	2
31	Solenoid Valve	17C64849A	P24511	SVA: Nichiden Kougyou, SR10PA	1	1	1	1
32	Solenoid Valve	17C77098A	P25246	SVF, SVG: Nichiden Kougyou, SR10D	4	4	4	4
33	Coil	17C76434B	P30572	SVA, SVF, SVG: Nichiden Kougyou, SR10PA	5	5	5	5
34	Stop Valve	H17F09234A	QU027002	1/1 (Gas)	2	2	2	2
35	Strainer	H17D55178A	QU030001		4	4	4	4
36	Strainer	H17G62700A	QU030004		1	1	1	1
37	Expansion Valve	17F07288A	P29262	MV1: Fujikoki, PAM-BBOYGHS-1	1	1	1	1
38	EXPV. Coil	17F07287A	P29263	MV1: Fujikoki, PAM-MD12HS-7	1	1	1	1
39	Pressure Sensor	17B35964A	P26013	PD: Saginomiya, NSK-BD050F-102	1	1	1	1
40	Pressure Sensor	17B35965A	P26014	PS: Saginomiya, NSK-BD020F-102	1	1	1	1
41	Sound Proof Cover	H7C03542A	QU032004		1	1	1	1
42	Sound Proof Cover	H17C59825B	QU032002		2	2	2	2
43	Sound Proof Cover	H7C02480A	QU032003		1	1	1	1
44	Thermistor	H7B00029A	QU015009	THM8: for Compressor (Td1)	1	1	1	1
45	Thermistor	H7B00030C	QU015011	THM17, 10: for Piping (Te, Tchg)	2	2	2	2
46	Thermistor	H7B00030A	QU015010	THM23: for Piping (Tbg)	1	1	1	1
47	Thermistor	H7B00029B	QU015014	THM9: for Compressor (Td2)	1	1	1	1
48	Thermistor	H7B00030B	QU015015	THM11: for Piping (Tg)	1	1	1	1

SERVICE PARTS LIST

LOCATION OF SERVICE PARTS IN THE UNIT

< Refrigerant System >

MODEL: (H,Y)VAH(P,R)096B31S
 (H,Y)VAH(P,R)120B31S
 (H,Y)VAH(P,R)096B41S
 (H,Y)VAH(P,R)120B41S



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

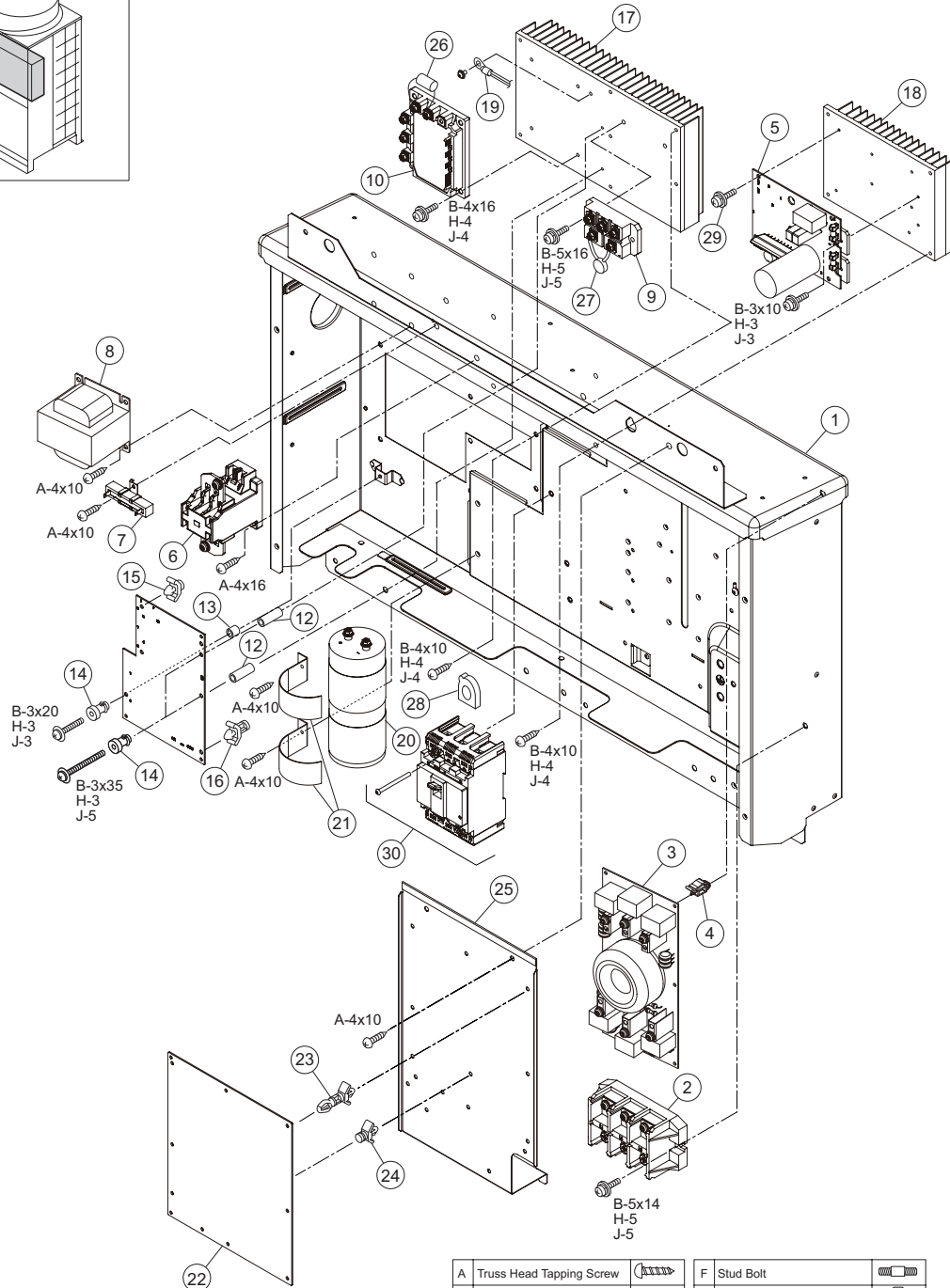
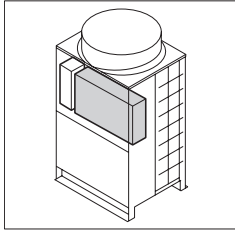
NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

SERVICE PARTS LIST

LOCATION OF SERVICE PARTS IN THE UNIT

< Electrical Parts > (208/230V 60Hz)

MODEL: (H,Y)VAH(P,R)072B31S
 (H,Y)VAH(P,R)096B31S
 (H,Y)VAH(P,R)120B31S



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:

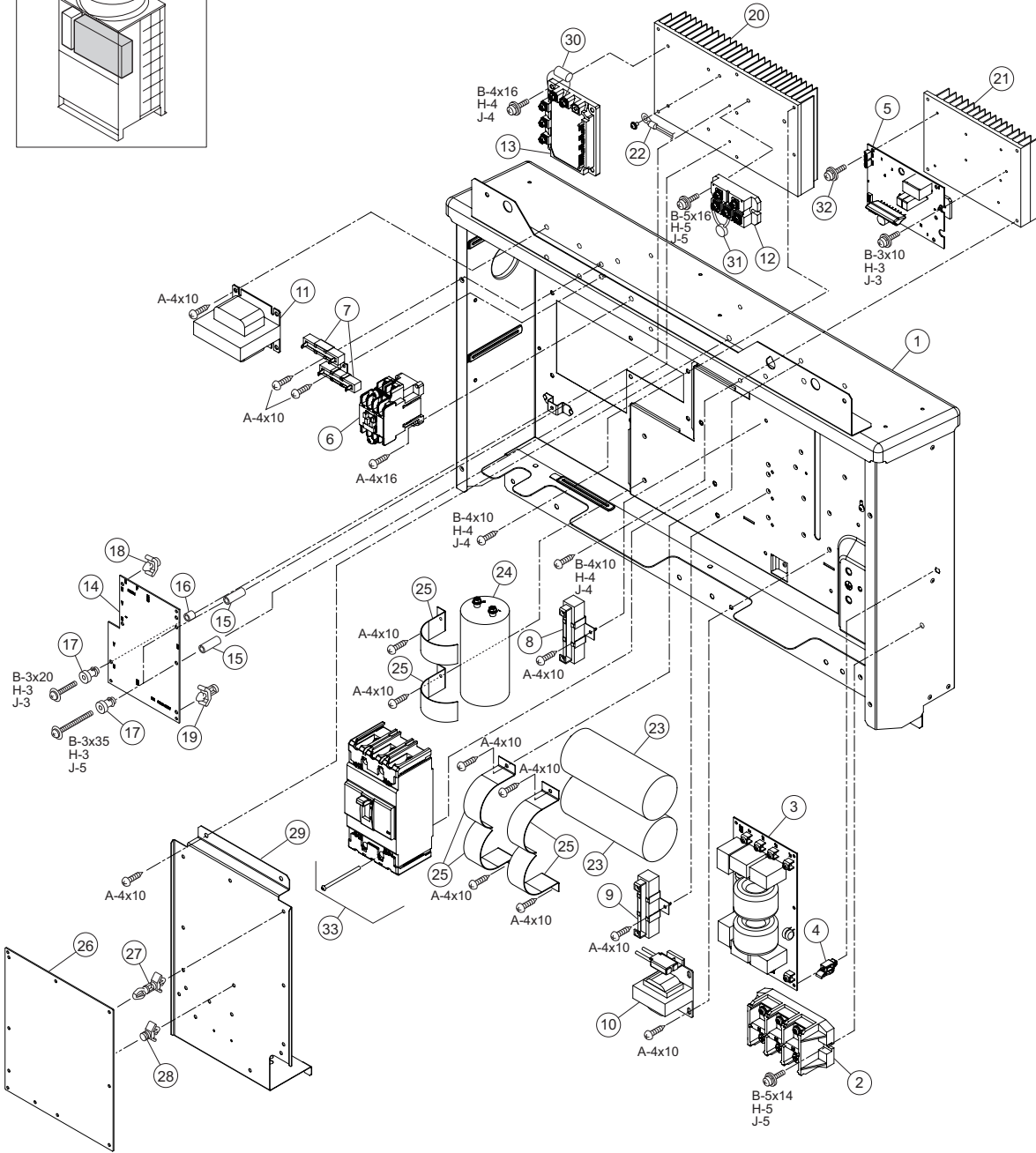
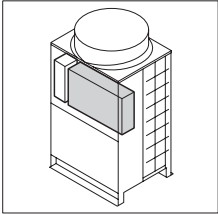
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

SERVICE PARTS LIST

LOCATION OF SERVICE PARTS IN THE UNIT

< Electrical Parts > (460V 60Hz)

MODEL: (H,Y)VAH(P,R)072B41S
 (H,Y)VAH(P,R)096B41S
 (H,Y)VAH(P,R)120B41S



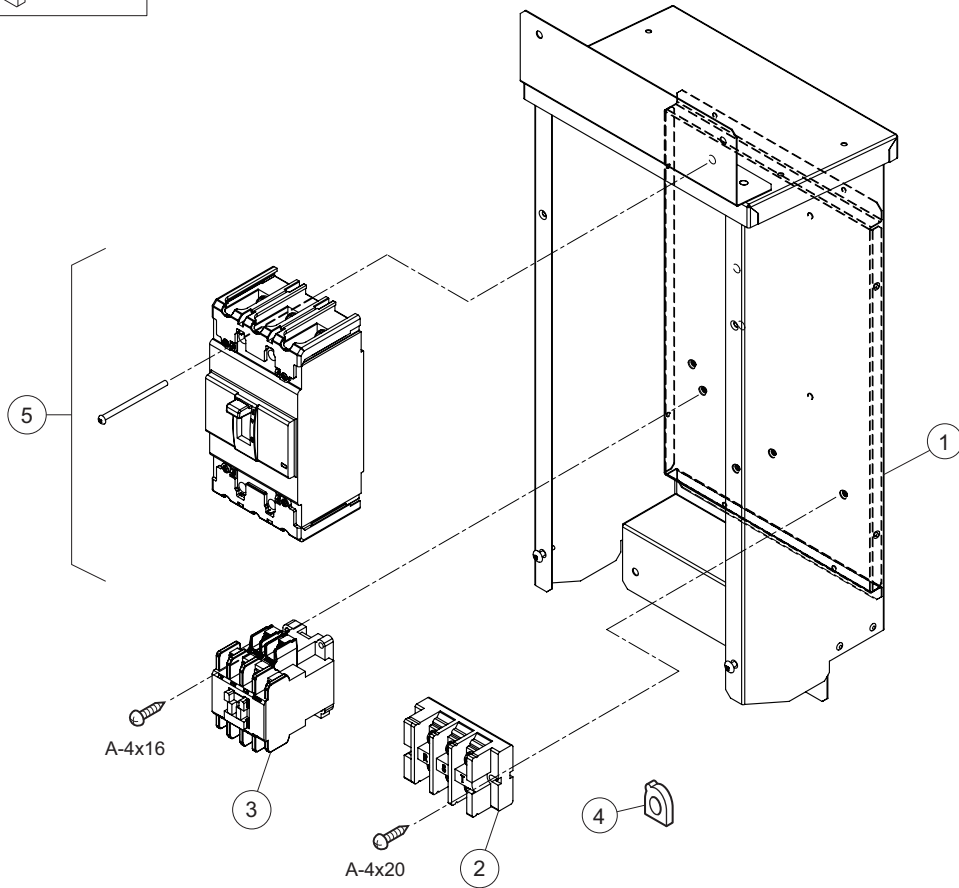
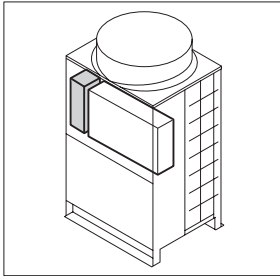
A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

< Sub Electrical Box >

MODEL: (H,Y)VAH(P,R)096B31S
 (H,Y)VAH(P,R)120B31S
 (H,Y)VAH(P,R)096B41S
 (H,Y)VAH(P,R)120B41S



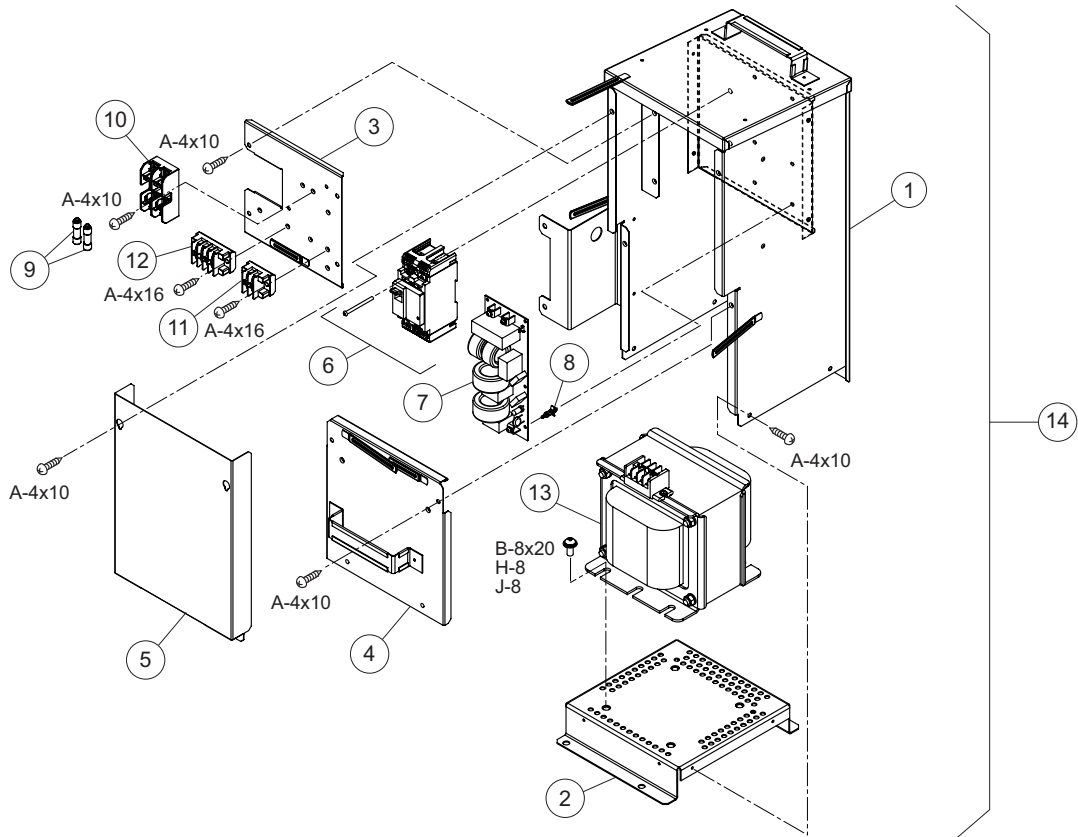
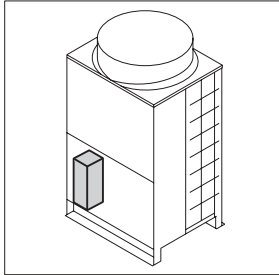
A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)VAH(P,R)072B41S
 (H,Y)VAH(P,R)096B41S
 (H,Y)VAH(P,R)120B41S

< TF Box >

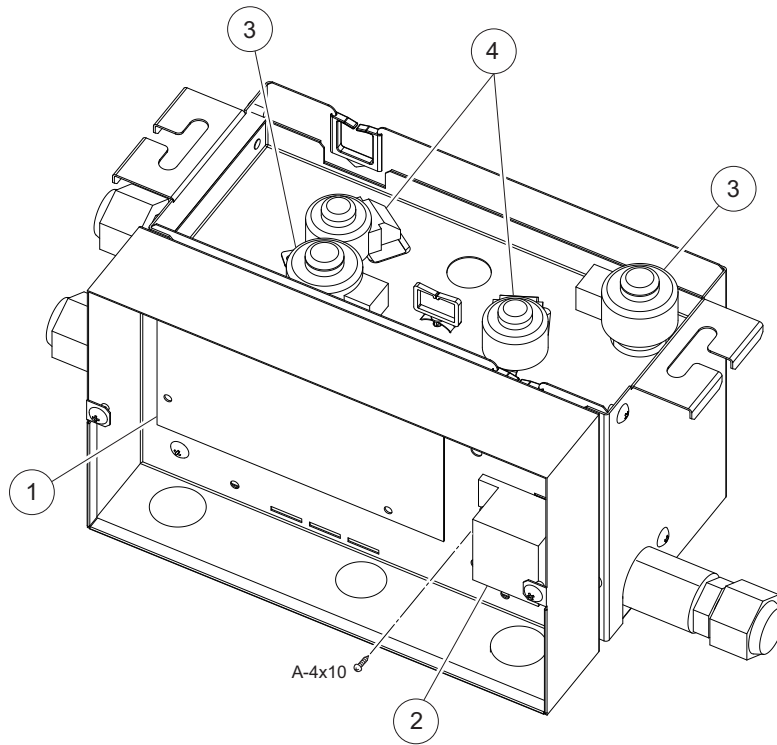












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B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: COBS048B21S
COBS096B21S



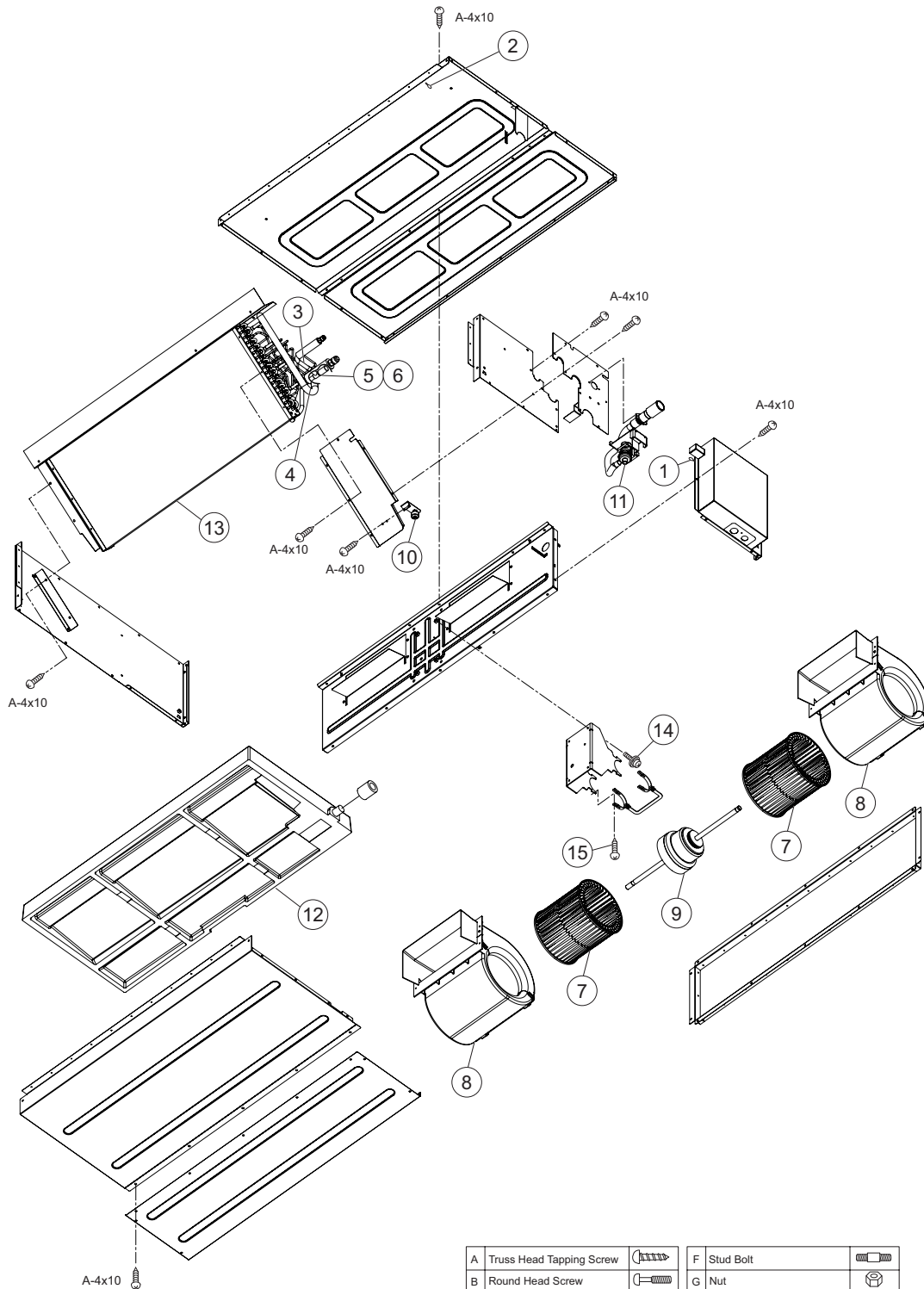
A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:

A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IDH018B21S

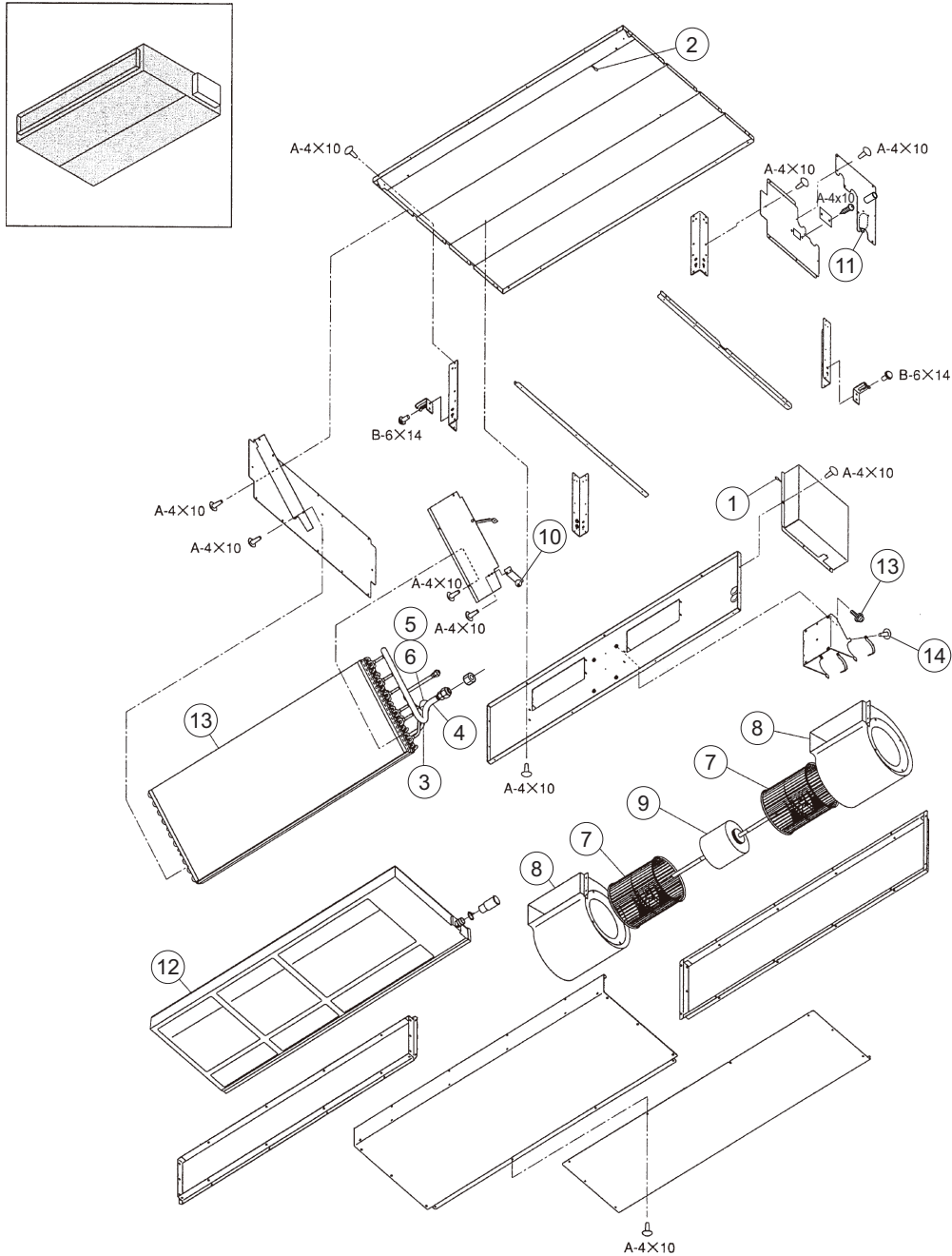


A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IDH024B21S
 (H,Y)IDH030B21S
 (H,Y)IDH036B21S
 (H,Y)IDH048B21S



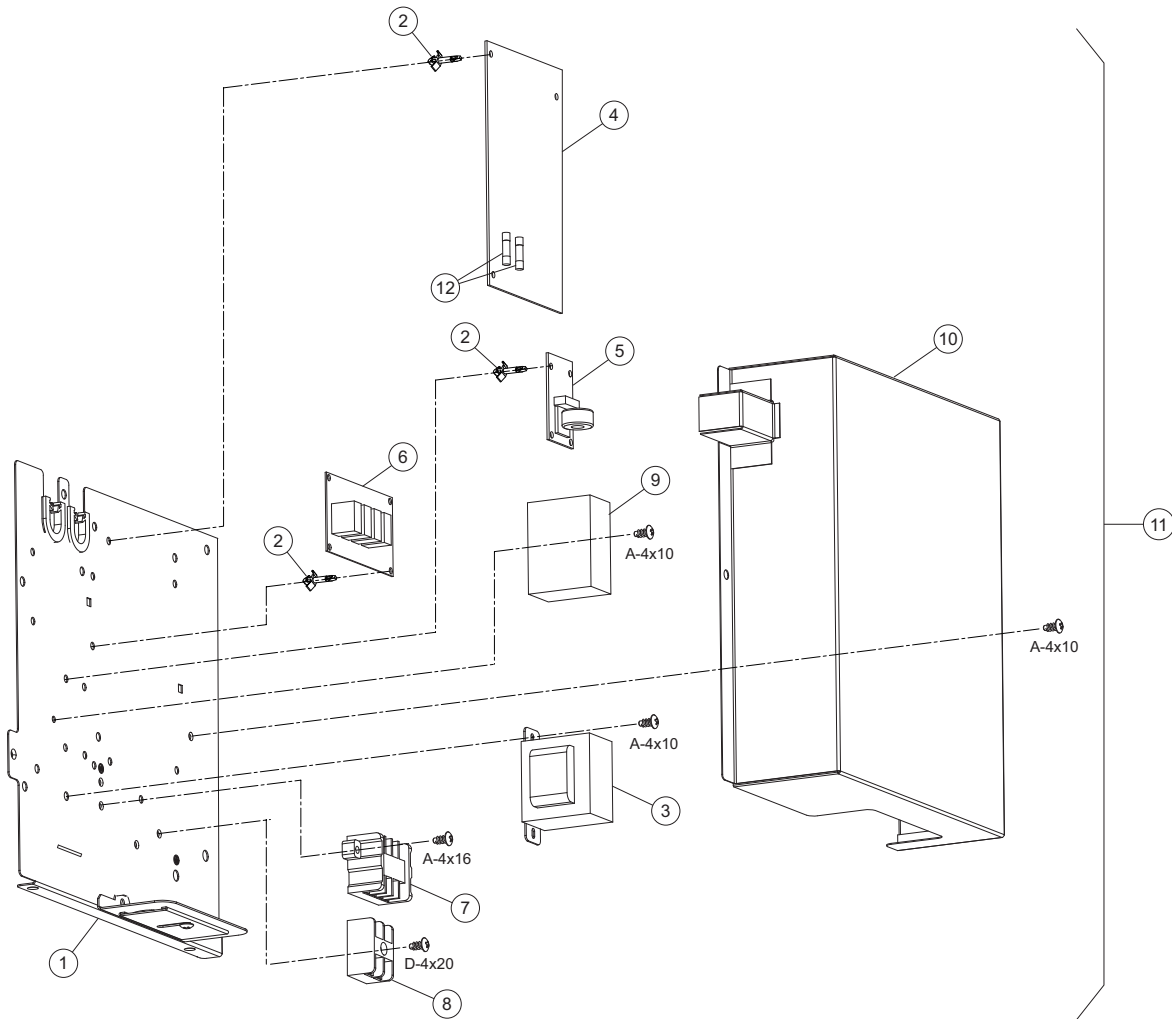
A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IDH018B21S

< Electrical Box >



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

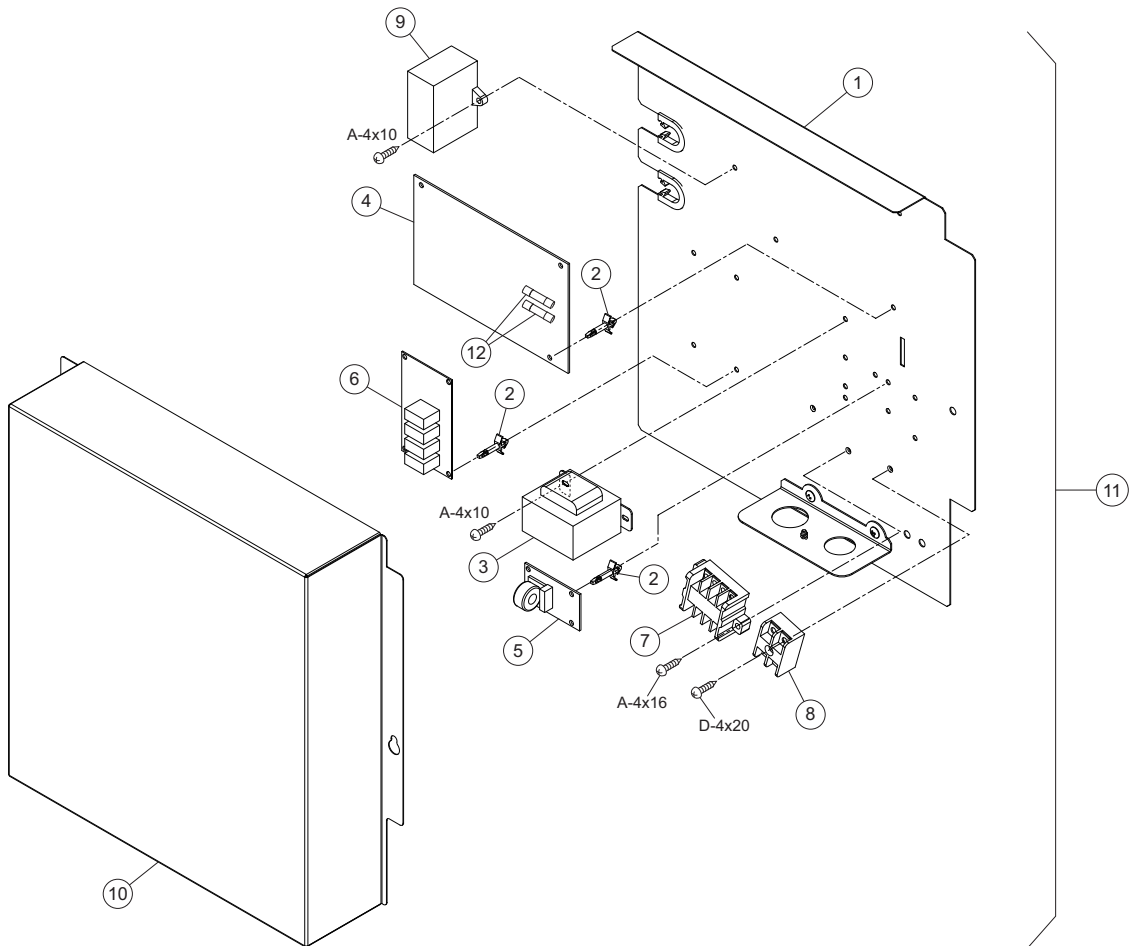
NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

SERVICE PARTS LIST

LOCATION OF SERVICE PARTS IN THE UNIT

< Electrical Box >

MODEL: (H,Y)IDH024B21S
 (H,Y)IDH030B21S
 (H,Y)IDH036B21S
 (H,Y)IDH048B21S

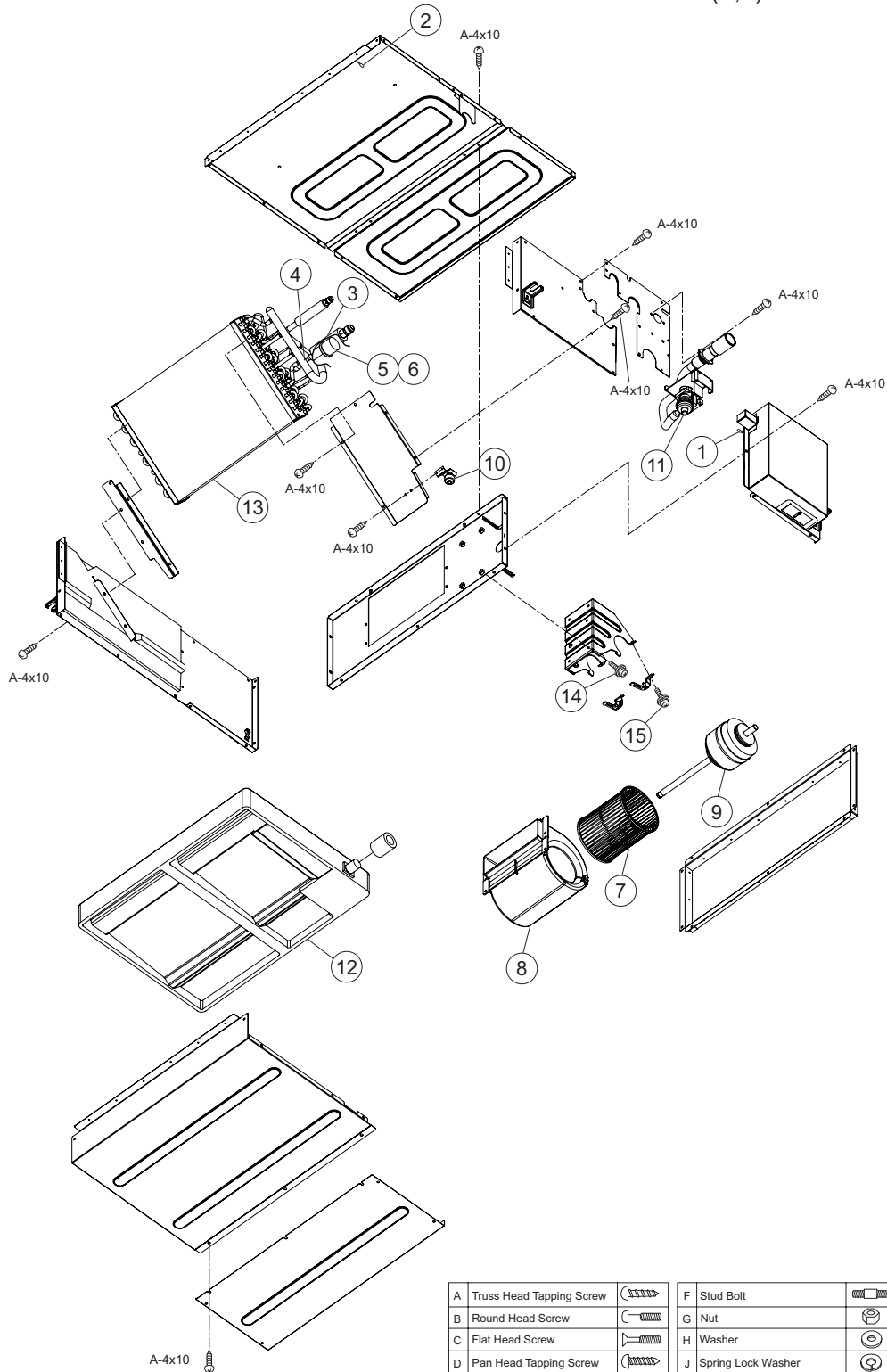


A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IDM006B21S
 (H,Y)IDM008B21S
 (H,Y)IDM012B21S



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

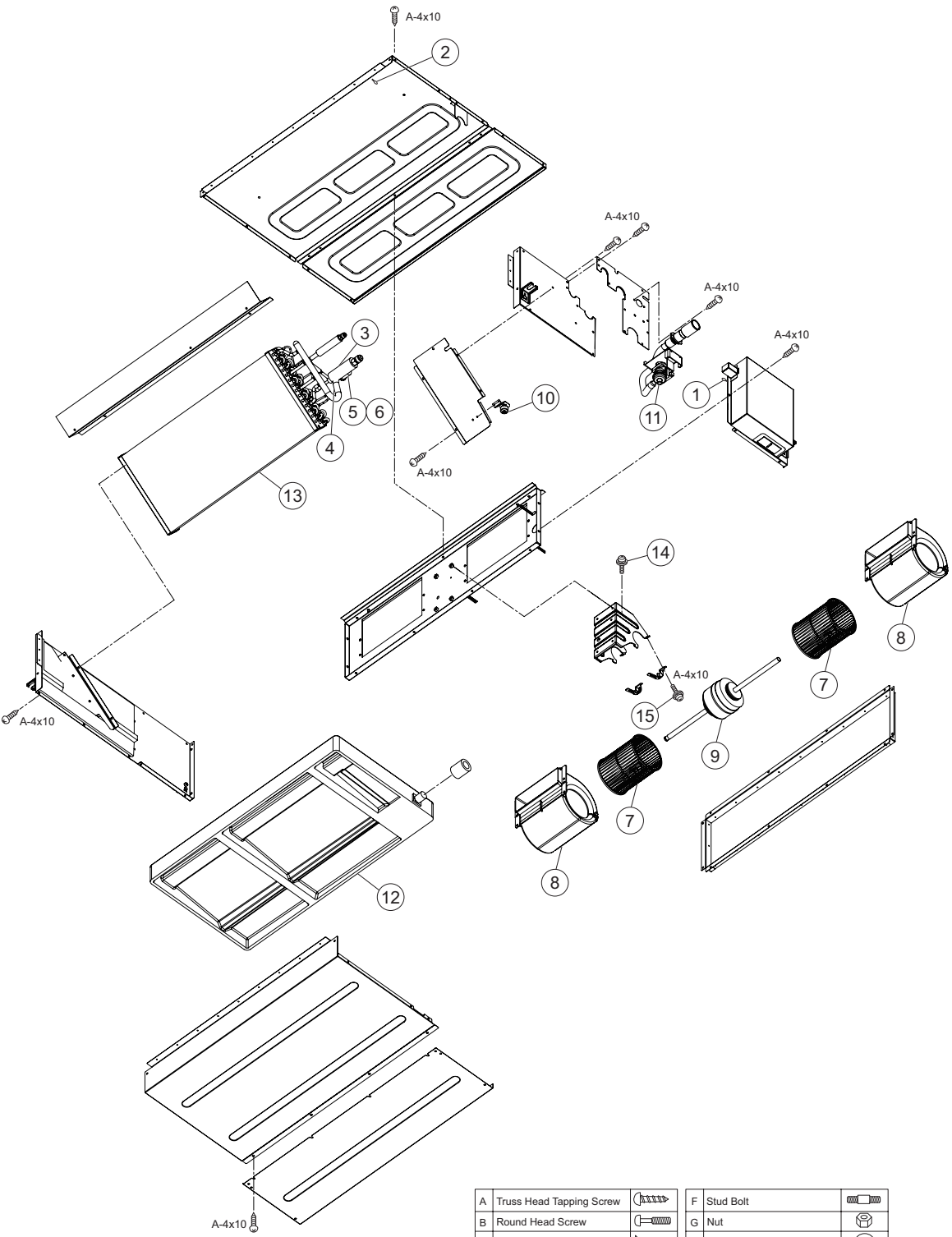
SERVICE PARTS LIST

					Voltage					
					1φ 208/230V 60Hz					
No.	Part Name	Replacement Part		Remarks	Q'ty Per Unit					
		Draw. No.	Part No.		(H,Y)IDM015B21S	(H,Y)IDM018B21S	(H,Y)IDM024B21S	(H,Y)IDM030B21S	(H,Y)IDM036B21S	(H,Y)IDM048B21S
1	Thermistor	H7B00027D	QU015002	for Air Inlet, THM1	1	1	1	1	1	1
2	Thermistor	H7B00027K	QU015004	for Air Outlet, THM2	1	1	1	1	1	1
3	Thermistor	H7B00031A	QU015007	for Freeze Protection, THM3	1	1	1	1	1	1
4	Thermistor	H7B00028A	QU015005	for Gas Pipe, THM5	1	1	1	1	1	1
5	Expansion Valve	17F04391A	P28701		1					
		17F04392A	P28702			1	1	1		
		17F04393A	P28703						1	1
6	EXPV. Coil	17F04390A	P29142	for Expansion Valve	1	1	1	1	1	1
7	Fan Runner	H17A07829A	QU036001		2	2				
		H7A00811A	QU036002				2	2	2	2
8	Fan Casing	H17A08938A	QU037001		2	2				
		H7A00812A	QU037004				2	2	2	2
9	Fan Motor	H7B01695B	QU071004		1	1				
		H7B01696B	QU071005				1	1	1	1
10	Float Switch	H7C00035A	QU087001		1	1	1	1	1	1
11	Drainage Pump	H7B03277A	QU071006		1	1	1	1	1	1
12	Drain Pan Assy	H7B00092E	QU095003		1	1				
		H7B02232C	QU095006				1	1		
		H7B02232D	QU095007						1	1
13	Heat Exchange Assy	H7B02214B	-		1					
		H7B02215A	-			1				
		H7B02217A	-				1	1		
		H7B02217B	-						1	
		H7B02218A	-							1
14	Screw	H17G09328A	-		4	4				
		H17G09328B	-				4	4	4	4
15	Screw	H17E19003C	-		2	2				
		H7D02125A	-				2	2	2	2

SERVICE PARTS LIST

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IDM015B21S
(H,Y)IDM018B21S

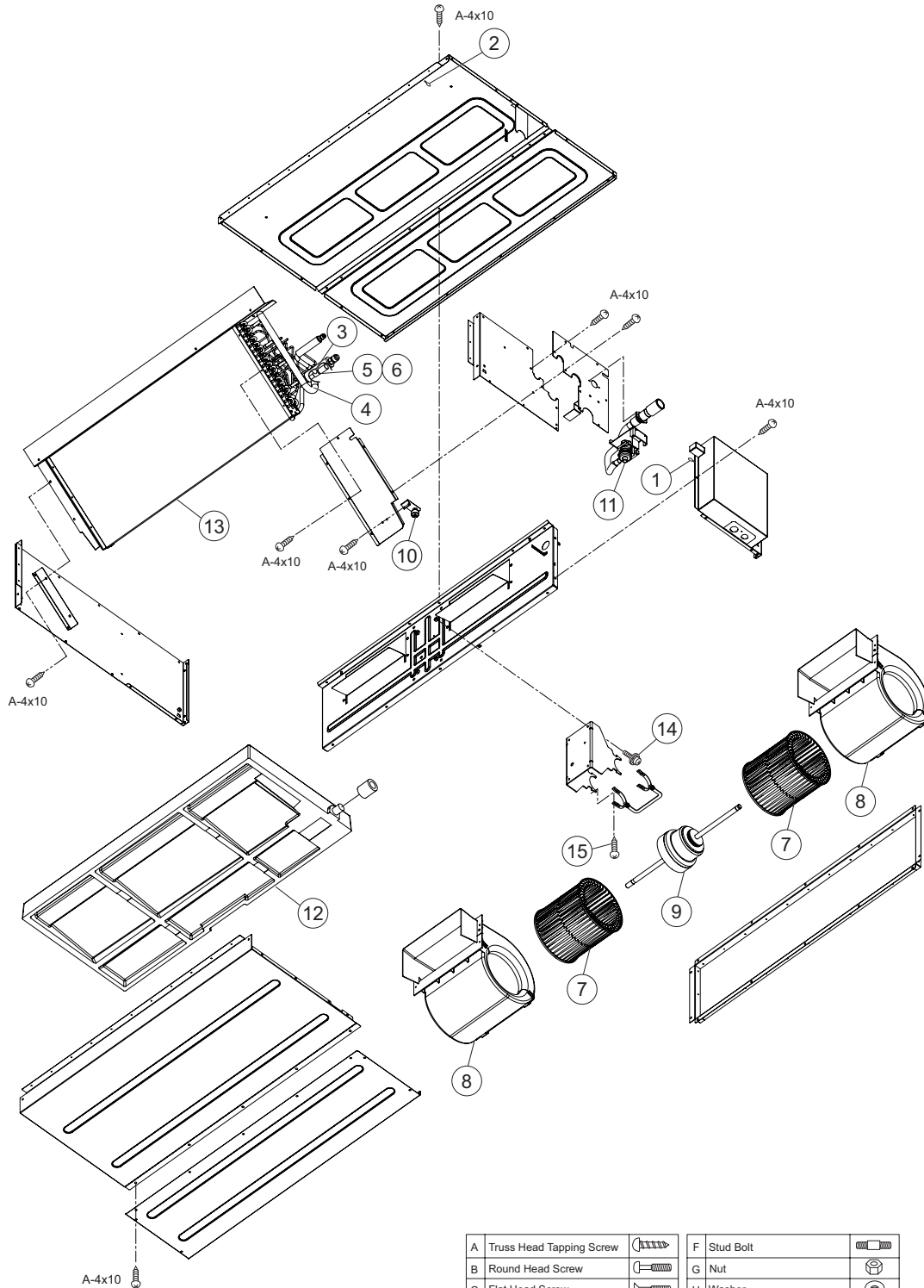


A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IDM024B21S
(H,Y)IDM030B21S

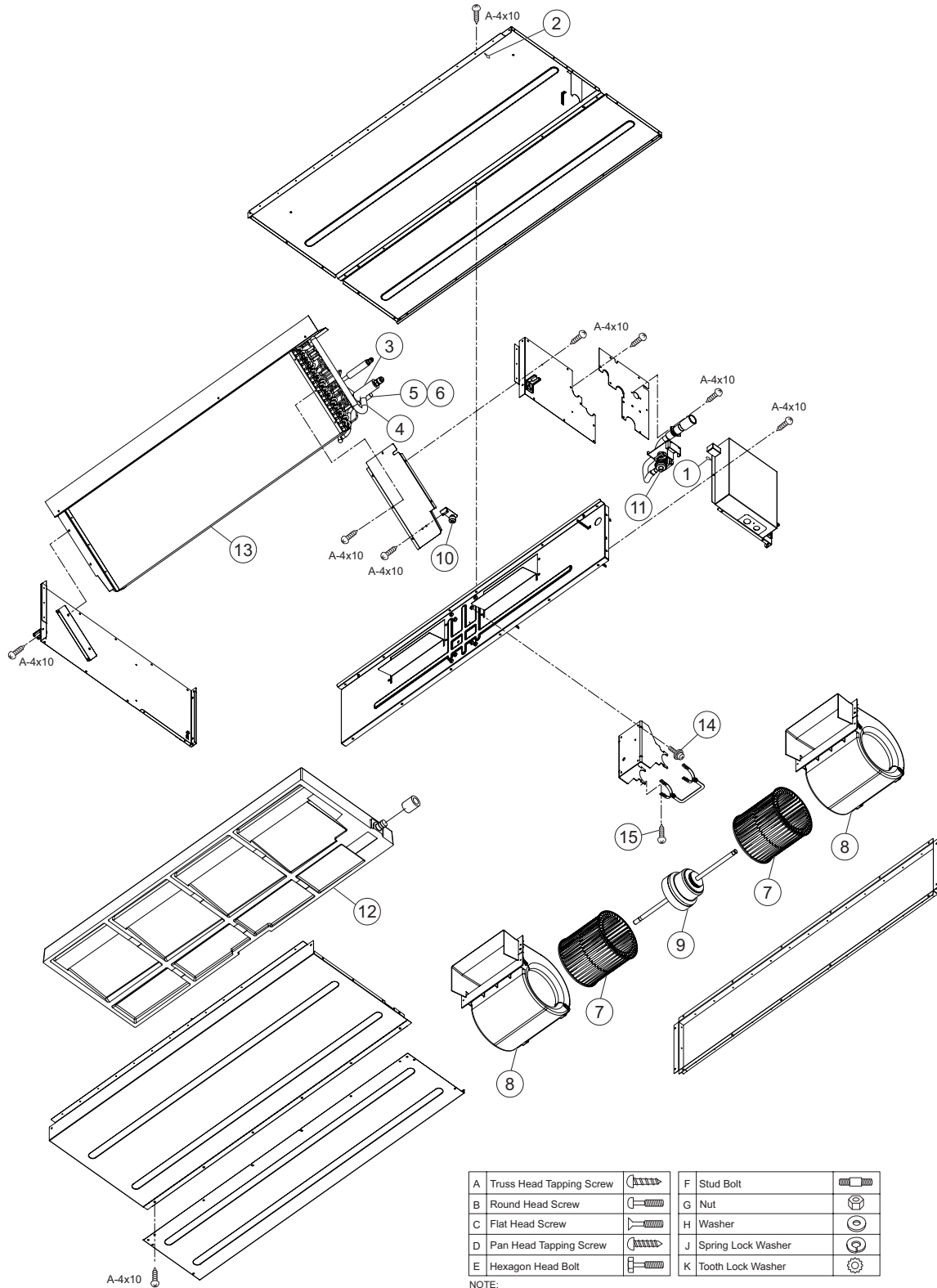


A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IDM036B21S
(H,Y)IDM048B21S



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

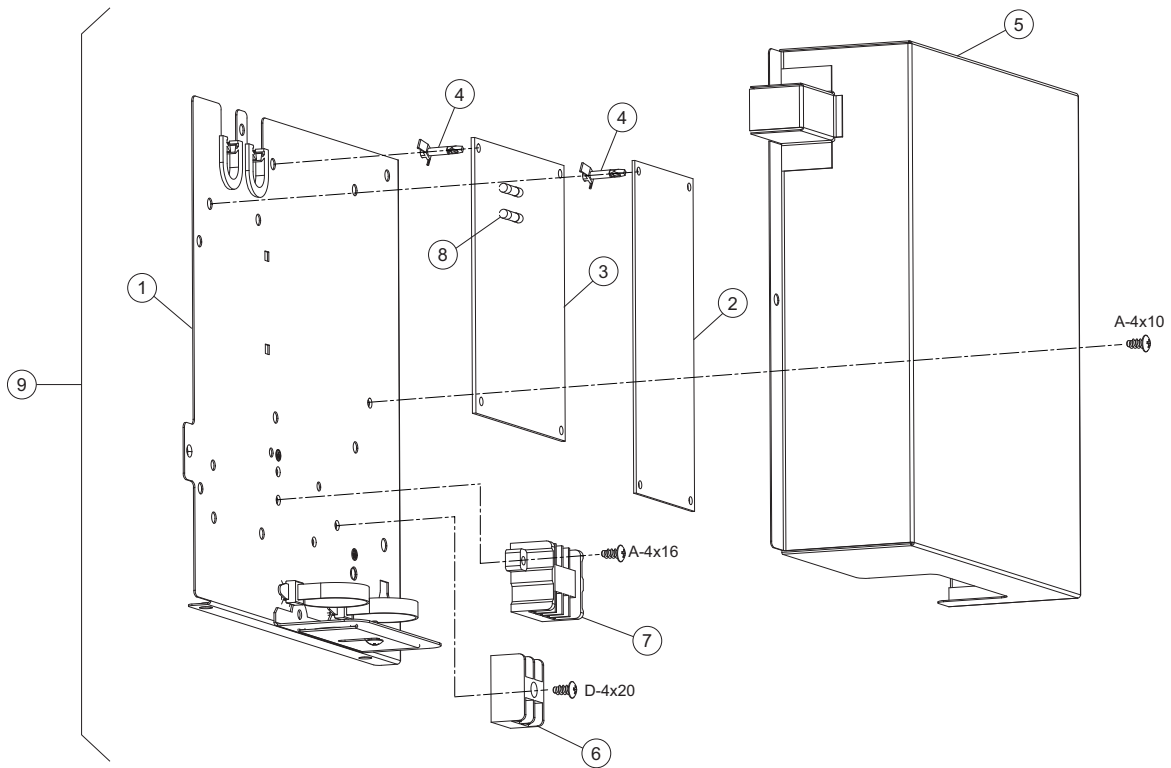
NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

SERVICE PARTS LIST

LOCATION OF SERVICE PARTS IN THE UNIT

< Electrical Box >

MODEL: (H,Y)IDM006B21S
 (H,Y)IDM008B21S
 (H,Y)IDM012B21S
 (H,Y)IDM015B21S
 (H,Y)IDM018B21S



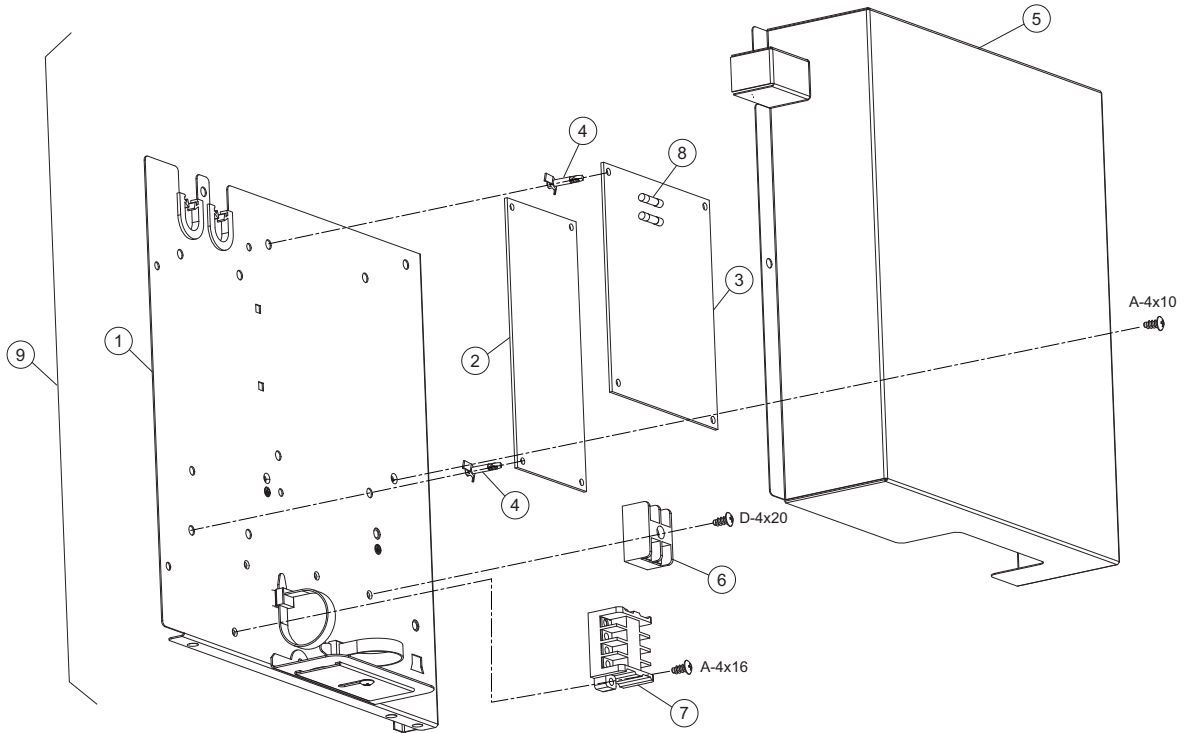
A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

< Electrical Box >

MODEL: (H,Y)IDM024B21S
 (H,Y)IDM030B21S
 (H,Y)IDM036B21S
 (H,Y)IDM048B21S

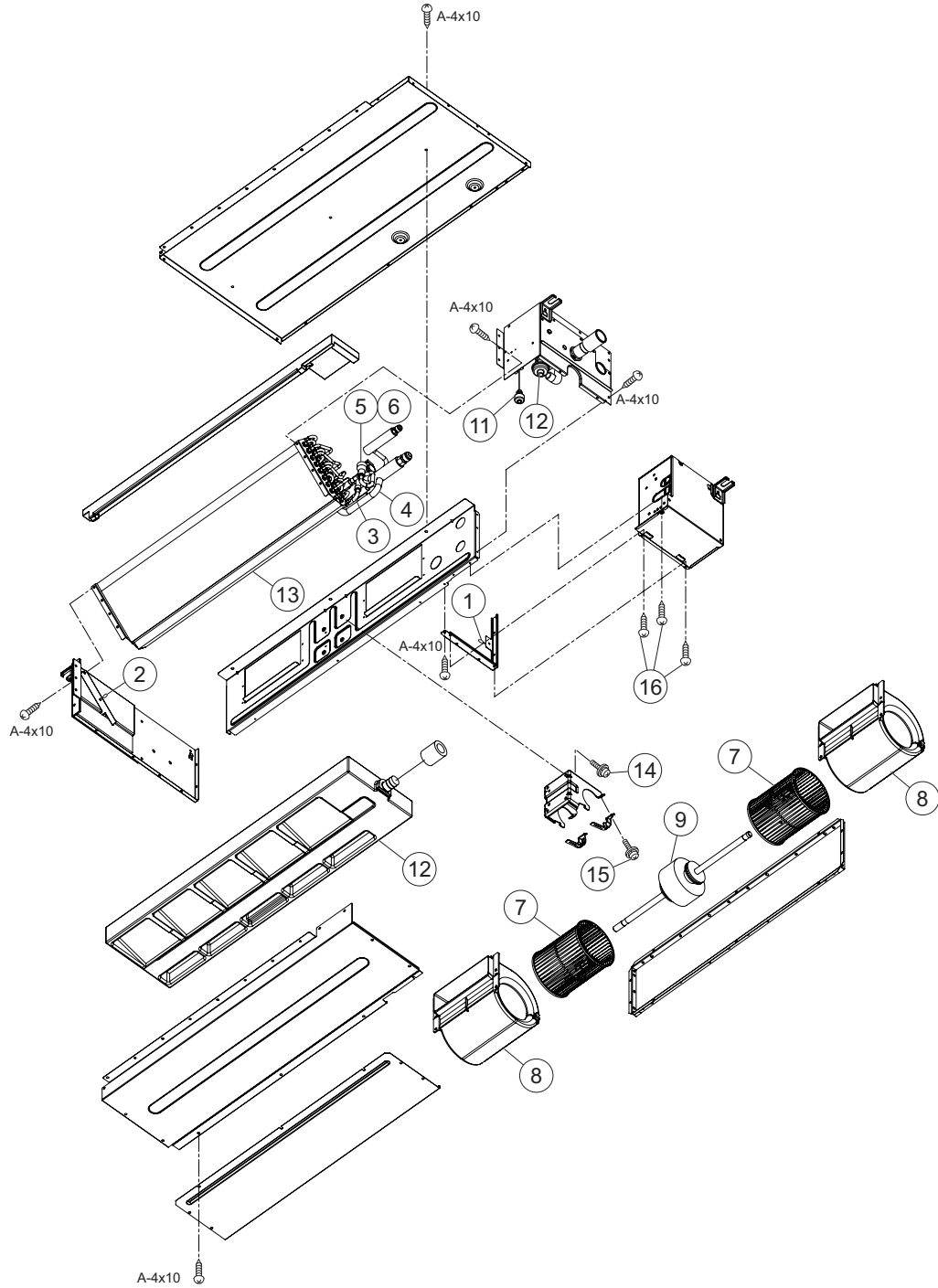


A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IDS006B21S
 (H,Y)IDS008B21S
 (H,Y)IDS012B21S

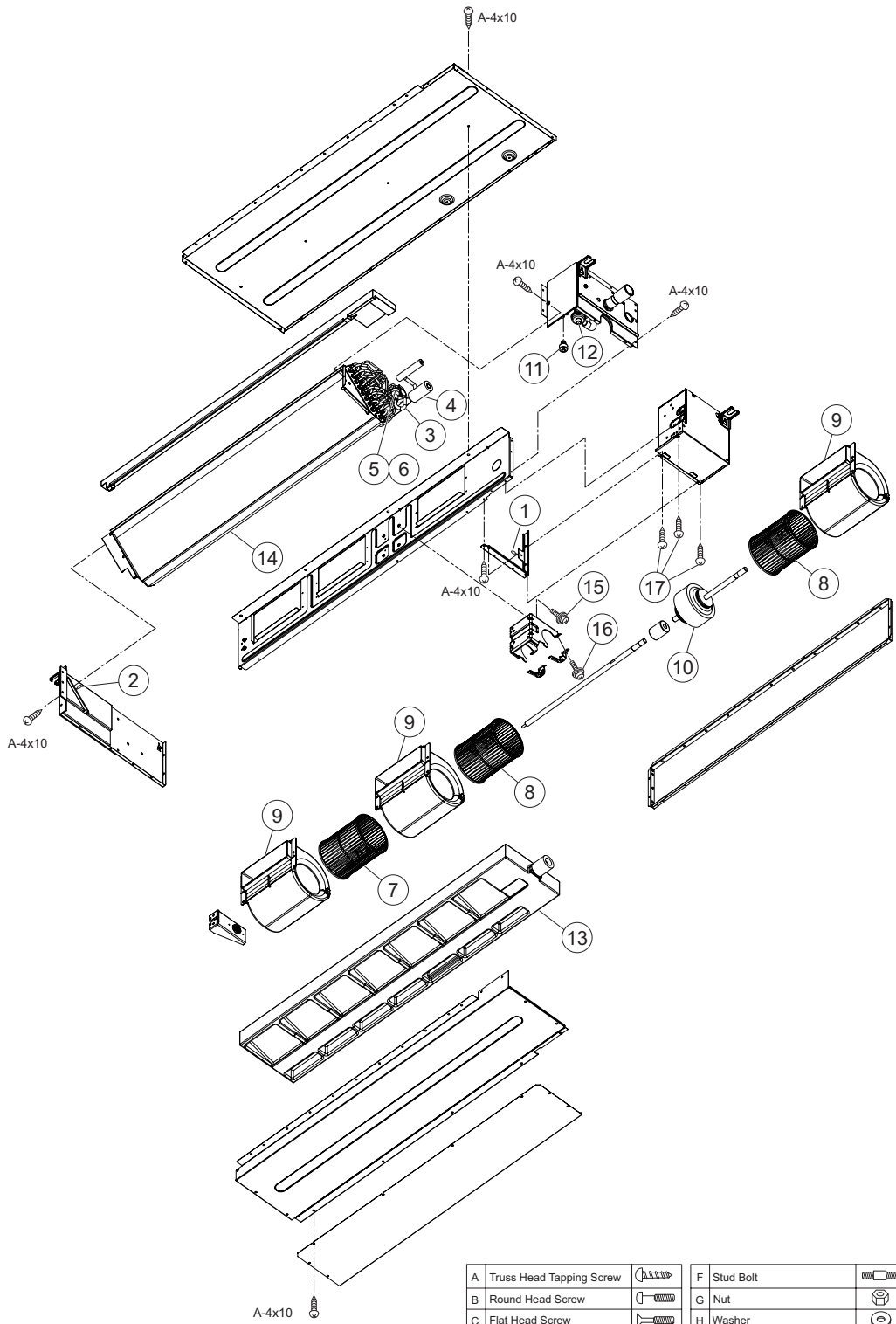


A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IDS015B21S
(H,Y)IDS018B21S



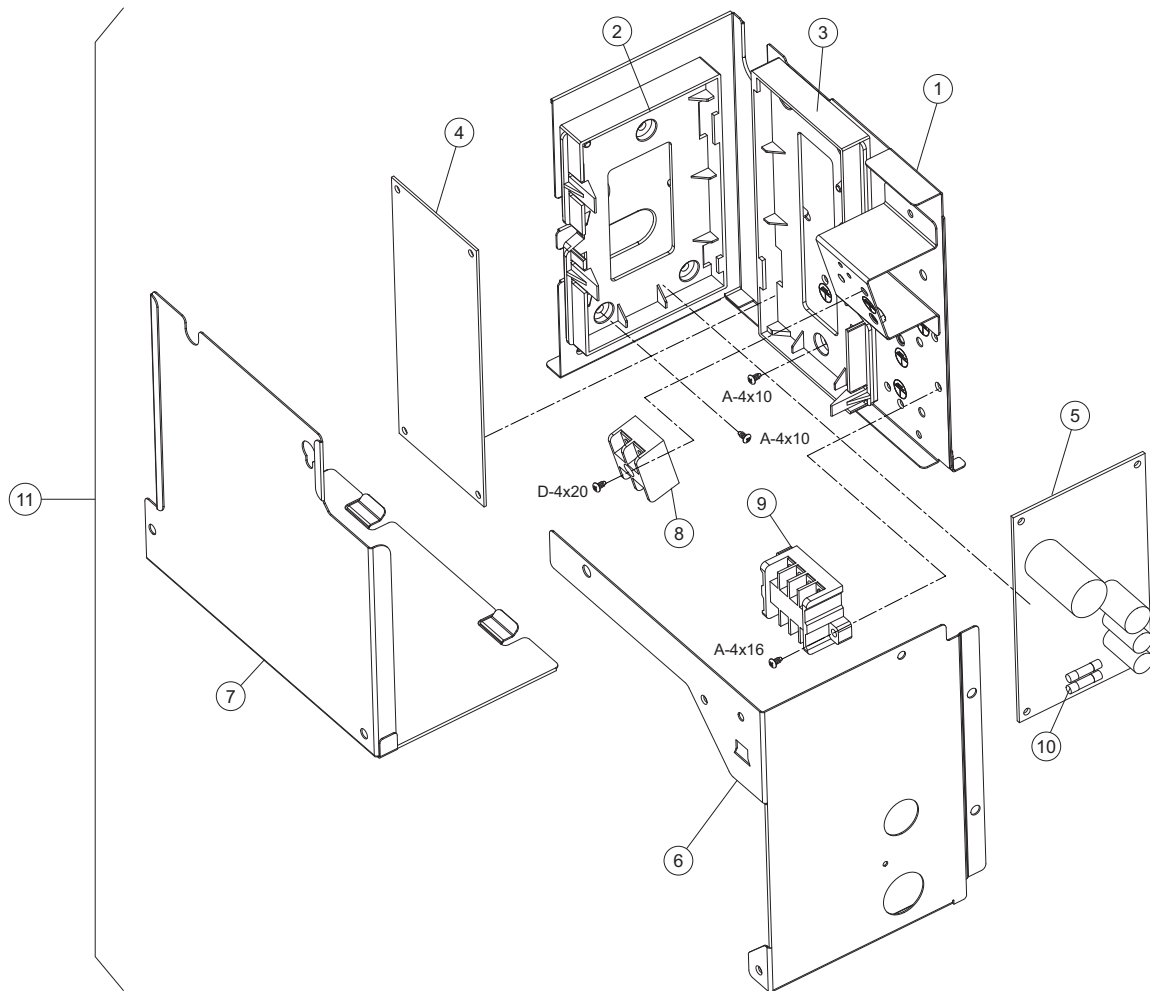
A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

< Electrical Box >

MODEL: (H,Y)IDS006B21S
 (H,Y)IDS008B21S
 (H,Y)IDS012B21S
 (H,Y)IDS015B21S
 (H,Y)IDS018B21S



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

SERVICE PARTS LIST

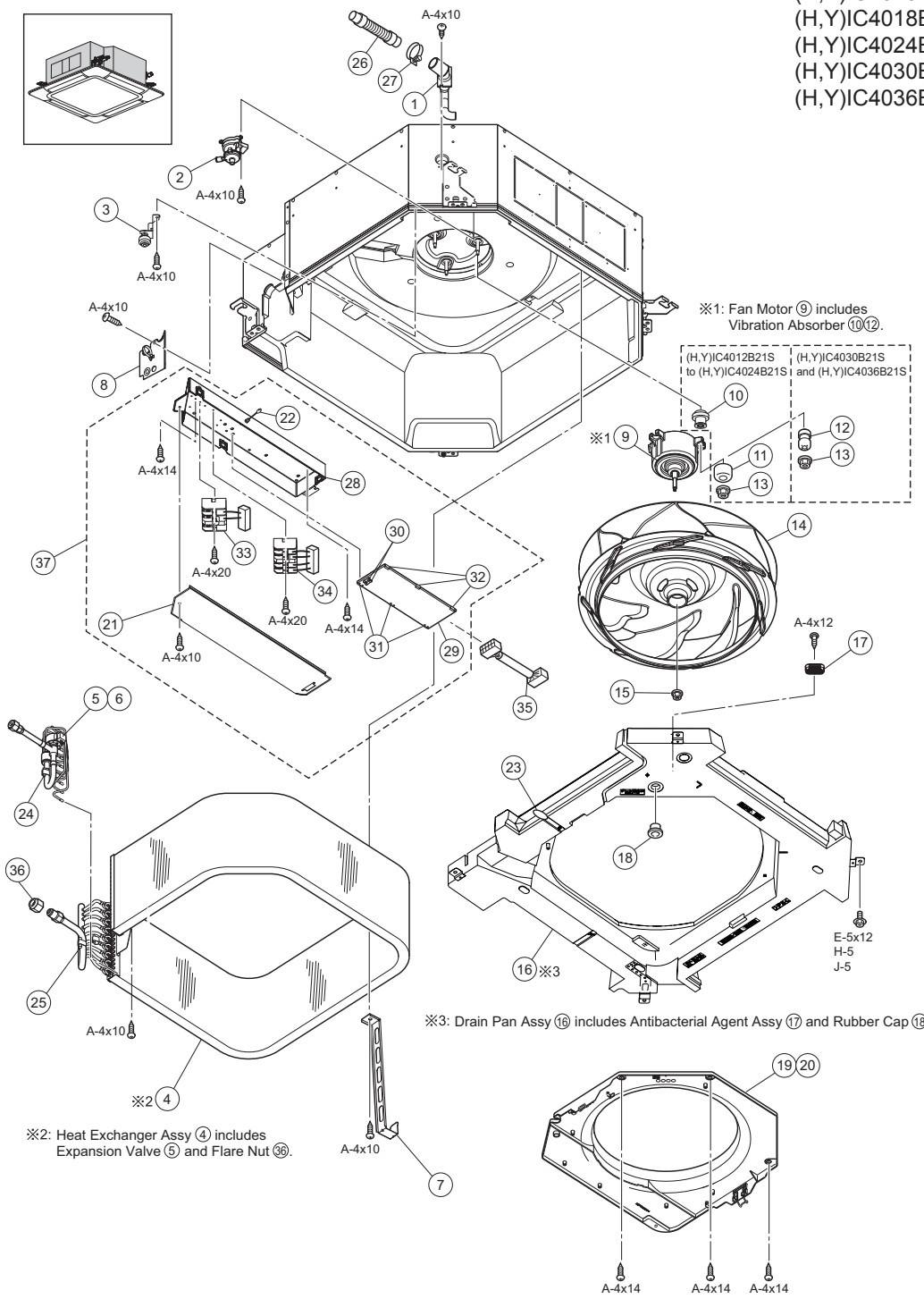
7.3.2 4-Way Cassette Type

SERVICE PARTS LIST

No.	Part Name	Replacement Part		Remarks	Voltage					
					1φ 208/230V 60Hz					
					Q'ty Per Unit					
Draw. No.	Part No.	(H,Y)IC4012B21S	(H,Y)IC4015B21S	(H,Y)IC4018B21S	(H,Y)IC4024B21S	(H,Y)IC4030B21S	(H,Y)IC4036B21S			
1	Drain Hose Assy	17H12539A	P28874		1	1	1	1	1	1
2	Pump Assy	17H17342A	P29235	Drain Discharge Mechanism	1	1	1	1	1	1
3	Float Switch Assy	17H12815A	P28876		1	1	1	1	1	1
4	Heat Exchanger Assy	17B42712C	P30094	No.5 Expansion Valve x 1, No.36 Flare Nut x 1	1	1				
		17B42713E	P30096				1			
		17B45849B	P30077					1	1	
		17B45849C	P30078							1
5	Expansion Valve	17F04391A	P28701		1	1				
		17F04392A	P28702				1	1	1	
		17F04393A	P28703							1
6	Motor for EXPV.	17F04390A	P29142		1	1	1	1	1	1
7	Support Plate	17H10482A	P28896		2	2				
		17H10482B	P28897				2			
		17H07420C	P28706					2	2	2
8	Pipe Cover Assy	17H24089B	-		1	1	1	1	1	1
9	Fan Motor	17B42561A	P28884	No.10,11 Vibration Absorber x 3	1	1	1			
		17B42561B	P28885					1		
		17B42562A	P29979							1
10	Vibration Absorber	17G54609A	P24315		3	3	3	3		
11	Vibration Absorber	17G84221A	P27141		3	3	3	3		
12	Vibration Absorber	17H12414A	P28887						3	3
13	Nut	17H12116A	P28899		3	3	3	3	3	3
14	Turbo Fan	17A21933A	P28709		1	1	1	1	1	1
15	Nut	17H12117A	P28900		1	1	1	1	1	1
16	Drain Pan Assy	17B45848A	P30079	No.17 Antibacterial Agent Assy x 1, No.18 Rubber Cap x 1	1					
		17B45848B	P30080			1	1			
		17B45848C	P30081					1	1	1
17	Antibacterial Agent Assy	17E26752A	P30499		1	1	1	1	1	1
18	Rubber Cap	17G53386A	P28881		1	1	1	1	1	1
19	Bell Mouth Assy	17H12533A	P28882		1	1	1			
20	Bell Mouth Assy	17H12534A	P28883					1	1	1
21	Electrical Box Cover	17H21563C	P30448		1	1	1	1	1	1
22	Thermistor	17B24598A	P24017	for Air Inlet, THM1	1	1	1	1	1	1
23	Thermistor	17B24598G	P22436	for Air Outlet, THM2	1	1	1	1	1	1
24	Thermistor	17B42636A	P28902	for Freeze Protection, THM3	1	1	1	1	1	1
25	Thermistor	17B42635A	P28901	for Gas Pipe, THM5	1	1	1	1	1	1
26	Hose	17C78348A	P25911		1	1	1	1	1	1
27	Hose Clip	17C93558A	P28308		1	1	1	1	1	1
28	Electrical Box	17F15212A	P30449		1	1	1	1	1	1
29	PCB-S	17H24323B	P30199	PCB1	1	1	1	1	1	1
30	Fuse	17C90851A	P27957	EFR1	2	2	2	2	2	2
31	Spacer	17H03507A	P28259	for PCB1	3	3	3	3	3	3
32	Spacer	17H03506A	P28260	for PCB1	3	3	3	3	3	3
33	Terminal Block	17B46279A	P30450	TB1	1	1	1	1	1	1
34	Terminal Block	17B42182A	P28715	TB2	1	1	1	1	1	1
35	Cable AS	17F01928A	-	for Connecting Air Panel	1	1	1	1	1	1
36	Flare Nut	17E20872C	R4226	φ12.7	1	1				
		17E20872D	R4227	φ15.88			1	1	1	1
37	Electrical Box Assy	17F16744A	-		1	1	1			
		17F16745A	-					1	1	1

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IC4012B21S
 (H,Y)IC4015B21S
 (H,Y)IC4018B21S
 (H,Y)IC4024B21S
 (H,Y)IC4030B21S
 (H,Y)IC4036B21S



※2: Heat Exchanger Assy ④ includes Expansion Valve ⑤ and Flare Nut ⑥.

※3: Drain Pan Assy ⑯ includes Antibacterial Agent Assy ⑰ and Rubber Cap ⑱.

※1: Fan Motor ⑨ includes Vibration Absorber ⑩⑫.

(H,Y)IC4012B21S (H,Y)IC4030B21S
 to (H,Y)IC4024B21S and (H,Y)IC4036B21S

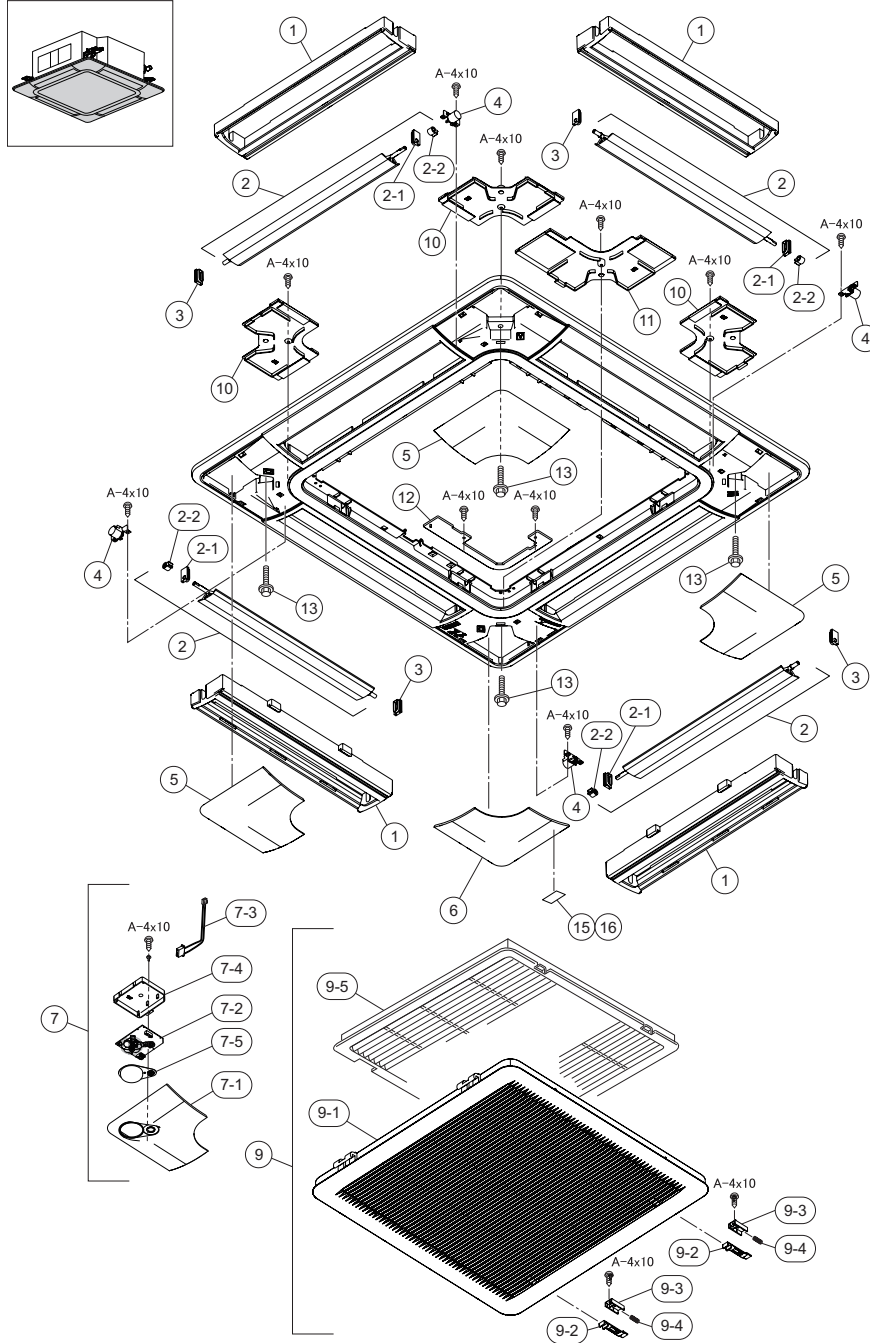
A	Truss Head Tapping Screw	F	Stud Bolt
B	Round Head Screw	G	Nut
C	Flat Head Screw	H	Washer
D	Pan Head Tapping Screw	J	Spring Lock Washer
E	Hexagon Head Bolt	K	Tooth Lock Washer

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: P-AP160NA2
P-AP160NAE1

< Air Panel >

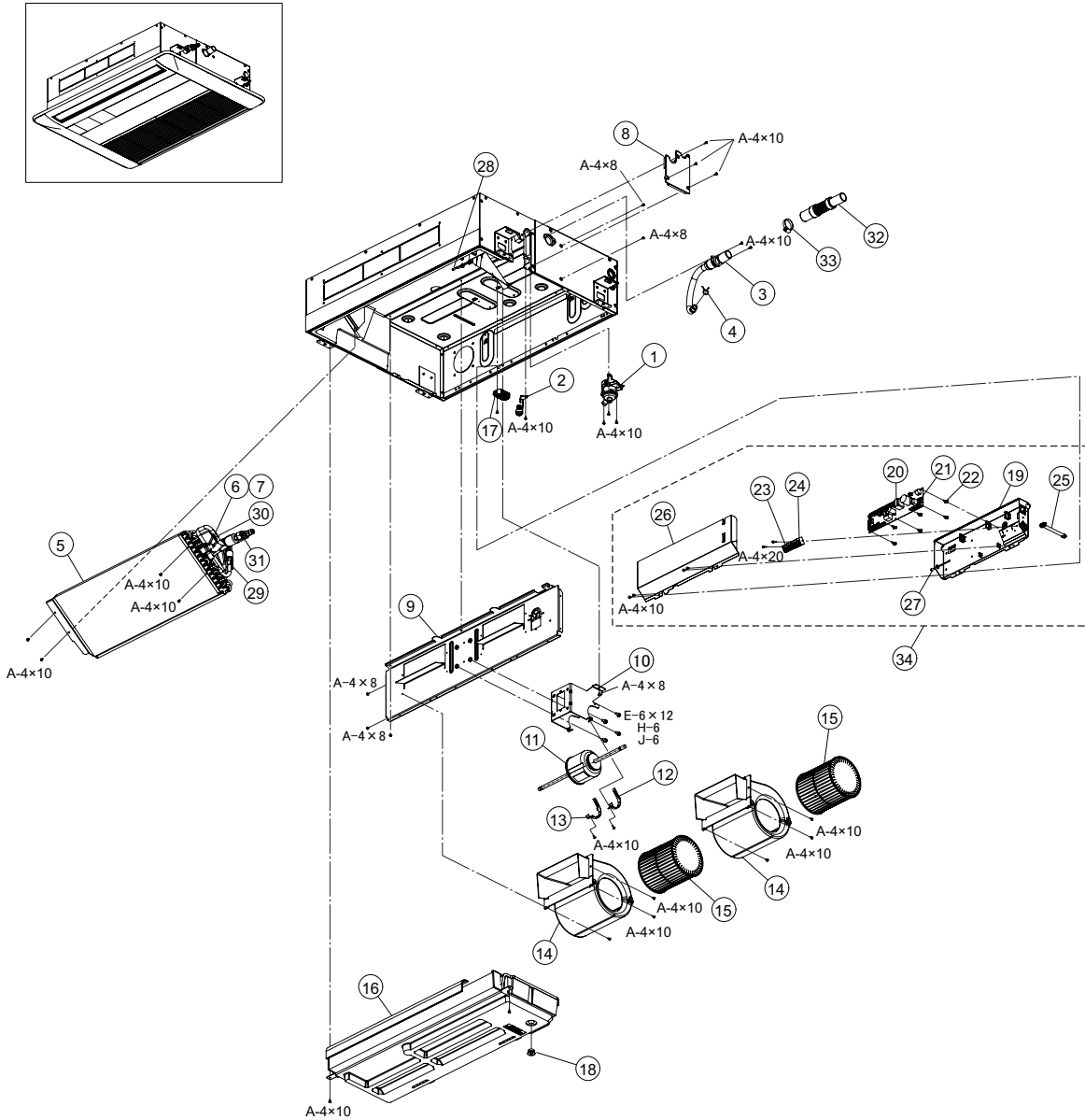


A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: (H,Y)IC1006B21S
 (H,Y)IC1008B21S
 (H,Y)IC1012B21S
 (H,Y)IC1015B21S



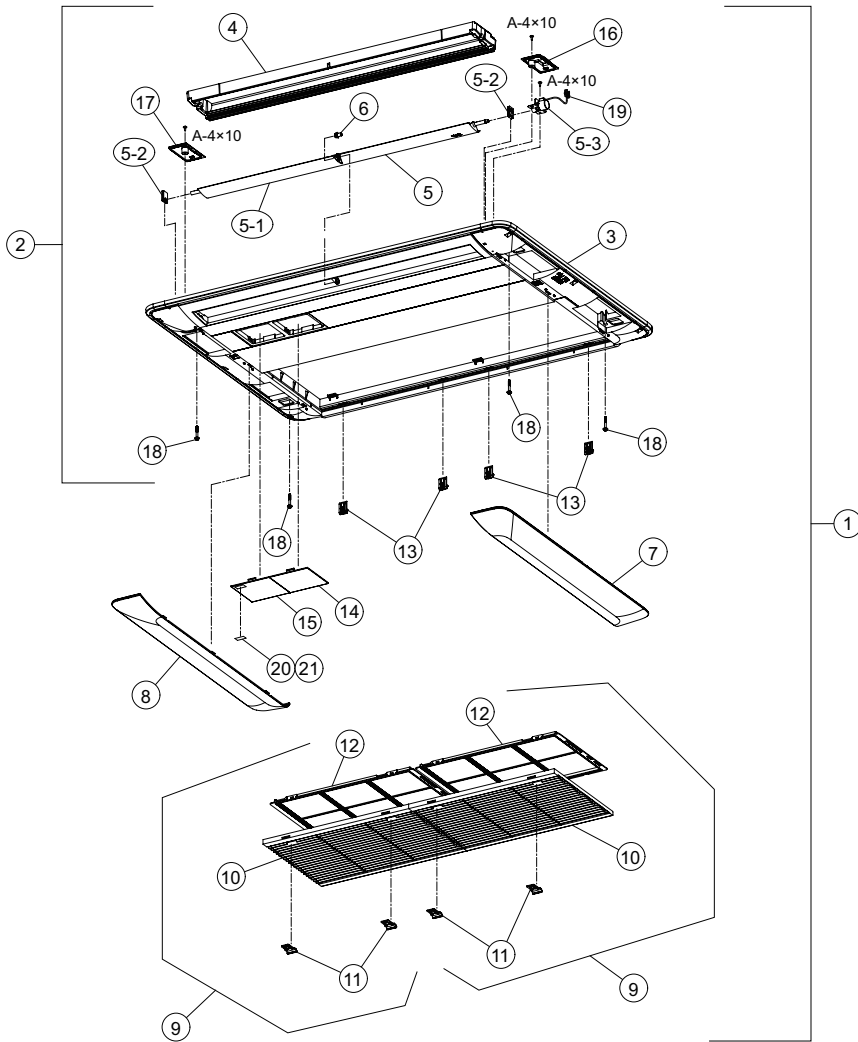
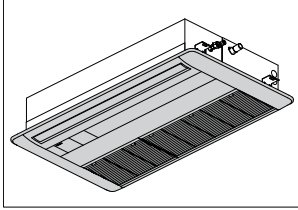
A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
 A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: P-AP36CNA
P-AP56CNA

< Air Panel >



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

SERVICE PARTS LIST

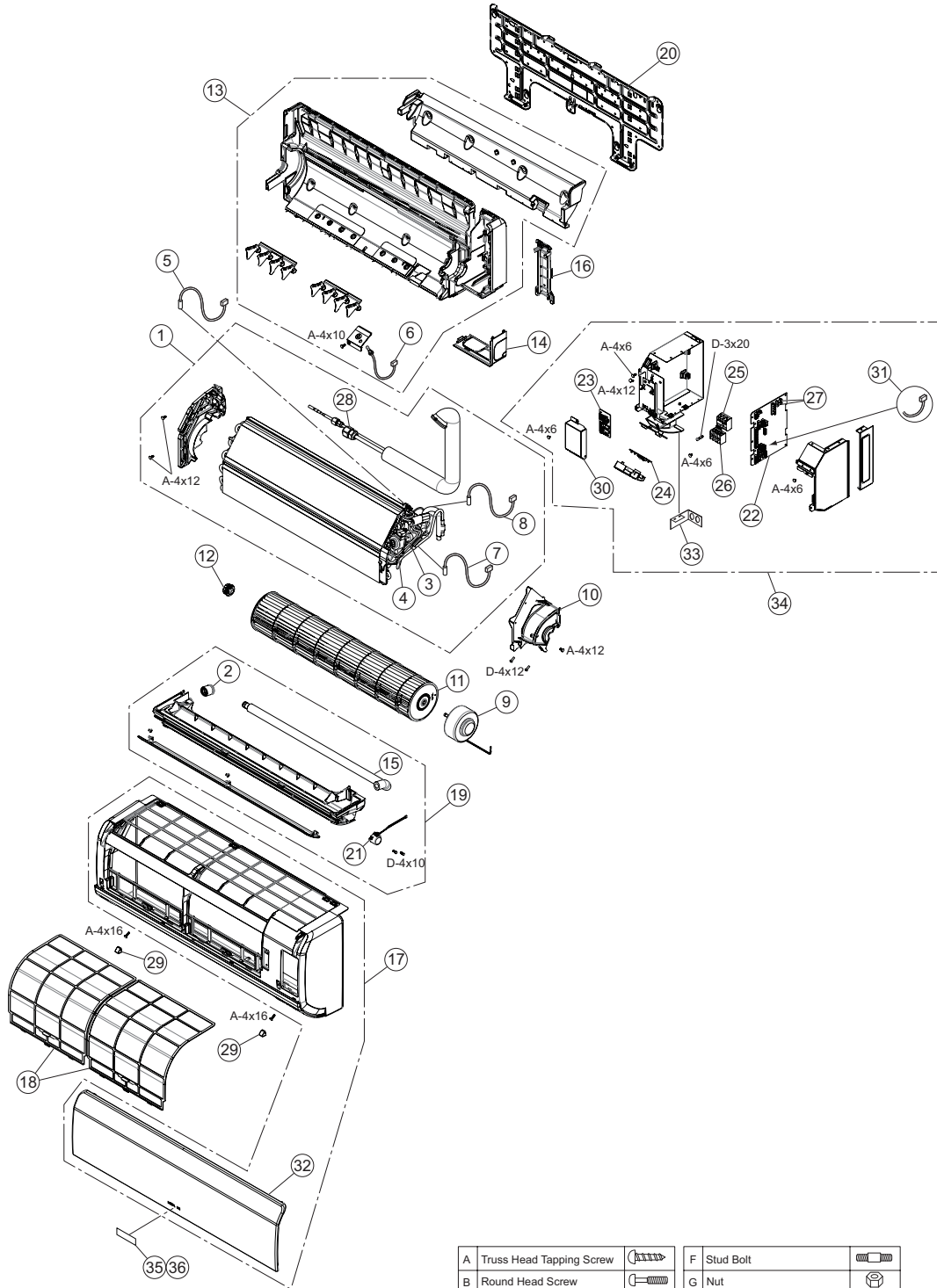
7.3.4 Wall Mount Type

SERVICE PARTS LIST

No.	Part Name	Replacement Part		Remarks	Voltage		
		Draw. No.	Part No.		1φ 208/230V 60Hz		
					T1WM006B21S	T1WM008B21S	T1WM012B21S
1	Heat Exchanger	17A23545A	P29606		1	1	
		17A23546A	P29607				1
2	Drain Cap	17C88465A	P27062		1	1	1
3	Expansion Valve	17F04391A	P28701		1	1	1
4	Motor for EXPV.	17F04390G	P29630		1	1	1
5	Thermistor	17B24598C	P24016	for Air Inlet, THM1	1	1	1
6	Thermistor	17B38999A	P29626	for Air Outlet, THM2	1	1	1
7	Thermistor	17B42636D	P29628	for Freeze Protection, THM3	1	1	1
8	Thermistor	17B42635D	P29627	for Gas Pipe, THM5	1	1	1
9	Fan Motor	17A23558A	P29608	DC, 38W	1	1	1
10	Motor Clamp	17A23547A	P29609		1	1	1
11	Fan	17A23548A	P29610		1	1	
		17A23549A	P29611				1
12	Bearing Assy	17C85253A	P26601		1	1	1
13	Bottom Base	17F11642A	P29612		1	1	
		17F11643A	P29613				1
14	Corner Cover	17B44470A	P29614		1	1	1
15	Drain Hose	17B44471A	P29615		1	1	1
16	Pipe Cover	17B44472A	P29616		1	1	1
17	Cabinet Cover	17A25146A	P30454	No.32 Flat Panel x 1	1	1	
		17A25145A	P30453	No.32 Flat Panel x 1			1
18	Air Filter	17A23214A	P29619		2	2	
		17A23215A	P29620				2
19	Drain Pan Assy	17A23554A	P29621		1	1	
		17A23555A	P29622				1
20	Mounting Plate	17A23556B	-		1	1	1
21	AS Motor	17B44473A	P29624		1	1	1
22	PCB-S	17H18655D	P30201	PWB1	1	1	1
23	PCB-S	17H18656A	P29519	PWB2	1	1	1
24	PCB-S	17F11644A	P29625	PWB3	1	1	1
25	Terminal Block	17C85280A	P26616	TB1	1	1	1
26	Terminal Block	17C85281A	P26618	TB2	1	1	1
27	Fuse	17C90851A	P27957	5A	2	2	2
28	Flare Nut	17E20872C	R4226	φ12.7	1	1	1
29	Screw Cap	17H20045A	P29629		2	2	2
30	Switch Cover	17F12199B	P30478		1	1	1
31	Cord	17H21273A	P29710		1	1	1
32	Flat Panel	17F16703A	P30457		1	1	
		17F16702A	P30456				1
33	Attaching Plate	17F16755A	-	for Conduit	1	1	1
34	Electrical Box Assy	17F16742A	-		1	1	1
35	Logo Label	17F17086A	P30481	HITACHI	1	1	1
36	Logo Label	17F17086B	P30482	YORK	1	1	1

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: TIWM006B21S
TIWM008B21S

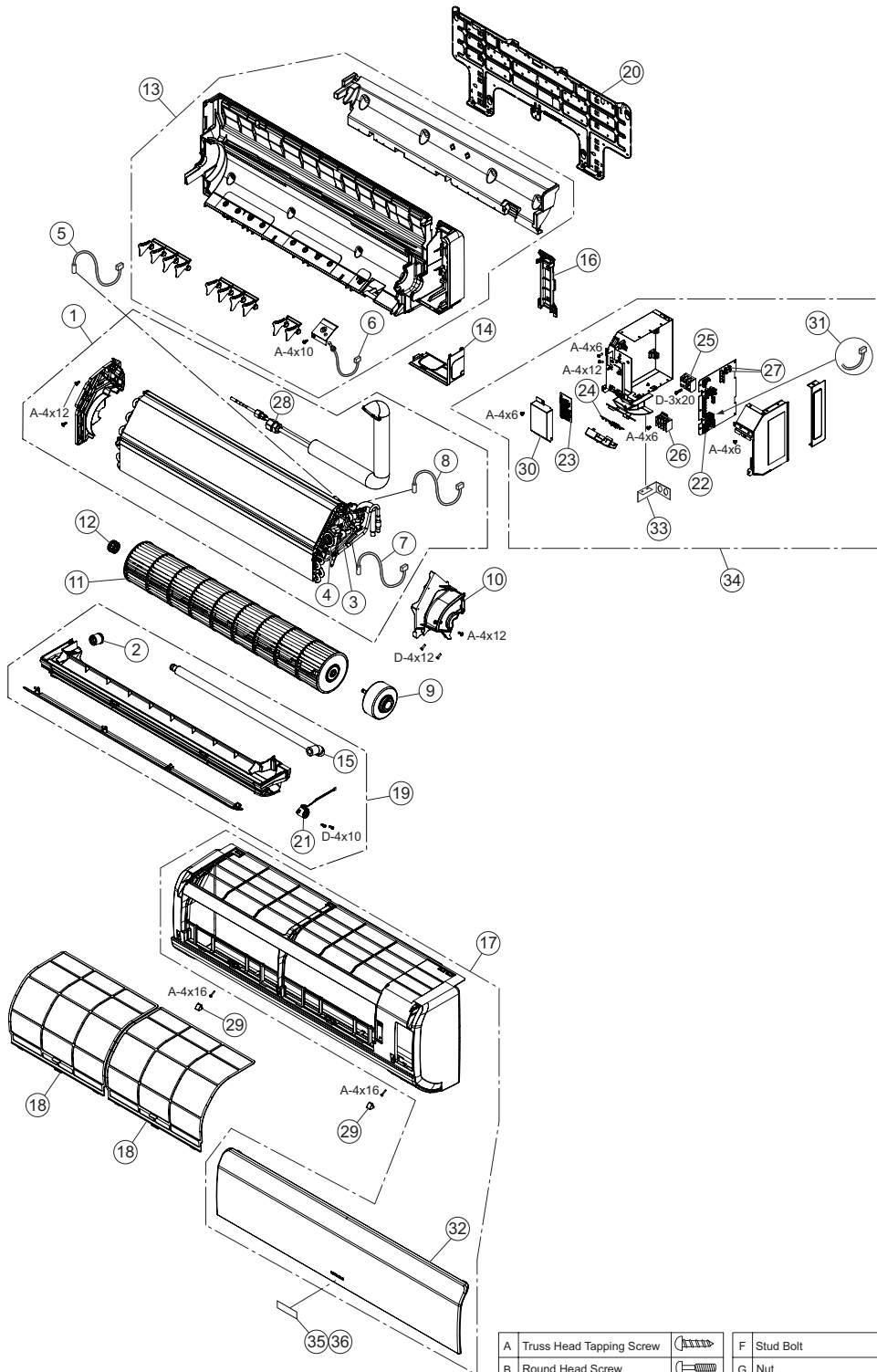


A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: TIWM012B21S



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:
A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

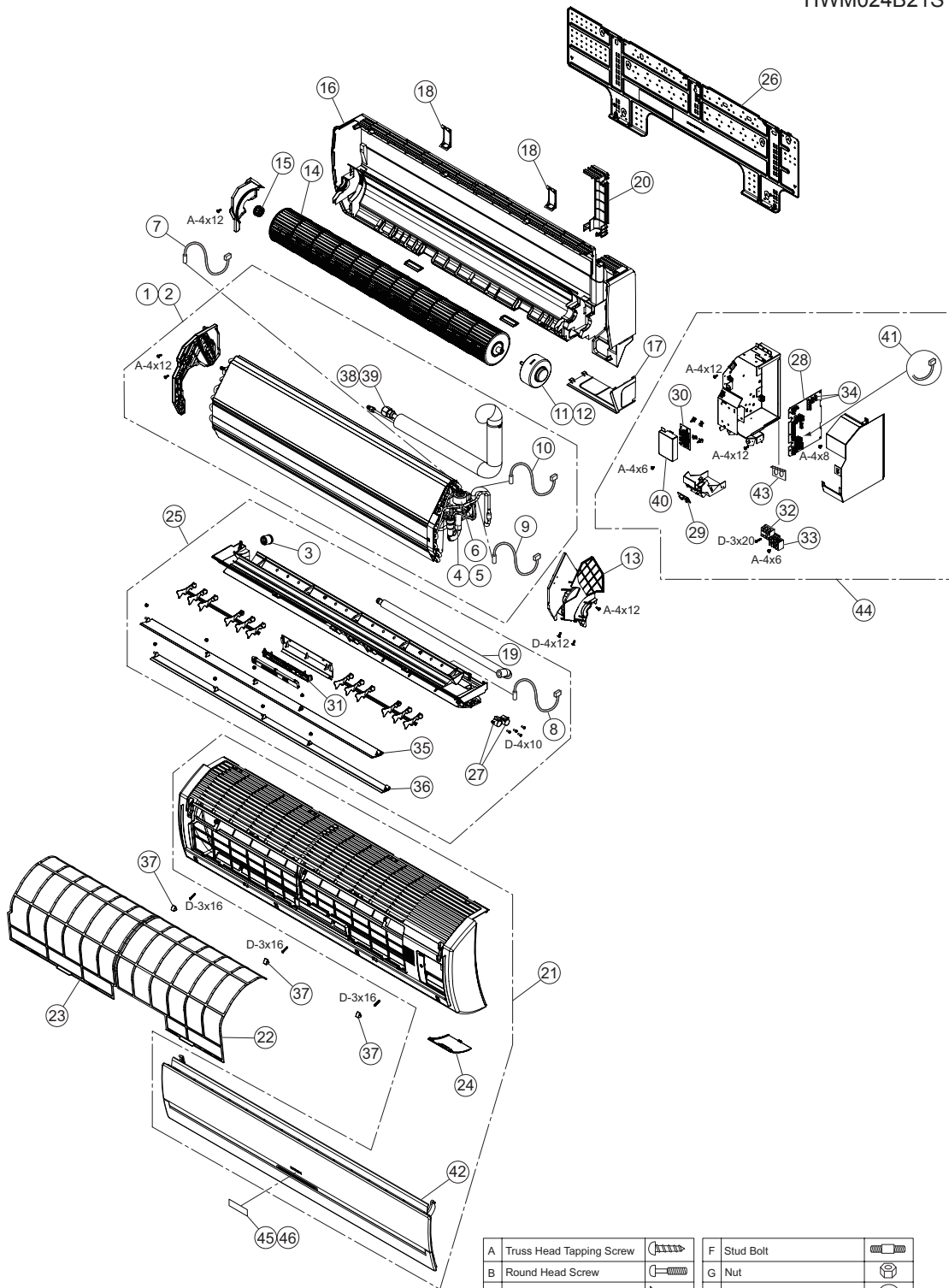
SERVICE PARTS LIST

No.	Part Name	Replacement Part		Remarks	Voltage		
		Draw. No.	Part No.		1φ 208/230V 60Hz		
					Qty Per Unit		
					T1WM015B21S	T1WM018B21S	T1WM024B21S
1	Heat Exchanger	17A23535A	P29594		1		
2	Heat Exchanger	17A23536B	P29596			1	1
3	Drain Cap	17C88465A	P27062		1	1	1
4	Expansion Valve	17F04391A	P28701		1		
5	Expansion Valve	17F04392A	P28702			1	1
6	Motor for EXPV.	17F04390G	P29630		1	1	1
7	Thermistor	17B24598C	P24016	for Air Inlet, THM1	1	1	1
8	Thermistor	17B38999A	P29626	for Air Outlet, THM2	1	1	1
9	Thermistor	17B42636D	P29628	for Freeze Protection, THM3	1	1	1
10	Thermistor	17B42635D	P29627	for Gas Pipe, THM5	1	1	1
11	Fan Motor	17B37604C	P27063	DC, 38W	1	1	
12	Fan Motor	17A23557A	P29597	DC, 38W			1
13	Motor Clamp	17A18031A	P27064		1	1	1
14	Fan	17A18032A	P27065		1	1	1
15	Bearing Assy	17C88466A	P27066		1	1	1
16	Cabinet Assy	17A23694A	P29705		1	1	1
17	Corner Cover	17A18034B	P27332		1	1	1
18	Pipe Fixing Plate	17B37605A	P27069		2	2	2
19	Drain Hose	17B37606A	P27070		1	1	1
20	Pipe Cover	17A18035B	P27333		1	1	1
21	Cabinet Cover	17A25144A	P30452	No.42 Flat Panel x 1	1	1	1
22	Air Filter	17A18037A	P27073		1	1	1
23	Air Filter	17A18038A	P27074		1	1	1
24	Receiver Cover	17F11640B	P29640		1	1	1
25	Drain Pan Assy	17A18039B	P29601		1	1	1
26	Mounting Plate	17A23541A	P29602		1	1	1
27	AS Motor	17A18041A	P27077		2	2	2
28	PCB-S	17H18655D	P30201	PWB1	1	1	1
29	PCB-S	17A23538A	P29603	PWB4	1	1	1
30	PCB-S	17H18656A	P29519	PWB2	1	1	1
31	PCB-S	17A18042A	P27080	PWB3	1	1	1
32	Terminal Block	17C85280A	P26616	TB1	1	1	1
33	Terminal Block	17C85281A	P26618	TB2	1	1	1
34	Fuse	17C90851A	P27957	5A	2	2	2
35	Horizontal Blade	17A23543A	P29604		1	1	1
36	Horizontal Blade	17A23544A	P29605		1	1	1
37	Screw Cap	17B37608A	P27079		3	3	3
38	Flare Nut	17E20872C	R4226	φ12.7	1		
39	Flare Nut	17E20872D	R4227	φ15.88		1	1
40	Switch Cover	17F12198B	P30458		1	1	1
41	Cord	17H21273A	P29710		1	1	1
42	Flat Panel	17F16701A	P30455		1	1	1
43	Attaching Plate	17F16756A	-	for Conduit	1	1	1
44	Electrical Box Assy	17F16743A	-		1	1	1
45	Logo Label	17F17086A	P30481	HITACHI	1	1	1
46	Logo Label	17F17086B	P30482	YORK	1	1	1

SERVICE PARTS LIST

LOCATION OF SERVICE PARTS IN THE UNIT

MODEL: TIWM015B21S
 TIWM018B21S
 TIWM024B21S



A	Truss Head Tapping Screw		F	Stud Bolt	
B	Round Head Screw		G	Nut	
C	Flat Head Screw		H	Washer	
D	Pan Head Tapping Screw		J	Spring Lock Washer	
E	Hexagon Head Bolt		K	Tooth Lock Washer	

NOTE:

A protective coating like zinc is applied to iron and steel for unspecified materials like a bolt or screw.

