Installation and Maintenance Manual

INVERTER-DRIVEN
MULTI-SPLIT SYSTEM
HEAT PUMP
AIR CONDITIONERS

Type	Model
Floor Exposed	(H,Y,C)IFE006B21S (H,Y,C)IFE008B21S (H,Y,C)IFE012B21S (H,Y,C)IFE015B21S
Floor Concealed	(H,Y,C)IFC006B21S (H,Y,C)IFC008B21S (H,Y,C)IFC012B21S (H,Y,C)IFC015B21S

IMPORTANT:

READ AND UNDERSTAND THIS MANUAL BEFORE INSTALLING THIS HEAT PUMP AIR CONDITIONER. KEEP THIS MANUAL FOR FUTURE REFERENCE.

PMGB0374

ATTENTION

Each model number and all matching model numbers within a system must have the same version of software.

Follow these steps to verify that your product model numbers have the same version of software.

- Access the main printed circuit board in each product.
- Locate a white sticker with a P-XXXX number or
- Connect a service checker and locate the ROM number.

For further assistance, please contact our Technical Support Center at **1 (844) 873-4445** and select **Option 2**.

Important Notice

- Johnson Controls, Inc. pursues a policy of continuing improvement in design and performance in its products. As such, Johnson Controls reserves the right to make changes at any time without prior notice.
- Johnson Controls 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.
- The installer and system specialist shall safeguard against leakage in accordance with local 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.
- 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, Dangers, Cautions, 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 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) *	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.

- 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.

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1. Introduction

Read following sections carefully before installing this product.

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

Forward this "Installation and Maintenance Manual", and the warranty 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 the central controller, refer to the "Installation and Maintenance Manual" for the central controller.

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. *Refer back to these safety instructions as needed.*

- 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. Suspend pipes at certain points and reinforce against earthquakes so that they will not be damaged by an external force. Check local codes and regulations.
- 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 wet 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 a 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 system 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 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. 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).
- 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 condensate pipe. If you do, you may have drain water flowing back which may cause leaks.
- Be sure the condensate 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 wind baffle.
  - A snowy area: Install the outdoor unit on a raised platform that is higher than drifting snow. Provide snow protection hood.
- 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 condensate 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 condensate pipe is installed incorrectly, water leakage and damage to the ceiling, floor, furniture, or other possessions may result. If the condensate pipe becomes clogged, water may drip from the indoor unit. Do not install the indoor unit where such dripping can cause moisture damage such as 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. The installation should meet the requirements in ASHRAE Standards 15 and 34. 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.
- 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 system will be 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, or disposing of the unit, dismantle the refrigerant piping after the compressor stops.
- When pipes are removed from under the piping cover, after the insulation work is completed, cover the gap between the piping cover and pipes using 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 $\pm 15^{o}$.

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 relevant regulatory standards.
- Do not open the service cover or access panel to indoor or outdoor units without turning OFF the main power supply. Before servicing, open and tag all disconnect switches. Never assume electrical power is disconnected. Check with a meter and equipment.
- Only use electrical protection equipment and tools suited for this installation.
- Use specified cables between units.
- Do not run the relay wiring for the motion sensor and power supply wiring in parallel. Electromagnetic Interference (EMI) may cause malfunction of the sensor.
- Communication cable should be a minimum of AWG18 (0.82mm^2), 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.
- The polarity of the input terminals is important, so be sure to match the polarity when using contacts that have polarity.
- Before installing the controller or remote devices, ensure 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.
- Clamp electrical wires securely with a cable band 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.
- This equipment can be installed with a Ground Fault Circuit Breaker (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.

⚠CAUTION

- Proper handling of this unit requires two people. Safe handling and installation of the indoor unit requires the strength of two people. Mounting the unit alone may cause injury due to a 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 condensate hose discharges moisture properly. If connected incorrectly, it can result in leakage and damage to property.
- Make sure to use the factory-supplied condensate hose and hose clamp. Other makes can cause moisture leakage.
- Do not bend or twist the factory-supplied condensate hose. This could compromise the seal and result in moisture leakage.
- Do not apply an excessive force to the condensate 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 condensate 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 condensate pan before the onset of winter to drain away all accumulated moisture in the pan.
- The heat exchanger of indoor units overheats whenever there is a slight amount of refrigerant circulating during slowdown or stoppage. As a result, moisture in the condensate pan evaporates where it can affect 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 external equipment.
- When the power supply wiring for the external equipment and the packaged air conditioner are located close to each other.

Regarding that mentioned above, surge voltage may be inducted into the power supply wiring for the crated unit 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 Combinations of Outdoor Units and Indoor Units

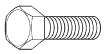
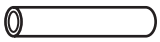
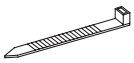
The combination capacity of the indoor unit against the outdoor unit is selected depending on the outdoor unit capacity. Refer to the "Installation and Maintenance Manual" for the outdoor unit to decide the required combination of indoor and outdoor units, and the combination unit capacity.

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 condensate 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 condensate pan. Do not handle the unit by grabbing the polystyrene pan and other air outlets as they are fragile and will sustain damage.
- The indoor unit handle is made 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
		(H,Y,C)IFE006-015B21S	(H,Y,C)IFC006-015B21S	
Adjustment Bolt for Installation		4	4	For Unit Adjusting the Flat Level of the Unit
PVC Tube		6	2	For Separating Communication Cables and Wired Controller Cables from Power Supply Wirings; 7/16 inch ID (11mm ID)
Cable Band		15	5	
Logo Label	HITACHI	1	-	Logo Label for HITACHI Brand
	YORK	1	-	Logo Label for YORK Brand

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	Copper Tube Cutter	18	Hoist (for Indoor Unit)
9	Brazing Kit	19	Ammeter
10	Hexagonal Wrench	20	Voltage Meter

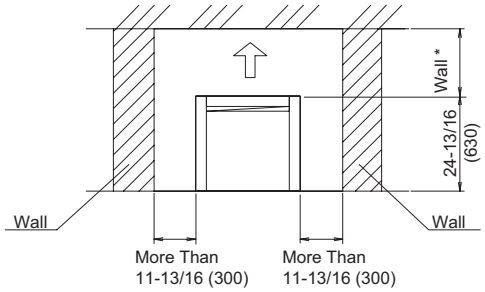
NOTE:
Use tools and measuring instruments (vacuum pump, gas hose, charging cylinder, manifold gauge) exclusively for refrigerant R410A.

4. Installation Location

(1) Install the indoor unit, allowing for proper clearance for operation and maintenance access, as shown below.

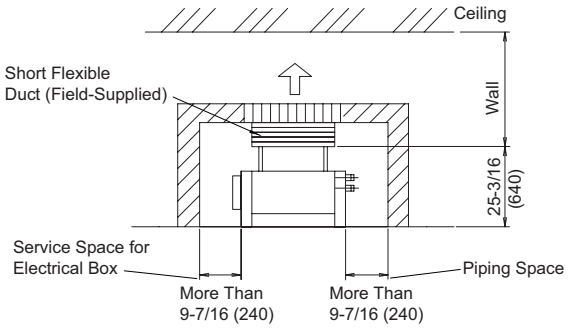
Unit: Inch (mm)

For Floor Exposed Model

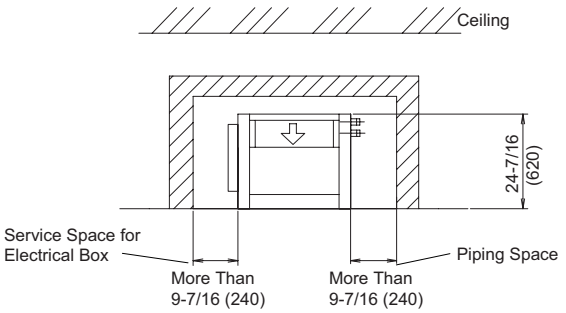


For Floor Concealed Model

● Upward Air Outlet with Short Flexible Duct (Field-Supplied)

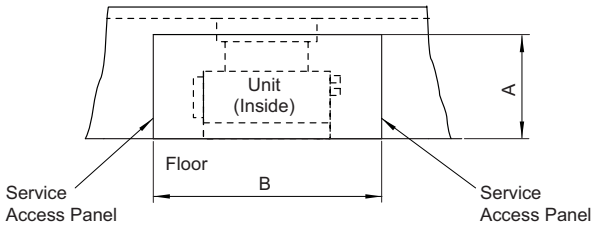


● Front Air Outlet



Service Access Panel

Provide a service access door or panel as shown below.



[Space Around Indoor Unit] inch (mm)

Unit Type	Floor Exposed		Floor Concealed	
	A	B	A	B
006	24-13/16 (630)	58-1/4 (1479)	24-7/16 (620)	53-1/2 (1359)
008				
012				
015		68-1/16 (1729)		63-3/8 (1609)

(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, destroy the plastic parts of the indoor unit.

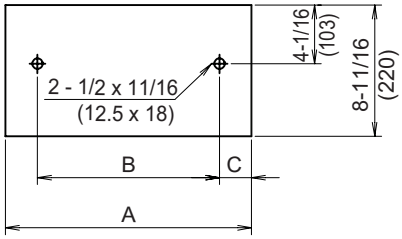
(6) Pay attention to the following when the indoor unit is installed in a hospital or other facility where there are electromagnetic waves from medical equipment.
   (a) Do not install the indoor unit where the electromagnetic wave is directly radiated to the electrical box, communication cable or wired 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 inside 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 electromagnetic interference (EMI).

(7) To avoid any corrosive action to the heat exchangers, do not install the indoor unit in an acidic or alkaline environment.

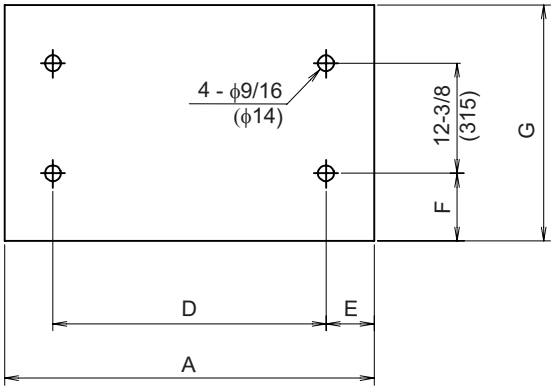
5. Installation Work

(1) Make sure to secure the position of the unit as shown below.

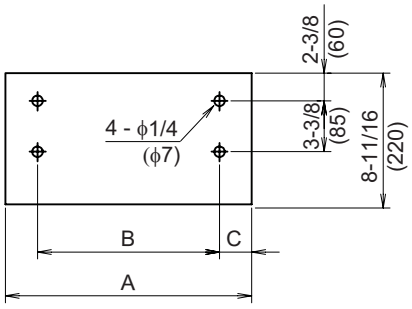
Securing onto Floor Using Wood Screws (2-M8)
(View from Top Side)



Securing onto Wall
(View from Front Side)



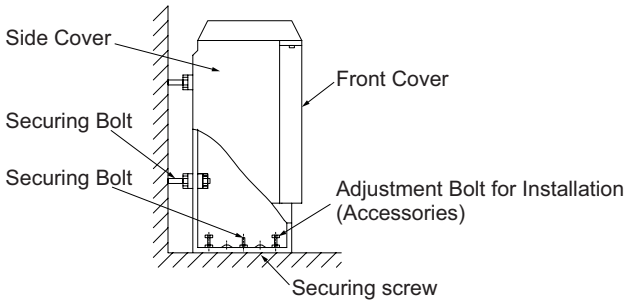
Securing onto Floor Using Wood Screws (4-M5)
(View from Top Side)



inch (mm)

Unit Type		A	B	C	D	E	F	G
Floor Exposed	006 008	41-1/8 (1045)	29-11/16 (754)	8-9/16 (217)	28-13/16 (732)	9 (228)	5-1/2 (140)	24-13/16 (630)
	012	46-1/16 (1170)	34-5/8 (879)	8-9/16 (217)	33-3/4 (857)	9 (228)	5-1/2 (140)	24-13/16 (630)
	015	55-7/8 (1420)	44-7/16 (1129)	7/16 (11)	43-9/16 (1107)	9 (228)	5-1/2 (140)	24-13/16 (630)
Floor Concealed	006 008	34 (863)	29-11/16 (754)	2-5/8 (66)	28-13/16 (732)	3-1/16 (77)	5-7/16 (138)	24-7/16 (620)
	012	38-7/8 (988)	34-5/8 (879)	2-5/8 (66)	33-3/4 (857)	3-1/16 (77)	5-7/16 (138)	24-7/16 (620)
	015	48-9/16 (1234)	44-7/16 (1129)	7/16 (11)	43-9/16 (1107)	2-1/16 (53)	5-1/2 (139)	24-7/16 (620)

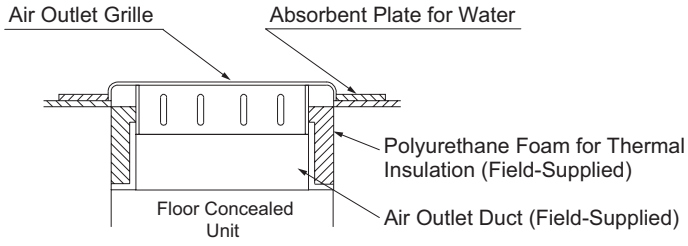
(2) In an instance of the floor exposed type unit, remove the front cover and side cover of the unit.



(3) Adjust the flat level of the unit by adjusting bolts for installation which are attached in the unit. Make the condensate pipe side lower than the opposite side for smooth drainage.

(4) Secure the base plate and back plate of the unit with field-supplied bolts and screws. When attaching the adjusting bolts for installation, remove the electrical wiring box.

(5) Install the field-supplied air outlet grille of the floor concealed type unit as shown in the following figure. If installed in a comparatively high humid place, condensation may occur. Therefore, attach a plate which can absorb water around the grille.



⚠CAUTION

Provide a field-supplied service access cover which is secured by screws so that the fan wheel is not directly touched (only floor concealed model).

NOTICE

The air outlet grille of the floor concealed model unit cannot be used in a highly humid place such as a kitchen, because condensation may occur on the grille surface.

Air Outlet Direction Change (Floor Concealed Model)

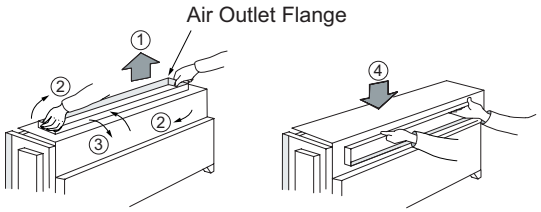
The air outlet direction of the unit can be changed from upward to front by following the procedures below.

(1) Remove the securing screws of the air outlet flange. Then, remove the air outlet flange.

(2) Turn the air outlet on itself until it is opposite its initial position.

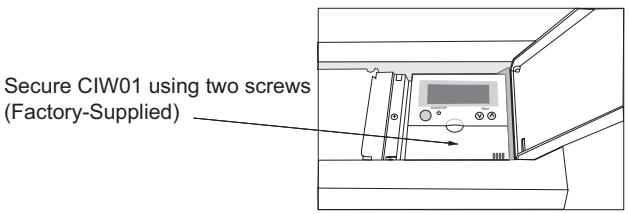
(3) Tilt the air outlet so that the nozzle is facing forwards.

(4) Secure the air outlet flange.



Optional Location for CIW01 (Floor Exposed Type)

In an instance of a floor exposed model unit, it is possible to install the CIW01 under the plastic cover as shown in the following figure.



6. Refrigerant Piping Work

⚠ DANGER

Use the specified non-flammable refrigerant (HFC R410A) for the outdoor unit refrigerant system. 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 combinations with the outdoor unit. Refer to the “Installation and Maintenance Manual” for the outdoor unit for details.

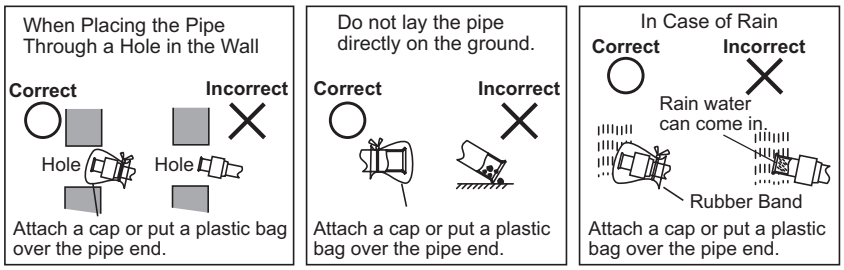
(2) Select the piping size from Section 6.2 "Piping Connection".

(3) Prepare the field-supplied copper piping.

(4) Select clean copper pipes. Make sure there is no dust or moisture inside.

(5) The refrigerant oil used in combinations 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 system. Otherwise, impurities may adhere to the expansion valve and it may prevent proper operation.

(6) Caution: When cutting piping, do not use conventional tools such as saws or grinding wheel cutting disks that 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 any residue before making pipe connections.

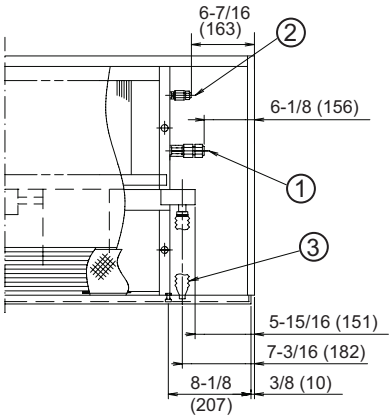


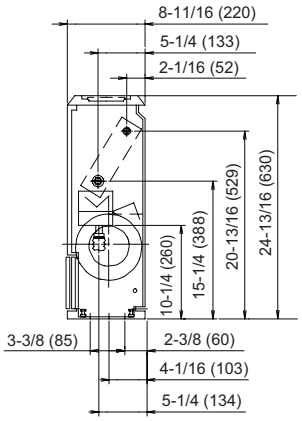
6.2 Piping Connection

(1) Position of piping connection is shown below.

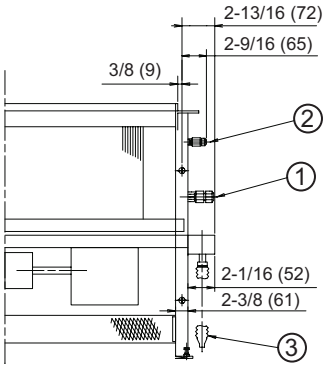
Unit: inch (mm)

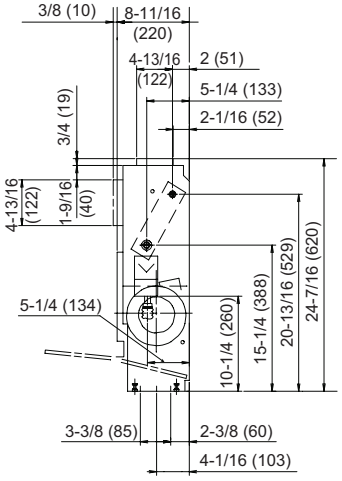
Piping Connection of Floor Exposed Type





Piping Connection of Floor Concealed Type

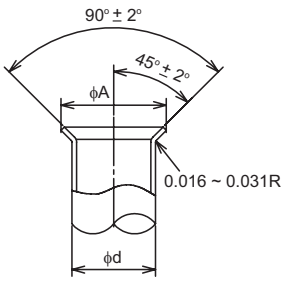




Piping Size inch (mm)

① Gas Piping	② Liquid Piping	③ Condensate Piping
1/2 (12.7)	1/4 (6.35)	3/4 (18.5) OD

(2) Perform the flaring work as shown below.



inch (mm)

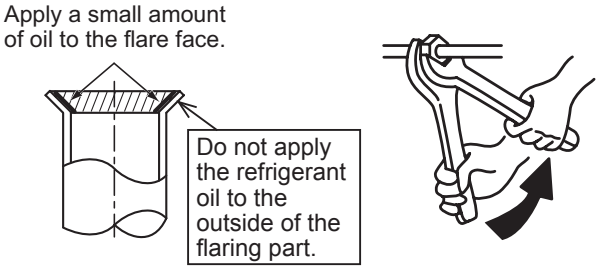
Diameter (d)	A +0 -0.02 (-0.4)
1/4 (6.35)	0.36 (9.1)
3/8 (9.52)	0.52 (13.2)
1/2 (12.7)	0.65 (16.6)
5/8 (15.88)	0.78 (19.7)

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

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

(5) Before tightening the flare nut, apply a small amount of oil (field-supplied) to the flare face. (Do not apply any oil to the backside of the flare or the threads.) Tighten the liquid pipe flare nut to the specified torque while using a backup wrench to prevent damage to the unit. Next, tighten the gas pipe flare nut following the same procedures. Ensure that the flare connections are leak free upon completion of the work.

NOTE:
Refrigerant oil is field-supplied.
[Polyvinyl Ether Oil FVC68D (Idemitsu Lubricants America)]



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 onsite, 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. Appropriate measures should be taken during installation to guard against possible damage or injury that might occur in an earthquake. Check local codes and regulations and refer to the Safety Section in this manual for information.

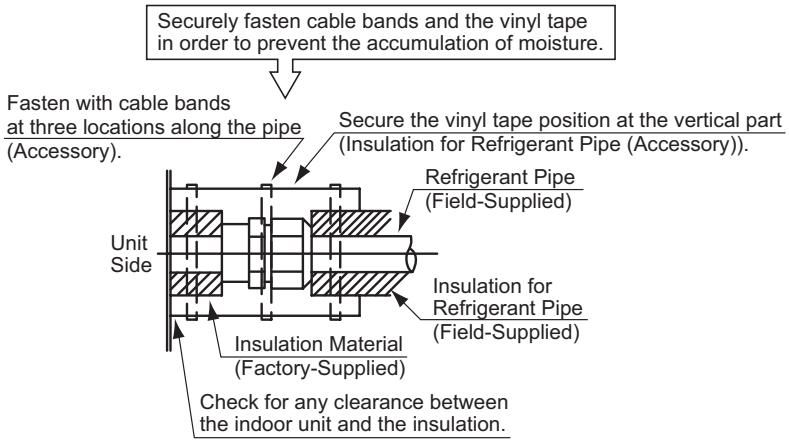
(8) Do not tightly secure refrigerant piping in order to accommodate expansion and contraction.

(9) Prevent the pipes from contacting weak portions such as walls or ceilings. (Otherwise, abnormal sound may be heard due to vibration of the piping.)

(10) Leak test all piping and connections. The 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 to 3/8 inch (5 to10mm) thickness) around the accessory insulation of the refrigerant pipe as a preventive measure.

(12) Insulate each flare connection ensuring no gaps 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. Condensate Piping

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

(1) Figure 7.1 shows condensate pipe connections.
(2) Prepare polyvinyl chloride (PVC) pipe with a 3/4 inch (18.5mm) outer diameter.
(3) Fasten the tube to the condensate hose with the adhesive agent and the field-supplied clamp. The condensate piping must be performed with a downward slope of 1/25 to 1/100.
(4) Insulate the condensate pipe after connecting the condensate hose.

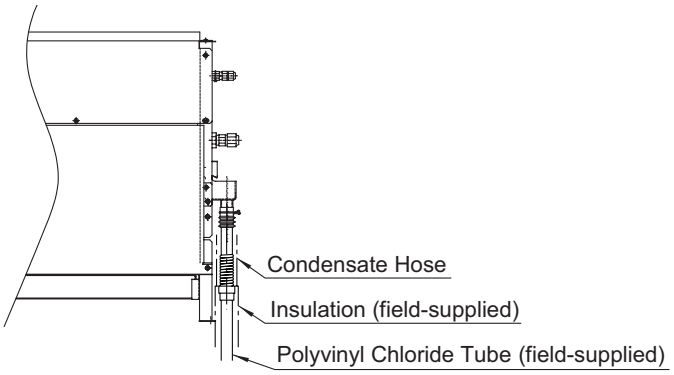
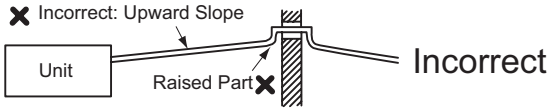


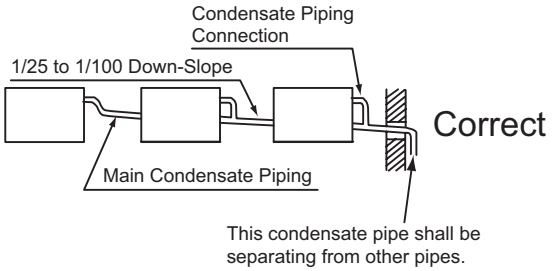
Figure 7.1 Condensate Piping

NOTICE

- Do not create an upper-slope or rise for the condensate piping, since condensate water will flow back to the unit and leakage to the room will occur when the unit operation is stopped.



- Do not connect the condensate pipe with sanitary or sewage piping or any other drainage piping.
- When the main condensate piping is connected with other indoor units, the connected position of each indoor unit must be higher than the main piping. The pipe size of the main condensate pipe must be large enough according to the unit size and number of units.



- Condensate piping will require insulating if the drain is installed in a location where condensation forming on the outside of the condensate pipe may cause it to drop and cause damage. The insulation for the condensate pipe must be selected to ensure vapor sealing and prevent condensation from forming.
- Do not tie or clamp the condensate pipe and refrigerant pipe together.
- Install drainage parts in accordance with national and local codes.

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

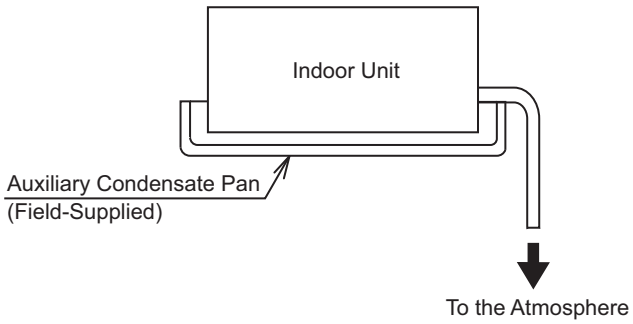


Figure 7.2 Auxiliary Condensate Pan

NOTICE

Checking Unit without Drain-up Mechanism

- Pour 61oz (1.8 liters) of water into the condensate pan.
- Check to ensure that the water flows smoothly and no water leakage occurs. When water cannot be found at the end of the condensate piping, pour another approximately 61oz (1.8 liters) of water into the condensate pan.
- Be aware of the thickness of the insulation when the left side piping is performed. If it is too thick, piping cannot be installed in the 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. Not doing so 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 bands and seal the connecting hole against 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 band 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 ±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 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.
- Communication cabling should 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.
- 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 the 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.

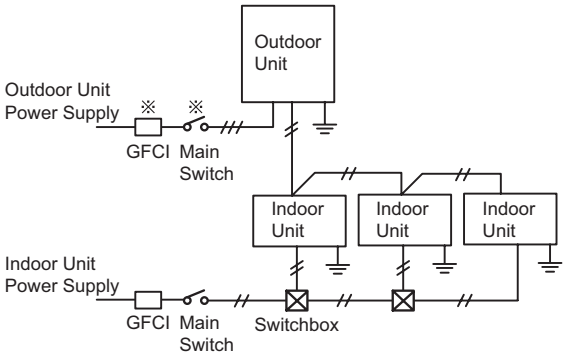
(C) Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.

- 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 higher than 194°F (90°C).

8.2.2 Details of Electrical Wiring Connection

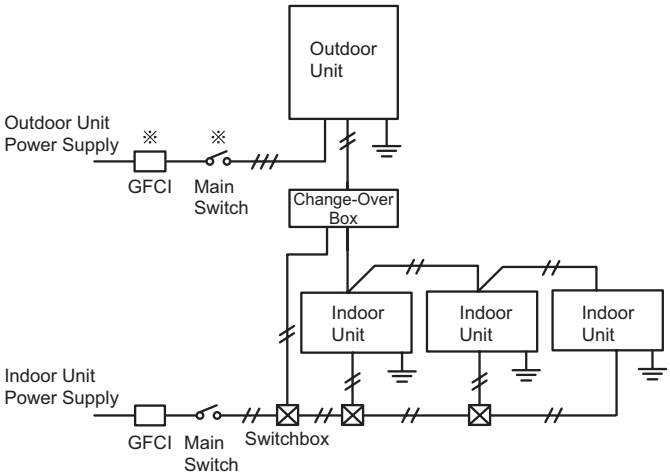
The electrical wiring capacity of the outdoor unit should be referenced according to the "Installation and Maintenance Manual" for the outdoor unit. Adjusting the DIP switches may be required depending on the arrangement with the outdoor unit.
Select wiring capacity according to Table 8.1. Install a 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 Size

Model	Power Supply	Minimum Wire Thickness [AWG (mm^2)]			GFCI		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]	[A]
(H,Y,C)IFE006B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	0.4
(H,Y,C)IFE008B21S									0.4
(H,Y,C)IFE012B21S									0.6
(H,Y,C)IFE015B21S									0.9
(H,Y,C)IFC006B21S									0.4
(H,Y,C)IFC008B21S									0.4
(H,Y,C)IFC012B21S									0.6
(H,Y,C)IFC015B21S									0.9

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

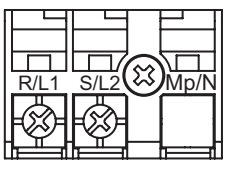
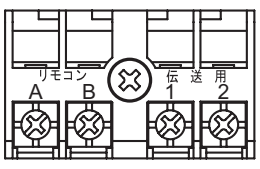
- Check for the recommended size of GFCI shown in Table 8.1.
- Between indoor and outdoor units, use communication cabling that is a minimum of 18-Gauge, 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially 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. Total cable length should not exceed 3281 ft (1000m).
- Select the wiring size, GFCI 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 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.

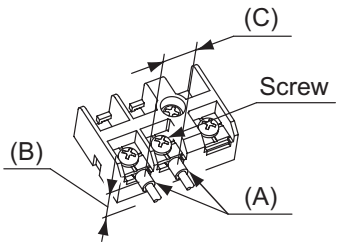
Tightening Torque for Terminals

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)

Terminal Block for Power Supply Wiring TB1 (black)	Terminal Block for Communication Cable TB2 (white)
	

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 the 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.



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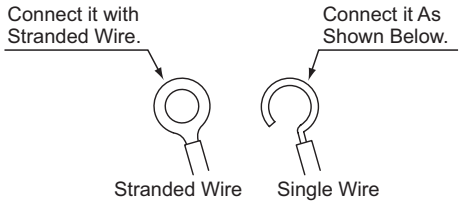
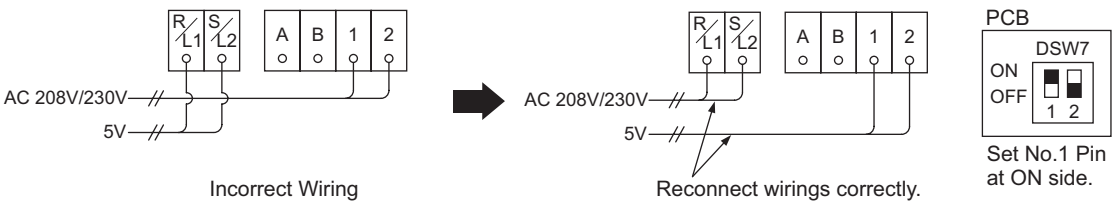
(1) Connect the cable for the optional controller or the optional extension cable to the terminals inside the electrical box through the connecting hole of the cabinet.
(2) Connect the power supply and the ground wiring to the terminals in the electrical box.
(3) Connect the cables between the indoor unit and the outdoor unit to the terminals inside the electrical box.
(4) Connect cables to their corresponding terminal numbers 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 band inside the electrical box.

NOTE:
When the stranded 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 the 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. If this happens, 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.

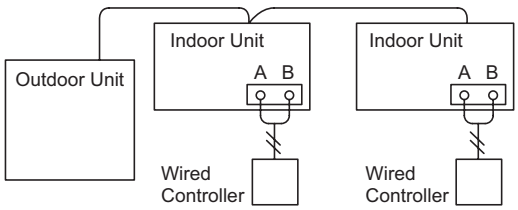
Upon PCB recovery after the fuse has been replaced, if 208V/230V is reintroduced into the communication line, the PCB will be seriously damaged and will not recover.



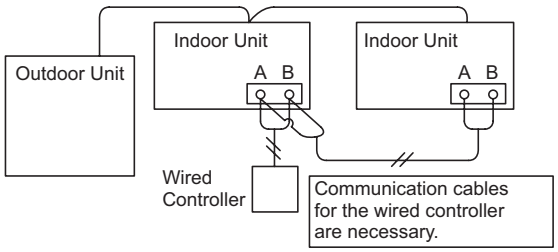
(10) Wired Controller Connection

- VRF Systems

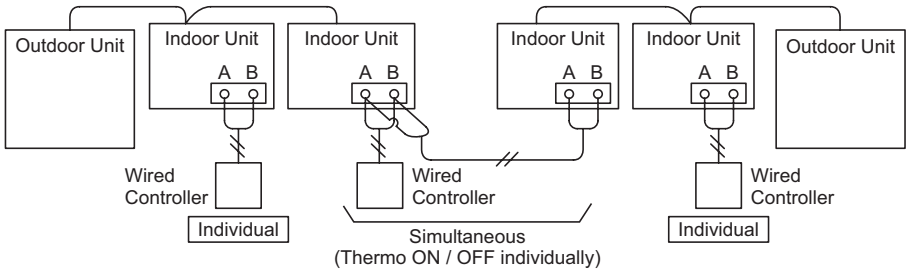
(a) Wired Controllers to each Unit for Individual Operation Setting



(b) Single Wired Controller for Individual Operation Setting



(c) Wired Controller Connections between Different Refrigerant Systems

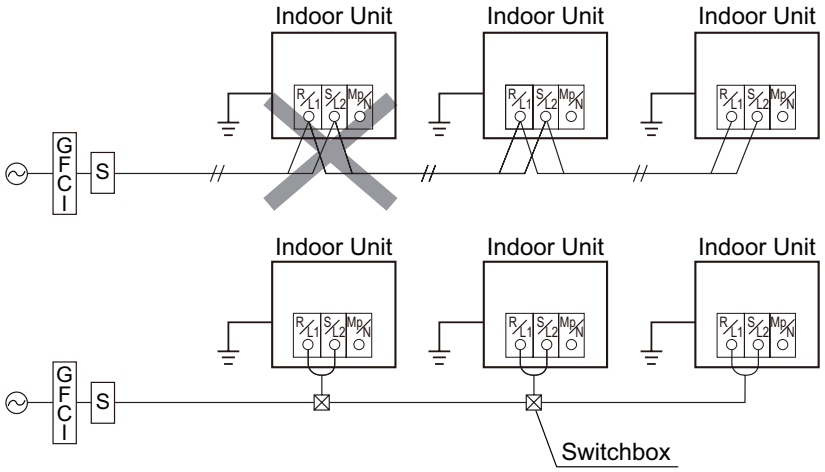


NOTICE

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 settings by the centralized controller
   b. The combination of twin, triple, or quad is controlled by a single wired controller.
   c The address for the indoor unit is changed from the wired controller.

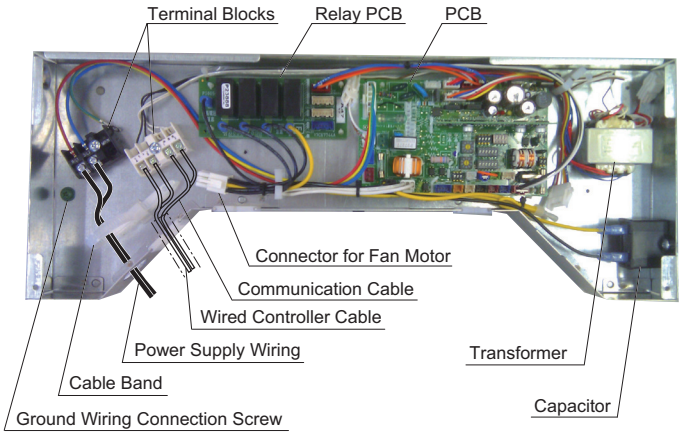
Caution for Electrical Wiring

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



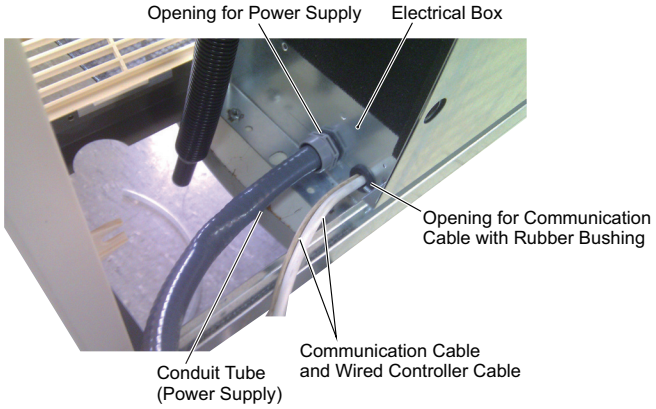
8.4 Wiring Connections

The wiring connections for the indoor unit are shown in the figures below.

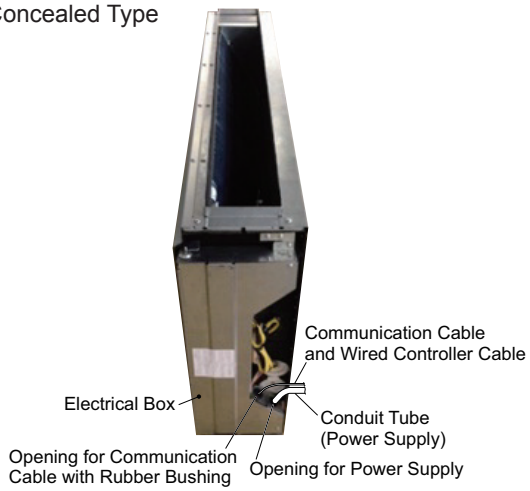


Locations of Wiring Connection Openings

- Floor Exposed Type



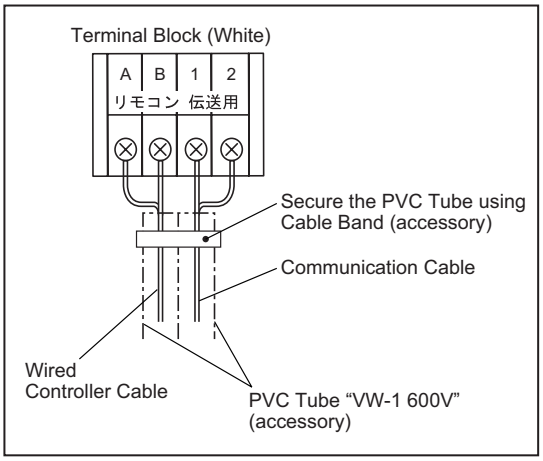
- Floor Concealed Type



(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. Be careful 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.
- Secure both ends of the PVC tube using a cable band (accessory).
- If shielded cable is used, terminate at the ground terminal.



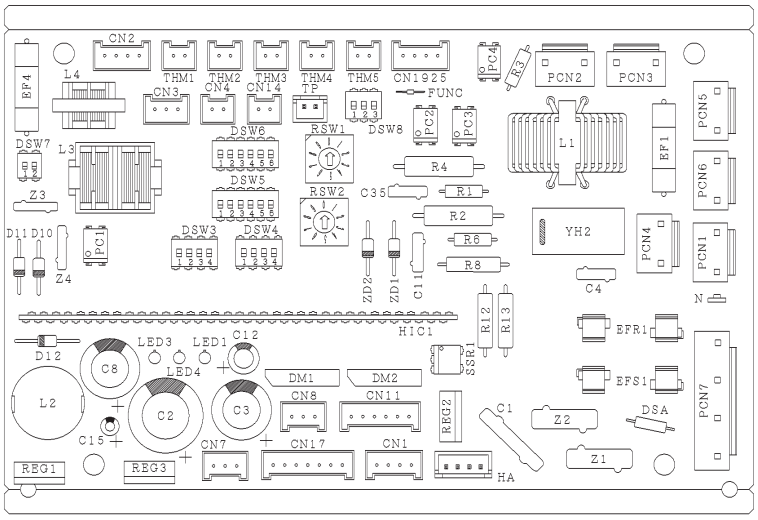
⚠WARNING

Install and secure all electrical wiring correctly through the connecting openings to the terminal blocks using the cable bands provided. Wiring should be spaced appropriately and firmly fastened to guarantee against electrical short circuit, sparks, and fire.

8.5 DIP Switch Settings

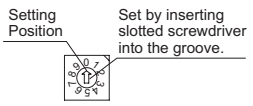
(1) Turn OFF the power supply to both indoor and outdoor units before adjusting DIP switch settings. Otherwise, the setting will be invalidated and not take effect.

(2) Positions of DIP switches are shown below.



(3) Unit No. Setting (RSW1 and 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 numbers of all indoor units respectively and sequentially by following setting positions. It is recommended that you assign a number to each indoor unit beginning with “1”. A maximum of 64 indoor units per refrigerant system 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

DSW6 (Tens Digit)	RSW1 (Units Digit)	Ex.) Set at No.16 Unit
		
Factory settings for 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 to 63).		Set No.1 Pin at ON side RSW1  Set at "6"

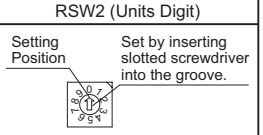
(4) Capacity Code Setting (DSW3)
No setting is required because of factory settings. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.

Indoor Unit Capacity (MBH)	6	8	12	15
Setting Position				

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

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

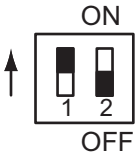
Refrigerant System No. Setting

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

(7) Fuse Recover (DSW7)

* Factory Setting

* If applying high voltage to the 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 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 the setting for DIP switches. Figures show factory settings.
- When the unit number and the refrigerant system are set, record the unit number and refrigerant system to facilitate future service and maintenance.

NOTICE

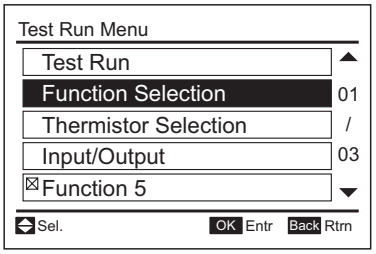
Turn OFF all power supply of the indoor units and the outdoor units before setting DIP switches. Otherwise, the setting will be invalid and not take effect.

8.6 Function Selection by Wired Controller

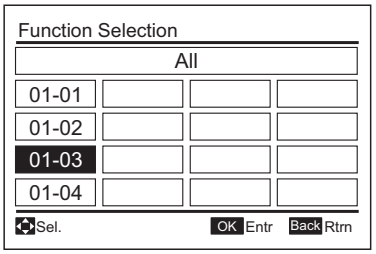
Each function can be selected with the wired controller.
Refer to the “Installation and Maintenance Manual” for the wired controller and the “Engineering Manual” for details.

(1) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds during the normal mode (when unit is not operating). The test run menu is displayed.

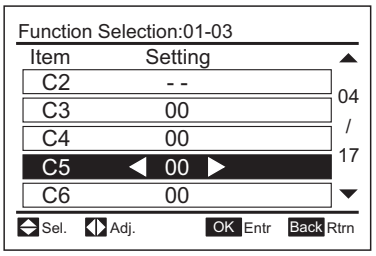
(2) Select “Function Selection” from the test run menu and press “OK”.



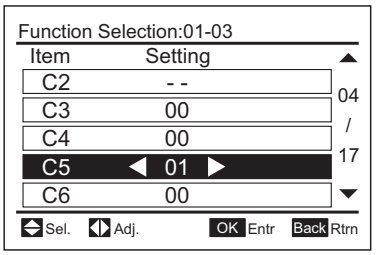
(3) Select the indoor unit by pressing “△ ▽ ◁ ▷” and press “OK”.
(This screen is NOT displayed when the number of indoor units connected to the controller is 1 (one).
In this case, (4) is displayed.)
Press "All" to select all the indoor units connected to the wired controller.



(4) Press “△ ▽” and select the item to change.



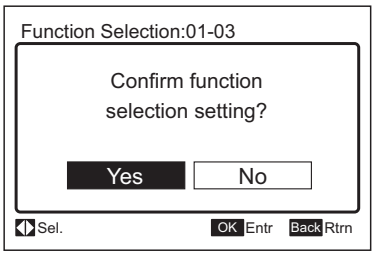
(5) Press “◁ ▷” and change the setting.



(6) Press “OK” to display the confirmation screen.

(7) Select “Yes” and press “OK”.
The test run menu is displayed after the setting is confirmed.
If “No” is pressed, the screen will return to (4).

(8) Press "Back/Help" on the test run menu to return to the normal mode.



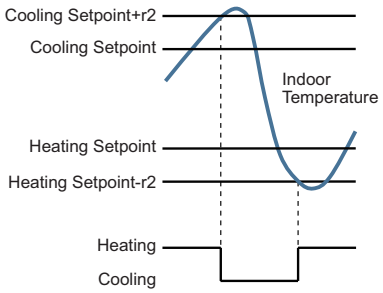
(Figure for Function Selection)

To set other units, press "Back/Help" at (4), (5) so that the screen will return to (3).
(If the number of indoor units connected to the controller is 1 (one), the screen will return to (1).)

Optional Function	Function Selection Item	Unit	Setting Condition (Underlined Part is Factory Setting)										
			00	01	02	03	04	05	06	07	08	09	10
Automatic COOL/HEAT Operation	b8	-	Not Available	Available									
Dual Setpoint	r1	-	Not Available	Available									
(A) Cooling/Heating Changeover Temperature	r2	°F (°C)	2 (1.0)	3 (1.5)	3* (2.0)	4 (2.5)	5 (3.0)	1 (0.5)					
Setback Temperature Compensation (Setback is initiated when the card key is removed.)	r3	°F (°C)	4 (2.5)	5 (3.0)	6 (3.5)	7 (4.0)	8 (4.5)	9 (5.0)	10 (5.5)	1 (0.5)	2 (1.0)	3 (1.5)	3* (2.0)

* Not displayed when fahrenheit (°F) is selected to display.

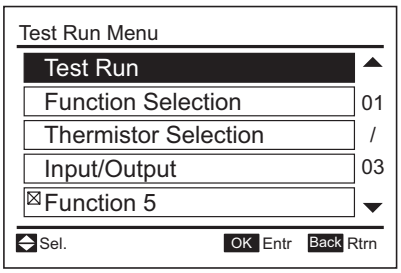
(A)



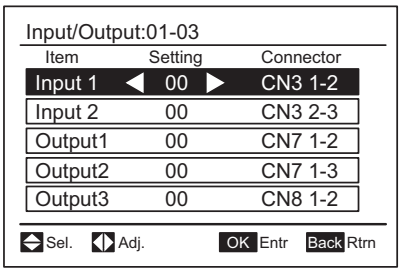
8.7 Setback Operation

(1) Press and hold “Menu” and “Back/Help”on the wired controller simultaneously for at least three seconds during the normal mode (unit stoppage).
The Test Run menu will be displayed.

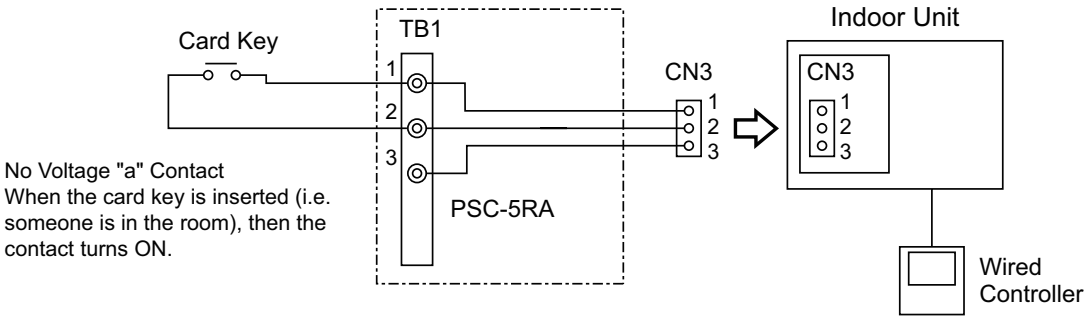
(2) Select “Input/Output” from the Test Run menu and press “OK”.



(3) Select either "Input 1" or "Input 2" and change the setting to "09".



(4) Build a circuit such as shown below.



(5) Temperature compensation for the setback function can be selected on the wired controller.
Refer to “Function Selection by Wired Controller” section for details.

9. Test Run

9.1 Before Test Run

Verify that there are no problems with the installation, and do not perform the 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 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 the ground and the terminal 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) Apply power to the outdoor unit(s) at least 12 hours prior to operation of the system for preheating of the compressor oil.

(4) Verify that all DIP switch settings are correct. Refer to Section 8.5 “DIP Switch Settings”.

9.2 Test Run

After all installation work is completed, a 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 multiple indoor units are operated simultaneously, system conformity cannot be verified.)

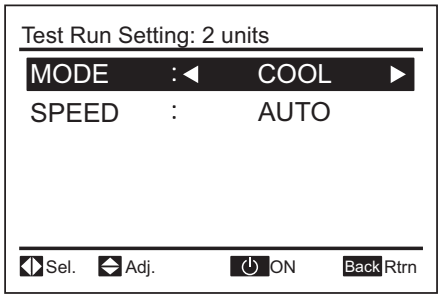
(3) Perform the test run in accordance with the following procedures. Ensure that the test run is carried out without any problems. The following procedures show an instance where a wired controller is utilized. If other controllers are activated instead, refer to the "Installation and Maintenance Manual" for those other controllers.

NOTE:
The outdoor unit may not operate 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 three seconds.

- 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 the “Test Run” mode and reset.

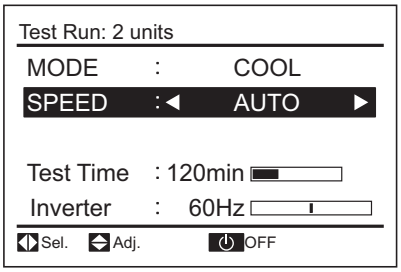
- The total number of connected indoor units is indicated on the Liquid Crystal Display (LCD). In the case of a twin combination (set of two indoor units), the total number of the connected indoor units is displayed as “2 units”, and where there is a triple combination (set of three indoor units), the 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.

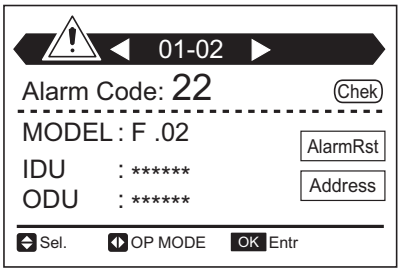
(c) Though temperature recordings by the thermistors are invalid during the Test Run phase, the protection devices are valid.

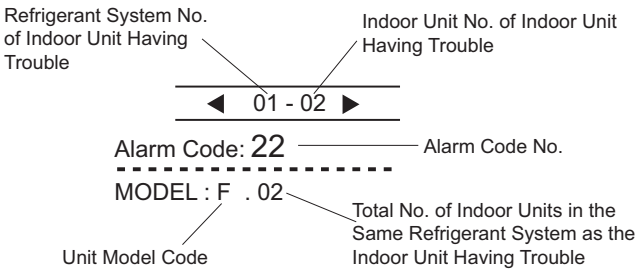
(d) For VRF System
According to the label; “Checking Method by 7-Segment Display” affixed to the inside of the front cover of the outdoor unit, check temperature, pressure, and operation frequency, and interconnected indoor unit numbers by the 7-Segment displays.

(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. The 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 malfunction in the communication cable between the indoor unit and the wired controller (a loose or severed connection). In this case, verify using 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 condensate 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 system. (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 system number	Unit number or refrigerant system $\geq$ 64
b5		Incorrect setting of indoor unit number for H-LINK type	Interconnected indoor units are not supporting H-LINK II $\geq$ 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 there is a 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 are completed.

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

Routine Preventive Maintenance

Perform routine preventative maintenance on the system to ensure high efficiency performance and containment of refrigerant over the life of the product. During installation, record the results of the following field procedures for future reference:

1) Pressure and leak testing of field installed piping
2) Triple evacuation and nitrogen purge of field installed piping
3) Total refrigerant quantity in the system including factory charge and trim charge volumes

This information should be included in the owner's final documentation including operation and maintenance (O&M) manuals for project close-out. All technical service and maintenance procedures must be performed by trained and authorized personnel only.

PMGB0374

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