Installation and Maintenance Manual

INVERTER-DRIVEN
MULTI-SPLIT SYSTEM
HEAT PUMP
AIR CONDITIONERS

Type	Model
Mini Cassette	(H,Y,C)ICM008B21S (H,Y,C)ICM012B21S (H,Y,C)ICM015B21S (H,Y,C)ICM018B21S

IMPORTANT:

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

PMGB0386 rev.1

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 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.
- 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 is 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.

Provide this "Installation and Maintenance Manual" to the building owner. 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 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 drain adapter. If you do, you may have condensate 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 install a decorative panel with a motion sensor 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 gasses 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 light such as sunlight or direct light affect the sensor.
  - Where hot air from a heater, or something similar directly affects the sensor.
  - Where the airflow bounces back to the sensor by hitting obstacles such as shelf or locker.
  - Where blower devices such as a ceiling fan or ventilating fan affect the airflow from the indoor unit.
  - Where weather directly affects the surface of the sensor.
  - Where the lens surface may smudge or be damaged from something like a dusty environment.

    Detecting function will decrease if the lens sensor has smudges.
    In this case, wipe off smudges using a cotton swab soaked with alcohol or a soft cloth. Isopropyl alcohol is recommended. (When wiping off smudges on the lens 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 motion.)
- 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

- The optional decorative panel can become deformed if the positioning of the indoor unit's 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 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 an indoor unit against an 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.

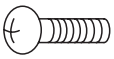
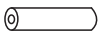
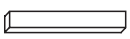
3.2 Transportation and Handling

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 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 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.

inch (mm)

Accessory	Qty.	Purpose
Checking Scale (Cut and Remove from Cardboard) 	1	For Adjusting Space of False Ceiling Opening and Position of Unit
Cross Recessed Head Screws (M5) 	4	For Fitting Paper Pattern
Washer with Insulation Material (M10) 	4	For Unit Installation
Washer (M10) 	4	
Condensate Hose 	1	For Condensate Pipe Connection
Hose Clamp 	1	
Pipe Insulation 	1	For Refrigerant Piping Connection
Pipe Insulation 	1	
Cable Band 	2	For Securing Wired Controller Cable, Louver Sensor and Insulation of Piping
Cable Band 	6	
Insulation 3/16T x 1-15/16 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 Condensate Connection
Insulation 3/16T x 1 x 19-11/16 (5T x 25 x 500) 	1	

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.

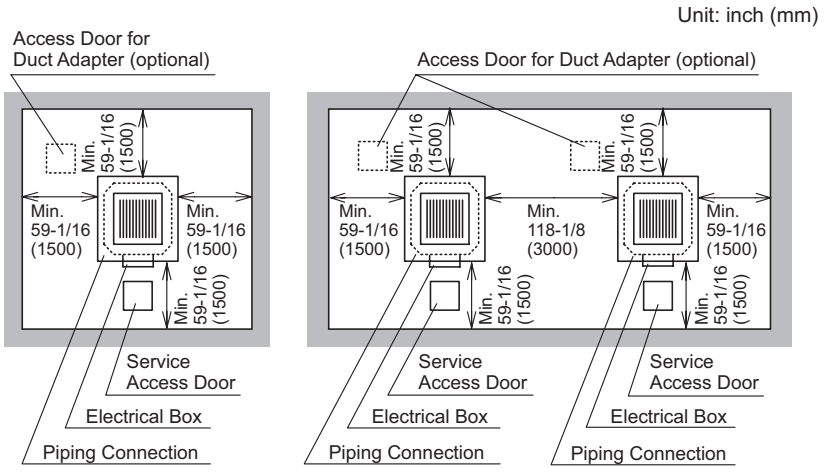
2. Do not insert or leave any foreign objects inside the indoor unit and verify that no foreign objects remain inside the indoor unit before installation and the test run. Failure to do this can result in equipment failure and damage to the unit.
3. Necessary Tools and Instrument List for Installation

No.	Tool	No.	Tool
1	Handsaw	11	Wrench
2	Philips Screwdriver	12	Charging Cylinder
3	Vacuum Pump	13	Manifold Gauge
4	Refrigerant Gas Hose	14	Wire Cutter
5	Megaohmmeter	15	Gas Leak Detector
6	Copper Pipe Bender	16	Level
7	Manual Water Pump	17	Clamp 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, and manifold gauge) exclusively for the refrigerant R410A.

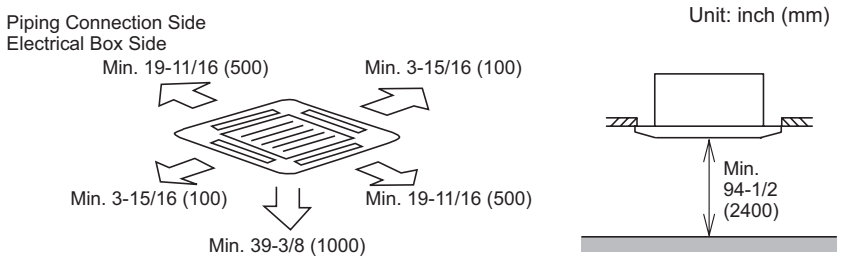
4. Installation Location

1. Install the indoor unit at a proper distance from walls as shown below.



Distance from Wall Side

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.

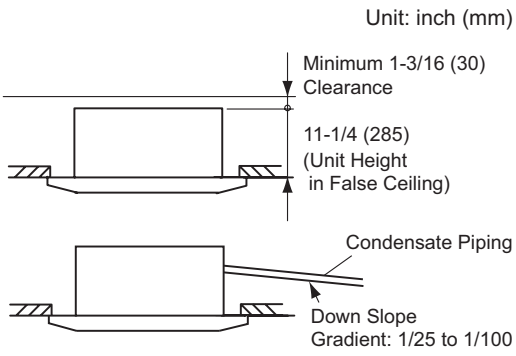


Minimum Service Space

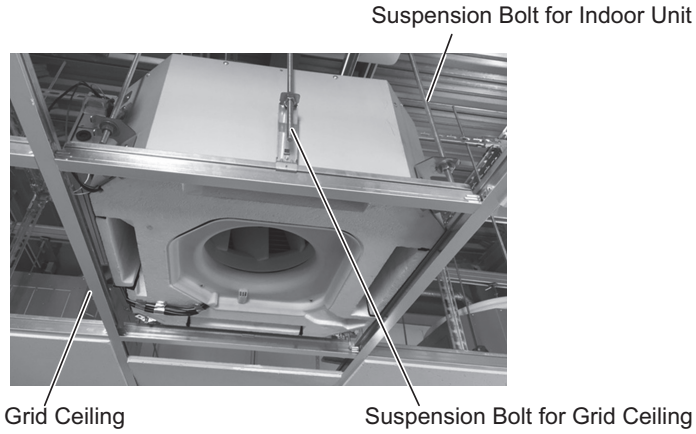
3. Select an installation location as follows:
   - Minimum Space
   - Down slope gradient for condensate piping: 1/25 to 1/100

   Install the indoor unit at least 8 ft (2.4m) above 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.
5. Install the unit where there are no obstacles which can impede the return air and discharged air.
6. Do not install the unit near a door or a window where the indoor unit comes 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 an alarm device or a control device. It can result in false readings and an alarm failure.
10. When installing the indoor unit to a grid ceiling, do not contact the unit body, the electrical wiring and refrigerant piping with a suspension bolt of a grid. Check the location of suspension bolts of a grid ceiling and indoor unit mounting position before installing the indoor unit.

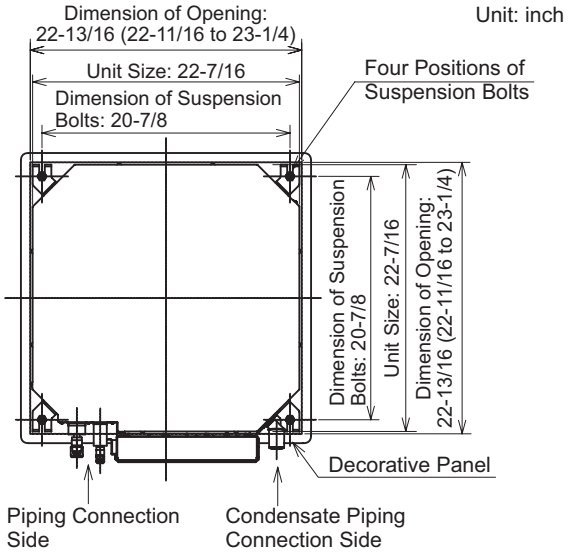


11. The electrical box is located on the side of the unit body. When installing the indoor unit, provide a service access door near the electrical box for servicing. For servicing of the electrical box, make sure that no refrigerant and condensate pipings are obstructing access to the electrical box.
12. When installing the IR receiver kit (optional) or the motion sensor (optional), refer to their respective installation manuals.
13. The ceiling height of the indoor units can be increased when using High Speed setting.
    Refer to Section 8.7 "High Speed Setting".

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 a false ceiling opening and locations 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.

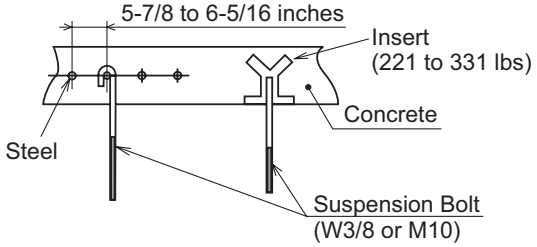
   NOTE:
   Do not install electric lighting in too close of a proximity to the unit as unit operation can cause the lights to flicker.

5.2 Installing Suspension Bolts

1. Reinforce the designated opening in the false ceiling area. Use approved materials of sufficient tensile strength to allow for quality installation.
2. Strengthen suspension bolts with support plates as required in preparation for an earthquake. (Refer to the Safety Section for more information.)
   Use field-supplied M10 suspension bolts and support plates.

<table>
<tr><th>For Wooden Beam</th><th>For Steel Beam</th></tr>
<tr><td>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 beams as shown below.

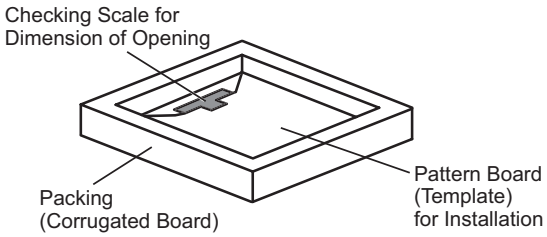
inch (mm)
<table>
<tr><th>Interval between Beams</th><th>Beam</th></tr>
<tr><td>≤ 35-7/16 (900)</td><td>2-3/8 (60) square</td></tr>
<tr><td>≤ 70-7/8 (1800)</td><td>3-9/16 (90) square</td></tr>
</table></td><td>Install suspension bolts to withstand the indoor unit weight load.

 
</td></tr>
</table>

5.3 Working Procedures

1. Size the opening to the correct dimensions to facilitate easy and ongoing installation by using the pattern board (template).

   The template provided for the installation comes with a scale printed on the outer packaging. Detach this area with the printed scale to use in sizing and checking the opening. Refer to the procedures shown in Step 5 below.



2. Installation Position of Indoor Unit

   a. Check the installation position of the indoor unit as shown below. The installation 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.

NOTE: If a false ceiling is already in place, determine the proper pathway for piping and electrical lines before the unit is installed.

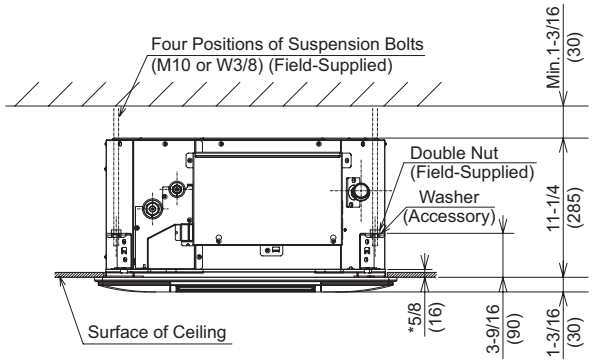
NOTICE

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.

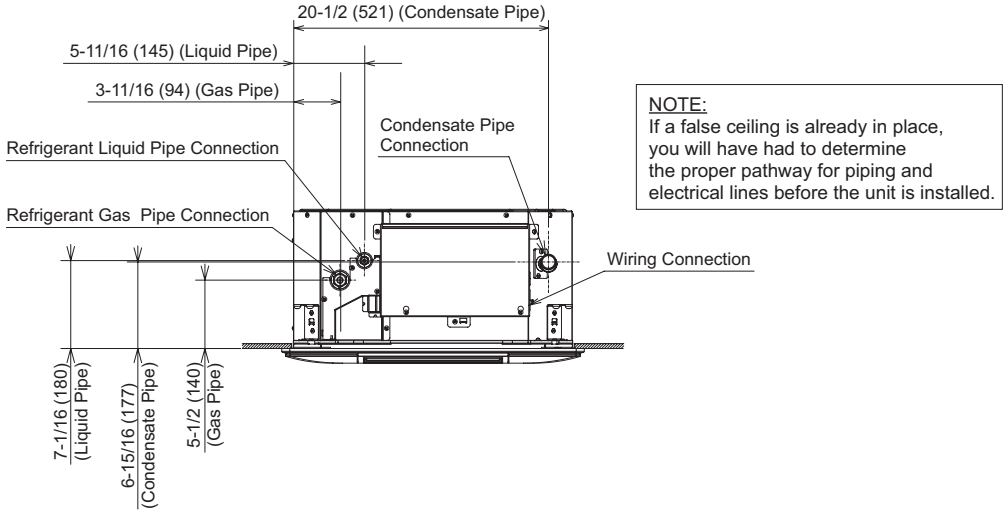
---

   b. The position relationship between the indoor unit and the decorative panel is shown below.

Unit: inch (mm)



* Dimensions between bottom side of unit and ceiling surface.

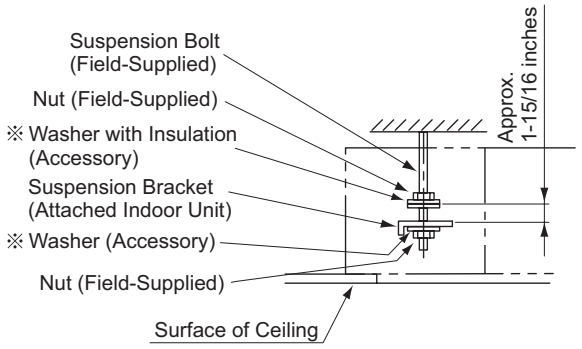


3. Mounting Nuts and Washers

   Mount nuts and washers onto the suspension bolts before mounting the indoor unit.

   NOTE:

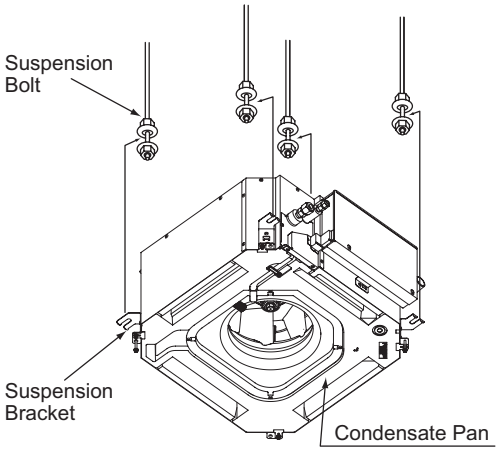
   ※ Make sure to use washers (accessory) for installing the suspension bolts to the suspension brackets. Install the washer with the insulation side facing down for suspended installation applications. This way, the washers themselves remain in position on the suspension bolts during the installation phase.



4. Mounting the Indoor Unit

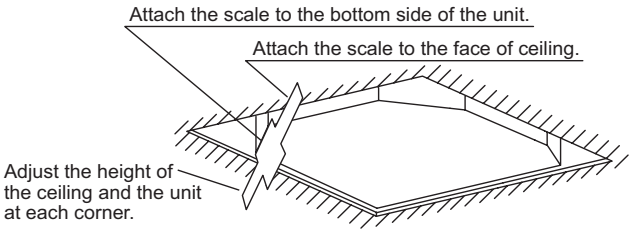
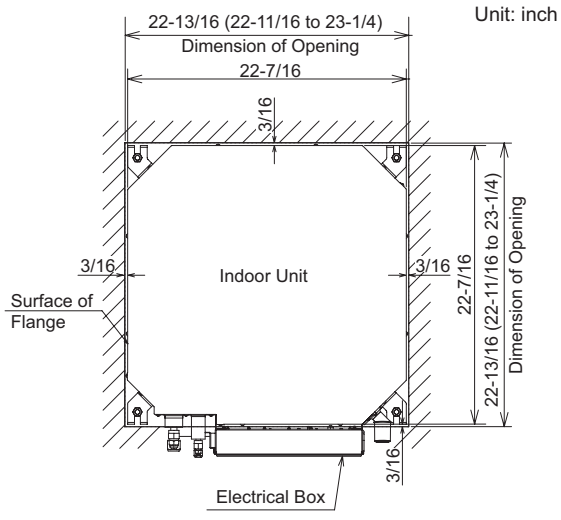
- Hoist the indoor unit but do not apply any force against the condensate pan (the air outlet portions and the condensate pan portion). If there is insufficient access for a hoist, the work must be performed manually by two skilled installers.
- Suspend the unit by handling the suspension brackets at all four corners of the unit. Do not apply any pressure to the polystyrene condensate 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. Remember, if a false ceiling is already in place, you will have had to determine the proper pathway for piping and electrical lines before the unit is installed.



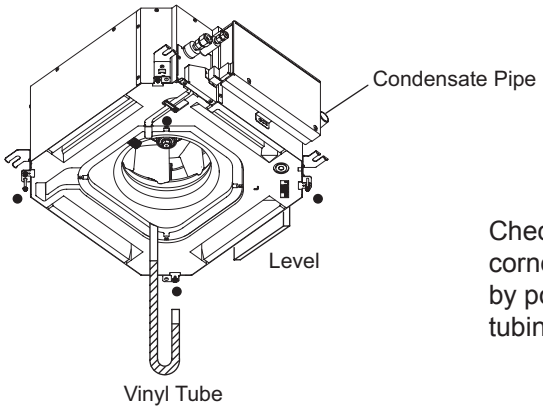
5. Space adjustments to accommodate the unit into a false ceiling:

- Adjust the position of the unit as shown below and maintain the installation position of the unit in accordance with Step (b) 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 the dimensions of the opening from packing to adjust the position of the indoor unit.

(a) For False Ceiling Applications: When installing the indoor unit to the false ceiling with an opening, check the dimensions of the opening and adjust the clearance between the indoor unit and the opening.	
(b) For False Ceiling Applications (without opening): If there is no opening in the existing false ceiling, provide an opening in it before installing the indoor unit. Cut out the false ceiling (22-13/16 inches x 22-13/16 inches (580mm x 580mm)). After hooking up the indoor unit, adjust the position according to Step (a).	

6. Tighten the nuts on the suspension brackets after adjustments are completed. Apply threadlocker 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.

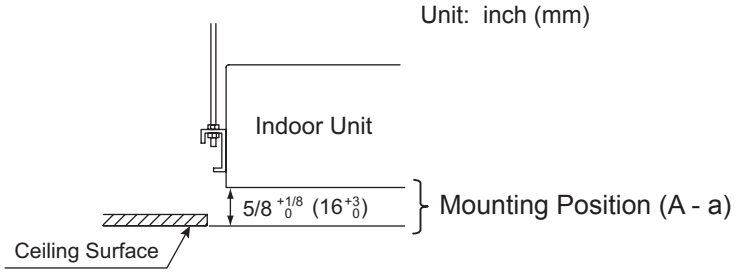
5.4 Installation of Decorative Panel

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.

1. Check the clearance dimension between the indoor unit and the false ceiling. The tolerance for that distance is within 5/8 $^{+1/8}_{0}$ inch (16 $^{+3}_{0}$ mm).
   If not correct, adjust the distance by using the scale of the pattern board (template) while maintaining the vertical alignment of the indoor unit.
2. Make sure that the securing screws for the panel are tightened. Tighten the securing screws for the panel until they touch 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 a 3/4 inch (19mm) gap from the mounting position (A-a), condensation may form due to escaping air from the packing seal.
3. Secure all connections for the optional decorative panel to the unit.

For Decorative Panel



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 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 combinations with the outdoor unit. Refer to the "Installation and Maintenance Manual" for the outdoor unit.
2. Select the piping size from the following table.

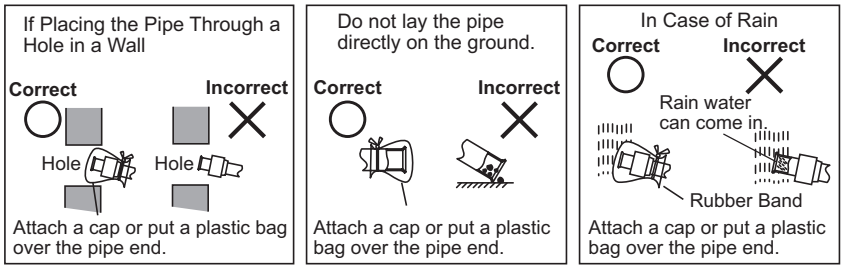
Table 6.1 Piping Size

inch (mm)

Model	Gas Piping	Liquid Piping
(H,Y,C)ICM008B21S (H,Y,C)ICM012B21S (H,Y,C)ICM015B21S	1/2 (12.7)	1/4 (6.35)
(H,Y,C)ICM018B21S	5/8 (15.88)	3/8 (9.52)

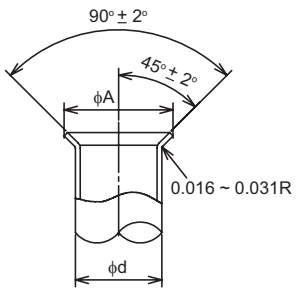
3. Prepare field-supplied copper pipes.
4. Select clean copper pipes. Make sure there is no dust or moisture inside.
5. The refrigerant lubricating oil used in these units is Polyvinylether (PVE), a chemically stable, resilient, synthetic lubricant that, when combined with refrigerant R410A, maintains 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 absorbs moisture and, once exposed to open air 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 any residue before making pipe connections.



6.2 Piping Connection

1. Perform the flaring work as shown below.

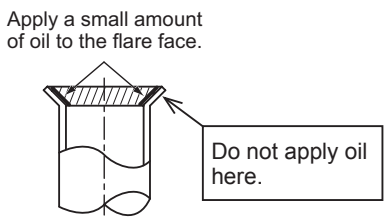


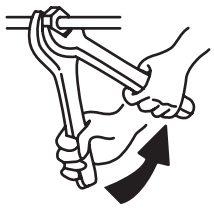
inch (mm)

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)

2. Use the specific flare nut included 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 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.

   NOTES:
   1. Refrigerant oil is field-supplied.
      [Ethereal Oil FVC50K, FVC68D (Idemitsu Kousan Co. Ltd.)]
   2. If refrigerant comes into contact with decorative panel surfaces, damage in the form of cracks can occur on panel surfaces. Use with caution.

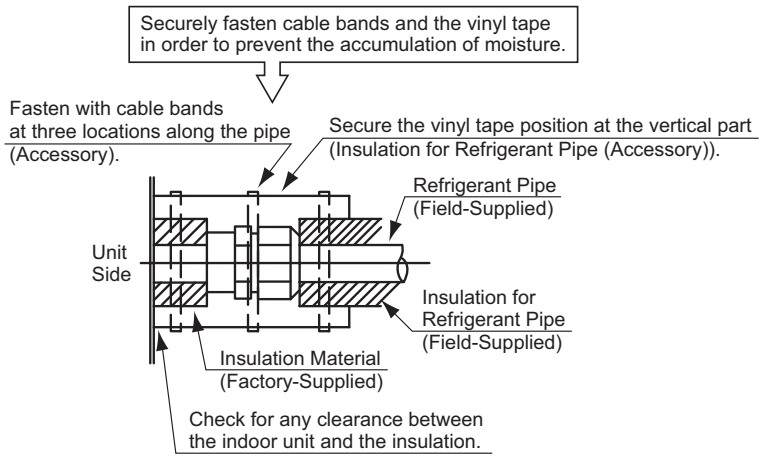




Required Tightening Torque (JIS B 8607)

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 onsite, make sure there is a service doorway to provide adequate access to inspect piping sockets and elbows, and for interconnecting parts.
6. Suspend pipes at certain points and reinforce against earthquakes so that they will not 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.
7. Do not secure refrigerant piping too tightly in order to accommodate expansion and contraction.
8. Prevent the pipes from contacting weak portions such as a wall or a ceiling. (Otherwise, abnormal sound may be heard due to vibration of the piping.)
9. Leak test all piping and connections. The 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 of approximately 1/4 to 7/16 inch (5 to10mm) thickness around the accessory insulation of the refrigerant pipe as a preventive measure.
11. 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. 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 asphyxiation to those nearby.**

7. Condensate Piping

⚠WARNING

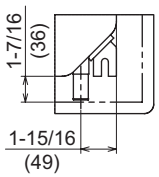
Do not run condensate piping into underground areas near sanitary or sewage lines where toxic and corrosive gases can seep into the system. This creates a pathway for the flow of poisonous gas to penetrate inhabited areas.

NOTICE

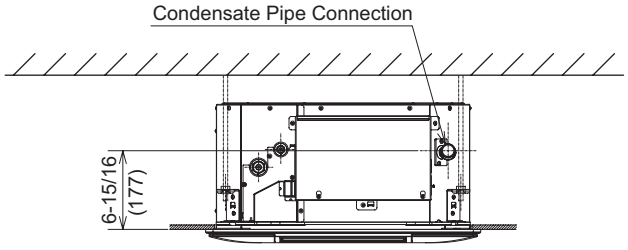
- Check to ensure that the condensate pipe discharges moisture properly. If connected incorrectly, it can cause structural damage to indoor wall and ceiling surfaces and damage to property.
- Avoid sloping the condensate pipe upward as it will impede drainage. Otherwise, moisture will settle back into the unit and it may cause water leakage when the unit operation stops.
- Do not connect condensate piping with sanitary or sewer lines or any other condensate pipe.
- When the main condensate pipe is connected with other indoor units, the connected position of each indoor unit must be higher than the main pipe. The pipe size of the main condensate pipe must be large enough according to the unit size and number of units.
- After performing condensate piping work and electrical wiring, check to ensure that water outflow is smooth as in the following procedures.

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

1. The position of the condensate pipe connection is shown below.



Unit: inch (mm)

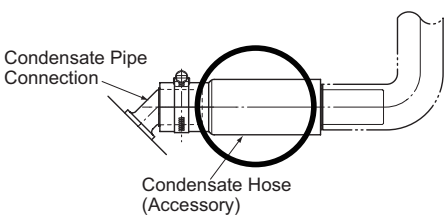


2. Prepare PVC piping with 1-1/4 inches (32mm) outer diameter and an elbow piping joint with VP25.
3. Connecting Condensate Piping

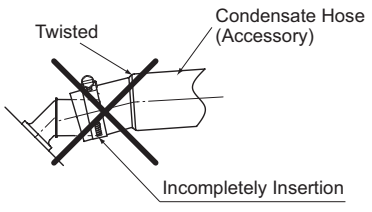
   NOTE:

   Follow procedures in Section 4 to install the factory supplied condensate hose and pipe without adhesive.

   a. Connect the factory-supplied condensate hose at the condensate pipe connection using PVC adhesive. Clean the affected surfaces, apply the adhesive and cure in accordance with manufacturer's instructions.
   b. Insert the condensate hose completely. If it is not inserted properly, or if it is twisted, water leakage can occur.



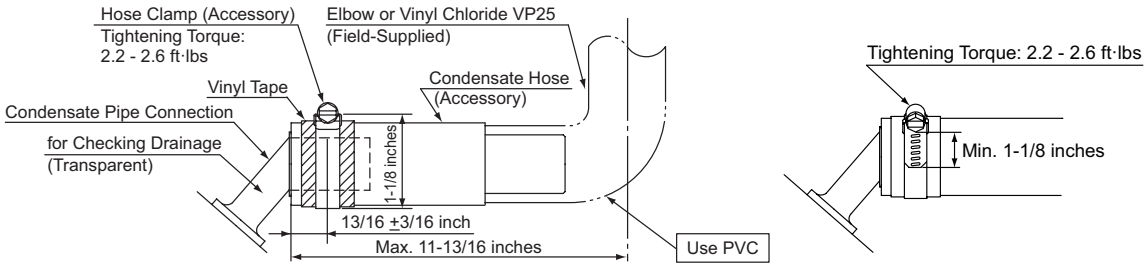
(Correct)



(Incorrect)

Twisted, incompletely insertion.

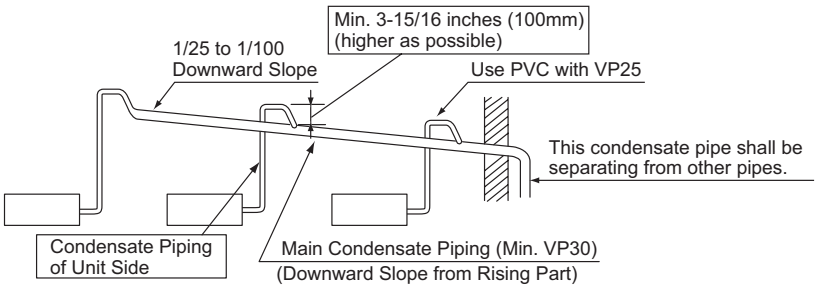
c. Attach the factory-supplied hose clamp to the vinyl tape (white) attached to the condensate hose. The hose clamp should be 13/16 inch (20mm) away from the end face of the condensate hose. Then tighten the hose clamp to make sure that it is approximately 1-1/8 inches (28mm) in length from the screw to the edge of the hose clamp as shown in the figure below.



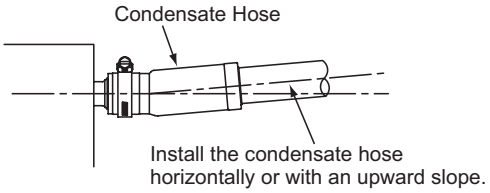
NOTICE

- Make sure to use the factory-supplied condensate hose and hose clamp. Other makes are more susceptible to moisture leakage.
- Do not bend or twist the factory-supplied condensate hose. Sealing properties of the hose can be compromised.
- Do not apply an excessive force to condensate pipe connections. They can be easily damaged.

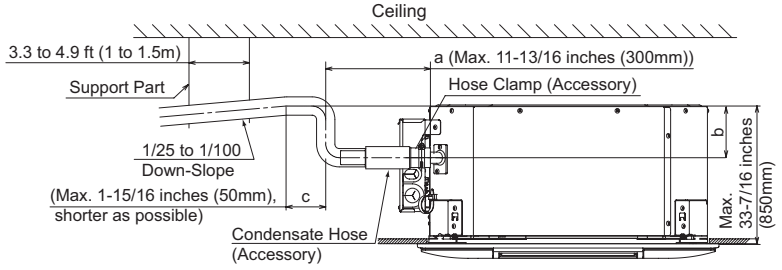
4. On-Site Condensate Piping Work
   a. Connect the factory-supplied condensate hose to the condensate pipe connection using the polyvinyl chloride adhesive.
   b. When cleaning the connection surface, applying the adhesive, inserting, retaining and curing the condensate pipe, refer to information given by the adhesive manufacturer.
   c. 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 condensate pipe.
   d. Install condensate piping with a downward slope of 1/25 to 1/100 as shown below.



   e. Install the condensate 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 and bubbling noises and spill over into the room after unit operation has stopped.

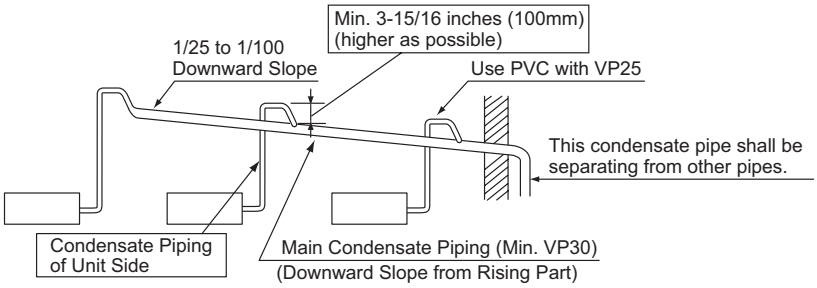


   f. Raising Condensate Piping
   When raising the condensate pipe, install it according to the dimensions shown in the figure below. The total condensate piping length of a+b+c should be within 43-5/16 inches (1,100mm).



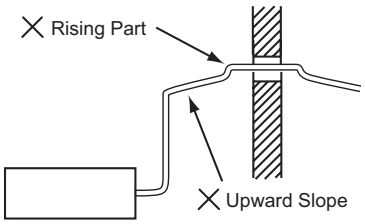
g. Installing Main Condensate Piping

- Install the main condensate pipe on a downward slope to make sure that it is lower than each rising part of the condensate pipe from the indoor unit.
- The size for the main condensate pipe must be larger than VP30, the nominal diameter size of 1-3/16 inches (30mm) and, outer diameter 1-1/2 inches (38mm) depending on the number of the connected indoor units.



NOTICE

- Do not allow condensate 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 sewer lines. Local applicable plumbing codes must be followed.



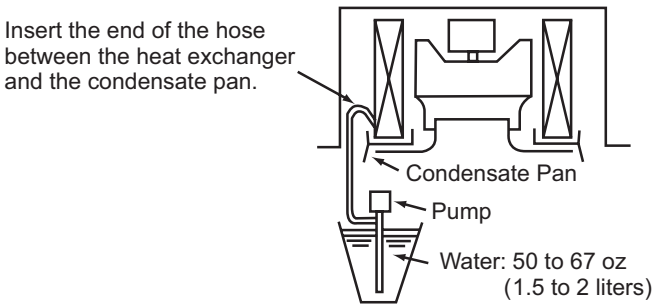
Incorrect Installation of Condensate Piping

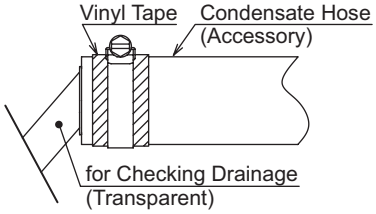
5. Drainage and Water Leakage Check

After performing the condensate piping work and the electrical wiring work, check to ensure that water flows smoothly as follows.

- Drainage Operation by Float Switch
  The following are regular procedures to check float switch operation:
  - Turn ON the power supply.
  - Pour 50 to 67oz (1.5 to 2 liters) of water gradually into the condensate pan.
  - Check to ensure that the water flows smoothly inside the transparent condensate piping and drained at the pipe end, and that no leakage occurs.
  - If the end of the condensate pipe cannot be checked visually, pour another 50 to 67oz (1.5 to 2 liters) of water into the condensate pan. If the water overflows from the condensate pan, the pipe might be blocked. Inspect the condensate pipe.

In Case of Pouring Water through Air Outlet





Position for Checking Drainage

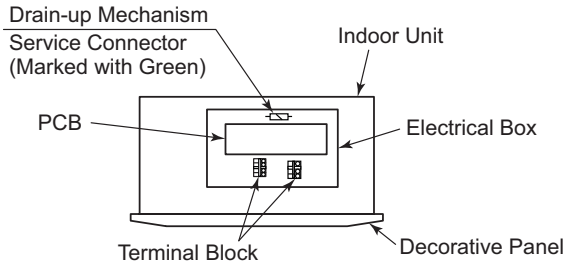
Be careful that water do not splash onto electrical components such as the fan motor, float switch, or thermistors.

NOTICE

- Moisture which has discharged into the condensate pan and checked for drainage in the heating season should be drained completely from the condensate 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 condensate pan evaporates, this could potentially cause 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 are simplified operation procedures for 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 for 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).

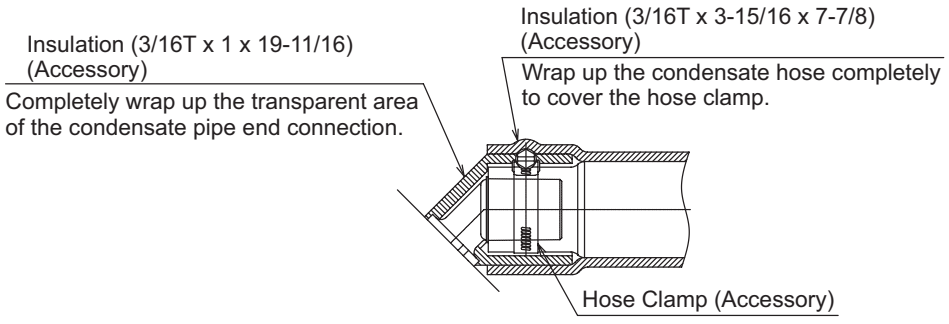


⚠WARNING

Turn off electrical power at the power supply when handling the service connector. Possibility of an electrical shock hazard exists.

6. Insulate the condensate pipe connection and the condensate hose after connecting them. If improperly insulated, condensation will occur.

Unit: inch



7. Insulate the condensate piping with insulation wrap since 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. 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" for indoor units. Make sure that the components comply with any local or national codes, for example 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

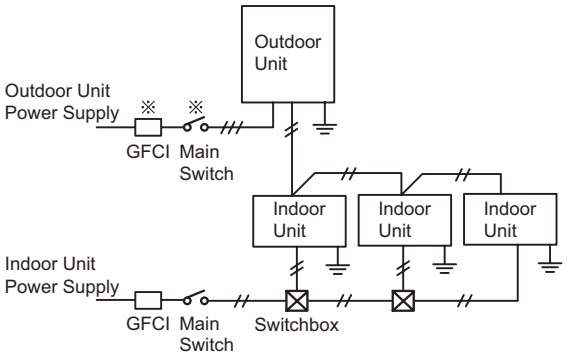
- Use a GFCI.
  Failure to use a GFCI can result in electric shock or fire.
- Do not operate the system until all check points have been cleared.
  - Check to ensure that the electrical resistance is more than one megaohm by measuring the resistance between ground and the terminal of the electrical parts. 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.
  - 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).

8.2.2 Details of Electrical Wiring Connection

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

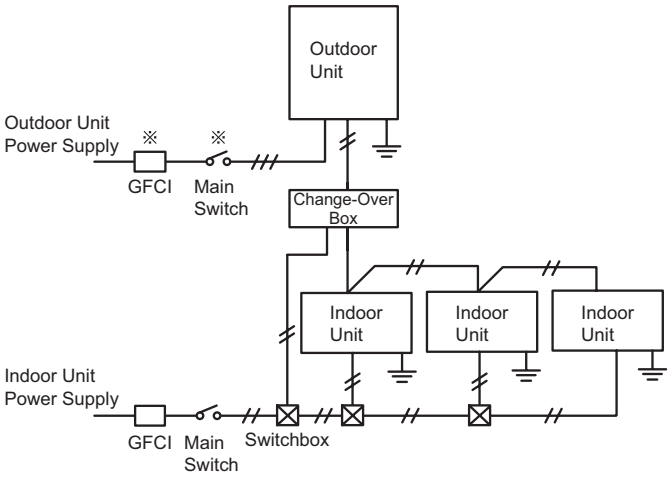
Select wiring capacity according to Table 8.1. Install a Ground Fault Circuit Interrupter (GFCI) and main switch as shown in each of the system diagrams below.

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		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)ICM008B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	0.7
(H,Y,C)ICM012B21S									0.8
(H,Y,C)ICM015B21S									1.0
(H,Y,C)ICM018B21S									1.0

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

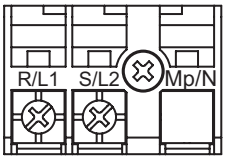
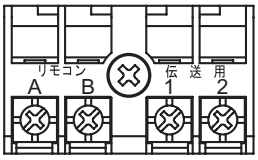
- Check for the recommended size GFCI shown in Table 8.1.
- Between indoor and outdoor units, communication cabling should be a minimum of AWG18 (0.82mm^2), 2-Conductor, Stranded Copper. Shielded cable must be considered for applications and routing in areas of high EMI and other sources of potentially excessive electrical noise to reduce the potential for communication errors. When shielded 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, Ground Fault Circuit Interrupter (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 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 the "Installation and Maintenance Manual" for the Mini Cassette 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.

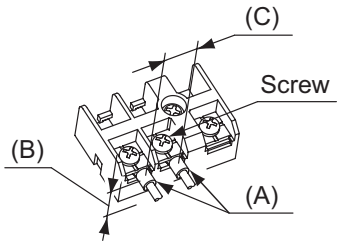
Tightening Torque for Terminals

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)

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

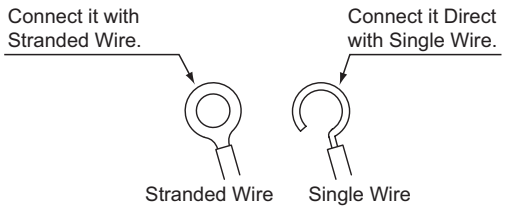
NOTICE

- 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 where 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.



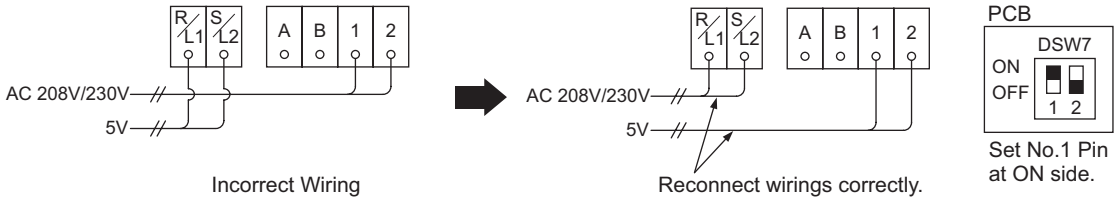
1. Connect the cable for the optional controller or the optional extension cable to the terminals inside the electrical box through the connecting hole of the cabinet.
2. Connect the power supply and the ground wiring to the terminals in the electrical box.
3. Connect the cables between the indoor unit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

NOTE:
When standard wire is used for the field-wiring connection, the M4 stranded wire 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.

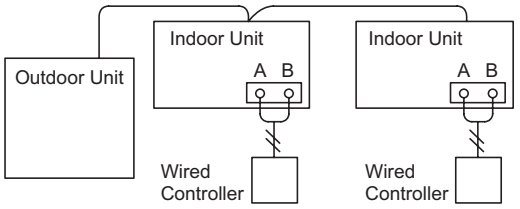


8. All electrical work should be performed in strict accordance with electrical schematics in the "Installation and Maintenance Manual".
9. If Power Supply Voltage (208V/230V) is introduced into the Communication Line:
   If 208V/230V are applied to the communication line at (Terminals 1 and 2 of TB2) 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.

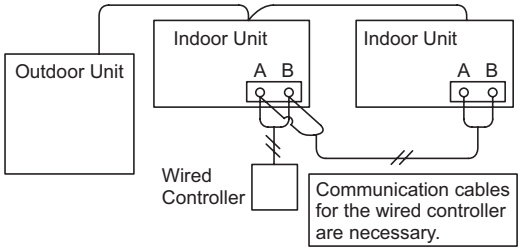
   Upon PCB recovery after the fuse has been replaced, if 208V / 230V is reintroduced into the communication line, the PCB will be seriously damaged and will not recover.



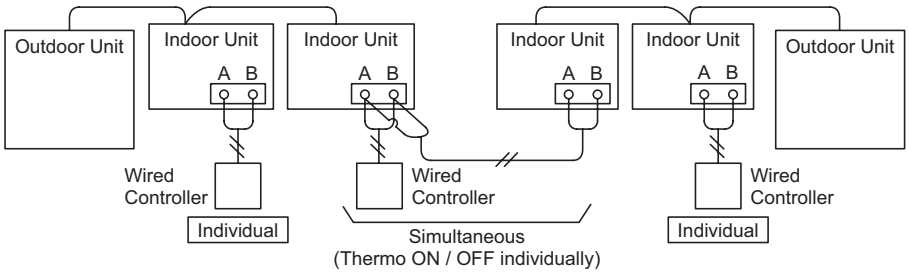
10. Wired Controller Connections
    a. Wired Controllers at each unit for an individual operation setting



    b. Single Wired Controller for an individual operation setting



    c. Wired Controller connections between different refrigerant 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.

NOTICE

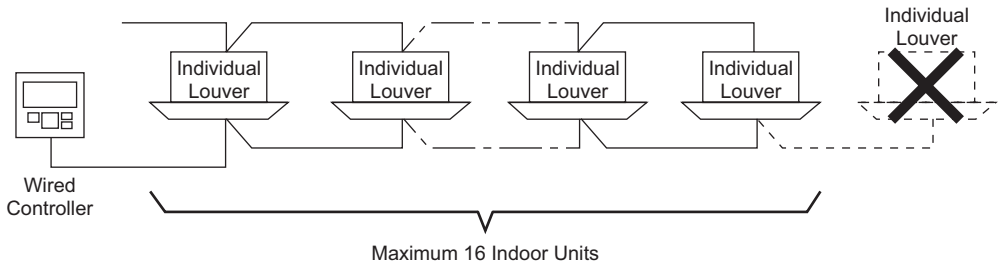
1. The DIP switch settings for the outdoor unit should be performed in accordance with the "Installation and Maintenance Manual" for the outdoor unit.
2. Be aware that communication cable for the wired controller is required in these instances:
   a. The following functions are set to the sub unit which 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 a 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 a single wired controller.

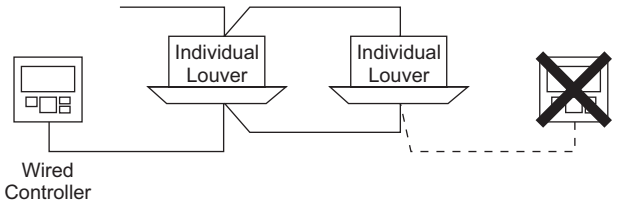
8.4 Wired Controller Cable

8.4.1 Cautions regarding Individual Louver Settings

1. Individual louver settings are available for up to 16 indoor units by a single wired controller. Connections for 17 or more indoor units are not possible.



2. Individual louver setting is NOT available with two wired controllers.

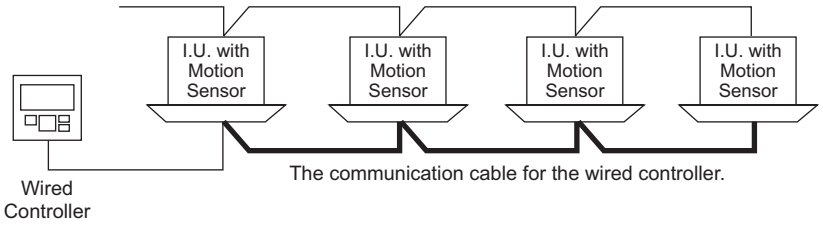


3. The individual louver function is not designed for blocking the air outlet. If the air outlets are required to be blocked, a three-way outlet set should be used.

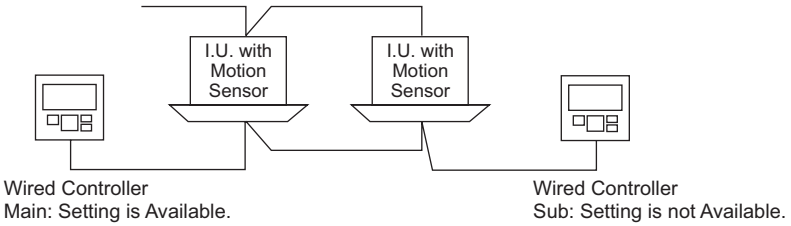
   NOTE:
   The air outlets cannot be closed individually by the individual louver setting.

8.4.2 Cautions for Decorative Panel with Motion Sensor Kit (SOR-NEC)

1. The decorative panel with a motion sensor can be connected to up to 16 indoor units by a single wired controller. The decorative panel equipped with a motion sensor is activated even if it is installed along with a decorative panel without a motion sensor.
2. When multiple indoor units equipped with a motion sensor are controlled by a single wired controller, then communication cables to the wired controller are required of all indoor units. If not, the indoor units equipped with a motion sensor is not 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 function can NOT correspond with the indoor unit without a wired controller.
6. The motion sensor cannot be set from the central controller.
7. 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 another refrigerant system which is set for a simultaneous operation.
8. The room thermostat function is not available.

Use Conditions and Precaution Statements

1. The motion sensor operates by detecting 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 a motion sensor in the following places. It can result in poorly identified or defined motion, or degraded performance of the motion sensor.

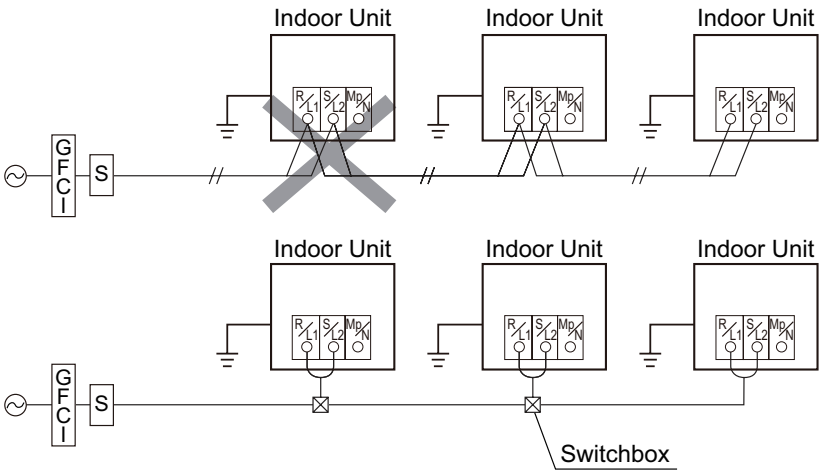
   - Where ambient temperature changes drastically.
   - Where excessive force or vibration is applied to the sensor.
   - Where static electricity or electromagnetic waves may generate.
   - Where there is interference of infrared light such as from gasses or mist is in the detecting area.
   - Where the lens for the sensor is exposed to high temperature and humidity for a long time.
   - Where fluid or corrosive gases exist.
   - Where light such as sunlight or direct light affects the sensor.
   - Where hot air from a heater, or something similar, directly affects the sensor.
   - Where the airflow bounces back to the sensor after hitting obstacles such as shelf or locker.
   - Where blower devices such as a ceiling fan or ventilating fan affects the airflow from the indoor unit.
   - Where weather directly affects the surface of the sensor.
   - Where the lens surface may smudge or be damaged such as from a dusty environment.

     Detecting function will decrease if the lens for the sensor smudges.
     If this happens, wipe off smudges using a cotton swab soaked with 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 and this may cause malfunctions such as misdetection or undetectable motion.

2. 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 conditioned to the set temperature. When activity ceases, the unit is signaled to decrease operation and the ambient air temperature rises. Thus, energy efficiency is achieved.

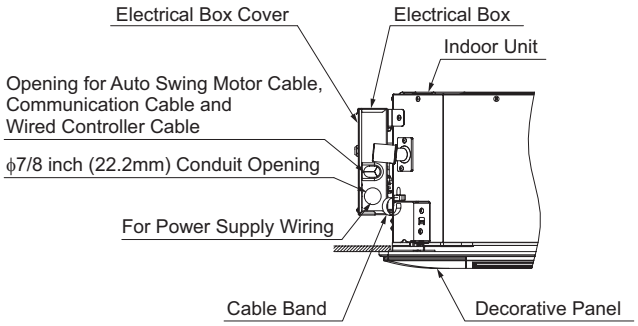
8.4.3 Caution for Electrical Wiring

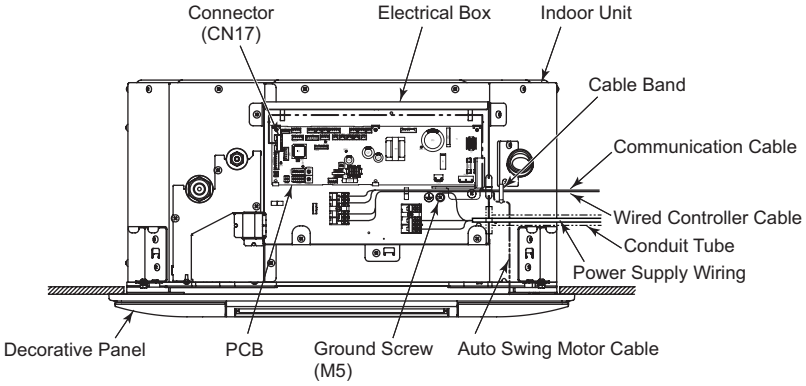
Do not connect the power supply wiring and the communication cable into one terminal.
A manual switchbox is required when communication cable is required.

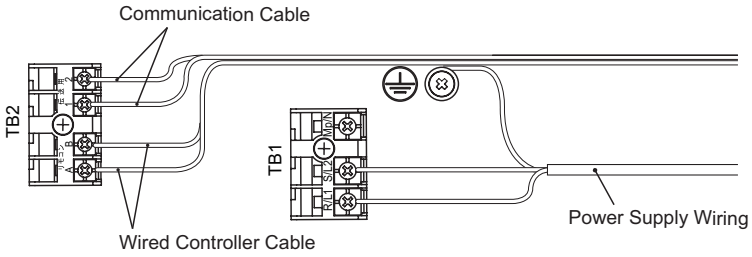


8.5 Wiring Connections

Wiring connections for the indoor unit are shown below.







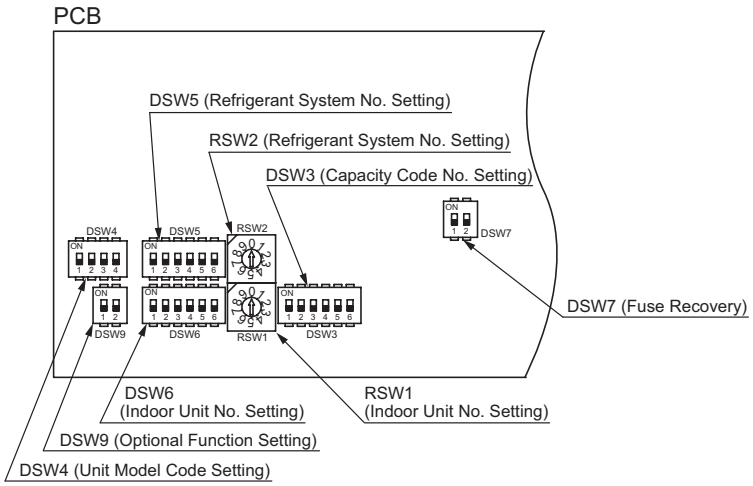
a. Remove the electrical box cover with the two screws.
b. Install the conduit tube into the conduit opening.
c. Secure all wires with the wiring support plate after the wires are installed through the wiring opening to the electrical box.
d. Secure all wires with a cable band at the pipe cover to avoid contact with other wires in close proximity with other components.
e. After all wiring is complete, exercise caution when reinstalling the electrical box.

⚠WARNING

Install and secure all electrical wiring correctly through the opening to the terminal blocks using the cable bands provided. Wiring should be spaced appropriately and firmly fastened to ensure against electrical short circuit, 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 are invalid and do not take effect.
2. Positions of DIP Switches on the PCB 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 number 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 ll System. Though the available numbers range from zero to 63, the applicable number for the 64th indoor unit in theory replaces 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
ON / OFF 1 2 3 4 5 6	Setting Position — Set by inserting slotted screwdriver into the groove.	DSW6: ON / OFF 1 2 3 4 5 6 — Set No.1 Pin at ON side
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).		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.

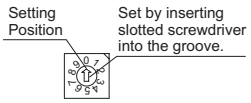
Indoor Unit Capacity (MBH)	8	12	15	18
Setting Position	ON 1 2 3 4 5 6 OFF	ON 1 2 3 4 5 6 OFF	ON 1 2 3 4 5 6 OFF	ON 1 2 3 4 5 6 OFF

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

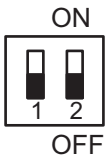
ON
1 2 3 4
OFF

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

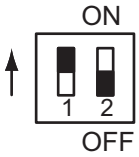
Refrigerant System No. Setting

DSW5 (Tens Digit)	RSW2 (Units Digit)	Ex.) Set at No.5 Cycle
		 Set All Pins OFF  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 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. Factory settings are all in the OFF position.

NOTES:

- The solid square "■" symbol signifies the "ON" and "OFF" positions for DIP switches. The diagrams show original factory settings.
- When the unit number and the refrigerant system are set, record the unit number and refrigerant system 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 High Speed Setting

- This function is used to set the airflow volume higher than normal airflow volume. This is used for high ceiling areas onsite. Set the 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
008 and 012 Type	015 and 018 Type	
Less than 8.2ft.	Less than 8.9ft.	Standard
8.2 - 9.5ft.	8.9 - 10.2ft.	High Speed 1
9.5 - 10.5ft.	10.2 - 11.5ft.	High Speed 2

Follow the procedure for changing the setting in Section 8.11, "Function Selection by Wired Controller" of the manual.

8.8 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.

*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.

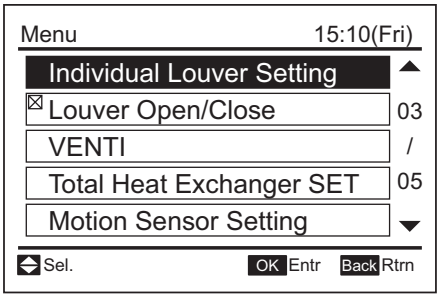
8.9 Individual Louver Settings (Number of Louver Outlets)

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 procedures. The number of individual louvers can be set when each of the louver outlets (louver outlet numbers 1 - 4) is set as the louver outlet number 1.

Individual Louver Setting Procedure

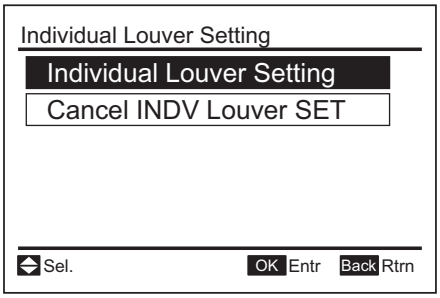
1. Press and hold “Menu” during the normal mode (when unit is operated).
   The menu is displayed.

2. Select “Individual Louver Setting” from the Menu and press “OK”.
   The individual louver setting is displayed.

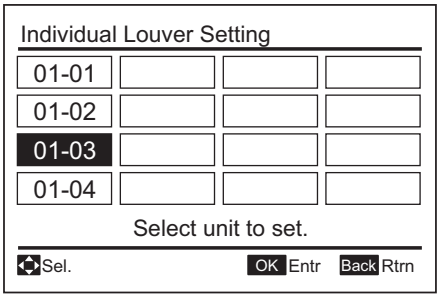


To Next Page

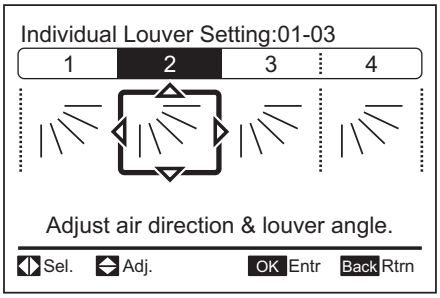
3. Select “Individual Louver Setting” from the Individual Louver Setting screen and press “OK”.



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 Step 5.)

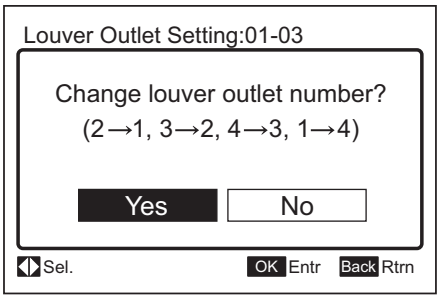


5. Press “◁ ▷” and select the louver direction.
The selected louver is opened and the other louvers are closed.



6. Press “Menu” while “Back/Help” is pressed.
The confirmation screen will be displayed.

7. Select “Yes” and press “OK”. Screen of Step 5 (above) is displayed after the setting change is confirmed.
If “No” is selected and “OK” is pressed, the screen returns to Step 5 (above).
   - Regarding the “Individual Louver Setting”, the louver selected at Step 5 (above) is set as “Number 1” and the other louver numbers are changed automatically as shown at the 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 using a single wired controller.

8.10 Control of Dew Condensation Prevention

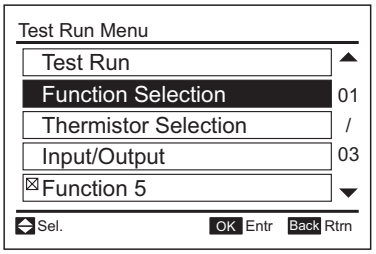
This function limits the occurrence of condensation around louvers. Condensation can occur when the air conditioner has run in cooling mode over a prolonged period of time at 86°F DB (30°C DB) and a high rate of humidity (relative humidity: approximately 80%). If there is any anticipation of upcoming operation under these conditions, set optional function K8 to "01" on the function selection menu to safeguard against condensation. Refer to the "Installation and Maintenance Manual" of wired controller for details.

8.11 Function Selection by Wired Controller

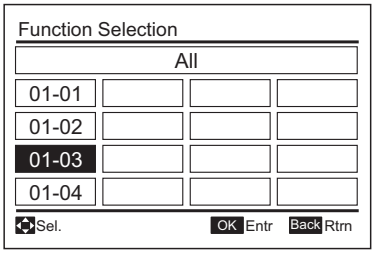
Each function can be selected with the wired controller. Refer to the "Installation and Maintenance Manual" for wired controller and the "Service Manual" for indoor units for details.

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

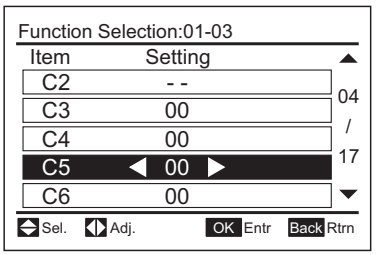
(2) Select “Function Selection” from the test run menu and press “OK”.



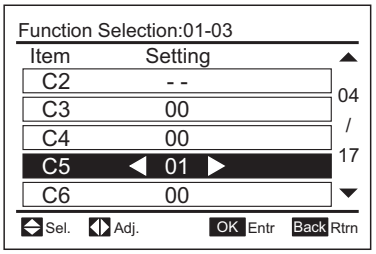
(3) Select the indoor unit by pressing “△ ▽ ◁ ▷” and press “OK”.
(This screen is NOT displayed when the number of indoor unit connected with the controller is 1 (one).
In this case, (4) is displayed.)
Press "All" to select all the indoor units connected to the wired controller.



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



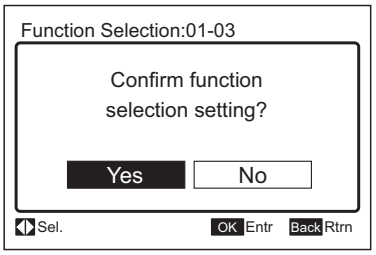
(5) Press “◁ ▷” and change the setting.



(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.



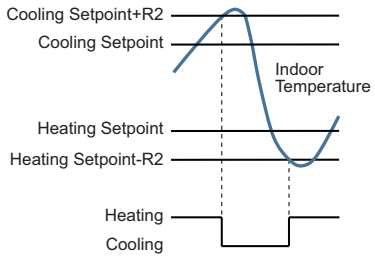
(Figure for Function Selection)

To set other units, press "Back/Help" at (4), (5) so that the screen returns to (3).
(If the number of indoor units connected with the controller is 1 (one), the screen returns 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
High Speed Setting	Ceiling Height of 008 and 012 Type		C5	ft. (m)	Less than 8.2 (2.5)	8.2-9.5 (2.5-2.9)	9.5-10.5 (2.9-3.2)								
	Ceiling Height of 015 and 018 Type				Less than 8.9 (2.7)	8.9-10.2 (2.7-3.1)	10.2-11.5 (3.1-3.5)								
Circulation Function at Heating Thermo-OFF			b2	-	Not Available	Available									
Control of Dew Condensation Prevention			K8	-	Not Available	Available									
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 Adjustment (During card key removal, setpoint is set back)			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 displayed.

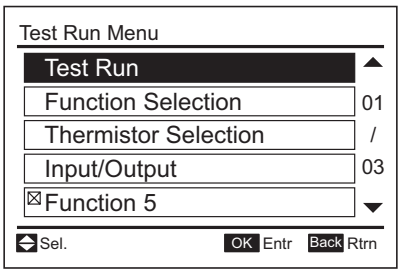
(A)



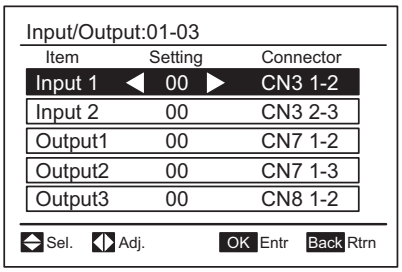
8.12 Setback Operation

(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 is displayed.

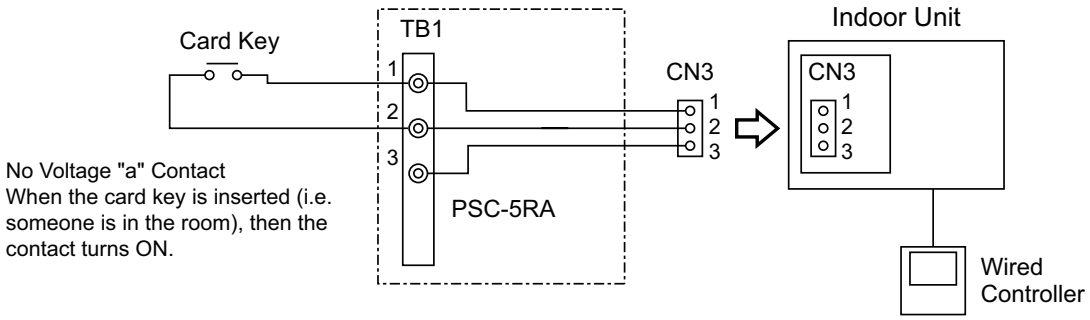
(2) Select “Input/Output” from the Test Run menu and press “OK”.



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



(4) Build a circuit such as shown below.



(5) Temperature adjustment for the setback function can be selected on the wired controller.
Refer to Section 8.11, "Function Selection by Wired Controller" of the manual 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 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”. If this happens, 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, make 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 8.6 “DIP Switch Settings”.

9.2 Test Run

After all installation work is completed, a test run should be performed.

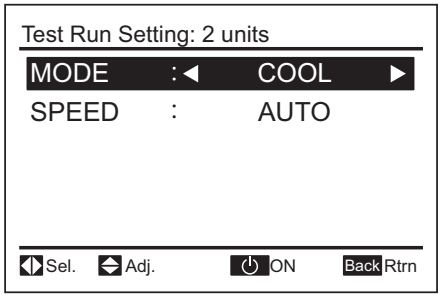
1. Check to ensure that any stop valves (gas and liquid) for the outdoor unit are fully opened.
2. Whenever indoor units are connected to the VRF system, perform the test run for the indoor units one-by-one sequentially and then check the refrigerant piping system and the electrical wiring system for 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 problem. The following procedures show 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 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 is 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 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 time period.)
  - 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 settings 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 is set automatically.

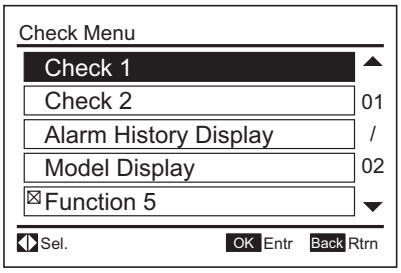
c. Press “△” or “▽”, select “LOUV.” and select “ ” (auto-swing) by pressing “◁” or “▷”. The auto swing operation will start. Check the operating sound at the louvers. If abnormal sound is not generated, press “◁” or “▷” again to stop the auto swing operation. If abnormal sound is generated from the louvers, remove the face panel and adjust the louver accordingly.

d. Verify that the motion sensor is operating correctly as in the following steps (if there is a decorative panel with a 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.

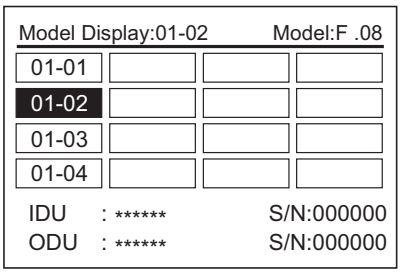
Select "Check 1" at the Check Menu screen and press "OK".

“A”



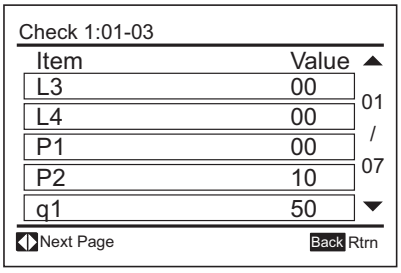
2. Screen “B” is displayed.
(This screen is NOT displayed when only one indoor unit is connected to the wired controller. In this case, screen “C” is displayed.)

“B”



3. Select the indoor unit by pressing “△ ▽ ◁ ▷” and press “OK”.
The Check Data screen “C” is displayed.

“C”

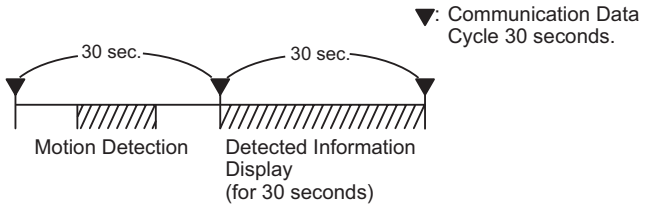


4. Press “△ ▽” to change the screen until it displays the check screen “q2” to "q6".

Checking the Motion Sensor

1. Perform a motion detection action (such as waving a hand) under the motion sensor of the selected indoor unit for approximately 10 to 15 seconds.
2. Check the value of “q3” to "q6" after 30 seconds(*1) from starting the motion detection at Step 1. The detection information from the motion sensor against the motion detection is displayed at 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.



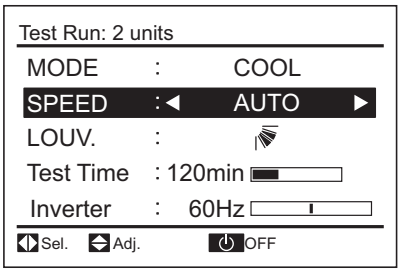
NOTE:
Refer to the operation manual for indoor unit settings, setup of the motion sensor. (“Motion Sensor Setting”, “If Absent” and “Check Interval” can be set.)

3. Check that the value of “q3” to "q6" is neither 0% nor 100%.
   If the value displayed is 0% or 100%, repeat the procedures from Step 1. If the same value reappears, it may be a malfunction of the motion sensor.

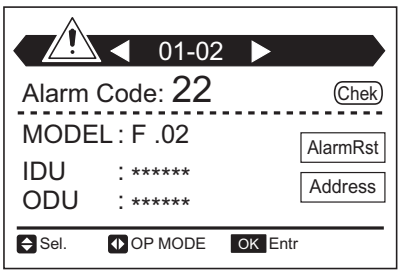
e. Though temperature recordings by the thermistors are invalid during the test run phase, the protection devices/functions are valid.

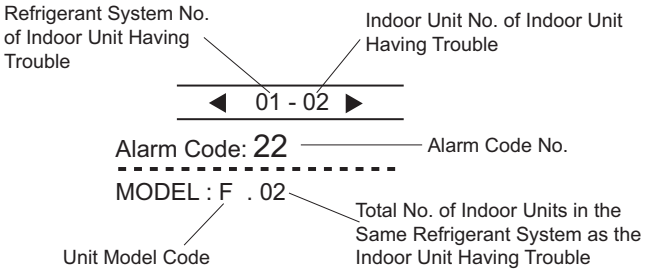
f. For VRF System
   According to the label; “Checking Method by 7-Segment Display” affixed to the inside of the front cover of the outdoor unit, check temperature, pressure, and operation frequency, and interconnected indoor unit numbers by 7-Segment displays.

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 “▷”.



- 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 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 unit	Indoor unit number duplicated in same refrigerant system.
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 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 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.
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 manual:

1. Results of a leak test all piping and connections
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.

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