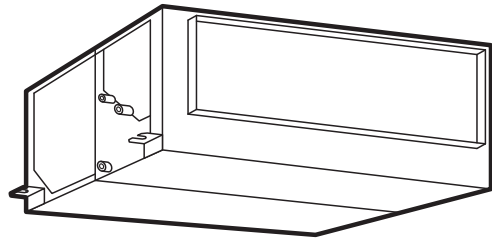


Installation and Maintenance Manual

***INVERTER-DRIVEN
MULTI-SPLIT SYSTEM
HEAT PUMP
AIR CONDITIONERS***

Type	Model
DOAS (Dedicated Outdoor Air System)	(H,Y)DOA096B21S



IMPORTANT:

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

P00860Q

Important Notice

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

Temperature

		Maximum	Minimum
Outdoor Air	Cooling Operation	109°F DB (43°C DB)	68°F DB (20°C DB)
	Heating Operation	59°F DB (15°C DB)	20°F DB (-7°C DB)

DB: Dry Bulb, WB: Wet Bulb

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

Product Inspection upon Arrival

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

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1. Introduction

Read following sections carefully before installing this product.

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



Provide this information and the warranty must be provided to all installers and users.

Ask end users to maintain copies for future reference.


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

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

2. Safety Instructions

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

General Precautions

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

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

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

NOTICE

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

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

Installation Precautions

⚠ WARNING

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

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

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

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

Refrigerant Precautions

WARNING

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

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

Electrical Precautions

WARNING

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

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

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

CAUTION

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

NOTICE

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

Electrical Installation

WARNING

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

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

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

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

3. Before Installation

3.1 Control Mode

- (1) This unit has two types of control mode which can keep either the Indoor temperature or the discharge temperature to be more or less the temperature setpoint determined by wired controller. Choose a suitable control mode according to the installation location and purposes. Refer to Section 8.7 "Setting of Control Mode" for details about setting.

Perform installation work and the setting of the units according to the table below.

Control Mode		Indoor Temperature Control (factory-setting)	Outlet Air Temperature Control
Details		This function controls operation to keep the indoor temperature almost at the set temperature on the wired controller.	This function controls operation to keep the discharge temperature almost at the set temperature on the wired controller.
Available Combination with Other Indoor Unit		Standard indoor unit	Only DOAS set the function of outlet air temperature control
Detection of Temperature		A remote sensor or a thermistor built in wired controller is necessary.	Nothing is necessary.
Setting of Indoor Unit	Control Mode (Refer to Section 8.7.1 to 8.7.4)	Turn OFF No.3 pin (DSW8). AND Set the function selection to "Cd:00" by optional wired controller. (Both of them are factory-setting.)	Turn ON No.3 pin (DSW8). OR Set the function selection to "Cd:01" by optional wired controller.
	Connected Outdoor Unit Type (Refer to Section 8.8)	According to the outdoor unit type.	
Setting of Outdoor Unit (Refer to Section 8.7.5)		No setting.	Set the function setting to "FT:02" by outdoor PCB.

3.2 Combination of Outdoor Unit and Indoor Unit

Indoor units can be connected with the outdoor unit (VRF system).

Combination of Outdoor Unit and Indoor Unit	
DOAS only	Total capacity of DOAS is 100%~145% of the outdoor unit.*2)
DOAS + Other Standard Indoor Unit	Capacity of DOAS shall be calculated by increased 1.5 times. AND Total capacity of indoor unit (including DOAS) shall be within capacity range of connected outdoor unit.

*1) DOAS can not be connected with Heat Recovery system.

*2) When connected outdoor unit is Less Module type [Model: (H,Y)VAHP_B(3,4)1LM], total capacity of DOAS shall be within 100%~120% of the outdoor unit.

*3) When connecting multiple DOAS and/or other standard indoor unit to the outdoor unit, be sure to operate all indoor units simultaneously.



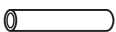


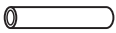
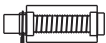



In addition, it is recommended that only connect one DOAS to the outdoor unit.

3.3 Transportation and Handling

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

3.4 Factory-Supplied Accessories

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

Accessory	Qty.	Purpose
Washer (M10) 	8	For Unit Suspension
Hose Clamp 	1	For Drain Pipe Connection
Pipe Insulation 	1	For Refrigerant Liquid Piping Connection ID 1 inch (26mm)
	1	For Refrigerant Gas Piping Connection ID 1-1/8 inches (28mm)
Cord Clamp 	5	For Fixing PVC Tube
Cord Clamp 	8	For Refrigerant Piping Thermal Insulation
PVC Tube 	2	For Separating Transmission Wirings and Wired Controller Wirings from Power Supply Wirings ID 1/2 inch (12mm)
Drain Hose 	1	For Drain Pipe Connection
Vibration-proof Rubber 	8	For Unit Suspension
Remote Sensor (*) 	1	For Detecting Indoor Temperature
Screw (M4) (*) 	1	For Fixing Remote Sensor

(*): Only for "Indoor Temperature Control" mode.

NOTICE

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

3.5 Necessary Tools and Instrument List for Installation

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

NOTE:

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

4. Installation Location

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

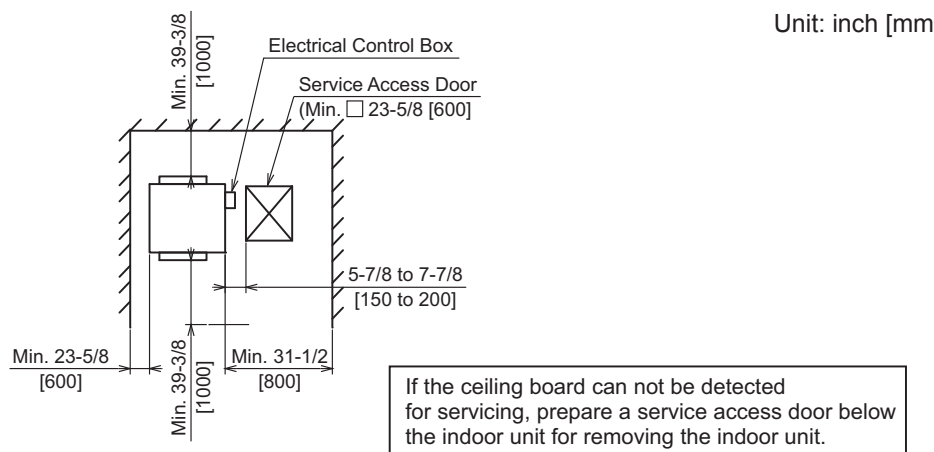


Figure 4.1 Operation and Installation Space

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

5. Installation Work

5.1 Suspension Bolts

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

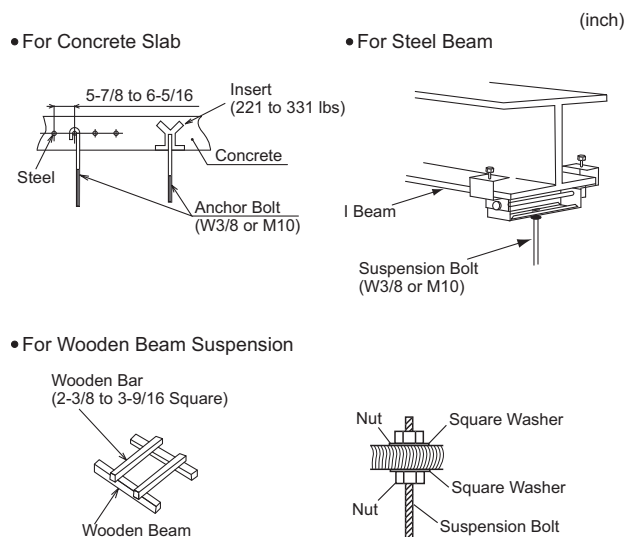


Figure 5.1 Mounting of Suspension Bolts

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

Technical drawing of the rear view of the condenser unit, showing dimensions and connection points. The drawing includes the following labels and dimensions:

- Top Dimensions:**
 - 52-3/8 [1330] (for Suspension Bolt)
 - 50 [1270]
 - 39-3/8 [1000]
 - 1-15/16 [50]
 - 1-9/16 [40]
 - 5-7/16 [138]
 - 1/2 [13]
 - 15/16 [24]
 - 1-1/8 [28]
- Left Side Dimensions:**
 - 2-9/16 x 1-3/8 [65 x 35] (for Suspension Bolt)
 - Refrigerant Gas Pipe Connection
 - Refrigerant Liquid Pipe Connection
 - Drain Pipe Connection
 - 9-15/16 [252]
 - 13-5/8 [346]
 - 18-7/16 [469]
- Right Side Dimensions:**
 - 40-3/16 [1021] (for Suspension Bolt)
 - 42-1/16 [1069]
 - 5/8 [16]
 - 1 [25]
 - 7/8 [23]
- Bottom Dimensions:**
 - 60-φ1/8 [3] Around the Flange
 - 41-5/16 [1050]
 - 1-15/16 [50]
 - 4-7/16 [113]

5.3 Mounting Indoor Unit

Field-Supplied Parts

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

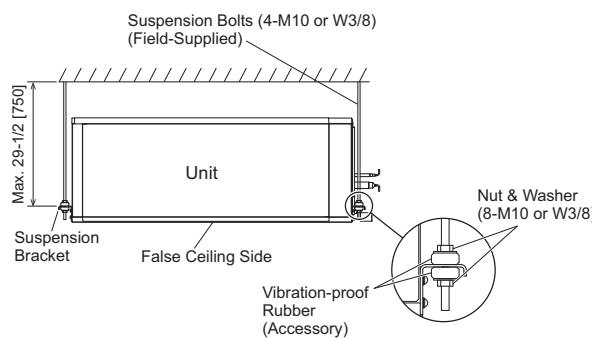


Figure 5.3 Mounting Indoor Unit

- (1) Prepare the suspension bolts, washers, nuts and vibration-proof rubbers, as shown in Figure 5.4.

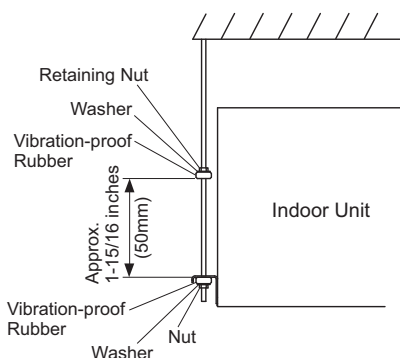


Figure 5.4 Suspension Bolts and Nuts

- (2) Suspension Indoor Unit

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

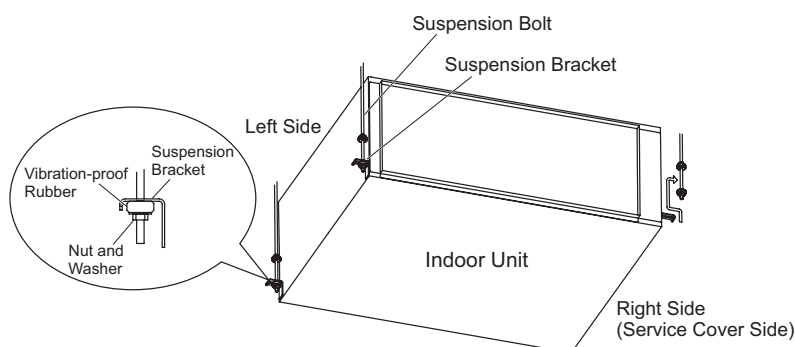
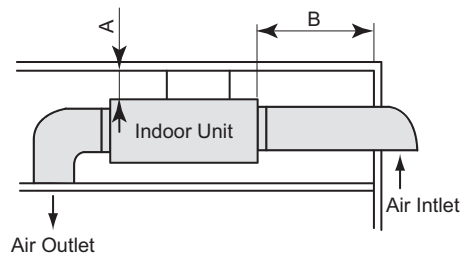


Figure 5.5 Suspended Indoor Unit

- (3) Install the indoor unit with sufficient space between the unit and the ceiling or wall as shown below. Do not use any duct made of flammable materials.



	Material of Wall, Frame	
	Flammable	Nonflammable
A	Min. 39-3/8 (1,000)	Min. 3-15/16 (100)
B	Min. 23-5/8 (600)	Min. 1-15/16 (50)

5.4 Adjusting of Unit Level

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

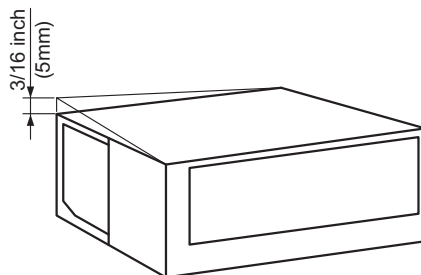


Figure 5.6 Adjusting of Unit Level

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

NOTE:

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

5.5 Connecting Supply Duct

- (1) Because the air filter is not included as accessories of the unit, install optional air filter which has higher than 50% of dust collecting efficiency.
- (2) If reducing the noise occurred by indoor unit is necessary, install silencers (field-supplied).
- (3) The canvas ducts shall be connected between the indoor unit and the supply duct as a figure shown below in order to avoid abnormal sound vibration.
- (4) Attach the vibration-proof rubber to suspension bolts in order to avoid abnormal sound vibration.
- (5) Design the duct arrangement as "Unit External Static Pressure = Duct Pressure Loss + Suction/Discharge Pressure Loss". If the duct design is not appropriate, a bigger noise, splashed the water etc. will occur. The damper or the duct fan etc. shall be used to adjust the fresh air volume to let the unit external static pressure be more or less within pressure loss of duct.
- (6) If pressure loss of duct is excessive, change the installation location of the unit or the shape of ducts in order to let the design arrangement be within the unit external static pressure.
- (7) Make sure that a service access panel is mounted on the ceiling for the service of electrical parts and motor etc.. If the service access panel can not be mounted on the ceiling, an alternative opening shall be prepared on the ceiling as shown figure above. It shall be a suitable size for the indoor unit to be installed and removed easily and for a fan, a heat exchanger and a drain pan to be installed through it.
- (8) Install thermal insulations over the duct to prevent it from condensation.
- (9) Do not install the duct in following places.
 - Places where is subject to directly radiant heat from the sunlight or heat sources.
 - Places where corrosive gases, volatile gases and explosive gases are generated.
 - Places where air intake of such as a kitchen etc. is faced on.In addition, install a protection hood and wrap the air inlet with seal materials (such as a net) to protect the duct from any insects or small animals.
- (10) Conduct the periodic maintenance of air filter and periodic check of the clogging of drain piping carefully when the indoor unit is installed near busy traffic. Especially if installing in places where strong salty wind blows (coast region, etc), consult with your distributor for countermeasures about the a periodic maintenance and contract to replace a heat exchanger.
- (11) If the outdoor temperature is low, "Defrosting Operation" is performed automatically and the air discharged from the air outlet will be colder. In general, moreover, the temperature of air flows will be decreased when heating operation is started up. Therefore, make sure to choose the location with care for air outlet and air flow direction.

- (12) The DOAS unit is designed to process outdoor air intake and should not be used as a standard indoor unit. If the internal load is higher, additional indoor units need to be added.
- (13) The DOAS unit is designed to intake outdoor air only.
Indoor air is not recommended to be returned to the DOAS unit.
- (14) Install the ducts with the its air inlet being a lower level than the indoor unit to protect the unit from rain.

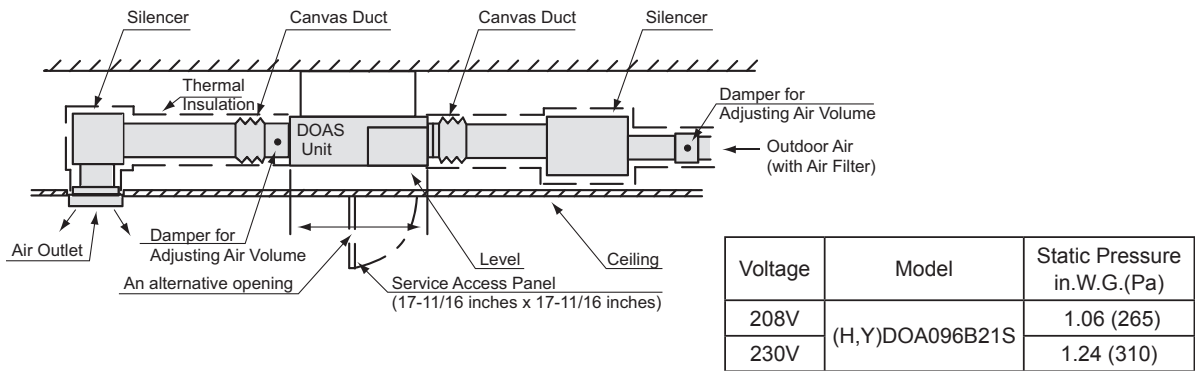
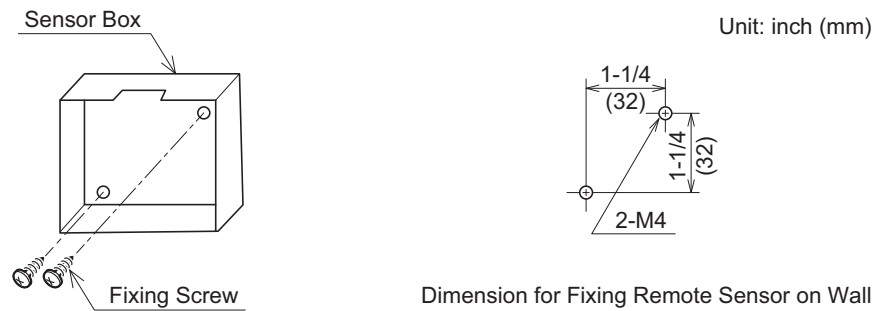


Figure 5.7 Duct Connection Example

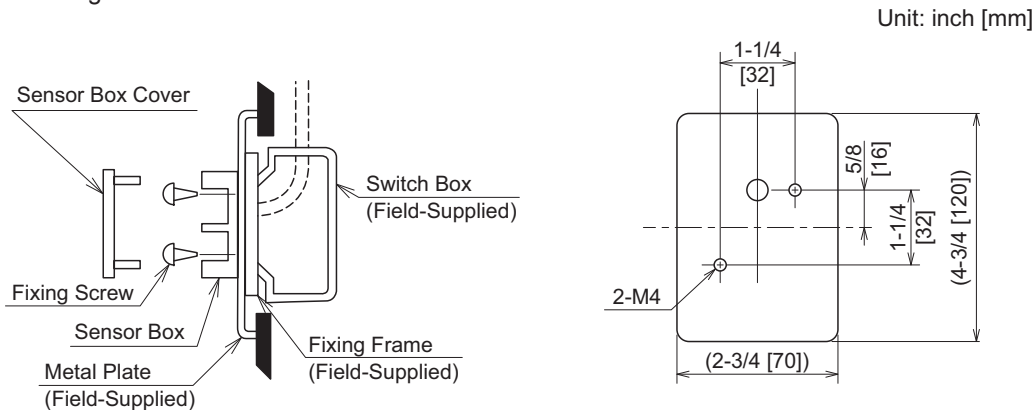
5.6 Installation of Remote Sensor

(1) Installing Remote Sensor on Wall



- Cut out the wiring holes in the sensor box and lead the wires for the sensor through the holes.
- Secure the sensor box on the wall with the two screws.
- If the sensor box cannot be secured on the wall with the screws, use double-sided tapes.

(2) Concealing Wires inside Wall



- Make the holes for securing the sensor box on the metal plate (field-supplied) as shown in the figure on the right, and secure the sensor box to the plate with screws.
- Make sure that the hole for air intake on the sensor box remains unobstructed.

5.7 Installation of Wired Controller (Optional Parts)

Refer to "Installation & Maintenance Manual" of optional wired controller.

5.8 Setting of Wired Controller and Remote Sensor

When the function of Indoor Temperature Control is set, a remote thermistor built in optional wired controller or remote sensor is necessary. Determine the installation location of the wired controller and remote sensor according to below.

Do not install the wired controller and remote sensor in following places.

- Places where the average temperature of indoor rooms can not be detected.
- Places where are directly subject to the sunlight.
- Places where is near heat sources.
- Places where are subject to air directly flows from air outlet.
- Places where are subject to the outdoor air by opening door etc.

Determine how to detect indoor temperature as follows, paying attention the installation location.

(1) Remote Sensor

Connect remote sensor to this unit. The setting is not necessary.

(2) Remote Thermistor Built in Optional Wired Controller

Connect optional wired controller to this unit. Select "Function Selection" menu by optional wired controller and follow as shown below.

Item Code	Optional Function	Setting Condition
C8	Thermistor of Wired Controller	01

(3) Combination of Remote Sensor and Remote Thermistor Built in Optional Wired Controller

Connect remote sensor and optional wired controller to this unit. Select "Function Selection" menu by optional wired controller and follow as shown below.

Item Code	Optional Function	Setting Condition
C8	Thermistor of Wired Controller	02

It works by calculating the average of the two different temperatures between the remote thermistor built in optional wired controller and remote sensor.

NOTES:

1. When the function of Indoor temperature control is set and the operation without optional wired controller or remote sensor is tried, alarm "16" and "17" will be indicated and operation will be not available. (Even if the function of Outlet Air Temperature Control is set without them, alarms are not indicated)
2. Refer to "Installation and Maintenance Manual" of the optional wired controller for details.

6. Refrigerant Piping Work

DANGER

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

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

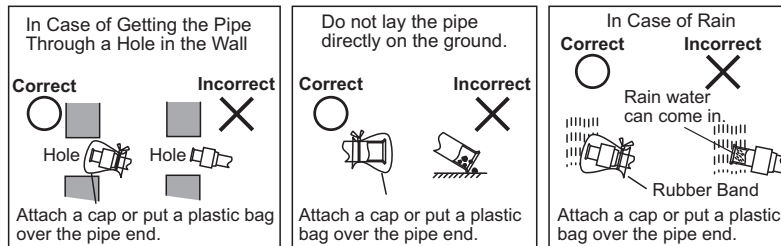
6.1 Piping Materials

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

Table 6.1 Piping Size

Model	inch (mm)	
	Gas Piping	Liquid Piping
(H,Y)DOA096B21S	$\phi 7/8$ (22.2)	$\phi 3/8$ (9.52)

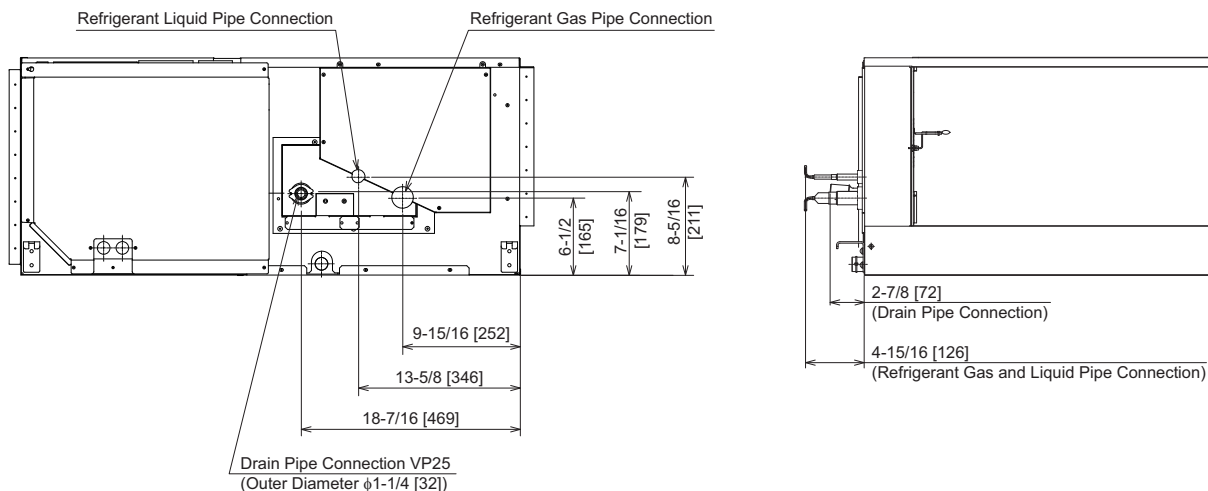
- (3) Prepare field-supplied copper pipes.
- (4) Select clean copper pipes. Make sure there is no dust and moisture inside.
- (5) The refrigerant oil for the refrigerant R410A is susceptible to moisture, an oxide film, and fatty oil. Take special care during the installation so that moisture, contaminations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



6.2 Piping Connection

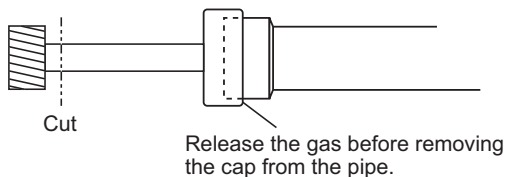
(1) Position of piping connection is shown below.

Unit: inch [mm]



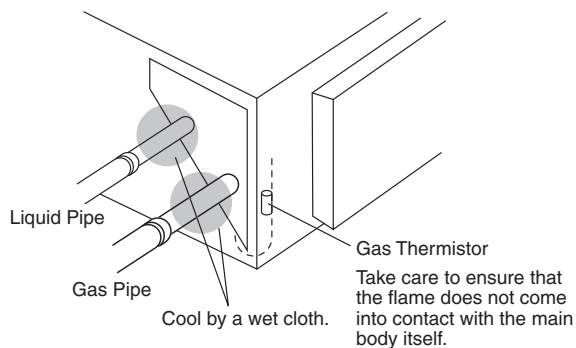
CAUTION

- Cut the pipe end before brazing to remove the cap, and discharge gas inside the pipe.
If not discharged, brazing material will be blown off.



- Pay attention so that the flame does not come into contact with the unit.

(2) Both the liquid refrigerant pipe and the gas refrigerant pipe have a thermistor for temperature detection. When brazing them to the indoor unit, cover and cool the pipes with a wet cloth so that the pipes will not be affected by the heat. Because the thermistor is attached near the side panel shown as the figure below, be careful not to affect the heat of brazing to the thermistor when brazing the gas refrigerant pipe. (If the gas refrigerant pipe is affected by the heat, it may cause malfunction.)



After brazing the pipes, check for leakage and then insulate the pipes. Wrap the connection between the pipe on the unit and the field-installed pipe with tape.

Figure 6.1 Brazing Pipes

- (3) After brazing, insulate the pipes after checking that there is no leakage.
At that time, be sure to cover the space between two insulating piece by insulation pipe (factory-supplied accessory).

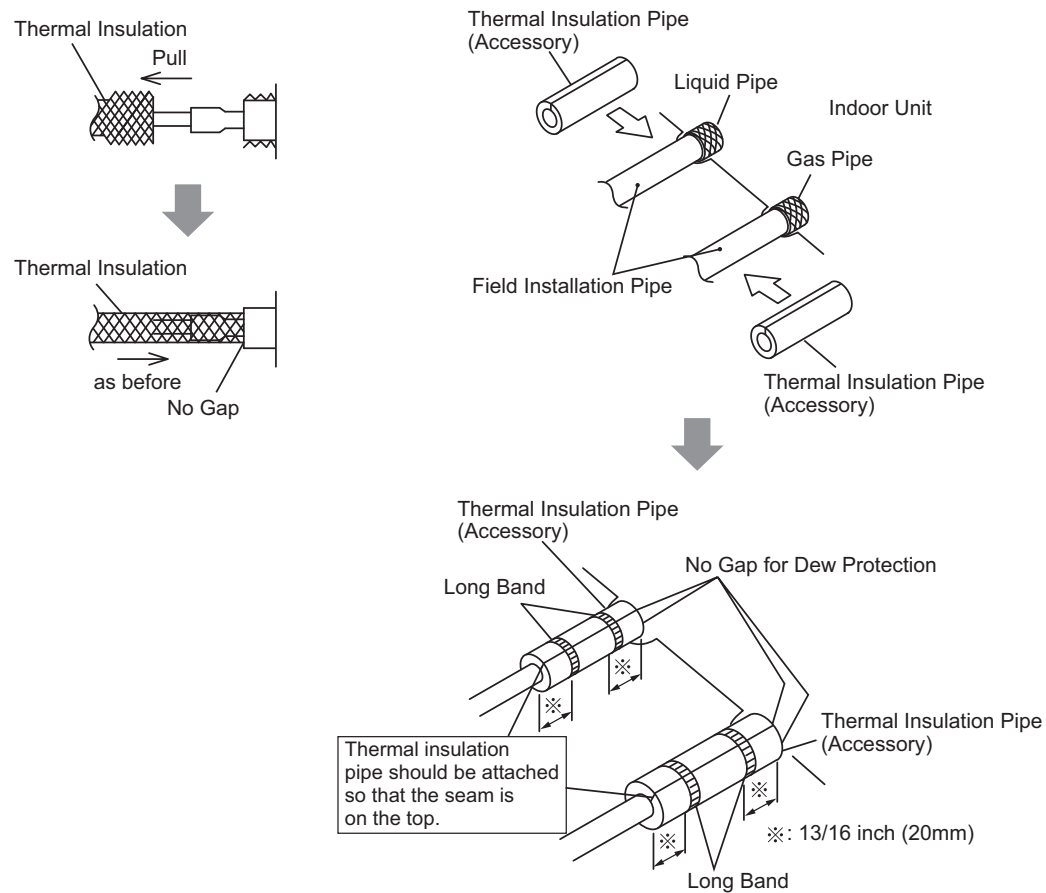


Figure 6.2 Insulating Pipes

- (4) Evacuation and refrigerant charging procedures should be performed according to "Installation & Maintenance Manual" of the outdoor unit.

! WARNING

Make sure that the refrigerant leak test has been performed. Refrigerant (fluorocarbon) for this unit is non-flammable, non-toxic and odorless. However if the refrigerant should leak and contact with fire, toxic gas will be generated. Also because the fluorocarbon is heavier than air, it settles near the floor, which could cause suffocation.

7. Drain Piping

! WARNING

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

NOTICE

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

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

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

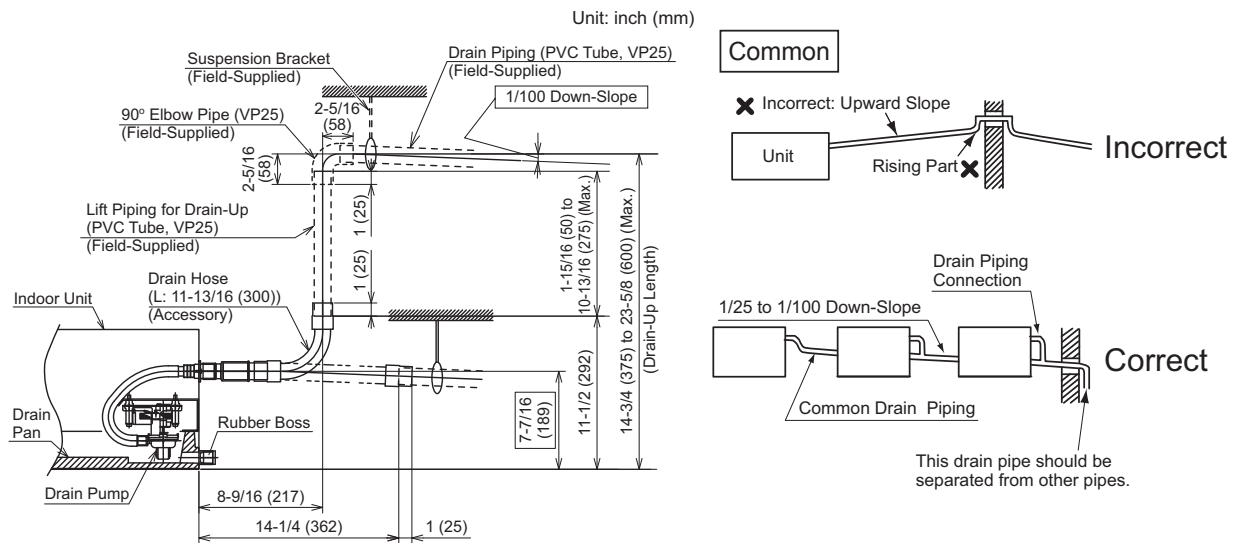


Figure 7.1 Drain Piping

NOTE:

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

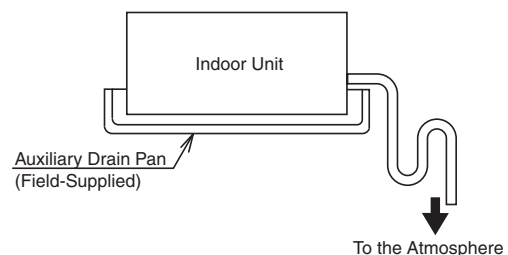


Figure 7.2 Auxiliary Drain Pan

NOTICE

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

Checking with the Float Switch

- a. Turn ON the power supply.
 - b. Pour 68 to 84oz (2 to 2.5 liters) of water into the drain pan.
 - c. Ensure that the water flows smoothly and no water leakage occurs. When water cannot be found at the end of the drain piping, check for leaks in main drain line if none are found repeat test until water is observed at end of main drain line.
-

8. Electrical Wiring

WARNING

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

M3.5: 0.9 ft·lbs (1.2 N·m)

M5: 1.5 to 1.8 ft·lbs (2.0 to 2.4 N·m)

CAUTION

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

8.1 General Check

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

8.2 Electrical Wiring Capacity

8.2.1 Field Minimum Wire Sizes for Power Supply

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

8.2.2 Details of Electrical Wiring Connection

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

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

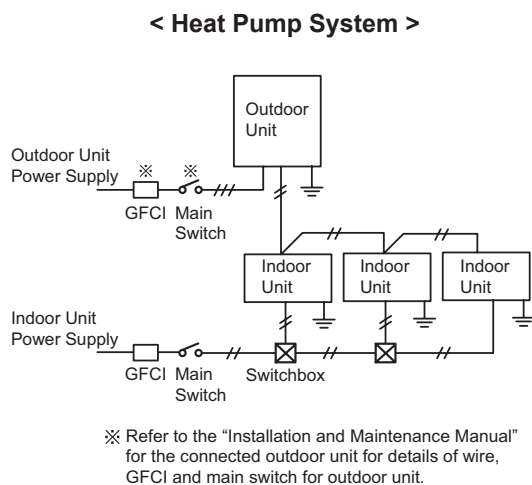


Table 8.1 Recommended Wiring Capacity and Size

Model	Power Supply	Minimum Wire Thickness [AWG (mm ²)]			GFCI <Ground Fault Circuit Interrupter>		Main Switch		MCA <Minimum Circuit Ampacity>
		Power Supply Wiring Size <Main>	Ground Wiring Size	Communication Cable Size	Nominal Current [A]	Nominal Sensitive Current [mA]	Nominal Current [A]	Fuse [A]	
(H,Y)DOA096B21S	1~, 208/230V 60Hz	18 (0.82)	18 (0.82)	18 (0.82)	15	30	15	15	4.3

NOTES:

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

NOTICE

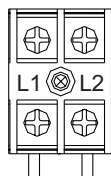
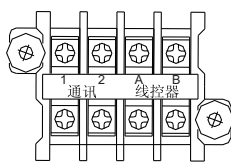
- Check for the recommended size GFCI shown in the table 8.1.
- Between indoor and outdoor units, use dual-conductor, AWG18 (0.82mm²) stranded copper cable for communication cable. Do not use any cable with more than two conductors. Twisted pair or shielded cable can be used in environments with excessive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

8.3 Position of Electrical Wiring Connection

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

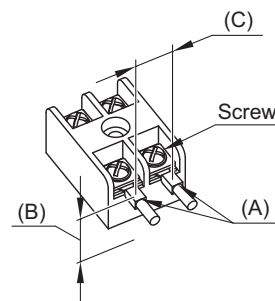
Tightening Torque for Terminals

Screw Size		Tightening Torque
TB1	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 Source Cable TB1	Terminal Block for Control Cable TB2
	

NOTICE

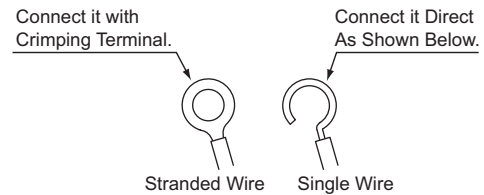
- Do not connect the main power supply wiring to the communication line (Terminals A, B, 1 and 2 of TB2). If these are connected, the printed circuit board (PCB) will be destroyed.
- Note the following for wire connections at TB1 and TB2:
 - (A) Attach a piece of insulation tape or sleeve at each terminal.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



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

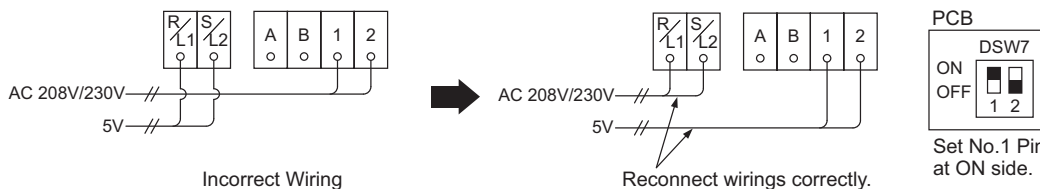
NOTE:

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



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

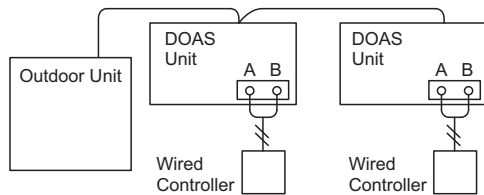
Upon PCB recovery after the fuse has been replaced, if 208V / 230V is reintroduced into the communication line, the PCB will be seriously damaged and will not recover.



(10) Wired Controller Connection

• VRF Systems

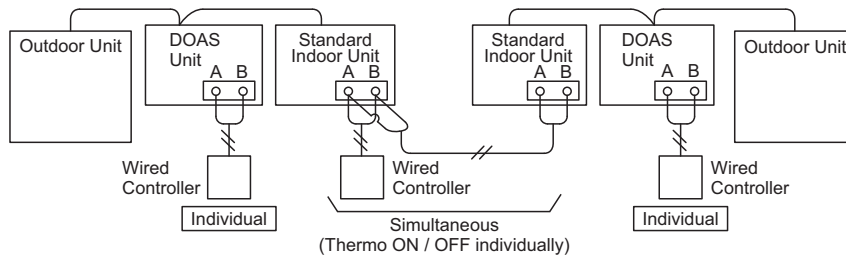
(a) Wired Controllers at each unit for individual operation setting



NOTE:

DOAS unit must be operated with single wired controller only.
Failure to do so can affect comfort and control.

(b) Wired Controller connections between different refrigerant systems



NOTE:

DOAS unit must be operated using single wired controller (CIW01) (individual) only.
Failure to do so can affect the comfort and control.

Thermo-ON: The outdoor unit and some indoor units are running.

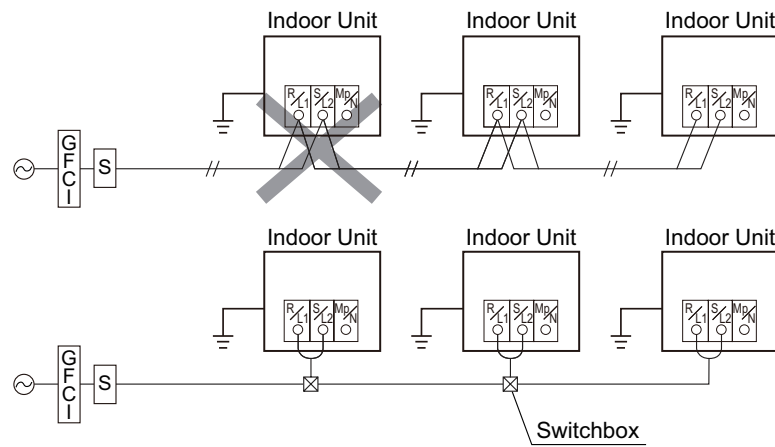
Thermo-OFF: The outdoor unit and some indoor units stay on, but don't run.

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 single wired controller.
 - c. The address for the indoor unit is changed from the wired controller.

< Caution for Electrical Wiring >

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

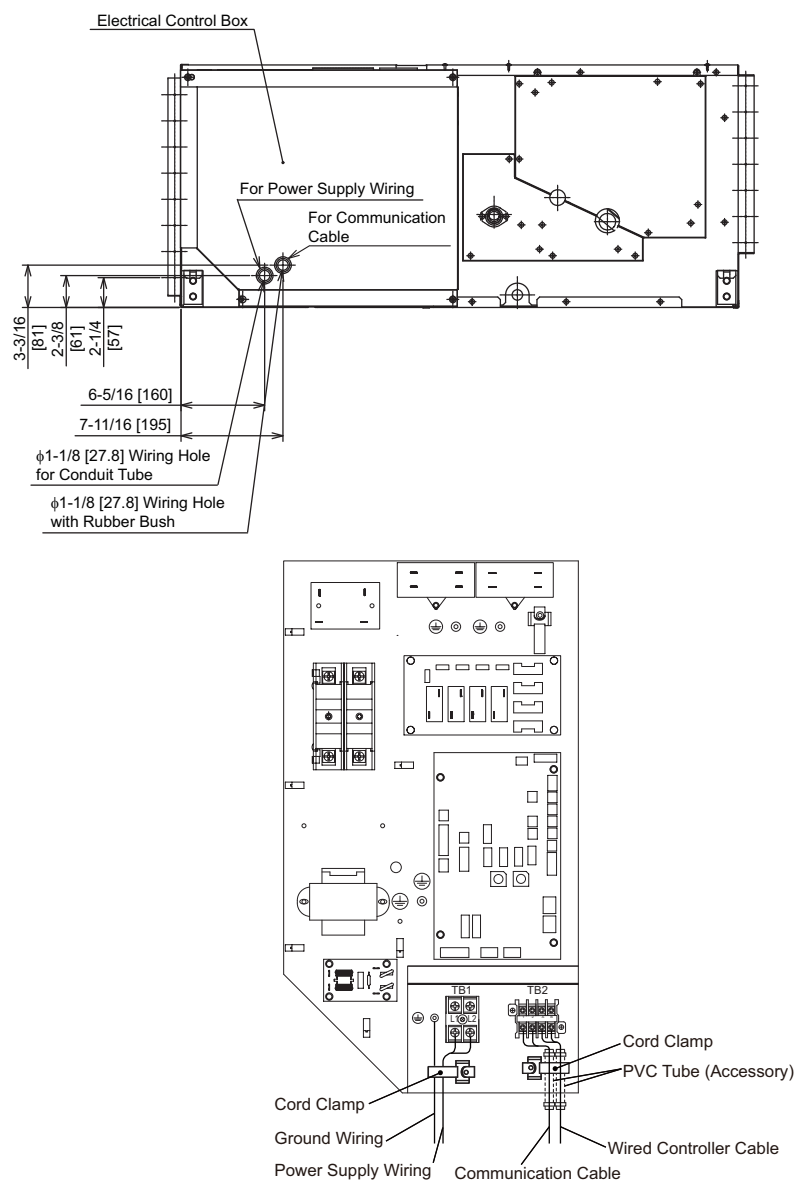


8.4 Wiring Connection

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

Produced in 2017 or earlier

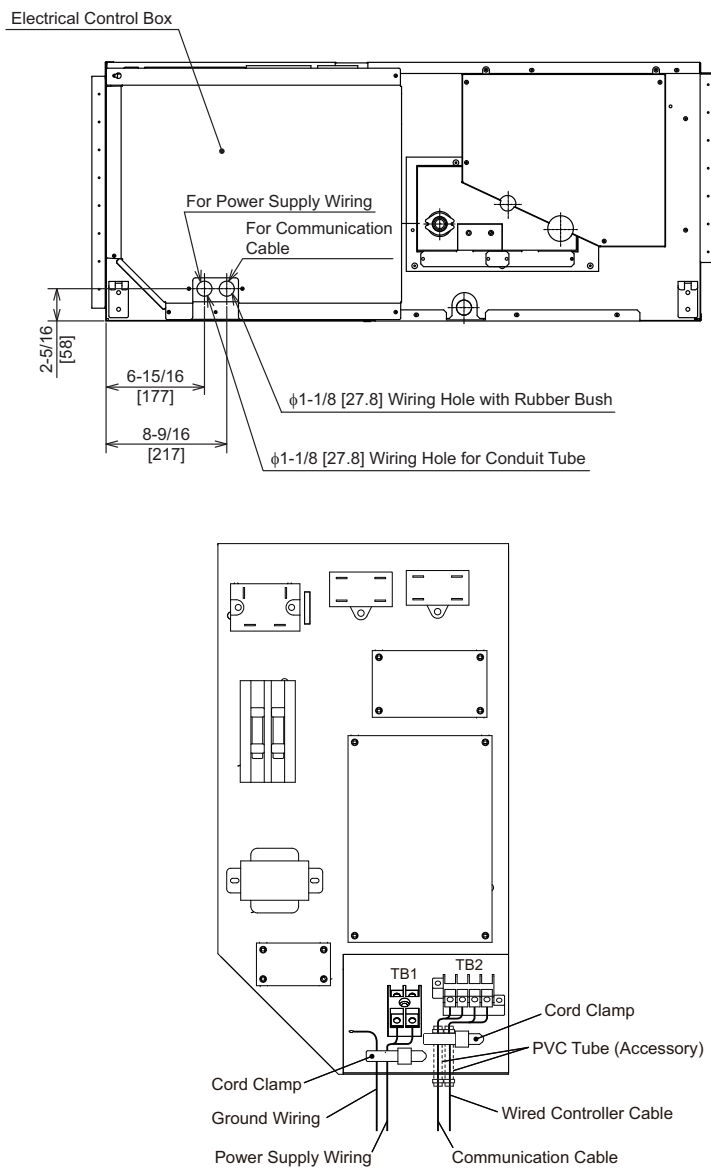
Unit: inch [mm]



Produced in 2018 or later

Electrical control box cover with cut-out panel

Unit: inch [mm]

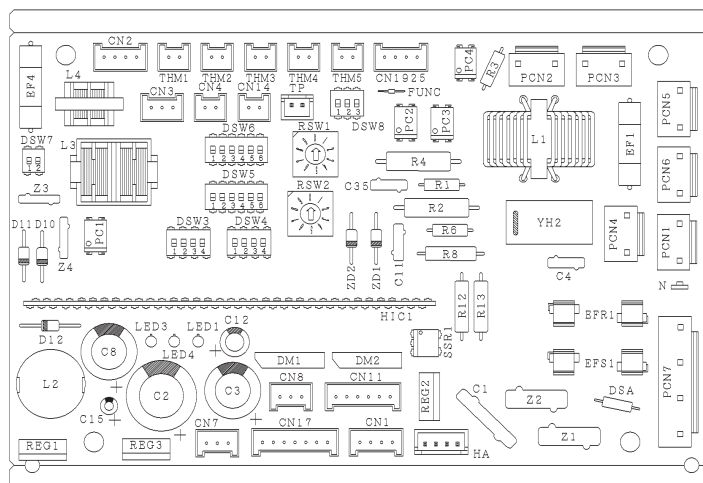


NOTE

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

8.5 DIP Switches Setting

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



- (3) Unit No. Setting (RSW1 & DSW6)

Setting is not required.

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

Unit No. Setting

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

- (4) Capacity Code Setting (DSW3)

No setting is required, due to setting before shipment. This switch is utilized for setting the capacity code which corresponds to the capacity of the indoor unit.



- (5) Unit Model Code Setting (DSW4)

No setting is required. It is for setting the model code of the indoor unit.



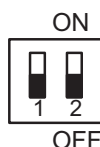
- (6) Refrigerant Cycle No. Setting (RSW2 & DSW5)
This setting is required. The unit arrives with all settings in the OFF position.

Refrigerant Cycle No. Setting

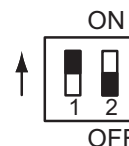
DSW5 (Tens Digit)	RSW2 (Units Digit)	Ex.) Set at No.5 Cycle
<p>Before shipment, DSW5 and RSW2 are set at "0".</p> <p>For the units supporting H-LINK II, the ref. cycle No. can be set for Max. 64 cycles. (No. 0~63)</p>		

- (7) Fuse Recover (DSW7)

* Factory Setting



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



- (8) Control Mode Setting (DSW8)

If the control mode type is "Outlet Air Temperature Control", this setting is required depending on the setting method of control mode.

Refer to Section 8.7 "Setting of Control Mode".

NOTES:

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

NOTICE

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

8.6 Function Selection by Wired Controller

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

< Selecting Thermistor for Detecting Indoor Temperature >

Refer to Section 5.8 "Setting of Wired Controller and Remote Sensor".

< Constant Air Volume Mode >

The airflow volume can be fixed with the item code of function selection set "b2" by optional wired controller, even when defrosting operation or hot start is performed. This function can help keep the balance of a supply/exhaust air volume. Therefore, if a ventilating fan is installed, it is useful.

Item Code	Optional Function	Setting Condition
b2	Constant Air Volume Mode	01

NOTE:

Because this mode is for constant airflow volume, a cold draft may discharge especially in a season when the Heating Operation is often used (defrosting operation and hot start is performed). Be careful of airflow direction when selecting the installation location. Consult with your customer.

8.7 Setting of Control Mode

The following procedure shows the setting by CIW01.

CAUTION

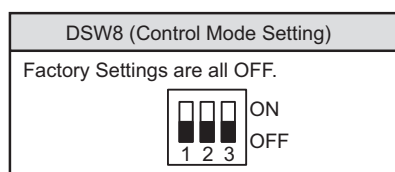
DOAS cannot set Outlet Air Temperature Control when combined with other standard indoor units.

The Indoor Temperature Control mode has been set at factory. It can be changed to Outlet Air Temperature mode, so comply with the following instructions according to the installation conditions and purposes. And the settings are necessary for both the indoor and outdoor unit. If either is failed to set, the Outlet Air Temperature mode is not available. Make sure to complete both settings. (Even if either is failed to set, the alarm does not go off.)

8.7.1 Setting of Indoor Unit by Optional Wired Controller

Turn ON the power supply (mains) and comply with the following procedure.

However, if the position of No.3 (DSW8: The Setting for Control Mode) is ON, the change of setting by optional wired controller is not available. Make sure to check it.



The "■" mark indicates position of DIP switches.

8.7.2 Function Selection and Input/Output Setting

<div>1. Press and hold “Menu” and “Back/Help” simultaneously for at least three seconds during the normal mode (when unit is not operated). The Test Run menu will be displayed.</div>	<div><div>Test Run Menu</div><div><div>Test Run</div><div>Function Selection01</div><div>Thermistor Selection/</div><div>Input/Output03</div><div>Elevating Grille Setting</div></div><div><div>Sel.</div><div>OK</div><div>Entr</div><div>Back</div><div>Rtrn</div></div></div>								
<div>2. Select “Function Selection” from the Test Run menu and press “OK”.</div>	<div><div>Function Selection</div><div><div>All</div><div>01-01</div><div>01-02</div><div>01-03</div><div>01-04</div></div><div><div>Sel.</div><div>OK</div><div>Entr</div><div>Back</div><div>Rtrn</div></div></div>								
<div>3. Select the indoor unit by pressing “△ ▽ ◀ ▶” and touch “OK”. (This screen is NOT displayed when the number of an indoor unit connected with the controller is "1". In this case, "4" will be displayed.)</div>	<div><div>Function Selection:01-03</div><div><div>ItemSetting</div><div>Cb◀ 00 ▶01</div><div>CC--/</div><div>Cd0023</div><div>CE00</div><div>CF00</div></div><div><div>Sel.</div><div>Adj.</div><div>OK</div><div>Entr</div><div>Back</div><div>Rtrn</div></div></div>								
<div>4. Press “△ ▽” and select the item "Cd".</div> <div>5. Press “◀ ▶” and change the setting from "00" to "01".</div> <div><table><thead><tr><th></th><th>Item Code</th><th>Setting Condition</th></tr></thead><tbody><tr><td>Indoor Temperature Control</td><td rowspan="2">Cd</td><td>00</td></tr><tr><td>Outlet Air Temperature Control</td><td>01</td></tr></tbody></table></div>		Item Code	Setting Condition	Indoor Temperature Control	Cd	00	Outlet Air Temperature Control	01	<div><div>Function Selection:01-03</div><div><div>ItemSetting</div><div>Cb0001</div><div>CC--/</div><div>Cd◀ 01 ▶23</div><div>CE00</div><div>CF00</div></div><div><div>Sel.</div><div>Adj.</div><div>OK</div><div>Entr</div><div>Back</div><div>Rtrn</div></div></div>
	Item Code	Setting Condition							
Indoor Temperature Control	Cd	00							
Outlet Air Temperature Control		01							
<div>6. Press “OK” so that the confirmation screen will be displayed.</div>	<div><div>Function Selection:01-03</div><div><div>Confirm function selection setting?</div><div>YesNo</div></div><div><div>Sel.</div><div>OK</div><div>Entr</div><div>Back</div><div>Rtrn</div></div></div> <div>(Figure for Function Selection)</div>								
<div>7. Select “Yes” and press “OK”. The Test Run menu will be displayed after the setting is confirmed. If “No” is selected, the screen will return to "4".</div>									
<div>8. Press “Back/Help” on the Test Run menu to return to the normal mode.</div>									

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



8.7.3 Setting by DSW8 (Control Mode) on PCB

CAUTION

Turn OFF all the power supply (mains) of indoor units and outdoor units before DIP switch setting. If not, the setting will be invalid.

- (1) Remove the electrical box cover according to Section 8 "Electrical Wiring", and Section 8.4 "Wiring Connection".
Refer to Section 8.5 "DIP Switches Setting" for the location of DSW8 (Control Mode).
- (2) Set DSW8 (Control Mode) on PCB according to the installation conditions and purposes, following the figure as shown below.

DSW8 (Control Mode Setting)

Indoor Temperature Control (Factory Setting)	Outlet Air Temperature Control
All shall be OFF.	No.3 shall be ON.
	

The "■" mark indicates position of dip switches.

- (3) Fix the electrical box cover again.

If the Outlet Air Temperature Control Mode is set by DSW8, the setting of optional wired controller automatically changes to the Outlet Air Temperature Control Mode ("Cd:01") as well. However, after that process, even if the change to Indoor Temperature Control mode is carried out by setting DSW8, the setting of optional wired controller still keeps the Outlet Air Temperature Control Mode. Therefore, setting of the Indoor Temperature Control mode ("Cd:00") by wired controller is necessary separately.

8.7.4 Setting of Indoor Unit

After setting the indoor unit for control mode, check to ensure that the range of the setting temperature on optional wired controller shall be within as shown in the table below. If the range of setting temperature are exceeded, it means a failure of setting. Set again by following the procedure of the setting the indoor unit for the control mode.

	Range of Setting Temperature	
	Heating	Cooling
Indoor Temperature Control	66 to 86°F (19 to 30°C)	62 to 86°F (17 to 30°C)
Outlet Air Temperature Control	56 to 77°F (13 to 25°C)	66 to 86°F (19 to 30°C)

8.7.5 Setting of Outdoor Unit

The applicable outdoor units of this setting are as below.

< Applicable Outdoor Units >

Type	Model
Top Flow	(H,Y)VAHP_B(3,4)1S

The setting of outdoor units for the control modes shall be performed by the function setting "Ff" of outdoor unit.

- (1) Turn on "DSW4-No.4" and "DSW7-No.4" on the outdoor PCB (Printed Circuit Board).
The function setting mode "F_{unc}" will be indicated on the 7-segment display.
- (2) Move to selecting of the function setting stage by pressing "PSW1".
- (3) Press "PSW4" or "PSW2" and select the item "Ff".
- (4) Press "PSW5" or "PSW3" and change the setting from "00" to "02".

Setting Item	7-Segment Display		Contents
	SEG2	SEG1	
Outlet Air Temperature Control for DOAS	Ff	00	Initial Setting
		02	Outlet Air Temperature Control

- (5) Turn off "DSW7-No.4" during indicated the function setting mode.
Then, turn off "DSW4-No.4".

NOTE:

The setting should be performed during the outdoor unit stoppage.

For a combination of outdoor units, set it to outdoor unit A.

(The setting cannot be performed to outdoor unit B, C, and D.)

Outdoor unit A is the unit to which the communication cable between the outdoor unit and indoor unit is connected.

If the outdoor unit is NOT the applicable outdoor units.

Refer to "Installation & Maintenance Manual" of the outdoor unit for details of setting control mode.

8.8 Setting of Connected Outdoor Unit Type

Set "Function Selection (b1)" by optional wired controller according to Section 8.7 "Setting of Control Mode".

Outdoor Unit		Function Selection by Wired Controller		Contents
Type	Model	Item Code	Setting Condition	
-	-	b1	00	Initial Setting
Top Flow	(H,Y)VAHP_B(3,4)1S		01	

NOTE:

Make sure to set "b1". If not, it may cause a failure of the unit.

9. Test Run

9.1 Before Test Run

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

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

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

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

9.2 Test Run

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

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

NOTE:

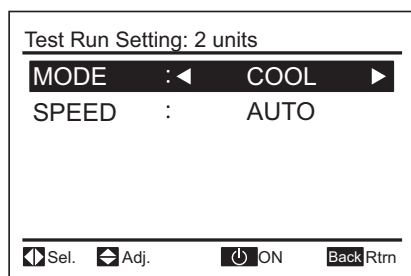
The outdoor unit may not be operated depending on the indoor and outdoor temperature conditions. Refer to the "Installation and Maintenance Manual" for outdoor units for details.

- (a) Press and hold "Menu" and "Back/Help" simultaneously for at least 3 seconds.

The Test Run menu will be displayed.

- The Test Run menu will be displayed.

Test Run Screen



NOTE

When the "00 unit" is displayed, the auto-address function may be working.

Cancel "**Test Run**" mode and reset.

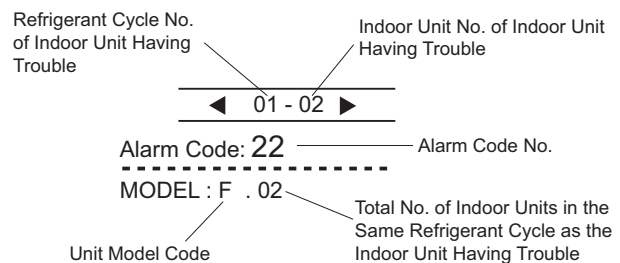
- The total number of connected indoor units is indicated on the LCD (Liquid Crystal Display). In the case of a twin combination (set of two indoor units), the total number of the connected indoor units is displayed as "**2 units**", and where there is a triple combination (set of three indoor units), the total number of the connected indoor units are displayed as "**3 units**".

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

Test Run: 2 units	
MODE	: COOL
SPEED	: ◀ AUTO ▶
Test Time	: 120min
Inverter	: 60Hz
Sel.	Adj. OFF

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

◀ 01-02 ▶	
Alarm Code: 22	Chek
MODEL : F .02	
IDU : *****	AlarmRst
ODU : *****	Address
Sel. OP MODE OK Entr	



< Unit Model Code >

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

Indication	Unit Model
F	VRF System
E	Except Above Models

9.3 Alarm Code

Alarm (Troubleshooting) Code Table

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

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

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

NOTICE

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

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

Routine Preventative Maintenance

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

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

This information should be included in the owner's final documentation for project close-out. All technical service and maintenance procedures must be performed by trained and authorized personnel only.

