



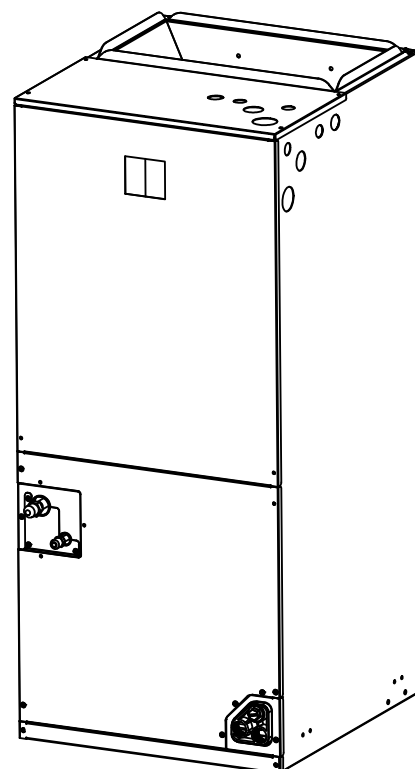
Operation Installation & Maintenance Manual

VRF INDOOR UNIT

Type	Model
MPAHU TYPE	CHV-RS09MPAHU CHV-RS12MPAHU CHV-RS18MPAHU CHV-RS24MPAHU CHV-RS30MPAHU CHV-RS36MPAHU CHV-RS42MPAHU CHV-RS48MPAHU CHV-RS54MPAHU CHV-RS60MPAHU

IMPORTANT:

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



M01664Q

ORIGINAL INSTRUCTIONS

IMPORTANT NOTICE

- Our company pursues a policy of continuing improvement in design and performance of products. The right is therefore reserved to vary specifications without notice.
- Our company cannot anticipate every possible circumstance that might involve a potential hazard.
- This heat pump air conditioner is designed for standard air conditioning only. Do not use this heat pump air conditioner for other purposes such as drying clothes, refrigerating foods or for any other cooling or heating process.
- The installer and system specialist shall secure safety against leakage according to local regulations or standards. The following standards may be applicable if local regulations are not available.
International Organization for Standardization: (such as ISO 5149, EN 378 and ASHRAE Standard 15).
- No part of this manual may be reproduced without written permission.
- Signal words (DANGER, WARNING and CAUTION) are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

! DANGER

: Immediate hazards which WILL result in severe personal injury or death.

! WARNING

: Hazards or unsafe practices which COULD result in severe personal injury or death.

! CAUTION

: Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.

NOTE

: Useful information for operation and/or maintenance.

- It is assumed that this heat pump air conditioner will be operated and serviced by English speaking people. If this is not the case, the distributor should add safety, caution and operating signs in the native language.
- This heat pump air conditioner can only be installed by dealers or professionals. The installation by user may lead to water leakage, electric shock or fire.
- If you have any questions, contact your distributor or dealer of our company.
- This manual gives a common description and information for this heat pump air conditioner which you operate as well as for other models.
- Refer to Installation & Maintenance Manual of outdoor unit for temperature operation range.
- This manual should be considered as a permanent part of the air conditioning equipment and should remain with the air conditioning equipment.
- The models in this manual are partial units shall only be connected to an appliance suitable for the same refrigerant.
- The models in this manual are partial units air conditioner, complying with partial unit requirements of the relevant standard, and must only be connected to other units that have been confirmed as complying to corresponding partial unit requirements of the relevant standard.
- Use ELB with high sensing speed (ELB with an operating time of 0.1 seconds or less), or electric shock or fire may arise.

GLB

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage.
Claims for damage, either apparent or concealed, should be filed immediately with the shipping company.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.

The standard utilization of the unit shall be explained in these instructions.

Therefore, the utilization of the unit other than those indicated in these instructions is not recommended.

Please contact your local agent, as the occasion arises.

Our company's liability shall not cover defects arising from the alteration performed by a customer without our company's consent in a written form.

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Section 1 Operation Manual

1. Safety Summary

⚠ DANGER

- Do not perform any alteration to this product, otherwise, it may cause water leakage, breakdown, short circuit, electric shock, fire, etc.
- Piping, welding and other such work should be carried out far away from the flammable and explosive materials, including the air conditioner refrigerant, to guarantee the security of the site.
- To protect the air conditioner from heavy corrosion, avoid installing the outdoor unit in the place, where sea water can splash directly onto it or in sulphurous air near a spa. Do not install the air conditioner where excessively high heat-generating objects are placed.
- Use ELB with high sensing speed (ELB with an operating time of 0.1 seconds or less), or electric shock or fire may arise.
- Do not pour water into the indoor or outdoor unit. These products are equipped with electrical parts. If poured, it will cause a serious electrical shock.
- Do not touch or adjust safety devices inside the indoor or outdoor units. If these devices are touched or readjusted, it may cause a serious accident.
- Do not open the service cover or access the indoor or outdoor units without turning OFF the main power supply.
- Do not touch electrical parts with the hands, or electric shock may arise.
- Refrigerant R32 is low burning velocity refrigerant, non-toxic, and odorless, and may produce toxic gases when exposed to open flame. Since this refrigerant gas is heavier than air, it may result in lack of oxygen, thereby leading to breathing difficulties when the area near the ground is filled with this gas. If that's the case, please turn off the main switch immediately, cut off the power supply, and open the doors and windows for ventilation. Put out any open flame, and contact your service dealer. Performing leak detection and gas tightness test with oxygen, acetylene or other flammable and toxic gases may cause explosion, so nitrogen is recommended for this test.
- The standards for safe refrigerant leakage in construction and system operation are determined based on local regulations or standards.
- Make sure remove the block in fan casing before switching on power in order to avoid serious accident.

⚠ WARNING

- You should consider the capacity of the electric current of your electrical meter and socket before installation.
- The power wire where this product is installed should have the independent leakage protection device and the electric current over-load protection device provided for this product.
- Never use gasoline or other inflammable gas near the air conditioner to avoid danger. When any abnormality like burnt smell, deformation, fire, smoke, etc. is found, you should stop using the air conditioner, immediately cut off the main power supply and contact the dealer.
- The first 23-5/8 inches of supply air plenum and duct work must be constructed of sheet metal.
- The supply air plenum or duct must have a solid sheet metal bottom piece directly after the air handler unit with no opening, registers or flexible air ducts located in it. If flexible supply air ducts are used, they may be located only in the side walls of the rectangular plenum, a minimum of 6 inches from the solid bottom.
- Turn OFF the main power switches to the indoor unit and outdoor unit before electrical wiring or periodical check, and wait for at least 10 minutes.
- Prevent rats or other small animals damaging the wiring and electrical components. Bitten unprotected parts may cause a fire.
- Refrigerant leakage can cause difficulty with breathing due to insufficient air. If leakage occurs, turn OFF the main switch, put out fire at once and contact your service contractor.
- Do not use any sprays such as insecticide, lacquer, hair spray or other flammable gases within approximately 3.3ft.(1m) from the system.
- If Ground Fault Circuit Interrupter (GFCI) or fuse is often activated, stop the system and contact your service contractor.
- It is prohibited to let foreign material fall into the air outlet to avoid fire or failure.
- If the supply cord is damaged, it must be replaced by the factory or its service department to avoid danger.
- The place where this product is installed must have the reliable electrical grounding facilities and protections. Please do not connect the grounding of this product to various kinds of air feeding ducts, drain pipes, lightning protection facilities as well as other piping lines to avoid electric shock and damage caused by other factors.
- Wiring must be done by the qualified electrician. All the wiring operations must be conducted according to the local electrical codes.

⚠ WARNING

PROPOSITION 65:

- This appliance contains fiberglass insulation. Respirable particles of fiberglass are known to State of California to cause cancer.
- All manufacturer products meet current federal OSHA Guidelines for safety. California Proposition 65 warnings are required for certain products, which are not covered by the OSHA standards. California's Proposition 65 requires warnings for products sold in California that contain or produce any of over 600 listed chemicals known to the State of California to cause cancer or birth defects such as fiberglass insulation, lead in brass, and combustion products from natural gas.
- All "new equipment" shipped for sale in California will have labels stating that the product contains and / or produces Proposition 65 chemicals. Although we have not changed our processes, having the same label on all our products facilitates manufacturing and shipping. We cannot always know "when, or if" products will be sold in the California market.
- You may receive inquiries from customers about chemicals found in, or produced by, some of our heating and air conditioning equipment, or found in natural gas used with some of our products. Listed below are those chemicals and substances commonly associated with similar equipment in our industry and other manufacturers.
 - Glass Wool (Fiberglass) Insulation
 - Carbon Monoxide (CO)
 - Formaldehyde
 - Benzene

NOTE

- Storage condition:
Temperature -13~140°F (-25~60°C)
Humidity 30%~80%

⚠ WARNING

- More details are available at the websites for OSHA (Occupational Safety and Health Administration), at www.osha.gov and the State of California's OEHHA (Office of Environmental Health Hazard Assessment), at www.oehha.org.
Consumer education is important since the chemicals and substances on the list are found in our daily lives. Most consumers are aware that products present safety and health risks, when improperly used, handled and maintained.

⚠ CAUTION

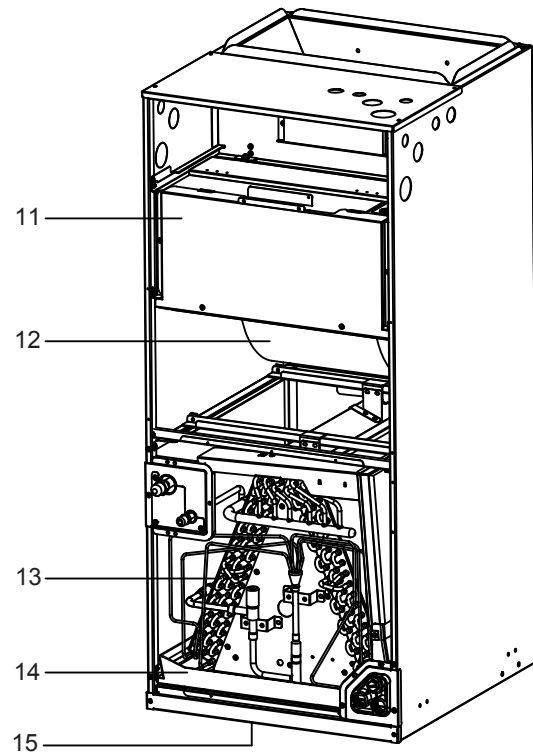
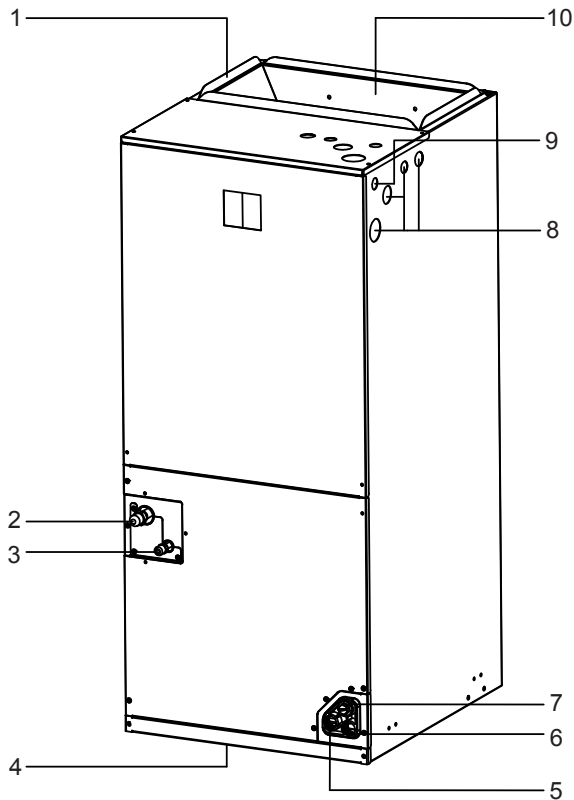
- Do not turn the air conditioner on and off from the main power switch. Use the ON/OFF operation button.
- Do not stick anything into the air inlet and air outlet of both the indoor and outdoor units.
This is dangerous because the fan is rotating at a high speed.
- Do not cool or heat the room too much if babies or invalids are present. GLB
Type and rating of circuit breakers / ELB are detailed Chapter 7 of Section 2.
- The method of connection of the appliance to the electrical supply and interconnection of separate components are detailed Chapter 7 of Section 2.
- The information of dimensions of the space necessary for correct installation of the appliance including the minimum permissible distances to adjacent structures is detailed Chapter 4 of Section 2.
- The range of external static pressures for ducted appliances is 0.2 to 0.8 in.W.G(50 to 200 Pa).
- Make sure the fan motor support is tight (3-motor mounting bolts). Then check to see if wheel is tightly secured to motor shaft before operation unit.
- The appliance is not to be used by children or person with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.
- Children should be supervised so that they do not play with the appliance.
- The appliance should not be installed in the laundry.

2. System Description

Table 2.1 Indoor Unit Type List

Indoor Unit type	Nominal Capacity (kBtu/h)									
	09	12	18	24	30	36	42	48	54	60
	○	○	○	○	○	○	○	○	○	○

○ : Available



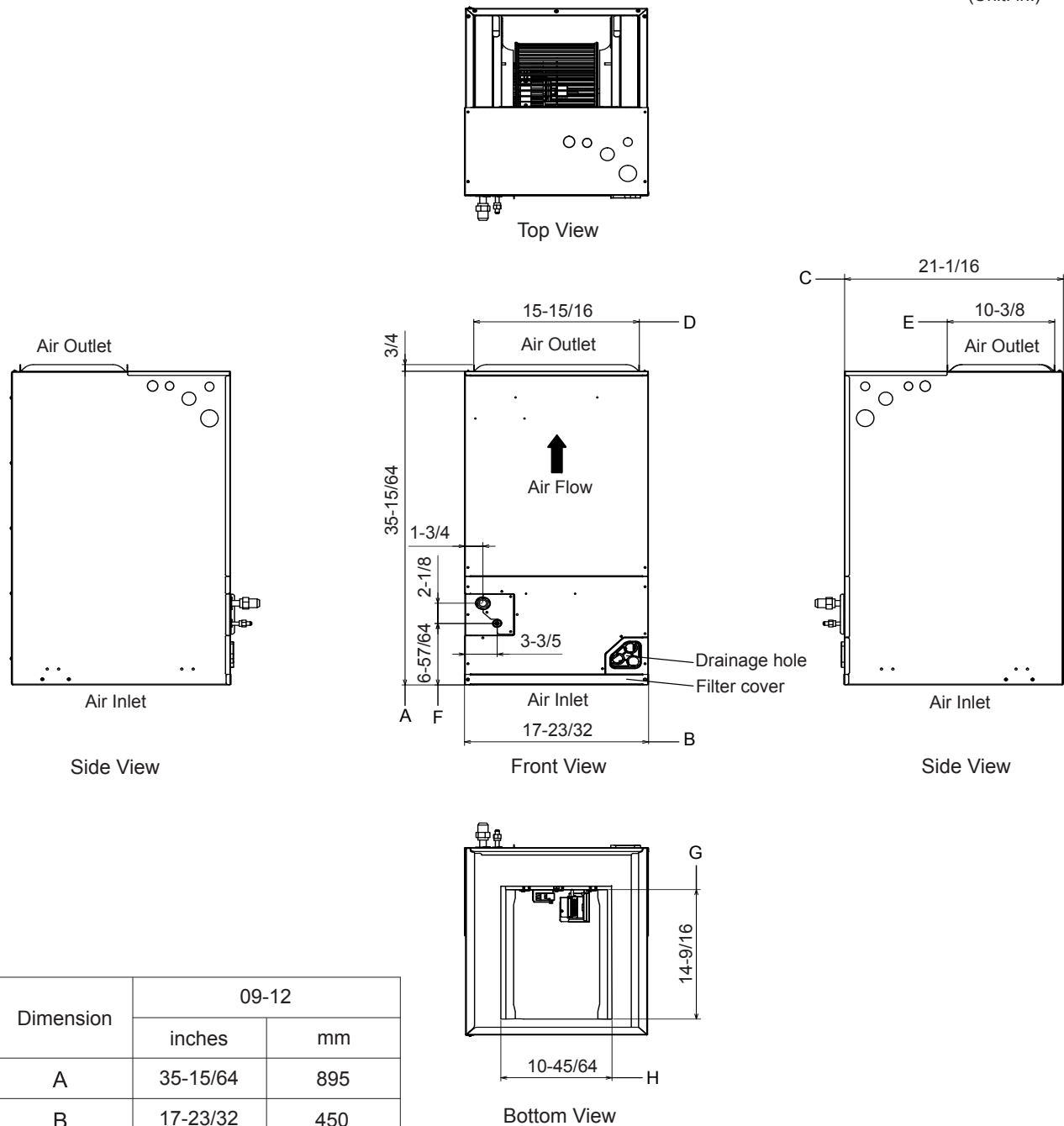
1. Air outlet flange
2. Refrigerant pipe (Gas)
3. Refrigerant pipe (Liquid)
4. Air inlet
5. Auxiliary drainage hole
6. Drainage hole
7. Auxiliary drainage hole
8. High voltage wiring hole
9. Communication wiring hole
10. Air outlet
11. Electrical box
12. Fan volute
13. Evaporator
14. Drain pan
15. Filter cover

NOTE

- The figures are based on the external views of the standard model. Consequently, the shape may differ for the air conditioner model you have selected.

Dimensions 09-12

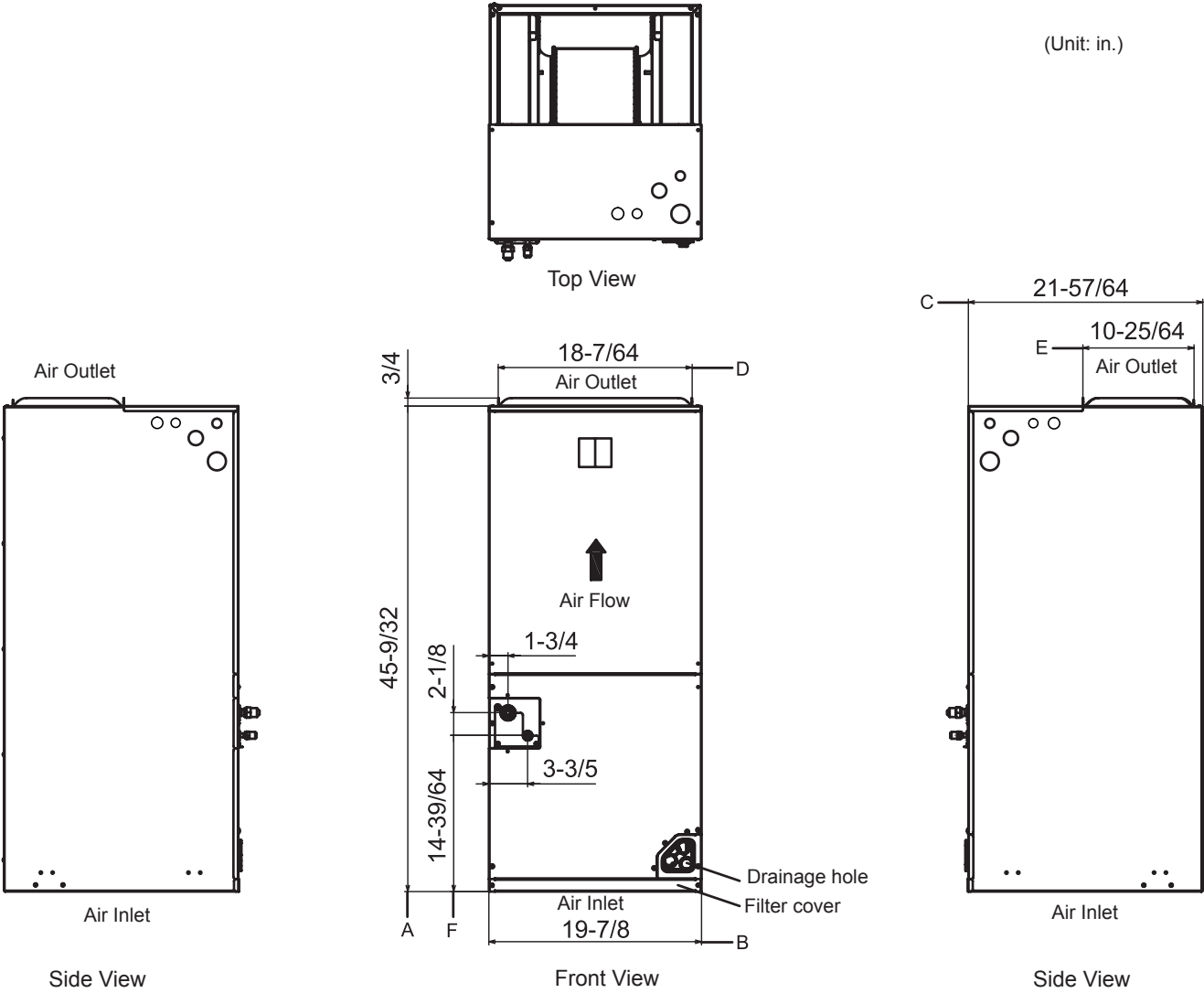
(Unit: in.)



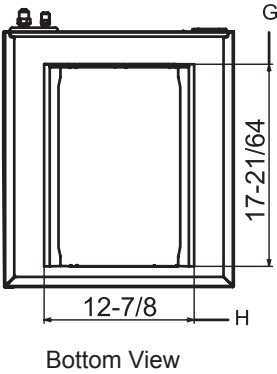
Dimension	09-12	
	inches	mm
A	35-15/64	895
B	17-23/32	450
C	21-1/16	535
D	15-15/16	405
E	10-3/8	264
F	6-57/64	175
G	14-9/16	370
H	10-45/64	272

Dimensions 18-42

(Unit: in.)

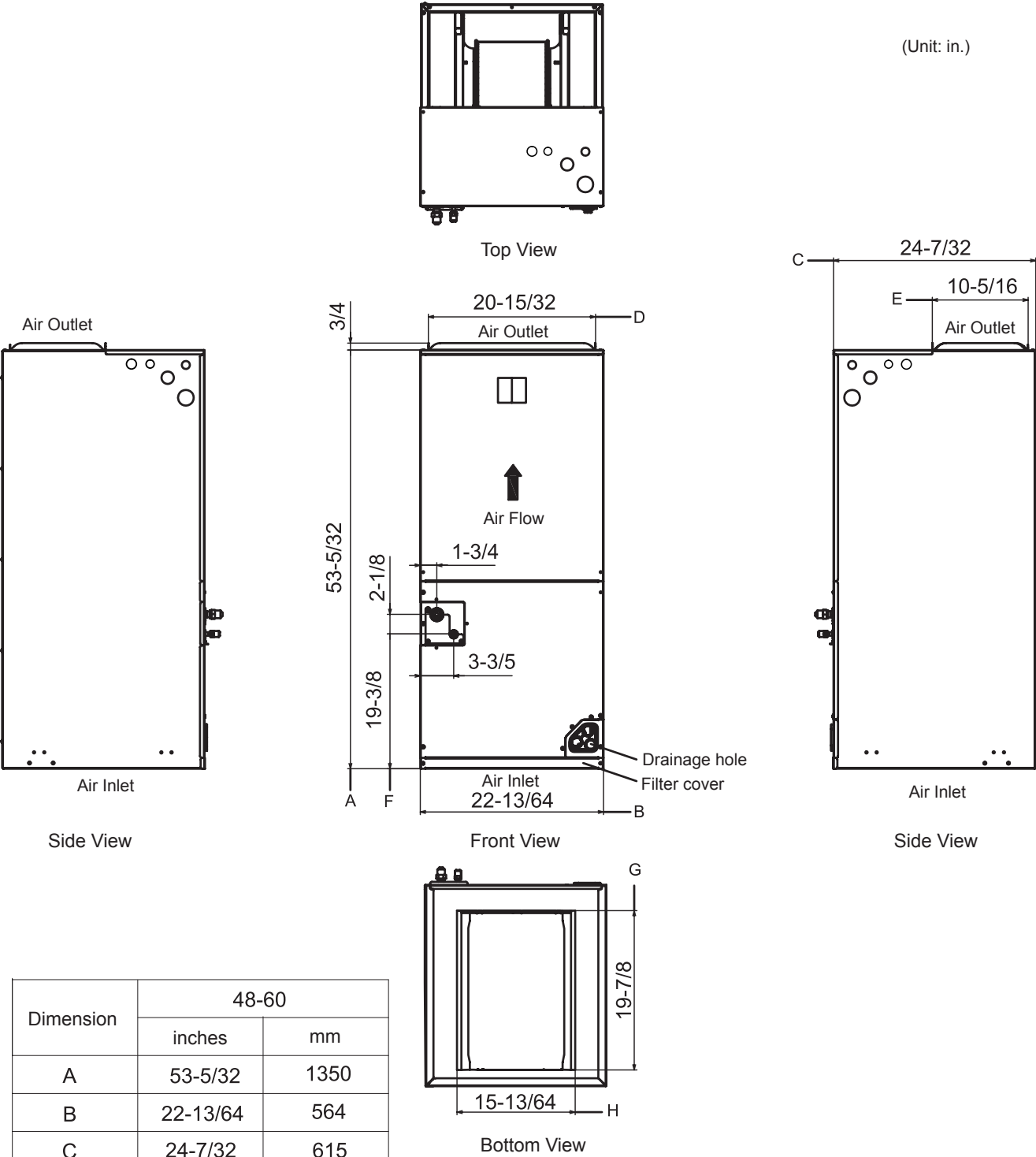


Dimension	18-42	
	inches	mm
A	45-9/32	1150
B	19-7/8	505
C	21-57/64	556
D	18-7/64	460
E	10-25/64	264
F	14-39/64	371
G	17-21/64	440
H	12-7/8	327



Dimensions 48-60

(Unit: in.)



Dimension	48-60	
	inches	mm
A	53-5/32	1350
B	22-13/64	564
C	24-7/32	615
D	20-15/32	520
E	10-5/16	262
F	19-3/8	492
G	19-7/8	505
H	15-13/64	386

3. Wired Controller

- Refer to the wired controller instruction manual for operation details.
- When selecting other manufacturer's wired controllers, they need to be matched with the indoor unit and 24V thermostat adapter.

NOTE

- The 24V thermostat adapter and our company wired controller cannot be connected at the same time, choose one of them to connect to A and B terminal of the indoor unit terminal block.
 - When use the third-party thermostat, an additional alarm with sound & light alarm function is required. The indoor unit has reserved an alarm communication signal. Third-party alarms need to meet the sound pressure greater than 75 dB.
-

4. Before Operation

 CAUTION

Supply electrical power to the system for approximately 12 hours before start-up after long shutdown. Do not start the system immediately after power supply, it may cause a compressor failure, because the compressor is not heated well.

Make sure that the outdoor unit is not covered with snow or ice. If covered, remove it by using hot water (approximately 122°F (50°C)). If the water temperature is higher than 122°F (50°C), it will cause damage to plastic parts.

When the system is started after a shutdown longer than approximately 3 months, it is recommended that the system be checked by your service contractor.

Turn OFF the main switch when the system is stopped for a long period of time. If the main switch is not turned OFF, electricity is consumed, because the oil heater is always energized during compressor stopping.

5. Automatic Control

The system is equipped with the following functions.

- **Three Minute Guard (Enforced Stoppage)**
The compressor remains off for at least 3 minutes once it has stopped. If the system is started within approximately 3 minutes after it has stopped, the RUN indicator is activated. However, the cooling operation or the heating operation remains off and does not start until 3 minutes has elapsed.
- **Three Minute Guard (Enforced Operation)**
If all indoor units of the system are Thermo-OFF within approximately 3 minutes after compressor has started, compressor is operated during 3 minutes continuously. However, if all indoor units of the system are stopped by remote control switch, compressor is stopped.
- **Oil Return Operation**
If an indoor unit is stopped more than 2 hours continuously, this function is operated during a few minutes. It has this function to prevent to accumulate in the heat exchanger of stoppage indoor unit at cooling operation.
- **Frost Prevention During Cooling Operation**
When the indoor unit is operated at low discharge air temperature, the cooling operation may be changed to fan operation for a while to avoid frost formation on the indoor heat exchanger.
- **Hot Start During Heating Operation**
To prevent cold air discharge in the room, the fan speed is controlled from the slow position and the low position and then to the set position according to the discharge air temperature.
- **Slow Air Control During Defrosting Operation**
When the outdoor unit is performing the automatic defrosting operation, the indoor fan is stopped.
- **Cooling of Indoor Unit**
When the heating operation is stopped, the indoor fan operation is maintained at the slow position for the maximum of 2 minutes to lower temperature of the inside unit.
- **Automatic Defrosting Cycle**
When the heating operation is stopped by pressing RUN/STOP switch, frosting on the outdoor unit is checked and the defrosting operation may be performed for the maximum of 10 minutes.

- **Prevention of Overload Operation**
When the outdoor temperature is high during heating operation, heating operation is stopped due to activation of the outdoor thermistor until the temperature becomes low.

NOTE

If the system is stopped due to a power failure, it will not automatically start again although power is restored.

Repeat the start-up procedure. In the event of a very brief power failure (2 seconds maximum), the settings are memorized.

Therefore, the system starts automatically after approximately 3 minutes.

6. Air Filter (Field-supplied)

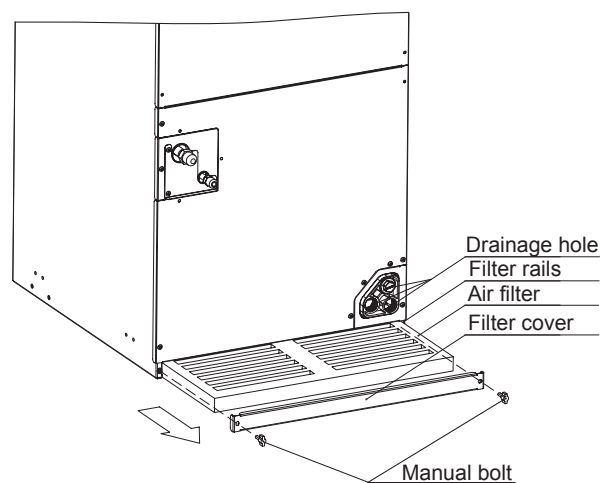
Please replace or clean the filter timely after the unit running for every 1200 hours, because there will be lots of dust accumulated on the surface of the filter after a period of time.

The indication, "FILTER" is shown on the display of the wired controller after approximately 1,200 hours operation.

Follow these steps to properly replace the filter:

- Turn OFF the main power switch before taking out the filter.
- Remove the two manual bolts.
- Take down the filter cover and pull out the filter from the case.
- Insert the clean filter (or a new one) into the case along the filter rail.
- Fix the filter cover with manual bolts.
- After cleaning the air filter, press the " FILTER " button. The "FILTER" indication will disappear and the next filter cleaning time will be set.

Model	Filter size (L×W×H) inches
09-12	20×15-3/4×1
18-42	20×18×1
48-60	22×20×1



NOTE

When cleaning the air filter, please check the dirty blockage of the drainage hole, and clean up according to the situation.

7. Troubleshooting

CAUTION

When overflow of drain water from the indoor unit occurs, stop the operation and contact your contractor.

When you smell or see white smoke coming from the unit, turn OFF the main power supply and contact your contractor.

7.1 If Trouble Still Remains

If the trouble still remains even after checking the following, contact your contractor and inform them of the following items.

- (1) Unit Model Name
- (2) Content of Trouble

7.2 No Operation

Check whether the SET TEMP is set at the correct temperature.

7.3 Not Cooling or Heating Well

- Check for obstruction of air flow of the outside or inside units.
- Check if too much heat source exists in the room.
- Check if the air filter is clogged with dust
- Check to see if the doors or windows are opened or not.
- Check if the temperature condition is not within the operation range.

7.4 This is Not Abnormal

- **Smells from Indoor Unit**
Smell adheres on indoor unit after a long period of time.
Clean the air filter and panels or allow a good ventilation.
- **Sound from Deforming Parts**
During system starting or stopping, an abrading sound might be heard. However, this is due to thermal deformation of plastic parts. It is not abnormal.
- **Steam from Outdoor Heat Exchanger**
During defrosting operation, ice on the outdoor heat exchanger is melted, resulting in making steam.
- **Dew on Air Panel**
When the cooling operation continues for a long period of time under high humidity conditions (higher than 80°F (27°C)/80% R.H), dew can form on the air panel.
- **Refrigerant Flow Sound**
While the system is being started or stopped, sound from the refrigerant flow may be heard.

Section 2 Installation & Maintenance Manual

1. Safety Summary

No part of this publication may be reproduced, copied, filed or transmitted in any shape or form without the permission of our company.

Within the policy of continuous improvement of its products, Our company reserves the right to make changes at any time without prior notification and without being compelled to introducing them into products subsequently sold. This document may therefore have been subject to amendments during the life of the product.

Our company makes every effort to offer correct, up-to-date documentation. Despite this, printing errors cannot be controlled by our company and are not its responsibility.

As a result, some of the images or data used to illustrate this document may not refer to specific models.

No claims will be accepted based on the data, illustrations and descriptions included in this manual.

No type of modification must be made to the equipment without prior, written authorization from the manufacturer.

During normal air conditioning system design work or unit installation, greater attention must be paid in certain situations requiring particular care in order to avoid injuries and damage to the unit, the installation or the building or property.

Situations that jeopardize the safety of those in the surrounding area or that put the unit itself at risk will be clearly indicated in this manual.

To indicate these situations, a series of special symbols will be used to clearly identify these situations.

Pay close attention to these symbols and to the messages following them, as your safety and that of others depend on it.

DANGER

- Our company is not able to foresee all the circumstances which may result in a potential danger.
- Do not pour water in the indoor or outdoor unit. These products are fitted with electric components.
- If water comes into contact with electric components, it will cause a serious electric shock.
- Do not handle or adjust the safety devices inside the indoor and outdoor units. The handling or adjustment of these devices may result in serious accident.
- Do not open the service cover or access panel of the indoor and outdoor units without disconnecting the main supply.
- In the event of fire, switch off the mains, put out the fire immediately and contact your service supplier.
- Check that the earth cable is correctly connected.
- The storage of equipment should be in accordance with the manufacturer's instructions.
- Do not install pipe work with diameters that are not specified for that model.
- Do not ground units to water pipes, gas pipes, telephone wires, or lightning rods as incomplete grounding can cause a severe shock hazard resulting in severe injury or death. Additionally, grounding to gas pipes could cause a gas leak and potential explosion causing severe injury or death.
- Do not install unit in an area where flammable materials are present due to risk of explosions that can cause serious injury or death.
- Safely dispose all packing and transportation materials in accordance with federal/state/local laws or ordinances. Packing materials such as nails and other metal or wood parts, including plastic packing materials used for transportation may cause injuries or death by suffocation.
- Refrigerant gas is heavier than air and replaces oxygen. A massive leak can lead to oxygen depletion, especially in basements, and an asphyxiation hazard could occur leading to serious injury or death.
- If refrigerant gas leaks during installation, ventilate the area immediately. Refrigerant gas may produce toxic gas if it comes into contact with fire. Exposure to this gas could cause severe injury or death.
- Only qualified personnel licensed or certified their jurisdiction must carry out the installation work. Installation must be done in accordance with this installation manual. Improper installation may result in water leakage, electric shock, or fire
- Pipe work and installation shall be in compliance with national codes (ASHRAE15 or IRC).
- Use only specified accessories and parts for installation work. Failure to use specified parts may result in water leakage, electric shock, fire, or the unit falling.
- Install the air conditioner or heat pump on a foundation strong enough that it can withstand the weight of the unit. A foundation of insufficient strength may result in the unit falling and causing injuries.

WARNING

- Take into account strong winds, typhoons, or earthquakes when installing. Improper installation may result in the unit falling and causing accidents.
- Make sure that a separate power supply circuit is provided for this unit and that all electrical work is carried out by qualified personnel licensed or certified in their jurisdiction according to local, state, and national regulations. An insufficient power supply capacity or improper electrical construction may lead to electric shock or fire.
- Make sure that all wiring is secured, that specified wires are used, and that no external forces act on the terminal connections or wires. Improper connections or installation may result in fire.
- Connect a fuse of specified capacity.
- Be sure to use a dedicated power circuit. (Never use the power supply shared by another appliance.)
- Do not put other loads on the power supply, and please use a dedicated power circuit.
- Incomplete connections or clamping may cause terminal overheating or fire.
- There is 100PSIG high pressure nitrogen in the evaporator, please release it first before installation. It proves the evaporator to be in good state if there is nitrogen out, otherwise, it indicates the evaporator leaks.
- When carrying out piping connection, do not let air substances other than the specified refrigerant get into refrigeration cycle. (Otherwise, it will cause decreased performance, abnormal high pressure in the refrigeration cycle, explosion and injury.)
- Make sure that the installation has a proper earth connection. Do not ground the unit to a utility pipe, arrester, or telephone grounding. Incomplete grounding may cause electrical shock. (A high surge current from lightning or other sources may cause damage to the air conditioner.)
- An earth leakage circuit breaker may be required depending on the site condition to prevent electrical shock.
- Disconnect the power supply before wiring, piping, or checking the unit.
- Avoid contact between wires and sharp sheet metal or sharp corners.
- Turn OFF the main power switches to the indoor unit and outdoor unit before electrical wiring or periodical check, and wait for at least 10 minutes.
- For wiring, use a cable long enough for the entire distance, and do not use an extension cord.
- When wiring, position the wires so that the electrical wiring box cover can be securely fastened. Improper positioning of the electrical wiring box cover may result in electric shock, fire, or the terminals overheating.
- Before touching electrical parts, turn off the unit.
- The circuit must be protected with safety devices in accordance with local and national codes, i.e. a circuit breaker.
- Securely fasten the outdoor unit terminal cover (panel). If the terminal cover/panel is not installed properly, dust or water may enter the outdoor unit causing fire or electric shock.
- Do not use means to accelerate the defrosting process (if possible) or to clean, other than those recommended by the manufacturer.
- Assure that the maximum operating pressure is checked when connecting to Outdoor UNIT.
- System contains oversize protective earthing (grounding) terminal which shall be properly connected.

CAUTION

- Refrigerant leaks may hinder respiration as the gas displaces the air in the room. It is assumed that this heat pump air conditioner will be operated and serviced by English speaking people. If this is not the case, the distributor should be added safely, caution and operating signs in the native language.
- Fit the indoor unit, the outdoor unit, the remote controller and the cable at a minimum of 3 meters away from sources of strong radiation from electromagnetic waves, such as medical equipment.
- Do not use sprays, such as insecticides, varnishes or enamels or any other inflammable gas within a meter of the system.
- If the circuit breaker or supply fuse of the unit comes on frequently, stop the system and contact the service supplier.
- Do not carry out maintenance or inspection work yourself. This work must be carried out by qualified service personnel with suitable tools and resources for the work.
- Do not place any foreign material (branches, sticks, etc.) in the air inlet or outlet of the unit. These units are fitted with high-speed fans and contact with any object is dangerous.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

- Means for disconnection from the supply mains, which have a contact separation in all poles that provide full disconnection under overvoltage category III conditions, must be incorporated in the fixed wiring in accordance with the wiring rules.
- The appliance shall be installed in accordance with national wiring regulations. The maximum working pressure is 4.30 MPa. This maximum working pressure shall be considered when connecting the indoor unit to outdoor unit.
- Do not touch the switch with wet fingers. Touching a switch with wet fingers can cause electric shock.
- This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Cleaning and user maintenance shall not be made by children without supervision.
- The heat exchanger fins are sharp enough to cut. To avoid injury, wear gloves or cover the fins while working around them.
- Do not touch the refrigerant pipes during and immediately after operation as the refrigerant pipes may be hot or cold, depending on the condition of the refrigerant flowing through the refrigerant piping, compressor, and other refrigerant cycle parts. Your hands may suffer burns or frostbite if you touch the refrigerant pipes. To avoid injury, give the pipes time to return to normal temperature or, if you must touch them, be sure to wear proper gloves.
- Install drain piping to ensure proper drainage. Improper drain piping may result in water leakage and property damage.
- Insulate piping to prevent condensation.
- Be careful when transporting the product.
- It is assumed that the air conditioning system will be installed and maintained by responsible personnel trained for the purpose. If this is not the case, the distributor should include all the safety, caution and operating signs in the native language of the personnel responsible.
- Do not install the unit in a place where the current of expelled air directly affects animals or plants as they could be adversely affected.
- Do not install the air conditioner or heat pump in the following locations:
 - Where a mineral oil mist or oil spray or vapor is produced, for example, in a kitchen. Plastic parts may deteriorate and fall off or result in water leakage.
 - Where corrosive gas, such as sulfurous acid gas, is produced. Corroding copper pipes or soldered parts may result in refrigerant leakage.
 - Near machinery emitting electromagnetic waves. Electromagnetic waves may disturb the operation of the control system and cause the unit to malfunction.
 - Where flammable gas may leak, where there is carbon fiber, or ignitable dust suspension in the air, or where volatile flammables such as thinner or gasoline are handled. Operating the unit in such conditions can cause a fire.
- Take adequate measures to prevent the outdoor unit from being used as a shelter by small animals. Small animals making contact with electrical parts can cause malfunctions, smoke, or fire. Instruct the user to keep the area around the unit clean.
- Servicing shall be performed only as recommended by the manufacturer and licensed or certified in their jurisdiction.
- Wear adequate personal protective equipment (protective gloves, safety glasses,...) when installing, maintaining or servicing the system.
- This air conditioner has been designed for standard air conditioning for human beings. For use in other applications, please contact your dealer or service contractor.
- The air conditioning system should only be installed by qualified personnel, with the necessary resources tools and equipment, who are familiar with the safety procedures required to successfully carry out the installation.
- PLEASE READ THE MANUAL BEFORE STARTING WORK ON THE INSTALLATION OF THE AIR CONDITIONING SYSTEM.
- Failure to observe the instructions for installation, use and operation described in this documentation may result in operating failure including potentially serious faults or even the destruction of the air conditioning system.

- Do not install the unit in places where silicon gas is present. Any silicon gas deposited on the surface of the heat exchanger will repel water. As a result, the condensate water will splash out of the collection tray and into the electrical box. Water leaks or electrical faults may eventually be caused.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

NOTES:

- The air in the room should be renewed and the room ventilated every 3 or 4 hours.
- The indoor unit should be positioned where the unit and interunit wires (outdoor to indoor) are at least 3.3ft (1m) away from any televisions or radios. (The unit may cause interference with the picture or sound.) Depending on the radio waves, a distance of 3.3ft (1m) may not be sufficient to eliminate the noise.
- Dismantling the unit, treatment of the refrigerant, oil and additional parts must be done in accordance with the relevant local, state, and national regulations.
- As maximum allowable pressure is 4.30MPa, minimum allowable pressure is 0.50MPa, the wall thickness of field-installed pipes should be selected in accordance with the relevant local, state, and national regulations.

Explanation of symbols displayed on the indoor unit or outdoor unit.

	WARNING	This symbol show that appliance uses a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire.
	CAUTION	This symbol shows that the Operation Manual should be read carefully.
	CAUTION	This symbol shows that a service personnel should be handling this equipment with reference to the Installation Manual.
	CAUTION	This symbol shows that there is information included in the Operation Manual and/or Installation Manual.

Precuations for R32

This air conditioner uses R32 flammable refrigerant.

Air conditioner with R32 refrigerant, if not be treated carefully, may cause serious harm to the human body or surrounding things. Please read the following instructions carefully before installing, using and maintaining.

! WARNING

- Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
- The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Do not pierce or burn the refrigerant system to avoid the leakage.
- Be aware that refrigerants might not contain an odour.
- Do not use a reclaim cylinder other than an R32 reclaim cylinder.
- Be sure to only use refrigerant piping approved for use with R32 refrigerant. The use of unapproved piping may result in explosive rupture.
- The pipe-work shall be securely mounted and guarded from physical damage.
- The national gas regulations shall also be observed when field-installed refrigerant pipes are required.
- Field-made refrigerant joints indoors shall be tightness tested. The test method shall have a sensitivity of 5 grams per year of refrigerant or better under a pressure of at least 0,25 times the maximum allowable pressure. No leak shall be detected; Mechanical connections shall be accessible for maintenance purposes.
- The joints shall not be reused, unless after reflaring the pipe.
- Joints made in the installation between parts of the refrigerating system, with outdoor part charged, shall be made in accordance with the following.
 - A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the refrigerating system parts. A vacuum valve shall be provided to evacuate the interconnecting pipe and/or any uncharged refrigerating system part.
 - Mechanical connectors used indoors shall comply with ISO 14903. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be refabricated.
 - Refrigerant piping shall be protected or enclosed to avoid damage.

- That after completion of field piping for split systems, the field pipe work shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements:
 - The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system, cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.
- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified.
- The appliances are designed for use at altitudes less than 6562ft.(2000m), may cause serious harm to the human body or surrounding things if used at altitudes 6562ft.(2000m) and above.
- Keep any required ventilation openings clear of obstruction, don't block air inlet or air outlet, Otherwise, the cooling or heating capacity will be weakened, even cause system stop operating or safety hazard.
- Maintenance or repair of air conditioner using R32 refrigerant must be carried out after security check to minimize risk of incidents.
- Ensure no following objects under the indoor unit:
 - Microwaves, ovens and other hot objects.
 - Computers and other high electrostatic appliances.
 - Sockets that plug frequently.
- Installation, maintenance, service, repairing, removing and disposal operations, shall only be performed by the qualified personnel or recommended by the manufacturer.
- If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO₂ fire extinguisher adjacent to the charging area.
- No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it can lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.
- Every working procedure that affects safety means shall only be carried out by competent persons. Examples for such working procedures are:
 - breaking into the refrigerating circuit;
 - opening of sealed components;
 - opening of ventilated enclosures.
- Precautions shall be taken to avoid excessive vibration or pulsation to refrigerating piping for the transport and installation.
- Protection devices, piping and fittings shall be protected as far as possible against adverse environmental effects, for example the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris.
- When installing or repairing the air conditioner and the connecting line is not long enough, the entire connecting line shall be replaced with the connecting line of the original specification; extension is not allowed.
- Refrigerating systems shall be so installed as to minimize the likelihood of hydraulic shock damaging the system.
- The appliance shall be stored and installed so as to prevent mechanical damage from occurring.
- Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.
- All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the non-existence of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. nonsparking, adequately sealed or intrinsically safe.
- Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.
- Anti-static precautions is necessary for installing and maintenance, for example, wear pure cotton clothes and gloves.
- Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

- If R32 refrigerant leakage occurs during the installation, operators shall immediately detect the concentration in indoor environment until it reaches a safe level. If the leakage affects the performance of the machine, please immediately stop the operation, and the air conditioner must be vacuumed firstly and be returned to the maintenance station for processing.
- Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the maintenance and service guidelines of this manual shall be followed. If in doubt, consult the manufacturer's technical department for assistance. The following checks shall be applied to installations using R32:
 - The refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed.
 - The ventilation machinery and inlets and outlets are operating adequately and are not obstructed; and shall keep away from heat source, inflammable or explosive conditions.
 - Marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected.
 - Refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which can corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.
- Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised. Initial safety checks shall include:
 - that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking.
 - that no live electrical components and wiring are exposed while charging, recovering or purging the system.
 - that there is continuity of earth bonding.
- Sealed electrical components shall not be repaired.
- Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.
- Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.
- Air-tightness test shall be carried out as guaranteed. Charging oxygen, acetylene or other inflammable and toxic gases during leakage inspection and air-tightness test may lead to explosions. It is recommended to use nitrogen gas for this test.
- The following leak detection methods are deemed acceptable for all refrigerant systems.
 - Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity can be inadequate, or can need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (no more than 25 %) is confirmed.
 - The fluid used in leak detection is applicable to most refrigerants. But do not use chloride solvents to prevent the reaction between chlorine and refrigerants and the corrosion of copper pipeline.
 - If a leak is suspected, all naked flames shall be removed/extinguished.
 - If a leakage of refrigerant is found which requires brazing, all of the refrigerant shall be recovered from the system, or isolated in a part of the system remote from the leak. Removal of refrigerant shall be according to this manual.
- When breaking into the refrigerant circuit to make repairs or for any other purpose conventional procedures shall be used. However, for flammable refrigerants it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:
 - safely remove refrigerant following local and national regulations;
 - evacuate;
 - purge the circuit with inert gas;
 - continuously flush with inert gas when using flame open circuit;
 - open the circuit.
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- The storage of the appliance should be in accordance with the applicable regulations or instructions, whichever is more stringent.

- Purging of the refrigerant circuit shall be achieved by breaking the vacuum in the system with inert gas and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. The system shall be vented down to atmospheric pressure to enable work to take place.
- Ensure that the outlet of the vacuum pump is not close to any potential ignition sources and that ventilation is available.
- In addition to conventional charging procedures, the following requirements shall be followed.
 - Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
 - Cylinders shall be kept in an appropriate position according to the instructions.
 - Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
 - Label the system when charging is complete (if not already labelled).
 - Extreme care shall be taken not to overfill the refrigerating system.
- Before carrying out the decommissioning procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.
 - Become familiar with the equipment and its operation.
 - Isolate system electrically.
 - Before attempting the procedure, ensure that:
 - (a) mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - (b) all personal protective equipment is available and being used correctly;
 - (c) the recovery process is supervised at all times by a competent person;
 - (d) recovery equipment and cylinders conform to the appropriate standards.
 - Pump down refrigerant system, if possible.
 - If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
 - Make sure that the cylinder is situated on the scales before recovery takes place.
- Start the recovery machine and operate in accordance with instructions.
- Do not overfill cylinders (no more than 80% volume liquid charge).
- Do not exceed the maximum working pressure of the cylinder, even temporarily.
- When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
- Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked.
- Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are label on the equipment stating the equipment contains flammable refrigerant.
- When removing refrigerant from a system, either for servicing or decommissioning, it is required to follow good practice so that all refrigerants are removed safely.
- When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.
- The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. Consult manufacturer if in doubt. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition.
- The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.
- If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. Draining of oil from a system shall be carried out safely.
- Disposal of equipment shall follow the national regulations.

- The maximum number of pieces of equipment permitted to be stored together notes by each product package information and standard follows ISO 780-2015.
- After completing the installation work, check that the refrigerant gas does not leak throughout the system.
- When installing the unit in a small room, take measures to keep the refrigerant concentration from exceeding allowable safety limits. Excessive refrigerant leaks, in the event of an accident in a closed ambient space, can lead to oxygen deficiency.
- When installing or relocating the air conditioner, do not let any other substances besides R32, such as air, enter the refrigerant circuit. The presence of air or foreign matter in the refrigerant circuit causes an abnormal pressure rise, which may result in equipment damage and even injury.
- Refrigerant R32 in the system must be kept clean, dry, and tight.
 - Clean and Dry -- Foreign materials (including mineral oils such as SUNISO oil or moisture) should be prevented from getting into the system.
 - Tight -- R32 does not contain any chlorine, does not destroy the ozone layer, and does not reduce the earth's protection against harmful ultraviolet radiation. R32 can contribute to the greenhouse effect if it is released.
- Only use tools for R32, such as a manifold gauge, charge hose, gas leak detector, reverse flow checkvalve, refrigerant charge base, vacuum gauge, or refrigerant recovery equipment.
- If the conventional refrigerant and refrigerator oil are mixed in R32, the refrigerant may deteriorate.
- Appliance shall be installed, operated and stored in a room with a floor area larger than $TA_{min}(m^2)$ [$TA_{min}(m^2)$ -see table below].
- The installation of pipe-work shall be kept to a room with a floor area larger than $TA_{min}(m^2)$ [$TA_{min}(m^2)$ - see table below].
- If the refrigerant charge of R32 (m_c) ≥ 1.84 kg, the minimum room area is required based on UL 60335-2-40. And the required minimum total conditioned room area TA_{min} of installed appliance with REFRIGERANT CHARGE m_c (kg) shall be in accordance with following: $TA_{min} = m_c / (SF \times LFL \times H)$.
- If the refrigerant charge of R32 (m_c) ≥ 15.96 kg, the indoor and outdoor units need to meet the requirements of enhanced tightness refrigerating systems, and the refrigerant charge and room area should meet the requirements specified in the outdoor unit manual.

where

* SF: safety factor of 0.50.

* TA_{min} : required minimum area of the total conditioned space in m^2 .

* H: height of the room = 2.2 m.

* m_c : REFRIGERANT CHARGE in appliance in kg.

* LFL: Lower Flammability Limit for R32, 0.307 kg/ m^3 .

Minimum required room area for each refrigerant amount charged

MPAHU							
Installation Height: 2.2m							
$m_c(kg)$	$TA_{min}(m^2)$	$m_c(kg)$	$TA_{min}(m^2)$	$m_c(kg)$	$TA_{min}(m^2)$	$m_c(kg)$	$TA_{min}(m^2)$
≤ 1.842	-	3.40	10.07	4.90	14.51	6.40	18.95
2.00	5.92	3.50	10.36	5.00	14.81	6.50	19.25
2.10	6.22	3.60	10.66	5.10	15.10	6.60	19.54
2.20	6.51	3.70	10.96	5.20	15.40	6.70	19.84
2.30	6.81	3.80	11.25	5.30	15.69	6.80	20.14
2.40	7.11	3.90	11.55	5.40	15.99	6.90	20.43
2.50	7.40	4.00	11.84	5.50	16.29	7.00	20.73
2.60	7.70	4.10	12.14	5.60	16.58	7.10	21.02
2.70	8.00	4.20	12.44	5.70	16.88	7.20	21.32
2.80	8.29	4.30	12.73	5.80	17.18	7.30	21.62
2.90	8.59	4.40	13.03	5.90	17.47	7.40	21.91
3.00	8.88	4.50	13.33	6.00	17.77	7.50	22.21
3.10	9.18	4.60	13.62	6.10	18.06	7.60	22.51
3.20	9.48	4.70	13.92	6.20	18.36	7.70	22.80
3.30	9.77	4.80	14.21	6.30	18.66	...	...

- If the minimum room area and total system refrigerant charge do not comply with the above calculation formula, The optional part Refrigerant Shut-off Box HESE-2V15A2 need to be selected. Detailed installation instructions/ periodic service/maintenance procedures/replace procedures can be found in the optional part manual and outdoor unit manual.

2. Structure

2.1 Refrigerant Cycle

Regarding the Refrigerant Cycle diagrams, refer to Technical Catalogue.

2.2 Necessary Tools and Instrument List for Installation

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

NOTE

- The size of the air filter refer to Chapter 6 of the operation manual.
- About vacuum pump, gas hose, charging cylinder, manifold gauge, please use suitable equipments for R32 respectively. Do not mix other refrigerant.

3. Transportation and Handling

3.1 Transportation

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

CAUTION

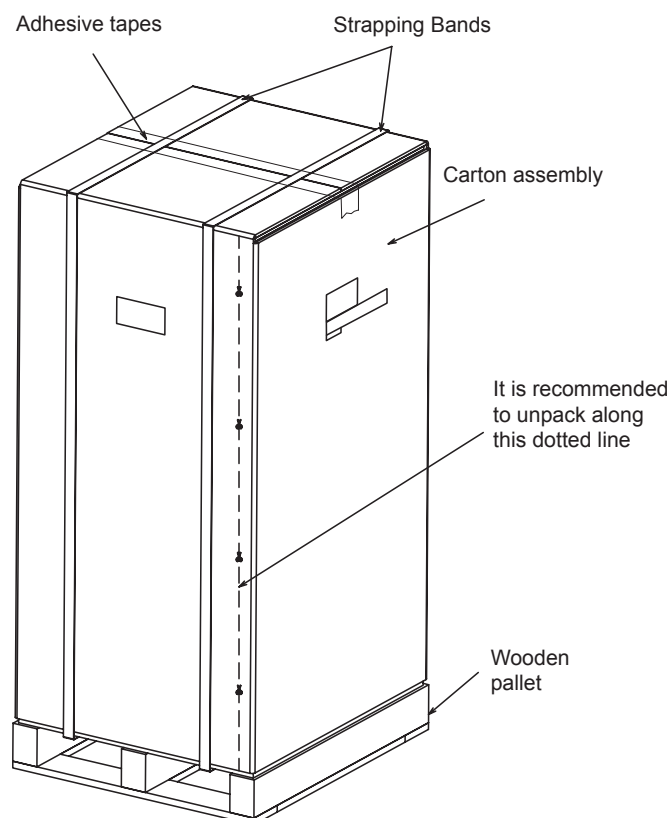
Do not put any material on the product.

3.2 Unpacking

All units are packed by a wooden pallet and carton assembly. Firstly to unpack it, place the unit on the assembly area to avoid damages in transport. Two persons are required.

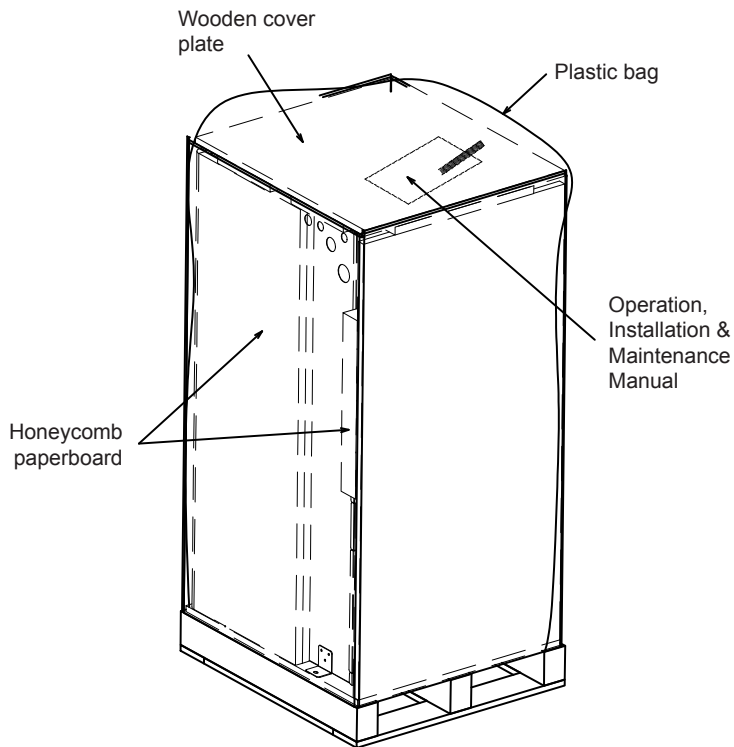
(A) Cut the strapping bands and remove the adhesive tapes.

(B) Cut to the carton assembly along the dotted line and then remove it.

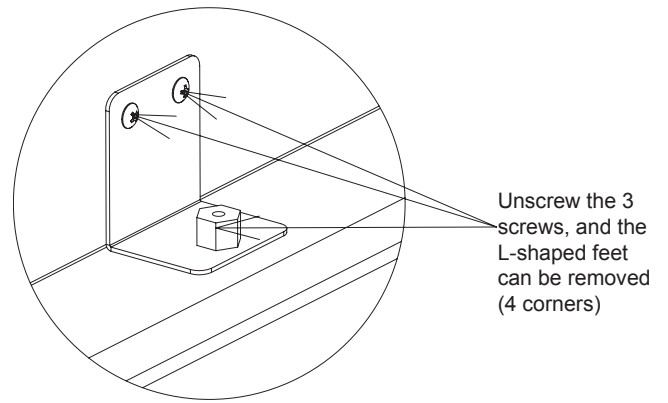
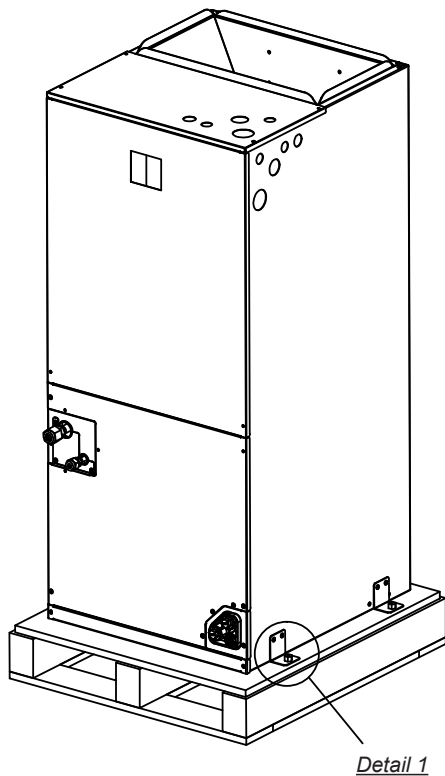


(C) Put away the operation Installation & maintenance manual and Factory-Supplied Accessories.

(D) Remove the wooden cover plate and honeycomb paperboards, and then remove the plastic bag around the unit.

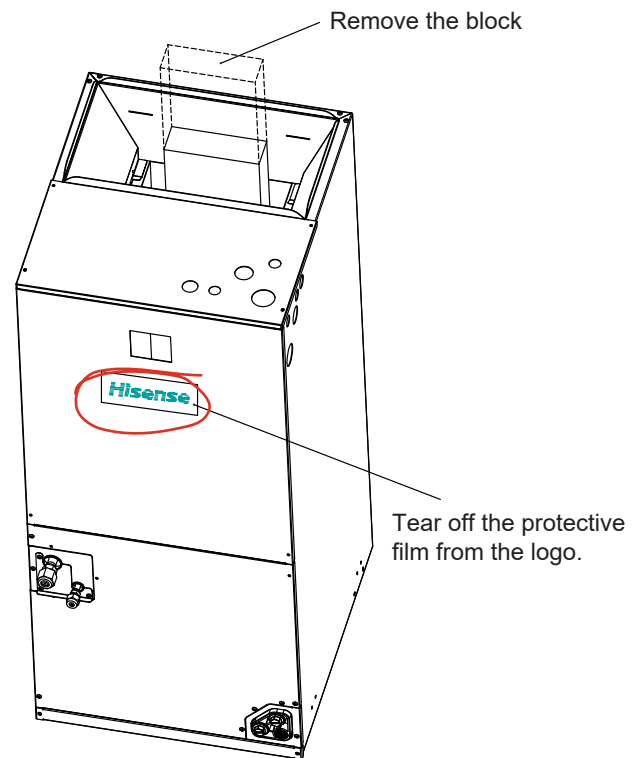


(E) Remove the 4 L-shaped feet at 4 corners, and then remove the indoor unit from wooden pallets, and place it carefully on the floor, as near as possible to its final location.



Detail 1

(F) Remove the block, and tear off the protective film from the logo.



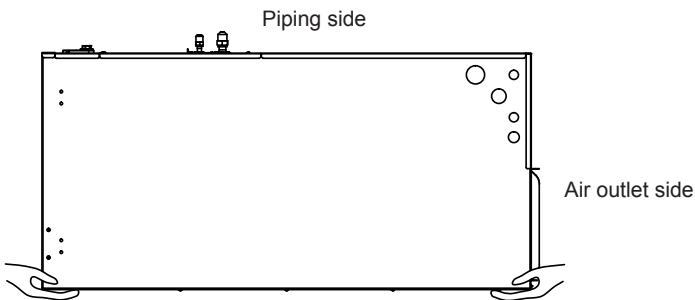
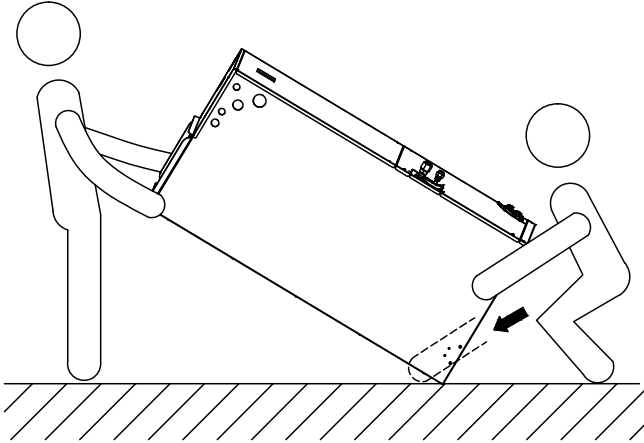
The Indoor Unit

⚠ DANGER

- Make sure remove the block in fan casing before switching on power in order to avoid serious accident.

3.3 Handling of Indoor Unit

- Two people are required when handling because of the weight of the unit.
- When transporting the indoor unit, it is necessary to face the unit upwards.
- Carefully tilt the unit to the back and two people should lift the bottom of the indoor unit with both hands.



⚠ WARNING

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

⚠ CAUTION

- Be careful not to damage on insulation materials on unit surface when lifting.
 - During the handling of the indoor unit, please wear protective equipment such as safety gloves to avoid cutting from sharp corners of the sheet metal.
-
-

4. Indoor Unit Installation

⚠ DANGER

Do not install the indoor unit in a flammable environment to avoid fire or an explosion.

⚠ WARNING

- Check to ensure that the indoor unit is placed in a position that is sturdy and stable enough to withstand the weight for a long time. If it is not strong enough, it may cause the indoor unit to fall down and cause personal injury.
- Do not install the indoor unit outdoors. If installed outdoors, an electric hazard or electric leakage will occur.

4.1 Factory-Supplied Accessories

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

NOTE

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

Table 4.1 Factory-Supplied Accessories

Accessory	Q'ty	Purpose
Rubber ring 	1	For horizontal left hand installation (vertical downflow installation)
Label 	1	For pasting unit
Cord Tie 	5	For horizontal left hand installation (vertical downflow installation) For communication wirings of third-party thermostat

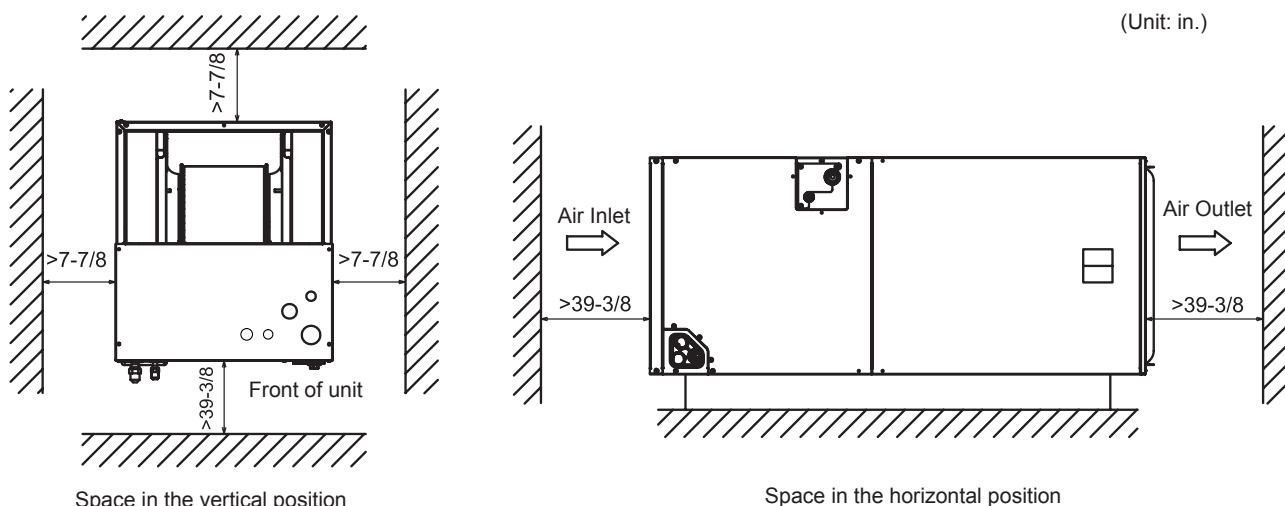
4.2 Initial Check

⚠ WARNING

- When moving the unit after unpacking, make sure not to exert any pressure on other parts, especially the refrigerant piping, drain piping and flange parts.

⚠ WARNING

- Wear protective gears when installing the unit.



4.3 Installation Location

- Before choosing the installation location, get the user's approval.
- 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.
- The air path is not blocked.
- Condensation can drain properly.
- Ensure sufficient clearance for maintenance and servicing
- Piping between the indoor and outdoor units should be within the allowable limits. (Refer to the installation of the outdoor unit)
- The indoor unit, outdoor unit, power supply wiring and transmission wiring should be kept at least 1 meter away from televisions and radio, which prevents image interference and noise in those electrical appliances. (Noise may be generated depending on the conditions under which the electric wave is generated, even if a one-meter distance is maintained.)
- Do not install the indoor unit in a machinery 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 performance of the indoor unit, and may deform and in the worst case, break the plastic parts of the indoor unit.
- When the unit is installed in a hot and humid place, it is recommended to insulate the cabinet exterior and to use auxiliary drain pan(field-supplied, must install float switch) .
- If installed above a finished living space, an auxiliary drain pan (as required by many building codes), must be installed under the entire unit and its condensate drain line must be routed to a location such that the user will see the condensate discharge.
- 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.

(B) Install the indoor unit and components as far as possible or at least 9.8ft (3m) from the electromagnetic wave radiator.

(C) Install a noise filter when the power supply emits harmful noises.

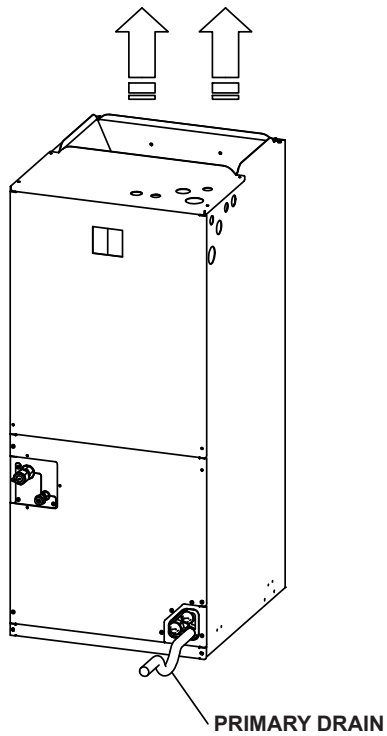
- To avoid any corrosive action to the heat exchangers, do not install the indoor unit in an acid or alkaline environment.

4.4 Installation

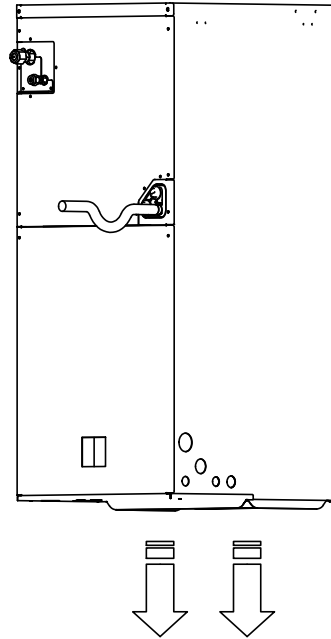
NOTE

- These appliances are designed for indoor installation only.
- The indoor unit has four installation configurations, including: vertical upflow installation, horizontal right flow installation, horizontal left flow installation and vertical downflow installation. Regardless of the installation configuration, the drainage hole is relatively located on the lower side of the gas/liquid refrigerant pipe to facilitate the normal discharge of condensate.
- The air filter is field-supplied. Please prepare the corresponding size filter according to Chapter 6 of the operation manual and install it on the indoor unit.
- It is must to install an external auxiliary drain pan (field-supplied, must install float switch) for all installation configurations. The auxiliary drain pan needs to be reliably fixed to avoid unit tilting caused by vibration during operation.
- The indoor unit has been configured for use in both vertical upflow installation and horizontal right flow installation at the factory. For horizontal left flow installation and vertical downflow installation, they need to be modified on site according to the installation instructions.

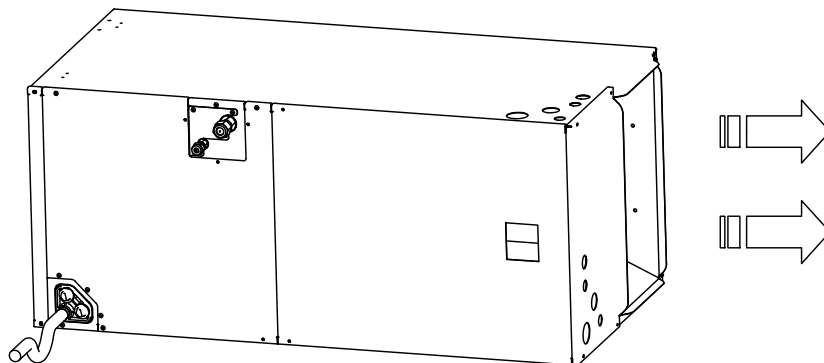
- The unit has 4 installation methods as shown.



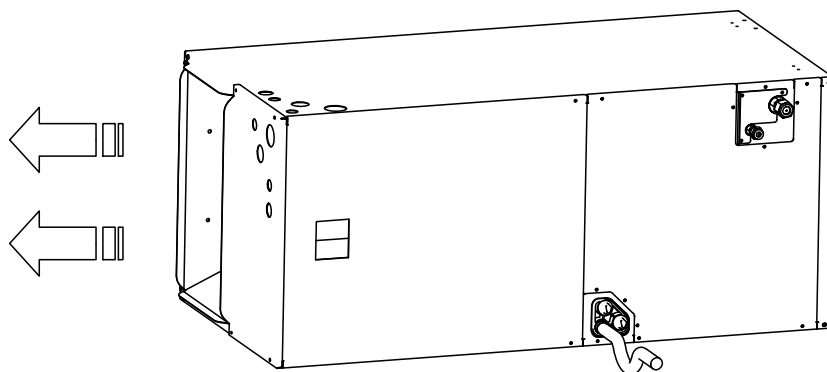
Vertical upflow installation



Vertical downflow installation

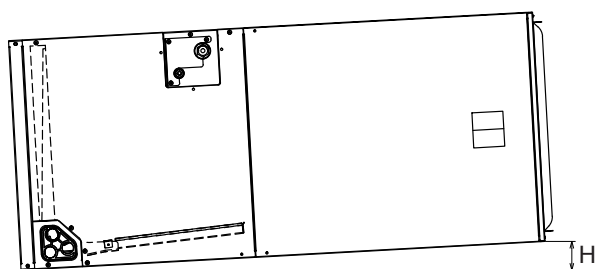


Horizontal right flow installation

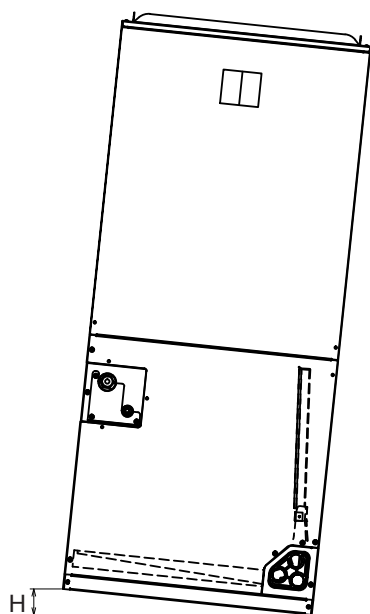


Horizontal left flow installation

- Adjust the installation surface of the indoor unit.
 - Check that the installation surface is horizontal and measure the maximum inclination.
 - In order to facilitate drainage, the installation tilt height of the indoor unit is as follows.



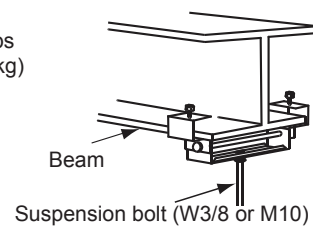
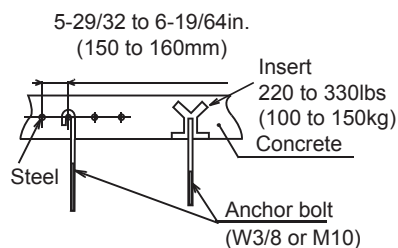
Horizontal Installation



Vertical Installation

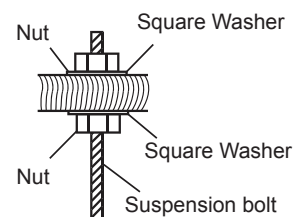
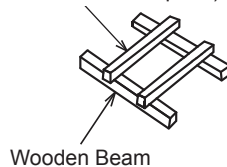
H: The allowable installation tilt height is 0~5 mm(0~13/64 in.).

- If installing through suspension bolts, at least four W3/8 or M10 or more bolts are required for fixing the indoor unit
- For Concrete Slab
- For Steel Beam



- For Wooden Beam Suspension

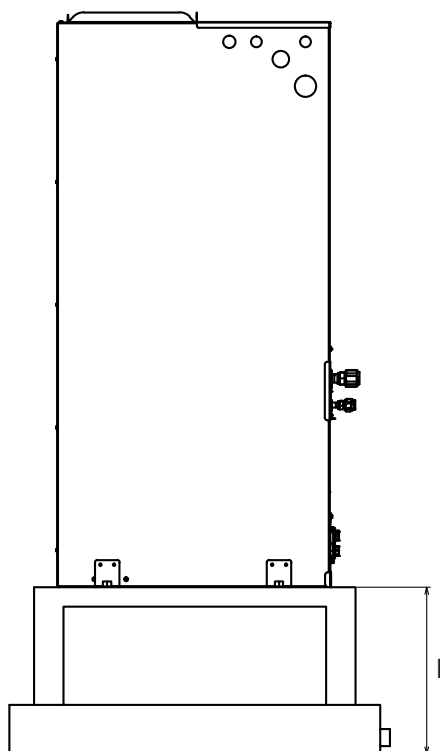
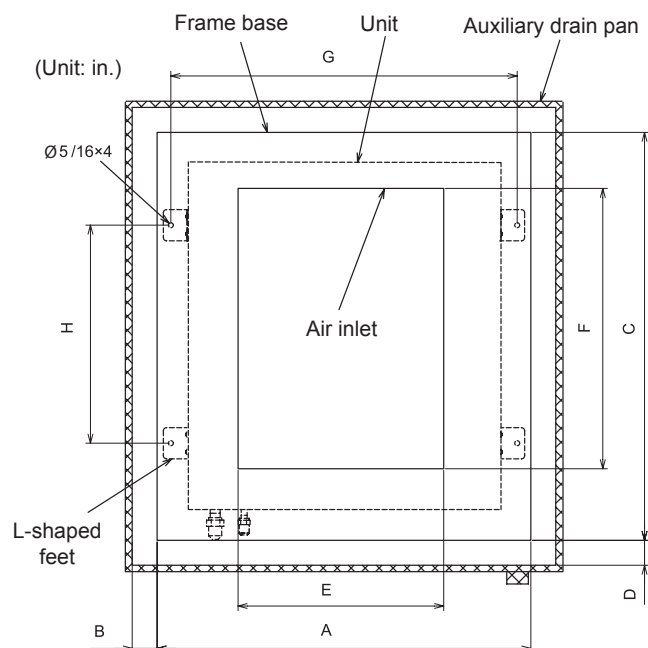
Wooden Bar
2-23/64in to 3-35/64in Square
(60mm to 90mm Square)



Mounting of Suspension Bolts

4.4.1 Vertical upflow installation

- The installation configuration for upflow is already configured at the factory and does not require on-site modifications.
- Frame base and auxiliary drain pan are field-supplied. Please ensure that the base is strong enough to support the weight of the indoor unit. Please refer to the size preparation as shown.

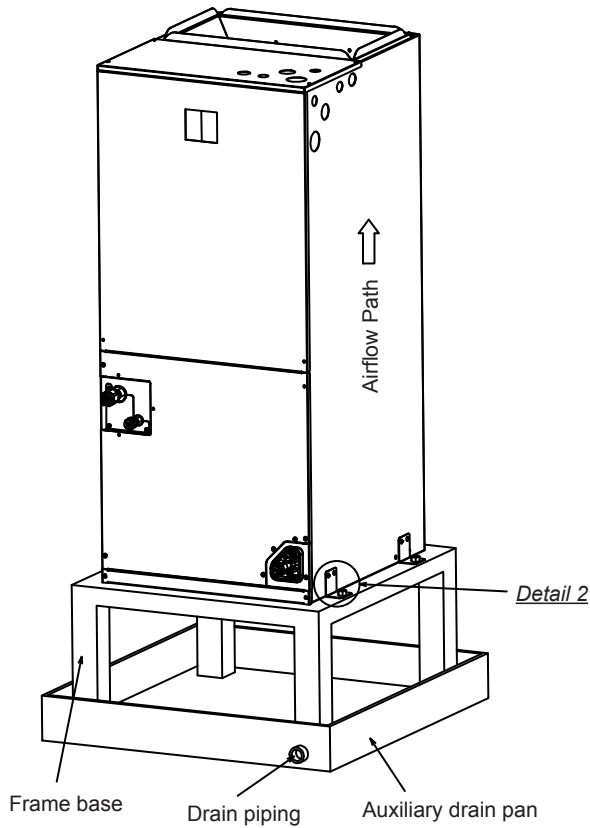


Dimension	09-12	
	inches	mm
A	>21-17/64	>540
B	>1-31/32	>50
C	>25	>635
D	>1-31/32	>50
E	11-1/32	280
F	14-61/64	380
G	19-41/64	499
H	12-61/64	329
I	19-11/16	500

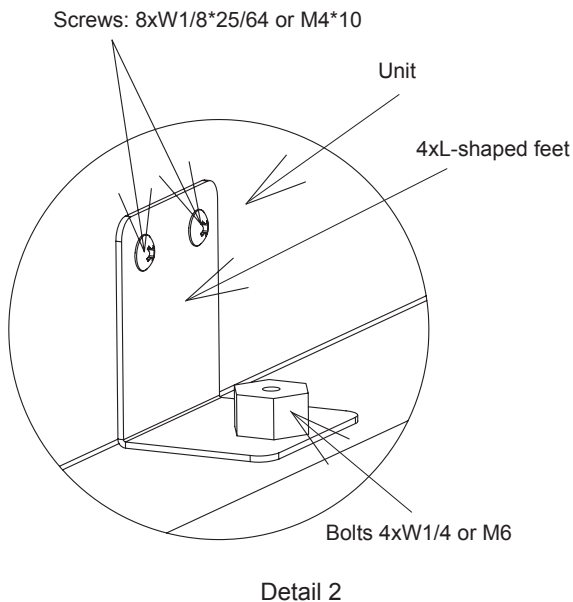
Dimension	18-42	
	inches	mm
A	>23-5/8	>600
B	>1-31/32	>50
C	>25-25/32	>655
D	>1-31/32	>50
E	12-63/64	330
F	17-23/32	450
G	21-57/64	556
H	13-25/32	350
I	19-11/16	500

Dimension	48-60	
	inches	mm
A	>25-63/64	>660
B	>1-31/32	>50
C	>28-5/32	>715
D	>1-31/32	>50
E	15-23/64	390
F	21-1/16	535
G	24-1/4	616
H	14-11/64	360
I	19-11/16	500

- Use four L-shaped feet on both sides to firmly fix the indoor unit to a reliable frame base and install an auxiliary drain pan at the bottom to discharge condensate.

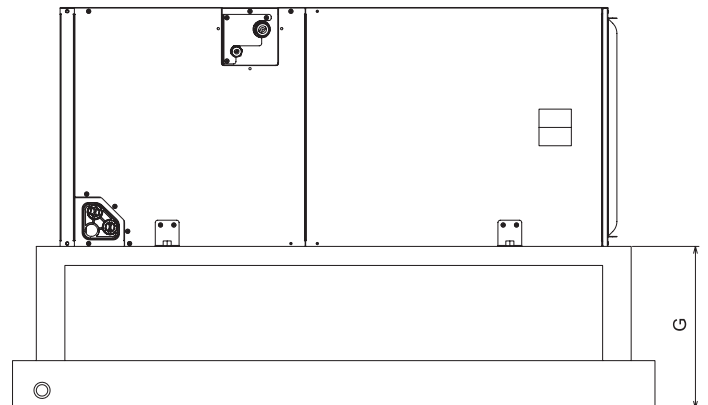
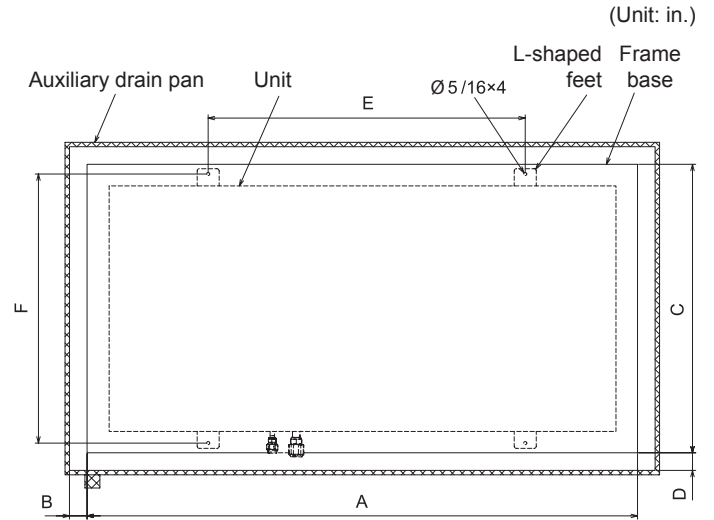


Vertical upflow installation



4.4.2 Horizontal right flow installation

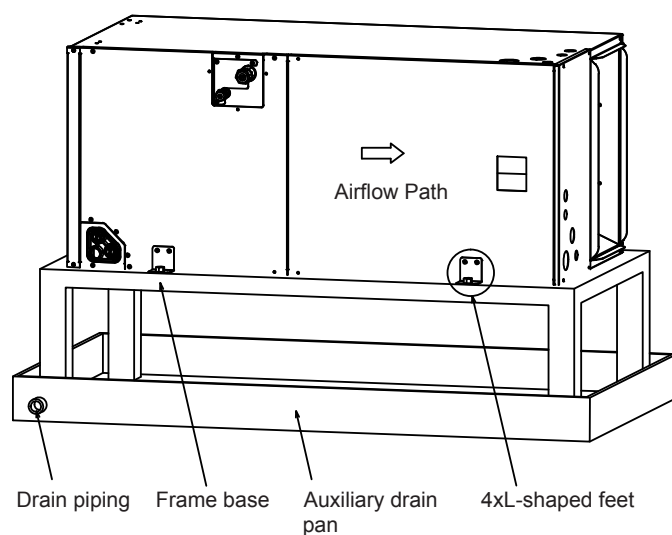
- The installation configuration for horizontal right flow is already configured at the factory and does not require on-site modifications.
- Frame base and auxiliary drain pan are field-supplied. Please ensure that the base is strong enough to support the weight of the indoor unit. Please refer to the size preparation as shown.



Dimension	09-12	
	inches	mm
A	>39-3/8	>1000
B	>1-31/32	>50
C	>25	>635
D	>1-31/32	>50
E	27-11/64	690
F	23-5/32	588
G	19-11/16	500

Dimension	18-42	
	inches	mm
A	>49-7/32	>1250
B	>1-31/32	>50
C	>25-25/32	>655
D	>1-31/32	>50
E	28-11/32	720
F	21-1/64	610
G	19-11/16	500

Dimension	48-60	
	inches	mm
A	>57-3/32	>1450
B	>1-31/32	>50
C	>28-5/32	>715
D	>1-31/32	>50
E	32-9/32	820
F	26-3/8	670
G	19-11/16	500

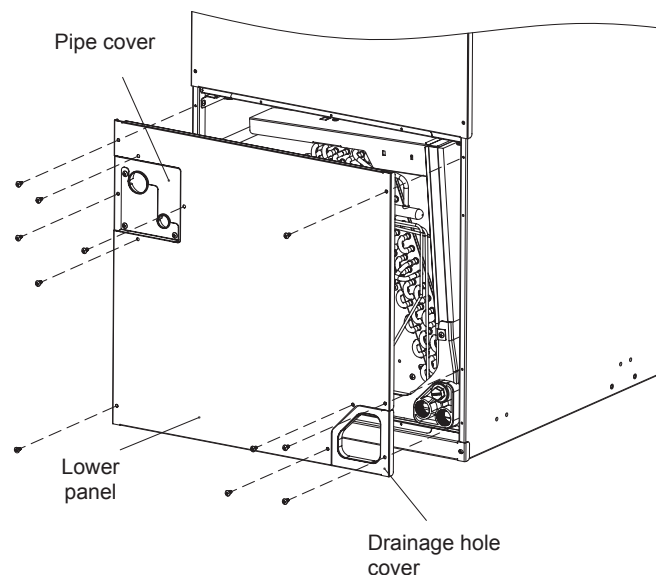


Horizontal right flow installation

4.4.3 Horizontal left flow installation (Vertical downflow installation)

- When the unit is horizontal left flow installation, the following steps are required.

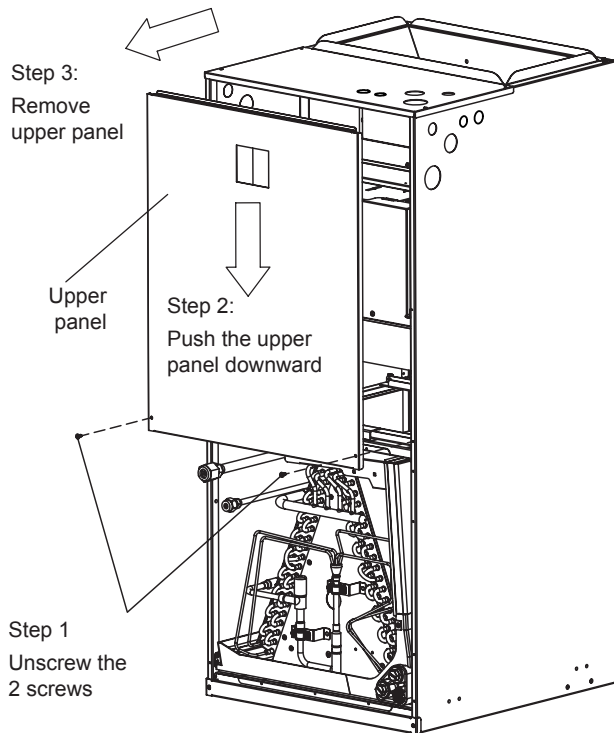
(A) Remove the lower panel, pipe and drainage hole cover. Unscrew screws.



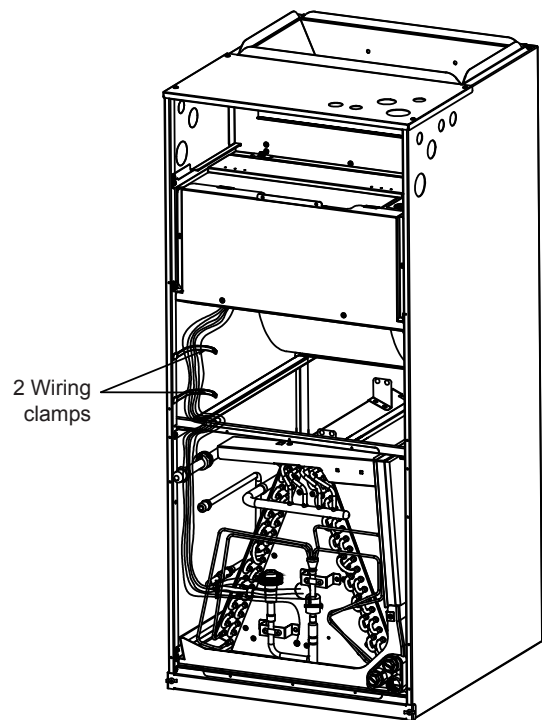
*The vertical downflow installation modification method is the same as the horizontal left flow installation.

- When the unit is horizontal right flow installation, rotate it clockwise for 90 degrees, as shown in Fig. horizontal right flow installation.
- Use four L-shaped feet on both sides to firmly fix the indoor unit to a reliable frame base and install an auxiliary drain pan at the bottom to discharge condensate.

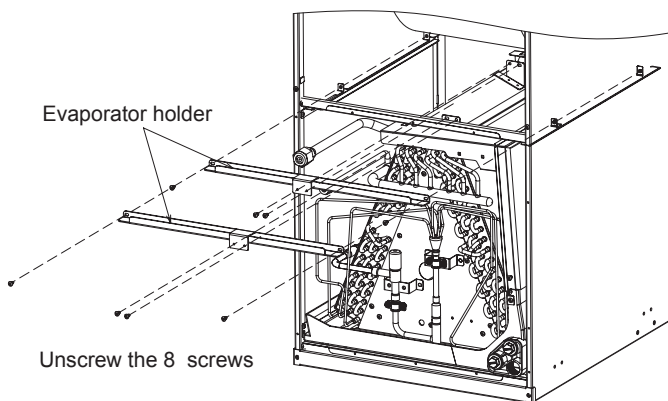
(B) Remove the upper panel.



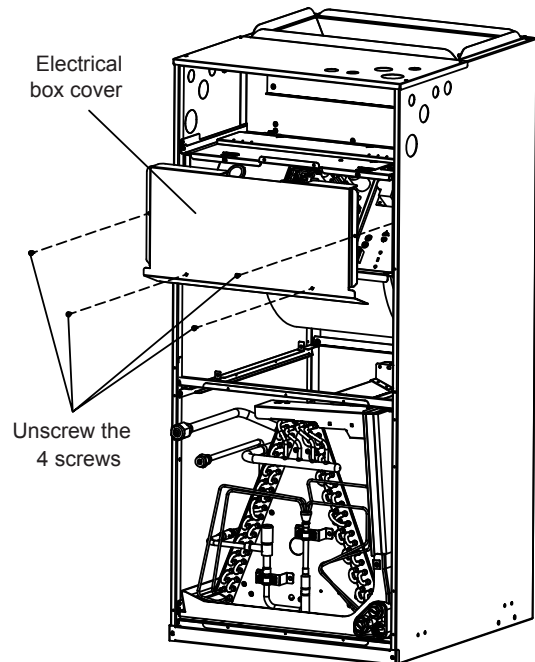
(D) Remove the two wiring clamps.



(C) The two holders used to fix the evaporator during transportation should be removed and stored properly. Before the next indoor unit transportation, they should be installed in their original positions and the evaporator should be fixed.

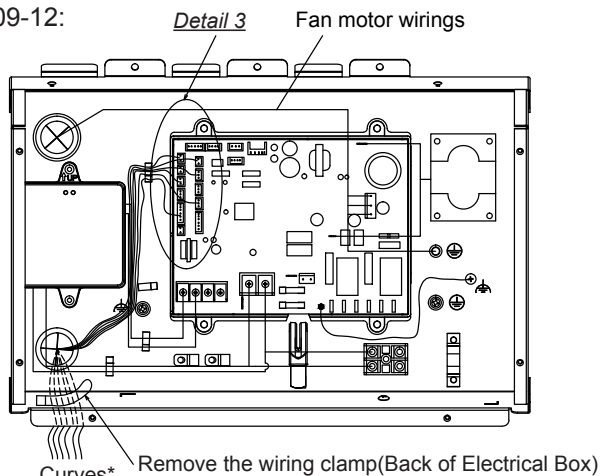


(E) Remove the electrical box cover.



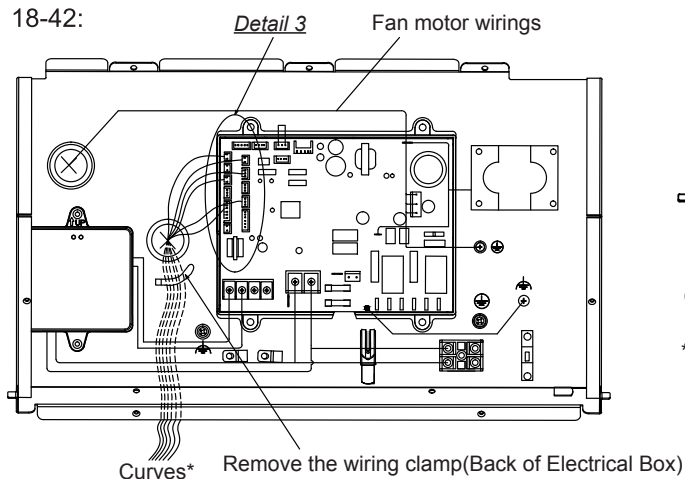
(F) Remove the wiring clamps, Ti, Tg, TL, EVI, refrigerant sensor and humidity sensor from the socket. Take out the wirings from the electrical box hole, and put them together with the evaporator, taking care not to damage the wirings and plugs.

09-12:

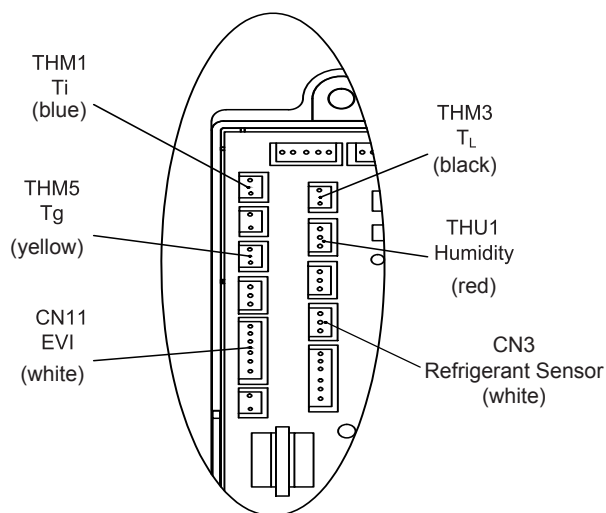


* The curve represents the wirings to be removed.

18-42:



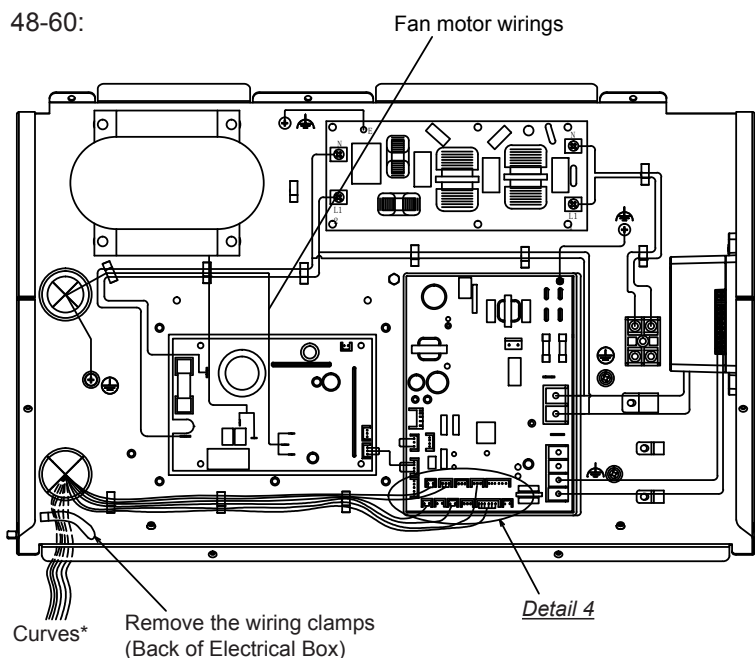
* The curve represents the wirings to be removed.



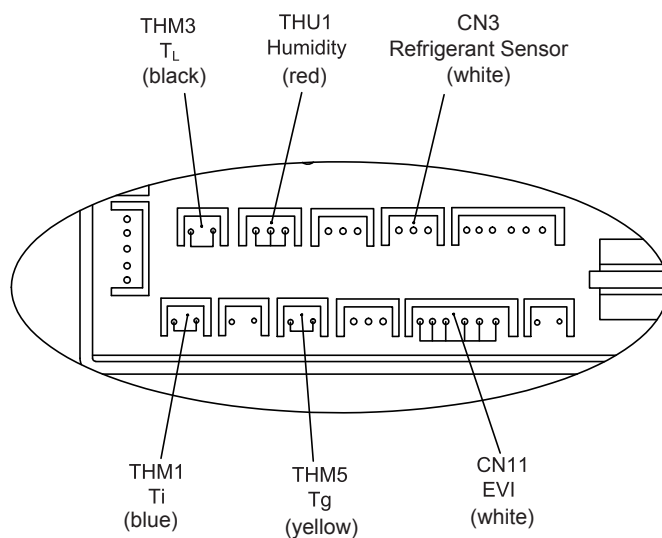
Detail 3

Ti : Air inlet thermistor
TL : Liquid pipe thermistor
Tg : Gas pipe thermistor
EVI : Micro-Computer Control Expansion Valve
Humidity : Humidity sensor

48-60:



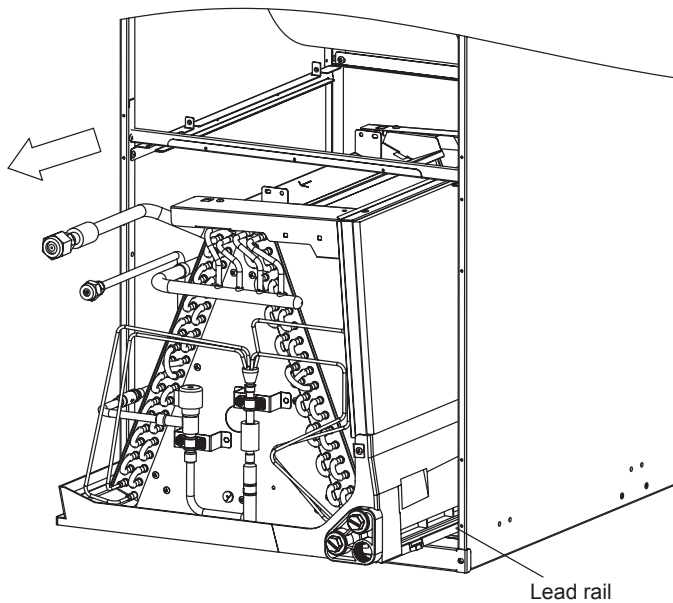
* The curve represents the wirings to be removed.



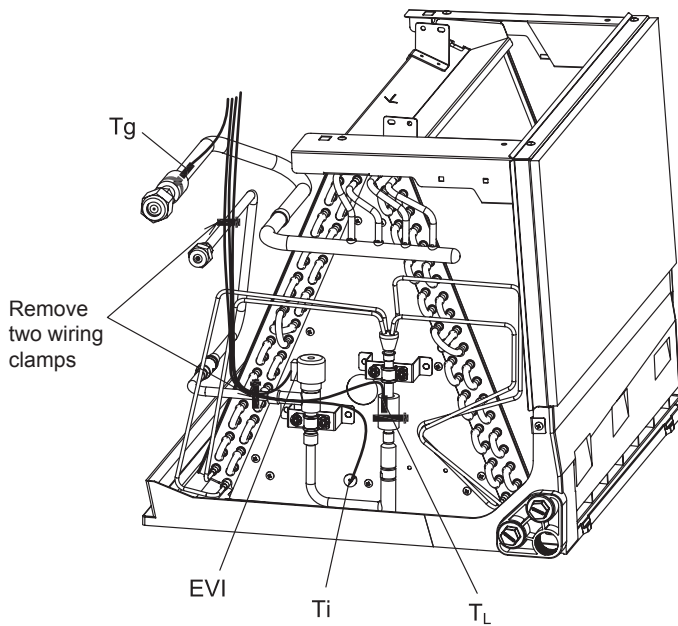
Detail 4

Ti : Air inlet thermistor
TL : Liquid pipe thermistor
Tg : Gas pipe thermistor
EVI : Micro-Computer Control Expansion Valve
Humidity : Humidity sensor

(G) Extract the evaporator with the removed wirings.

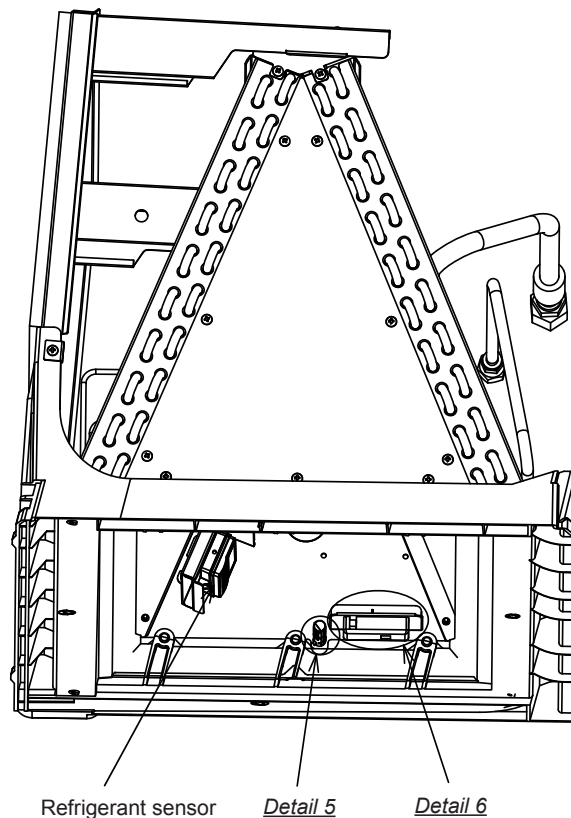


(H) Remove the two wiring clamps.

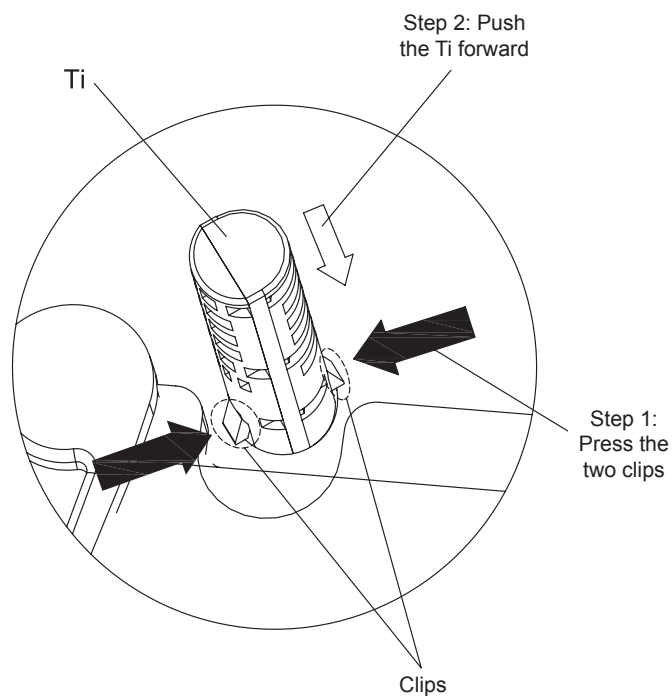


- Ti : Air inlet thermistor
- TL : Liquid pipe thermistor
- Tg : Gas pipe thermistor
- EVI : Micro-Computer Control Expansion Valve
- Humidity : Humidity sensor

(I) Tilt the bottom of the evaporator from backward to show Ti (Air inlet thermistor) and Humidity sensor. Follow the instructions to remove it.



Press the clips on both sides of Ti (Air inlet thermistor).

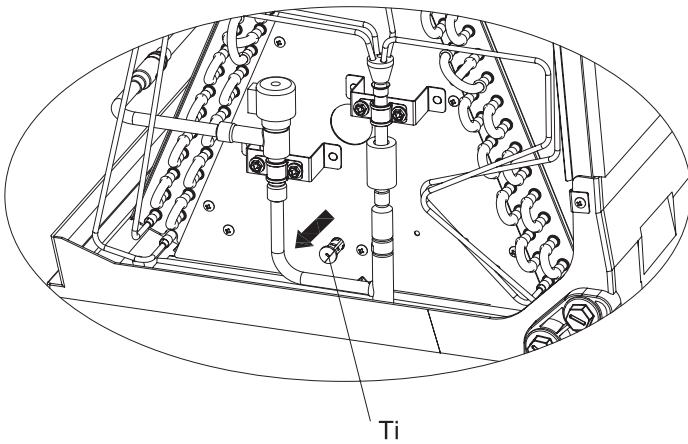


Ti : Air inlet thermistor

Detail 5

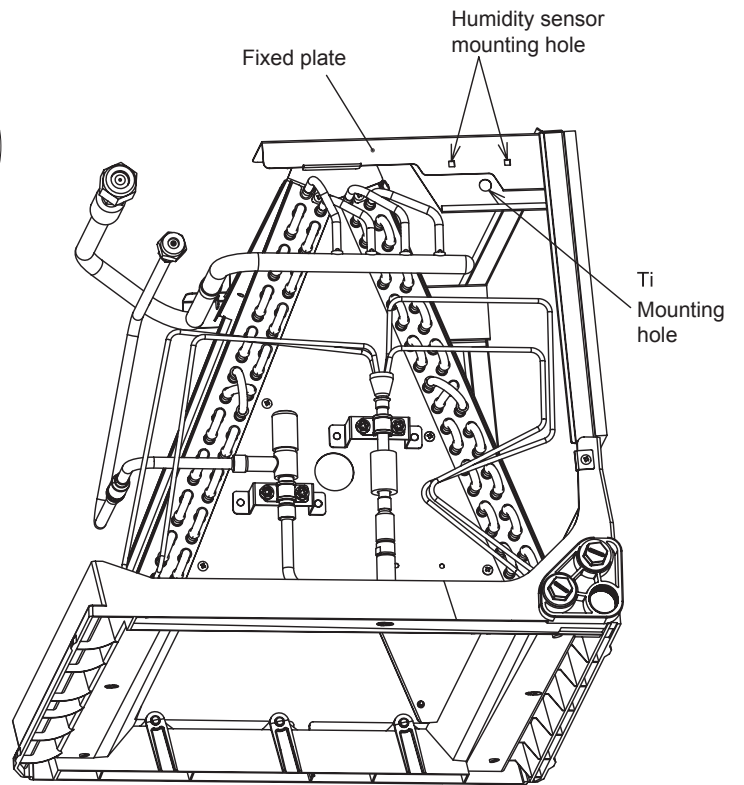
(J) Install the removed Ti (Air inlet thermistor) and Humidity sensor into the fixed plate above the front of the evaporator.

Remove Ti from the front of the evaporator.

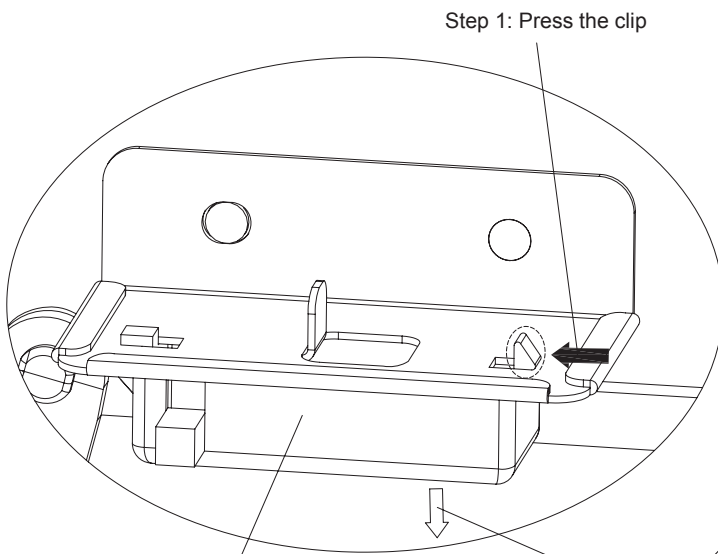


Ti : Air inlet thermistor

Press the Humidity sensor indicator side clip. Remove it from the evaporator.



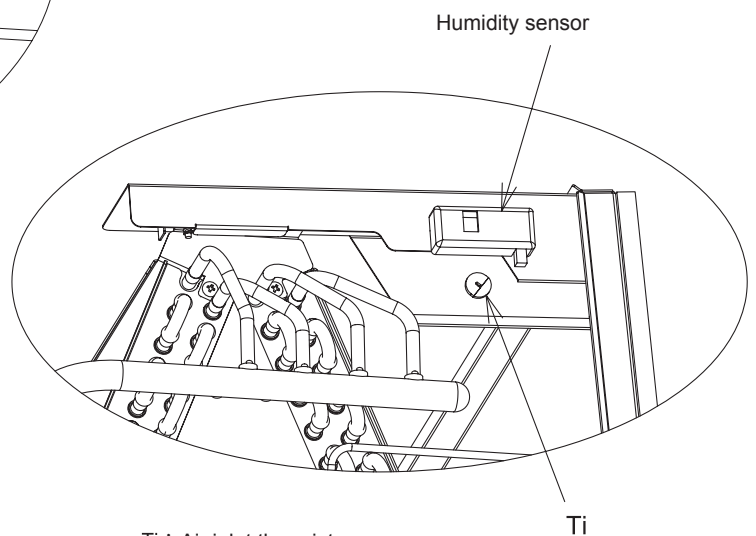
Ti : Air inlet thermistor



Humidity sensor

Step 2:
Removed the
sensor downward

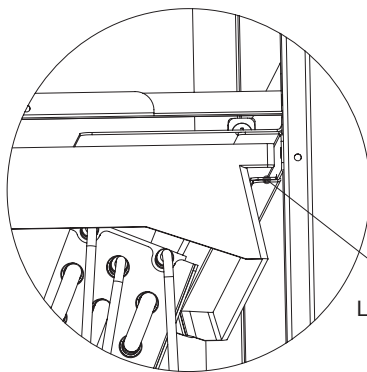
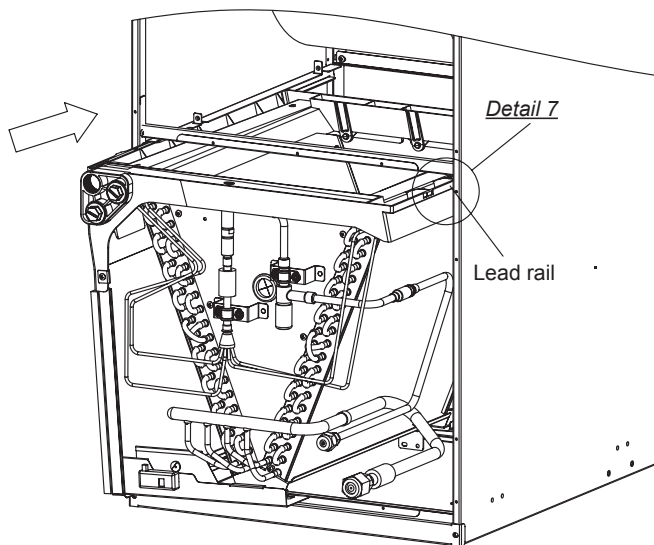
Detail 6



Ti : Air inlet thermistor

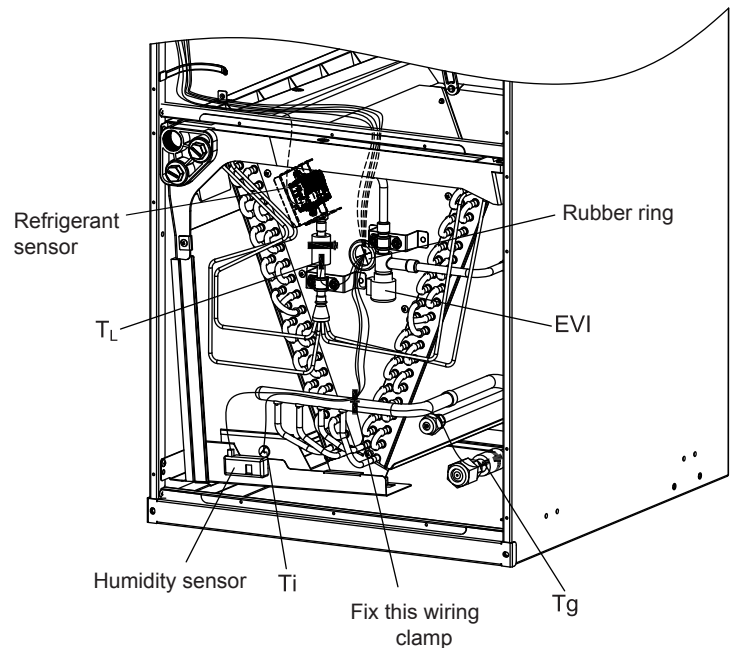
Ti

(K) Rotate the evaporator for 180 degrees and insert it into the upper side of the lead rail. Pay attention to protecting the wirings during the process.



Detail 7

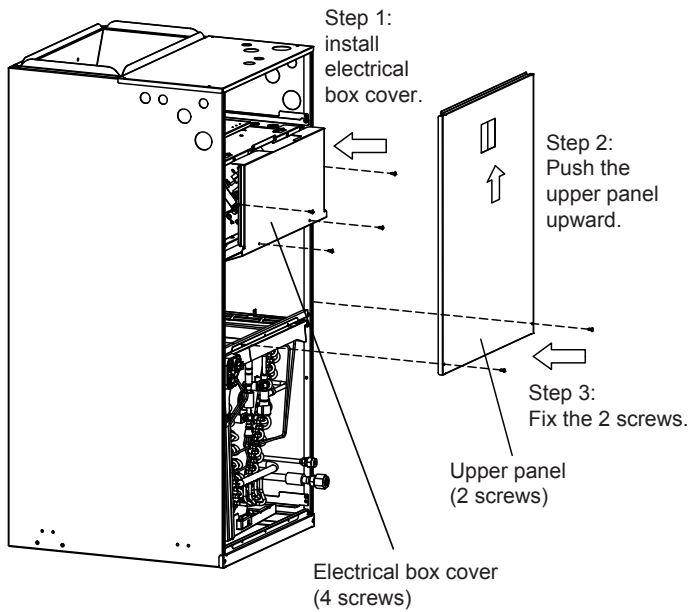
(L) Fix the wirings of Ti and Tg and Humidity sensor with wiring clamps according to the positions shown in the figure. Remove the refrigerant sensor wiring through the rubber ring and then thread the wirings of Ti & Tg & TL & EVI & Humidity sensor into the rubber ring.



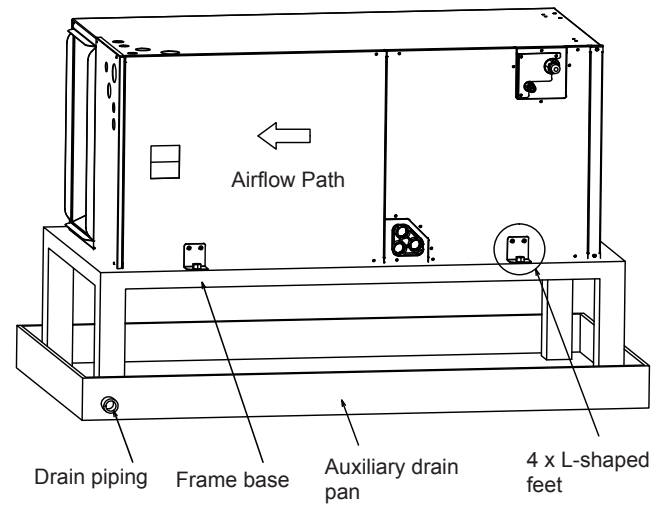
- Ti : Air inlet thermistor
- T_L : Liquid pipe thermistor
- Tg : Gas pipe thermistor
- EVI : Micro-Computer Control Expansion Valve
- Humidity : Humidity sensor

(M) Insert the wirings into the electrical box in its original position (refer to 4.4.3.F). And then refix the wirings with wire clamps (refer to 4.4.3.D&F).

(N) Reinstall electrical box cover and then reinstall the upper panel.



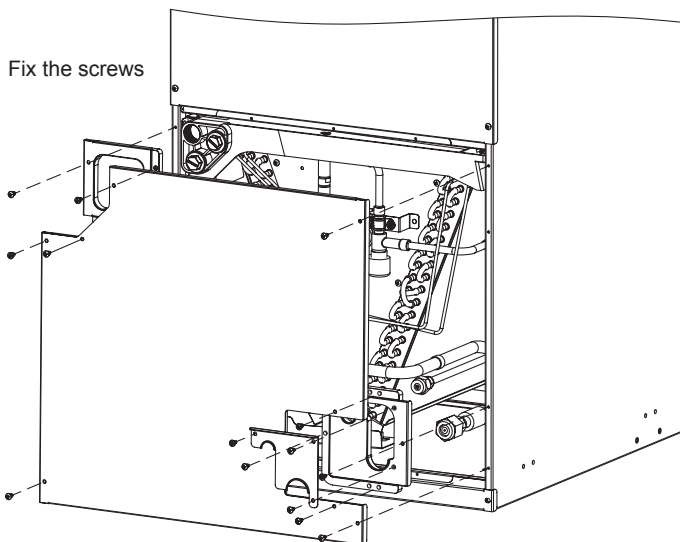
- Use four L-shaped feet on both sides to firmly fix the indoor unit to a reliable frame base and install an auxiliary drain pan at the bottom to discharge condensate.



Horizontal left flow installation

- * Frame base and auxiliary drain pan are field-supplied. Please refer to the size preparation as Horizontal right flow installation.

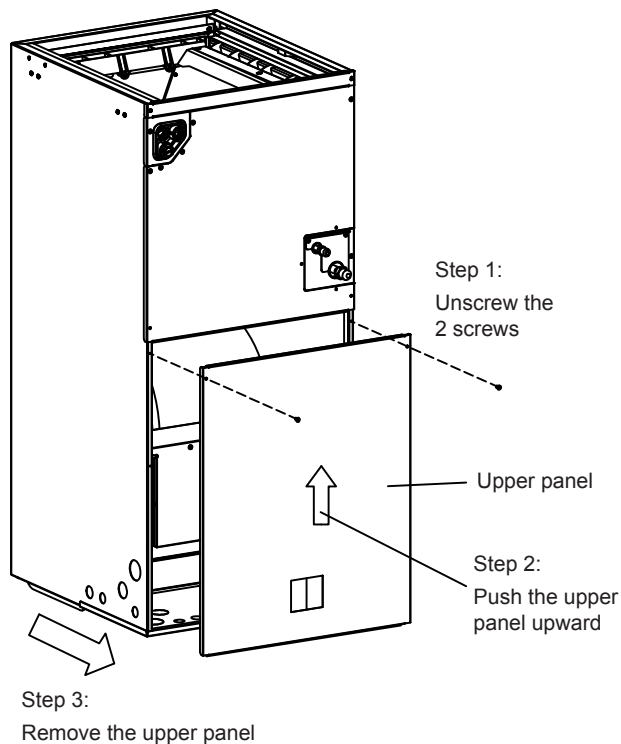
(O) Reinstall the lower panel, pipe and drainage hole cover. Rotate the unit anticlockwise for 90 degrees, as shown in figure horizontal left flow installation.



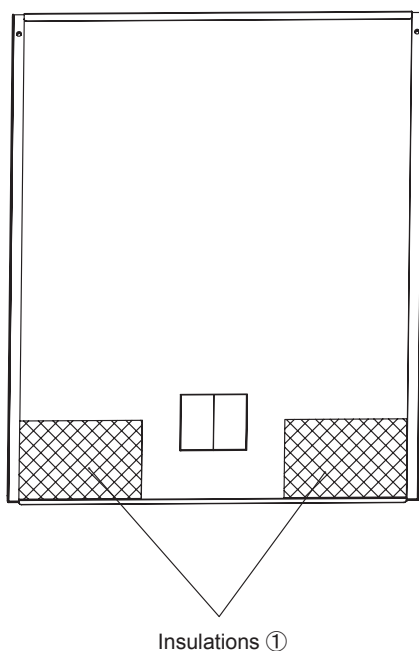
4.4.4 Vertical downflow installation

- When the unit is vertical downflow installation, it is also necessary to modify the indoor unit on site, and the modification method is the same as the horizontal left hand airflow installation. Please refer to 4.4.3 for details.
- Using the vertical downflow installation, when indoor temperature is 77~80.6°F (25~27°C) and humidity is 85% or more, there is a risk of condensation in the indoor unit. Insulations (optional) need to be pasted on the indoor unit as shown in the figure below:

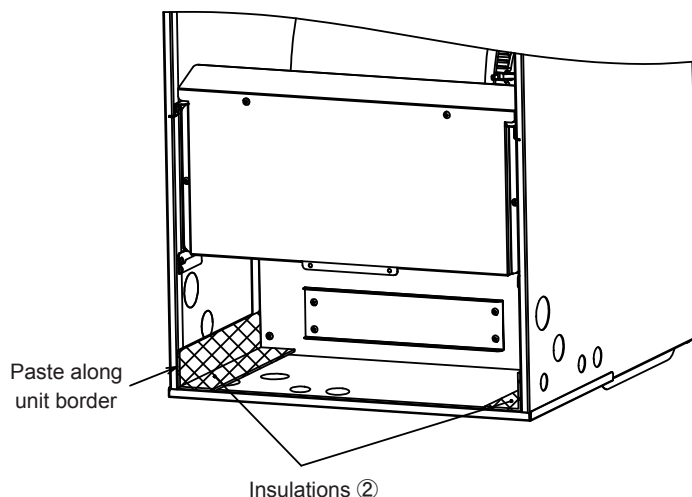
(A) Remove the upper panel.



Paste the insulations ① at the corners as shown on the back of the upper panel.

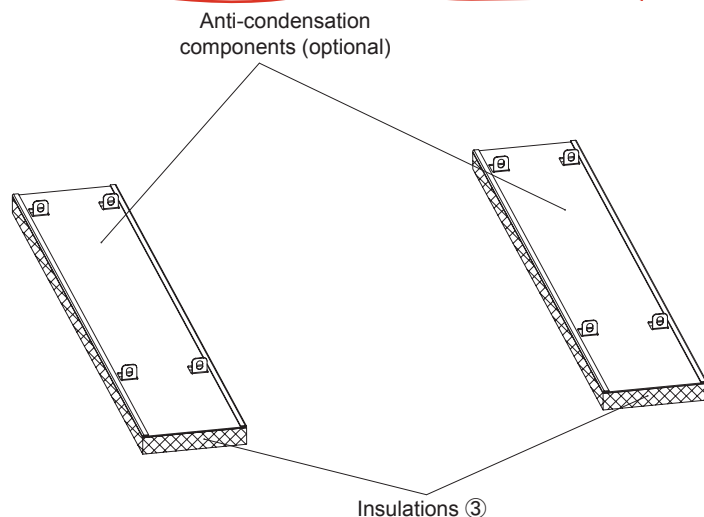


Paste the insulations ② at two corners inside the indoor unit.



(B) Install two anti-condensation components (optional) under the evaporator.

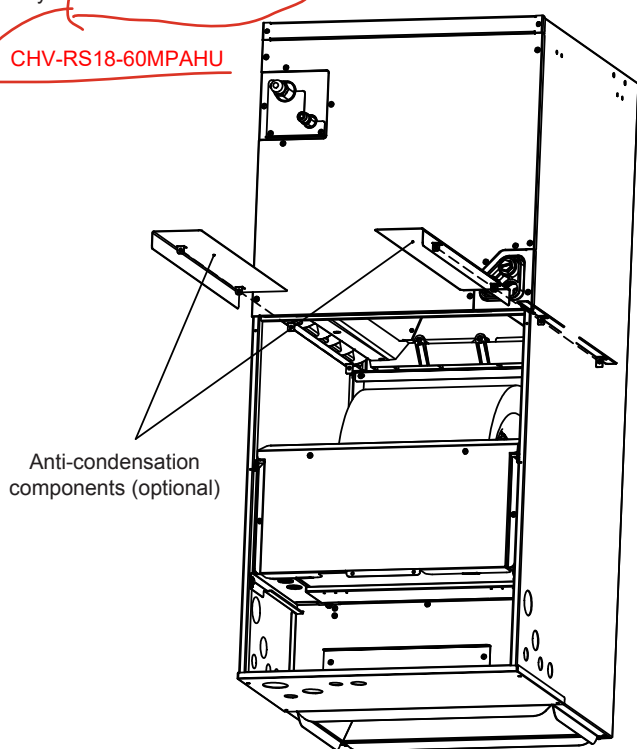
Only for AVU-18~60H3DKHA CHV-RS18-60MPAHU



Then install the anti-condensation components (optional) with 4 screws.

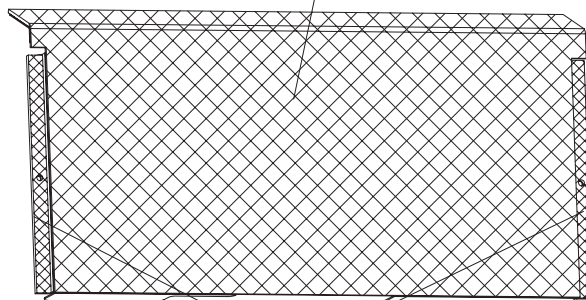
Only for AVU-18~60H3DKHA

CHV-RS18-60MPAHU



Paste the insulations ④ and ⑤ on the outer side of the electrical box cover.

Insulation ④

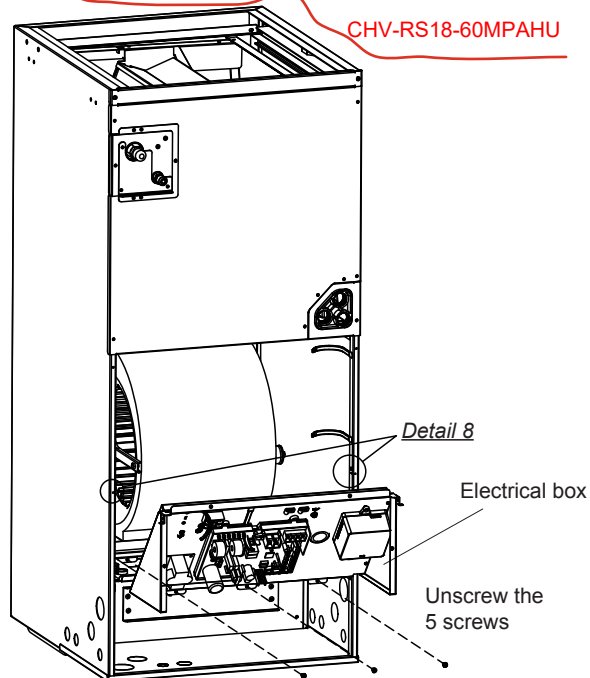


Insulations ⑤

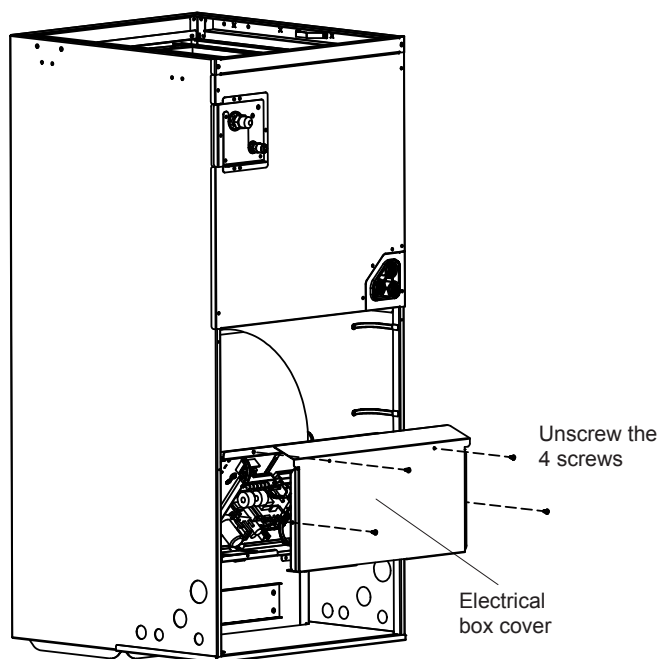
(D) Remove wiring clamps, sensor plugs and fan volute wirings refer to 4.4.3 (F) and then remove the electrical box. Pay attention to protecting the wirings during the process. The electrical box is heavy, please hold it well to avoid falling and injuring.

Only for AVU-18~60H3DKHA

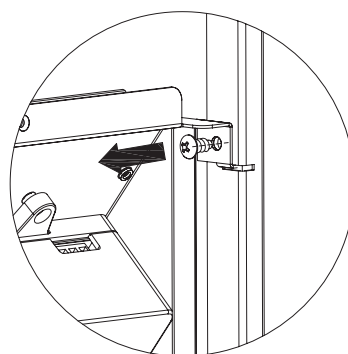
CHV-RS18-60MPAHU



(C) Remove the electrical box cover.



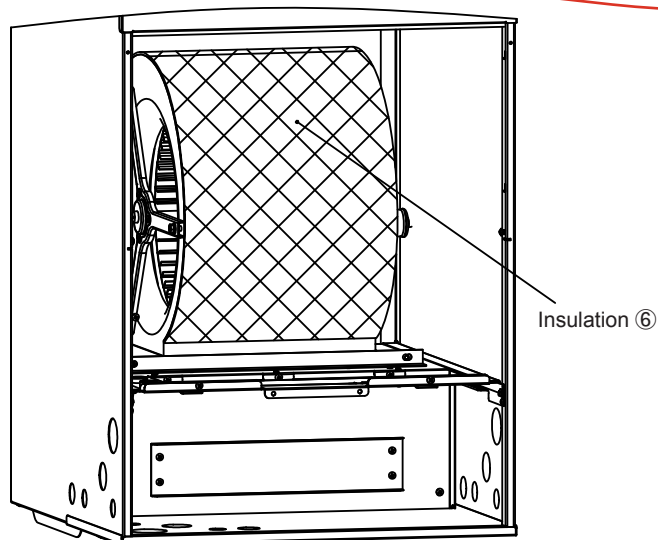
Detail 8



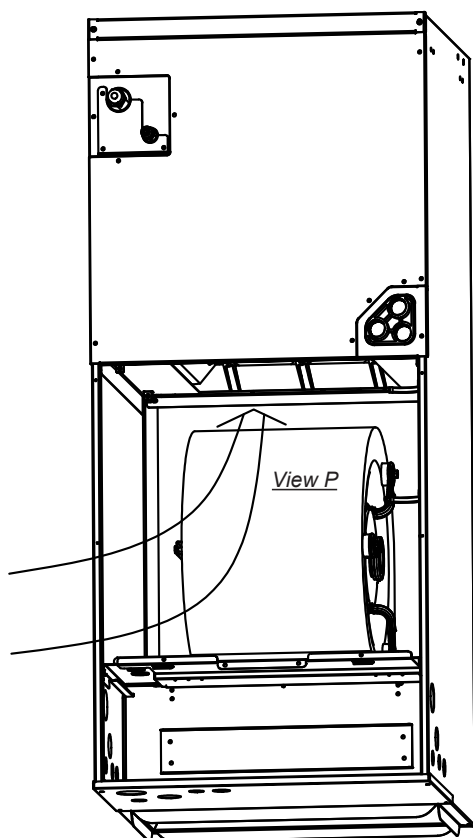
Paste the insulation ⑥ on the fan volute.

Only for AVU-18~60H3DKHA

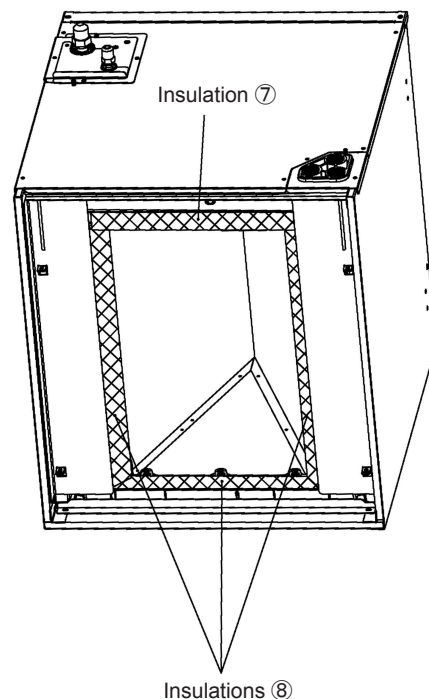
CHV-RS18-60MPAHU



Paste the insulations ⑦ and ⑧ on the gaps between the bottom of the drain pan and the sheet metal.

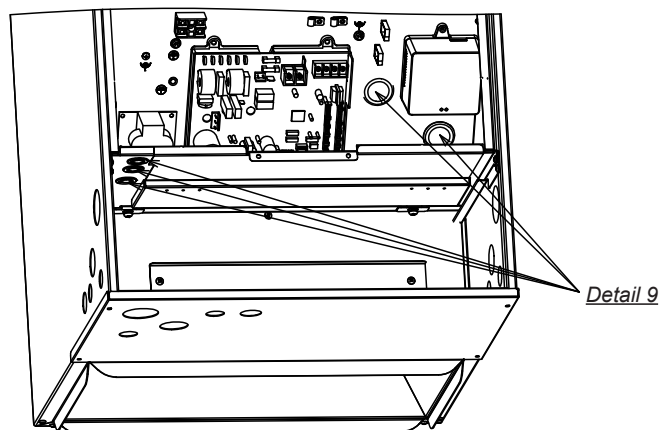


View P

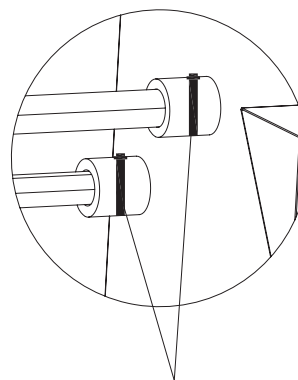


(E) Reinstall the electrical box in its original position (refer to 4.4.4 (D)).

Paste the insulations ⑨ around the wirings near the five wiring connection holes as shown. Paste tightly according to the size of the wiring to protect the unit from condensate.

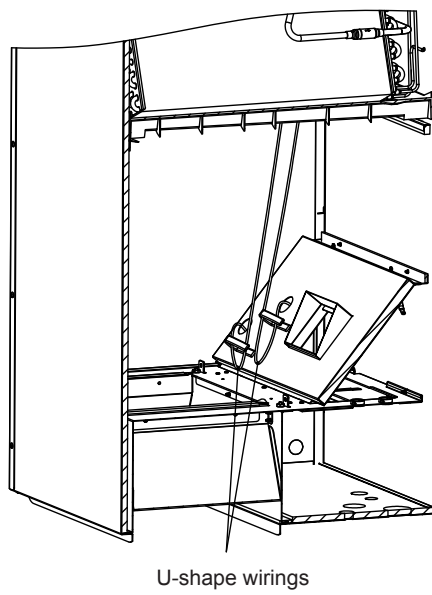


Detail 9



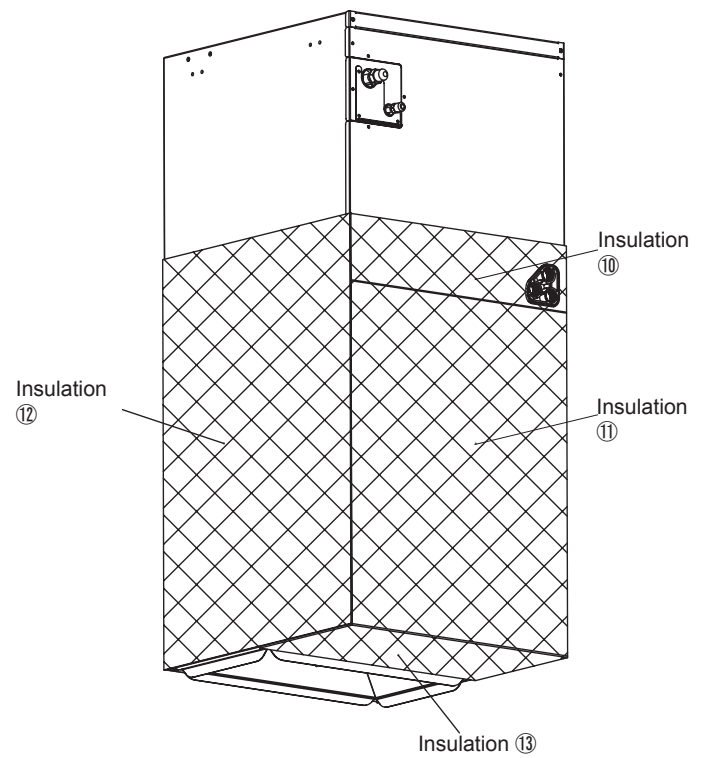
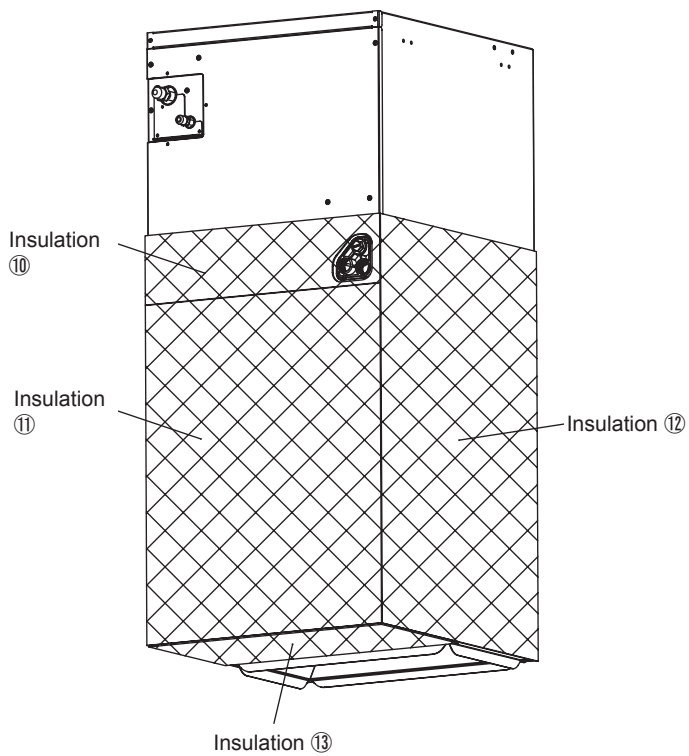
Insulations ⑨

Clamp the wirings as U-shape to prevent the water enters into the electrical box.

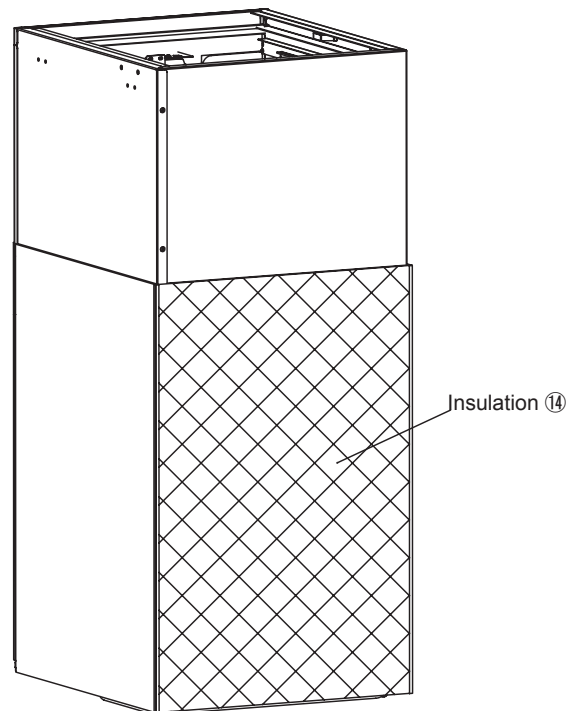


(F) Reinstall electrical box cover and the upper panel (refer to 4.4.3 (O)).

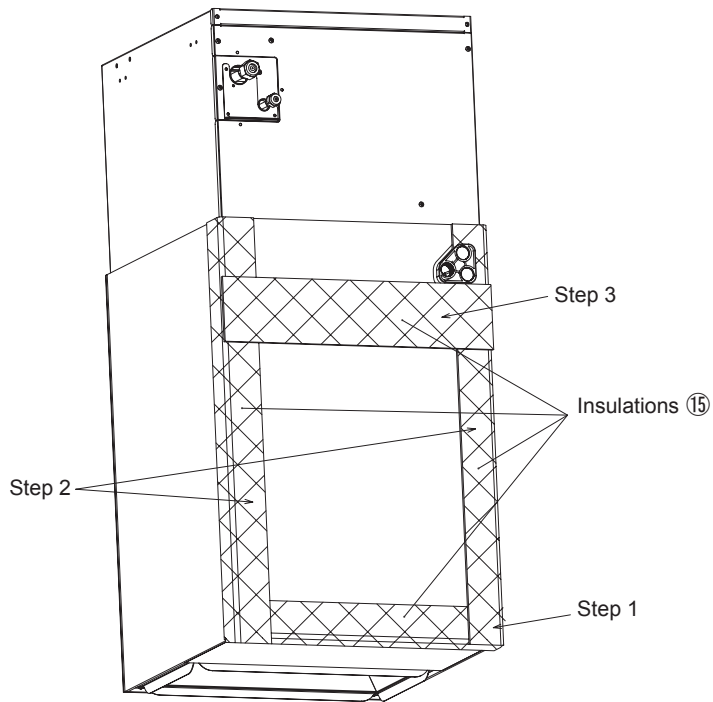
Paste the insulations ⑩, ⑪, ⑫ and ⑬ on the front, bottom, left and right sides of the indoor unit.



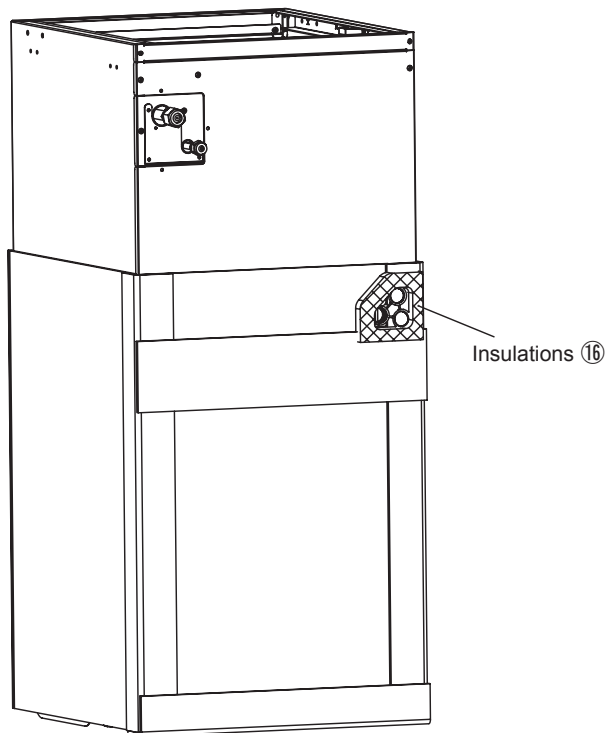
Paste the insulation ⑭ on the back side of the indoor unit.



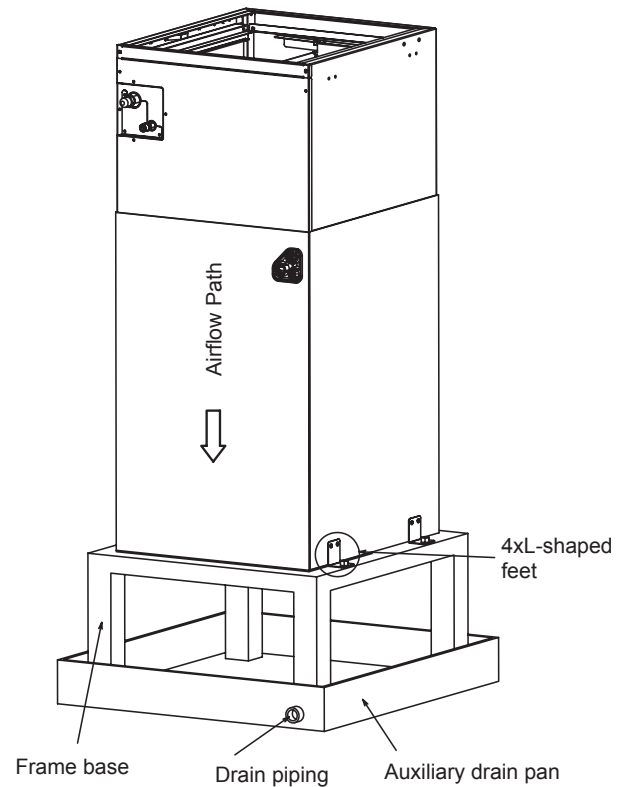
Paste the insulations ⑮ in order.



Paste the insulation ⑮ near the drainage hole.



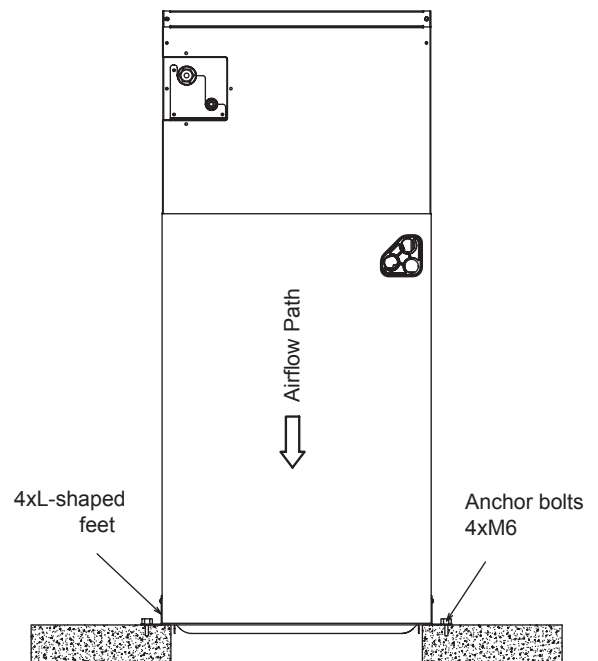
- After the modification according to the instructions, use four L-shaped feet on both sides to firmly fix the indoor unit to a reliable frame base and install an auxiliary drain pan at the bottom to discharge condensate.



Vertical downflow installation

* Frame base and auxiliary drain pan are field-supplied. Please refer to the size preparation as vertical upflow installation.

- If the space is limited and cannot be fixed to the frame base, the indoor unit needs to use four L-shaped feet on both sides to be fixed into the ground.



SPDFCGK-03

Insulation (optional part) 09-12:

HOPT-ECG03

Insulation number*	09-12
	Quantity per unit
①	2
②	2
④	1
⑤	2
⑦	1
⑧	3
⑨	5
⑩	1
⑪	1
⑫	2
⑬	1
⑭	1
⑮	4
⑯	1

SPDFCGK-01

Insulation (optional part) 18-42:

HOPT-ECG01

Insulation number*	18-42
	Quantity per unit
①	2
②	2
③	2
④	1
⑤	2
⑥	1
⑦	1
⑧	3
⑨	5
⑩	1
⑪	1
⑫	2
⑬	1
⑭	1
⑮	4
⑯	1

SPDFCGK-02

Insulation (optional part) 48-60:

HOPT-ECG02

Insulation number*	48-60
	Quantity per unit
①	2
②	2
③	2
④	1
⑤	2
⑥	1
⑦	1
⑧	3
⑨	5
⑩	1
⑪	1
⑫	2
⑬	1
⑭	1
⑮	4
⑯	1

*Note: There is a corresponding number tag on the insulation.

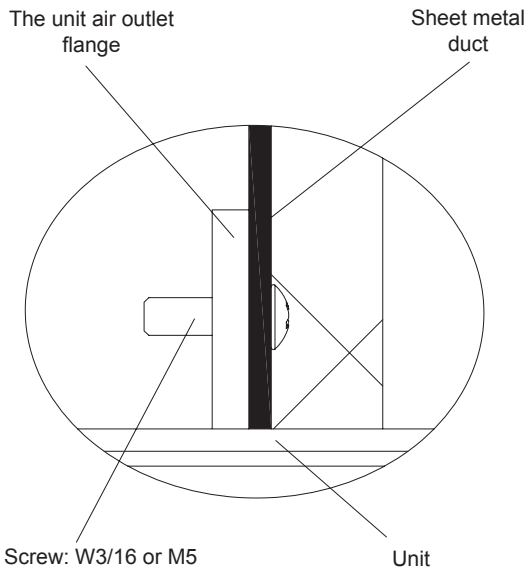
4.5 Air duct

Field duct work must comply with the National Fire Protection Association NFPA 90A, NFPA 90B and any applicable local ordinance.

⚠ WARNING

- Flame retardant ductwork is to be used and sealed to the unit in a manner that will prevent leakage.
- The first 23-5/8 inches of supply air plenum and duct work must be constructed of sheet metal.
- The thickness of sheet metal ducts must meet NFPA 90B requirements.
- Sheet metal duct work must be insulated and covered with glass fiber no less than 7/8 inches thickness. Fibrous duct work may be used if constructed and installed in accordance with SMACNA Construction Standard on Fibrous Glass Ducts. Duct work must comply with National Fire Protection Association as tested by U/L Standard 181 for Class I Air Ducts. Check local codes for requirements on duct work and insulation.
- Joints and seams shall be fastened and made airtight. Material must be nonflammable and meet NFPA 90A, NFPA 90B and any applicable local ordinance.
- Ducts shall be supported by metal hangers, straps, lugs, or brackets.
- No nails shall be driven through the duct walls, and no unnecessary holes shall be cut therein.

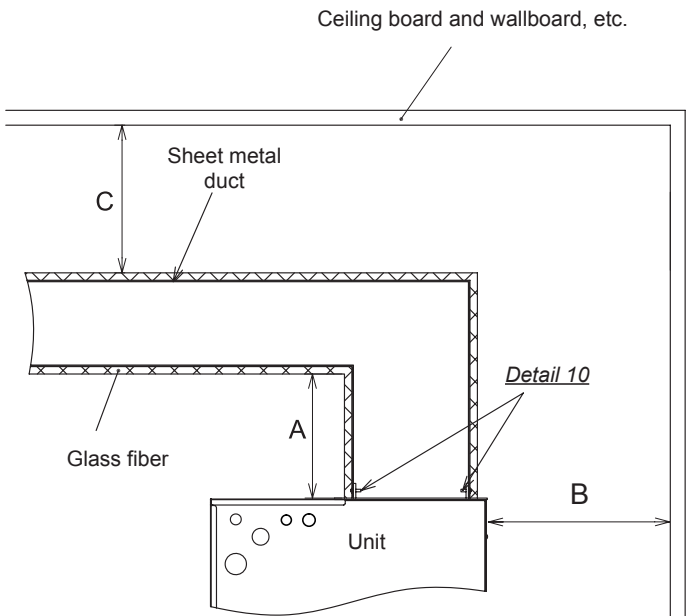
- Duct work shall be installed in conformance with **SMACNA HVAC Duct Construction Standards-Metal and Flexible**, and **SMACNA Residential Comfort System Installation Standards Manual**.
- Duct system must be designed within the range of external static pressure the unit is designed to operate against. It is important that the system airflow be adequate. Make sure supply and return duct work, grills, special filters, accessories, etc. are accounted for in total resistance.
- If a vibration isolation connectors used in duct systems, the material must meet NFPA 90A, NFPA 90B and any applicable local ordinance.



Detail 10

	Equipped with Auxiliary Electric Heater (optional part)	
A	Length of sheet metal air duct ≥23-5/8in (600mm)	

	Materials of Wallboard and pillars, etc.	
	Flammable	Non-flammable
B	>39-3/8in. (1000mm)	>7-7/8in. (200mm)
C	>23-5/8in. (600mm)	>2in. (50mm)



- **Do not, under any circumstances, connect return duct work to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury or property damage.**
- **The supply air plenum or duct must have a solid sheet metal bottom piece directly after the air handler unit with no opening, registers or flexible air ducts located in it. If flexible supply air ducts are used, they may be located only in the side walls of the rectangular plenum, a minimum of 6 inches from the solid bottom.**
- **It is prohibited to let foreign material fall into the air outlet to avoid fire or failure.**

NOTE

- The size of the duct connection refers to the operation manual for indoor unit dimensions.
 - The length of the screws for fixing the duct should no longer than 0.75in (19mm).
 - The duct system must not be supported by the indoor unit.
 - When installing the indoor unit in location with noise requirements, the duct system should be designed to avoid vibration transmission.
 - During installation, it is prohibited to let foreign material fall into the air outlet to avoid fire or failure.
-
-

5. Refrigerant Piping Work

⚠ DANGER

Use refrigerant R32 in the refrigerant cycle. Do not charge oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air-tightness test. These types of gases are extremely dangerous and can cause an explosion. It is recommended that compressed air, nitrogen or refrigerant be used for these types of tests.

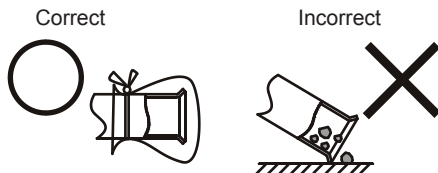
5.1 Piping Materials

- (1) Prepare locally-supplied copper pipes.
- (2) Select clean copper tubes making sure there is no dust and moisture inside the tubes.
Before connecting pipes, blow the inside of the tubes with nitrogen or dry air, to remove any dust or foreign materials.

5.2 Piping Connection

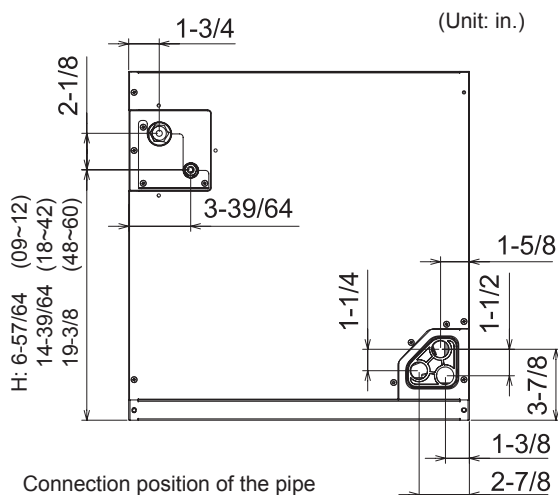
⚠ CAUTION

- Cap the end of the pipe when the pipe is to be inserted through a hole.
- Do not put pipes on the ground directly without a cap or vinyl tape at the end of the pipe.



- An excess or a shortage of refrigerant is the main cause of trouble to the units.
Charge the correct refrigerant quantity.

- (1) The connection positions of the pipe are shown below:

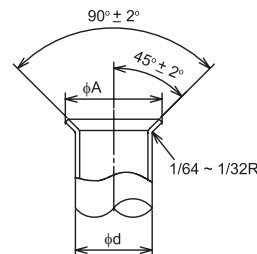


Model	Gas Piping	Liquid Piping
09-60	5/8 (Ø15.88)	3/8 (Ø9.53)

Unit: in. (mm)

※ Flaring Dimension

Perform the flaring work as shown below.



Unit: in. (mm)

Diameter ØD	A ⁺⁰ -1/64(0.4)
	R32
1/4 (6.35)	1/32 (9.1)
3/8 (9.53)	33/64 (13.2)
1/2 (12.7)	21/32 (16.6)
5/8 (15.88)	25/32 (19.7)
3/4 (19.05)	(*)

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

- (2) When tightening the flare nut, use two spanners as shown

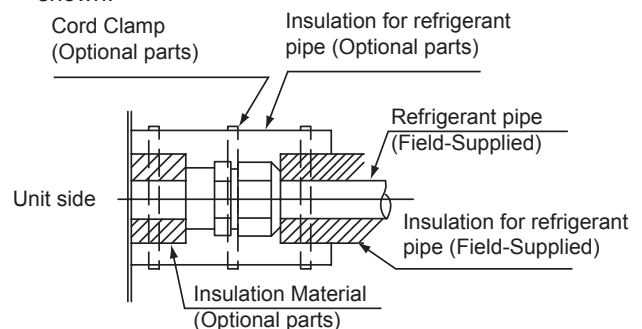


Required tightening torque

Pipe Size	Tightening Torque
Ø1/4 in. (6.35 mm)	10.3 - 13.3 ft·lbs (14 - 18 N·m)
Ø3/8 in. (9.53 mm)	25.1 - 31.0 ft·lbs (34 - 42 N·m)
Ø1/2 in. (12.7 mm)	36.1 - 45.0 ft·lbs (49 - 61 N·m)
Ø5/8 in. (15.88 mm)	50.2 - 60.5 ft·lbs (68 - 82 N·m)

Tightening work of flare nut

- (3) After connecting the refrigerant piping, seal the refrigerant pipes by using the field-supplied insulation material as shown.



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

Coil is shipped filled with Nitrogen. Evacuate the system before charging with refrigerant. Install refrigerant lines so that it does not block service access to the front of the unit. Nitrogen should flow through the refrigerant lines while brazing. Use a wet rag or an approved heat paste to protect the TXV sensing bulb during the brazing process.

The indoor unit has field supplied primary and secondary 3/4-in. NPT drain connections.

When making drain fitting connections to drain pan, do not over-tighten.

condensate drain trap

(Unit: in.)

Teflon paste, Silicone
or Teflon tap

To the Atmosphere

6

6

To approved drain

Drain fitting

Unit

Insulation for drain
pipe (Field-supplied)

Do not over tighten drain
fitting. Unit must be
slightly pitched toward
drain connection.

✗ Incorrect upward Slope

Unit

Rising part ✗

Incorrect

1/25 to 1/100 Down-Slope

Drain piping connection

Common drain piping

Correct

The drain pipe shall be separating from other pipes.

The drain line should be insulated where necessary to prevent sweating and damage due to condensate forming on the outside surface of the pipe.

- Do not create an upper-slope or rise for the drain piping, since drain water can flow back to the unit and leakage to the room will occur when the unit operation is stopped.
- When the common drain piping is connected with other indoor units, the connected position of each indoor unit must be higher than the common piping. The pipe size of the common drain pipe must be large enough according to the unit size and number of units.
- After performing drain piping work and electrical wiring, check to ensure that water flows smoothly as in the following procedure. Checking with the Float Switch.
 - a. Switch ON the power supply.
 - b. Pour 2 to 2.5 liters of water into the drain pan.
 - c. Check to ensure that the water flows smoothly and no water leakage occurs. When water cannot be found at the end of the drain piping, pour another 2 liters of water into the drain pan.
- If unit is located in or above a living space where damage may result from condensate overflow, a field-supplied, external condensate pan should be installed underneath the entire unit, and a secondary condensate line (with appropriate trap) should be run from the unit into the pan. Any condensate in this external condensate pan should be drained to a noticeable place. The owner of the structure must be informed that when condensate flows from the secondary drain or external condensate pan, the unit requires servicing or water damage will occur. Install traps in the condensate lines as close to the coil as possible.

7. Electrical wiring

WARNING

- Turn OFF the main power switches to the indoor unit and outdoor unit before electrical wiring or periodical check, and wait for at least 10 minutes.
- 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.
- The wires must be firmly secured. External force applied to terminals may cause a fire.
- It is forbidden to connect a plurality of power lines into one power terminal block. At the indoor unit side of air conditioner, power wiring can be extended through a power distribution box. Be sure to calculate the wiring capacity carefully, since excessively low wiring capacity may frequently cause fire.
- Do not start the system before all check points are thoroughly checked. **GLB**
- Use **ELB** with high sensing speed (**ELB** with an operating time of 0.1 seconds or less), or electric shock or fire may arise.
- Avoid the contact of wires with the refrigerant piping, sheet metal edges and electrical components in unit. Otherwise, the wires may get damaged or even cause a fire.
- The power cord should not come into direct contact with the wire hole sheet metal after installation.
- Prevent rats or other small animals damaging the wiring and electrical components. Bitten unprotected parts may cause a fire.
- Avoid contact between wires and sharp sheet metal or sharp corners.

WARNING

- Knockouts are providing on the indoor unit top panel and sides of the cabinet to allow for the entry of the supply voltage conductors. If the knockouts on the cabinet sides are used for electrical conduit, an adapter ring must be used in order to meet UL 60335 safety requirements. An MEC or CEC approved strain relief is to be used at this entry point. Some codes/ municipalities require the supply wire to be enclosed in conduit. Consult your local codes.
- Do not cut, puncture or alter the cabinet for electrical wiring.

CAUTION

- Before proceeding with electrical connections, make certain that power supply is as specified on the unit rating plate. See unit wiring label for proper field high and low-voltage wiring. Make all electrical connections in accordance with the NEC and any local codes or ordinances that may apply. Refer to the NEC (USA) or CSA (Canada) for wire sizing. Use copper wire only.
- Every installation must include an NEC (USA) or CSA (Canada) approved over-current protection device.
- Wrap the field-supplied packing around the wires, and plug the wiring connection hole with the seal material to protect the product from any condensate or insects.
- Tightly secure the wires with the cord clamp inside the indoor unit.
- Secure the cable of wired control using the cord clamp inside the electric box. But North American products, Local safety standards are adopted for power wiring.
- Tighten screws to the following torques.

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)

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

M6: 3.0 to 3.7 ft·lbs (4.0 to 5.0 N·m)

M8: 6.6 to 8.1 ft·lbs (9.0 to 11.0 N·m)

M10: 13.3 to 17.0 ft·lbs (18.0 to 23.0 N·m)

7.1 General Check

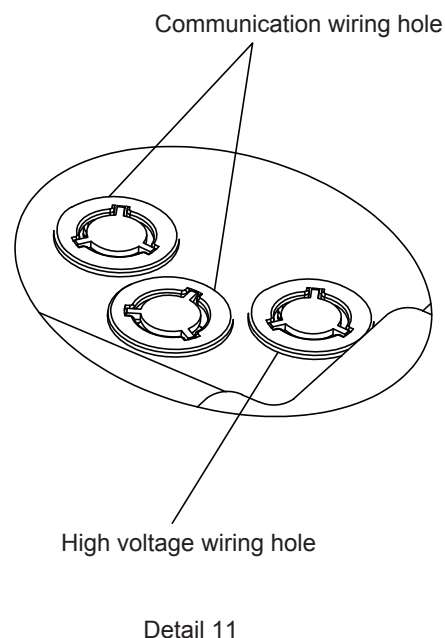
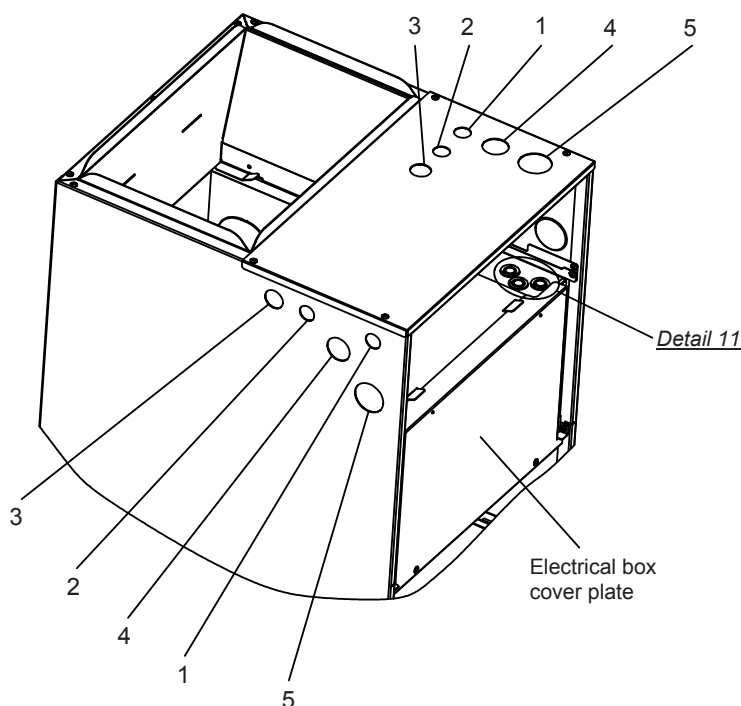
- (1) Make sure that the field-selected electrical components (main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data. Make sure that the components comply with National Electrical Code (NEC).
- (2) Check to ensure that the voltage of power supply is within $\pm 10\%$ of nominal voltage and earth phase is contained in the power supply wires. If not, electrical parts will be damaged.
- (3) Check to ensure that the capacity of power supply is enough. If not, the compressor will not be able to operate cause of abnormally voltage drop at starting.
- (4) Check to ensure that the earth wire is connected.
- (5) Check to ensure that the electrical resistance is more than 1 megohm, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.

7.2 Electrical Wiring Connection

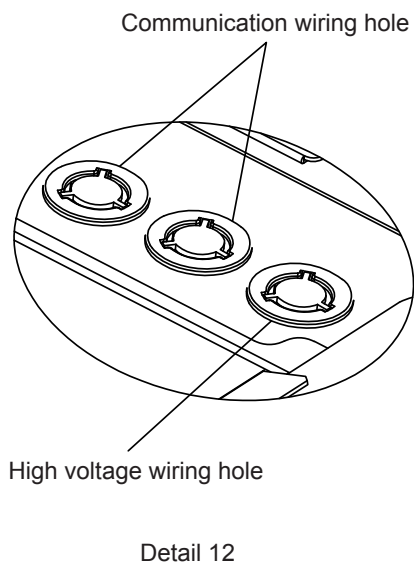
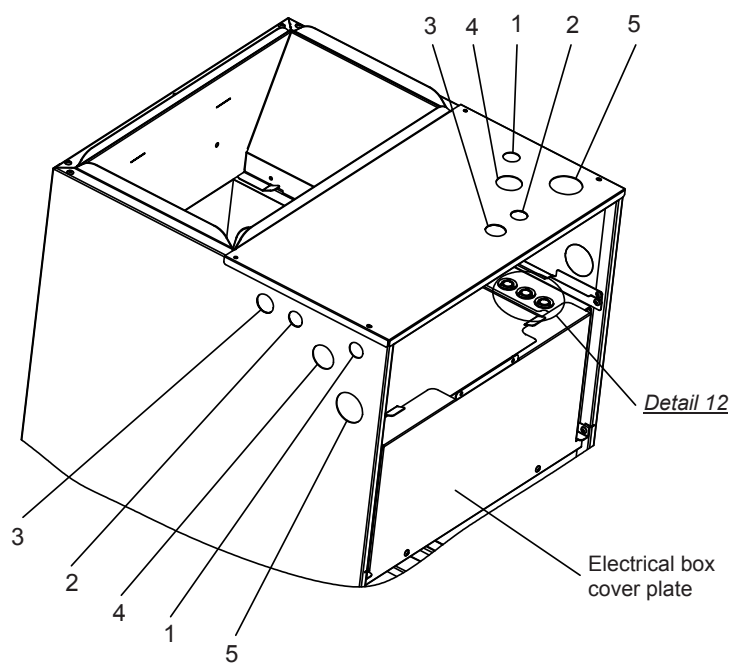
The electrical wiring connection for the indoor unit is shown in Figure 7.1

- (1) Connect the power supply wires to the terminal board in the electrical box of both outdoor unit and indoor unit. And connect the earth wire to the electrical box of outdoor unit. In addition, connect the earth wire to earth screw in the electrical box of indoor unit. Refer to Figure 7.1.
- (2) Connect the communication wires between the outdoor and indoor units to terminals 1 and 2 on the terminal board. If power supply wiring is connected to 1 and 2 of terminal board, printed circuit board will be damaged.
- (3) Use shielded twisted pair for communication wire connecting of the indoor unit and outdoor unit, respectively connected to the 1 and 2 terminals of the terminal block between the indoor and outdoor unit. Connect the communication wire of the wired controller to the A and B terminals of the indoor unit terminal block.
- (4) The recommended **ELB**, FUSE sizes etc. are shown in Table 7.1. **GLB**
- (5) In the case that a conduit tube for field-wiring is not used, fix rubber bushes with adhesive on the panel
- (6) Fix the power supply wirings and communication wirings with wiring clamps.

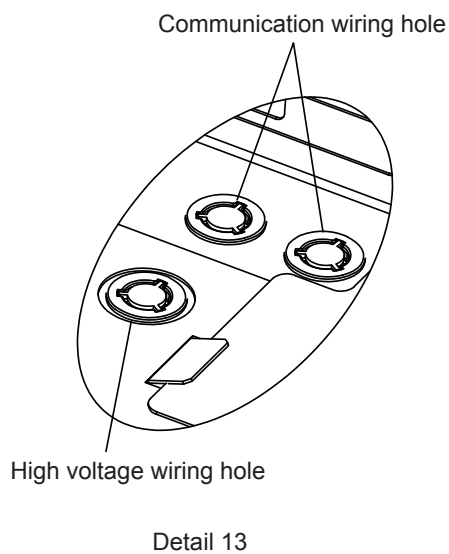
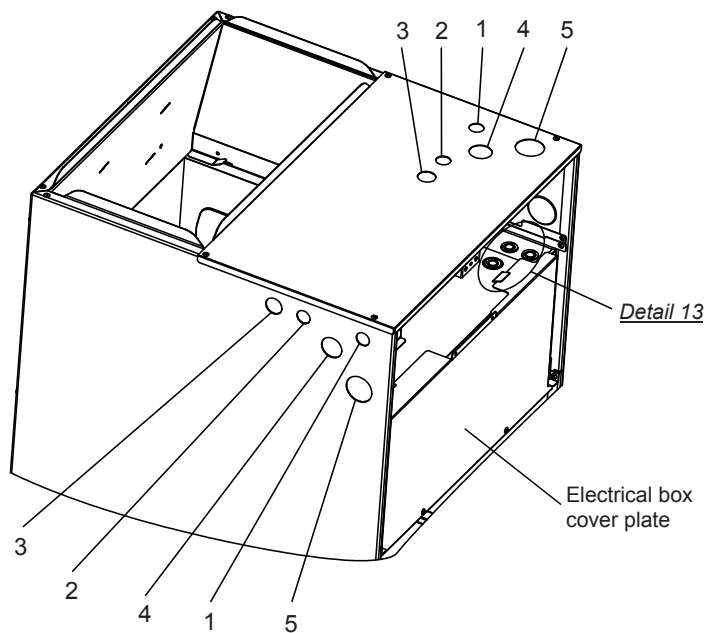
09-12:



18-42:



48-60:

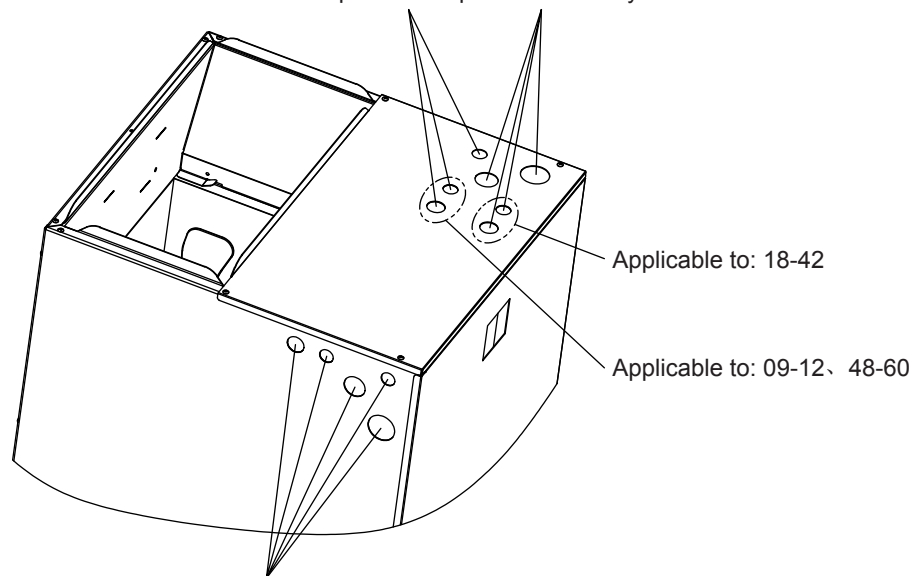


No.	Knockout or hole diameter		Trade size of conduit		Application
	mm	in.	mm	in.	
1	22.2	7/8	16	1/2	Communication wiring hole
2	22.2	7/8	16	1/2	High voltage wiring hole
3	27.8	1-3/32	21	3/4	
4	34.5	1-23/64	27	1	
5	43.7	1-23/32	35	1-1/4	

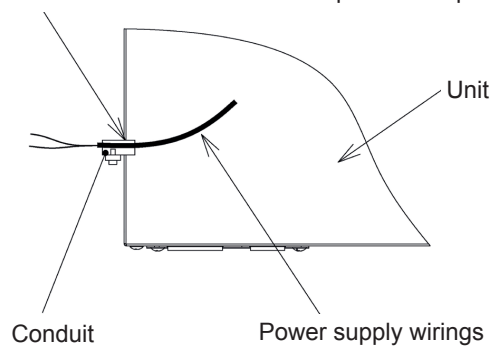
NOTE

09-60:

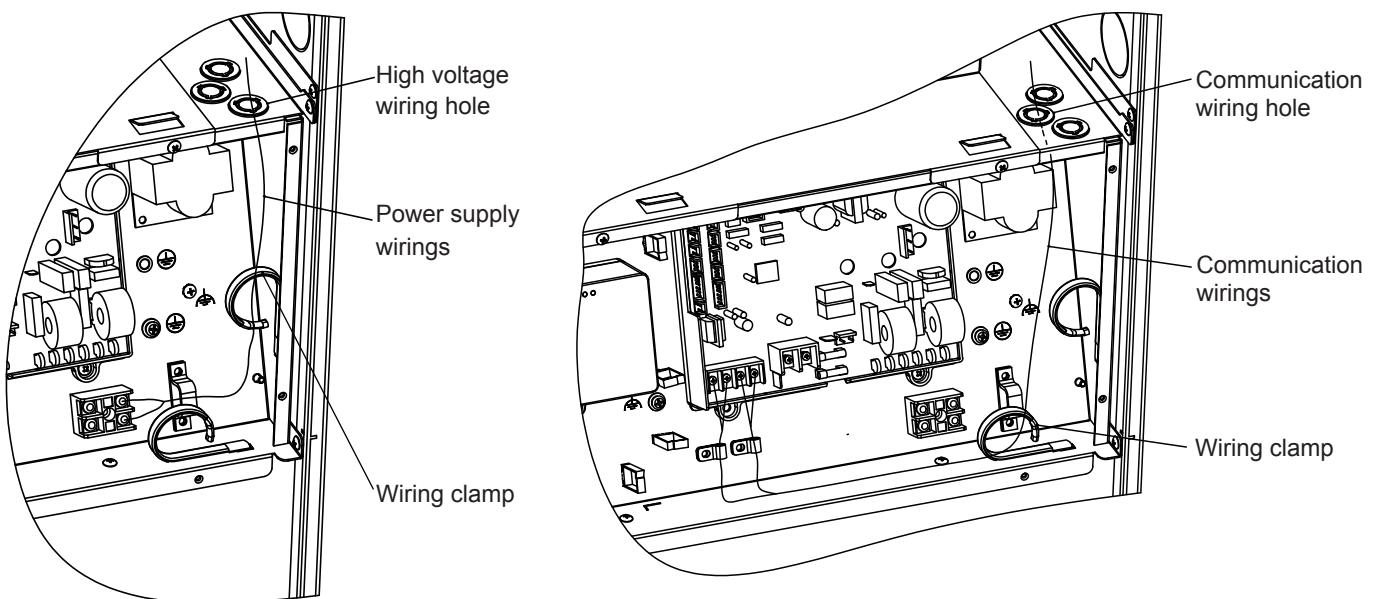
Plug the wiring connection hole with the seal material to protect the product from any condensate water and insects.



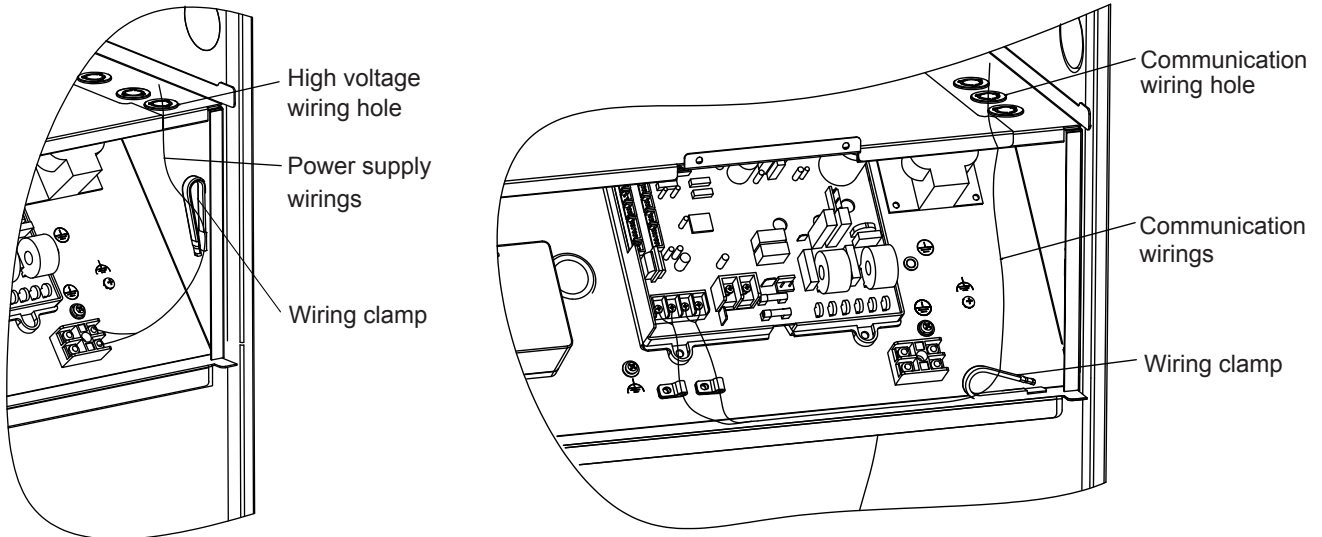
Plug the wiring connection hole with the seal material to protect the product from any condensate water and insects.



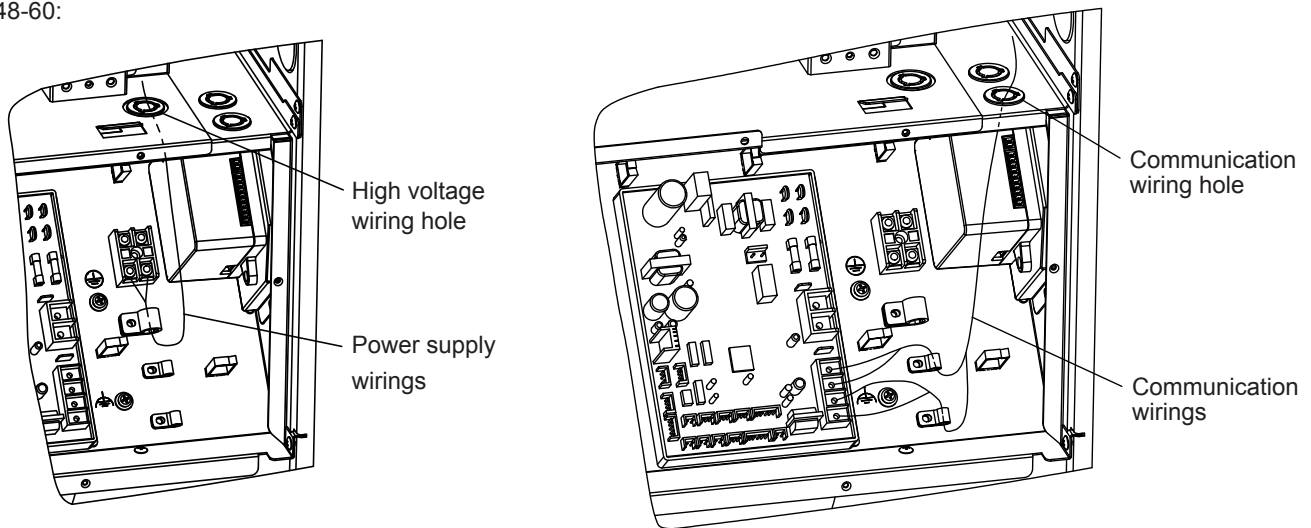
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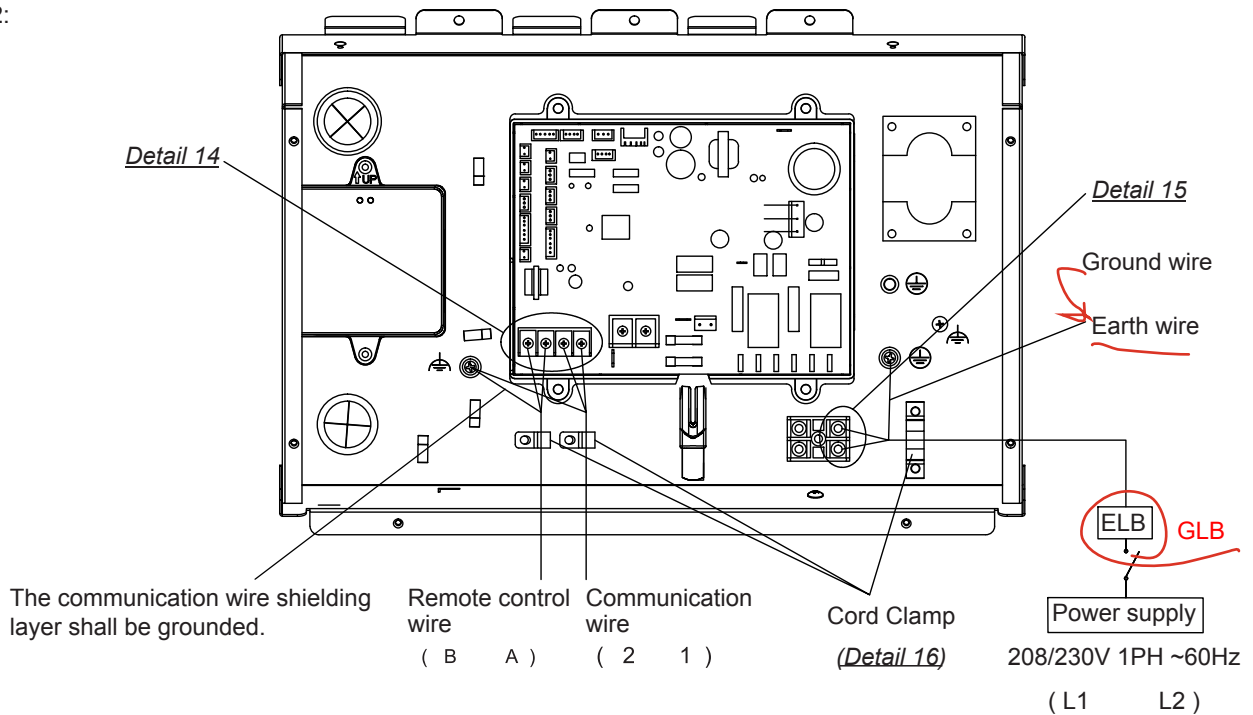
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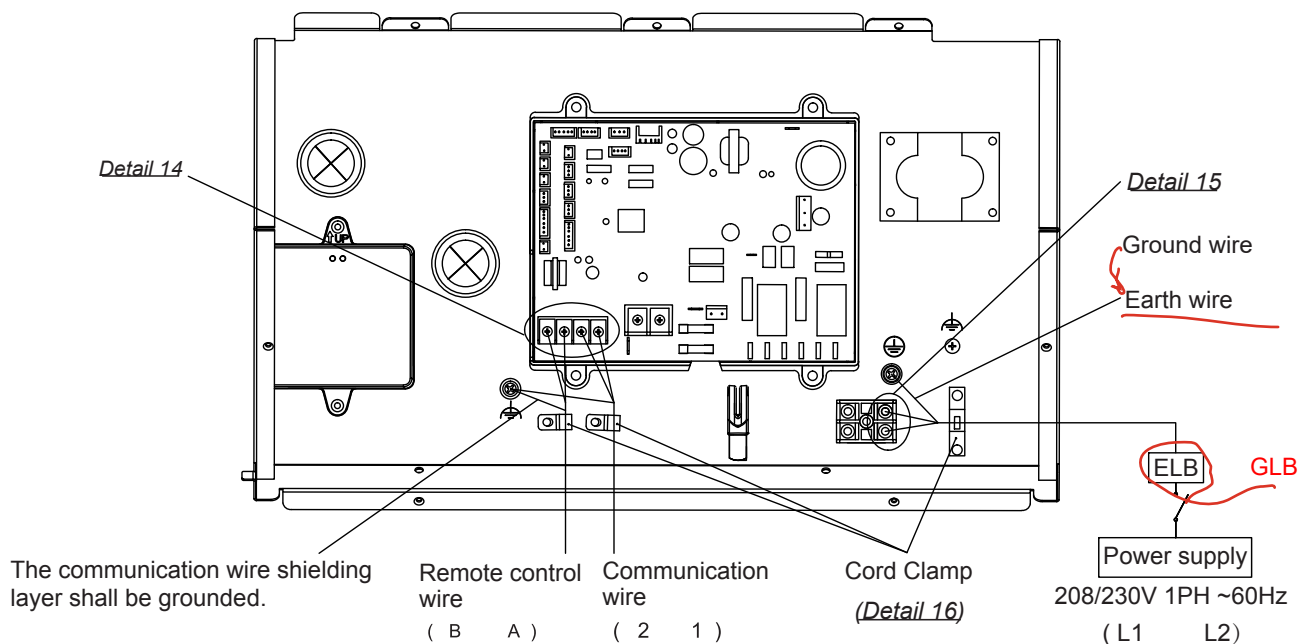
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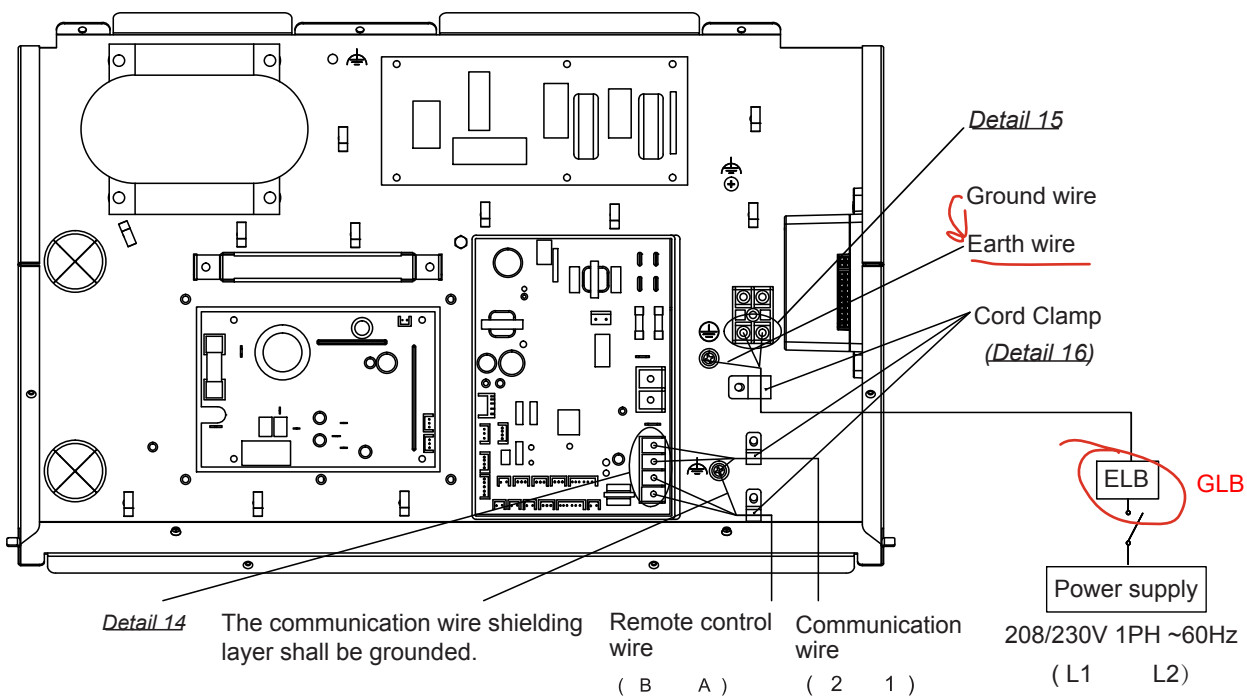
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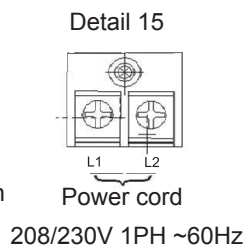
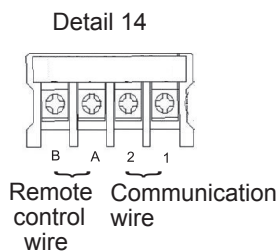
18-42:



48-60:



Enlarged View of Terminal Block (TB) Wiring



Detail 16: Cord Clamp Installation Diagram

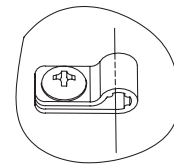
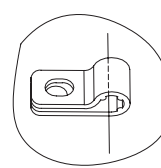
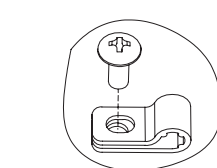
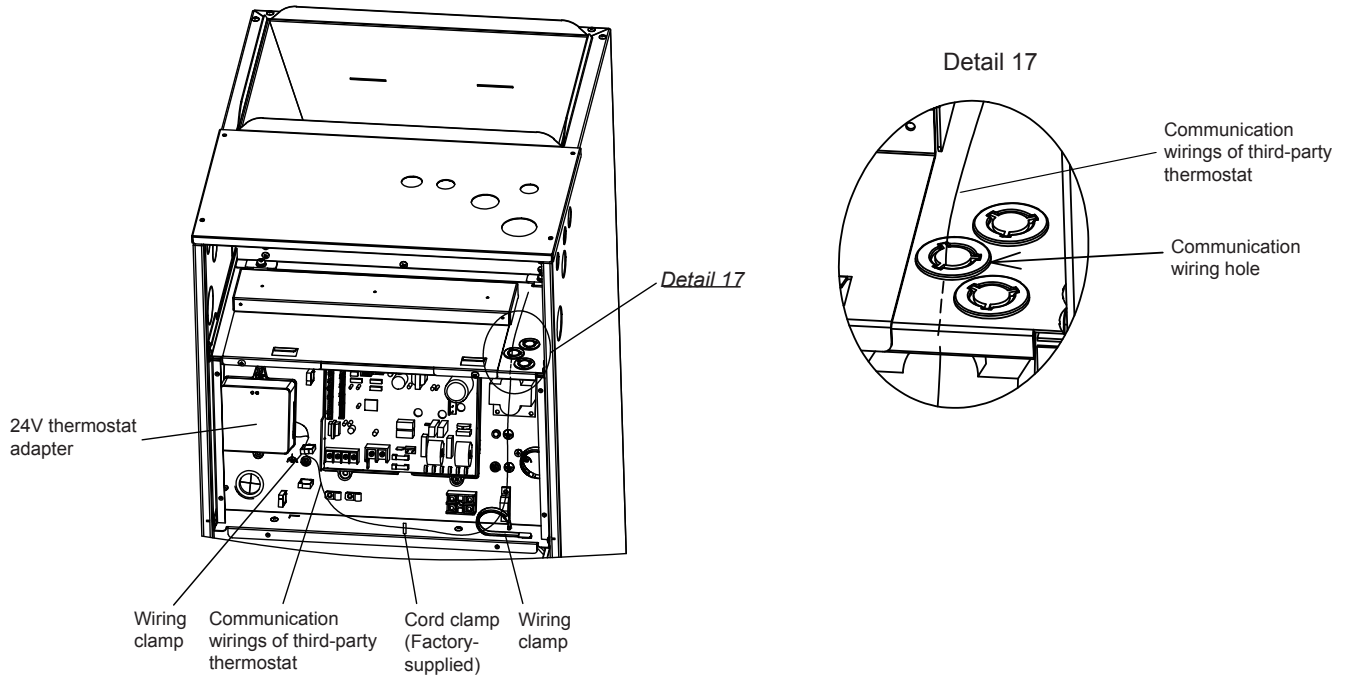


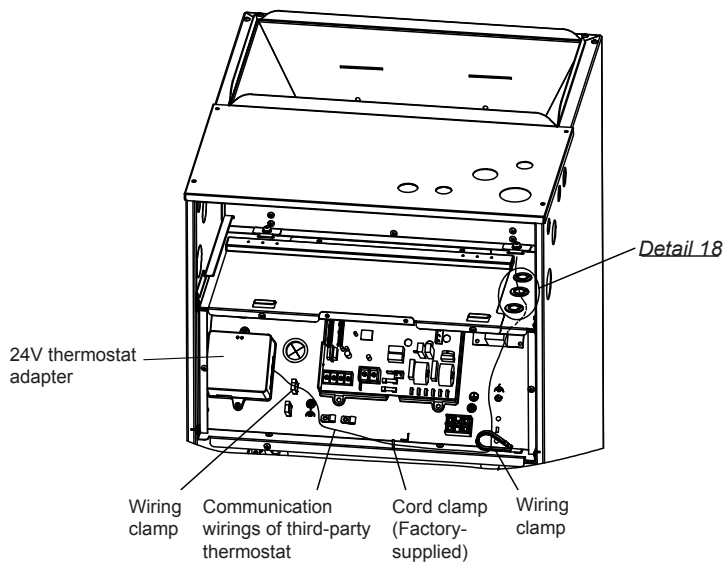
Figure 7.1 Wiring connection for Indoor

- When using third-party thermostat, fix the wirings as below figure
Refer to the 24V Thermostat Adapter manual for third-party thermostat wiring.

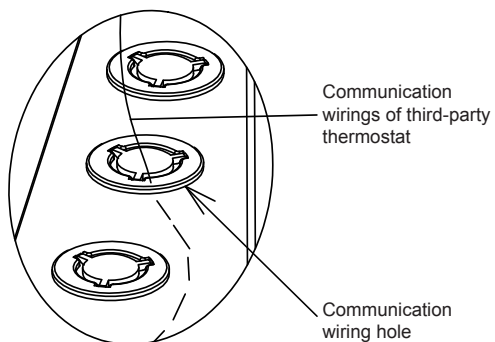
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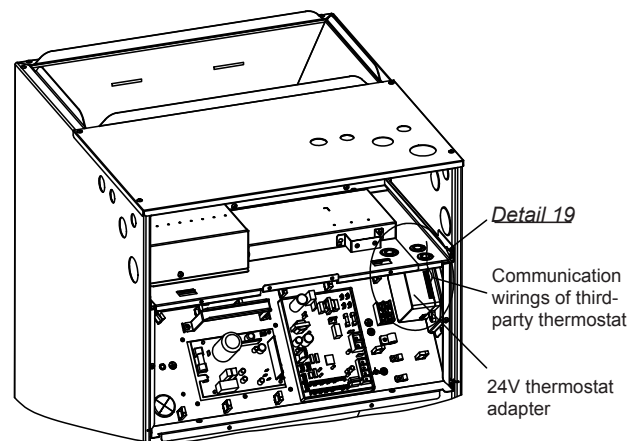
18-42:



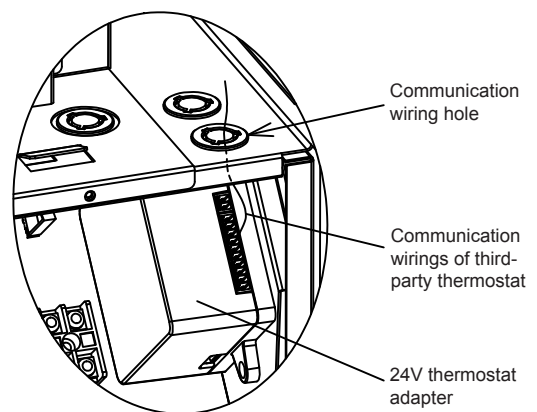
Detail 18



48-60:



Detail 19



7.3 Field Minimum Wire Sizes for Power Source

! WARNING

- Use an **ELB (earth leakage breaker)**. If not used, it will cause an electric shock or a fire.
- Run through the cables using conduit tube, and completely seal the end of conduit tube with sealing materials.

GLB (Ground Leakage Breaker)

Table 7.1 Recommended wiring capacity and size

GLB

Model	Power supply	MCA (A)	MOP (A)	Power supply wiring size	Communication cable size (AWG)	ELB	
						Nominal current (A)	Nominal sensitive current (mA)
CHV-RS09MPAHU	208/230V 60Hz	2.35	15	Wiring size and length must comply with local codes.	AWG18 (0.82mm ²)	15	30
CHV-RS12MPAHU		2.35	15			15	30
CHV-RS18MPAHU		5.94	15			15	30
CHV-RS24MPAHU		5.94	15			15	30
CHV-RS30MPAHU		5.94	15			15	30
CHV-RS36MPAHU		5.94	15			15	30
CHV-RS42MPAHU		5.94	15			15	30
CHV-RS48MPAHU		7.81	15			15	30
CHV-RS54MPAHU		7.81	15			15	30
CHV-RS60MPAHU		7.81	15			15	30

MCA: Minimum Circuit Amps (A)

MOP: Maximum Overcurrent Protective Device (A)

ELB: Earth Leakage Breaker

NOTES:

- (1) Field wiring shall conform to local laws and regulations, and all wiring operations must be performed by qualified professionals
- (2) Refer to relevant standards for above-noted power cord size.
- (3) Power cord selection shall be compliant with requirements stated in UL 62 and C22.2 number 49, while the power cord shall be made from copper conductor.
- (4) Use the charts above to select appropriate sized breakers / fuses / overcurrent protection switches and wiring in accordance with local codes.
- (5) Ensure communication cable is a minimum of AWG18 (0.82mm²), 2-Conductor, Stranded Copper.
- (6) A switch that can ensure all-pole disconnection shall be installed between power supply and air conditioning unit in such a manner that the contact spacing shall not be less than 1/8 in (3mm).
- (7) Once the power cord is damaged, the dealer or the professionals from designated maintenance department must be contacted in a timely manner for repair and replacement.
- (8) For the installation of power cord, the ground wire must be longer than the current-carrying conductor.
- (9) Select power wire size based on the value of the MCA.
- (10) Use shielded cables for communication wire and the shielding layer shall be grounded.
- (11) Select circuit breaker model based on the value of the MOP.

8. Test Run

Test run should be performed according to “Installation & Maintenance Manual” of the outdoor unit.

WARNING

- **Do not operate the system until all the check points have been cleared.**
 - (A) **Check to ensure that the electrical resistance is more than 1 megohm, by measuring the resistance between ground and the terminal of the electrical parts. If not, do not operate the system until the electrical leakage is found and repaired.**
 - (B) **Check to ensure that the stop valves of the outdoor unit are fully opened, and then start the system.**
 - (C) **Check to ensure that the switch on the main power source has been ON for more than 12 hours, to warm the compressor oil by the crankcase heater.**
- **Pay attention to the following items while the system is running.**
 - (A) **Do not touch any of the parts by hand at the discharge gas side, since the compressor chamber and the pipes at the discharge side are heated higher than 194°F (90°C)**
 - (B) **DO NOT PUSH THE BUTTON OF THE MAGNETIC SWITCH(ES). It will cause a serious accident.**

9. Safety and Control Device Setting

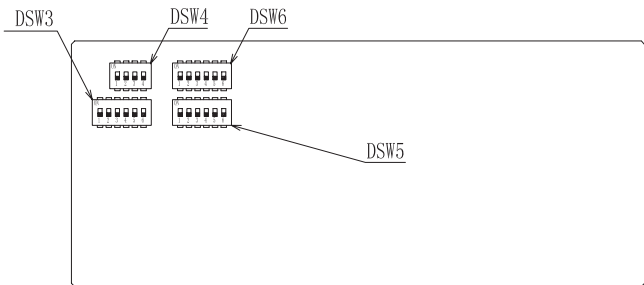
Indoor Unit

Indoor Unit Capacity (kBtu/h)		09-42	48-60
Capacity of Fuse on Indoor Unit Control Circuit	A	10	5
Freeze Protection Temperature	Cut-out	°F (°C)	32 (0)
	Cut-in	°F (°C)	57.2 (14)
Set Temperature Difference	°F (°C)	35.6 (2)	

10. Common

10.1 Setting of DIP Switch

- (1) DIP switch must be set with power sources of the indoor and outdoor units in OFF state. Otherwise, the settings are invalid.
- (2) The location of DIP switch is shown in the figure below



- (3) The PCB of indoor unit is furnished with 4 DIP switches that must be set based on the following requirements before test run. The system must not be started before the completion of DIP setup.
- (a) All indoor units must be numbered (DSW6) as shown in the figure below. The outdoor unit numbering must start with "0".

Setting Method 1	DSW6 (Setting 0~63)	Ex.) Set unit number 16
	1 2 3 4 5 6 ON OFF Note: 8421 coding method	DSW6 1 2 3 4 5 6 ON OFF

DSW6 is set to "0" before delivery; up to 64 indoor units can be connected with.

- (b) Capacity Code Setting (DSW3)
No setup is required.
The code is set before delivery. This switch is used to set the capacity of indoor unit.
- (c) Model Code Setting (DSW4)
No setup is required. The code is set before delivery.
- (d) Cooling System Code number Setting (DSW5)
The setup is needed. All are set to OFF before delivery.

Setting Method 1	DSW5 (Setting 0~63)	Ex.) Set system number 5
	1 2 3 4 5 6 ON OFF Note: 8421 coding method	DSW5 1 2 3 4 5 6 ON OFF

DSW5 is set to "0" before delivery; up to 64 indoor units can be connected with.

Note:

Symbol "■" indicates the location of DIP switch.

The position indicated in the diagram is in the factory-set state.

⚠ CAUTION

The power supply shall be turned off before the setup of DIP switch. Otherwise, the settings will be invalid.

Decimal number	8421 code					
	1	2	3	4	5	6
0	○	○	○	○	○	○
1	●	○	○	○	○	○
2	○	●	○	○	○	○
3	●	●	○	○	○	○
4	○	○	●	○	○	○
5	●	○	●	○	○	○
6	○	●	●	○	○	○
7	●	●	●	○	○	○
8	○	○	○	●	○	○
9	●	○	○	●	○	○
10	○	●	○	●	○	○
11	●	●	○	●	○	○
12	○	○	●	●	○	○
13	●	○	●	●	○	○
14	○	●	●	●	○	○
15	●	●	●	●	○	○
16	○	○	○	○	●	○
17	●	○	○	○	●	○
18	○	●	○	○	●	○
19	●	●	○	○	●	○
20	○	○	●	○	●	○
21	●	○	●	○	●	○
22	○	●	●	○	●	○
23	●	●	●	○	●	○
24	○	○	○	●	●	○
25	●	○	○	●	●	○
26	○	●	○	●	●	○
27	●	●	○	●	●	○
28	○	○	●	●	●	○
29	●	○	●	●	●	○
30	○	●	●	●	●	○
31	●	●	●	●	●	○
32	○	○	○	○	○	●
33	●	○	○	○	○	●
34	○	●	○	○	○	●
35	●	●	○	○	○	●
36	○	○	●	○	○	●
37	●	○	●	○	○	●
38	○	●	●	○	○	●
39	●	●	●	○	○	●

40	○	○	○	●	○	●
41	●	○	○	●	○	●
42	○	●	○	●	○	●
43	●	●	○	●	○	●
44	○	○	●	●	○	●
45	●	○	●	●	○	●
46	○	●	●	●	○	●
47	●	●	●	●	○	●
48	○	○	○	○	●	●
49	●	○	○	○	●	●
50	○	●	○	○	●	●
51	●	●	○	○	●	●
52	○	○	●	○	●	●
53	●	○	●	○	●	●
54	○	●	●	○	●	●
55	●	●	●	○	●	●
56	○	○	○	●	●	●
57	●	○	○	●	●	●
58	○	●	○	●	●	●
59	●	●	○	●	●	●
60	○	○	●	●	●	●
61	●	○	●	●	●	●
62	○	●	●	●	●	●
63	●	●	●	●	●	●



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The Company is committed to continuous product improvement. We reserve the right, therefore, to alter the product information at any time and without prior announcement.

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