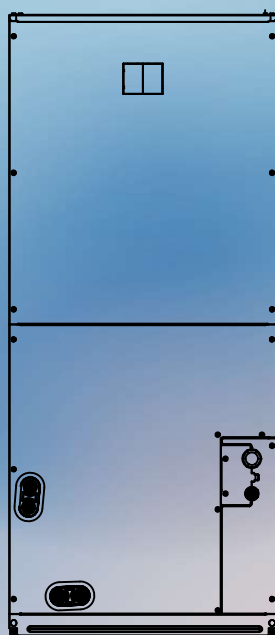




HAVELLS

— Air Handling Units —

OWNER'S MANUAL



Please read this owners manual carefully before operating the appliance and handy for reference for all the time.

Contents

Warning	1
Safety Precautions	3
Notices for Usage	5
Notices for Installation	6
Before Installation	6
Before Operation Check List	7
Installation of the Indoor Unit	8
Drain Piping Work	15
Electric Wiring Work	15
Testing and Inspection	20
Clean	20
Fault Code	21
Maintenance Notice	22

Note:

- *All the illustrations in this manual are for explanation purpose only.*
- *Your air conditioner may be slightly different. The actual shape shall prevail.*
- *They are subject to change without notice for future improvement.*

Warning

NOTE : FCC and IC related content only applies to models with WiFi function.

※ FCC WARNING

WARNING: Changes or modifications to this unit not expressly approved by the party responsible for compliance could void the user's authority to operate the equipment.

※ FCC STATEMENT

This device complies with Part 15 of the FCC Rules. Operation is subject to the following two conditions:

(1) this device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

NOTE: This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:

- Reorient or relocate the receiving antenna.
- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.

※ IC STATEMENT

This device complies with Industry Canada licenceexempt RSS standard(s).

Operation is subject to the following two conditions: (1) this device may not cause interference, and (2) this device must accept any interference, including interference that may cause undesired operation of the device.

※ IC STATEMENT

This equipment complies with FCC's and IC's RF radiation exposure limits set forth for an uncontrolled environment. The antenna(s) used for this transmitter must be installed and operated to provide a separation distance of at least 7-7/8in.(20cm) from all persons and must not be collocated or operating in conjunction with any other antenna or transmitter. Installers must ensure that 7-7/8in.(20cm) separation distance will be maintained between the device (excluding its handset) and users.

Warning

Symbol	Note	Explanation
 A2L	WARNING	This symbol shows that this appliance uses a flammable refrigerant. If the refrigerant is leaked and exposed to an external ignition source, there is a risk of fire. (Only for the AC with UL or ETL-MARKING, UL60335-2-40)
	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 information is available such as the operating manual or installation manual.

NOTE:

The Air conditioner with R32 refrigerant, if roughly treated, may cause serious harm to the human body or surrounding things.

- The room space and maximum refrigerant charge requirements are shown in the table.
- If ice has formed on the unit, do not use means to accelerate the defrosting process other than those recommended by the manufacturer.
- Do not use any cleaners on the unit other than what's approved by the manufacture.
- Do not pierce or burn air conditioner and ensure that the refrigerant pipeline is not damaged.
- The appliance must be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater).
- Notice that the refrigerant may be odorless.
- The storage of the air conditioner should be in a location that's able to prevent unintentional damage to the unit.
- Be sure to follow all local codes and safety requirements.

Room Space and Maximum Refrigerant Charge Requirements

Refrigerant Type	Allowable Refrigerant Charge Amount, (oz(kg))	Min. Floor Area For Installation, (ft ² (m ²))
R32	< 64.9 (< 1.84)	75. 35 (7)
	64.9~82.54 (1.84~2.34)	86. 11 (8)
	82.58~100.18 (2.341~2.84)	96. 88 (9)
	100.21~117.82 (2.841~3.34)	107. 64 (10)
	117.85~135.45 (3.341~3.84)	129. 17 (12)
	135.49~153.09 (3.841~4.34)	139. 93 (13)
	153.12~170.73 (4.341~4.84)	161. 46 (15)
	170.76~188.36 (4.841~5.34)	199. 13 (18. 5)
	188.4~206 (5.341~5.84)	236. 81 (22)
	206.04~223.64 (5.841~6.34)	279. 86 (26)
	223.67~241.27 (6.341~6.84)	322. 92 (30)

Note:

Data calculation scenario: The minimum installation height of the duct outlet from the floor is 7.22ft. (2.2m).

Safety Precautions

Incorrect installation or operation by not following these instructions may cause harm or damage to people, properties, etc. The seriousness is classified by the following indications:

WARNING

This symbol indicates the possibility of death or serious injury.

CAUTION

This symbol indicates the possibility of injury or damage to properties.

 Things you shouldn't do.

 Follow the instructions.

 Cut the power off.

 Environmental notices.

WARNING



- **Don't** connect the ground wire to the gas pipeline, water pipeline, lightning rod, or telephone earth wire.
- **Don't** pull the power cable. Pulling the power cable could result in damage to the unit and electrical shock.
- **Don't** cut off main power switch during operating or with wet hands. It may cause electric shock.
- **Don't** let the air conditioner blow against the heater appliance. Otherwise it will lead to incomplete combustion, thus causing poisoning.
- **Don't** let the remote control and the indoor unit watered or being too wet. Exposure to excessive moisture may cause damage to the unit and or electrical shock.
- **Don't** install the air conditioner in a place where there is flammable gas or liquid unless the distance is equal to or greater than 3-1/4ft.(1m) apart.
- **Don't** use any unapproved liquid or cleaning agent to clean the air conditioner.
- **Don't** attempt to repair the air conditioner by yourself. Incorrect repairs may cause fire or explosion. Contact a qualified service technician for all service requirement.
- **Don't** operate the air conditioner during a lightning storm. The power should be switched off to prevent danger or injury.
- **Don't** put hands or any objects into the air inlets or outlets. This may cause personal injury or damage to the unit.
- **Don't** block air inlet or air outlet. Otherwise, the cooling or heating capacity will be diminished, or cause the system to stop operating.
- **The** storage of the appliance should be in accordance with the applicable regulations

WARNING



- **Always** switch off the device and cut the power supply before performing any maintenance or cleaning. Otherwise, it may cause electric shock or damage.



CARBON MONOXIDE POISONING HAZARD

Special Warning for Installation of Furnace or Air Handling Units in Enclosed Areas such as Garages, Utility Rooms or Parking Areas.

Carbon monoxide producing devices (such as an automobile, space heater, gas water heater, etc.) should not be operated in enclosed areas such as unventilated garages, utility rooms or parking areas because of the danger of carbon monoxide (CO) poisoning resulting from the exhaust emissions. If a furnace or air handler is installed in an enclosed area such as a garage, utility room or parking area and a carbon monoxide producing device is operated therein, there must be adequate, direct outside ventilation.

This ventilation is necessary to avoid the danger of CO poisoning which can occur if a carbon monoxide producing device continues to operate in the enclosed area. Carbon monoxide emissions can be (re) circulated throughout the structure if the furnace or air handler is operating in any mode.

CO can cause serious illness including permanent brain damage or death.

WARNING



This product contains fluorinated greenhouse gases.

- **Refrigerant** leakage will contribute to climate change.
- **Never** tamper with the refrigerant system or attempt repair without proper training and compliance to local and national codes.
- **The** refrigerant in this system has a lower global warming potential (GWP) than a refrigerant with higher GWP, if leaked to the atmosphere. This appliance contains a refrigerant fluid with a GWP equal to [675]. This means that if 35 oz (1kg) of this refrigerant fluid would be leaked to the atmosphere, the impact on global warming would be [675] times higher than 35 oz (1kg) of CO₂, over a period of 100 years.

Safety Precautions

⚠ WARNING



- **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.
- **Please** mount the system on a secure surface to prevent the unit from falling and causing injury or damage.
- **The** appliance shall be installed in accordance with national wiring regulations.
- **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.
- **Contact** a qualified service technician for all service requirements.
- **The** air conditioner must be grounded. Incomplete grounding may result in electric shocks.
- **Make sure** that the system has its own dedicated electrical circuit and that all electrical work is conducted by an individual that is certified or licensed to do such work in the state or region in which the insulation is taking place.
- **Ensure** the following objects are not under the indoor unit: Microwaves, ovens and other hot objects. Computers and other high electrostatic appliances. Electrical sockets. Items susceptible to water damage.
- **The** piping between indoor and outdoor unit shall not be reused, unless they can be properly flushed and re-flared.
- **The** specifications for electrical requirements are listed on the data plate of the unit.
- **WARNING** RISK OF ELECTRIC SHOCK. CAN CAUSE INJURY OR DEATH: System contains oversize protective earthing (grounding) terminal which shall be properly connected.
- **WARNING** RISK OF ELECTRIC SHOCK. CAN CAUSE INJURY OR DEATH: System contains two independent protective earthing (grounding) terminals which both shall be properly connected and secured.

⚠ CAUTION



- **Don't** operate the system with windows or doors open. Doing so will limit the system effectiveness.
- **Don't** stand on the top of the outdoor unit or place heavy objects on it. This could cause personal injuries or damage to the unit.
- **Don't** use the system for other purposes, such as drying clothes, preserving foods, etc.
- **Don't** apply the cold air to the body for a long time. It will deteriorate your physical conditions and cause health problems.

⚠ CAUTION



- **Appropriate** adjustments of the setting temperature can prevent the waste of electricity.
- **Use** an all-pole disconnection type breaker with at least 1/8 in. (3mm) between the contact point gaps that provide full disconnection under overvoltage category III.
- **If** your air conditioner is permanently connected to the fixed wiring, a residual current device (RCD) having rated residual operating current not exceeding 30 mA should be installed in the fixed wiring.
- **The** power supply circuit should have leakage protector and air switch of which the capacity should be more than 1.5 times of the maximum current.
- **Regarding** the installation of the air conditioners, please refer to the below paragraphs in this manual.
- **LEAK DETECTION SYSTEM installed.**
Unit must be powered except for service.
Continuous air circulation required for proper functioning. Unit must be powered except for service
- **This** unit is equipped with electrically powered safety measures. To be effective, the unit must be electrically powered at all times after installation, other than when servicing.

E-Waste

Meaning of crossed out wheeled dustbin:

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

Contact your local government for information regarding the collection systems available.

If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being. When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposals at least free of charge.



Notices for Usage

Operating Range

- Operating the unit outside the recommended temperature range may have an impact on the system performance. When the temperature is too high, the air conditioner may trip the circuit breaker causing the air conditioner to shut down. When the temperature is too low, the outdoor heat exchanger may generate excessive moisture, leading to water dripping from the unit.
- In long-term cooling or dehumidification with a relative humidity of above 80%, doors and windows should be closed to prevent the indoor unit from generating too much water and causing leaks.

Type	Range	Indoor	Outdoor
Regular	Cooling	60.8°F~89.6°F (16°C~32°C)	5°F~125.6°F (-15°C~52°C)
	Heating	50°F~89.6°F (10°C~32°C)	5°F~75.2°F (-15°C~24°C)
Extreme	Cooling	60.8°F~89.6°F (16°C~32°C)	5°F~125.6°F (-15°C~52°C)
	Heating	50°F~89.6°F (10°C~32°C)	-22°F~75.2°F (-30°C~24°C)

Notes for Heating

- The fan of the indoor unit will not start immediately when the heating cycle has started. The unit will warm up and then start blowing air to avoid blowing out cool air.
- When it is cold and wet outside, the outdoor unit will develop frost over the heat exchanger which over time will cause the system to start the defrost function.
- During defrost, the air conditioner will stop heating for about 5-12 minutes.
- Vapor may come out from the outdoor unit during defrost. This is not a malfunction, but a result of fast defrost.
- Heating will resume after defrost is complete.

Notes for Turning Off

- When the air conditioner is turned off, the main controller will automatically decide whether to stop immediately or after running for dozens of seconds with lower frequency and lower air speed.

Important Notices

- This unit must be installed by a certified contractor to avoid:
 - Damage to the unit
 - Refrigerant leaking in the atmosphere
 - Electrical shock
 - Burns from refrigerant
 - Other serious injuries including death
- Leak test must be made after installation.
- To move and install air conditioner to another place, please contact our local authorized contractor.

Installation Environment Inspections

- Check nameplate of outdoor machine to make sure whether the refrigerant is R32.
- Check the floor space of the room. The space shall not be less than usable space in the specification.
- The outdoor unit shall be installed at a well-ventilated place.

- Check the surrounding environment of installation site: R32 shall not be installed in the enclosed reserved space of a building.
- When using electric drill to make holes in the wall, check first whether there is pre-buried pipeline for water, electricity and gas. It is suggested to use the reserved hole in the roof of the wall.

Unpacking Inspections

- Open the box and check air conditioner in area with good ventilation and without ignition source.
- Note: Operators are required to wear anti-static devices.
- It is necessary to check whether there is refrigerant leakage before opening the box of outdoor machine; stop installing the air conditioner if leakage is found.
- The fire prevention equipment shall be prepared well before checking.
- Then check the refrigerant pipeline to see if there is any damage or leaks.

Safety Principles for Installing Air Conditioner

- Fire prevention device shall be prepared before installation.
- Keep installing site ventilated.(open the door and window)
- Ignition source, smoking and calling is not allowed to exist in area where R32 refrigerant located.
- Anti-static precautions in necessary for installing air conditioner, e.g. wear pure cotton clothes and gloves.
- Keep leak detector in working state during the installation.
- If R32 refrigerant leakage occurs during the installation, you shall immediately detect the concentration in indoor environment until it reaches a safe level.
- If refrigerant leakage affects the performance of the air conditioner, please immediately stop the operation, and the air conditioner must be vacuumed firstly and be returned to the maintenance station for processing.
- Keep electric appliance, power switch, plug, socket, high temperature heat source and high static away from the area underneath sidelines of the indoor unit.
- The air conditioner shall be installed in an accessible location for installation and maintenance, without obstacles that may block air inlets or outlets of indoor /outdoor units. It shall be kept away from heat source, inflammable or explosive conditions as well.
- 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.
- The indoor unit should be install in a room without continuously operating open flames (e.g. an operating gas appliance) or other POTENTIAL IGNITION SOURCES (for e.g. an operating electric heater, hot surfaces). A flame-producing device may be installed in the same space if the device is provided with an effective flame arrest.

Requirements for Operations at Raised Height

- When carrying out installation at 6-9/16ft. (2m) or higher above the base level, safety belts must be worn and ropes of sufficient strength must be securely fastened to the outdoor unit to prevent falling that could cause personal injury or death as well as property loss.

Notices for Installation

Requirements for Installation Position

- Avoid places of flammable or explosive gas leakage or where there is poor ventilation.
- Avoid places subject to strong electric/magnetic fields like microwaves and florescent lights.
- Avoid places like subject to noise and resonance like walls above a sleeping area.
- Avoid severe natural conditions (e.g. strong wind, direct sunshine or high temperature heat sources).
- Avoid places within the reach of children.
- Shorten the connection between the indoor and outdoor units as much as possible for best performance.
- Select a location where it is easy to perform service and repair.
- The outdoor unit shall not be installed in any way that could occupy an aisle, stairway, exit, fire escape, catwalk or any other public area.
- The outdoor unit shall be installed as far as possible from the doors and windows of the neighbors as well as plants.

Requirements of the Mounting Structure

- The mounting rack must meet the relevant national or industrial standards
- It is recommended that the mounting rack and its load carry surface shall be able to withstand 4 times or above the weight of the unit.
- The mounting rack of the outdoor unit shall be fastened with expansion bolts or as recommended by the manufacturer.
- Ensure the secure installation regardless of what type of wall on which it is installed, to prevent potential dropping that could cause damage or injury.

Grounding Requirements

- Be sure to properly ground the unit. Follow all local and national codes as applicable.
- Do not connect the grounding wire to a gas pipe, water pipe, lightning rod, telephone line, or a circuit poorly grounded to the earth.
- The grounding wire is specially designed and shall not be used for other purpose, nor shall it be fastened with a common tapping screw.
- Ensure that all electrical connects are securely fasted and connected to the correct terminals.
- Local and national electrical codes must be utilized.
- The connection method of the air conditioner and the power cable and the interconnection method of each independent element shall be subject to the wiring diagram affixed to the machine.

Others

- The connection method of the air conditioner and the power cable and the interconnection method of each independent element shall be subject to the wiring diagram affixed to the machine.
- The model and rating value of the fuse should match the information printed on the silkscreen of the corresponding controller or the fuse sleeve. This ensures that the fuse is correctly rated for the specific application, providing proper protection and functionality.

Before Installation

Accessories

The air conditioning system comes with the following accessories. Use all of the installation parts and accessories to install the air conditioner. Improper installation may result in water leakage, electrical shock and fire, or equipment failure.

Installation Fittings		
Name	Shape	Quantity
Installation and owner's manual(this book)		1
Wired controller operation manual		1
Wired controller (match)		1
Clamp		4
Insulation for fitting		2

Installation Fittings

Name	Shape	Quantity
Flare nut (Large/Small)		2

Tools Required

Phillips screwdriver	Level	Refrigerant Scale
Utility knife or scissors	Torque wrench	Wrench (or spanner)
Clamp on Amp Meter	Hole Saw	Manifold and Gauges
Hexagonal Wrench	Flare tool	Pipe Cutter
Vacuum Pump	Safety Glasses	Work Gloves

Before Operation Check List

For the following items, take special care during construction and check after installation is finished.

1. Items to be checked after completion of work

Items to be checked	If not properly done, what is likely to occur.	Check
Are the indoor and outdoor unit fixed firmly?	The units may drop, vibrate or make noise.	
Was the installation of the outdoor unit completed?	The unit may malfunction or the components burn out.	
Is the gas leak test finished?	No cooling or heating.	
Is the unit fully insulated? (Refrigerant piping, drain piping, and duct)	Condensate water may drip.	
Does drainage flow smoothly?	Condensate water may drip.	
Does the power supply voltage conform to the indication on the name plate?	The unit may malfunction or the components burn out.	
Are wiring and piping correct?	The unit may malfunction or the components burn out.	
Is the air conditioner or heat pump properly grounded?	Dangerous in case of current leakage.	
Is wiring size according to specifications?	The unit may malfunction or the components burn out.	
Is something blocking the air outlet or inlet of either the indoor or outdoor units?	No cooling or heating.	
Did you set the external static pressure?	No cooling or heating.	
Are refrigerant piping length and additional refrigerant charge noted down?	The refrigerant charge in the system is not clear.	
Did you check that no wiring connection screws were loose?	Electric shock or fire.	

2. Items to be checked at the time of delivery

Items to be checked	Check
Did you explain about operations while showing the operation manual to your customer?	
Did you deliver the operation manual along with the installation manual to the customer?	
Did you deliver instruction manual, if any, for the field supplies to the customer?	

3. Points for explanation about operations

The items with WARNING and CAUTION marks in the operation manual are the items pertaining to possibilities for bodily injury and material damage in addition to the general usage of the product. Accordingly, it is necessary that you make a full explanation about the described contents and also ask your customers to read the operation manual.

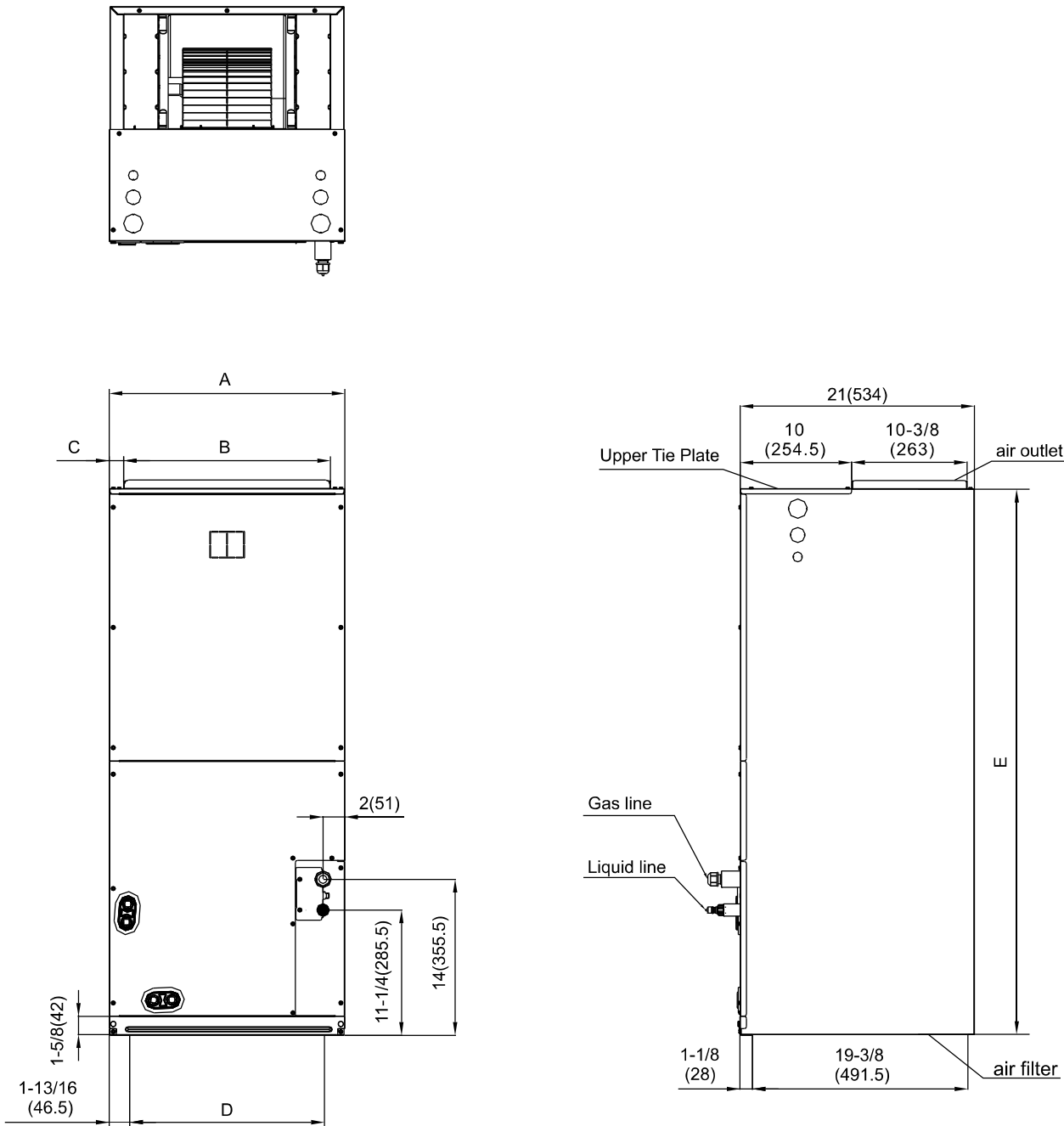
Note to Installer

- Be sure to instruct customers how to properly operate the unit (especially cleaning filters, operating different functions, and adjusting the temperature) by having them carry out operations themselves while looking at the manual.

Installation of the Indoor Unit

Indoor Unit Size Diagram

unit: in.(mm)



Model		A	B	C	D	E
18K/24K	inch	17-1/2	15-3/16	1-1/8	14	45
	mm	445	386.5	29	355	1143
30K/36K	inch	21	18-9/16	1-1/4	17-1/2	49
	mm	534	472	31	444	1245
48K/60K	inch	24-1/2	22-1/8	1-3/16	20-15/16	53
	mm	622	562	30	532	1346

Installation of the Indoor Unit

⚠ CAUTION

- Install the indoor and outdoor units, cables and wires at least 3-1/5ft.(1m) from televisions or radios to prevent static or image distortion. Depending on the appliances, a 3-1/5ft.(1m) distance may not be sufficient.
- The Indoor unit must be electrically grounded per national and local electrical code.

⚠ WARNING

DO NOT LOCATIONS:

- Install the indoor unit in a moist environment. Excessive moisture can corrode the equipment, electrical components, and cause electrical shorts.
- Areas with strong electromagnetic waves.
- Coastal areas with high salt content in the air.
- Areas with oil drilling or fracking.
- Areas that store flammable materials or gas.
- Areas where there may be detergent or other corrosive gases in the air, such as bathrooms, or laundry rooms.
- Areas where the air inlet and outlet may be obstructed.
- Danger of explosion. Keep flammable materials and vapors, such as gasoline, away from air handler.

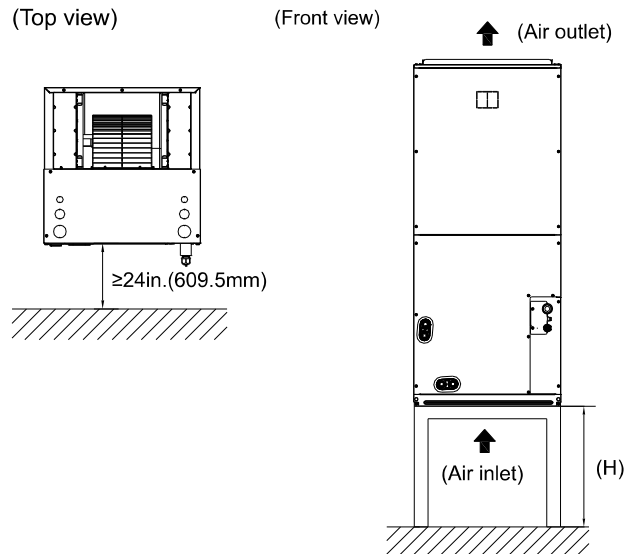
MUST BE INSTALLED IN A LOCATION THAT MEETS THE FOLLOWING REQUIREMENTS:

- Securely install the indoor unit on a structure that can support its weight. If the structure is too weak, the unit may fall and cause personal injury, unit and property damage, or death.
- Place air handler so that heating elements are at least 18 in. (45.7 cm) above the floor for a garage installation. Failure to follow these instructions can result in death, explosion, or fire.
- Enough room for installation and maintenance.
- Enough room for the connecting pipe and drainpipe.
- The structure that the equipment is suspended from must support the weight of the indoor unit.
- There must be an airtight seal between the bottom of the air handler and the return air plenum. Use fiberglass sealing strips, foil duct tape, caulking, or equivalent sealing method between the plenum and the air handler cabinet to ensure a tight seal. Return air must not be drawn from a room where this air handler or any gas-fueled appliance (i.e., water heater), or carbon monoxide-producing device (i.e., wood fireplace) is installed.

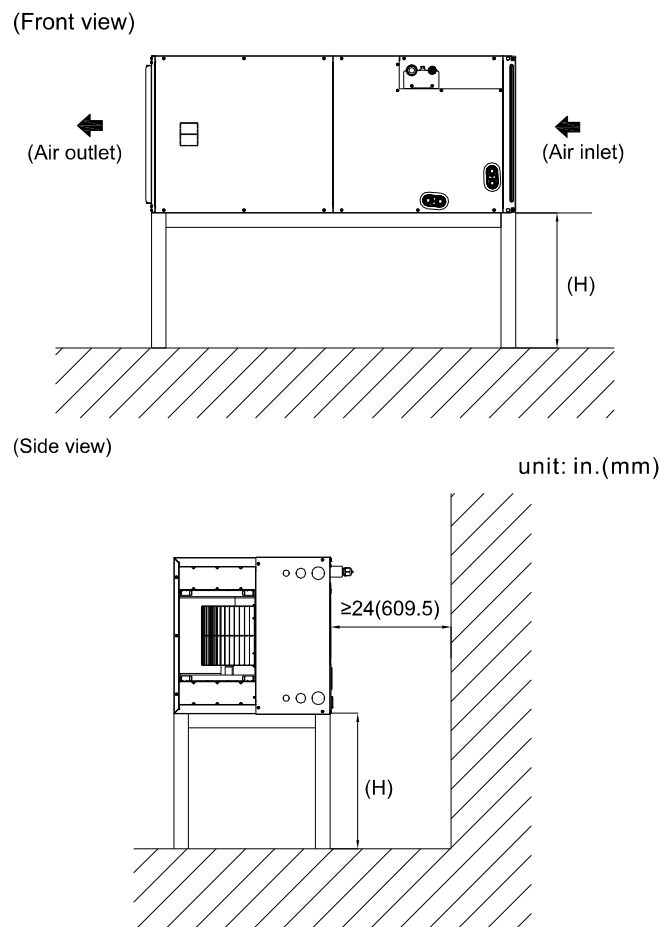
Preparation and Precautions

- Where optimum air distribution can be ensured.
 - Where nothing blocks air passage.
 - Where condensate can be properly drained.
 - Where the supports are strong enough to bear the indoor unit weight.
 - Where the false ceiling is not noticeably on an incline.
 - Where sufficient clearance for maintenance and service can be ensured.
 - Where piping between indoor and outdoor units is possible within the allowable limit.
- (Refer to the installation manual for the outdoor unit.)
- If the a return-air duct is not installed, carefully select the place and method of product installation so that air flow into the product will not be blocked.

Installed Vertically



Installed Horizontally



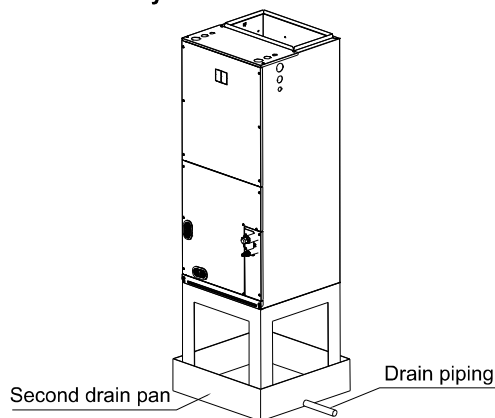
- Remove and reword-- ensure level installation in all directions, ensure condensate drain connection is located on the bottom of the unit.
- Ensure sufficient space for the bottom of the product (H dimensions) so that a downward slope of 1/100 can be maintained for drain piping, as described for the intake duct installation and in "Drain Piping Work".

Installation of the Indoor Unit

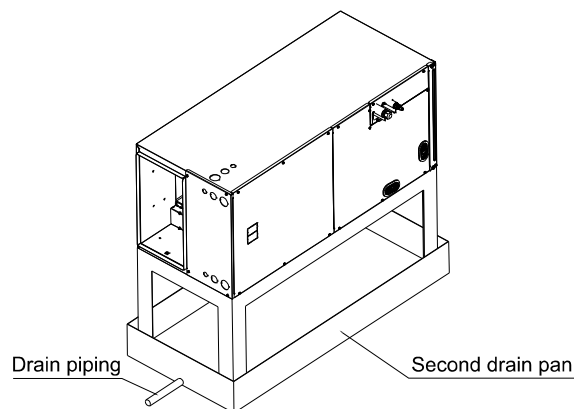
Second Drain Pan

Condensation may form on the product during COOL operation. Be sure to provide (field supplied) and install a second drain pan.

If installed vertically



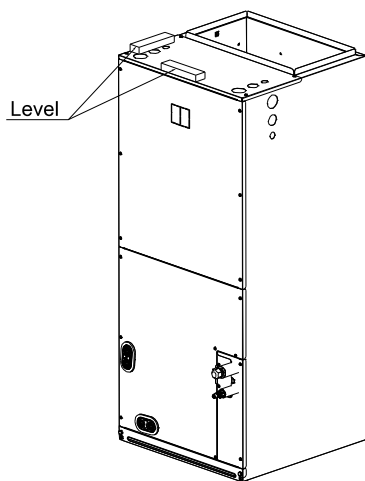
If installed horizontally



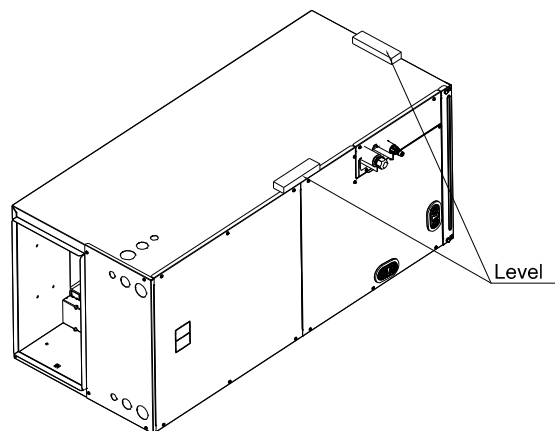
Check Horizontally Level

Make sure the unit is installed level using a level: four sides. (One thing to watch out for in particular is if the unit is installed so that the slope is not in the direction of the drain piping, this might cause leaking.)

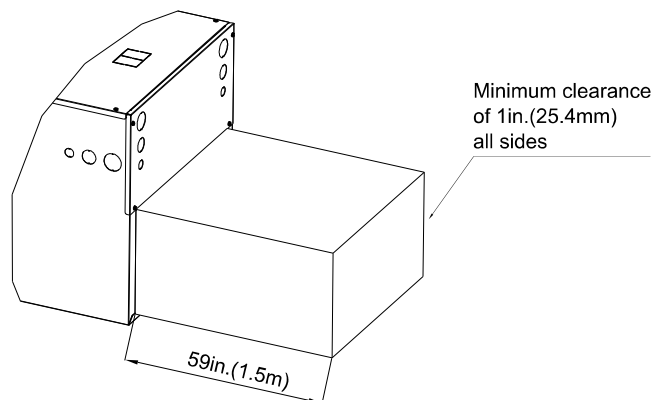
If installed vertically



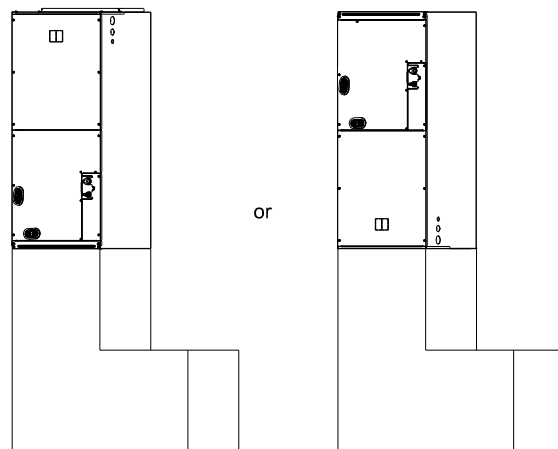
If installed horizontally



Horizontal Installations



Vertical Installations



Fixing instructions:

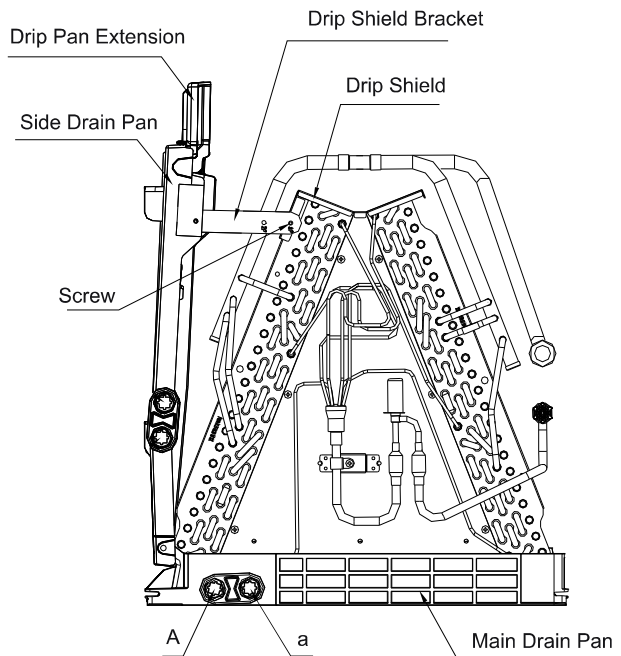
When installed vertically (upward or downward), the lower end of the air outlet needs to be connected to the L-shaped metal air duct and fastened by screws.

Installation of the Indoor Unit

Upflow Installation

No field modifications are mandatory; however, to obtain maximum efficiency, the horizontal drip shield, side drain pan and drain pan extension can be removed.

Side Drain Pan and Extension Removal: Refer to Fig. 1, remove the two screws that secure the drip shield support brackets to the condensate collectors (front and back). Unsnap the side drain pan from the main drain pan using a screw driver or any small lever. The side drain pan, drip shield brackets and the drain pan extension may now be removed. From Fig. 1, drain port labeled (A) is the primary drain for this application and condensate drain line must be attached to this drain port. Drain port (a) is for the secondary drain line (if used).



SIDE DRAIN PAN REMOVAL

Fig. 1

Horizontal Left Installation

No field modifications are permissible for this application. The bottom right drain connection is the primary drain for this application and condensate drain line must be attached to this drain connection. The top connection of the three drain connections on the drain pan must remain plugged for this application. The bottom left drain connection is for the secondary drain line (if used).

In applications where the air handler is installed in the horizontal left position, and the return air environment see humidity levels above 65% relative humidity coupled with total external static levels above 1/2in. (12.7mm) e.s.p., a condensate kit is available for field application.

Downflow/Horizontal Installation

IMPORTANT NOTE: In the downflow application, to prevent coil pan "sweating", a downflow kit (DFK) is available through your local distributor. The DFK is not supplied with the air handler and is required on all downflow installations.

Refer to Fig. 5 and 6 for the location of the components referenced in the following steps.

1. Before inverting the air handler, remove blower access panel and coil access panel. The coil access panel and tubing panel may remain screwed together during this procedure. Remove and retain the seven screws securing the coil access panel to the cabinet and the six screws securing the blower access panel to the cabinet.

2. Slide the coil assembly out using the drain pan to pull the assembly from the cabinet.

NOTE: DO NOT USE MANIFOLDS OR FLOWRATOR TO PULL THE COIL ASSEMBLY OUT. FAILURE TO DO SO MAY RESULT IN BRAZE JOINT DAMAGE AND LEAKS.

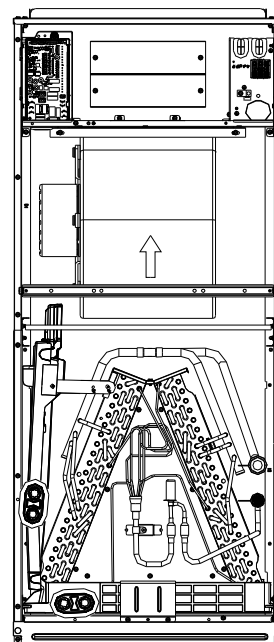
3. Removal of the center support is required on units with 21in. (533.4mm) wide cabinet. Remove and retain the two screws that secure the center support to the cabinet. Remove the center support.

4. Using the drain pan to hold the coil assembly, slide the coil assembly back into the cabinet on the downflow brackets as shown in Fig. 7.

5. Re-install the center support (if removed) using the two screws removed in Step 4.

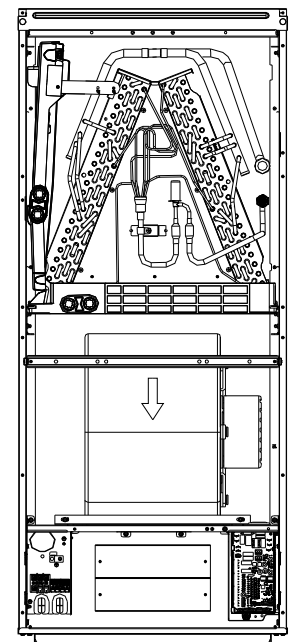
6. Re-install the access panels removed in Step 1 as shown in Fig. 8.

7. The bottom left drain connection is the primary drain for this application and condensate drain line must be attached to this drain connection. The top connection of the three drain connections on the drain pan must remain plugged for this application. The bottom left drain connection is for the secondary drain line (if used).



UPFLOW

Fig. 2

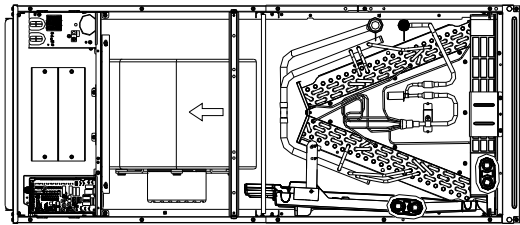


DOWFLOW

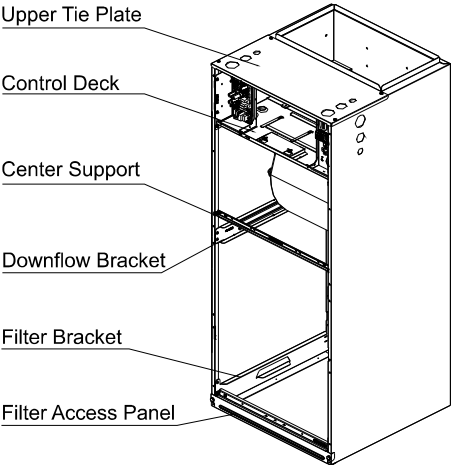
Fig. 3

Installation of the Indoor Unit

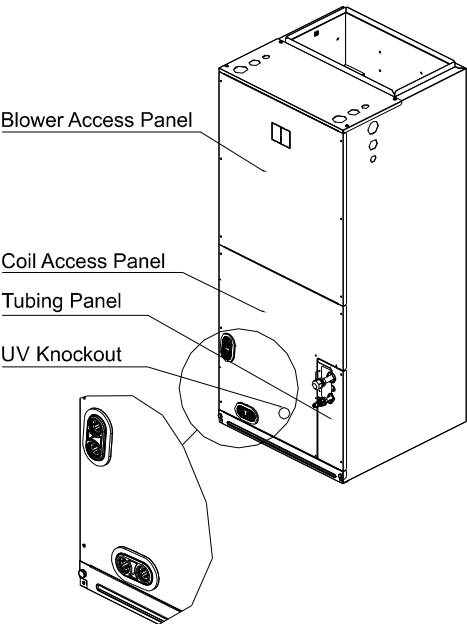
NOTE: If removing only the coil access panel from the unit, the filter access panel must be removed first. Failure to do so may result in panel damage.
Do not install the air handler in a location that violates the instructions provided with the condenser. If the unit is located in an unconditioned area with high ambient temperature and/or high humidity, the air handler may be subject to nuisance sweating of the casing. On these installations, a wrap of 2in.(50.8mm) fiberglass insulation with a vapor barrier is recommended.



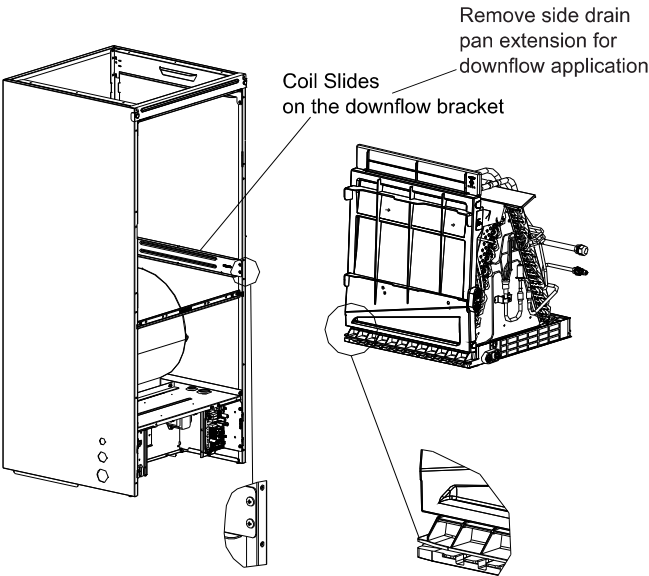
HORIZONTAL LEFT
Fig. 4



INTERNAL PART TERMINOLOGY
Fig. 5

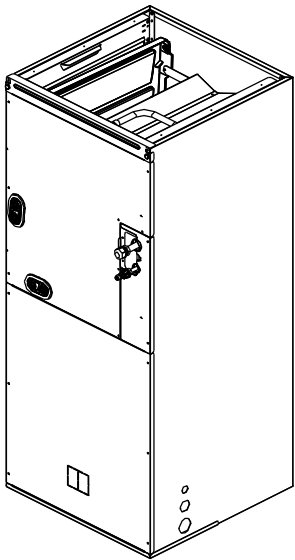


EXTERNAL PART TERMINOLOGY
Fig. 6



Ensure coil slides on the rails along the groove provided on the drain pan side walls.
Failure to do so will result in improper condensate drainage.

COIL INSTALLATION FOR DOWNFLOW
Fig.7



ACCESS PANEL CONFIGURATION
FOR DOWNFLOW OR HORIZONTAL RIGHT
Fig. 8

Installation of the Indoor Unit

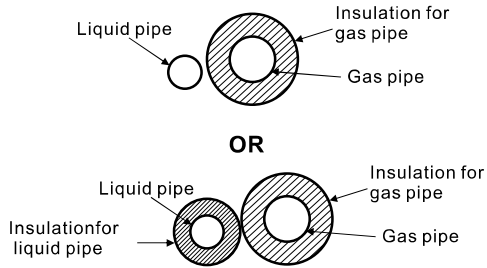
Piping Works and Flaring Techniques

Observe the requirements listed below for refrigerant piping sizes .

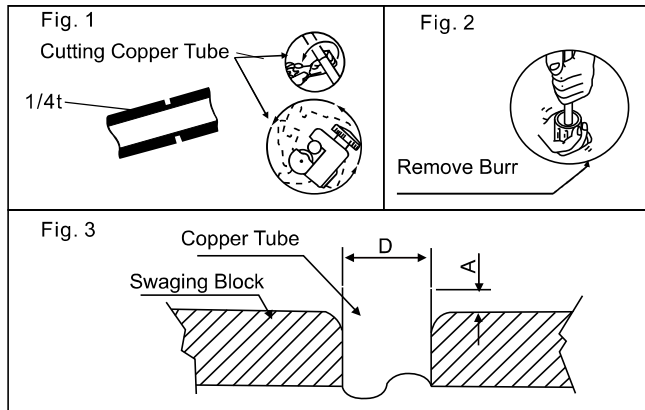
model	liquid(in.(mm))	Gas(in.(mm))
18K/24K/30K/36K	Ø3/8 (Ø9.52)	Ø5/8 (Ø15.88)
48K/60K	Ø3/8 (Ø9.52)	Ø3/4 (Ø19.05)

NOTE:

It is recommended that all connecting copper pipes be insulated.



- Do not use contaminated or damaged copper tubing. If the evaporator, condenser, or any piping has been open and exposed to the atmosphere the system must be evacuated below 500 microns. Do not remove plastic plugs or brass nuts from piping connections until the connections are ready to be made.
- If any brazing work is required, ensure that a nitrogen gas purge is utilized to prevent soot formation on the inside wall of copper tubing. Failure to do so may cause damage to the unit and void warranty.
- Cut the pipe as straight as possible (See Fig. 1). Make sure to use a deburring tool to remove any burrs. Hold the pipe with opening facing down to prevent metal chips from entering the pipe (See Fig. 2).
- This will avoid unevenness on the flare faces which will cause gas leak.
- Insert the flare nuts, mounted on the connection parts of both the indoor unit and outdoor unit, into the copper pipes.
- The exact length of pipe protruding from the top surface of the swaging block is determined by the flaring tool. (See Fig. 3)
- Fix the pipe firmly on the swaging block. Match the centers of both the swaging block and the flaring punch, then tighten the flaring punch fully.
- The refrigerant pipe connection are insulated by closed cell polyurethane.



Ø Tube, D	A(Inch/mm)		
	Inch	mm	Imperial (Wing-nut Type) Rigid (Clutch Type)
1/4		6.35	0.051" (1.3) 0.028" (0.7)
3/8		9.52	0.063" (1.6) 0.039" (1.0)
1/2		12.70	0.075" (1.9) 0.051" (1.3)
5/8		15.88	0.087" (2.2) 0.067" (1.7)
3/4		19.05	0.098" (2.5) 0.079" (2.0)

Connect the pipe to the unit

Align the center of the piping and tighten the flare nut sufficiently with fingers.

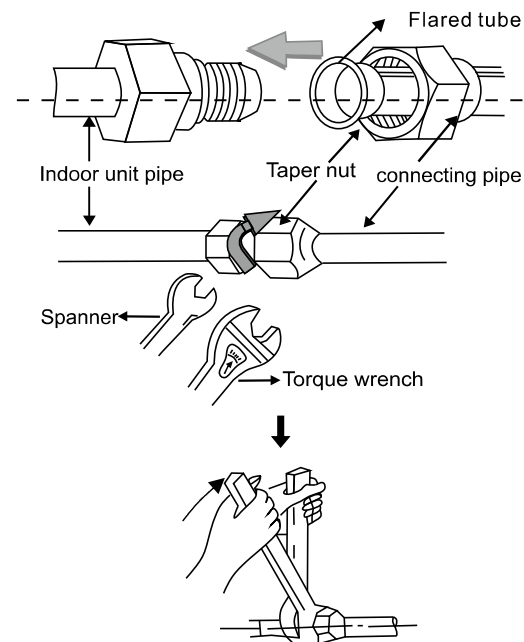
Finally, tighten the flare nut with torque wrench until the wrench clicks.

When tightening the flare nut with the torque wrench, ensure that the tightening direction follows the arrow indicated on the wrench.

The refrigerant pipe connection are insulated by closed cell polyurethane.

Tightening torque table

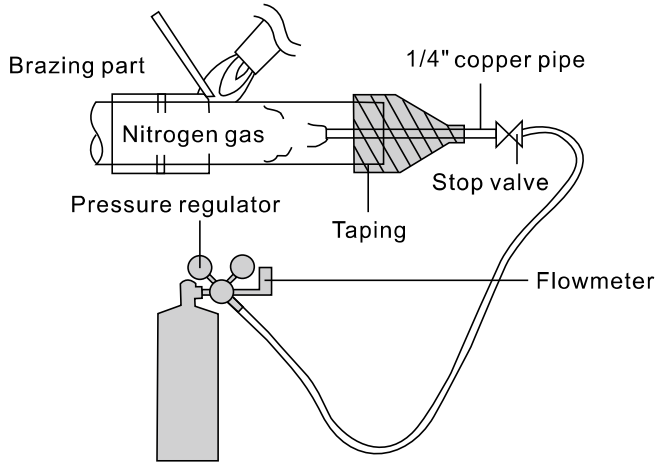
The size of pipe, in.(mm)	Torque, ft-lb(N·m)
Ø1/4 (Ø6.35)	11.0-18.4 (15-25)
Ø3/8 (Ø9.52)	25.8-29.5 (35-40)
Ø1/2 (Ø12.7)	33.2-44.3 (45-60)
Ø5/8 (Ø15.88)	53.9-57.6 (73-78)
Ø3/4 (Ø19.05)	55.3-59.0 (75-80)



Installation of the Indoor Unit

Requirement of Brazing the Pipe

- Make sure that there is no moisture inside the pipe.
- Make sure that there are no foreign materials and impurities in the pipe. Make sure that there is no leak.
- Be sure to follow the instruction when brazing the pipe.



The use of Nitrogen gas

- Use Nitrogen gas when brazing the pipes as shown in the picture. If you do not use Nitrogen gas when brazing the pipes, oxide may form inside the pipe. It can cause the damage of the compressor, valves.
- Adjust the flow rate of the Nitrogen gas with a pressure regulator to maintain 0.05m³/h or less.
- Wet rags must be used to protect EXV (Electronic expansion valve) and other heat sensitive components when brazing.

Installing the Duct

Exercise care regarding the following when performing duct work.

- Verify that duct work does not exceed the unit's setting range of external static pressure (up to 1.0 in.Wg at "H" speed) .
- Install canvas ducts at air outlets and inlets so that vibrations from the main unit are not transmitted to ducts or the floor. Additionally, line the duct with sound-absorbing material (heat insulation material) as necessary.
- Be sure to install an air filter to the product's air inlet or to a field-supplied air inlet inside the air passage on the suction side.
- Perform the curing and other work during duct welding so that the inside of the product is not exposed to spatter.
- If the metal duct passes through a metal lath, wire lath, or metal plate of a wooden structure, isolate the duct from the wall electrically.
- Be sure to heat-insulate the duct to prevent the formation of condensation.
(Material: Glass wool or polyethylene foam; thickness: 1in.(25.4mm)).
- Explain to the customer how to operate and clean field-supplied components such as air filters, air inlet grilles, air outlet grilles.
- To prevent drafts, locate the air outlet grille on the indoor side so that warm air from the outlet does not come into direct contact with room occupants.
- When an electric heater (optional) is installed, use metal duct and wrap the duct with a glass-wool insulation material.

CAUTION



This air handler is designed for a complete supply and return ductwork system.
Please ensure that the inlet and outlet ducts are completely sealed.
Do not operate this product without all the ductwork attached.

External Static Pressure Setting

The air handler is equipped with an adjustable static pressure setting. The static pressure can be changed by dip the SW2 in the PCB. The available settings are shown in the table below.

External Static Pressure Dial code SW2 of Controlling panel				
ESP(In.WG)	SW2-1	SW2-2	SW2-3	SW2-4
Default	0	0	0	0
0	0	0	0	1
0.1	0	0	1	0
0.2	0	0	1	1
0.3	0	1	0	0
0.4	0	1	0	1
0.5	0	1	1	0
0.6	0	1	1	1
0.7	1	0	0	0
0.8	1	0	0	1
0.9	1	0	1	0
1.0	1	0	1	1

CAUTION



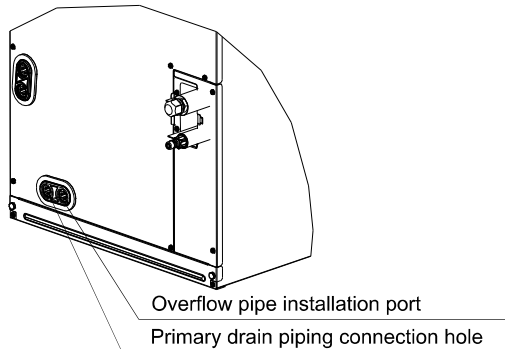
Keep in mind that a shortage of airflow quantity or water leakage will result because the air conditioner will be operated outside the rated range of airflow quantity if the external static pressure is wrongly set.

Drain Piping Work

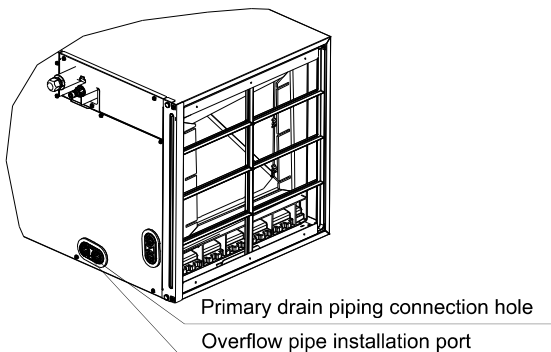
CAUTION

- Make sure all water is out before making the duct connection.

In case of vertical installation

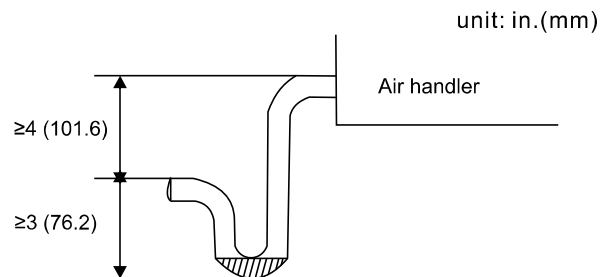


In case of horizontal installation



Drain Socket Thermal Insulation Work

- The drain pan has connections for a primary and secondary drain.
- The diameter of the drain piping should be greater than or equal to the diameter of the connecting pipe (vinyl tube, pipe size: 25/32 in.(20mm); outer dimension : 1-1/32 in.(26mm)). (not including a riser)
- Keep piping runs short with a downward slope of at least 1/100 to prevent air pocket from forming.
- Be sure to install a drain trap at the drain outlet since the inside of the unit is at negative pressure relative to atmospheric pressure during operation.
- To keep the piping from becoming clogged with dirt, avoid bends where possible and install so that traps can be cleaned.
- In the event that the building is exposed to freezing temperatures, all water pipes should be drained, the building should be properly winterized, and the water source should be closed. Should the building be exposed to freezing temperatures, any hydronic coil units should be drained as well. In such case, after native heat sources should be utilized.



Electric Wiring Work

Electrical Safety Requirements

- Be sure to use the correct rated voltage for the air conditioner and a dedicated circuit for the power supply.
- All wires must be sized per NEC (National Electrical Code) and local codes.
- The operating range is 90%-110% of the local rated voltage. Insufficient power supply causes malfunction, electrical shock, or fire. If the voltage instability occurs, install the voltage regulator.
- The minimum clearance between the air conditioner and the combustibles is 4.92ft (1.5m) or greater.
- Use the correct wire size and type for connecting the indoor unit to the outdoor unit.
- The size of the interconnection cord, power cable, fuse, and switch needed is determined by the maximum current of unit.
- The maximum current is indicated on the nameplate located on the side panel of the unit. Refer to this nameplate to choose the right wire size, breaker, or switch.

WARNING

- All electrical works must be carried out & checked by a qualified electrician and must adhere to the IET regulations, local and national legislation and industry best practice. The system must have its own independent power supply.
- Do not attempt any electrical works yourself.
- An Earth Leakage Protector, Power Switch and Circuit Breaker or Fuse must be installed in the dedicated power supply or there is the risk of electric shock.

CAUTION

- The grounding must be reliable. If grounding is not correct, it may lead to electric shock.
- All power cables should be properly secured with cable ties so that external forces can not disconnect the wired from the terminals. Improper connections or insecure fastening can cause electric shocks or fire.
- use a circuit breaker that disconnects all electrical connections (both live and neutral wires) and has a gap of at least 1/8 inch (3 mm) between the contact points. This ensures complete disconnection in high voltage situations.

- Do not connect the ground cable to gas or water pipes, telephone lines, lightning rods, or the ground cables of other products. This is crucial for safety and to prevent electrical hazards.
- Once the indoor and outdoor units are switched on, do not cut off the power supply within the first minute. The system needs this time to automatically set itself up, and interrupting the power could cause it to operate abnormally.
- Please connect the power cord and interconnecting cable according to the wiring diagram.
- Connect the wire firmly to the terminal block using crimps and secure in order to prevent external forces pulling on the wire causing risk of fire or electric shock.
- After completing the electrical connections, ensure that all wires are kept away from other components like tubing and the compressor. This helps prevent potential damage and ensures safe operation.

Electric Wiring Work

Selection of Electrical Parts

- The definition of power cord is the power supply cable from the isolating switch attached to the dedicated power supply to the indoor unit or outdoor unit. Interconnecting cable for the indoor and outdoor unit is the power cable that connects indoor unit and outdoor unit.
 - Above-mentioned definitions are the specifications of power supply, power cord and interconnecting cable of indoor unit and outdoor unit of all different types of air conditioners.
 - To avoid voltage drops, if the cross-sectional area of a power cable core is at its minimum size and the power cord is lengthened, you should opt for a larger power cable size. This ensures that the electrical system remains efficient and safe.
- The wiring cable specification that is needed in the installation: (Recommended specifications)

Model	Recommended power line (AWG)	Recommended communication cable	Switch/fuse nominal value(A)	Certification Type
18/24K	16	22AWG ≤1640ft. (≤500m)	6	UL
30/36K			10	
48/60K			15	

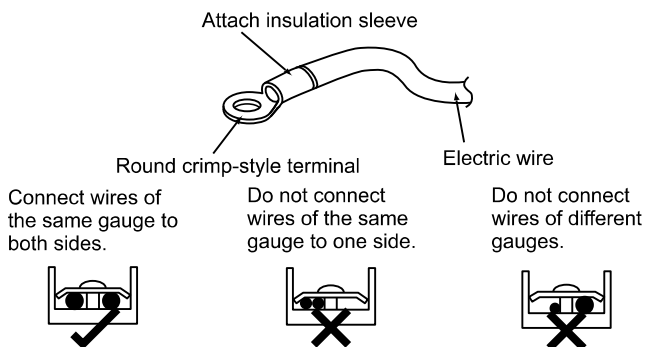
If other than uncoated (non-plated) 75°C copper wire (solid wire for 10 AWG and smaller, stranded wire for larger than 10 AWG) is used consult applicable tables of the National Electric Code (ANSI/NFPA 70).

Specifications of circuit breaker are based on a working condition where the working temperature is 40°C. If working condition changes, please adjust the specifications according to national standards.

Connection Wire

Precautions when laying power supply wiring

- Wiring of different thicknesses cannot be connected to the power supply wiring terminal block. Slack in the power supply wiring may cause abnormal heat.
- Use sleeve-insulated round crimp-style terminals for connections to the power supply wiring terminal block. When none are available, connect wires of the same diameter to both sides, as shown in the figure.

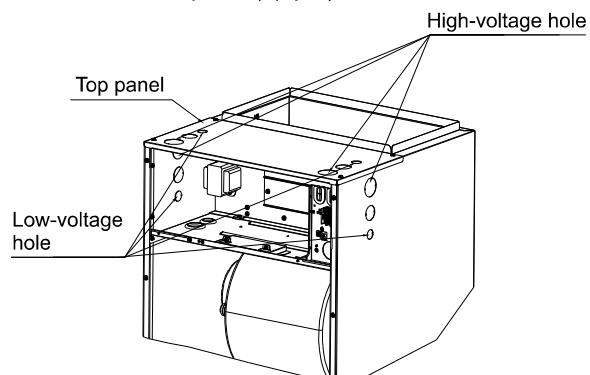


If the wiring gets too hot due to loose power-supply wiring, use the following precautions:

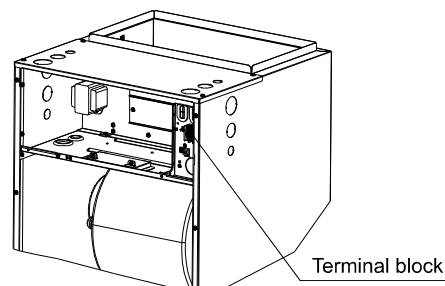
- For wiring, use the designated power supply wiring and connect firmly, then secure to prevent outside pressure being exerted on the terminal board.
- Use the correct screwdriver for tightening the terminal screws. If the blade of screwdriver is too small, the head of the screw might be damaged, and the screw will not be properly tightened.
- If the terminal screws are tightened too hard, screws might be damaged.

Terminal Block

- (1) Remove the front panel (up per).



- (2) Remove the electric component box cover.

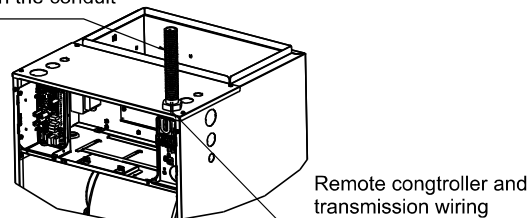


- (3) Pass the power supply wiring and the ground wire through the top panel's high-voltage hole (requires use of conduit) and pass the remote controller wiring and transmission wiring through the top panel's low-voltage hole.

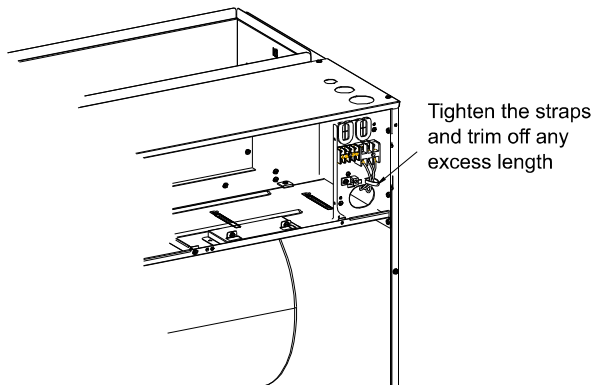
- (4) Pass the power supply wiring and the ground wire through the conduit (conduit should be field sup-pled). The hole for running wires through should be sealed completely to prevent air from entering.

*When installing an optional electric heater kit, run both the power supply wiring and ground wire of the electric heater kit through the conduit.

Pass through the conduit

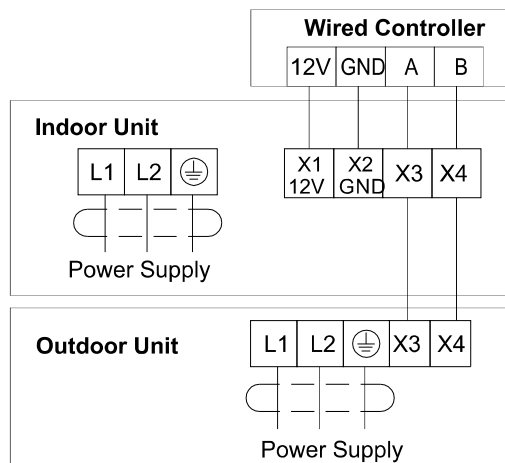


- (5) After completing the wiring, use the pre-installed ties to secure the power cable and trim off any excess ties.

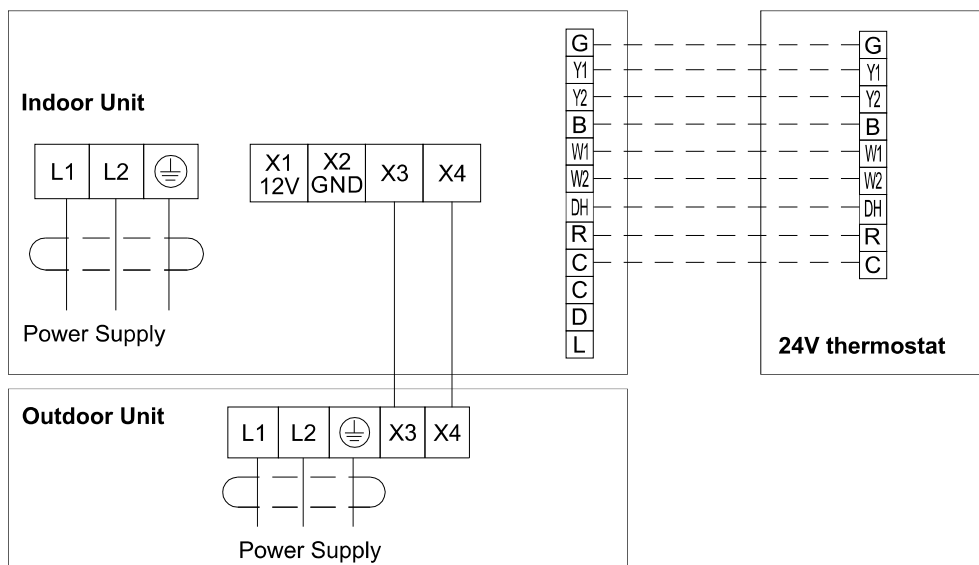


Electric Wiring Work

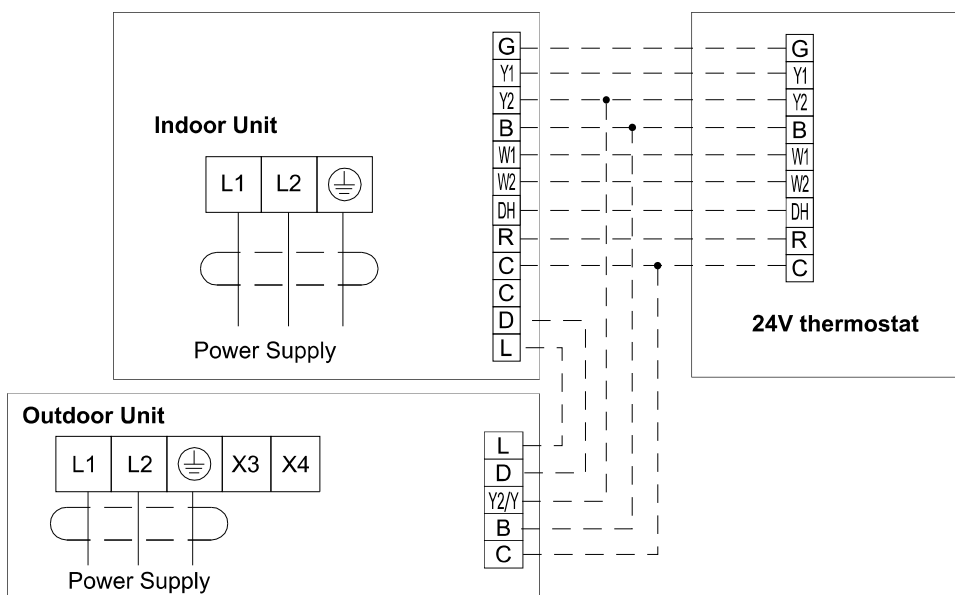
RS485 Communication



RS485 communication with 24V thermostat



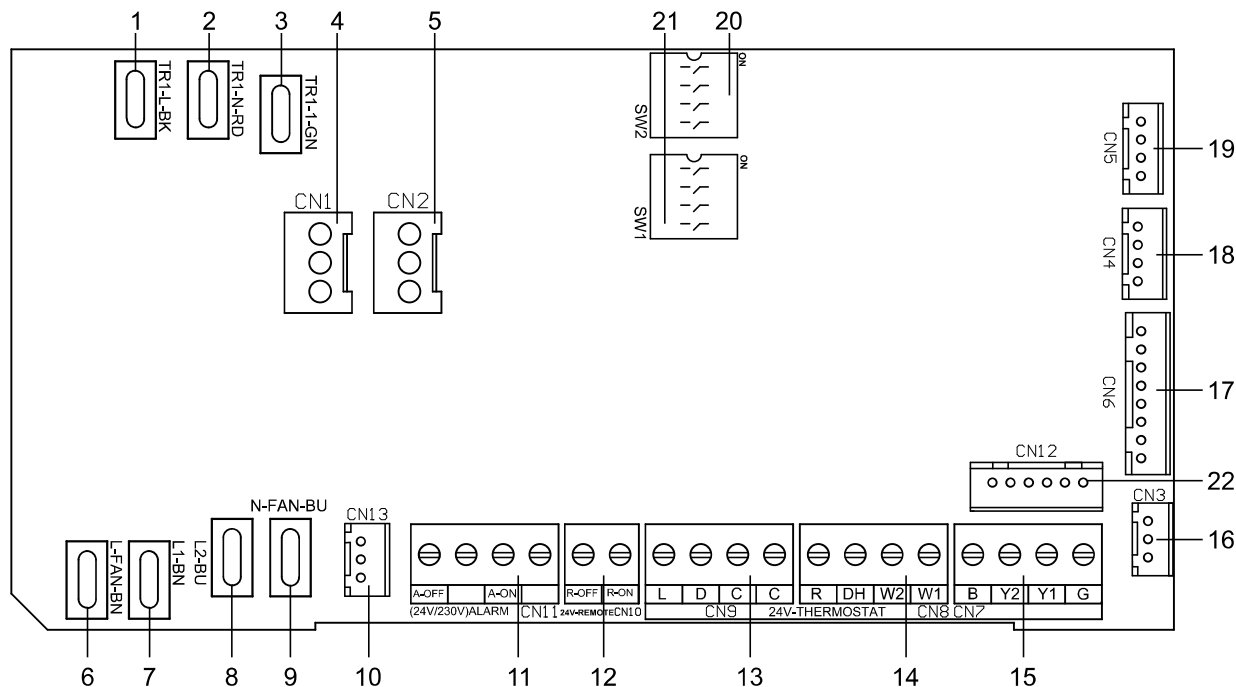
24V Communication



Electric Wiring Work

ENGLISH

Optional Function Wiring



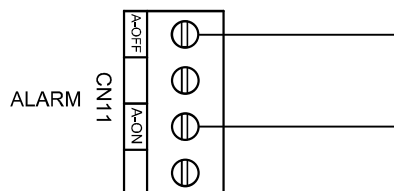
No	Port	Remark	No	Port	Remark
1	TR1-L-BK	Power supply transformer primary	12	CN10	Remote Control Interface
2	TR1-N-RD		13	CN9、CN8、CN7	24V switch volume interface
3	TR1-1-GN		14		
4	CN1	Electric heating interface 1	15		
5	CN2	Electric heating interface 2	16	CN3	Indoor fan control signal interface
6	L-FAN-BN	Live wire interface of indoor fan	17	CN6	Temperature sensor interface
7	L1-BN	Power cord L1 interface	18	CN4	The refrigerant detection sensor interface
8	L2-BU	Power cord L2 interface	19	CN5	Wired controller RS485 communication interface
9	N-FAN-BU	Zero-line interface of the indoor fan	20	SW2	Dial switch 2
10	CN13	Power supply transformer secondary stage	21	SW1	Dial switch 1
11	CN11	External alarm interface	22	CN12	Electronic expansion valve coil interface

Alarm Output

An alarm output (CN11(A-OFF、A-ON)) can be utilized if actions are required when a fault is present. This is a passive outlet port, so you will need to input a voltage signal. The relay is normally-open for normal operation, and closed when a fault condition is active.

Note:

The current of load is $\geq 2.0A$, the AC contactor is required to connected for the load.



Electric Wiring Work

24V Control logic

Indoor unit connector

Connector	Purpose
R	24V AC power supply
C	24V Common
G	Fan Control
Y1	Low cooling
Y2	High cooling
B	Heatingreversing Valve
W1	Stage 1 Electric Heating
W2	Stage 2 Electric Heating
DH	Dehumidification
D	Defrosting signal
L	Fault signal

Outdoor unit connector

Connector	Purpose
C	24V Common
Y/Y2	High cooling
B	Heatingreversing Valve
D	Defrosting signal
L	Fault signal

NOTE: When outdoor defrosts, D of outdoor unit will send 24V signal to avoid cold winds.

NOTE: When refrigerant leakage in the indoor unit, L of the indoor unit will send 24V signal to shut down the Outdoor unit

24V Signal Chart

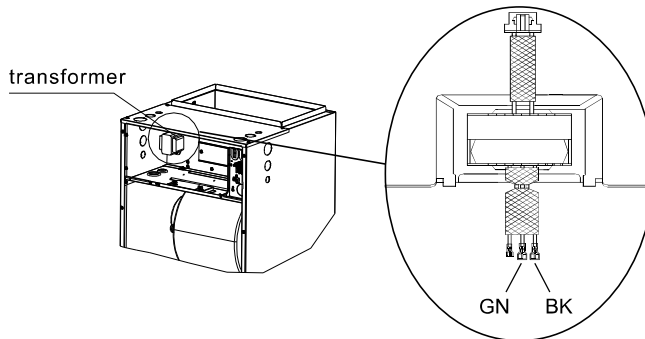
Mode	terminal							
	G	Y1	Y2	B	W1	W2	DH	Fan speed
OFF	0	0	0	0	0	0	0	OFF
FAN	1	0	0	*	*	*	0	High
	*	0	0	*	*	*	1	LOW
COOLING	*	1	0	0	*	*	0	Med
	*	*	1	0	*	*	0	High
Dehumidification	*	1	0	0	*	*	1	Low
	*	*	1	0	*	*	1	Low
HEATING	*	1	0	1	0	0	*	Med
	*	*	1	1	0	0	*	High
HEATING+ Electric heater kit 1	*	1	0	1	1	0	*	High
	*	*	1	1	1	0	*	High
HEATING+ Electric heater kit 2	*	1	0	1	*	1	*	High
	*	*	1	1	*	1	*	High

Note:

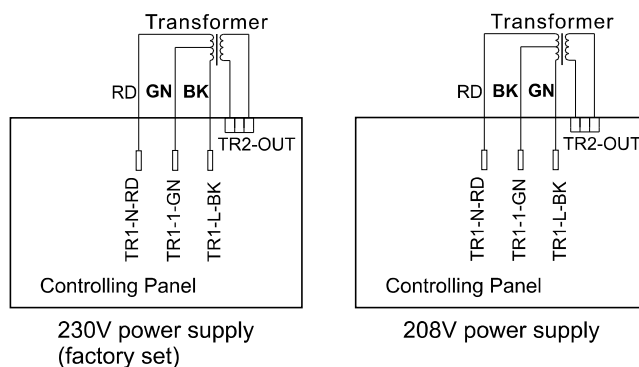
1: 24V signal 0: No 24V signal *: 1 or 0.

The AHU will turn off if the 24V input cannot meet the table.
Electric heating cannot be turned on when not in the heating mode.

Change Voltage



The primary input voltage of transformer is defaulted at 230V(BK). When switching the power supply of the complete unit to 208V, connect the primary input voltage of transformer to 208V(GN), which can be realized by exchanging the black wire and the green wire.



230V power supply
(factory set)

208V power supply

Dialing Function

Communication function: SW1-1

No.	SW1-1
1	OFF 24V, RS485 communication compatible.(Default)
2	ON Dedicated for RS485 communication.

NOTE: The factory default dial code can be compatible with 24V and 485 communication. If 485 communication is selected for project installation, if it fails to start normally during the first power-on debugging, please set the SW1-1 dial code to ON to check whether there is communication fault.

Capacity choosing: SW1-2~SW1-4

No.	Capacity	SW1-2	SW1-3	SW1-4
0	Factory Default	OFF	OFF	OFF
1	18K	OFF	OFF	ON
2	24K	OFF	ON	OFF
3	30K	OFF	ON	ON
4	36K	ON	OFF	OFF
5	40K	ON	OFF	ON
6	48K	ON	ON	OFF
7	60K	ON	ON	ON

NOTE: The whole machine is set to the default dial code when it leaves the factory. If PCB has been replaced after sales, please redial the SW1-2~SW1-4 according to the corresponding capacity model.

Ducts static pressure selection: SW2;
See in "External Static Pressure Setting"

Testing and Inspection

Check after Installation

• Electrical Safety Check

1. If the supply voltage is within tolerance.
2. If the indoor and outdoor units are properly wired.
3. If the grounding wire of the air conditioner is securely grounded.

• Installation Safety Check

1. If the unit is mounted properly and securely.
2. If the water drains smoothly from indoor unit to outdoor drain.
3. If the wiring and piping are correctly installed and free of leaks.
4. Check that no foreign matter or tools are left inside the unit.
5. Check the refrigerant pipeline and connections are properly insulated.

• Leak test of the refrigerant

Depending on the installation method, the following methods may be used to check for suspect leak, on areas such as the connections of the outdoor unit and the cores of the cut-off valves and t-valves:

1. Bubble method: Apply of spray a uniform layer of soap water over the suspected leak spot and observe carefully for bubble.
2. Instrument method: Checking for leak by pointing the probe of the leak detector according to the instruction to the suspect points of leak.

Note:

Make sure that the ventilation is good before checking.

Test Operation

• Test Operation preparation:

1. Verify that all piping and wiring is properly connected.
2. Confirm that the valve at the gas side and the liquid-side are fully open.
3. Verify that power is turned on to the unit.
4. Install batteries in the remote control.

Note:

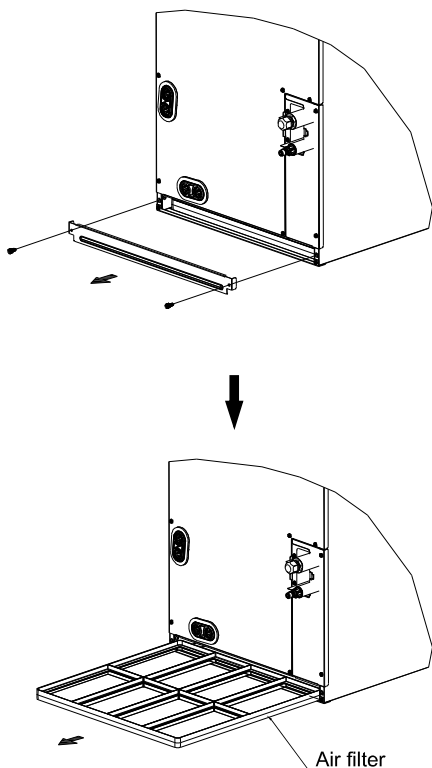
Make sure that the ventilation is good before testing.

• TEST operation method:

1. Turn on the power and push the ON/OFF switch button of the remote controller to start the air conditioner.
2. Select COOL or HEAT, adjust the SWING and other operation modes with the remote controller to verify proper operation.

Clean

Check your air filter every 30 days during cooling and heating seasons, and clean or replace it if its dirty. To access your air filter, remove the filter access door and pull the air filter out of the Indoor Unit, as shown in the steps below:



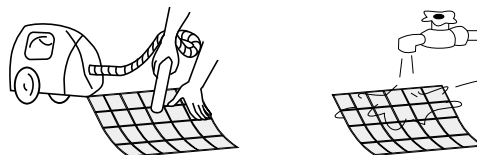
Cleaning the Air Filter

In order to ensure the best performance from your air conditioner clean the air filter regularly. We recommend cleaning once a month or more frequently if required.

1. The filter can be cleaned using a vacuum cleaner or with soap and water.
2. Take off the air filter

① First, take off the bolt casing on the air inlet grille, then take off the bolts using the screwdriver, and take off the filter net.

② Set the filter net back to the air inlet grille, fix its bolt and the casing.



⚠ CAUTION



- Electricity, Dangerous! Cut off all the power supply before maintenance.
- When the filter is very dirty it can be washed in detergent and hot water (below 104°F(40°C)).
- Ensure the filter is fully dry before reinstallation to avoid risk of electric shock or short circuiting
- Do not dry the filter using direct sunlight.
- If the building in which any such device is located will be vacant, care should be taken that such device is routinely inspected and maintained.

Fault Code

After indoor and outdoor units shut down due to failure, failure code will display on wired controller or remote receiving board. In case of normal protection, no failure code will display on wired controller or remote receiving board of indoor unit. Among others, wired controller doesn't automatically send warning, which requires pressing CHECK button to display corresponding failure codes. Remote receiving board directly displays failure codes. After failures are removed, display will automatically disappear.

Indoor Unit Malfunction

No.	PCB lamp display	Fault code	Fault description
1	Light keep off	—	Normal (485/24V signal received)
2	The light stays on for five minutes	—	Normal (485/24V signal not received)
3	Lights blink once and stop for eight seconds	A9	485 Communication abnormal between the ODU and IDU
4	Lights blink twice and stop for eight seconds	AA	Fault with the wired controller communication
5	Lights flash three times and stop for eight seconds	A6	Fault with the fan motor of IDU
6	Lights blink four times and stop for eight seconds	A0	Fault with the refrigerant sensor
7	Lights blink five times and stop for eight seconds	AF	Refrigerant leakage protection
8	Lights flash six times and stop for eight seconds	A1	Fault with the room temperature sensor on the IDU
9	Lights blink seven times and stop for eight seconds	A2	Fault with the temperature sensor in the Middle evaporator of IDU
10	Lights blink eight times and stop for eight seconds	A3	IDU coil pipe inlet temperature sensor failure
11	Lights blink eight times and stop for eight seconds	A4	IDU coil pipe outlet temperature sensor failure
12	Lights blink nine times and stop for eight seconds	AE	Operation mode abnormal
13	Lights blink ten times and stop for eight seconds	See Outdoor unit malfunction	Fault with ODU

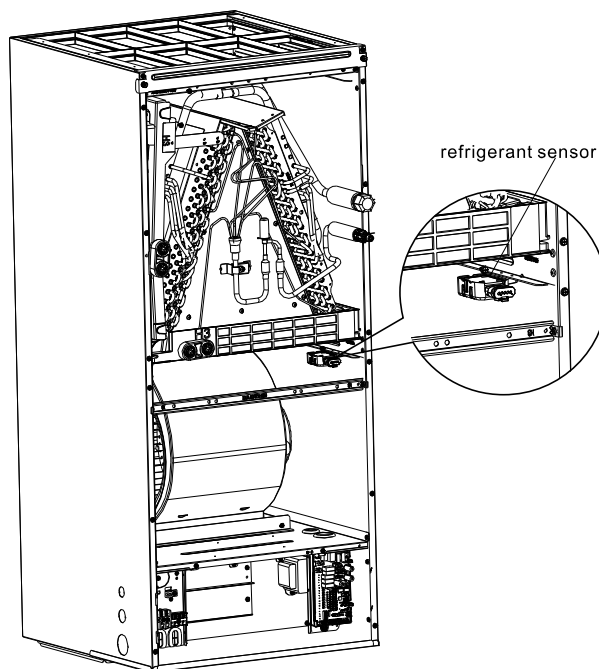
Refrigerant Leakage Protection

When the refrigerant sensor detects refrigerant leakage, the internal fan will operate at a strong wind speed to increase the circulating air volume and dilute the refrigerant concentration. The line controller will display a refrigerant leakage fault. If 485 communication wiring is used, the external machine will shut down after receiving a fault. If 24V control is used, the 24V fault signal L will output a 24V signal, which can be used to control the shutdown of the external unit (with 24V function). At the same time, the alarm output signal will be closed, and you need to connect an alarm device to remind.

Note:

- If refrigerant leakage protection is found, please open the doors and windows. Do not cut off the power or use open flames until the fault signal disappears and the fan resumes normal operation.
- If there is a refrigerant leakage protection(AF), it needs to be repaired before use.
- If the refrigerant sensor malfunctions, please replace it with a refrigerant sensor of the same model and do not use sensors of other specifications and types. When replacing, please install the refrigerant sensor in the original installation position.
- The refrigerant sensor normal service life is 15 years.
- If there is a refrigerant leak and manual release of the fault protection is required, the air conditioning operation mode needs to be switched from other modes to fan mode. When the refrigerant concentration drops to the safe concentration, the fault protection is released, and the protection will not be released in other modes.
- The location of the refrigerant sensor installed in the factory is suitable for installation with upward and horizontal air outlets; When choosing downflow installation, please adjust the position of the refrigerant sensor. (see the figure below)

Downflow



Maintenance Notice

Attention :

For maintenance or scrap, please contact a authorized contractor.

Maintenance by unqualified person may cause injury or damage to the unit.

Charge air conditioner with R32 refrigerant only, and maintain the air conditioner in a strict accordance with the manufacturer's requirements.

Qualification of Workers

1. Special training is required to work on equipment with A2L refrigerants. Only rely on qualified contractors to install, service, and repair this system.

2. The maintenance and repair of the air conditioner must be conducted according to the method recommended by the manufacturer.

If other professionals are needed to help maintain and repair the equipment, it should be conducted under the supervision of individuals who have the qualification to repair AC equipped with flammable refrigerants.

Inspection of the Site

Safety inspection must be conducted before maintaining equipment with R32 refrigerant to make sure the risk of fire is minimized.

Check whether the space is well ventilated and whether anti-static or fire prevention equipment is required.

While maintaining the refrigeration system, observe the following precautions before operating the system.

Operating Procedures

1. General work area:

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.

2. Checking for presence of refrigerant:

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

3. Presence of fire extinguisher:

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.

4. No ignition sources:

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 may 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.

5. Ventilated Area:

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.

6. Checks to the refrigeration equipment:

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using FLAMMABLE REFRIGERANTS:

- The actual REFRIGERANT CHARGE is in accordance with the room size within which the refrigerant containing parts are installed;
- The ventilation machinery and outlets are operating adequately and are not obstructed;
- If an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- 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 may 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.

7. Checks to electrical devices:

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.

Repairs to Sealed Components

● During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

- Sealed electrical components shall be replaced.

Maintenance Notice

Repair to Intrinsically Safe Components

- Do not apply any permanent inductive or capacitance loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use.

- Intrinsically safe components must be replaced.

- Replace components only with parts specified by the manufacturer. Other parts may result in the ignition of refrigerant in the atmosphere from a leak.

NOTE: The use of silicon sealant can inhibit the effectiveness of some types of leak detection equipment. Intrinsically safe components do not have to be isolated prior to working on them.

Cabling

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.

Detection of Flammable Refrigerants

- 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.

- 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 may not be adequate, or may 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 (25 % maximum) is confirmed.

- Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

NOTE:

Examples of leak detection fluids are

- bubble method,

- fluorescent method agents.

- 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 (by means of shut off valves) in a part of the system remote from the leak.

Removal and Evacuation

1. 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 be 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 (optional for A2L);

- evacuate (optional for A2L);

- purge with inert gas (optional for A2L);

- continuously flush or purge with inert gas when using flame to open circuit, and open the circuit.

2. The refrigerant charge shall be recovered into the correct recovery cylinders if venting is not allowed by local and national codes. For appliances containing flammable refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process might need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

3. For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place.

4. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

Charging Procedures

1. 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).

- Extreme care shall be taken not to overfill the REFRIGERATING SYSTEM.

2. 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.

Decommissioning

Before carrying out this 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.

a) Become familiar with the equipment and its operation.

b) Isolate system electrically.

Maintenance Notice

Decommissioning

- c) Before attempting the procedure, ensure that:
- mechanical handling equipment is available, if required, for handling refrigerant cylinders;
 - all personal protective equipment is available and being used correctly;
 - the recovery process is supervised at all times by a competent person;
 - recovery equipment and cylinders conform to the appropriate standards.
- d) Pump down refrigerant system, if possible.
- e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
- f) Make sure that cylinder is situated on the scales before recovery takes place.
- g) Start the recovery machine and operate in accordance with instructions.
- h) Do not overfill cylinders (no more than 80 % volume liquid charge).
- i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
- j) 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.
- k) Recovered refrigerant shall not be charged into another REFRIGERATING SYSTEM unless it has been cleaned and checked.

Labelling

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 labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

Recovery

1. When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.
2. 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.
3. 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. If in doubt, the manufacturer should be consulted. 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.
4. 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.
5. 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. When oil is drained from a system, it shall be carried out safely.

DE-COMMISSIONING,DISMANTLING&DISPOSAL

This product contains refrigerant under pressure, rotating parts, and electrical connections which may be a danger & cause injury. All work must only be carried out by competent persons using suitable protective clothing and safety precautions.



Read the Manual



Risk of Electric Shock

RoHS



Unit is Remotely controlled
& may start without warning



1. Isolate all sources of electrical supply to the unit including any control system supplies switched by the unit.
Ensure that all points of electrical and gas isolation are secured in the OFF position.
The supply cables and gas pipe work may then be disconnected and removed.
For points of connection refer to unit installation instructions.
2. Remove all refrigerant from each system of the unit into a suitable container using a refrigerant reclaim or recovery unit.
This refrigerant may then be reused, if appropriate, or returned to the manufacturer for disposal.
Under no circumstances should refrigerant be vented to atmosphere Where appropriate, drain the refrigerant oil from each system into a suitable container and dispose of according to local laws and regulations governing disposal of oily wastes.
3. Packaged units can generally be removed in one piece after disconnection as above.
Any fixing down bolts should be removed and then unit lifted from position using the points provided and equipment of adequate lifting capacity.
Reference **MUST** be made to the unit installation instructions for unit weight and correct methods of lifting.
Note that any residual or spilt refrigerant oil should be mopped up and disposed of as described above.
4. After removal from position the unit parts may be disposed of according to local laws and regulations.
5. Meaning of crossed Out wheeled dustbin: Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.
Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well being. When replacing old appliances with new ones, the retailer is legally obligated to take back your old appliance for disposals at least free of charge.



Designed by Havells assembled in PRC



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