



Installer's Guide

Package Unit



Inverter Heat Pump Package Unit
Up to 18.5 SEER2
2 - 3 Tons
R32

PXV36H2A

NOTE: Appearance of unit may vary.



ALL phases of this installation must comply with NATIONAL, STATE AND LOCAL CODES

IMPORTANT — This Document is customer property and is to remain with this unit. Please return to service information pack upon completion of work.

These instructions do not cover all variations in systems or provide for every possible contingency to be met in connection with the installation. Should further information be desired or should particular problems arise which are not covered sufficiently for the purchaser's purposes, the matter should be referred to your installing dealer or local distributor.

Note : *The manufacturer recommends installing only approved matched indoor and outdoor systems. All of the manufacturer's split systems are A.H.R.I. rated only with TXV indoor systems. Some of the benefits of installing approved matched indoor and outdoor split systems are maximum efficiency, optimum performance and the best overall system reliability.*

NOMENCLATURE

	P	X	V	36	H	2	A	
	1	2	3	4	5	6	7	
Series	Package Unit							
Refrigerant	R32						Version	
Feature	Variable Speed					Electrical		
						2	208/230V, 1PH, 60Hz	
Nominal Capacity							Type	
24	24K BTU						H	Heat Pump
36	36K BTU							
48	48K BTU							
60	60K BTU							

FOR UP TO DATE INFORMATION SUCH AS SPECIFICATIONS, CATALOGS, AND BULLETINS, PLEASE SCAN BELOW OR VISIT INNOVAIR.COM



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NOTE:

- This air conditioner has been designed for the following temperatures.
Operate the heat pump air-conditioner within this range.

Mode	Outdoor operation temperature range [°F (°C)]	
	Maximum	Minimum
Cooling operation	125 (52)	50 (10)
Heating operation	75 (24)	-4 (-20)

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


Safety precautions


1. This air conditioner uses new refrigerant HFC (R32).
2. HFC R32 is different from HFC R22 / R410A, some of the piping and installation and service tools are special.
3. This air conditioner uses power supply: 208/230V ~, 60Hz.
4. Be sure that servicing equipment and replacement components are applicable for R32 refrigerant.
5. Do not discharge R32 refrigerant into the air, and when recover it, the cylinder service pressure rating must be over 750 psig (5.17MPa). R32 refrigerant systems should be charged with liquid refrigerant and the service pressure rating of the hoses used must be over 750 psig (5.17MPa).
6. Leak detectors should be designed to detect HFC refrigerant.
7. R32 refrigerant is only compatible with POE oils, which could absorb moisture rapidly, so do not expose it to the air, in case that it damages certain plastics materials.
8. Replace all the filter driers after maintenance.

Please read these SAFETY PRECAUTIONS carefully to ensure correct installation.

- Be sure to use a dedicated power circuit, and do not put other loads on the power supply.
- Be sure to read these SAFETY PRECAUTIONS carefully before installation.
- Be sure to comply with SAFETY PRECAUTIONS of installation manual, because it contains important safety issues. Definitions for identifying hazard levels are provide below with their respective safety symbols.

 **DANGER** : The symbol refers to a hazard which can result in severe personal injury or death.

 **WARNING** : The symbol refers to a hazard or an unsafe practice which may result in severe personal injury or death.

 **CAUTION** : The symbol refers to a hazard or an unsafe practice which may result in personal injury, product or property damage.

NOTE : It refers to the remarks and instruction to the operation, maintenance, and service.

WARNING

- Installation should be performed by a qualified personnel.
Improper installation may cause water leakage, electrical shock or fire.
- Install the air conditioner on a solid base that can support the unit weight.
An inadequate base or incomplete installation may cause injury if the unit falls off the base.
- Use the specified type of wire for electrical connections safely.
And firmly clamp the interconnecting wires so their terminals receive no external stresses.
- For wiring, use a cable long enough to cover the entire distance with no connection.
And do not connect multiple devices to the same AC power supply.
Otherwise, it may be due to bad contact, poor insulation, exceed the allowable current and cause a fire or electric shock.
- After all installation is completed, check to make sure that no refrigerant is leaking out.
If the refrigerant gas leakage to the interior, and the heater, stove flame touching it, will generate harmful substances.
- Perform the installation securely referring to the installation manual.
Incomplete installation could cause a personal injury due to fire, electric shock, the unit falling or leakage of water.
- In accordance with the installation instructions for electrical work, please be sure to use a dedicated line.
- If the power supply circuit capacity or electrical work is not in place, may cause a fire or electric shock.
- Attach the electrical cover and the service panel to the unit securely.
- If the electrical covers or the service panel of the unit are not attached securely, it could result in a fire or an electric shock due to dust water, etc.
- Please be sure to cut off the main power supply before the installation of electronic PCB or wiring.
Otherwise, it will cause electric shock.

Safety precautions

- The device should be in accordance with the state provisions for installation wiring.
- The outdoor machine installation location should pay attention to the protection, avoid people or other small animals contact with electrical components, please keep the unit of the surrounding environment clean and tidy.
- When installing or relocating the unit, make sure that no substance other than the specified refrigerant (R32) enters the refrigerant circuit.
Any presence of foreign substance such as air can cause abnormal pressure rise or an explosion.



- Perform grounding
Does not connect the earth wire to a gas pipe, water pipe, lightning rod or telephone earth wire.
Defective grounding could cause an electric shock.
- Do not install the unit in a place where an inflammable gas leaks.
If gas leaks and accumulates in the area surrounding the unit, it could cause an explosion.
- Fasten a flare nut with a torque wrench as specified in this manual.
When fastened too tight, a flare nut may break after a long period and cause a leakage of refrigerant.
- Install an earth leakage breaker depending on the installation place (where it is humid).
If an earth leakage breaker is not installed, it could cause an electric shock.
- Perform the drainage/piping work securely according to the installation manual.
- If there is a defect in the drainage/piping work, water could drop from the unit and household goods could be wet and damaged.

Safety instructions

- Do not let air enter the refrigeration system or discharge refrigerant when moving the air conditioner.
- 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.
- 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.
- The appliance shall be installed in accordance with national wiring regulations.
- Servicing shall only be performed as recommended by the equipment manufacturer.
- Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- Means for disconnection, such as circuit breaker, which can provide full disconnection in all poles, must be incorporated in the fixed wiring in accordance with the wiring rules.
It is necessary to allow the disconnection of the appliance from the supply after installation.
Make sure the disconnection of the appliance from the supply when service and maintenance, a disconnection with a locking system in the isolated position shall be provided.
- The method of connection of the appliance to the electrical supply and interconnection of separate components, and the wiring diagram with a clear indication of the connections and wiring to external control devices and supply cord are detailed in below parts.
- Details of type and rating of circuit breakers / ELB is detailed in below parts.
- The information of dimensions of the space necessary for correct installation of the appliance including the minimum permissible distances to adjacent structures is detailed in below parts.
- This appliance is intended to be used by expert or trained users in shops, in light industry and on farms, or for commercial use by lay persons.
- Instructions on additional charging of refrigerants are detailed below.

Safety Precautions

Precautions for using R32 refrigerant

The basic installation work procedures are the same as the conventional refrigerant (R22 or R410A). However, pay attention to the following points:

WARNING

1. Transport of equipment containing flammable refrigerants.

Attention is drawn to the fact that additional transportation regulations may exist with respect to equipment containing flammable gas. The maximum number of pieces of equipment or the configuration of the equipment, permitted to be transported together will be determined by the applicable transport regulations.

2. Marking of equipment using signs

Signs for similar appliances (containing flammable refrigerants) used in a work area generally are addressed by local regulations and give the minimum requirements for the provision of safety and/or health signs for a work location. All required signs are to be maintained and employers should ensure that employees receive suitable and sufficient instruction and training on the meaning of appropriate safety signs and the actions that need to be taken in connection with these signs. The effectiveness of signs should not be diminished by too many signs being placed together. Any pictograms used should be as simple as possible and contain only essential details.

3. Disposal of equipment using flammable refrigerants

Compliance with national regulations

4. Storage of equipment/appliances

The storage of equipment should be in accordance with the manufacturer's instructions.

5. Storage of packed (unsold) equipment

- Storage package protection should be constructed such that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant charge.
- The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.

6. Information on servicing

6-1 Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimized. For repair to the refrigerating system, the following precautions should be complied with prior to conducting work on the system.

6-2 Work procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of flammable gas or vapour being present while the work is being performed.

6-3 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.
- The area around the workspace shall be sectioned off. Ensure that the conditions within the area have been made safe by control of flammable material.

6-4 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 flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for use with flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

6-5 Presence of fire extinguisher

- If any hot work is to be conducted on the refrigeration 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.

6-6 No ignition sources

- No person carrying out work in relation to a refrigeration system which involves exposing any pipe work that contains or has contained flammable refrigerant 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 flammable 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.

6-7 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.

6-8 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.

Safety Precautions

WARNING

- The following checks shall be applied to installations using flammable refrigerants:
 - The charge size 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;
 - Refrigeration 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.

6-9 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 there no live electrical components and wiring are exposed while charging, recovering or purging the system;
 - That there is continuity of earth bonding.

7. Repairs of sealed components

Sealed electrical components shall be replaced.

8. Repairs of intrinsically safe components

Intrinsically safe components must be replaced.

9. 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.

10. Detection of flammable refrigerants

- Under no circumstances shall potential sources of ignition be used in the searching or detection of refrigerant leaks.
- A halide torch (or any other detector using a naked flame) shall not be used.

11. Leak detection methods

The following leak detection methods are deemed acceptable for systems containing flammable refrigerants:

- Electronic leak detectors shall be used to detect flammable refrigerants, but 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 (maximum 25%) is confirmed.
- Leak detection fluids are 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.
- 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 of refrigerant shall be according to the manual.

WARNING

12. Removal and evacuation

- 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);
 - Continuously flush or purge with inert gas when using flame to open circuit;
 - Open the circuit.
- The refrigerant charge shall be recovered into the correct recovery cylinders.
- The system shall be “flushed” with OFN to render the unit safe.
- This process may need to be repeated for several times.
- Compressed air or oxygen shall not be used for this task.
- Flushing shall be achieved by breaking the vacuum in the system with OFN 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. When the final OFN charge is used, the system shall be vented down to atmospheric pressure to enable working.
- This operation is absolutely vital if brazing operations on the pipe-work are to take place.
- Ensure that the outlet for the vacuum pump is not close to any ignition sources and there is ventilation available.

13. Charging procedures

- 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 upright.
 - Ensure that the refrigeration 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 refrigeration system.
 - Prior to recharging the system pressure shall be tested with OFN.
- 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.

14. 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 that all refrigerants are recovered safely.

Prior to the task, an oil and refrigerant sample shall be taken in case that an analysis is required prior to the re-use of recovered refrigerant. It is essential that electrical power is available before the task.

- a) Become familiar with the equipment and its operation.
- b) Isolate system electrically.
- 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.
- g) Start the recovery machine and operate in accordance with manufacturer's 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 refrigeration system unless it has been cleaned and checked.

WARNING

15. Labelling

Equipment shall be labelled stating that it has been de-commissioned and empty 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 REFRIGERANTS.

16. Recovery

- When removing refrigerant from a system, either for servicing or decommissioning, it is recommended that all refrigerant is 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.
- 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 flammable refrigerants.
- 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.
- Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release.
- Consult manufacturer if in doubt.
- The recovered refrigerant shall be returned to the refrigerant supplier 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 evacuation process shall be carried out prior to returning the compressor to the suppliers.
- Only electric heating to the compressor body shall be employed to accelerate this process.
- When oil is drained from a system, it shall be carried out safely.

17. Competence of service personnel

Information and training

The training should include the substance of the following:

Information about the explosion potential of flammable refrigerants to show that flammables may be dangerous when handled without care.

Information about potential ignition sources, especially those that are not obvious, such as lighters, light switches, vacuum cleaners, electric heaters.

Information about the concept of sealed components and sealed enclosures according to UL 60335.

Information about the correct working procedures:

a) Commissioning

- Ensure that the floor area is sufficient for the refrigerant charge or that the ventilation duct is assembled in a correct manner.
- Connect the pipes and carry out a leak test before charging with refrigerant.
- Check safety equipment before putting into service.

b) Maintenance

- Portable equipment shall be repaired outside or in a workshop specially equipped for servicing units with flammable refrigerants.
- Ensure sufficient ventilation at the repair place.
- Be aware that malfunction of the equipment may be caused by refrigerant loss and a refrigerant leak is possible.
- Discharge capacitors in a way that won't cause any spark. The standard procedure to short circuit the capacitor terminals usually creates sparks.
- Reassemble sealed enclosures accurately. If seals are worn, replace them.
- Check safety equipment before putting into service.

c) Repair

- Portable equipment shall be repaired outside or in a workshop specially equipped for servicing units with flammable refrigerants.

Safety Precautions

WARNING

- Ensure sufficient ventilation at the repair place.
- Be aware that of the equipment may be caused by refrigerant loss and a refrigerant leak is possible.
- Discharge capacitors in a way that won't cause any spark.
- When brazing is required the following procedures shall be carried out in the right order.
 - Remove the refrigerant. If the refrigerant is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.
 - Evacuate the refrigerant circuit.
 - Purge the refrigerant circuit with nitrogen for 5 min.
 - Evacuate again (not required for A2L refrigerants)
 - Remove parts to be replaced by cutting, not by flame.
 - Purge the braze point with nitrogen during the brazing procedure.
 - Carry out a leak test before charging with refrigerant.
- Reassemble sealed enclosures accurately. If seals are worn, replace them.
- Check safety equipment before putting into service.
- d) Decommissioning
 - If the safety is affected when the equipment is put out of service, the refrigerant charge shall be removed before decommissioning.
 - Ensure sufficient ventilation at the equipment location.
 - Be aware that malfunction of the equipment may be caused by refrigerant loss and a leak is possible.
 - Discharge capacitors in a way that won't cause any spark.
 - Remove the refrigerant. If the recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.
- e) Disposal
 - Ensure sufficient ventilation at the working place.
 - Remove the refrigerant. If the recovery is not required by national regulations, drain the refrigerant to the outside. Take care that the drained refrigerant will not cause any danger. In doubt, one person should guard the outlet. Take special care that drained refrigerant will not float back into the building.
 - Evacuate the refrigerant circuit
 - Purge the refrigerant circuit with nitrogen for 5 min.
 - Evacuate again.
 - Cut out the compressor and drain the oil.
- The pipe-work shall be complied with national gas regulations.
- Appliance shall be installed, operated and stored in a room with a floor area larger than Y (Y see below).
- The installation of pipe-work shall be kept to a room with a floor area larger than Y (Y see below).
- When moving or relocating the air conditioner, consult experienced service technicians for disconnection and reinstallation of the unit.
- Do not place any other electrical products or household belongings under indoor unit or outdoor unit. Condensation dripping from the unit might get them wet, and may cause damage or malfunction of your property.
- 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.
- Be aware that refrigerants may not contain an odour.
- To keep ventilation openings clear of obstruction.
- The appliance shall be stored in a well-ventilated area where the room size meets requirements as specified for operation.
- The appliance shall be stored in a room without continuously operating open flames (for example an operating gas appliance) and ignition sources (for example an operating electric heater).
- Any person involved with a refrigerant circuit should hold a valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with required specification.
- Service shall only be performed as recommended by the equipment manufacturer.
- Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.
- The appliance shall be installed and stored so as to prevent mechanical damage.
- 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 re-fabricated.

Safety Precautions

WARNING

- The installation of pipe-work shall be kept to a minimum.
- Mechanical connections shall be accessible for maintenance purposes.
- That pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be in compliance with national and local codes and standards, such as ASHRAE 15, ASHRAE 15.2, IAPMO Uniform Mechanical Code, ICC International Mechanical Code, or CSA B52. All field joints shall be accessible for inspection prior to being covered or enclosed;
- That after completion of field piping for split systems, the field pipework 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: 240 psig (1.65MPa)
The minimum test pressure for the high side: 600 psig (4.14MPa)
- 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. The joints must be welded or brazed.
- The appliances are equipped a REFRIGERANT DETECTION SYSTEM.
The indoor unit must be powered except for service.
And the selected controller shall be connected to this symbol wire and can display the caution information if the REFRIGERANT leakage is detected.
When REFRIGERANT leakage is detected, the fan shall work. And the compressor shall stop.
You must contact qualified personnel to repair.
- REFRIGERANT DETECTION SYSTEM include a means for self-testing to determine if a REFRIGERANT SENSOR or SENSING ELEMENT malfunction has occurred. If occurs, the fan shall work, and the compressor shall stop. The controller displays the caution information.
You must contact qualified personnel to repair.
REFRIGERANT DETECTION SYSTEM shall only be replaced by the appliance manufacture

Note:






- The indoor unit shall be installed in the room whose area Y bigger than the below requirements;
Or installed in a room, naturally ventilated to outdoors;
Or installed 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.
- If the duct system meet the below requirement, the minimum room area of conditioned space (equal to Y) can be calculated by all the rooms.
 - 1) The appliances shall be connected via an air duct system to one or more rooms, the supply and return air shall be directly ducted to the space.
 - 2) If no refrigerant detection system is provided, then, spaces where the airflow may be limited by zoning dampers shall not be included in the determination of Y. Y shall not less than below requirement.
- If the duct system doesn't meet the below requirement, any one room shall meet below minimum room area. And any duct outlet(the supply and return air) shall be 7.2ft.(2.2m) high.

Required minimum room area Y [ft.²(m²)]

Refrigerant charge X[oz.(g)]	Inverter Packaged Heat Pump unit					
	Return air outlet height [ft.(m)]	Y[ft. ² (m ²)]	Return air outlet height [ft.(m)]	Y[ft. ² (m ²)]	Return air outlet height [ft.(m)]	Y[ft. ² (m ²)]
77.6(2200)	7.2(2.2)	73(6.8)	5.9(1.8)	89(8.3)	2(0.6)	485(45.1)

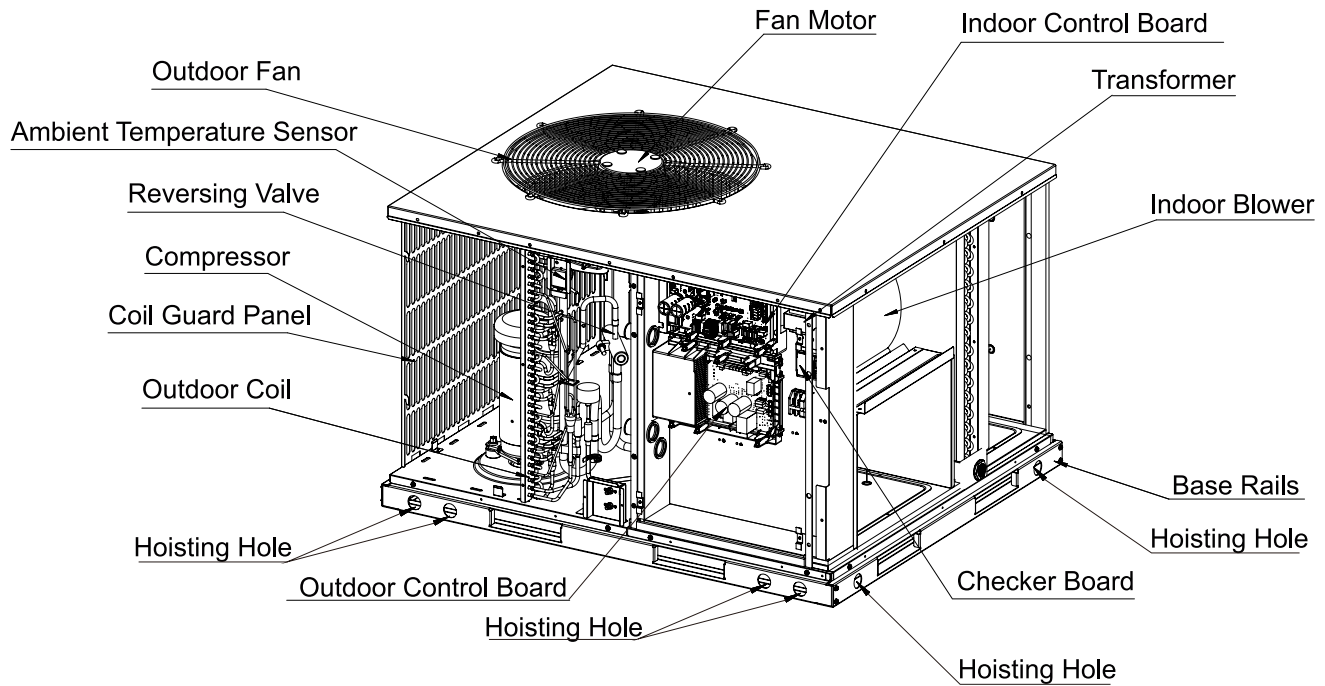
Safety Precautions

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

  <div>Refrigerant safety group A2L</div>	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.
	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.

Component Location

Component Location

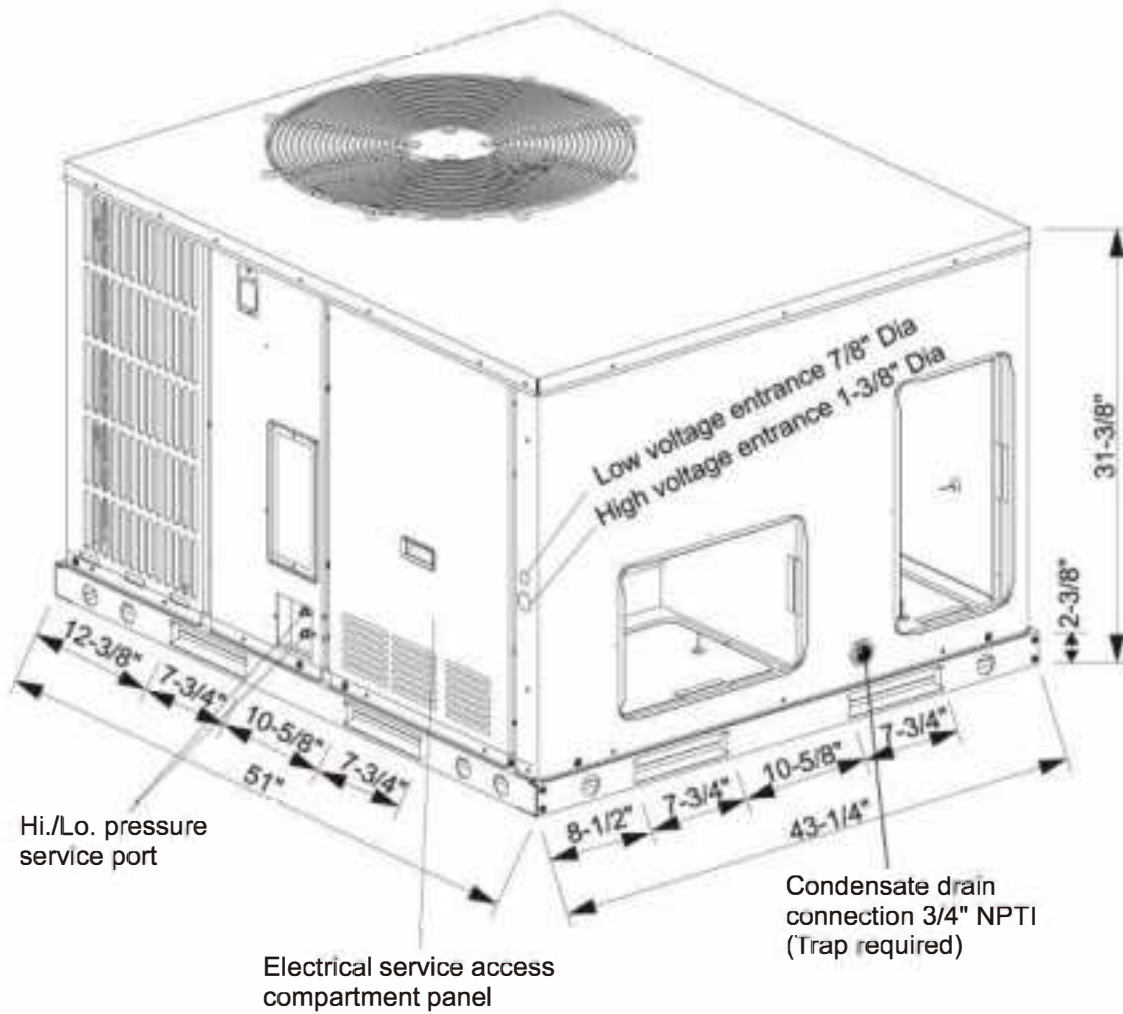


NOTE: The figures are based on the external views of the standard model.
Consequently, the shape may differ for the air conditioner model you have selected.

Dimensions

Dimensions- Unit dimensions

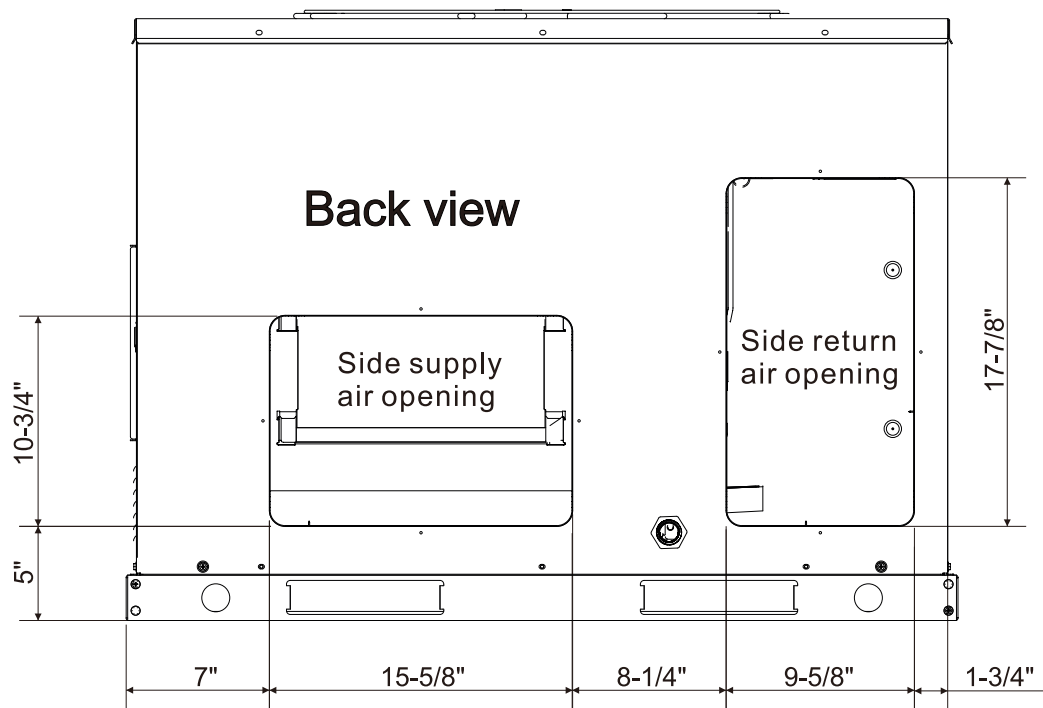
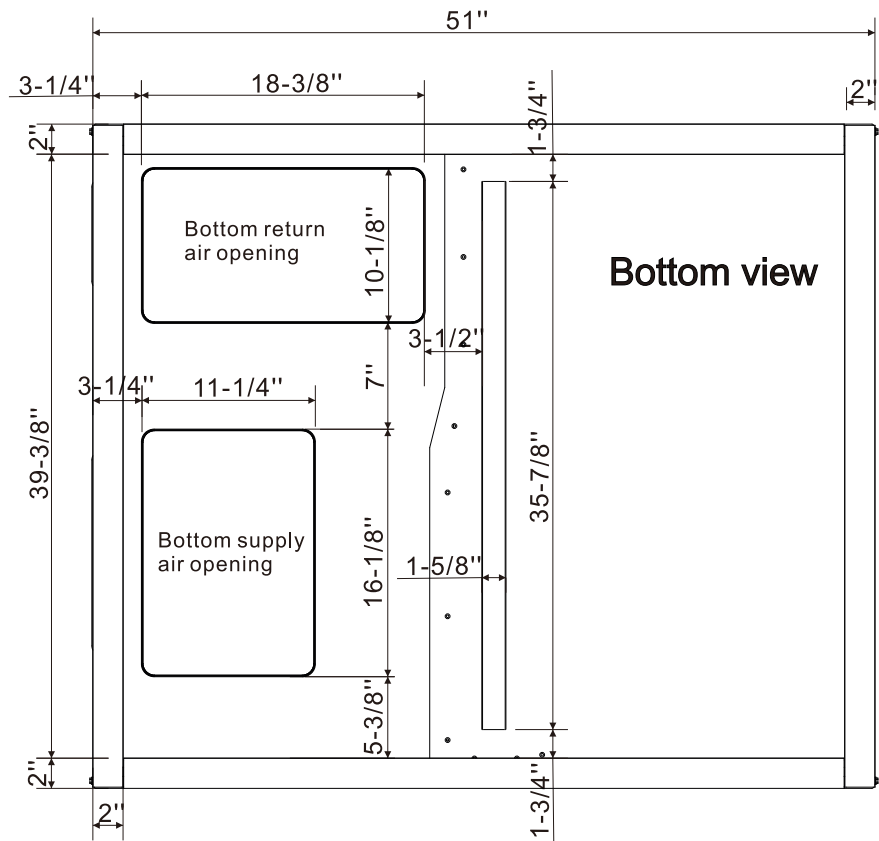
Unit: in.



Dimensions

Dimensions- Back and Bottom

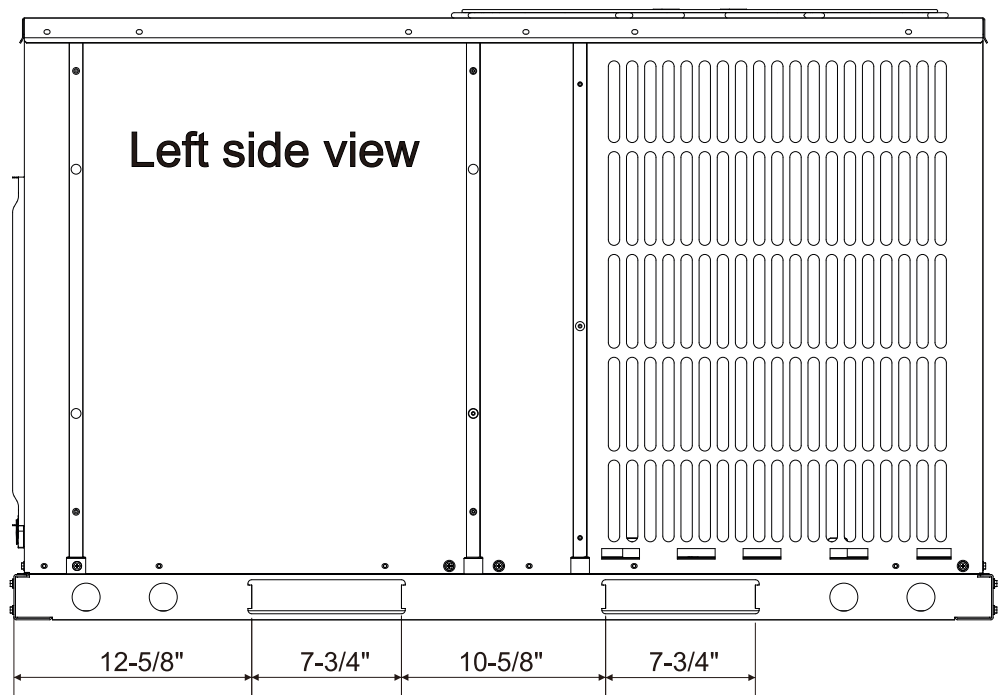
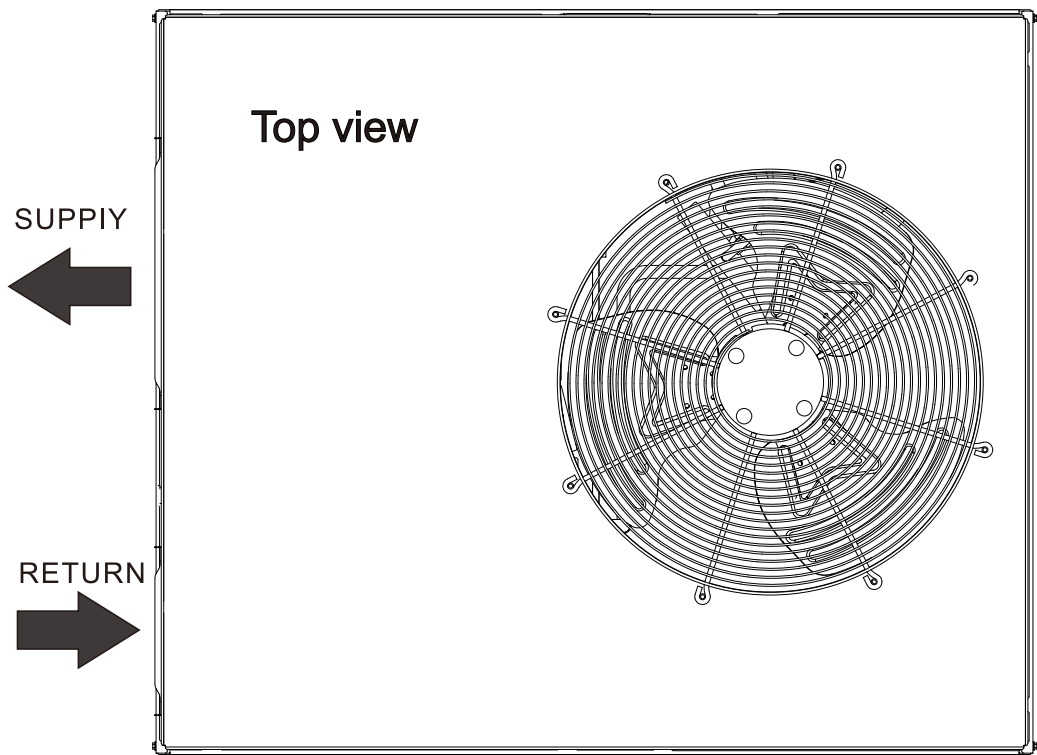
Unit: in.



Dimensions

Dimensions- Left and Top

Unit: in.



Installation instructions

Safety Notice

WARNING

- Read and follow the local safety regulations, including but not limited to ANSI/NFPA No. 70.
- Installation should be performed by a qualified personnel. (Improper installation may cause water leakage, electrical shock or fire.)
- Install the unit according to the instructions given in this manual. (Incomplete installation may cause water leakage, electrical shock or fire).
- Be sure to use the supplied or specified installation parts. (Use of other parts may cause the unit to get loosened, water leakage, electrical shock or fire).
- For installation of the rooftop unit, ensure that the supports are strong enough to bear the weight of the unit.
- Prevent the air inlet and outlet of the condenser from being blocked in the installation area of the rooftop unit.
- Perform the sealing and insulation at the connection between the rooftop unit's outlet and the user's air duct.
- Electrical work should be carried out in accordance with the installation manual and the local national electrical wiring rules or code of practice. (Insufficient capacity or incomplete electrical work may cause electrical shock or fire).
- Be sure to use a dedicated power circuit. (Never use a power supply shared by another appliance).
- For wiring, use a cable long enough to cover the entire distance. Do not use an extension cord.
- Do not put other loads on the power supply, use a dedicated power circuit.
- Use the specified types of wires for electrical connections. (Firmly clamp the connecting wires so its terminals receive no external stresses).
- Incomplete connections or clamping may cause terminal overheating or fire.
- After connecting all the wires be sure to fix the cables so that they do not put undue force on the electrical covers or panels. (Install covers over the wires, incomplete cover installation may cause terminal overheating, electrical shock or fire).
- When installing or relocating the system, be sure to keep the refrigerant circuit free from air (Air in the refrigerant circuit may cause an abnormal pressure rise or rupture, resulting in injury).
- After all installation is completed, check to make sure that no refrigerant is leaking out. (The refrigerant produces a toxic gas if exposed to flames).
- When carrying out piping connection, take care not to let air substances other than the specified refrigerant get into refrigeration cycle. (Otherwise, it will cause lower performance, abnormal high pressure in the refrigeration cycle, explosion and injury).
- Make sure that the installation is properly grounded. Do not ground the unit to a utility pipe, lightning 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.

Installation instructions

Transportation and handling before installation

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

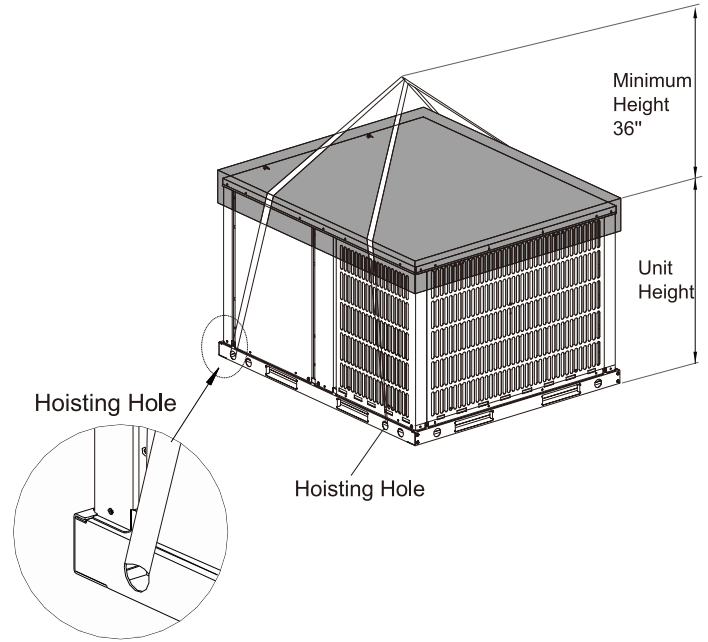
Before hoisting, carefully check the hoisting equipment.

During handling, ensure the balance and safety of the unit.

Do not remove the packaging of the unit before it reaches the installation site.

• Handling Method

- (1) Put the sling through the hoisting hole at the bottom of the roof, as shown in the figure.
- (2) Ensure the clearance between the top of the sling connection point and that of the unit above 36 in.
- (3) When hoisting, keep the weight of the unit evenly distributed on the sling for stable hoisting.



Installation locations selection

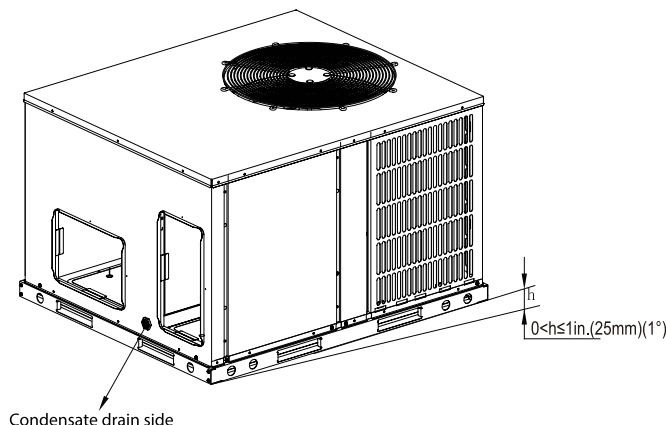
Before choosing the installation site, obtain user's approval.

- Where airflow is good and clean.
- Where it is without a strong breeze.
- Keep the distance from the air inlet and outlet of the condenser to the user's window above 25 in to reduce the impact of outdoor fan noise on users.
- Where rigid wall or support is available to prevent the increase of operation sound or vibration.
- Where there is no risk of combustible gas leakage.
- Where it is at least 3m away from the antenna of TV set or radio. An amplifier may be required for the affected device.
- Do not install the unit in a place with running water or falling ice from high places or roofs.
- Ensure the place with enough space for good ventilation, electronic control wiring, and subsequent maintenance of the unit.

⚠ CAUTION:

In areas subject to heavy snow accumulation or constant temperature below freezing temperature, take special considerations as follows:

- (1) Install the unit at a location 3–12 in. (76–304 mm) above the ground or roof and a location available for the defrost water discharged from the holes at the bottom of the outdoor condenser.
- (2) Mount the unit at an inclined angle to keep the evaporator drain at a low point, as shown in the figure [diagram of drain inclined 1 in. (25 mm)].
- (3) Do not install the unit in areas prone to snow accumulation. If unavoidable, install an anti-snow barrier around the unit to prevent snow accumulation at the air inlet of the condenser.



Installation instructions

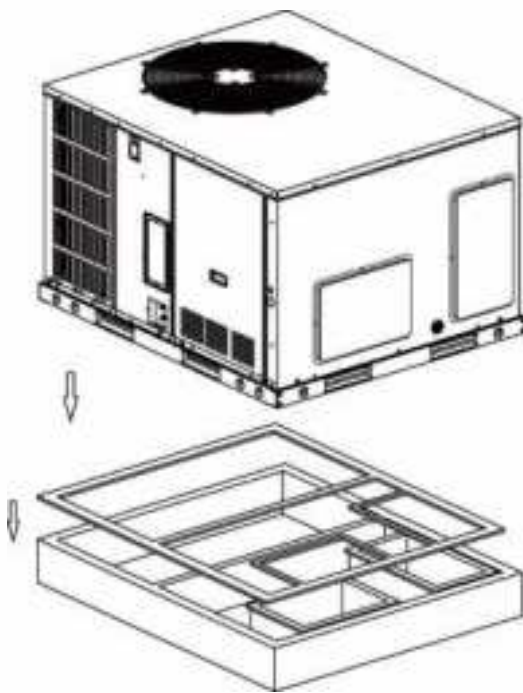
Rooftop Installation- Curb Mounting

The unit is installed at the mode of side return and outlet by default. If the mode of lower return and outlet is required, the roof curbs must be used. (The roof curbs are not attached, they must be field supplied.)

When converting, place the unit above the roof curb, and closely fit the lower air outlet of the unit to the air inlet and outlet of the curb (as shown in the figure) for converting to the mode of lower return and outlet.

Additionally, please note the following matters:

1. Put the unit on the ground, disassemble the air return and outlet sealing plate at the bottom of the unit, and install it on the side air outlet.
2. Paste the thermal insulation foam around the conversion part, and install the unit on the curb, with the contact position kept sealed.



Air duct

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

⚠ WARNING

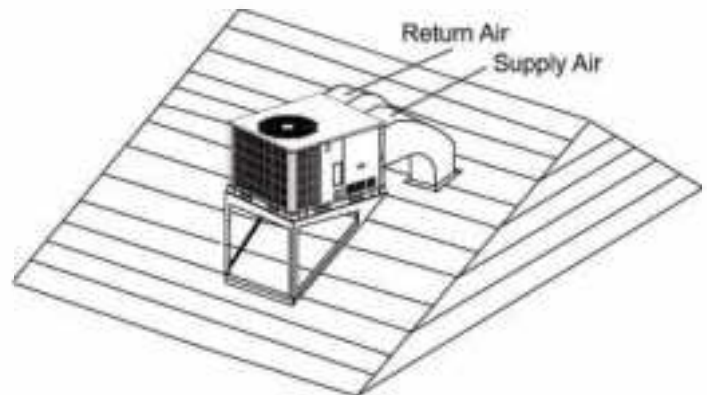
Do not, under any circumstances, connect return duct work to any other heat producing device such as fireplace insert, stove, etc. Unauthorized use of such devices may result in fire, carbon monoxide poisoning, explosion, personal injury or property damage.

Sheet metal duct work run in unconditioned spaces must be insulated and covered with a vapor barrier. 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.

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.

• Sideflow installation.

For the sideflow designed with a flange, fix the air duct system and its fasteners on the flange, and seal the connection between the air duct and the unit with thermal insulation foam as required to prevent air leakage, as shown in the figure.

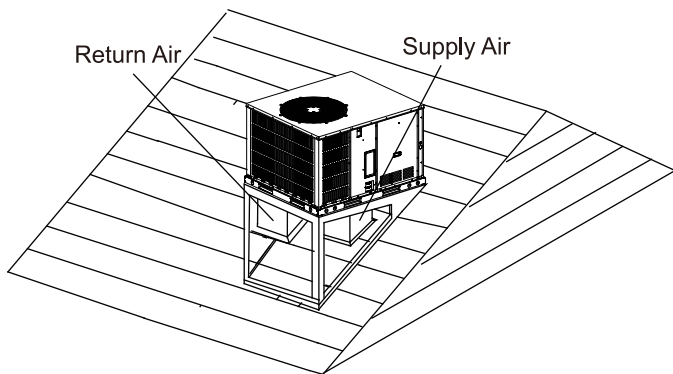
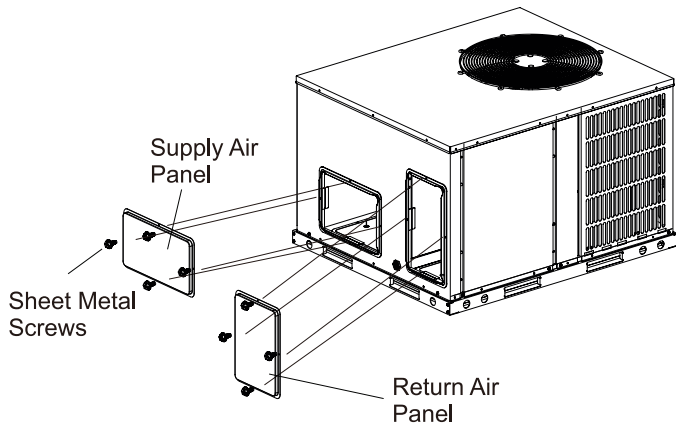


Installation instructions

- Downflow installation.

For the side air outlet installation, remove the return air panel and the supply air panel on the side.

For the lower air outlet installation, first remove the return air panel and the supply air panel on the side, then remove the return air panel and the supply air panel at the bottom, and finally re-install the return air panel and the supply air panel on the side.



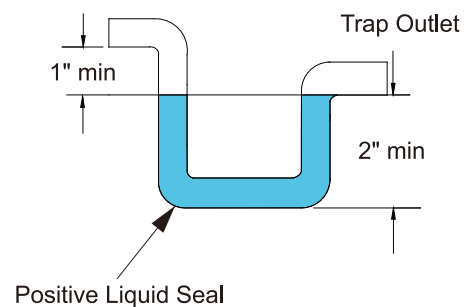
NOTE:

1. Before installing the rooftop unit on the roof, ensure that the roof and support are strong enough to bear the weight of the unit (see nameplate for unit weight). This is a critical point and must be carefully verified by the after-sales installer.
2. Ensure the sealing and reliability of the roof support and the air outlets of the rooftop unit, while also ensuring that condensate from the unit can be properly drained.

Condensate Drain Connection

The evaporator drain is 3/4 female thread, which is connected to the 3/4 male thread drain pipe. Where permitted, discharge the condensate directly to the outside of the roof or the sand gravel pavement. Keep the unit drain at least 1 in above the pipeline drain and the pipeline drain at least 2 in above the ground. Tilt the drain pipe towards the pipeline drain to ensure smooth drainage.

Perform the sealing and insulation on the surface of the drain pipe as necessary to prevent condensation on the pipe surface or aging damage to the pipe.



Air Filter (Not Factory-Installed)

The unit is not equipped with an air filter when it leaves the factory, and it is provided on-site. During the air duct system design, the size, type, and pressure drop of the air filter shall be fully considered. The air volume varies with different types and installations of air filters, which has an impact on the performance of cooling and heating.

The flow rate of installing an external filter or other filter must be appropriate. The recommended flow rate is 300 feet/min to 390 feet/min.

It is very important to avoid air volume reduction while installing a HEPA filter or electronic air filtration system, so we recommend you contact a professional installer for proper installation.

After installation, the air filter shall be checked regularly and kept clean. However, an air filter full of dirt will increase the air resistance and reduce the air volume, lower the operating efficiency, and increase the operating cost and wear of the unit.

Installation instructions

System Charge Adjustment

Factory refrigerant precharge

Model(Capacity)	Factory refrigerant precharge [oz.(kg)]
24K/36K	77.6(2.2)

Note:

- 1.If refrigerant needs to be charged, it is recommended to use the Weigh-In Method.
- 2.The maximum refrigerant charge amount is as shown in the table above.

Installation instructions

Electrical Wiring



WARNING

- Turn OFF the main power switch to the indoor unit and the outdoor unit and wait for more than 3 minutes before electrical wiring work or a periodical check is performed.
- Check to ensure that the indoor fan and the outdoor fan have stopped before electrical wiring work or a periodical check is performed.
- Protect the wires, electrical parts, etc. from rats or other small animals. If not protected, rats may gnaw at unprotected parts and at the worst, a fire will occur.
- Avoid the wirings from touching the refrigerant pipes, plate edges and electrical parts inside the unit. If not do, the wires will be damaged and at the worst, a fire will occur.
- Install an ELB (Electric Leakage Break) in the power source. If ELB is not used, it will cause electric shock or fire at the worst.
- This unit uses an inverter, which means that it must be used an earth leak detector capable handling harmonics in order to prevent malfunctioning of the earth leak detector itself.
- Do not use intermediate connection wires, stranded wires (see **<Attentions when Connect the power supply wiring>**), extension cables or control line connection, because the use of these wires may cause fever, electric shock or fire.
- The tightening torque of each screw shall be as follows.
 - M4: 0.7 to 1.0 lbf·ft. (1.0 to 1.3 N·m)
 - M5: 1.5 to 1.8 lbf·ft. (2.0 to 2.5 N·m)
 - M6: 3.0 to 3.7 lbf·ft. (4.0 to 5.0 N·m)
 - M8: 6.6 to 8.1 lbf·ft. (9.0 to 11.0 N·m)
 - M10: 13.3 to 217 lbf·ft. (18.0 to 23.0 N·m)Keep the above tightening torque when wiring work.



CAUTION

- With tape material along the wire wrapped, sealed wiring holes, prevent the condensed water and insects.
- Tightly secure the power source wiring using the cord clamp inside the unit.
Note: Fix the rubber bushes with adhesive when conduit tubes to the outdoor unit are not used.

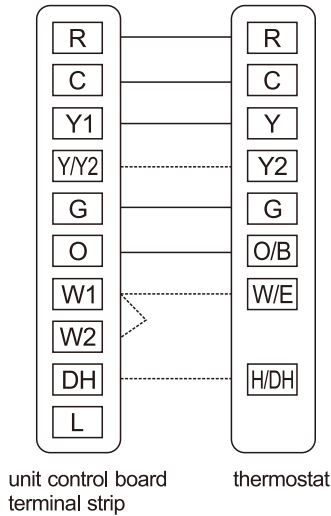
General check

- (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 +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 be not able to operate cause of voltage drop abnormally at starting.
- (4) Check to ensure that the earth wire is connected.
- (5) Install a main switch, multi-pole main switch with a space of 0.14 in. (3.5mm) or more, single phase main switch with a space of 0.12 in. (3.0mm) or more between each phase.
- (6) Check to ensure that the electrical resistance is more than 2 MΩ, 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.

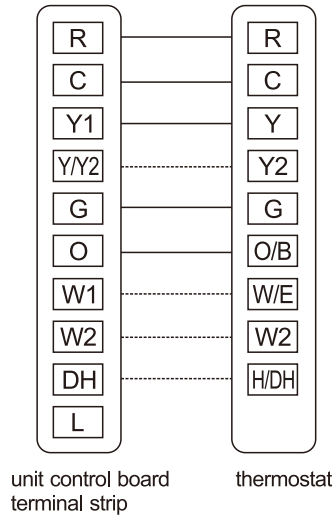
Installation instructions

Electrical wiring diagram

Support 3H and 2C thermostat



Support 4H and 2C thermostat



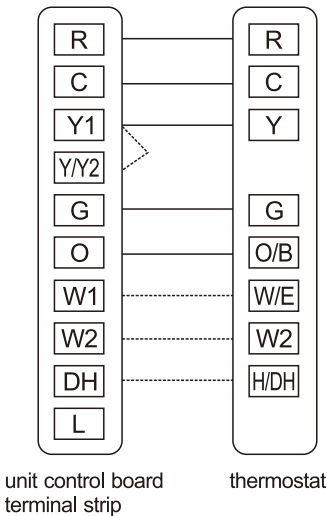
Indoor unit main control board 24V interface definition:

Terminal	Definition
R	AC 24V power supply
C	AC 24V common
L	Fault terminal
G	Fan signal
W1/W2	Electric auxiliary heat signal
DH	Dehumidification
O	4-Way valve
Y1	Cool1/ Heat 1
Y/Y2	Cool 2/ Heat 2

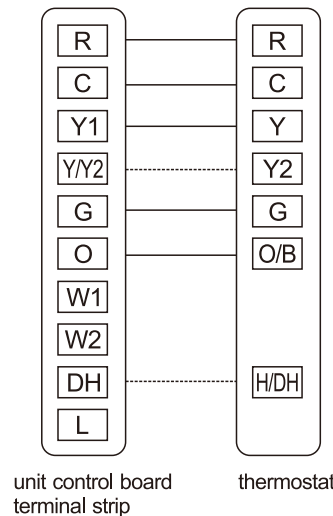
Note:

1. The "L" port displays fault information. If the thermostat has a port with function corresponding to "L", it needs to be connected to the "L" port of the unit.
2. When the machine does not have auxiliary electric heating, the machine only supports 2H2C and 1H1C working modes.

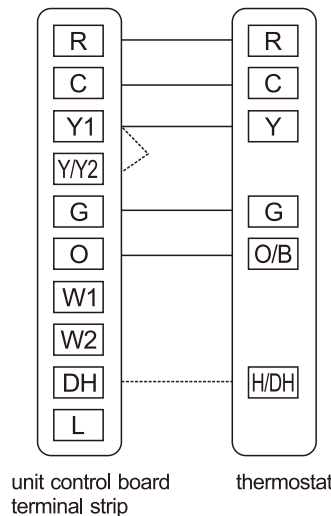
Support 3H and 1C thermostat



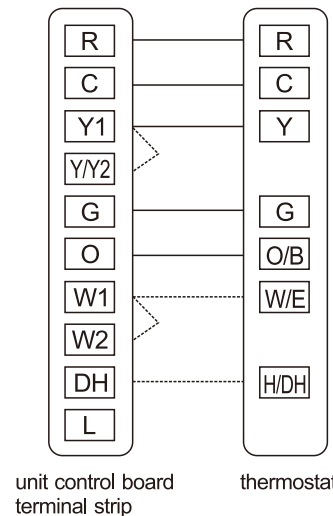
Support 2H and 2C thermostat



Support 1H and 1C thermostat



Support 2H and 1C thermostat



Installation instructions

Electrical Data

Model (Capacity)	Power Supply	ELB		Power Source Cable Size	Circuit Breaker (A)
		Rated Current (A)	Nominal Sensitive Current (mA)		
24K/36K	208/230V ~/60Hz	40	5	3×10AWG	40

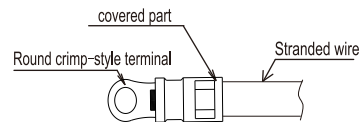
Max. Running Current (A): REFER TO NAMEPLATE

Note:

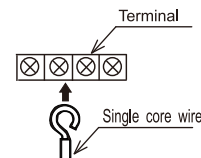
- (1) Follow local codes and regulations when select field wires ,and all the above are the minimum wire size.
- (2) 18AWG. color-coded low voltage wire should be used for lengths less than 100ft.(30m). For wire lengths than 100ft.(30m), 16AWG. wire should be used. When transmitting cable length is longer than 262ft. (80m), a larger wire size should be selected.
- (3) Install main switch and ELB for each system separately. Select the high response type ELB that is acted within 0.1second. Recommended capacity to see outdoor machine switch capacity.

<Attentions when Connect the power supply wiring>

1. When connecting the terminal block using stranded wire, make sure to use the round crimp-style terminal for connection to the power supply terminal block. Place the round crimp-style terminals on the wires up to the covered part and secure in place.


















2. When connecting the terminal block using a single core wire, be sure to perform curing.



Installation instructions

DIP Switch Setting

SW5 DIP Switch Setting		SW4 DIP Switch Setting		SW3 DIP Switch Setting					
Factory Setting: Q3 Wind Gear		Factory Setting		36K					
Q1 Wind Gear		Refrigerant Leak Recovery		24K					
Q2 Wind Gear		<div>DIP Switch Setting of Indoor Main Board</div> <div>1. Mark of "■" indicates the position of DIP switches.</div> <div>2. SW3: capacity select DIP switch .</div> <div>3. SW4-4 : When refrigerant leakage occurs on the machine, you need to flip the dip switch. When the DIP switch status changes, the machine will be unlocked .</div> <div>4. SW5-1、SW5-2、SW5-3 : Wind shift dip switches.</div> <div>5. SW5-4: Constant air volume control DIP switch .</div>							
Q4 Wind Gear									
Q5 Wind Gear									
Air Volume Settingre	<table><tr><td>Automatic</td><td>Manual</td></tr><tr><td></td><td></td></tr></table>					Automatic	Manual		
Automatic	Manual								
									

The indoor unit has 5 wind levels, and the DIP switch settings for each wind level are shown in Table 1.

Note:

- SW5-4: Constant air volume ON/OFF control.

DIP switch ON: The indoor unit runs in manual constant air volume control mode (regulated by professionals according to the static pressure setting instructions in the wire controller document).

DIP switch OFF: The indoor unit runs in automatic constant air volume control mode. After selecting the wind level according to Table 1, the indoor unit automatically matches the static pressure of air ducts, and please refer to the technical service manual for airflow performance.

Table 1 Dip switch setting

	SW5-1	SW5-2	SW5-3
Q1	OFF	OFF	ON
Q2	OFF	ON	OFF
Q3	OFF	OFF	OFF
Q4	OFF	ON	ON
Q5	ON	OFF	OFF

Installation instructions

Test run

Test run should be performed after refrigerant piping, drain, wiring, etc. have been finished.



The heat pump air conditioner is provided with a crankcase heater, check to ensure that the switch on the main power source has been ON for more than 6 hours ahead of power on preheating, otherwise it might damage the compressor!

Do not operate the system until all the check points have been cleared.

(A) Check to ensure that the stop valves of the outdoor unit are fully opened.

(B) Check to ensure that the electric wires have been fully connected.

(C) Check to ensure that the electrical resistance is more than 2MΩ, 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.

Test run function identification

Operate the thermostat to turn ON the appliance, and then proceed test run.

Pay attention to the following items while the system is running.

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) .

- Turn off the power after test run is finished.

Installation of the appliance is generally finished after the above operations are done. If you still have any trouble, please contact local technical service center of our company for further information.

Electric Heat Kit Selection Table

Electric Heat Kit Model	Air Handler Model	Electric Heat (kW)	MIN. Circuit Ampacity		MAX. Fuse or Breaker (HACR) Ampacity		Fan Speed Tap
			230VAC	208VAC	230VAC	208VAC	High
21-4405-04 A2L	24K/36K	5	25	22.6	30	30	●
21-4405-03 A2L		7.5	37.4	33.9	40	40	●
21-4405-01 A2L		10	49.9	45.2	60	50	●
21-4405-02 A2L		15	37.4+37.4	33.9+33.9	40+40	40+40	●

● : available
× : unavailable

NOTE:

Heat kit is an optional part, and it must be connected to the power supply separately.

It is recommended that electric heater kit should be installed in low temperature area or when long piping is used.

Check if heat kit suitable for Inverter Packaged Heat Pump unit 2-way position installation.

Ampacities for MCA and Fuse/breaker not including the heat pump.

Heat pump systems require a specified airflow. Each ton of cooling requires between 350 and 450 cubic feet of air per minute(CFM).