USE AND INSTALLATION INSTRUCTIONS

Thank you very much for purchasing this Heat Pump Air Conditioner
Please read this use and installation instructions carefully before installing and using this appliance and keep
this manual for future reference.

⚠ WARNING

This product can expose you to chemicals which are known to the State of California to cause cancer, birth defects, or other reproductive harm.
For more information go to www.P65Warnings.ca.gov.

Contents

Safety Precautions.....1
Identification of Parts 10

Operation Manual

Special Remarks 11
Filter Cleaning.....12
Trouble Shooting.....13

Installation and Maintenance

1. Safety Notice.....13
2. Tools and Instruments for Installation 14
3. Installation of the Indoor Unit 14
4. Refrigerant Pipe.....19
5. Drain Piping 21
6. Electrical Wiring 23
7. Electrical Installation 24
8. Trial Run.....24

IMPORTANT NOTICE

- We pursue a policy of continuous improvement in design and performance of products. Company reserves the right to vary specifications without prior notice.
- We cannot anticipate every possible circumstance that might involve a potential hazard.
- This air conditioner is designed for standard air conditioning only (comfort cooling). Do not use this air conditioner for other purposes such as drying clothes, refrigerating foods or for any other process cooling or heating.
- The installer and system specialist shall secure safety against leakage according to local regulations or standards.
- No part of this manual may be reproduced without written permission.
- Signal words (DANGER, WARNING and CAUTION) are used to identify levels of hazard seriousness. Definitions for identifying hazard levels are provided below with their respective signal words.

⚠ DANGER	:	Immediate hazards which WILL result in severe personal injury or death.
⚠ WARNING	:	Hazards or unsafe practices which COULD result in severe personal injury or death.
⚠ CAUTION	:	Hazards or unsafe practices which COULD result in minor personal injury or product or property damage.
NOTE	:	Useful information for operation and/or maintenance.

- It is assumed that this air conditioner will be operated and serviced by English speaking personnel. If this is not the case, the customer should add safety, caution and operating signs in the native language.
- If you have any questions, contact your dealer.
- This manual gives the common description and information of the air conditioner you operate and of other models.
- Storage condition: Temperature -13~140°F (-25~60°C)
  Humidity 30%~80%
- Heating and electric heater function are not available for cooling only models.
- This manual should be considered as a permanent part of the air conditioner equipment and should be kept with it.

CHECKING PRODUCT RECEIVED

- Upon receiving this product, inspect it for any shipping damage. Claims for damage, either apparent or concealed, should be filed with the shipping company immediately.
- Check the model number, electrical characteristics (power supply, voltage and frequency) and accessories to determine if they are correct.
  The standard utilization of the unit shall be explained in this manual.
  Therefore, the utilization of the unit other than those specified in this manual is not recommended.
  Please contact your dealer, as the occasion arises.
- We recommend that this air-conditioner is installed properly by qualified personnel in accordance with the installation instructions provided with the unit.
- Before installation, check if the voltage of the power supply at installation site is the same as the voltage shown on the nameplate.

⚠ DANGER

- Do not perform any alterations to this product, otherwise, it may possibly cause water leakage, breakdown, short-circuit, electric shock, fire, and so on.
- Piping and welding work should be carried out far away from the flammable explosive material vessels, including the air-conditioner refrigerant, to guarantee the security of the site.
- To protect the air-conditioner from heavy corrosion, avoid installing the outdoor unit where salt water can splash directly onto it or in sulphurous air near a spa. Do not install the air-conditioner where excessively high heat-generating objects are placed.

⚠ WARNING

- The place where this product is installed must have reliable electrical earth facility and protections. Please do not connect the grounding of this product to various kinds of air-feeding ducts, drain piping, lightning protection facility as well as other piping lines to avoid an electric shock and damages caused by other factors.
- Wiring must be done by a qualified electrician. All the wiring must comply with the local and national electrical codes.
- Consider the capacity of the electric current of your electrical meter and socket before and national installation.
- This product must be installed on a single dedicated electrical circuit. Circuit breaker protection must be installed in accordance with this manual. In moist and humid locations, an ELB type circuit breaker must be used.
- 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.
- Means for disconnection to provide complete disconnection in all poles, must be incorporated in the fixed wiring in accordance with the wiring regulations.
- When abnormalities like burnt smell, deformation, fire, smoke, and so on is observed, stop using the air conditioner, cut off the main power supply immediately and contact the dealer.
- 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 are detailed in below parts.
- The cord of the H07RN-F type or the electrically equivalent type must be used for power connection and interconnection between outdoor unit and indoor unit. The size of the cord is detailed in outdoor instruction manual.
- Details of type and rating of circuit breakers / ELB is detailed in outdoor instruction manual.
- 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.

Precautions for using R454B 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. **Transportation equipment containing flammable refrigerants.**
Pay attention 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. **Equipment 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 accordance 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 containing flammable refrigerants**
In 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 so that mechanical damage to the equipment inside the package will not cause a leak of the refrigerant.
- The maximum number of pieces of equipment permitted to be stored together will be determined by local regulations.
- The storage temperature should not exceed 140°F / 60°C, as the refrigerant leakage may occur above 140°F / 60°C, which can cause danger.

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. To repair 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 following a controlled procedure so as to minimise the risk of flammable gas or vapour being leaked while the work is being performed.

6-3 **General working 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 controlling flammable material.

6-4 **Checking for leakage of refrigerant**
- The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potential flammable atmospheres.
- Ensure that the leak detection equipment being used is suitable for flammable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

6-5 **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 CO_2 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 working, the area around the equipment should be checked 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 air or that it is adequately ventilated before tearing down the system or conducting any hot work.

⚠ WARNING

•A degree of ventilation shall be kept during the period that the work is carried out.
•The ventilation should safely disperse any released refrigerant and preferably discharge it externally into the atmosphere.

6-8 **Checks of the refrigeration equipment**

- Where electrical components are being changed, they shall be fit for the purpose and 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 charge amount 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 used, the secondary circuit shall be checked for the leak of refrigerant;
  - Marking of the equipment should be visible and legible. Illegal markings and signs hall 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 of electrical devices**

- Repair and maintenance of 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 nitrogen (optional for A2L);
  - Evacuate (optional for A2L);
  - Continuously flush or purge with nitrogen 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 on 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.

⚠ 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 putted 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 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 complianced 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 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.

⚠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 afer 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: 415psig(2.86Mpa)
  The minimum test pressure for the high side: 600psig(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:

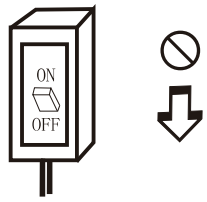
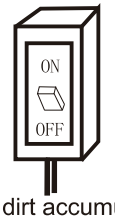
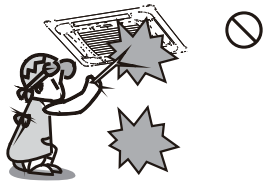
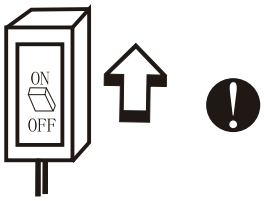
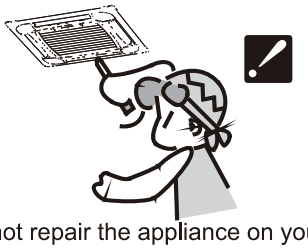
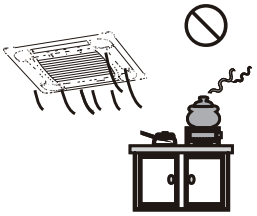
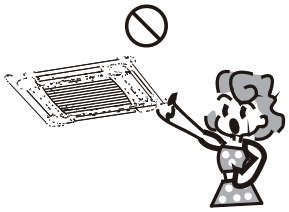
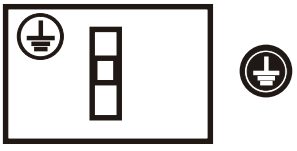
- The indoor unit comes with refrigerant detection sensor as standard.

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

  Refrigerant safety group 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.
	**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.

Symbols in this User's Manual are interpreted as shown below:

- Be sure not to do.
- The feature of the appliance, instead of a fault.
- Pay attention to such a situation.
- Be sure to follow the instruction.
- Grounding is necessary.
- Warning: Incorrect handling could cause a serious hazard, such as death, serious injury,etc.

 Do not use the power supply circuit breaker or pull off the plug to turn it off during operation. This may cause a fire due to spark, etc.	 Avoid dirt accumulation on power supply circuit breaker. Connect the power supply cord to it firmly and correctly, Otherwise it may lead to electric shock or a fire break out due to insufficient contact.	Provide accurate power supply in accordance with the rating plate requirement. Otherwise, serious faults may occur or a fire may be break out.
 Do not apply excess pressure, pull or press the power supply cord, otherwise, the power supply cord can break leading to electric shock or fire.	 Never insert a stick or similar object to the unit. Since the fan is rotating at high speed, this may cause an injury.	 It is harmful for your health if you are exposed to cold air for prolonged period of time. Hence it is recommended for uniform distribution of airflow in the room.
 Turn off the appliance first and then cut off power supply when appliance malfunctions.	 Do not repair the appliance on your own, this may lead to electric shock and so on.	 Prevent the air flow from reaching the gas burners and stove.
 Do not operate the unit with wet hands.		 It is user's responsibility to make the appliance grounded according to local and national codes or ordinances by a licensed person.

Operating condition

The protective device may trip and stop if it is operated outside the allowed temperature range.

If the air conditioner runs in "COOLING" or "DRY" mode with door or window open for a long time when relative humidity is above 85%, dew may drip down from the air outlet.

Noise pollution

- Install the air conditioner at a place that can bear its weight to for quiet operation.

Features of protector

The protective device will work at following cases:

- Turning off the appliance and restarting it at once or changing mode during operation, you need to wait at least 3 minutes.

Inspection

After operating for a long time, the air conditioner should be inspected on the following items:

- Overheat of the power supply cord and plug or even a burnt smell.
- Abnormal operating sound or vibration.
- Water leakage from indoor unit.
- Electrification of metal cabinet.

☑ Stop the air conditioner if above trouble occurs. It is advisable to have a detailed inspection after using the appliance for 5 years even if none of the above condition occurs.

Features of HEATING mode

Preheating

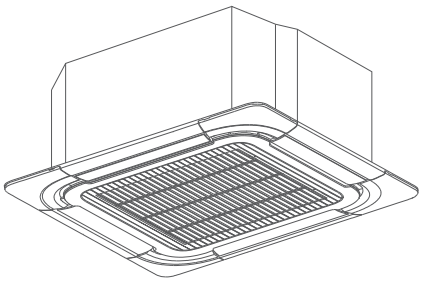
At the beginning of HEATING operation, the airflow from indoor unit is discharged 2-5 minutes later.

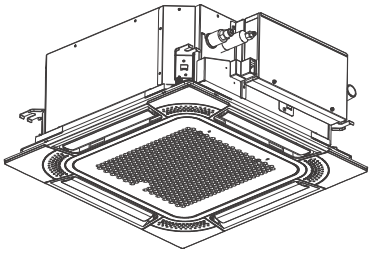
Defrosting

During HEATING operation the appliance will defrost automatically to improve efficiency. This procedure usually lasts for 2-10 minutes. During defrosting, fans stop operation. After defrosting completes, it returns to "HEATING" mode automatically.

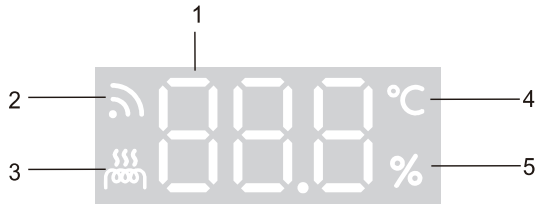
It is hard to increase the room temperature when outdoor temperature is very low. It might take longer time if the working temperature range not closer to the operation limits.

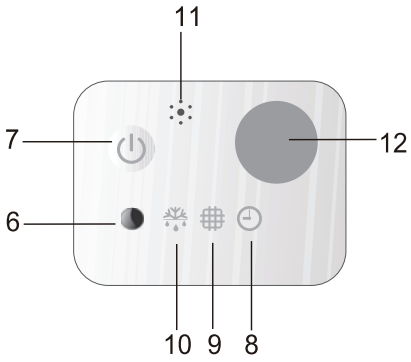
Indoor unit





Display panel





1 Temperature/humidity indicator
Display indoor set temperature or indoor temperature; Display indoor humidity (models without a humidity sensor display "--.-").

2 Wi-Fi receiver
It lights up when Wi-Fi is connected. It stops lighting when Wi-Fi is disconnected.

3 Electric heater indicator (It is only valid for the air conditioner with electric heater function.)
It lights up during heating mode when electric heater is on. It stops lighting when heater is completed.

4 Temperature Unit (℃) indicator
It lights up when the air conditioner displays with Celsius temperature, and stops lighting when it is displays with Fahrenheit temperature.

5 Humidity indicator
It lights up when display humidity.

NOTE: **The figures in this manual are based on the external view of a standard model. Consequently, the shape may differ from the air conditioner model you have selected.**

6 Run indicator (Red)
It lights on during operation. It lights off during SLEEP mode.
7 Emergency switch
The filter clean indicator is reset when the switch is pressed. The unit will be started or stopped when the switch is pressed. The unit will be operated in forced cooling mode if press the switch continuously for more than 5s when the unit is off.
8 Timer indicator (Green)
It lights on when timer is in use. It lights off when timer completes.
9 Filter clean (Yellow)
It lights on when the filter should be cleaned.
10 Defrost indicator (Green)
It lights on during defrosting and it lights off when defrosting is complete.
11 Buzzer
It rings when the signal from remote controller is received.
12 Infrared receiver
Receives signal from the remote controller.

1. Special Remarks

- **3-minute protection after the compressor stops**
  To protect compressor, the system implements a 3 minutes once operation is stopped.
- **5 minute-protection**
  Compressor must run for at least 5 minutes once operation starts. During the 5 minutes, compressor will not stop even after set point is reached. The system will shut off if manually turned off using the remote controller.
- **Cooling operation**
  The fan of the indoor unit will never stop running in cooling operation. It continues to operate even if the compressor stops working.
- **Heating operation**
  Heating capacity depends on external factors like outdoor unit temperature. Heating capacity might decrease if outdoor ambient temperature is too low.
- **Anti-freezing function during cooling**
  When the air temperature from the indoor outlet is too low, the unit will run for some time under the fan mode, to avoid frost or ice forming on the indoor heat exchanger.
- **Anti cold air function**
  When heating, in order to prevent the indoor unit from blowing cold air, the fan speed is controlled at low speed air or stopped in heating mode, and the fan speed is set according to the indoor coil temperature.
- **Defrosting**
  When the outdoor temperature is too low, ice may form on the outdoor heat exchanger, reducing heating performance. When this happens, the defrost cycle of the system will start. During the defrost cycle, the indoor unit fan stops (or runs at a very low speed in some cases), to prevent cold draft.
  Once the defrost cycle is complete, heating operation and the fan speed resume.
- **Discharging the residual heating air**
  When stopping the air conditioner in normal operation, the fan motor will run with low speed for a while to blow out the residual hot air.
- **Auto restart from power outage**
  When the power supply is recovered after power outage, all presets still be in effect and the system will run according to the previous settings.

2.Filter Cleaning

⚠CAUTION

Do not operate the system without air filter to protect the indoor unit heat exchanger against being clogged.

Turn off the main power switch before changing or cleaning filter. (The previous operation mode may appear.)

Installation or maintenance work of air filter must be performed by qualified professional personnel.

2.1 Filter Cleaning Indication

(1) For THREE-EIGHT indicators

When letters “FC” displays, it indicates it’s time to clean the filter.

(2) For light indicators

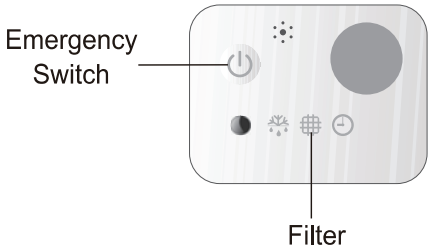
Step 1

It is time to clean the filter, when the filter icon is turned on.

Step 2

Cancel the setting

Press Emergency switch to return to the standard state.



2.2 Take Out the Filter

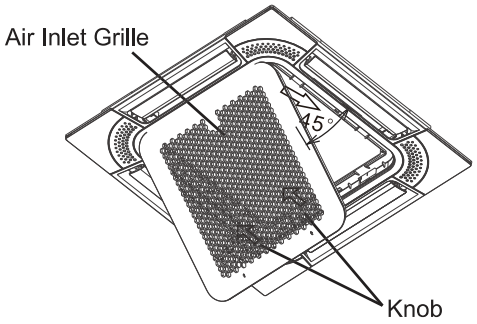
Take out the air filter according to the following steps.

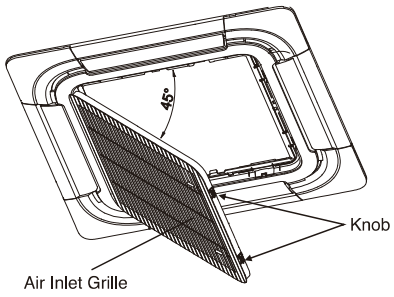
Step 1

Open the air inlet grille after pushing the two knobs as the arrow mark.

Step 2

Take out the air filter from the air inlet grille by supporting the air grille and lifting the air filter after detaching the filter from the hinges.





2.3 Clean the Filter

Clean the air filter according to the following steps.

Step 1

Use a vacuum cleaner or rinse the air filter to remove the dirt.

⚠ CAUTION

Do not use hot water with temperature higher than 104°F (40°C).

Step 2

Dry the air filter in the shade to remove excess moisture.

2.4 Resetting of Filter

Press key “TURBO” on the remote controller for 5 seconds, then release the button to restore.

For the operation of wired controller, please refer to manual of the wired controller for related information.

3.Trouble Shooting

⚠ CAUTION

When condensate drain overflows from the indoor unit, stop the operation and contact a qualified, licensed service professional.
When you smell or see smoke coming out of the unit, turn OFF the main power supply and contact a qualified, licensed service professional.

3.1 If Trouble issue persists

If the issue continues after checking the following, contact your contractor and inform them of the following items.

(1) Model number and serial number
(2) Details of the issue

3.2 No Operation

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

3.3 Not Cooling or Heating Properly

- Check for obstruction of air flow of outdoor or indoor units.
- Check if there are too many heating sources in the room.
- Check if the air filter is clogged.
- Check if the doors or windows are open.
- Check if the temperature condition is within the operation range.

3.4 This is Not Abnormal

- **Odour from Indoor Unit**
  Unpleasant odour diffuses from indoor unit after a long period of time. Clean the air filter and panels or allow a good ventilation.
- **Sound from Deforming Parts**
  When start or stop the system, a sound might be heard. However, this is due to thermal deformation of plastic parts. It is not abnormal.
- **Dew on Air Panel**
  When the cooling operation continues for a long period of time under high humidity conditions, dew can form on the air panel.
- **Refrigerant Flow Sound**
  While the system is being started or stopped, the refrigerant flow sound may be heard.

1. Safety Notice

⚠ WARNING

·Installation should be performed by a qualified personnel. (Improper installation may cause water leakage and damage, shock, or fire.)
·Install the unit according to the instructions given in this manual. (Incomplete installation may cause water leakage and damage, electrical shock, or fire).
·Be sure to use the supplied or specified installation parts. (Use of other parts may result in a poor installation, water leakage, shock, or fire).
·Install the air conditioner on a solid structure that can support the unit weight. (Inadequate support or incomplete installation may cause injury).
·Electrical work should be carried out in accordance with the installation manual and national and local codes.(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.
·Use the specified types of wires for electrical connections between the indoor and outdoor units. (Tightly connect the wires so their terminals with no external stresses).
·Poor or loose connections may cause terminal overheating or fire.
·After connecting all the wiring be sure to secure the cables so that they do not put pressure 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).
·If any refrigerant has leaks out during the installation work, ventilate the room.
·After all installation is completed, check to make sure that no refrigerant is leaking out. (Refrigerant produces a toxic gas if exposed to flames).
·When making piping connection, do not let any debris or contaminants other than the specified refrigerant get into refrigeration cycle. (Doing so will cause reduced performance, abnormal high pressure in the refrigeration cycle, explosion and injury).
·Make sure that the equipment 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 equipment).
·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.
·When moving the units, do not tilt the unit incline more than 45 degree. Pay attention to the sharp edges of the air conditioner to avoid any injury.
·During wired controller installation, ensure that the length of the wire between the indoor unit and remote controller is within 131 ft. (40 m).

⚠ CAUTION

- Do not install the equipment in a location where there is danger of exposure to flammable gas leakage. (A high concentration of flammable gas near the unit may result in fire)
- Install condensate drain piping according to the instructions in this manual. (Inadequate piping may cause flooding).
- Tighten the flare nut according to the specifications with a torque wrench. (Tightening the flare nut beyond specified torque may damage the flare nut).

2. Tools and Instruments for Installation

Number	Tool	Number	Tool
1	Standard screwdriver	8	Knife or wire stripper
2	Refrigerant vacuum pump	9	Level
3	Charge hose	10	Hammer
4	Pipe bender	11	Drill
5	Adjustable wrench	12	Flaring kit
6	Pipe cutter	13	Inner hexagon spanner and torque wrench
7	Cross head screwdriver	14	Measuring Tape

3. Installation of the Indoor Unit

⚠ DANGER

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

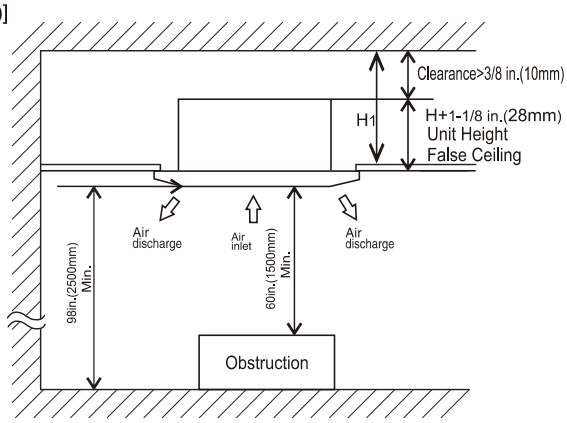
⚠ WARNING

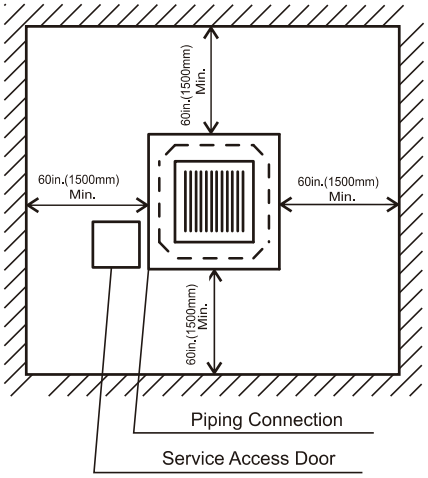
- **Check to ensure that the overhead structure can support the weight of the equipment. Otherwise the indoor unit may topple, and fall down causing injury.**
- **Do not install the indoor unit outdoors. If done, an electric hazard or electric leakage will occur.**

3.1 Initial Check

- Install the indoor unit with a proper clearance around it for operation and maintenance space, as shown in Fig.3.1.
- Provide a service access door near the unit piping connection area on the ceiling.
- Ensure that the ceiling has a sufficient strength to hang the indoor unit.
- Check that the ceiling surface is flat for the air panel installation work.

[Unit : in.(mm)]





NOTE:
H1: Size determination with at least a 1% downward slope of the drain pipe.

[Unit : in.(mm)]

Capacity (Btu/h)	H
9K/12K	8-7/16 (215)
18K/24K	9-1/4 (236)
36K/48K	10-3/4 (272)

Fig. 3.1 Space around Indoor Unit

- Consider the air distribution from the indoor unit to the space of the room, and select a suitable location so that uniform air distribution can be achieved in the room. It is recommended that the indoor unit is installed 8 ft. (2.5m) to 10 ft. (3m) from the floor level.
- Do not install flammable items in the service space for the indoor unit.
- Avoid obstacles which may obstruct the air intake or the air discharge flow.
- Do not install the indoor unit in a machine shop or kitchen where oil vapor or mist flows through the indoor unit.
  The oil will deposit on the heat exchanger, thereby reducing the indoor unit performance, and in severe cases, damaging the indoor unit.
- Pay attention to the following points when the indoor unit is installed in a hospital or other facilities with electromagnetic waves from medical equipment:
  (A) Do not install the indoor unit where the electromagnetic wave is directly radiated to the electrical box, remote control cable or remote control switch.
  (B) Install the indoor unit and components at least 10 ft. (3m) from the electromagnetic wave source.

(C) Instal the remote controller within a field provided and installed steel box. Prepare a steel case and install the remote control switch in it. Install remote controller wire with a steel electric conduit. Connect a ground wire to both the box and the tube.

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

- To avoid any corrosive chemical reaction at the heat exchanger, do not install the indoor unit in an acid or alkaline environment. If the indoor unit has to be installed in such environments, use corrosion-proof type unit.

3.2 Installation

3.2.1 Opening of False Ceiling and Suspension Bolts

(1) Determine the final location and orientation of installation of the indoor unit. Allow adequate space for piping, wiring, and maintenance.
Indoor unit installation template is printed on the packaging. Cut out the template for opening the false ceiling and installing the suspension bolts.

(2) Cut out the area for the indoor unit in the false ceiling and install suspension bolts, as shown in Fig. 3.2.

Unit: in. (mm)

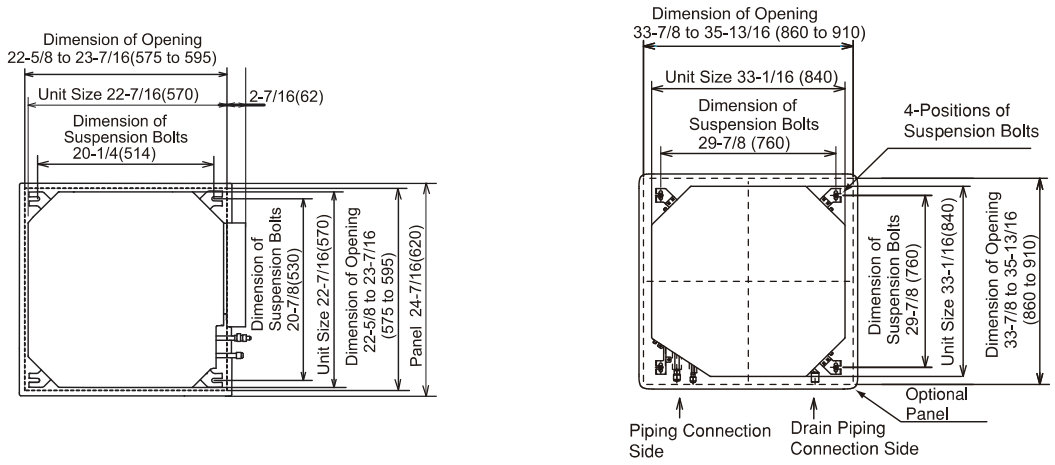


Fig. 3.2 Opening of False Ceiling and Suspension Bolts

(3) Check to ensure that the ceiling is horizontally level, otherwise the condensate may not drain properly, issues can occur.

(4) Strengthen the opening parts of the false ceiling.

(5) Mount suspension bolts, as shown in Fig. 3.3.

Unit: in. (mm)

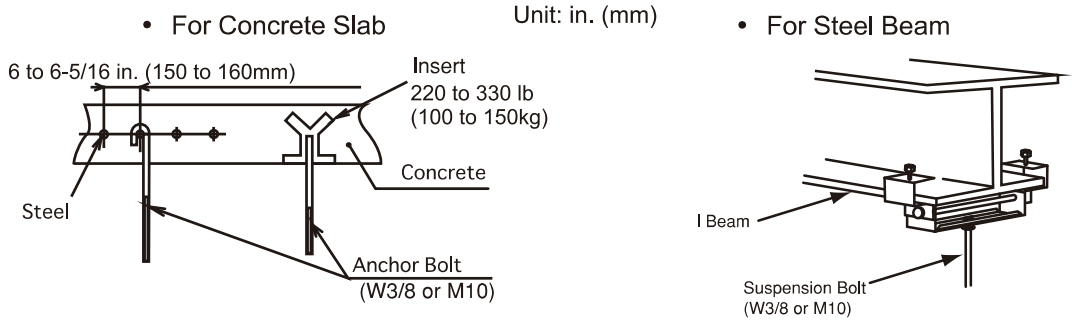
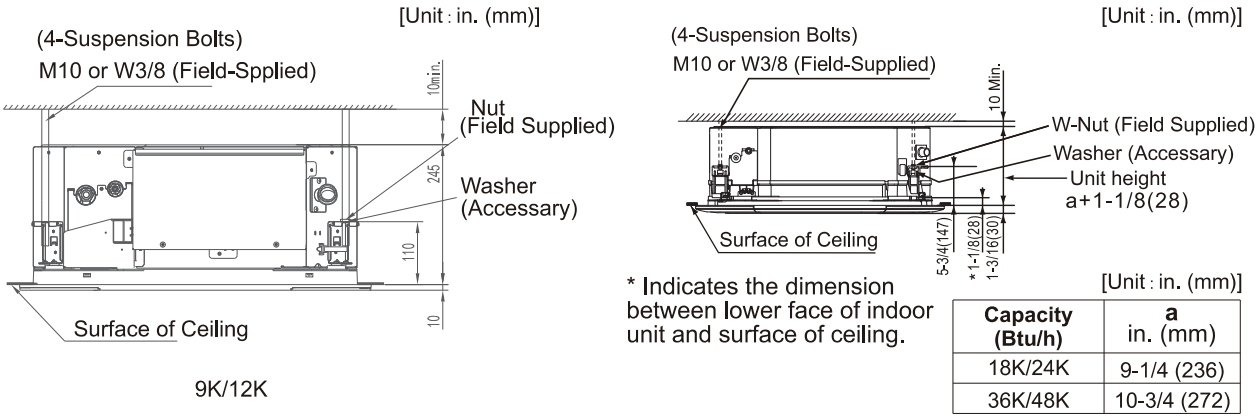


Fig. 3.3 Mounting Suspension Bolts

3.2.2 Mounting Position of the Indoor Unit



[Unit : in. (mm)]

Capacity (Btu/h)	a in. (mm)
18K/24K	9-1/4 (236)
36K/48K	10-3/4 (272)

Fig. 3.4 Mounting Position [Unit : in. (mm)]

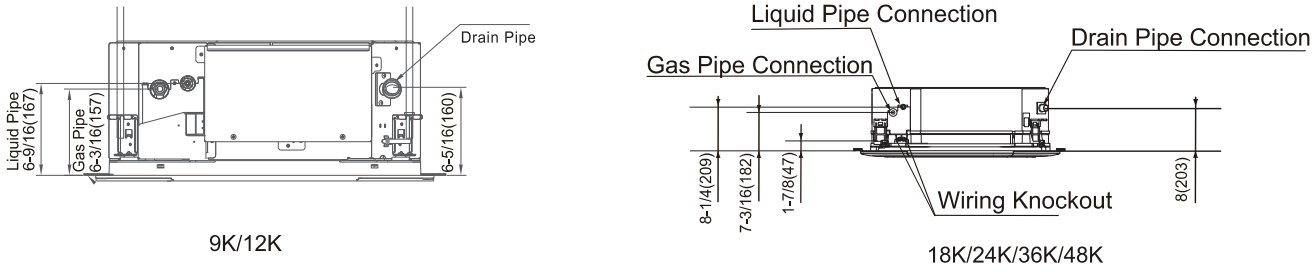
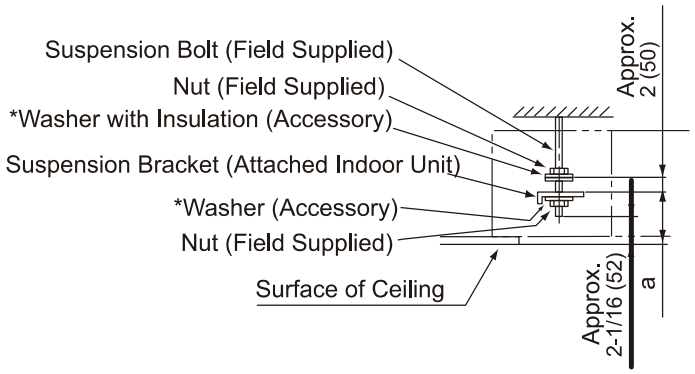


Fig. 3.5 Indoor Unit and Air Panel [Unit : in. (mm)]

3.2.3 Installing the Indoor Unit

(1) Mount the nuts and washers into the suspension bolts, as shown in Fig. 3.6.



Capacity (Btu/h)	a in. (mm)
9K/12K	4-3/8(110)
18K/24K/36K/48K	5-3/4(147)

*Place the washer so that the surface with insulation faces downwards.

Fig. 3.6 Mounting Nuts and washer

(2) Lift the indoor unit by hoist, and do not apply any force on the drain pan.

(3) Secure the indoor unit using the nuts and washer, as shown in Fig. 3.7.

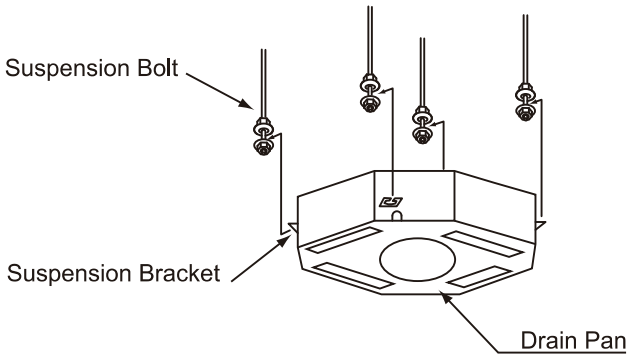


Fig. 3.7 Mounting the Indoor Unit

NOTE: If a false ceiling is already constructed, complete all piping and wiring work inside the ceiling before securing the indoor unit.

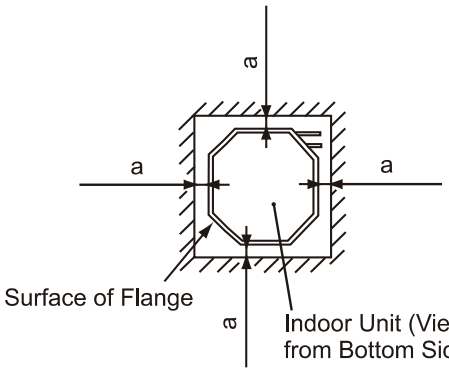
3.2.4 Adjusting the Space between Indoor Unit and False Ceiling Opening

⚠ CAUTION

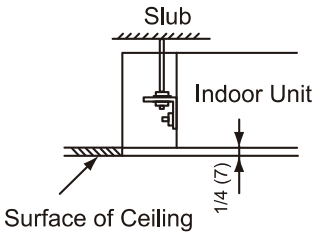
- **Check the level of the drain pan using a leveler to avoid incorrect operation of the drain discharge mechanism in the indoor unit. The drain piping side of the indoor unit must be approximately 5mm lower than the other side.**
- **Tighten the nuts of the suspension brackets after the adjustment is completed. Apply LOCK-TIGHT paint∗ to the bolts and nuts to prevent them from loosening, otherwise, abnormal noises or sounds may occur and the indoor unit may fall down.**

LOCK-TIGHT paint∗: Paint the lock bolts and nuts. Adjust the indoor unit to the correct position while checking with the scale (factory-supplied).

(1) Installation template is attached with the packing.
(2) Adjust the position of indoor unit, according to the dimensions.

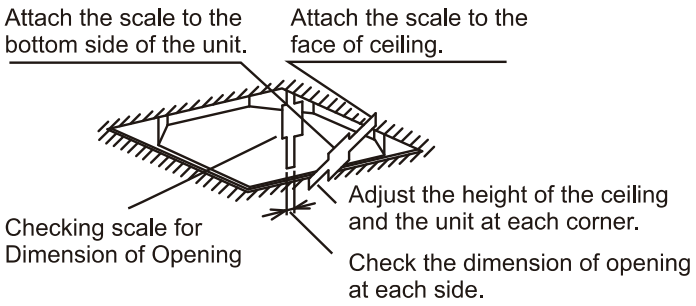


[Unit : in. (mm)]

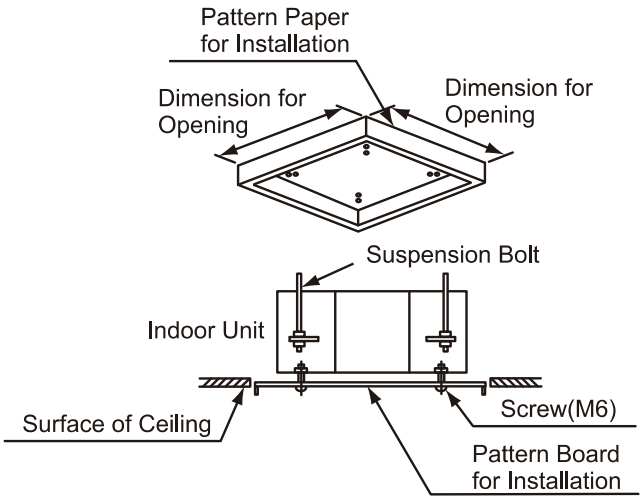


Capacity(Btu/h)	a in. (mm)
9K/12K	3/16 to 3/8 (5-10)
18K/24K/36K/48K	3/8 to 1-3/8 (10-35)

a. For Ceiling already Completed with Panels



b . Ceiling not Completed with Panels yet



3.3 Installation Details for Air Panels

- Installation work for air panel should be done according to the Installation Manual for Air Panel.
- Ensure that the connector between indoor unit and the air panel is properly connected.

4. Refrigerant Pipe

⚠ DANGER

Use refrigerant R454B in the refrigerant cycle (refer to outdoor nameplate). Do not add oxygen, acetylene or other flammable and poisonous gases into the refrigerant cycle when performing a leakage test or an air–pressure test. These type of gases are extremely dangerous, which may cause an explosion. It is recommended to use nitrogen to perform these tests.

4.1 Pipe Material

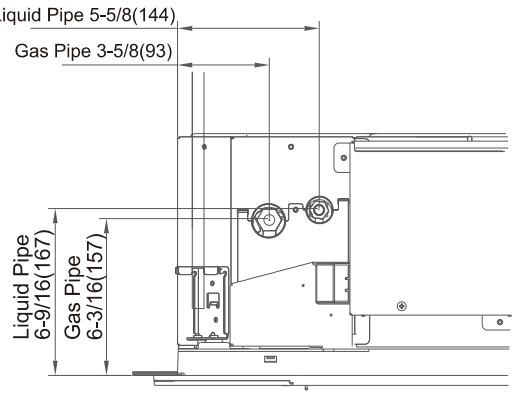
(1) Prepare locally-supplied copper pipes.
(2) Select the piping size from the following table.

Model	Gas pipe [in. (mm)]	Liquid pipe [in. (mm)]
9K/12K	ø 3/8 (9.52)	ø1/4 (6.35)
18K	ø 1/2 (12.7)	ø 1/4 (6.35)
24K/36K	ø 5/8 (15.88)	ø 3/8 (9.52)
48K	ø 3/4 (19.05)	ø 3/8 (9.52)

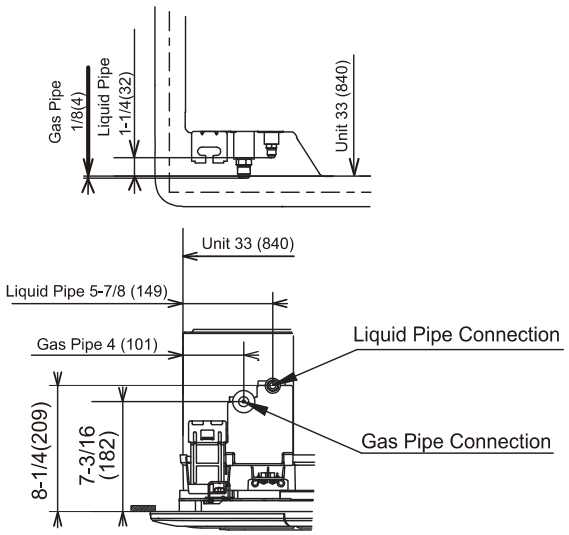
(3) Select clean copper pipes. Make sure that there is no dust and moisture inside. Blow the pipes with nitrogen or dry air to remove dust and foreign materials before connecting pipes.

4.2 Pipe Connection

(1) Position of piping connection is shown in Fig. 4.1.(Indoor Unit)



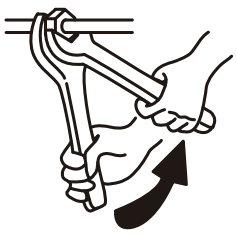
9K/12K



18K/24K/36K/48K

Fig. 4.1 Position of Piping Connection [Unit : in. (mm)]

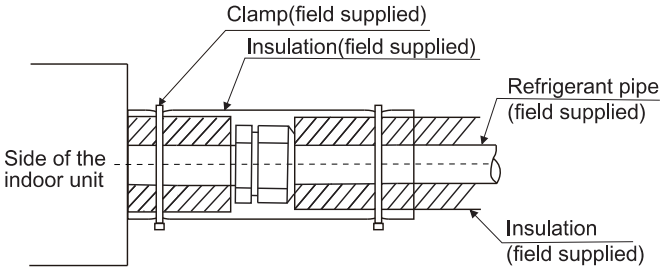
(2) When tightening the flare nut, use torque wrench and adjustable as shown in Fig.4.2.



Tube size [in. (mm)]	Torque [lbf·ft. (N·m)]
ø 1/4 (6.35)	14.8 (20)
ø 3/8 (9.52)	29.5 (40)
ø 1/2 (12.7)	44.3 (60)
ø 5/8 (15.88)	59.0 (80)
ø 3/4 (19.05)	73.8 (100)

Fig. 4.2 Tightening Work of Flare Nut

(3) After finishing connecting the refrigerant pipes, keep it warm with the insulation material.



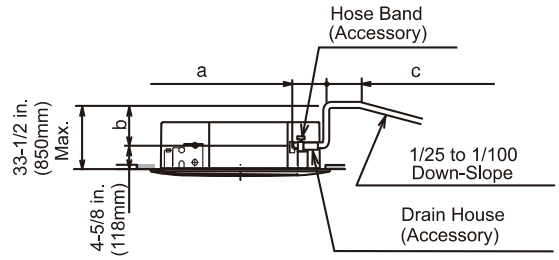
5.Drain Piping

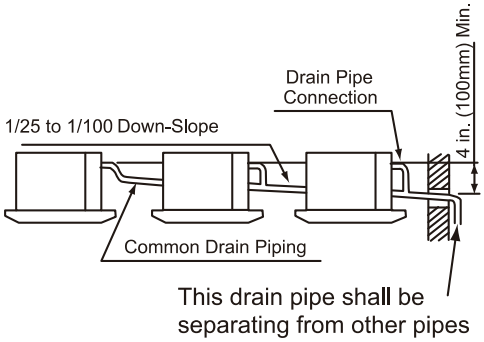
⚠ CAUTION

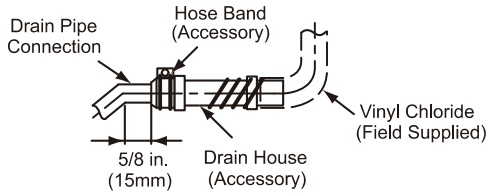
- Do not create an upper-slope or rise for the drain piping, since drain water can flow back to the indoor unit causing leakage into the room when the system operation is stopped.
- Do not connect the drain pipe with sanitary, sewage piping, or any other drainage piping.
- When the common drain piping is connected with other indoor units, the connected position of each indoor unit must be higher than the common drain pipe, also the pipe must be sized properly based on system capacity.

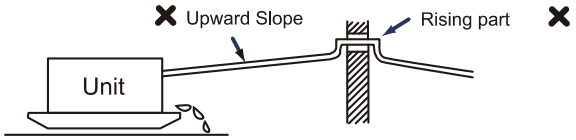
5.1 Conduct Drain Piping Work

(1) Prepare a polyvinyl chloride pipe with a 1-1/4 in. (32mm) outer diameter.
(2) Fasten the tubing to drain hose with the adhesive agent and factory-supplied clamp.
The drain piping must be performed with a down-slope pitch of 1/25 to 1/100.



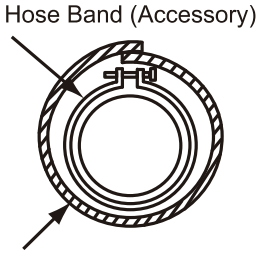






∗ The total length of a+b+c :
a≤12 in. (300mm)，b≤33-1/2 in. (850mm)，c≤2 in. (50mm), a+b+c≤43-5/16 in. (1100mm)
∗ In case of lifting the drain pipe at outlet part, perform the drain piping work as shown in the above figure.

(3) Insulate the drain pipe after connecting the drain hose.

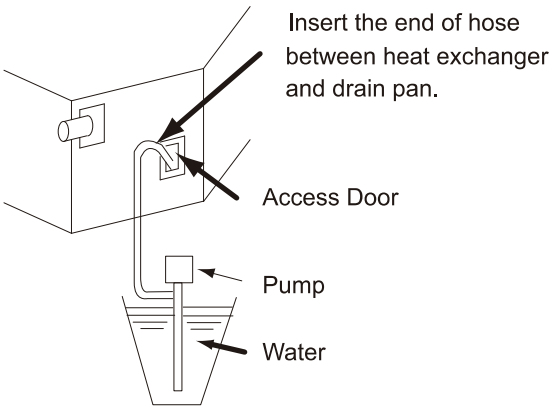


Unit: in. (mm)

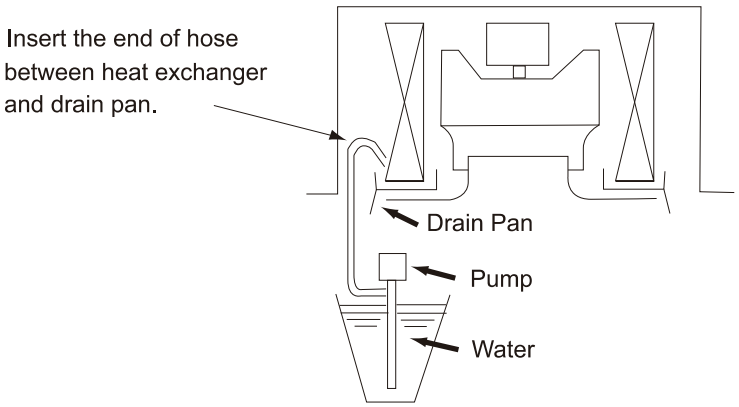
5.2 Check Draining of the Piping

- After performing drain piping work and electrical wiring, check to ensure that water drains properly per the following procedure.
- Checking with the Float Switch:
  (A) Switch ON the power supply.
  (B) Start cooling operation.
  (C) Gradually pour 64~80.6 oz(2~2.5 liters) of water into the drain pan through the access door or the air outlet.
  (D) Check to ensure that the water flows out at the end of drain piping and no water leakage occurs. When water cannot be found at the end of drain piping, pour another 64 oz(2 liters) of water into the drain pan.

- If pouring water through the access door.



- To add water through the air outlet use the diagram below for guidance.



6. Electrical Wiring

⚠ WARNING

- Turn OFF the main power switch to the indoor unit and the outdoor unit 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, drain pipe, 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.
- Check the item below before turning ON the main switch.
- Tighten screws according to the following torque.
  M3.5: 0.9 lbf·ft. (1.2 N·m)
  M5: 1.5 to 1.8 lbf·ft. (2.0 to 2.4 N·m)

⚠ CAUTION

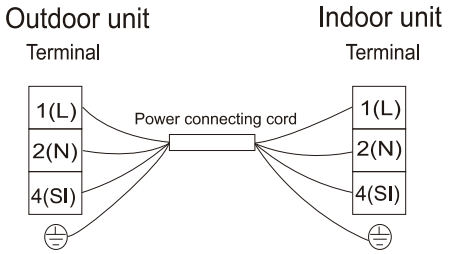
- Wrap the accessory packing around the wires, and plug the wiring connection hole with the seal material to protect the product from any condensate water or insects.
- Tightly secure the wires with the cord clamp inside the indoor unit.
- Secure the cable of the remote control switch using the cord clamp inside the electrical box.

6.1 General Check

(1) Make sure that the field-selected electrical components(main power switches, circuit breakers, wires, conduit connectors and wire terminals) have been properly selected according to the electrical data given in "7.Electrical Installation". Make sure that the components comply with National Electrical Code(NEC).
(2) Check to ensure that the power supply voltage is within ±10% of the rated voltage.
(3) Check the capacity of the electrical wires. If the power source capacity is too low, the system cannot be started due to the voltage drop.
(4) Check to ensure that the ground wire is connected.
(5) Power Source Main Switch Install a multi-pole main switch with a space of 1/8 in. (3.5mm) or more between each phase.

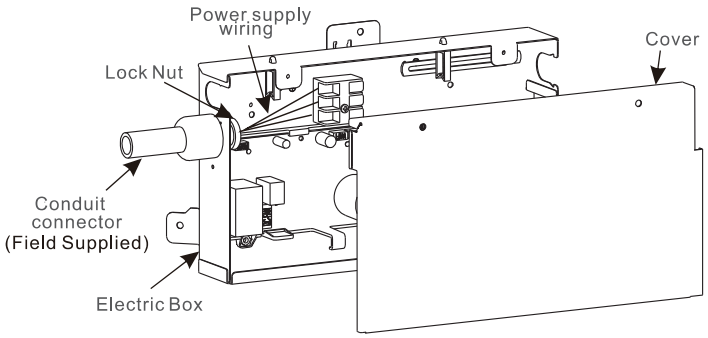
6.2 Electrical Wiring Connection

The intermediate connection between the indoor unit and the air panel should be referred to in the "Installation Manual for Air Panel".
(1) Connect the power supply and earth wires to the terminals in the electrical box.
(2) Connect the wires between the indoor unit and the outdoor unit to the terminals in the electrical box.

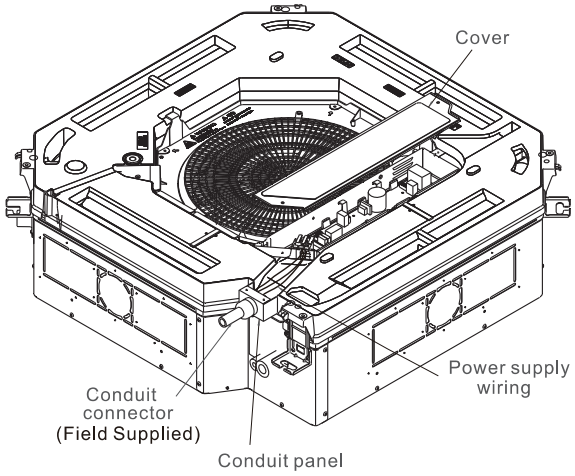


6.3 Wire connects step

(1) Remove the screws and the cover.
(2) Pass power supply wiring through the hole on the conduit panel or electric box .
(3) Fasten the conduit connection to the conduit panel using the lock nut.
(4) Connect the power supply wiring to the terminal.
(5) Tie the power supply wiring with the clamp tightly.
(6) After completing the wiring, seal the wiring hole with the sealing material.
(7) Put the cover after completion of the work.



9K/12K



18K/24K/36K/48K

7. Electrical Installation

⚠WARNING

- This product must be installed on a single dedicated electrical circuit. Circuit breaker protection must be installed in accordance with this manual. In moist and humid locations, an ELB type circuit breaker must be used.
- Do not operate the system until all the check points have been cleared.

(A) Check to ensure that the insulation 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.

(B) Check to ensure that the stop valves of the outdoor unit are fully opened and then start the system.

Model Capacity(Btu/h)	Transmitting Cable Size
9K~48K	4×14AWG

Note:

(1) Follow local and national codes and regulations when select field wires ,and all the above are the minimum wire size.

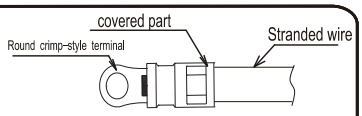
(2) Use copper supply wires.

(3) Install main switch and ELB for each system separately. When used, select the high response type ELB that is acted within 0.1second.

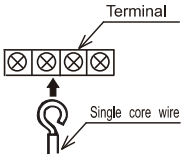
Recommended capacity to see outdoor machine switch capacity.

<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.



8. Trial Run

Please perform trial run according to outdoor unit installation manual.