

D5FUHA

Installation Instruction

Crossover Air Handler - Sizes 18K to 60K

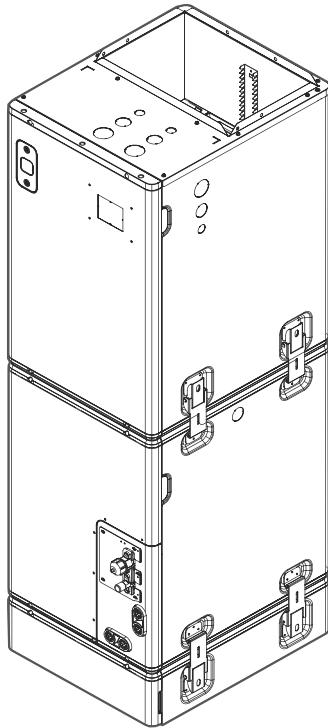


Fig. 1 — Sizes 18K - 60K

NOTES: Read the entire instruction manual before starting the installation. Images are for illustration purposes only. Actual models may differ slightly.

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SAFETY CONSIDERATIONS

Installing, starting up, and servicing air- conditioning equipment can be hazardous due to system pressures, electrical components, and equipment location (roofs, elevated structures, etc.).

Only trained, qualified installers and service mechanics should install, start- up, and service this equipment.

Untrained personnel can perform basic maintenance functions such as coil cleaning. All other operations should be performed by trained service personnel only.

When working on the equipment, observe the precautions in the literature and on tags, stickers, and labels attached to the equipment.

Follow all safety codes. Wear safety glasses and work gloves. Keep a quenching cloth and a fire extinguisher nearby when brazing. Use care in handling, rigging, and setting bulky equipment.

Read these instructions thoroughly and follow all warnings or cautions included in the literature and attached to the unit. Consult local building codes and National Electrical Code (NEC) for special requirements.

Recognize safety information.

This is the safety - alert symbol

When you see this symbol on the unit and in instructions or manuals, be alert to the potential for personal injury. Understand these signal words: **DANGER**, **WARNING**, and **CAUTION**. These words are used with the safety- alert symbol.

DANGER identifies the most serious hazards which will result in severe personal injury or death.

WARNING signifies hazards which could result in personal injury or death.

CAUTION is used to identify unsafe practices which may result in minor personal injury or product and property damage.

NOTE is used to highlight suggestions which will result in enhanced installation, reliability, or operation.



WARNING

ELECTRICAL SHOCK HAZARD

Failure to follow this warning could result in personal injury or death.

Before installing, modifying, or servicing system, the main electrical disconnect switch must be in the OFF position. There may be more than 1 disconnect switch. Lock out and tag switch with a suitable warning label.



WARNING

EXPLOSION HAZARD

Failure to follow this warning could result in death, serious personal injury, and/or property damage.

Never use air or gases containing oxygen for leak testing or operating refrigerant compressors. Pressurized mixtures of air or gases containing oxygen can lead to an explosion.



CAUTION

EQUIPMENT DAMAGE HAZARD

Failure to follow this caution may result in equipment damage or improper operation.

Do not bury more than 36 in. (914 mm) of refrigerant pipe in the ground. If any section of pipe is buried, there must be a 6 in. (152 mm) vertical rise to the valve connections on the outdoor units. If more than the recommended length is buried, refrigerant may migrate to the cooler buried section during extended periods of system shutdown. This causes refrigerant slugging and could possibly damage the compressor at start-up.



WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.



WARNING

Only use the specified wire. If the wire is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard. The product must be properly grounded at the time of installation, or electric shock may occur.

For all electrical work, follow all local and national wiring standards, regulations, and the Installation Manual. Connect the cables tightly, and clamp them securely to prevent external forces from damaging the terminal. Improper electrical connections can overheat and cause fire, and may also cause shock. All electrical connections must be made according to the Electrical Connection Diagram located on the panels of the indoor and outdoor units.

All wiring must be properly arranged to ensure that the control board cover can close properly. If the control board cover is not closed properly, it can lead to corrosion and cause the connection points on the terminal to heat up, catch fire, or cause electrical shock.

Disconnection must be incorporated in the fixed wiring in accordance with NEC, CSA and Local Codes. **Do not** share the electrical outlet with other appliances. Improper or insufficient power supply can cause fire or electric shock.

If connecting power to fixed wiring, an all-pole disconnection device which has at least 3mm clearances in all poles, and have a leakage current that may exceed 10mA, the residual current device (RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with NEC, CSA and Local Codes.



WARNING

Turn off the air conditioner and disconnect the power before performing any installation or repairing. Failure to do so can cause electric shock.

Installation must be performed by an authorized dealer or specialist. Defective installation can cause water leakage, electrical shock, or fire. Installation must be performed according to the installation instructions.

Improper installation can cause water leakage, electrical shock, or fire. Contact an authorized service technician for repair or maintenance of this unit. This appliance shall be installed in accordance with national wiring regulations.

Only use the included accessories, parts, and specified parts for installation. Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.

Install the unit in a firm location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and damage. Install drainage piping according to the instructions in this manual. Improper drainage may cause water damage to your home and property. For units that have an auxiliary electric heater, do not install the unit within 3 feet (1 meter) of any combustible materials.

If combustible gas accumulates around the unit, it may cause fire. Do not turn on the power until all work has been completed. When moving or relocating the air conditioner, consult experienced service technicians for disconnection and re-installation of the unit.

Read the information for details in "indoor unit installation" and "outdoor unit installation" sections.

NOTE: The air conditioner's circuit board (PCB) is designed with a fuse to provide overcurrent protection. The specifications of the fuse are printed on the circuit board, for example: T3.15AL/250VAC, T5AL/250VAC, T3.15A/250VAC, T5A/250VAC, T20A/250VAC, T30A/250VAC,etc.

NOTE: Only a blast-proof ceramic fuse can be used.



WARNING

FOR FLAMMABLE REFRIGERANTS

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 odor.



WARNING

PERSONAL INJURY AND PROPERTY DAMAGE HAZARD

For continued performance, reliability, and safety, the only approved accessories and replacement parts are those specified by the equipment manufacturer. The use of non-manufacturer approved parts and accessories could invalidate the equipment limited warranty and result in a fire risk, equipment malfunction, and failure.

Review the manufacturer's instructions and replacement parts catalogs available from your equipment supplier.

WARNING - RISK OF FIRE DUE TO FLAMMABLE REFRIGERANT USED. FOLLOW HANDLING INSTRUCTIONS CAREFULLY IN COMPLIANCE WITH NATIONAL REGULATIONS.



Table 1 — Symbols displayed on the indoor unit or outdoor unit

	WARNING	This symbol shows that this appliance used 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.

FCC

This device complies with part 15 of the FCC Rules. Operation is subject to the following two conditions: (1) This device may not cause harmful interference, and (2) this device must accept any interference received, including interference that may cause undesired operation.

For Class B Digital Device

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

- Reorient or relocate the receiving antenna
- Increase the distance between the equipment and the receiver
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.

Consult the dealer or an experienced radio/TV technician for assistance.

MODIFICATION: Any changes or modifications not expressly approved by the grantee of this device could void the user's authority to operate this device.

Room Size Restriction

The appliances are connected via an air duct system to one or more rooms, the bottom of the air outlet of the air duct in the room should be at a height.7.3ft/ 2.2m from the floor. In UL/CSA 60335-2-40, the R454B refrigerant belongs to mildly flammable refrigerants, which will limit the room area of the system service. Similarly, the total amount of refrigerant in the system should be less than or equal to the maximum allowable refrigerant charge, which depends on the room area serviced by the system.

Table 2 — A (min)

MC or Mrel Refrigerant Charge Amount pounds (kilograms)	Mc or Mrel (lbs (kg))	HO, RELEASE HEIGHT FT (M)					
		≤ 7.2 (2.2)	7.5 (2.3)	7.9 (2.4)	8.5 (2.6)	9.2 (2.8)	9.8 (3.0)
≤ 3.91 (1.776)		12 (1.10)					
4.0 (1.8)	60 (5.53)	57 (5.29)	55 (5.07)	50 (4.68)	47 (4.34)	44 (4.05)	
4.4 (2.0)	66 (6.14)	63 (5.88)	61 (5.63)	56 (5.2)	52 (4.83)	48 (4.5)	
4.9 (2.2)	73 (6.76)	70 (6.46)	67 (6.19)	62 (5.72)	57 (5.31)	53 (4.95)	
5.3 (2.4)	79 (7.37)	76 (7.05)	73 (6.76)	67 (6.24)	62 (5.79)	58 (5.41)	
5.7 (2.6)	86 (7.99)	82 (7.64)	79 (7.32)	73 (6.76)	68 (6.27)	63 (5.86)	
6.2 (2.8)	93 (8.6)	89 (8.23)	85 (7.88)	78 (7.28)	73 (6.76)	68 (6.31)	
6.6 (3.0)	99 (9.21)	95 (8.81)	91 (8.45)	84 (7.8)	78 (7.24)	73 (6.76)	
7.1 (3.2)	106 (9.83)	101 (9.4)	97 (9.01)	90 (8.32)	83 (7.72)	78 (7.21)	
7.5 (3.4)	112 (10.44)	108 (9.99)	103 (9.57)	95 (8.84)	88 (8.2)	82 (7.66)	
7.9 (3.6)	119 (11.06)	114 (10.58)	109 (10.14)	101 (9.36)	94 (8.69)	87 (8.11)	
8.4 (3.8)	126 (11.67)	120 (11.16)	115 (10.7)	106 (9.88)	99 (9.17)	92 (8.56)	
8.8 (4.0)	132 (12.29)	126 (11.75)	121 (11.26)	112 (10.4)	104 (9.65)	97 (9.01)	
9.3 (4.2)	139 (12.9)	133 (12.34)	127 (11.82)	117 (10.91)	109 (10.14)	102 (9.46)	
9.7 (4.4)	145 (13.51)	139 (12.93)	133 (12.39)	123 (11.43)	114 (10.62)	107 (9.91)	
10.1 (4.6)	152 (14.13)	145 (13.51)	139 (12.95)	129 (11.95)	119 (11.1)	112 (10.36)	
10.6 (4.8)	159 (14.74)	152 (14.1)	145 (13.51)	134 (12.47)	125 (11.58)	116 (10.81)	
11 (5.0)	165 (15.36)	158 (14.69)	152 (14.08)	140 (12.99)	130 (12.07)	121 (11.26)	
11.5 (5.2)	172 (15.97)	164 (15.28)	158 (14.64)	145 (13.51)	135 (12.55)	126 (11.71)	
11.9 (5.4)	179 (16.58)	171 (15.86)	164 (15.2)	151 (14.03)	140 (13.03)	131 (12.16)	
12.3 (5.6)	185 (17.2)	177 (16.45)	170 (15.77)	157 (14.55)	145 (13.51)	136 (12.61)	
12.8 (5.8)	192 (17.81)	183 (17.04)	176 (16.33)	162 (15.07)	151 (14)	141 (13.06)	
13.2 (6.0)	198 (18.43)	190 (17.63)	182 (16.89)	168 (15.59)	156 (14.48)	145 (13.51)	
13.7 (6.2)	205 (19.04)	196 (18.21)	188 (17.45)	173 (16.11)	161 (14.96)	150 (13.96)	
14.1 (6.4)	212 (19.66)	202 (18.8)	194 (18.02)	179 (16.63)	166 (15.44)	155 (14.41)	
14.6 (6.6)	218 (20.27)	209 (19.39)	200 (18.58)	185 (17.15)	171 (15.93)	160 (14.86)	
15 (6.8)	225 (20.88)	215 (19.98)	206 (19.14)	190 (17.67)	177 (16.41)	165 (15.32)	
15.4 (7.0)	231 (21.5)	221 (20.56)	212 (19.71)	196 (18.19)	182 (16.89)	170 (15.77)	
15.9 (7.2)	238 (22.11)	228 (21.15)	218 (20.27)	201 (18.71)	187 (17.37)	175 (16.22)	

Amin (ft² (m²)
Mc: Actual refrigerant charge in the system lbs (Kg)
Mrel: Refrigerant releasable charge lbs (Kg)
Ho: Release height, measured from duct opening, in ft (m)
Hinst: Height of install, from the bottom of the indoor appliance, measured in ft (m)
Ho ≈ Hinst
Warning: Minimum room area of conditioned space is based on releasable charge or total system refrigerant charge.

When the unit detects a refrigerant leak, the indoor unit's minimum airflow appears (see Table 3).

Table 3 — Minimum Airflow

MODEL	18K	24K	30K	36K	48K	60K
NOMINAL AIRFLOW	400CFM	400CFM	447CFM	541CFM	706CFM	824CFM

For R454B refrigerant charge amount and minimum room area:

1. Installation (where refrigerant pipes are allowed)

Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.

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.

That the installation of pipe-work shall be kept to a minimum.

That pipe-work shall be protected from physical damage.

Where refrigerant pipes shall be compliance with national gas regulations.

That mechanical connections shall be accessible for maintenance purposes.

Be more careful that foreign matter (oil, water, etc) does not enter the piping.

Also, when storing the piping, securely seal the opening by pinching, taping, etc.

All working procedure that affects safety means shall only be carried by competent persons.

Appliance shall be stored in a well ventilated area where the room size corresponds to the room area as specified for operation.

Joints shall be tested with detection equipment with a capability of 5 g/year of refrigerant or better, with the equipment in standstill and under operation or under a pressure of at least these standstill or operation conditions after installation. Detachable joints shall NOT be used in the indoor side of the unit (brazed, welded joint could be used). In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.

LEAK DETECTION SYSTEM installed. Unit must be powered except for service. For the unit with refrigerant sensor, when the refrigerant sensor detects refrigerant leakage, the indoor unit will display a error code and emit a buzzing sound, the compressor of outdoor unit will immediately stop, and the indoor fan will start running. The service life of the refrigerant sensor is 15 years. When the refrigerant sensor malfunctions, the indoor unit will display the error code "FHCC".

The refrigerant sensor can not be repaired and can only be replaced by the manufacturer. It shall only be replaced with the sensor specified by the manufacturer.

2. When a FLAMMABLE REFRIGERANT is used, the requirements for installation space of appliance and/or ventilation requirements are determined according to

- the mass charge amount (M) used in the appliance, the installation location, the type of ventilation of the location or of the appliance. 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, 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 protection devices, piping, and fittings shall be protected as far as possible against adverse environmental affects, for example, the danger of water collecting and freezing in relief pipes or the accumulation of dirt and debris;

- that piping in refrigeration systems shall be so designed and installed to minimize the likelihood of hydraulic shock damaging the system;

- that steel pipes and components shall be protected against corrosion with a rustproof coating before applying any insulation;
- that precautions shall be taken to avoid excessive vibration or pulsation;

the minimum floor area of the room shall be mentioned in the form of a table or a single figure without reference to a formula; 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:

- a. The minimum test pressure for the low side of the system shall be the low side design pressure and the minimum test pressure for the high side of the system shall be the high side design pressure, unless the high side of the system cannot be isolated from the low side of the system in which case the entire system shall be pressure tested to the low side design pressure.

- b. The test pressure after removal of pressure source shall be maintained for at least 1 h with no decrease of pressure indicated by the test gauge, with test gauge resolution not exceeding 5% of the test pressure.

- c. During the evacuation test, after achieving a vacuum level specified in the manual or less, the refrigeration system shall be isolated from the vacuum pump and the pressure shall not rise above 1500 microns within 10 min. The vacuum pressure level shall be specified in the manual, and shall be the lesser of 500 microns or the value required for compliance with national and local codes and standards, which may vary between residential, commercial, and industrial buildings.

- field-made refrigerant joints indoors shall be tightness tested according to the following requirements: 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.

3. Qualification of Workers

Any maintenance, service and repair operations must be required qualification of the working personnel. Every working procedure that affects safety means shall only be carried out by competent persons that joined the training and achieved competence should be documented by a certificate. The training of these procedures is carried out by national training organizations or manufacturers that are accredited to teach the relevant national competency standards that may be set in legislation. All training shall follow the ANNEX HH requirements of UL 60335-2-40 4th Edition.

Examples for such working procedures are:

- breaking into the refrigerating circuit;
- opening of sealed components;
- opening of ventilated enclosures.

4. 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 shall be complied with prior to conducting work on the system.

5. Work procedure

Works shall be undertaken under a controlled procedure so as to minimize the risk of a flammable gas or vapor being present while the work is being performed.

6. 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.

7. 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. no sparking, adequately sealed or intrinsically safe.

8. 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.

9. No ignition sources

No person carrying out work in relation to a REFRIGERATING SYSTEM which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. "No Smoking" signs shall be displayed.

10. Ventilated area

Ensure that the area is in the open or that it 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.

11. Checks to the refrigeration equipment

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

- a. the actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed;
- b. the ventilation machinery and outlets are operating adequately and are not obstructed;
- c. if an indirect refrigerating circuit is being used, the secondary circuits shall be checked for the presence of refrigerant; marking to the equipment continues to be visible and legible, marking and signs that are illegible shall be corrected;
- d. 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.

12. 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, and 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.

13. Wiring

Check that wiring will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental

affects. The check shall also take into account the affects of aging or continual vibration from sources such as compressors or fans.

14. Detection of flammable refrigerants

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used. The following leak detection methods are deemed acceptable for refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of FLAMMABLE REFRIGERANTS, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed. Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

NOTE: Examples of leak detection fluids are: bubble method:

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. See the following instructions of removal of refrigerant.

15. 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; and
- open the circuit.

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

For appliances containing flammable refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum (optional for A2L). This process shall be repeated until no refrigerant is within the system (optional for A2L). When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. The outlet for the vacuum pump shall not be close to any potential ignition sources, and ventilation shall be available.

16. Charging procedures

In addition to conventional charging procedures, the following requirements shall be followed:

Works shall be undertaken with appropriate tools only (In case of uncertainty, please consult the manufacturer of the tools for use with flammable refrigerants). Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimize 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 it shall be pressure tested with oxygen free nitrogen (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.

17. Decommissioning

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

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

18. Labeling

Equipment shall be labeled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing FLAMMABLE REFRIGERANTS, ensure that there are labels on the equipment stating the equipment contains FLAMMABLE REFRIGERANT.

19. Recovery

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants

are removed safely. When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labeled for that refrigerant (i. e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. If in doubt, the manufacturer should be consulted. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. The recovered refrigerant shall be processed according to local legislation in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders. If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The compressor body shall not be heated by an open flame or other ignition sources to accelerate this process. When oil is drained from a system, it shall be carried out safely.

20. Unventilated areas

For appliances containing more than for any refrigerating circuit, the manual shall include a statement advising that an unventilated area where the appliance using FLAMMABLE REFRIGERANTS is installed shall be so constructed that should any refrigerant leak, it will not stagnate so as to create a fire or explosion hazard. This shall include:

- a warning that if appliances with A2L REFRIGERANTS connected via an air duct system to one or more rooms are installed in a room with an area less than >Amin as determined in Clause GG.2, that room shall be without continuously operating open flames (for example an operating gas appliance) or other POTENTIAL IGNITION SOURCES (for example 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;

- for appliances using A2L REFRIGERANTS connected via an air duct system to one or more rooms, a warning with the substance of the following: "Auxiliary devices which may be a POTENTIAL IGNITION SOURCE shall not be installed in the duct work. Examples of such POTENTIAL IGNITION SOURCES are hot surfaces with a temperature exceeding X °C and electric switching devices". NOTE X is the maximum allowable surface temperature as defined in 22.117.

The manufacturer should specify other potential continuously operating sources known to cause ignition of the refrigerant used. The appliance shall be stored so as to prevent mechanical damage from occurring.

- for appliances using A2L refrigerants connected via an air duct system to one or more rooms, a warning that only auxiliary devices approved by the appliance manufacturer or declared suitable with the refrigerant shall be installed in connecting ductwork. The manufacturer shall list in the instructions all approved auxiliary devices by manufacturer and model number for use with the specific appliance, if those devices have a potential to become an ignition source.

- a warning that if appliances connected via an air duct system to one or more rooms with A2L REFRIGERANTS are installed in a room with an area less than 4min as determined in Clause GG.2. or installed in a room with an EFFECTIVE DISPERSAL VOLUME VED less than the minimum as determined by Clause 101.DVN.8, that room shall be 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.

- for REFRIGERANT DETECTION SYSTEMS, the function and operation and required servicing measures;
- for LIMITED LIFE REFRIGERANT SENSORS Used in REFRIGERANT DETECTION SYSTEMS, the specified end-of-life and replacement instructions;
- REFRIGERANT SENSORS for REFRIGERANT DETECTION SYSTEMS Shall Only be replaced with sensors specified by the appliance manufacture; and instructions to verify actuation of mitigation actions per Annex GG or Annex 101.DVN as applicable.

For appliances using FLAMMABLE REFRIGERANTS with safety features that depend upon the proper function of a leak detection system used for leak mitigation, the instructions and unit markings shall contain the substance of the following: "LEAK DETECTION SYSTEM installed. Unit must be powered except for service." If any remote located REFRIGERANT SENSOR is employed to detect leaked refrigerant, such a remote located REFRIGERANT SENSOR shall also apply to this marking or be accompanied by such instructions.

21. Transportation, marking and storage for units that employ flammable refrigerants
 - General: The following information is provided for units that employ FLAMMABLE REFRIGERANTS.
 - 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.
 - Marking of equipment using signs. Signs for similar appliances used in a work area are generally 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.
 - Disposal of equipment using flammable refrigerants. See national regulations.
 - Storage of equipment/appliances. The storage of the appliance should be in accordance with the applicable regulations or instructions, whichever is more stringent.
 - Storage of packed (unsold) equipment. Storage package protection should be constructed in such a way 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.

Table 4 — Symbols displayed on the indoor unit or outdoor unit

	WARNING	This symbol shows that this appliance used 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.

PRODUCT INSTALLATION WARNINGS

- Turn off the air conditioner and disconnect the power before performing any installation or repairing. Failure to do so can cause electric shock.
- Installation must be performed by an authorized dealer or specialist. Defective installation can cause water leakage, electrical shock, or fire.
- Installation must be performed according to the installation instructions.
- Improper installation can cause water leakage, electrical shock, or fire. Contact an authorized service technician for repair or maintenance of this unit.
- This appliance shall be installed in accordance with national wiring regulations.
- Only use the included accessories, parts, and specified parts for installation.
- Using non-standard parts can cause water leakage, electrical shock, fire, and can cause the unit to fail.
- Install the unit in a firm location that can support the unit's weight. If the chosen location cannot support the unit's weight, or the installation is not done properly, the unit may drop and cause serious injury and damage.
- Install drainage piping according to the instructions in this manual. Improper drainage may cause water damage to your home and property.
- For units that have an auxiliary electric heater, do not install the unit within 1 meter (3 feet) of any combustible materials.
- For the units that have a wireless network function, the USB device access, replacement, maintenance operations must be carried out by professional staff.
- Do not install the unit in a location that may be exposed to combustible gas leaks. If combustible gas accumulates around the unit, it may cause fire.
- Do not turn on the power until all work has been completed.

- When moving or relocating the air conditioner, consult experienced service technicians for disconnection and re-installation of the unit.
- How to install the appliance to its support, please read the information for details in “indoor unit installation” and “outdoor unit installation” sections.

TAKE NOTE OF FUSE SPECIFICATIONS

The air conditioner's circuit board (PCB) is designed with a fuse to provide overcurrent protection. The specifications of the fuse are printed on the circuit board, for example: T3.15AL/250VAC, T5AL/250VAC, T3.15A/250VAC, T5A/250VAC, T20A/250VAC, T30A/250VAC,etc.

NOTE: Only the blast-proof ceramic fuse can be used.

CLEANING AND MAINTENANCE WARNINGS

- Turn off the device and disconnect the power before cleaning. Failure to do so can cause electrical shock.
- **Do not** clean the air conditioner with excessive amounts of water.
- **Do not** clean the air conditioner with combustible cleaning agents. Combustible cleaning agents can cause fire or deformation.

FLAMMABLE REFRIGERANT USE WARNINGS

1. Installation (Space)
 - That the installation of pipe-work shall be kept to a minimum.
 - That pipe-work shall be protected from physical damage.
 - Where refrigerant pipes shall be compliance with national gas regulations.
 - That mechanical connections shall be accessible for maintenance purposes.
 - In cases that require mechanical ventilation, ventilation openings shall be kept clear of obstruction.
 - When disposing of the product is used, be based on national regulations, properly processed.
2. Servicing
 - Any person who is involved with working on or breaking into a refrigerant circuit should hold a current valid certificate from an industry-accredited assessment authority, which authorizes their competence to handle refrigerants safely in accordance with an industry recognized assessment specification.
3. 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.
4. Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer.
5. 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).
6. Be more careful that foreign matter (oil, water, etc) does not enter the piping. Also, when storing the piping, securely seal the opening by pinching, taping, etc.
7. Do not pierce or burn.
8. Be aware that refrigerants may not contain an odor.
9. All working procedure that affects safety means shall only be carried by competent persons.
10. Appliance shall be stored in a well -ventilated area where the room size corresponds to the room area as specific for operation.
11. The appliance shall be stored so as to prevent mechanical damage from occurring.

12. Joints shall be tested with detection equipment with a capability of 5 g/year of refrigerant or better, with the equipment in standstill and under operation or under a pressure of at least these standstill or operation conditions after installation. Detachable joints shall **NOT** be used in the indoor side of the unit (brazed, welded joint could be used).

NOTE: FUSE SPECIFICATIONS

The air conditioner's circuit board (PCB) may be designed with a fuse to provide overcurrent protection. This fuse must be replaced with identical component. The specifications of the fuse, if equipped, are printed on the circuit board, examples of such are T5A/250VAC and T10A/250VAC.

NOTE: FLUORINATED GASES (NOT APPLICABLE TO THE UNIT USING R290 REFRIGERANT)

This air-conditioning unit contains fluorinated greenhouse gases. For specific information on the type of gas and the amount, please refer to the relevant label on the unit itself or the “Owner's Manual - Product Fiche” in the packaging of the outdoor unit.

Installation, service, maintenance and repair of this unit must be performed by a certified technician. Product un-installation and recycling must be performed by a certified technician. When the unit is checked for leaks, proper record-keeping of all checks is strongly recommended.

The allowed static pressure range of the air conditioner on site is 0-0.80 in.wc.(0-200 Pa). The data below represents the static pressures at full required air flow used for AHRI testing.

Table 5 — Static Pressure Range

MODEL	18K-24K	30K-36K	48K-60K
PRESSURE (After January 1, 2023)	0.5 in.wc.(125Pa)		

NOTE: The maximum functional total external static pressure can not exceed 0.80 in.wc. or 200 Pa. The airflow reduces significantly beyond 0.80 in.wc. or 200Pa. System design should allow for the increased resistance of filters as they become dirty.

Room Size Restriction

The appliances are connected via an air duct system to one or more rooms, the bottom of the air outlet of the air duct in the room should be at a height.7.3ft/2.2m from the floor. In UL/CSA 60335-2-40, the R454B refrigerant belongs to mildly flammable refrigerants, which limits the room area of the system service. Similarly, the total amount of refrigerant in the system should be less than or equal to the maximum allowable refrigerant charge, which depends on the room area serviced by the system.

NOTE:

The nouns in this section are explained as follows:

- Mc: The actual refrigerant charge in the system.
- A: the actual room area where the appliance is installed.
- Amin: The required minimum room area.
- Mmax: The allowable maximum refrigerant charge in a room.
- Qmin: The minimum circulation airflow.
- Anvmin The minimum opening area for connected rooms.
- TAmin: The total area of the conditioned space (For appliances serving one or more rooms with an air duct system).
- TA: The total area of the conditioned space connected by air ducts.

Refrigerant Charge and Room Area Limitations

For the purpose of determination of room area (A) when used to calculate the maximum allowable refrigerant charge (mmax) in an unventilated space, the following shall apply.

The room area (A) shall be defined as the room area enclosed by the projection to the floor of the walls, partitions and doors of the space in which the appliance is installed.

Spaces connected by only drop ceilings, ductwork, or similar connections shall not be considered a single space.

For units mounted higher than 6.0ft/1.8m, spaces divided by partition walls which are no higher than 5.3ft/1.6m shall be considered a single space.

For fixed appliances, rooms on the same floor and connected by an open passageway between the spaces can be considered a single room when determining compliance to Amin, if the passageway complies with all of the following.

- It is a permanent opening.
- It extends to the floor.
- It is intended for people to walk through.

For fixed appliances, the area of the adjacent rooms, on the same floor, connected by permanent opening in the walls and/or doors between occupied spaces, including gaps between the wall and the floor, can be considered a single room when determining compliance to Amin, provided all of the following are met.

- The space shall have appropriate openings according to Sec.2.
- The minimum opening area for natural ventilation Anvmin shall not be less than listed in Table 6.

Table 6 — Opening Area

HEIGHT OF OUTLET, FT (M)	A, FT ² (M ²)	MC, LB (KG)	MAX, LB (KG)	ANVMIN, FT ² (M ²)
7.2 (2.2)	53.8 (5)	11.0 (5.0)	5.9 (2.7)	0.48 (0.045)
	64.5 (6)		6.4 (2.9)	0.45 (0.042)
	75.3 (7)		7.0 (3.2)	0.41 (0.038)
	86.1 (8)		7.5 (3.4)	0.38 (0.035)
	96.9 (9)		7.9 (3.6)	0.33 (0.031)
	107.6 (10)		8.4 (3.8)	0.30 (0.028)
	118.4 (11)		8.6 (3.9)	0.26 (0.024)
	129.2 (12)		9.3 (4.2)	0.21 (0.020)
	139.9 (13)		9.5 (4.3)	0.17 (0.016)
	150.7 (14)		9.9 (4.5)	0.14 (0.013)
	161.5 (15)		10.1 (4.6)	0.10 (0.009)
	172.2 (16)		10.6 (4.8)	0.05 (0.005)
	183 (17)		10.8 (4.9)	0.01 (0.001)

NOTE: Take the $Mc = 11 \text{ lb (5 kg)}$ as an example. For appliances serving one or more rooms with an air duct system, the room area calculation shall be determined based on the total area of the conditioned space (TA) connected by ducts taking into consideration that the circulating airflow distributed to all the rooms by the appliance integral indoor fan will mix and dilute the leaking refrigerant before entering any room.

Opening Conditions for Connected Rooms

When the openings for connected rooms are required, the following conditions shall be applied.

- The area of any openings above 300mm from the floor shall not be considered in determining compliance with Anvmin.
- At least 50% of the required opening area Anvmin shall be below 200mm from the floor.
- The bottom of the lowest openings shall not be higher than the point of release when the unit is installed and not more than 100mm from the floor.
- Openings are permanent openings which cannot be closed.
 - For openings extending to the floor the height shall not be less than 20mm above the surface of the floor covering
- A second higher opening shall be provided. The total size of the second opening shall not be less than 50% of minimum opening area for Anvmin and shall be at least 1.5 m above the floor.

NOTE: The requirement for the second opening can be met by drop ceilings, ventilation ducts, or similar arrangements that provide an airflow path between the connected rooms.

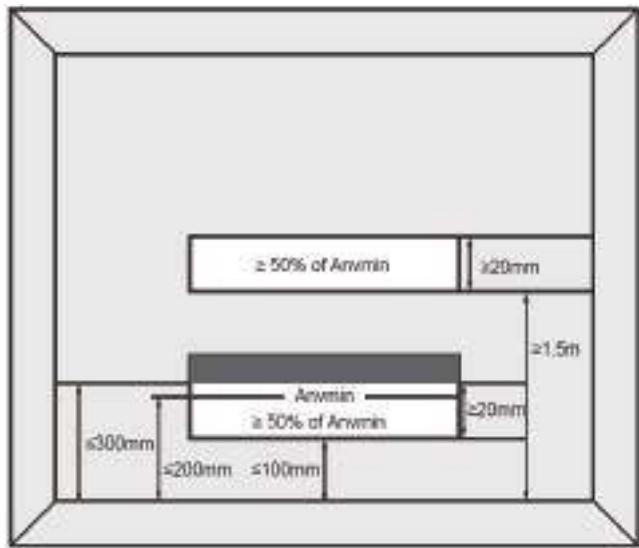


Fig. 2 — AnvMin

- The room into which refrigerant can leak, plus the connected adjacent room(s) shall have a total area of not less than TAmin.
- The room area in which the unit is installed shall be not less than 20% TAmin.

R454B Refrigerant Charge Amount and Minimum Room Area:

The machine you purchased may be one of the 3 sizes in Table 7. The indoor and outdoor units are designed to be used together. Check the unit you purchased. The minimum room area of operating or storage should be as specified in Table 2 on page 5.

Table 7 — Compatible Indoor / Outdoor Units

SIZE	INDOOR UNIT	OUTDOOR UNIT
18K	D5FUHAH24AAK	D5CUAH18AAK
24K		D5CUAH24AAK
30K	D5FUHAH36AAK	D5CUAH30AAK
36K		D5CUAH30AAK
48K	D5FUHAH60AAK	D5CUAH48AAK
60K		D5CUAH60AAK

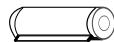
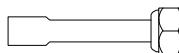
NOTE: Additional refrigerant for the indoor unit might be required based on the outdoor unit, please refer to the Outdoor Manual.

NOTE: Wiring Diagram, Capacity Setting has more instructions regarding dual capacity settings of each Air Handler.

ACCESSORIES

The system is shipped with the following accessories. Use all of the installation parts and accessories to install the system. Improper installation may result in water leakage, electrical shock and fire, or cause the equipment to fail. Keep the installation manual in a safe place and do not discard any other accessories until the installation has been completed.

Table 8 — Accessories

NAME	SHAPE	QUANTITY
Manual		2
Cable ties		4
Insulation Sleeve		2
Flare Nut		2
Braze to flare adapter		2
Remote Controller		1
Remote Controller Holder		1
Batteries		2
Wired Remote Controller (purchase separately)		1
Zip ties (type B)		2
Insulator tape		1
24V Connection Cable to 3rd Party Condenser		1
CN15 24V output harness		1

NOTE: The wired system control functions as an IR receiver for the handheld remote. If the remote is not used, it must be retained with the indoor unit to adjust parameters, and for troubleshooting.

PRODUCT OVERVIEW

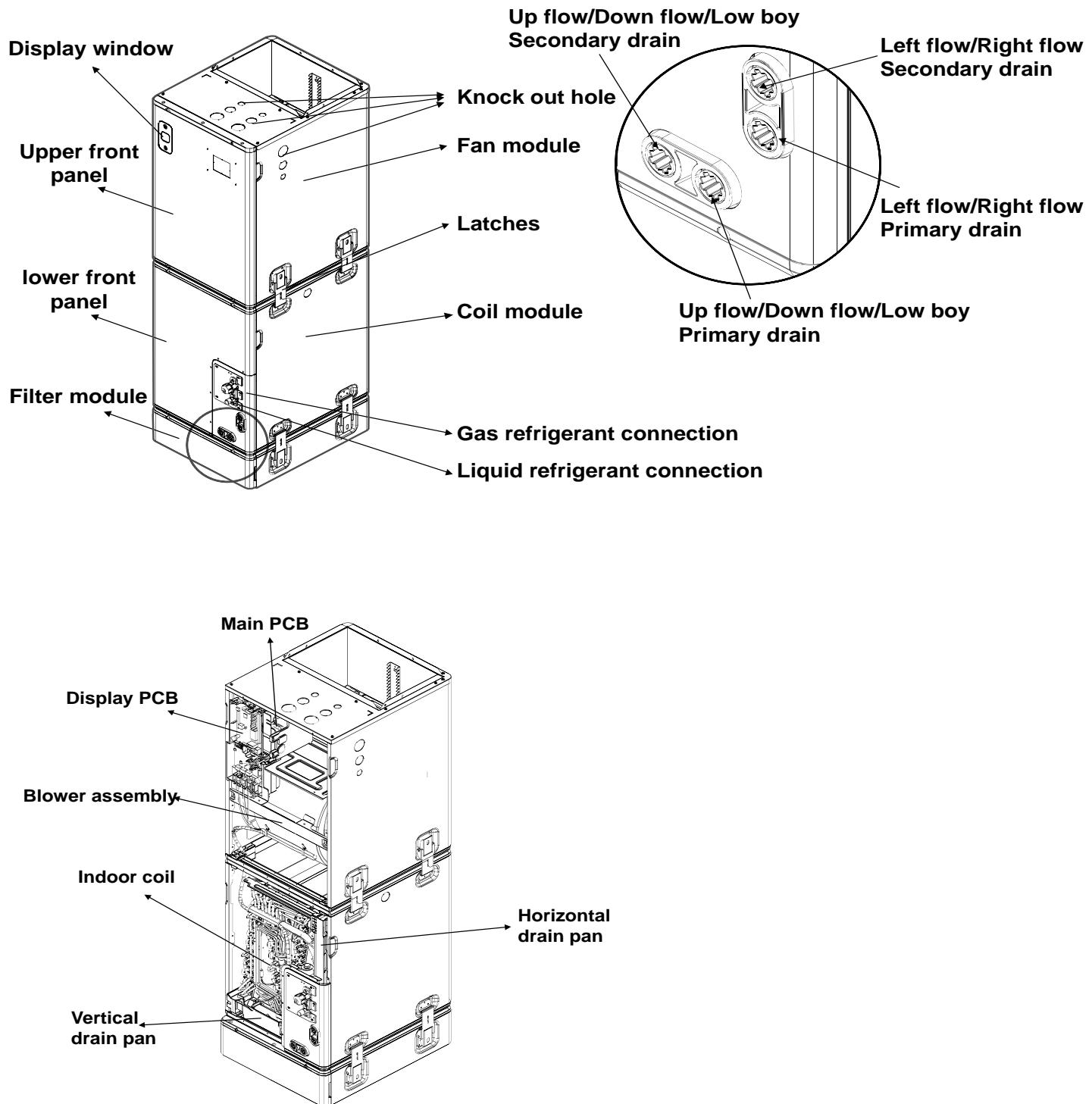


Fig. 3 — Product Overview

STEP 1 - INDOOR UNIT INSTALLATION

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

Select the installation location for the indoor units



WARNING DO NOT LOCATIONS:



DO NOT install the indoor unit in a moist environment. Excessive moisture can corrode the equipment, electrical components, and cause electrical shorts.



Areas with strong electromagnetic waves.



Coastal areas with high salt content in the air.



Areas with oil drilling or fracking.



Areas that store flammable materials or gas.



Areas where there may be detergent or other corrosive gases in the air, such as bathrooms, or laundry rooms.



Areas where the air inlet and outlet may be obstructed.



Danger of explosion. Keep flammable materials and vapors, such as gasoline, away from air handler.

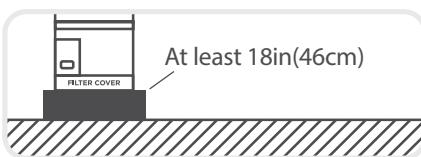


WARNING MUST BE INSTALLED IN A LOCATION THAT MEETS THE FOLLOWING REQUIREMENTS:

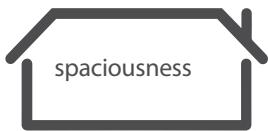
A stable position



Securely install the indoor unit on a structure that can support its weight. If the structure is too weak, the unit may fall and cause personal injury, unit and property damage, or death.



Place air handler so that heating elements are at least 18 inches (46 cm) above the floor for a garage installation. Failure to follow these instructions can result in death, explosion, or fire.



spaciousness

Enough room for installation and maintenance.

Enough room for the connecting pipe and drainpipe.

Must support the weight of the indoor unit.

The structure that the equipment is suspended from must support the weight of the indoor unit.

PREPARATION AND PRECAUTIONS FOR THE INDOOR UNIT INSTALLATION



WARNING

Prior to Installation

Before installing the indoor unit, ensure the compatibility with the outdoor unit using the product data as a reference. It is also necessary to confirm the proper application of the equipment and to perform a heat load calculation for proper sizing.

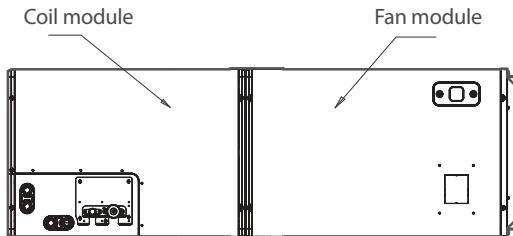


Fig. 4 — Coil Module and Fan Module



WARNING

Apply sealant around the places where the wires, refrigerant pipes and condensate pipes enter the cabinet.

Use duct tape or flexible sealant to seal closed any space around the holes where the drain lines exit the cabinet. Warm air must not be allowed to enter through any gaps or holes in the cabinet.

of vibration/noise into the conditioned space. Where the return air duct is short, or where sound is liable to be a problem, sound absorbing glass fiber should be used inside the duct. Insulation of duct work must be installed according to local codes and best practices.

The supply air duct should be properly sized by use of a transition to match unit opening. This unit is not designed for non-ducted (free blow) applications.

NOTE: Duct work should be fabricated and installed in accordance with local and/or national codes.

Recommended Distances Between the Indoor Unit

The distance between the mounted indoor unit should meet the specifications illustrated in Figure 6.

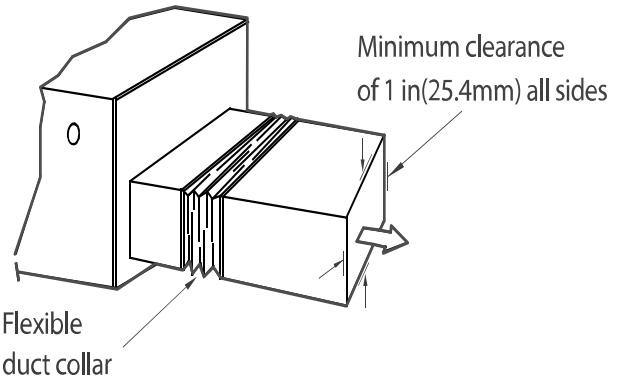


Fig. 6 — Specifications

Vertical Installations

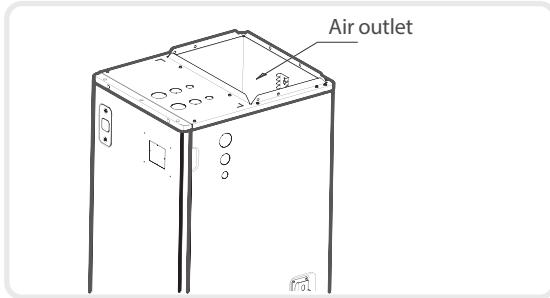


Fig. 5 — Air Outlet

NOTE: Remove all accessories and packing in the air outlet before installation.

Ductwork Acoustical Treatment

Metal duct systems that do not have a 90 degree elbow and 10ft (3m) of main duct to the first branch takeoff may require an internal acoustical insulation lining. As an alternative, fibrous ductwork may be used if constructed and installed in accordance with the latest edition of the SMACNA construction standard on fibrous glass ducts. Both acoustical lining and fibrous ductwork shall comply with the National Fire Protection Association as tested by UL Standard 181 for Class 1 air ducts. The air supply and return may be handled in one of several ways; whichever situation is best suited for the installation). A large number of issues encountered with split-system installations can be linked to improperly designed or installed duct systems. It is therefore very important that the duct system be properly designed and installed. Use of flexible duct collars is recommended to minimize the transmission



Fig. 7 — Vertical Installations

Securing Instructions: When installed vertically (upward or downward), the lower end of the air outlet needs to be connected to the L-shaped metal air duct and fastened by screws. If return air is to be ducted, install duct flush with floor. Set the unit on the floor over the opening. All return air must pass through the coil.

Indoor Unit Parts Installation Size

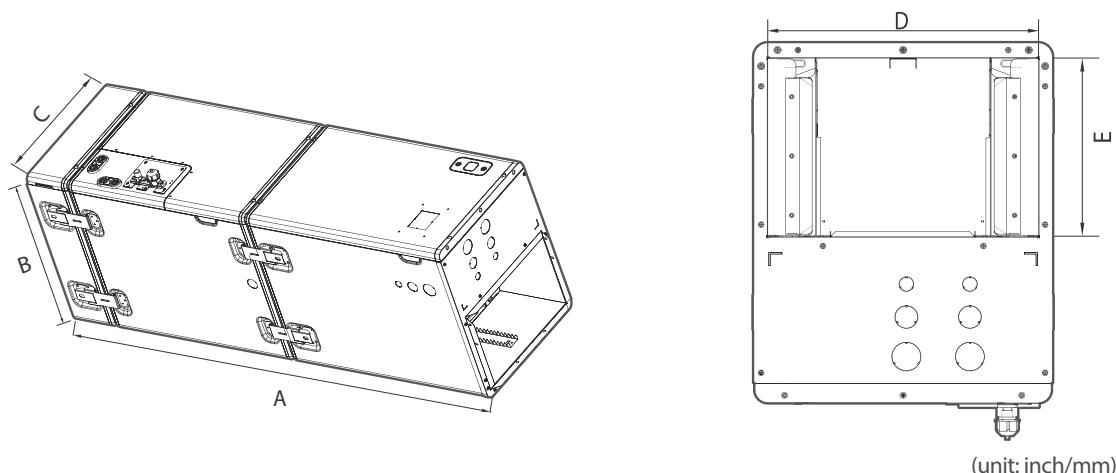


Fig. 8 — Indoor Unit Dimensions

Table 9 — Indoor Unit Dimensions

MODEL (BTU/H) DIMENSIONS		18K-24K	30K-36K	48K-60K
A	inch	53-7/8	58-1/8	60-1/8
	mm	1368	1476	1526
B	inch	21-1/2	21-1/2	21-1/2
	mm	546	546	546
C	inch	14-1/2	17-1/2	21-1/2
	mm	368	445	546
D	inch	13	13	20
	mm	330	407	508
E	inch	10-1/4	10-1/4	10-1/4
	mm	273	273	273

Actual dimensions of applied filters can't exceed the size in Table 10.

Table 10 — Applied Filter Dimensions

	WIDTH (IN)	DEPTH (IN)	THICKNESS (IN)
18K-24K	12	20	1 or 2 or 4
30K-36K	16	20	
48K-60K	20	20	

NOTE: The user needs to use a standard filter that meets the requirements of UL900. For questions about the selection of filters, consult the manufacturer.

Lowboy Duct Size (Applied for Lowboy Application)

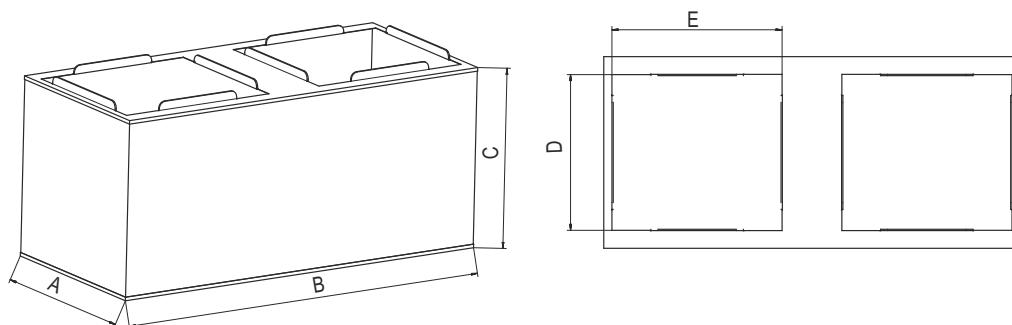


Fig. 9 — Lowboy Duct Application

Table 11 — Lowboy Duct Dimensions

		A	B (REFERENCE)	C	D	E
18K,24K	inch	≥22	≥ 38-1/2	≥14-1/2	18	12-3/4
	mm	≥560	≥ 980	≥368	455	324
30K,36K	inch	≥22	≥ 40	≥17-1/2	18	15-3/4
	mm	≥560	≥ 1018	≥445	455	398
48K,60K	inch	≥22	≥ 48	≥21-1/2	18	19-1/2
	mm	≥560	≥ 1218	≥546	455	495

Installation Position Requirements

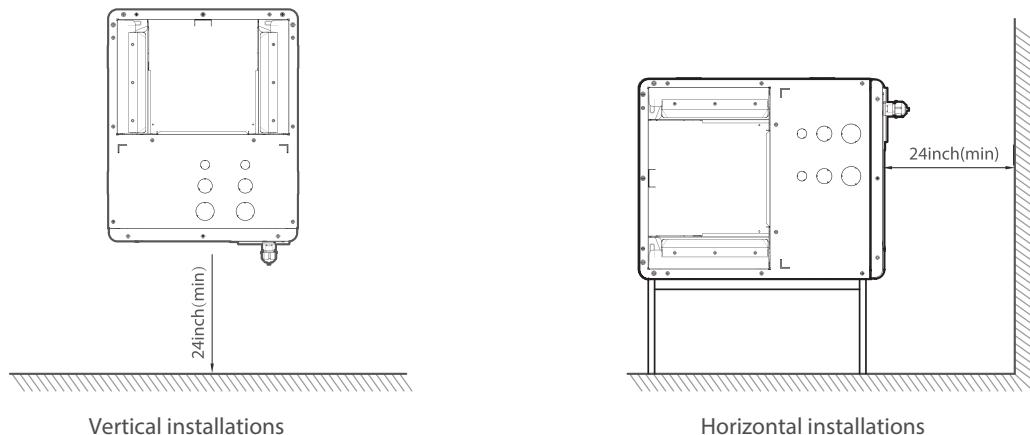


Fig. 10 — Installation Position Requirements

All fan coils have a DC fan motor with variable speeds for efficiency. The units have been designed for up-flow, down-flow, and horizontal orientations., including manufactured and mobile home applications.



NOTICE FOR DUCT CONNECTIONS :



It should be assembled accordance to the instructions.



It should be insulated and use a Vapor Barrier.



It should be Flexible suspension mounted and not fastened



It should be fabricated and installed in accordance with local and/or national codes.

More Requirements

- Air supply and return may be handled in one of several ways best suited to the installation (See table for dimensions for duct inlet and outlet connections). The vast majority of problems encountered with combination cooling systems can be linked to improperly designed or installed duct systems. It is therefore highly important to the success of an installation that the duct system be properly designed and installed. Use flexible duct collars to minimize the transmission of vibration/noise into the conditioned space. Where return air duct is short, or where sound could potentially be a problem, sound absorbing liner should be used inside the duct.
- Duct must be insulated where it runs through an unconditioned space during the cooling season. The use of a vapor barrier is recommended to prevent absorption of moisture from the surrounding air into the insulation.
- The supply air duct connection should be properly sized by use of a transition to match unit opening.
- All ducts should be suspended using flexible hangers and never fastened directly to the structure. This unit is not designed for nonducted (freeblow) applications.
- Duct work should be fabricated and installed in accordance with local and/or national codes.

⚠ CAUTION

A field-fabricated secondary drain pan, with a drain pipe to the outside of the building, is required in all installations over a finished living space or in any area that may be damaged by overflow from the main drain pan. In some localities, local codes may require a secondary drain pan for any horizontal installation.

STEP 2 - SELECT INSTALLATION DIRECTION

Different Installation Directions

The units can be installed in a vertical (down and up) and horizontal (right and left) configuration.

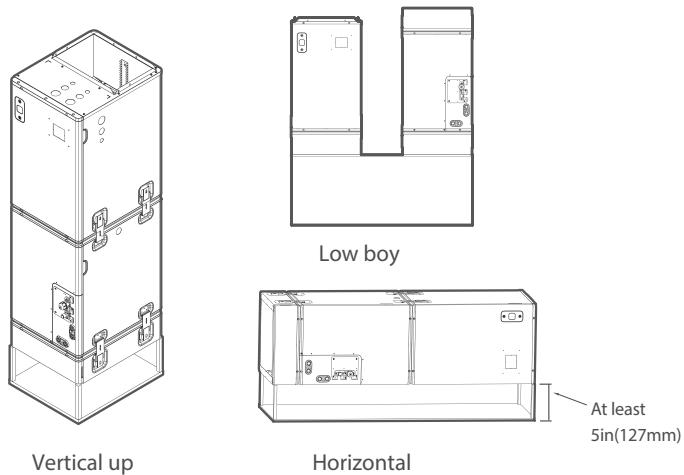


Fig. 11 — Different Installation Directions

NOTE: For horizontal installation, a secondary drain pan (not supplied) must be installed.

Airflow Direction For Different Installation Directions

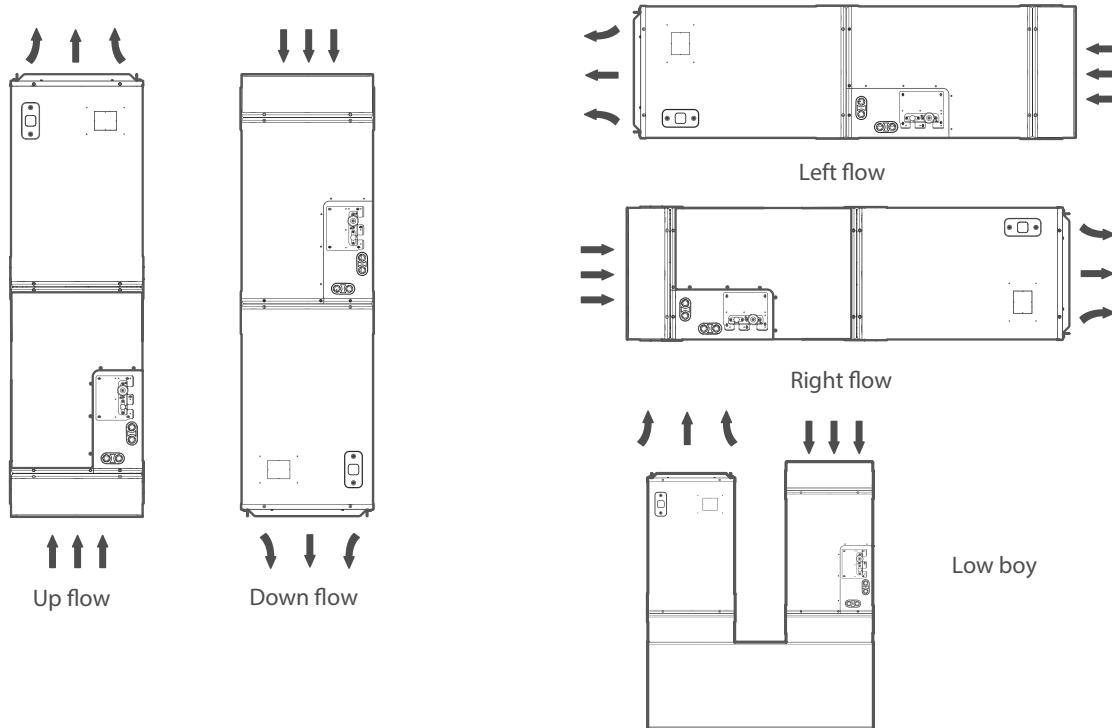
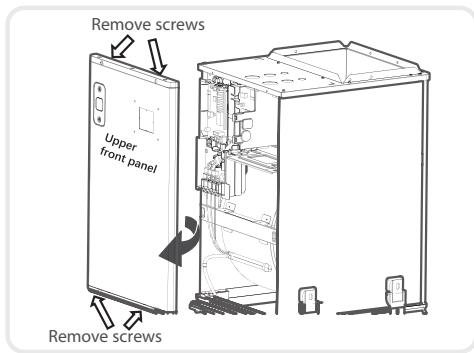


Fig. 12 — Airflow Direction For Different Installation Directions

NOTE: Vertical up and horizontal left installation does not need to change the direction of evaporator.

STEP 3 - CONNECTING THE WIRE, PIPES, AND DRAINAGE PIPES

Follow these steps to perform Vertical down installation and Horizontal right installation:



Step 1

Remove the four screws and open the upper front panel.

Step 2

Connect the wire according to the wiring diagram.

Step 3

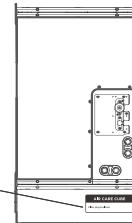
Connect the pipes and install the drainage pipes.

Step 4

Tape the label on the filter box.

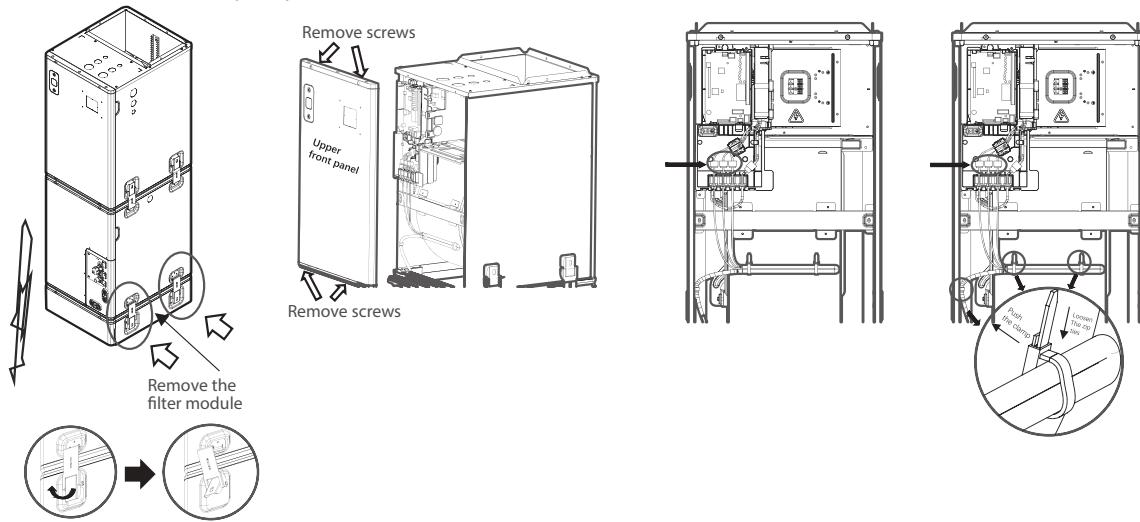


Labeling direction



Down flow and horizontal left instructions

Please follow these steps to perform Down flow installation and Left flow installation:



Step 1

Unlock the 4 latches and remove the filter module.

Step 2

Remove the four screws and open the upper front panel.

Step 3

Disconnect the connectors.

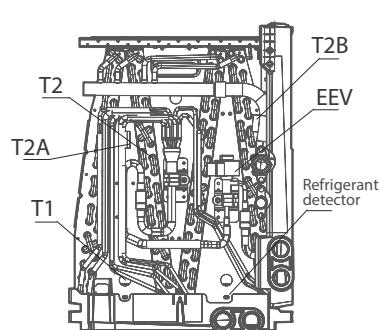
Step 4

Loosen three zip ties (reusable zip ties).

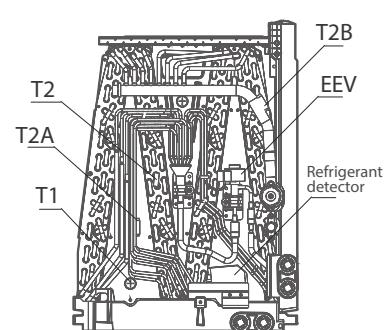
Step 5

Indication of the position of each temperature sensor of the evaporator:

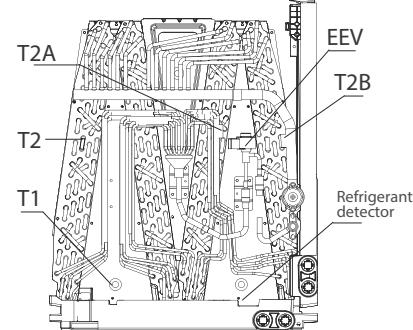
18-24K model



36K model

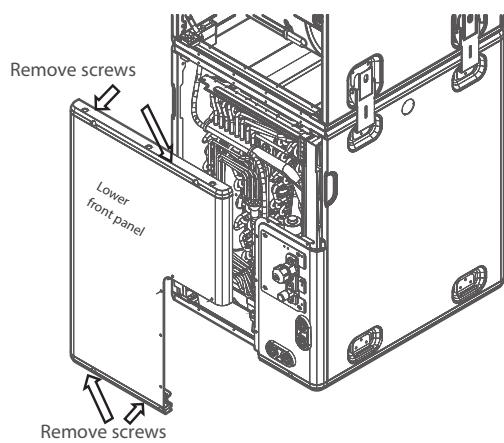


48-60K model



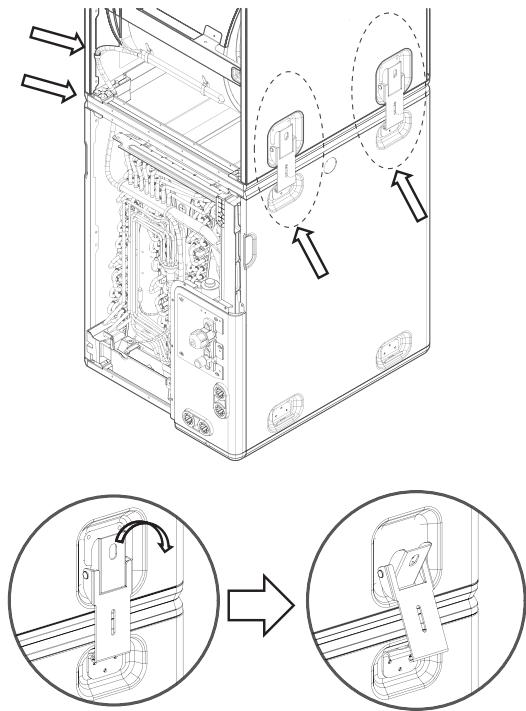
Step 6

Remove the four screws and open the lower front panel.



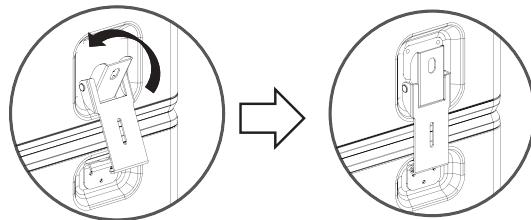
Step 7

Unlock the 4 latches.



Step 8

Turn the fan module 180 degree and put it under the coil module. Re-lock the 4 latches.

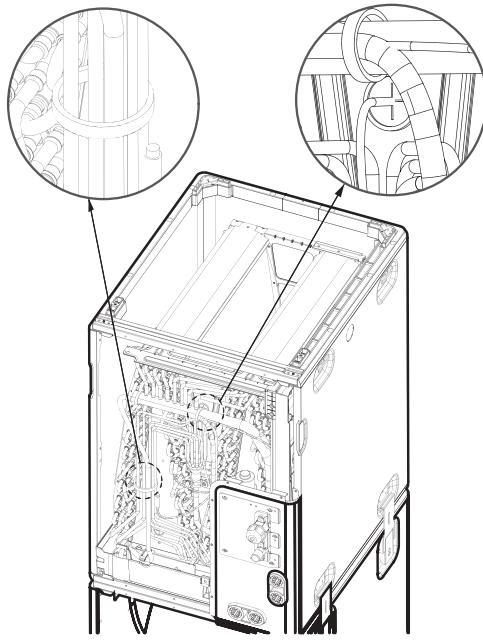


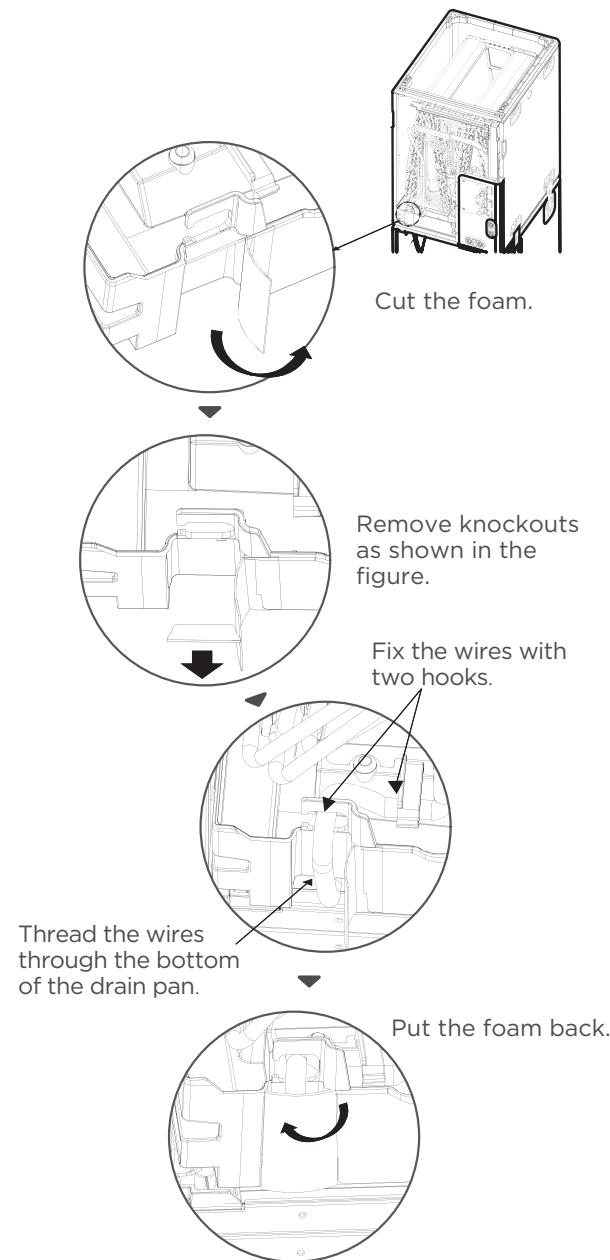
Step 9

Relocate the wires in the coil module.

Tie the wires with
a zip tie(Type A)

T1 new location





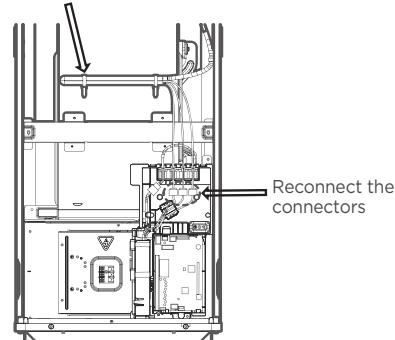
NOTICE

The wire body needs to pass through the wire groove from the drain pan and be stuck on the hook of the drain pan.

Step 10

Relocate the wires in the fan module.

Fix the wires with the zip tie of fan housing.

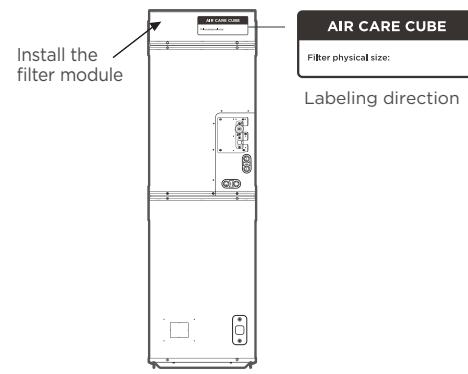


Step 11

Connect the wire according to the wiring diagram.

Step 12

Reassemble the upper and lower front panel, Install the filter module. Tape the label on the filter box.



Low boy installations

Step 1~6

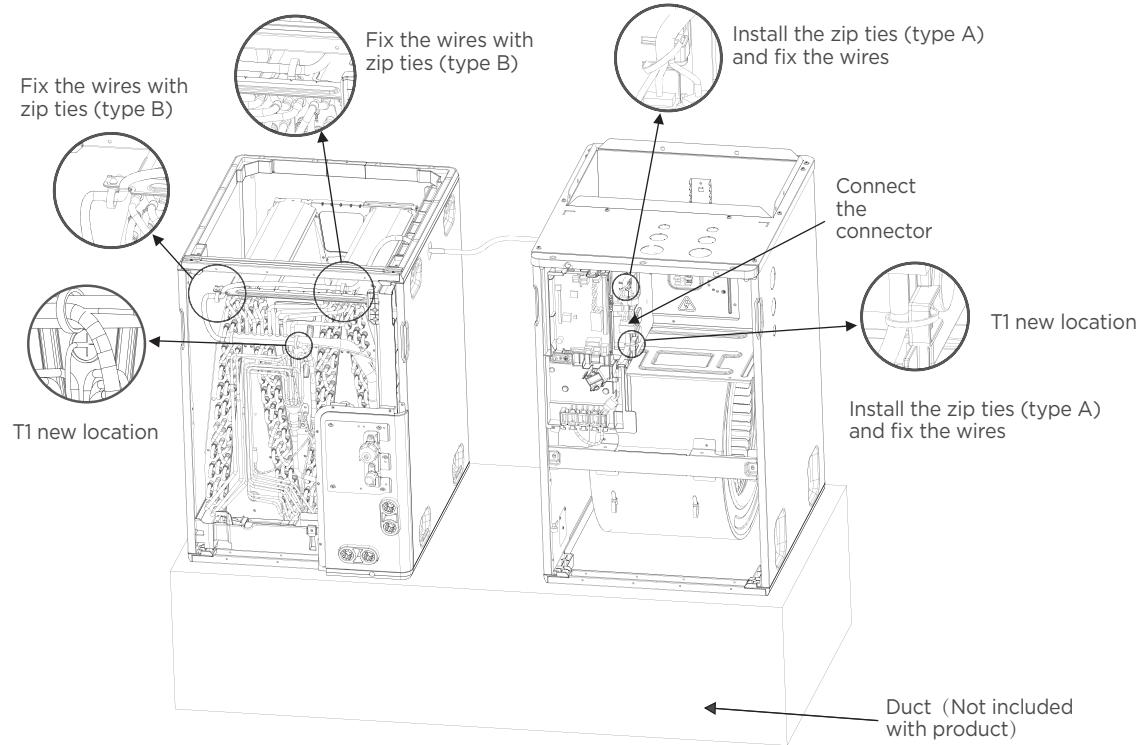
Refer to down flow and horizontal left instructions.

Step 7

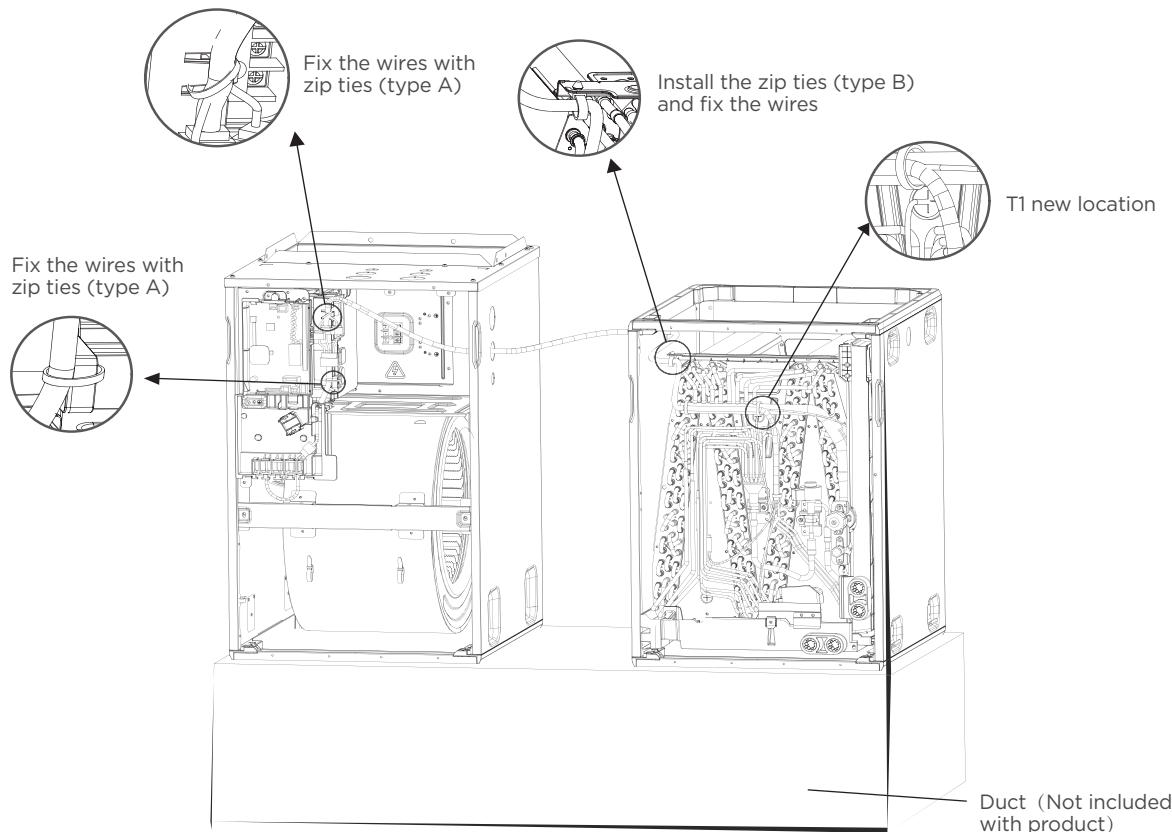
Remove the screws and 4 latches on the fan module.

Step 8

Fix the wires according the picture below if the fan module is on the right side.



Fix the wires according the picture below if the fan module is on the left side.



Step 9

Connect the wire according to the wiring diagram.

Step 10

Reassemble the upper and lower front panel.

⚠ CAUTION FOR ALL PIPES INSTALLATION

- The drainpipe is used to drain water away from the unit. If the drainpipe is bent or installed incorrectly, water may leak and cause a water-level switch malfunction.
- In HEAT mode, the outdoor unit will discharge water. Ensure that the drain hose is placed in an appropriate area to avoid water damage and icy conditions on walkways.
- **DO NOT** pull the drainpipe forcefully. This could disconnect it.

● NOTICE

If installed above a finished living space, a secondary drain pan (as required by many building codes), must be installed under the entire unit and its condensate drain line must be routed to a location such that the user will see the condensate discharge.



CAUTION

FOR ALL PIPES INSTALLATION

Insulate all piping to prevent condensation, which could lead to water damage. The drainpipe is used to drain water away from the unit. If the drainpipe is bent or installed incorrectly, water may leak and cause a water-level switch malfunction. In **HEAT** mode, the outdoor unit discharges water. Ensure the drain hose is placed in an appropriate area to avoid water damage and icy conditions on walkways.

DO NOT pull the drainpipe forcefully; doing so could disconnect it.

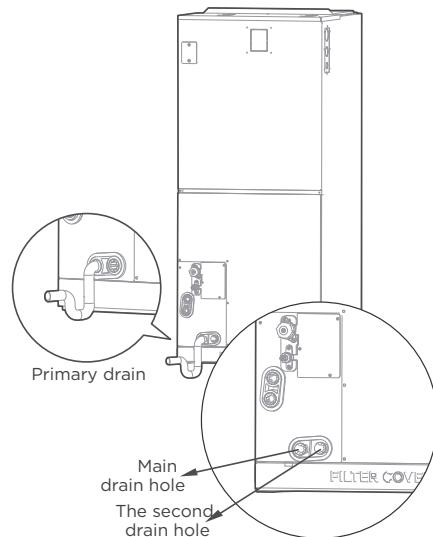


Fig. 13 — Vertical Discharge

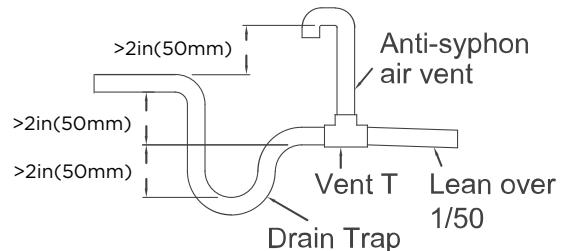


Fig. 14 — Drain Trap

NOTE: Horizontal runs must also have an anti-siphon air vent (standpipe) install ahead of the horizontal run to eliminate air trapping.



WARNING

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.



WARNING

After removal of drain pan plug(s), check drain hole(s) to verify that drain opening is fully open and free of any debris. Also check to ensure that no debris has fallen into the drain pan during installation that may plug up the drain opening.

Seal around the exiting drain pipe, liquid and suction lines to prevent infiltration of humid air.

On units of this type, where the blower “draws” rather than “blows” air through the coil, traps must be installed in the condensate drain lines (primary and auxiliary, if used).

Traps prevent the blower from drawing air through the drain lines into the air supply.

NOTE ON DRAINPIPE INSTALLATION

- Figure 13 shows how to trap or plug all drains during vertical discharge.
- Figure 14 shows how to trap or plug all drains during right-hand discharge.
- The seal plug are supplied as accessories and should be screwed tightly only by hand.
- Incorrect installation could cause water to flow back into the unit and flood.



CAUTION

The drainpipe outlet should be at least 1.9in(5cm) above the ground. If the outlet touches the ground, the unit may become blocked and malfunction.

Vertical Installations

These units operate with a negative pressure at the drain connections and a drain trap is **required**. Install the trap as close as possible to the unit. Ensure the top of the trap is below the connection to the drain pan to allow complete drainage of the pan.

REFRIGERANT PIPING CONNECTION



WARNING

All field piping must be completed by a licensed technician and must comply with the local and national regulations.

When the air conditioner is installed in a small room, measures must be taken to prevent the refrigerant concentration in the room from exceeding the safety limit in the event of refrigerant leakage.

If the refrigerant leaks and its concentration exceeds its proper limit, hazards due to lack of oxygen may result.

When installing the refrigeration system, ensure that air, dust, moisture or foreign substances do not enter the refrigerant circuit. Contamination in the system may cause poor operating capacity, high pressure in the refrigeration cycle, explosion or injury.

Ventilate the area immediately if there is refrigerant leakage during the installation. Leaked refrigerant gas is both toxic and may be flammable. Ensure there is no refrigerant leakage after completing the installation work.

Pipe Length and Elevation

Table 12 — Maximum Length and Drop Height Based on Models (Unit: ft./m)

CAPACITY (BTU/H)	MAXIMUM PIPING LENGTH		MAXIMUM DROP HEIGHT	
	ft.	m	ft.	m
18K/24K/30K	164	50	82	25
36K	213.2	65	98.4	30
48K/60K	246	75	98.4	30

Ensure that the length of the refrigerant pipe, the number of bends, and the drop height between the indoor and outdoor units meets the requirements (see Table 12).

Table 13 — Pipe Specifications

NAME	MODEL	PIPE SPECIFICATION		REMARK
		LIQUID SIDE	GAS SIDE	
Connecting pipe assembly	18K	Ø3/8in(Ø9.52mm)	Ø3/4in(Ø19mm)	Pipes are not included in the accessories and you need to purchase it separately from the local dealer.
	24K	Ø3/8in(Ø9.52mm)	Ø3/4in(Ø19mm)	
	30K	Ø3/8in(Ø9.52mm)	Ø3/4in(Ø19mm)	
	36K	Ø3/8in(Ø9.52mm)	Ø3/4in(Ø19mm)	
	48K	Ø3/8in(Ø9.52mm)	Ø3/4in(Ø19mm)	
	60K	Ø3/8in(Ø9.52mm)	Ø3/4in(Ø19mm)	

STEP 4 - REFRIGERANT PIPING

Table 14 — Refrigerant Piping

AIR HANDLER UNIT MODEL	AIR HANDLER UNIT CONNECTION (IN.FLARE)		ADAPTER REQUIRED AT AIR HANDLER UNIT (IN. FLARE TO BRAZE)
18K to 60K	Liquid	3/8	3/8 flare → 3/8 braze
	Gas	3/4	3/4 flare → 3/4 braze

Use the following steps to connect the refrigerant piping:

1. Run the interconnecting piping from the outdoor unit to the indoor unit.
2. Connect the refrigerant piping and drain line outside the indoor unit. Complete the pipe insulation at the flare connection then fasten the piping and wiring to the wall as required. Completely seal the hole in the wall.
3. Cut tubing to correct length.

When preparing refrigerant pipes, take extra care to cut and flare them properly. This ensures efficient operation and minimizes the need for future maintenance.

- a. Measure the distance between the indoor and outdoor units.
- b. Using a pipe cutter, cut the pipe a little longer than the measured distance.
- c. Ensure the pipe is cut at a perfect 90° angle.

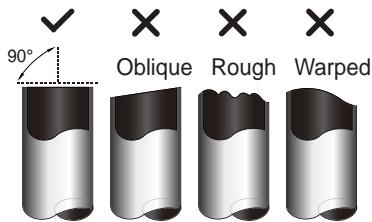


Fig. 15 — Pipe Cutting

4. Remove Burrs

Burrs can affect the air-tight seal of the refrigerant piping connection. Therefore, they must be completely removed. To remove:

- a. Hold the pipe at a downward angle to prevent burrs from falling into the pipe.
- b. Using a reamer or deburring tool, remove all burrs from the cut section of the pipe.

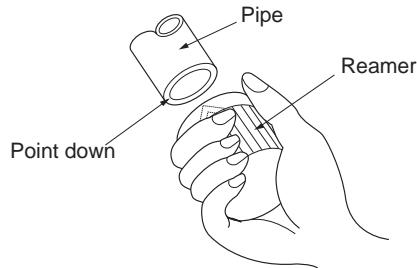


Fig. 16 — Deburring tool

5. Flare Pipe Ends

Proper flaring is essential to achieving an airtight seal.

- After removing the burrs from the cut pipe, seal the ends with PVC tape to prevent foreign materials from entering the pipe.
- Sheath the pipe with insulating material.
- Place flare nuts on both ends of the pipe. Ensure they are facing the right direction. Once the ends are flared, it is impossible to put them on or change their direction.

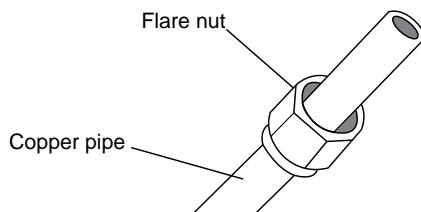


Fig. 17 — Copper pipe and flare nut

- Remove the PVC tape from ends of pipe when ready to perform the flaring work.
- Clamp the flare block on the end of the pipe. The end of the pipe must extend beyond the flare form.
- Place the flaring tool onto the form.
- Turn the handle of the flaring tool clockwise until the pipe is fully flared. Flare the pipe in accordance with the dimensions in Table 15.
- Remove the flaring tool and flare block, then inspect the end of the pipe for cracks and even flaring.

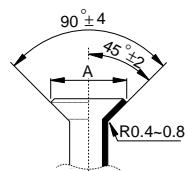


Fig. 18 — Flare shape

Table 15 — Flare Nut Spacing

Pipe Gauge	Tightening Torque	Flare Dimension (A) (Unit: MM/Inch)	
		Min	Max
3/8 in (Ø9.52)	25-25 N.m (18-19 ft-lb)	13.2 / 0.52	13.5 / 0.53
3/4 in (Ø19)	65-67 N.m (48-49 ft-lb)	23.2 / 0.91	23.7 / 0.93
7/8 in (Ø22)	75-85 N.m (55-63 ft-lb)	26.4 / 1.04	26.9 / 1.06

- Connect the copper pipes to the outdoor unit first, then connect the pipes to the indoor unit. Connect the low-pressure pipe first, then connect the high pressure pipe.
- When connecting the flare nuts, apply a thin coat of refrigeration oil to the flared ends of the pipes.
- Align the center of the two pipes that you will connect.

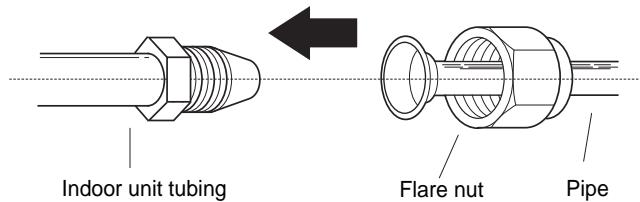


Fig. 19 — Align the center of the two pipes

- Tighten the flare nut as much as possible by hand.
- Using a wrench, grip the nut on the unit tubing.
- While firmly gripping the nut, use a torque wrench to tighten the flare nut. See Table 15.

NOTE: Use both a backup wrench and a torque wrench when connecting or disconnecting pipes to or from the unit.

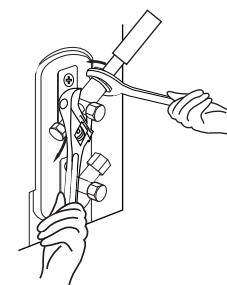


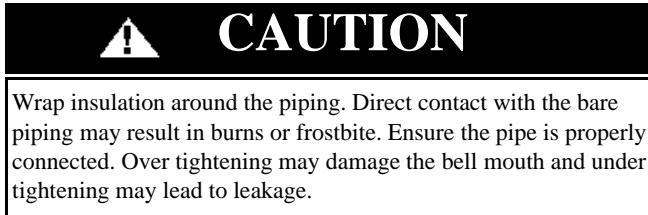
Fig. 20 — Torque wrench with backup wrench

All tubing bends should be performed with a properly sized tubing bender to prevent kinking or damaging the tubing.

- After connecting the copper pipes to the outdoor unit, wrap the power cable, signal cable and the piping together with binding tape.

NOTE: While bundling these items together, DO NOT intertwine or cross the signal cable with any other wiring.

13. Thread this lineset through the wall to connect to the indoor unit.
14. Refer to the liquid line and gas line connection O.D. sizes in Table 14 based on the model being installed. Cut and deburr the tubing (review "Remove Burrs" on page 27) to prepare it for brazing. Setup the nitrogen apparatus and connect to the outside unit to flow nitrogen while brazing. Braze the tubing and any fittings to obtain a proper seal.
15. Adjust the nitrogen apparatus to pressurize the system. Pressure test the system to a maximum of 500 psig for at least 60 minutes.
16. Insulate suction line completely, including the outdoor unit valves.



17. Braze Adapter (Optional)

When flare to braze adapter is used, follow these steps:

- a. Refer to the liquid line and gas line connection O.D. sizes in Table 14 based on the model being installed. Cut and deburr the tubing (review "Remove Burrs on page 27.") to prepare it for brazing. Setup the nitrogen apparatus and connect to the

Table 16 — Units Without Electrical Heat

Unit Size	Volts- Phase	Rated Current	MCA Minimum Circuit Ampacity	Branch Circuit	
				Min Wire Size AWG	Fuse/CKT BKR Amps
18K	115/208/230-1	115V: 6.0A, 208/230V: 4.0A	115V: 8.0A, 208/230V: 5.5A	14#	115V: 15A, 208/230V: 15A
24K		115V: 6.0A, 208/230V: 4.0A	115V: 8.0A, 208/230V: 5.5A		115V: 15A, 208/230V: 15A
30K		115V: 7.5A, 208/230V: 4.5A	115V: 10.0A, 208/230V: 6.0A		115V: 15A, 208/230V: 15A
36K		115V: 7.5A, 208/230V: 4.5A	115V: 10.0A, 208/230V: 6.0A		115V: 15A, 208/230V: 15A
48K		115V: 14.0A, 208/230V: 8.5A	115V: 17.5A, 208/230V: 11.0A		115V: 20A, 208/230V: 15A
60K		115V: 14.0A, 208/230V: 8.5A	115V: 17.5A, 208/230V: 11.0A		115V: 20A, 208/230V: 15A

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

NOTE: The specification may be different between different models, please refer to indoor unit's nameplate. Choose the cable type according to the local electrical codes and regulations. Please choose the right cable size according to the Minimum Circuit Ampacity indicated on the nameplate of the unit.

Table 17 — Selection of Available Sizes

		Heater Unit Models					
Outdoor Unit Model	Indoor Unit Models	EHKMD05KN	EHKMD08KN	10kWEHKMD10KN	EHKMD15KN	EHKMD20KN	EHKMD25KN
D5CUHAH18AAK	D5FUHAH24XAK	Y	Y	Y	-	-	-
D5CUHAH24AAK		Y	Y	Y	Y	-	-
D5CUHAH30AAK	D5FUHAH36XAK	Y	Y	Y	Y	-	-
D5CUHAH36AAK		Y	Y	Y	Y	Y	-
D5CUHAH48AAK	D5FUHAH60XAK	-	Y	Y	Y	Y	-
D5CUHAH60AAK		-	-	Y	Y	Y	Y

NOTE: Only use matched modules certified for use with model. Refer to the Electric Auxiliary Heat Model specification for additional details to ensure proper selection and installation.

NOTE: This heater cannot be powered from a 115 volt circuit. Separate 208/230 volt power must be supplied to the electric heaters for 115 volt applications.

NOTE: If the unit needs to be equipped with the electric auxiliary heat module, check the electric auxiliary heat module specification that is compatible with the unit to avoid unnecessary consequences caused by improper matching and refer to the Product Data manual.

outside unit to flow nitrogen while brazing. Braze the tubing and any fittings to obtain a proper seal.

- b. Adjust the nitrogen apparatus to pressurize the system. Pressure test the system to a maximum of 500 psig for at least 60 minutes.
- c. Insulate suction line completely, including the outdoor unit valves.

NOTE: MINIMUM BEND RADIUS: Carefully bend the tubing in the middle according to Figure 21. DO NOT bend the tubing more than 90° or more than 3 times.

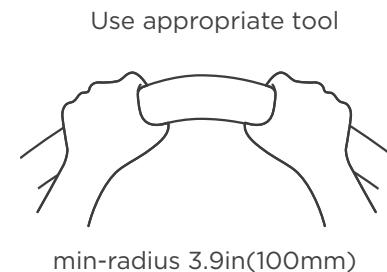
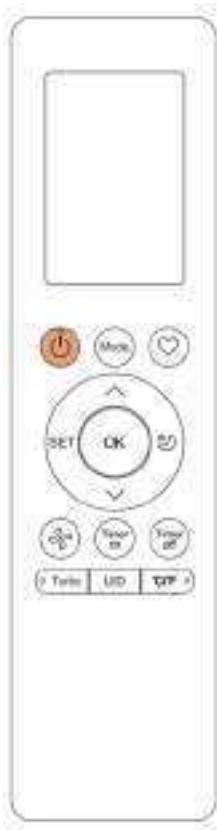


Fig. 21 — Minimum Bend Radius

- d. After connecting the copper pipes to the indoor unit, wrap the power cable, signal cable and the piping together with binding

WIRELESS REMOTE CONTROLLER INSTALLATION



**Fig. 22 — Wireless Remote Controller (RG10F8(2)/
BGEFU1)**

To attach the mounting bracket:

1. Use the two screws supplied with the wireless remote control to attach the mounting bracket to the wall in a location selected by the customer and within operating range.
2. Install the batteries in the remote control.
3. Place the remote control into the remote control mounting bracket.

NOTE: For remote control operation, refer to the remote control's owners manual.

OPTIONAL WIRED WALL-MOUNTED REMOTE CONTROL INSTALLATION

The wired remote controller comes with the following items:

- A set of installation instructions and owner's manuals
- 3 M4X20 Screws to mount on the wall
- 4 wall plugs to mount on the wall
- 2 M4X25 to mount on switch box
- 2 plastic screw bars to fix on switch box
- 1 set of batteries

1 set of connecting wires to connect to indoor unit's main board



Fig. 23 — Wired Controller

For wired controller set up and installation instructions, consult the wired controller installation manual.