



Owner's Manual

Original Instructions

Ducted Type Indoor Unit



Models:

BXAFZ09CDH

BXAFZ12CDH

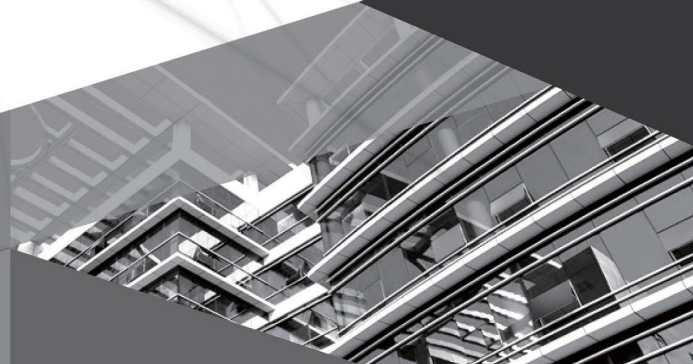
BXAFZ18CDH

BXAFZ24CDH

Thank you for choosing our product.

Please read this Owner's Manual carefully before operation and retain it for future reference.

If you have lost the Owner's Manual, please contact the local agent at 800-865-5931 or visit www.alpinehomeair.com.



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This appliance is not intended for use by people (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.

**DANGER**

Indicates a hazardous situation that, if not avoided, will result in death or serious injury.

**WARNING**

Indicates a hazardous situation that, if not avoided, could result in death or serious injury.

**CAUTION**

Indicates a hazardous situation that, if not avoided, may result in minor or moderate injury.

NOTICE

Indicates important but not hazard-related information, used to indicate risk of property damage.



Indicates a hazard that would be assigned to a signal word WARNING or CAUTION.

The manufacturer will bear no responsibilities when personal injury or property loss is caused by the following reasons.

1. Damage the product due to improper use or misuse of the product;
2. Alter, change, maintain or use the product with other equipment without abiding by the instruction manual of manufacturer;
3. After verification, the defect of product is directly caused by corrosive gas;
4. After verification, the defects are due to improper operation during transportation of product;
5. Operate, repair, maintain the unit without abiding by instruction manual or related regulations;
6. After verification, the problem or dispute is caused by the quality specification or performance of parts and components that are produced by other manufacturers;
7. The damage is caused by natural calamities, bad use environment or force majeure.



Please read this owner's manual carefully before operating the unit and keep it carefully for consultation.



Only use the air conditioner as instructed in this booklet. These instructions are not intended to cover every possible condition and situation. As with any electrical household appliance, common sense and caution are therefore always recommended for installation, operation and maintenance.

The refrigerant

 Refrigerant Safety Group A2L Appliance filled with flammable magas R32.	 Before install the appliance, read the installation manual first.
 Before use the appliance, read the owner's manual first.	 Before repair the appliance, read the service manual first.

- To realize the function of the air conditioner unit, a special refrigerant circulates in the system. The used refrigerant is the fluoride R32, which is specially cleaned. The refrigerant is flammable and inodorous. Furthermore, it can lead to explosion under certain conditions. But the flammability of the refrigerant is very low. It can be ignited only by fire.
- Compared to common refrigerants, R32 is a nonpolluting refrigerant with no harm to the ozonosphere. The influence upon the greenhouse effect is also lower. R32 has got very good thermodynamic features which lead to a high energy efficiency. The units there fore need a less filling.

WARNING

- Appliance filled with flammable gas R32.
- Appliance shall be installed, operated and stored in a room with a total floor area not less than $X \text{ m}^2$.
(Please refer to table "a" in section of " Safety operation of flammable refrigerant " for space X.)
- 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.)
- The appliance shall be stored in a well-ventilated area where the room size corresponds to the room area as specified for operation.
- The appliance shall be stored so as to prevent mechanical damage from occurring.
- Ducts connected to an appliance shall not contain an ignition source.
- Keep any required ventilation openings clear of obstruction.
- Do not pierce or burn.
- Be aware that refrigerants may not contain an odor.
- Do not use means to accelerate the defrosting

process or to clean, other than those recommended by the manufacturer.

- Servicing shall be performed only as recommended by the manufacturer.

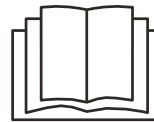
- Should repair be necessary, contact your nearest authorized Service Centre. Any repairs carried out by unqualified personnel may be dangerous.

Compliance with national gas regulations shall be observed.

Read specialist's manual.



Refrigerant Safety Group
A2L



Safety operation of flammable refrigerant

Qualification of workers

Qualification of the working personnel for maintenance, service and repair operations should according to UL 60335-2-40, CAN/C-SA-C22.2 No. 60335-2-40: 22 Annex HH.. Every working procedure that affects safety means shall only be carried out by competent persons according to Annex HH. Special training additional to usual refrigerating equipment repair procedures is required when equipment with FLAMMABLE REFRIGERANTS is

affected. **Installation notes**

- The air conditioner must be installed so the connected ducted/conditioned area served by the indoor unit meets or exceeds the minimum area requirement for the system's total R32
- refrigerant charge. For ducted applications, use the aggregate floor area of the rooms served by
- the same duct system, not only the room or ceiling space where the indoor unit is installed. The minimum area is shown on the nameplate or in Table A.

It is not allowed to drill hole or burn the connection pipe.

Leak test is a must after installation.

table a - Minimum room area (m²)

Based on UL 60335-2-40 requirements

The following installation height and area for customer reference

Charge amount (kg)	Installation height(m)			
	1.8	2.2	2.5	3
Minimum room area (m ²)				
<1.836	/	/	/	/
1.836~2.7	9.8	8.1	7.1	5.9
2.8	10.2	8.4	7.4	6.2
2.9	10.6	8.7	7.6	6.4

For ducted BXAFCZCDH installations: **Use the total connected ducted/conditioned floor area** served by the indoor unit when checking the minimum area requirement. If the indoor unit serves multiple rooms through the same duct system, add the floor area of those rooms together. Do not use only the room or ceiling space where the air handler is installed.

Maintenance notes

- Check whether the maintenance area or the room area meet the requirement of the nameplate. - It's only allowed to be operated in the rooms that meet the requirement of the nameplate.
- Check whether the maintenance area is well-ventilated.
 - The continuous ventilation status should be kept during the operation process.
- Check whether there is fire source or potential fire source in the maintenance area.
 - The naked flame is prohibited in the maintenance area; and the "no smoking" warning board should be hanged.
- Check whether the appliance mark is in good condition.
 - Replace the vague or damaged warning mark.

Welding

- If you should cut or weld the refrigerant system pipes in the process of maintaining, please follow the steps as below:
 - a. Shut down the unit and cut power supply
 - b. Eliminate the refrigerant
 - c. Vacuuming
 - d. Clean it with N₂ gas
 - e. Cutting or welding
 - f. Carry back to the service spot for welding
- The refrigerant should be recycled into the specialized storage tank.
- Make sure that there isn't any naked flame near the outlet of the vacuum pump and it's well-ventilated.

Filling the refrigerant

- Use the refrigerant filling appliances specialized for R32. Make sure that different kinds of refrigerant won't contaminate with each other.
- The refrigerant tank should be kept upright at the time of filling refrigerant.
- Stick the label on the system after you have finished filling (or haven't finished).
- Don't overfill.
- After filling is finished, please do the leakage detection before test running; another time of leak detection should be done when it's removed.

Safety instructions for transportation and storage

- Please use the flammable gas detector to check before opening the container.
- No fire source and smoking.
- According to the local rules and laws.

Safety of Construction

- For appliances using FLAMMABLE REFRIGERANTS, all joints made in the installation between parts of the REFRIGERATING SYSTEM, with at least one part charged, shall be made in accordance with the following:
 - A brazed, welded, or mechanical connection shall be made before opening the valves to permit refrigerant to flow between the REFRIGERATING SYSTEM parts. A vacuum valve shall be provided to evacuate the interconnecting pipe or any uncharged REFRIGERATING SYSTEM part.
 - Mechanical connectors used indoors shall comply with ISO 14903. When mechanical connectors are reused indoors, sealing parts shall be renewed. When flared joints are reused indoors, the flare part shall be refabricated.
 - Refrigerant tubing shall be protected or enclosed to avoid damage.
 - Flexible refrigerant connectors (such as connecting lines between the indoor and outdoor unit) that may be displaced during NORMAL OPERATION shall be protected against mechanical damage.

Safety operation of flammable refrigerant

Pressure test and leak detect

- After completion of field piping for split systems, the field pipework shall be pressure tested with an inert gas and then vacuum tested prior to refrigerant charging, according to the following requirements.

The minimum test pressure for the low side 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.

- 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.

Notices for using refrigerant sensor

- The refrigerant sensor can monitor whether R32 refrigerant leaks in real time. When the leakage of R32 refrigerant is detected, the sensor will trigger the alarm and emit a buzzer, and the indoor unit will display "EA" code. Meanwhile, the outdoor unit will stop running.
- In case of refrigerant leakage, please open the window immediately for ventilation to reduce the concentration of refrigerant in the room. Meanwhile, check the room to ensure that there is no fire source. After completing the above operations, please leave the room and go to the safe place, and then contact the after-sales service team for maintenance.
- When the refrigerant sensor reaches its service life or is damaged, the indoor unit will display "FE" code. Please contact the after-sales service team to replace the refrigerant sensor.
- Avoid oil and water splashing into the refrigerant sensor, otherwise it may cause damage to the refrigerant sensor.

- Avoid using it in the environment with electro-magnetic interference, chemical substances (such as chemical plants, etc.), flammable gas, combustible and explosive gas and smog, etc.
- Avoid using items containing ethanol (such as perfume, etc.) and smog-producing items (such as cigarettes, etc.) near the refrigerant sensor, otherwise it will lead to abnormal conditions such as false alarms of the refrigerant sensor. If such phenomenon occurs, please contact the after-sales service team for maintenance.
- Only applicable to refrigerant sensor models.



1 Operation and Maintenance

- This appliance can be used by children aged from 8 years and above and people with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
- Children should not play with the appliance.
- Cleaning and user maintenance shall not be done by children without supervision.
- Do not connect air conditioner to multi-purpose socket. Otherwise, it may cause fire hazard.
- Do disconnect power supply when cleaning air conditioner. Otherwise, it may cause electric shock.
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified people in order to avoid a hazard.
- Do not wash the air conditioner with water to avoid electric shock.
- Do not spray water on indoor unit. It may cause electric shock or malfunction.
- After removing the filter, do not touch fins to avoid injury.
- Do not use fire or hair dryer to dry the filter to avoid deformation or fire hazard.
- Maintenance must be performed by qualified professionals. Otherwise, it may cause personal injury or damage.
- Do not repair air conditioner by yourself. It may cause electric shock or damage. Please contact dealer when you need to repair air conditioner.
- Do not extend fingers or objects into air inlet or air outlet. It may cause personal injury or damage.
- Do not block air outlet or air inlet. It may cause malfunction.
- Do not spill water on the remote controller, otherwise the remote controller may be broken.
- When the situations below occur, please turn off air conditioner and disconnect power immediately, and then contact the dealer or qualified professionals for service.
 - Power cord is overheating or damaged.
 - There's abnormal sound during operation.
 - Circuit break trips frequently.
 - Air conditioner gives off burning smell.
 - Indoor unit is leaking.



- If the air conditioner operates under abnormal conditions, it may cause malfunction electric shock or fire hazard.
- When turning on or turning off the unit by emergency operation switch, please press this switch with an insulating object other than metal.
- Do not step on top panel of outdoor unit or put heavy objects on it. It may cause damage or personal injury.
- If this system includes multiple factory-made components that are designed to be installed together, follow the manufacturer's instructions for assembling and connecting those components. This helps ensure the completed system meets safety and performance requirements.
- The machine must be connected to the air duct for use.

Attachment

- Installation must be performed by qualified professionals. Otherwise, it may cause personal injury or damage.
- Must follow the electric safety regulations when installing the unit.
- According to the local safety regulations, use qualified power supply circuit and circuit break.
- Do install the circuit break. If not, it may cause malfunction.
- Means for disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.
- Use a properly sized circuit breaker or fuse as specified in the table. The breaker must provide both short-circuit and overload protection.
- Air Conditioner should be properly grounded. Incorrect grounding may cause electric shock.
- Don't use an unqualified power cord.
- Make sure the power supply matches with the requirement of air conditioner. Unstable power supply or incorrect wiring may result in electric shock, fire hazard or malfunction. Please install proper power supply cables before using the air conditioner.
- Properly connect the live wire, neutral wire and grounding wire of power socket.
- Be sure to cut off the power supply before proceeding with any work related to electricity and safety.
- Do not turn on power until installation is complete
- If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified people to avoid a hazard.
- Refrigerant piping can become hot during operation. Keep the interconnecting cable away from the copper refrigerant lines.



- The appliance shall be installed in accordance with national wiring regulations.
- Installation must be performed in accordance with the requirements of NEC and CEC by authorized personnel only.
- This is a Class I electrical appliance and must be properly grounded. Grounding must be completed by a qualified professional. Poor or missing grounding can cause electric shock.
- The yellow-green wire in air conditioner is grounding wire, which can't be used for other purposes.
- The grounding resistance should comply with national electric safety regulations.
- The appliance must be positioned so that the plug is accessible.
- All wires of indoor unit and outdoor unit should be connected by a professional.
- If the power or interconnecting cable is not long enough, use a properly sized replacement cable that meets the unit requirements and local code. Do not splice, patch, or extend the cable.
- If the unit is hardwired, a properly sized circuit breaker or disconnect must be installed in the electrical circuit. Follow the unit nameplate, wiring diagram, and local code.
- If you need to relocate the air conditioner to another place, only the qualified person can perform the work. Otherwise, it may cause personal injury or damage.
- Select a location which is out of reach for children and far away from animals or plants. If it is unavoidable, please add the fence for safety.
- Before operation, confirm that the power supply matches the voltage and electrical requirements listed on the unit nameplate.
- Before cleaning or maintaining the air conditioner, turn off the unit and disconnect power at the breaker or disconnect.
- Make sure the power wiring is not pinched, crushed, or pressed against sharp edges or heavy objects.
- Do not pull, drag, or move the unit by the power wiring.
- Do not touch electrical components with wet hands. Make sure the unit is properly grounded.
- If the power supply wiring is damaged, it must be replaced by the manufacturer, an authorized service provider, or another qualified professional.
- If an abnormal condition occurs, such as a burning smell, disconnect power immediately and contact the dealer or a qualified service technician.
- If the unit will not be used for an extended period, turn it off and disconnect power if appropriate.

**WARNING****GENERAL INFORMATION**

- Do not splash or pour water on the air conditioner. Water can cause electrical shorts or equipment damage.
- Keep heaters, open flames, flammable gas, explosive materials, and other ignition sources away from the unit.
- Do not install or operate the unit in a bathroom, laundry room, or other high-moisture location unless the installation is specifically approved and meets code.
- Keep children from playing on or climbing on the unit.
- Do not place or hang dripping objects above the unit.
- Do not repair, modify, or disassemble the unit yourself. Service must be performed by a qualified professional.
- Do not block the return-air inlet or supply-air outlet.
- Do not insert fingers, tools, or other objects into the air inlet, air outlet, or ductwork.
- Do not allow debris or foreign objects to enter the ductwork. If foreign material enters the duct system, stop using the unit and contact a qualified professional.
- Do not use an extension cord.
- Install the required fuse, circuit breaker, or disconnect according to the unit nameplate, wiring diagram, and local code. Do not exceed the MOP value listed on the nameplate.
- Install the appliance according to national and local wiring regulations.
- For hardwired installations, an all-pole disconnecting switch with at least 3 mm contact separation in all poles must be installed in the fixed wiring, unless local code requires otherwise.

 Working temperature range

	Indoor side DB/WB(°C/°F)	Outdoor side DB/WB(°C/°F)
Maximum cooling	26.7/19.4(80/67)	see the outdoor unit Instruction manual
Maximum heating	26.7/-(80/-)	see the outdoor unit Instruction manual

- The operating temperature range (indoor temperature):
Heat pump models in cooling mode: 61°F–
104°F/16°C40°C
Heat pump models in heating mode: 41°F–86°F / 5°C–
30°C

2 Product Introduction

2.1 Names of Key Components

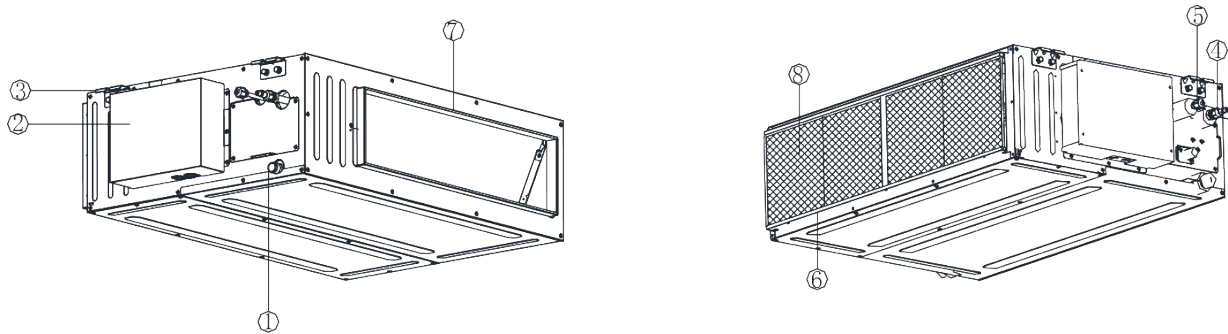


Fig 2.1.1

NO.	1	2	3	4	5	6	7	8
Name	Drain Pipe	Control box	Pothook	Gas pipe	Liquid pipe	Air-return Opening	Air Outlet	Filter

2.2 Rated Working Condition

	Indoor Side Condition		Outdoor Side Condition	
	Dry Bulb Temp °C(°F)	Wet Bulb Temp °C(°F)	Dry Bulb Temp°C(°F)	Wet Bulb Temp°C(°F)
Rated Cooling	26.7(80.0)	19.4(67.0)	35(95.0)	23.9(75.0)
Rated Heating	21.1(70.0)	15.6(60.0)	8.3(47.0)	6.1(43.0)

3 Preparations for Installation

NOTICE!

Product graphics are only for reference. Please refer to actual products. Unspecified measure unit is mm(in.).

3.1 Location for Installation

- (1) Do not install the indoor unit in a laundry room or other high-moisture location unless the installation is specifically approved and meets code.
- (2) The ceiling structure or support frame must be strong enough to support the full weight of the indoor unit.
- (3) Choose a location where the condensate drain can be routed properly and drain freely.
- (4) Keep the return-air inlet and supply-air outlet clear of obstructions to maintain proper airflow.
- (5) Install the indoor unit with the service clearances shown below so the unit can be accessed for maintenance.
- (6) Keep the unit away from heat sources, smoke, flammable gas, and other ignition sources.
- (7) This indoor unit is designed for concealed ceiling installation. Provide an access panel for service.
- (8) Keep the indoor unit, outdoor unit, power wiring, and communication wiring at least 39-3/8 in. / 1 m from TVs, radios, and similar electronics when possible. Electrical interference may still occur in some locations.

Unit: mm(in.)

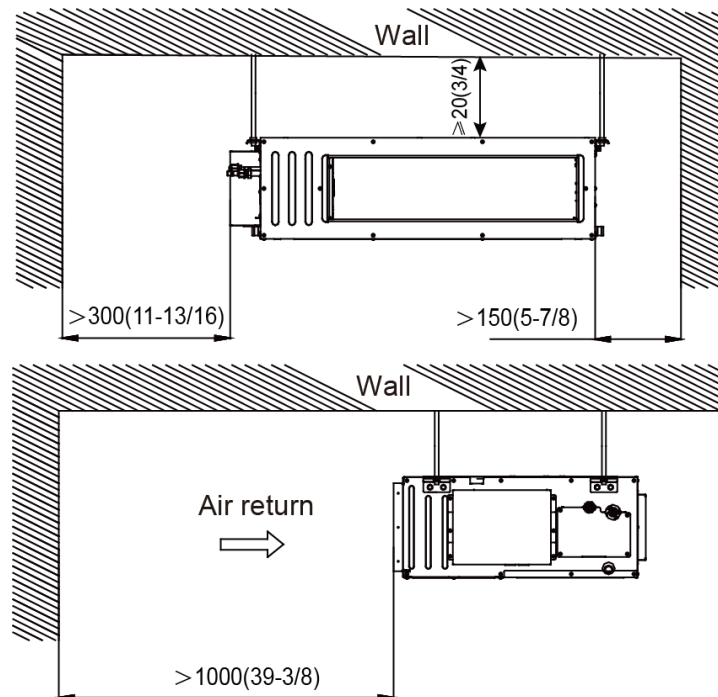


Fig 3.2.1

NOTICE

(1) Installation of the unit must be in accordance with National Electric Codes and local regulations.

(2) Improper installation will affect unit's performance, so do not install the unit by yourself. Please contact local dealer to arrange professional technicians for the installation.

(3) Do not connect power until all installation work is finished.

3.2 Wiring Requirements

(1) Indoor-to-Outdoor Interconnecting Cable and Indoor Fuse

Model	Power Supply	Fuse Capacity	Minimum Interconnecting Cable
	V/Ph/Hz	A	
09K	208/230V-1ph-60Hz	5	4xAWG18
12K			
18K			
24K			

NOTICE

(1) Use copper wire only. Operating temperature should be within its value.

(2) If the interconnecting cable is more than 15m (49-1/4 ft.) long, please increase properly the sectional area of power cord to avoid overload, which may cause accident.

(3) The listed wire size is based on copper conductors installed under the manufacturer's stated conditions. If the actual installation conditions are different, such as higher ambient temperature, longer wire runs, or different conduit/routing conditions, size the wiring and overcurrent protection according to local code, the unit nameplate, and the wire/circuit breaker manufacturer's specification.

(4) Provide a code-compliant disconnecting means for servicing the system. If local code or the wiring design requires a disconnect at the indoor unit, it must be properly rated and must provide at least 1/8 in. / 3 mm contact separation.

4 Installation Instructions

NOTICE!

Before installation, verify that the total connected ducted/conditioned area served by the indoor unit meets or exceeds the minimum area required for the system's total R32 refrigerant charge. For ducted systems, use the aggregate floor area of the rooms served by the duct system, not only the room or ceiling space where the air handler is installed.

4.1 Installation of Indoor Unit

4.1.1 Outline Dimension and Installation Spots

After the indoor unit is installed, provide an inspection/access panel for service. The access panel should be located below the unit and near the electrical control box .

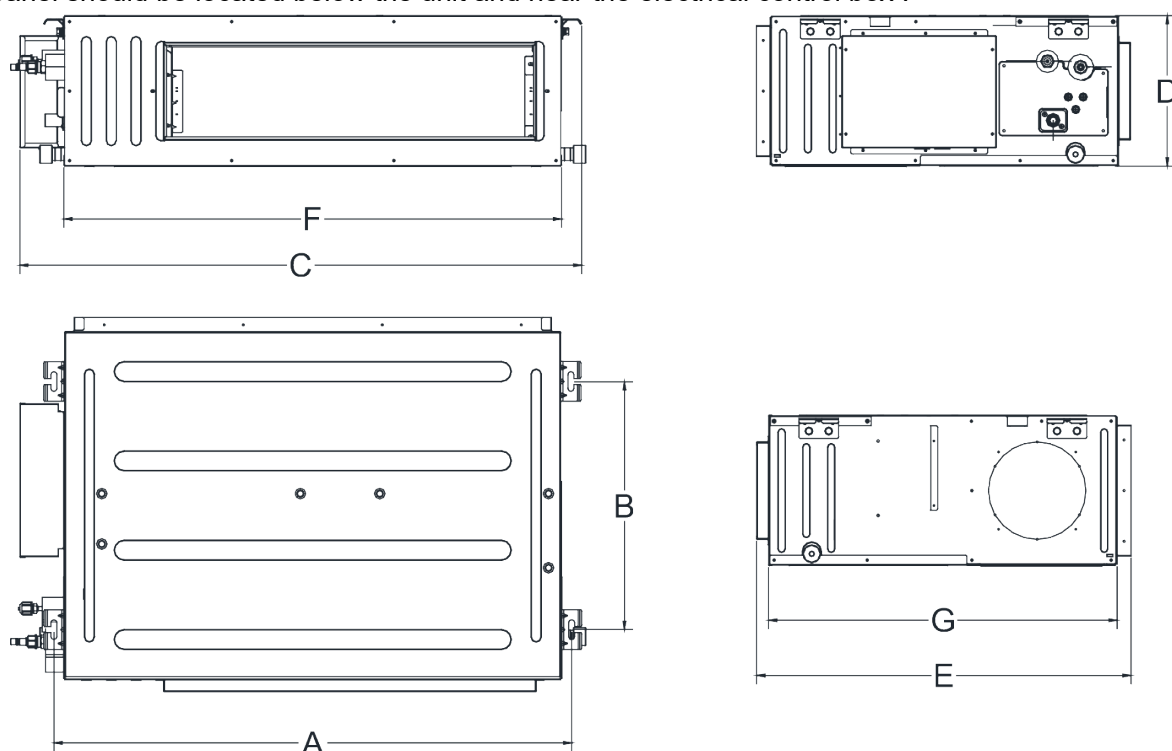


Fig 4.1.1

Below are dimensions of A, B, C, etc. for different models:

Unit:mm(in.)

Model	A	B	C	D	E	F	G
09K、12K	740 (29-1/8)	500 (19-11/16)	830 (32-11/16)	300 (11-13/16)	754 (29-11/16)	700 (27-9/16)	700 (27-9/16)
18K、24K	1040 (40-15/16)	500 (19-11/16)	1130 (44-1/2)	300 (11-13/16)	754 (29-11/16)	1000 (39-3/8)	700 (27-9/16)

4.1.2 Suspending the indoor unit

(1) Drill bolt holes and install bolts

- 1) Place the installation template at the selected mounting location. Drill four holes at the marked locations on the template. Match the hole diameter to the expansion bolts being used. Drill each hole 60–70 mm / 2-3/8–2-3/4 in. deep, as shown in Fig. 4.1.4

2) Unit: mm(in.)

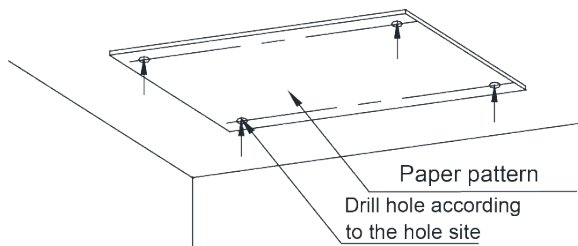


Fig 4.1.3

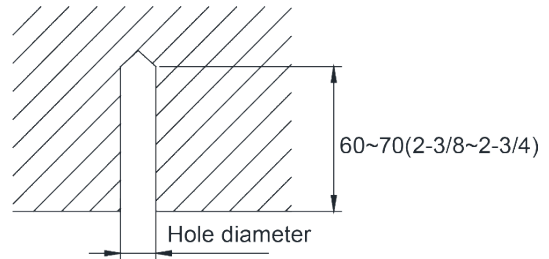


Fig 4.1.4

- 3) Insert the M10 expansion bolt into the hole and then knock the nail into the bolt, as shown in fig 4.1.5, and then remove the paper pattern.

NOTICE!

The length of bolt depends on the installation height of the unit, bolts are field supplied.

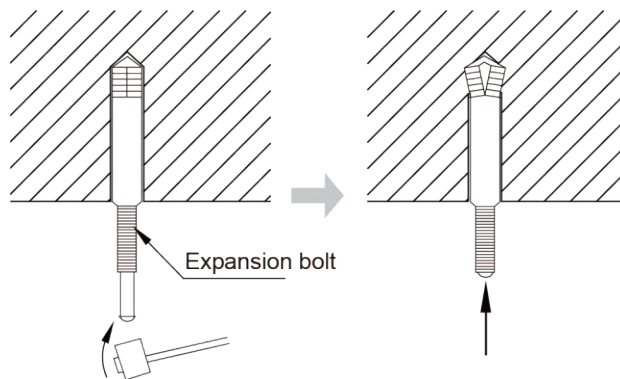


Fig 4.1.5

(2) Install the indoor unit temporarily

Install the suspension bolts onto the expansion bolts, then attach the indoor unit's hanger brackets to the suspension bolts. Secure each hanger bracket with a nut and washer above and below the bracket. Use the washer fixing plate to help keep the washer in place.

09K-24K are as follows:

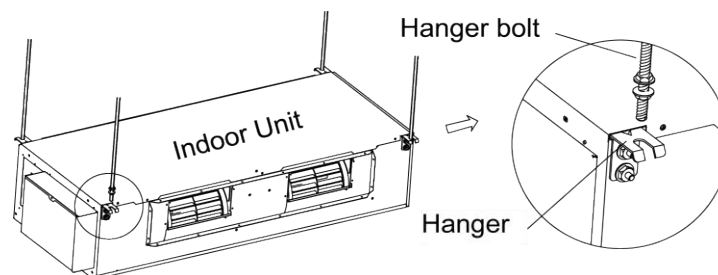


Fig 4.1.6

NOTICE!

- 1) Before operation, please prepare all pipelines (connection pipe, drainage PVC) and wires (connection wire for wired controller, connection wire for indoor unit).
- 2) When drilling holes on ceiling (air return outlet or air outlet), you may need to reinforce the ceiling to prevent vibration. For details, please consult user or builder.
- 3) If the ceiling structure is not strong enough to support the unit, install a structural support frame or beam support before mounting the unit.
- (3) Adjust the unit to the right position.
- (4) Check the level of the unit

After the indoor unit is installed, check its position. The unit should be level along the airflow direction and pitched 1% toward the condensate drain connection.

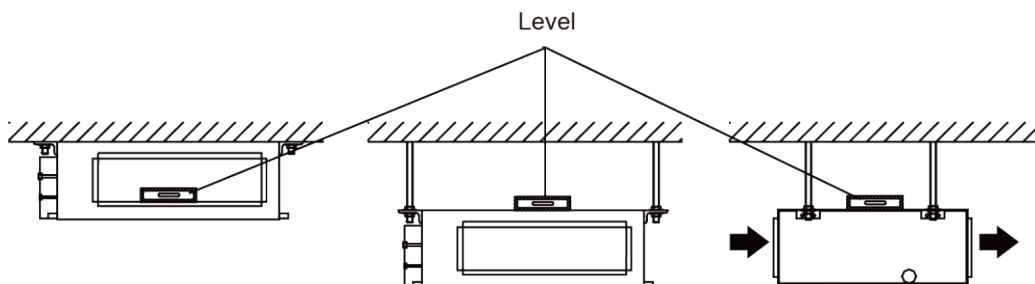
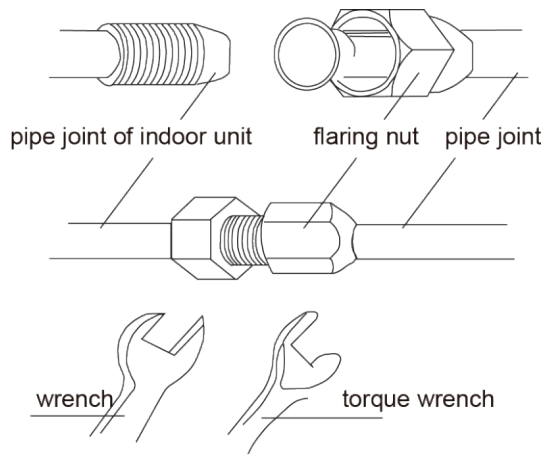


Fig 4.1.8

- (5) Remove the washer locating plate and then tighten the nut on it.

4.2 Refrigerant Pipe Connection

- (1) Align the flared end of the copper pipe with the center of the indoor unit pipe fitting.
Start the flare nut by hand to avoid cross-threading as shown in fig 4.2.1.
- (2) Tighten the flaring nut with torque wrench and a backup wrench.



Torque for tightening nut

Pipe diameter mm(in.)	Torque(ft lbs)
Φ6.35(1/4)	11.1-22.1
Φ9-9.52(3/8)	25.8-29.5
Φ12.7(1/2)	33.2-36.9
Φ15.9(5/8)	44.3-47.9
Φ19.05(3/4)	51.6-55.3

Fig 4.2.1

- (3) Use a pipe bender when bending refrigerant piping. Do not make sharp bends or kink the tubing.
- (4) After tightening the refrigerant pipe connection, wrap the pipe joint with the provided insulation. Secure the insulation tightly with tape.

4.3 Drainage Pipe Installation and Drainage System Testing

4.3.1 Notice regarding Installation of Drain Pipe

- (1) The condensate drain pipe should be as short as practical and must slope downward continuously after the initial rise. Maintain a 1%–2% downward slope to allow condensate to drain properly. (A 1/4 in. drop per foot is recommended).
- (2) The diameter of drainage pipe should be bigger or equal to the diameter of drainage pipe joint.
- (3) Install and insulate the condensate drain pipe as shown in Fig. 4.3.1. Improper drain installation can cause water leaks and damage ceilings, walls, furniture, or other property.
- (4) Connect the supplied drain adapter to the indoor unit drain outlet, then connect field-supplied rigid PVC drain pipe to the adapter. Secure and insulate the connection. Do not glue the adapter directly to the indoor unit drain outlet.
- (5) When multiple indoor units share a common condensate drain line, the shared drain line should be installed at least 4 in. / 100 mm below each unit's drain outlet. Use a larger drain pipe sized for the total condensate load of all connected units.

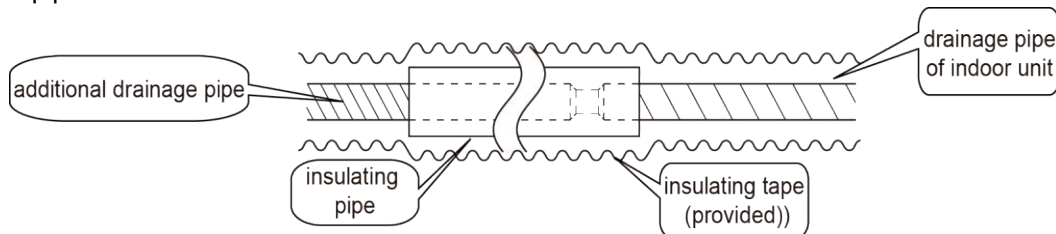


Fig 4.3.1

4.3.2 Drainage pipe installation

- (1) Insert the supplied drain adapter onto the indoor unit drain outlet, as shown in Fig. 4.3.2
- (2) Tighten the metal clamp. Keep the distance between the clamp screw and the end of the adapter less than 1/8 in. / 4 mm, as shown in Fig. 4.3.3.
- (3) Wrap the clamp and drain adapter connection with the supplied insulation to prevent condensation.
- (4) Connect field-supplied rigid PVC drain pipe to the outlet side of the drain adapter. Support and slope the PVC drain piping as required.

① metal clamp(accessory figure 4.3.2 and 4.3.3)

② drain adapter(accessory)

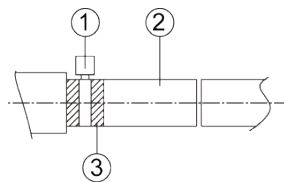


Fig 4.3.2

② thermal sponge(accessory) Unit: mm(in.)

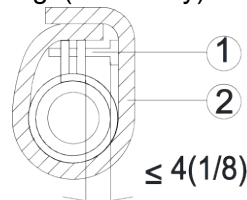


Fig 4.3.3

- (5) When connecting several drainpipes, follow the instruction as indicated in Fig 4.3.4. Choose the drain collecting pipe that matches unit capacity. Unit: mm(in.)

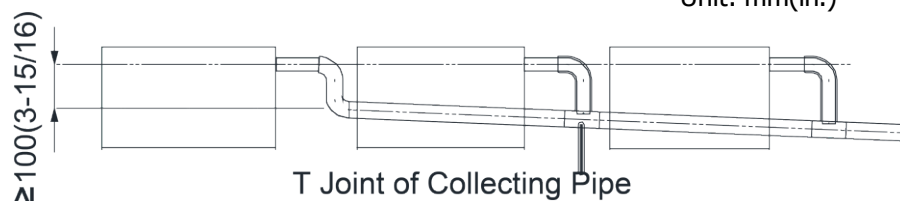


Fig 4.3.4

- (6) Install the trap as shown in following Fig 4.3.5.
- (7) Install one trap for each unit.
- (8) Locate the trap where it can be accessed for future inspection and cleaning.

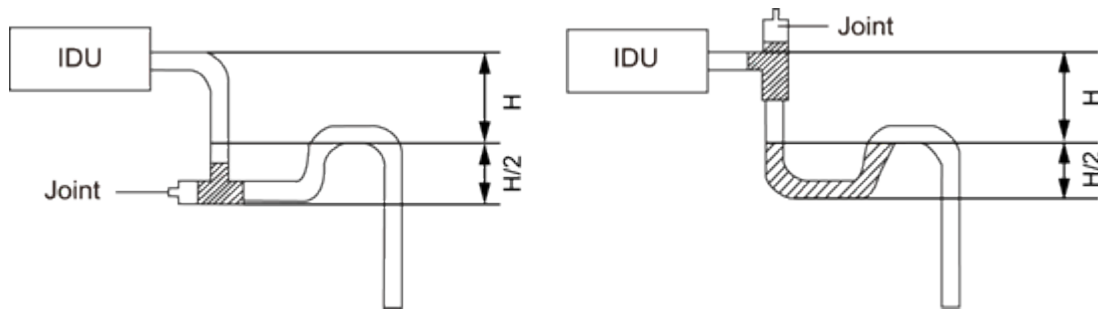


Fig 4.3.5

- (9) Horizontal drain piping may connect to a vertical drain pipe at the same level. Use one of the connection methods shown in Fig. 4.3.6, Fig. 4.3.7, or Fig. 4.3.8.

NO1: Connection of drainage pipe joints (Fig4.3.6)

NO2: Connection of downspout elbow (Fig4.3.7)

NO3: Inserting pipe connection (Fig4.3.8)

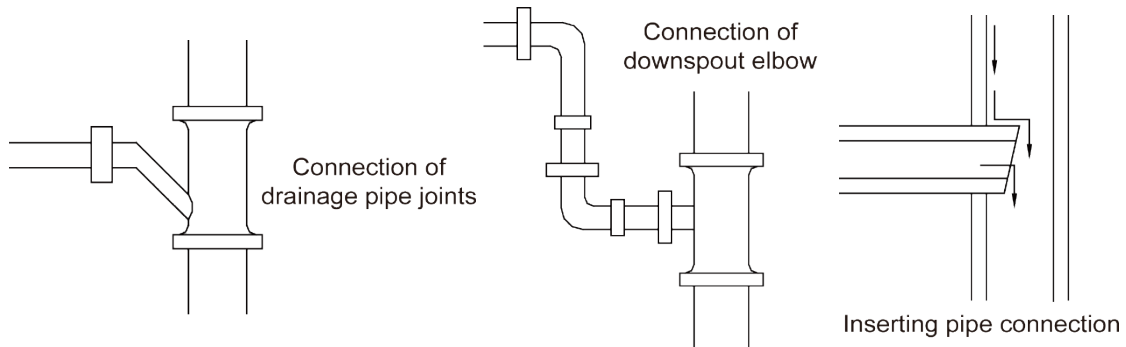


Fig 4.3.6

Fig 4.3.7

Fig 4.3.8

- (10) Keep the drain lift as low as practical. Do not raise the condensate drain more than 31-1/2 in. / 800 mm before it begins sloping downward. After the lift, the drain pipe must slope downward continuously at 1%–2% (1/4 inch per foot is recommended).

Unit: mm(in.)

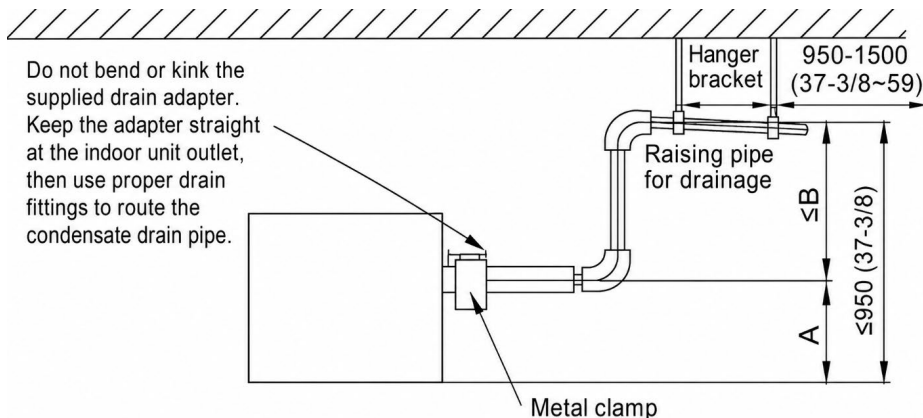


Fig 4.3.9

Model	A	B	
09K、12K、18K、 24K	150 (5-7/8)	800 (31-1/2)	

(11) Drain pipes should have a downward slope of at least 1%~2% (1/4 inch per foot is recommended), to prevent pipes from sagging, install hanger bracket at intervals of 1000~1500mm(39-3/8~59 in.).

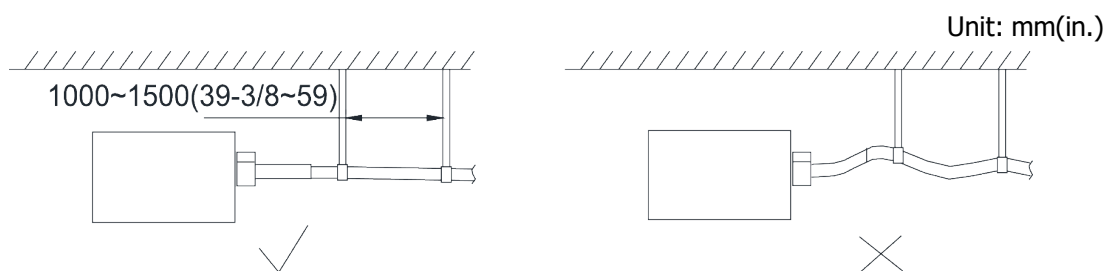
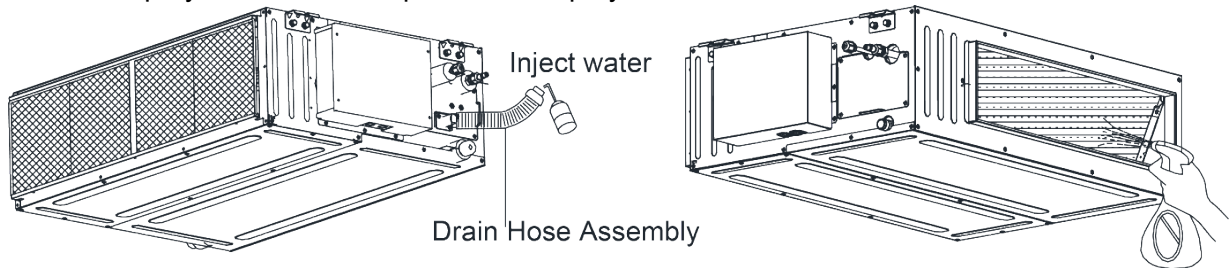


Fig 4.3.10

4.3.3 Test of Drainage System

- Test the drainage system after the electrical work is complete.
- Add approximately 1 liter of clean water to the drain pan from the air inlet side. Do not splash water on electrical components, including the water pump.
- Spray approximately 1 liter of water onto the evaporator coil.
- After commissioning is complete, energize the indoor unit and run it in cooling or dry mode. The drain pump should operate. Check for water draining through the transparent section of the drain connection.
- If the communication wire is not connected, communication error "E6" may appear after approximately 3 minutes of power being applied. In this condition, the drain pump will operate automatically. Check that water drains properly from the drain outlet. The drain pump will stop automatically after running for approximately 1 minute.
- During the test, carefully check all drain connections and confirm there are no leaks.
- The drain test must be completed before the ceiling is closed.
- It is strongly recommended to do the drain test before restricting air handler access.

- Connect the drain hose to the other drain connection pipe of water tray and inject approximately 1L water. (Remove the drain hose after finishing testing and then put on the plug of water tray.)
- Spray 1L water on evaporator with sprayer.



• Fig 4.3.11

- Check if the water drains smoothly from the drain pipe and check if there is water leakage on the connection pipe.
- Arrange insulation of drain hose and pipe clamp after checking the drain system.

4.4 Installation of Air Duct

NOTICE!

- Insulate the supply-air duct, return-air duct, and fresh-air duct to prevent heat loss and condensation. Seal all insulation joints with approved tape or another suitable sealing method.
- Secure each supply-air duct and return-air duct to a properly supported duct frame or plenum. Seal all duct joints to prevent air leakage.
- The air duct design and installation must comply with national and local requirements.
- Keep the edge of the return-air duct at least 5-7/8 in. / 150 mm from the wall. Install a filter at the return-air opening.
- Design the duct system to reduce noise and vibration. Avoid placing the return-air opening directly above areas where people will be sitting, working, or resting, such as offices, bedrooms, or living areas.

4.4.1 Shape and Size of Air Outlet and Air-return Opening

Unit: mm(in.)

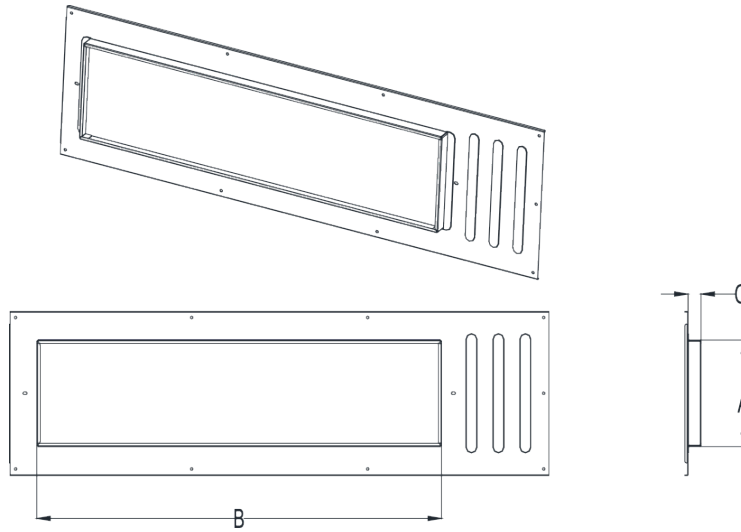


Fig 4.4.1 Air Outlet

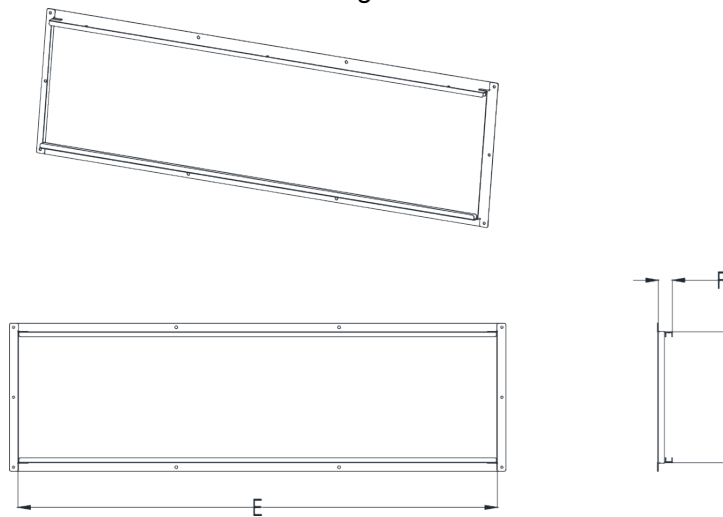


Fig 4.4.2 Air-return Opening

Model	Size of Air Outlet			Size of Air-return Opening		
	A	B	C	D	E	F
09K、12K	195 (7-5/8)	451 (17-3/4)	25 (1)	264 (10-3/8)	660 (26)	29 (1-1/8)
18K、24K	195 (7-5/8)	751 (29-9/16)	25 (1)	264 (10-3/8)	960 (37-3/4)	29 (1-1/8)

4.4.2 Installation of Air-out Duct

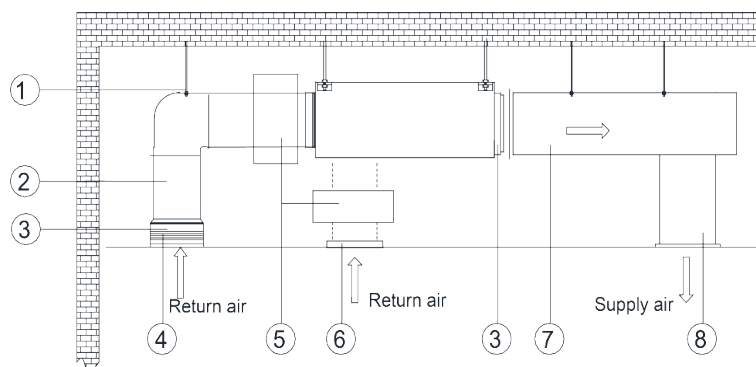


Fig 4.4.5

No.	Name	No.	Name
1	Hanger Rod	5	Static Pressure Box
2	Return Air Duct	6	Filter
3	Canvas Duct	7	Main Supply Air Duct
4	Return Air Inlet	8	Supply Air Outlet

4.4.3 Installation of the Return Air Duct

- (1) The rectangular return-air flange is installed at the back of the unit by default. The return-air cover plate is installed on the bottom of the unit, as shown in Fig. 4.4.6.

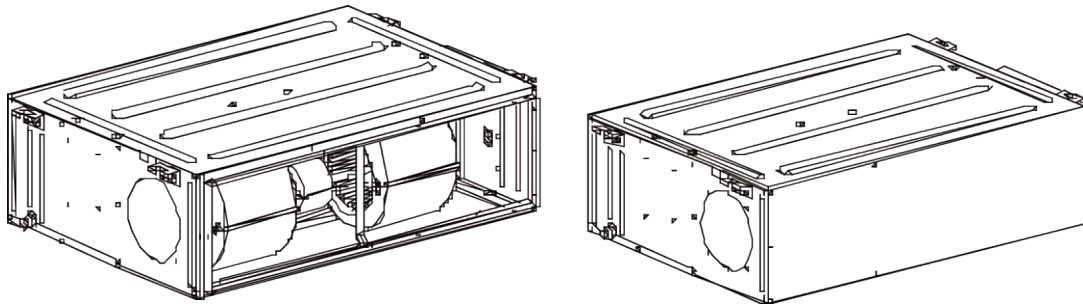


Fig 4.4.6

- (2) If bottom return air is required, switch the positions of the rectangular return-air flange and the return-air cover plate.
- (3) Connect one end of the return-air duct to the return-air opening on the indoor unit. Connect the other end to the return-air grille. A short flexible canvas duct section may be used to help with alignment and height adjustment. Reinforce the canvas duct as needed.
- (4) Bottom return air may be louder than rear return air. If bottom return air is used, consider adding a silencer and/or static pressure box to reduce noise.
- (5) Choose the return-air installation method based on the building layout, service access, and maintenance needs, as shown in Fig. 4.4.7.

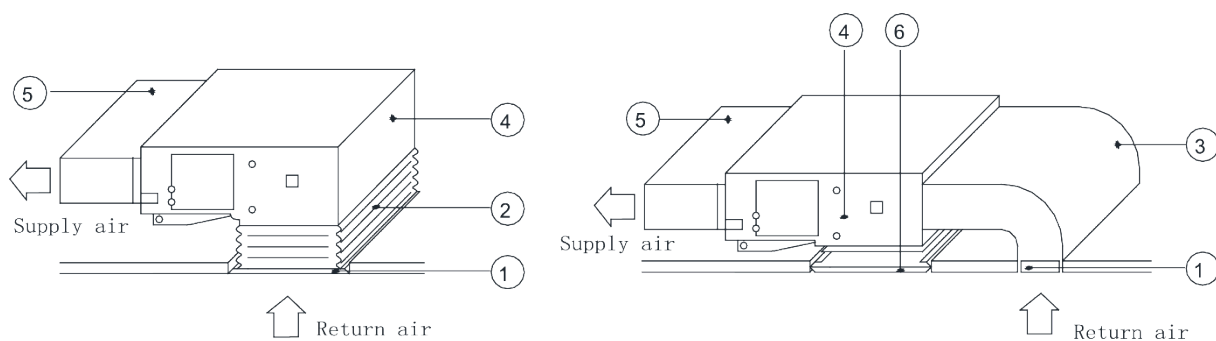


Fig 4.4.7

Table 5 Installation of the return air duct

No.	Name	No.	Name
1	Return Air Inlet (with filter)	4	Indoor unit
2	Canvas Duct	5	Supply Air Duct
3	Return Air Duct	6	Grille

4.4.4 Installation of the Fresh Air Pipe

- (1) If a fresh-air duct will be connected, remove the fresh-air knockout/baffle as shown in Fig. 4.4.8.

Install the properly sized round takeoff collar, as shown in Fig. 4.4.9.

(2) Seal and insulate both the fresh-air duct and the round flange connection.

(3) If a fresh-air duct is connected, the incoming fresh air must be filtered before it enters the unit. Install an inline filter or other approved filtration method in the fresh-air duct.

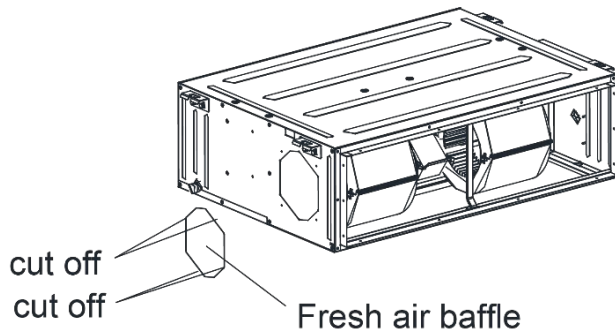


Fig 4.4.8

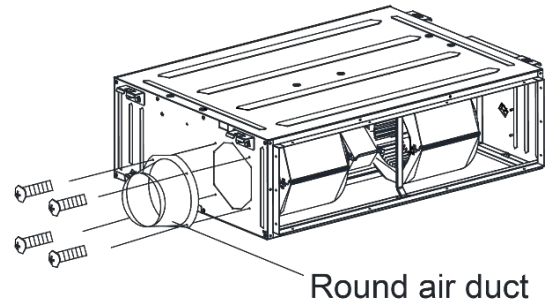


Fig 4.4.9

4.5 Installation of Wired Controller

Please refer to User Manual of Wired Controller for the installation details.

NOTICE! After installation is complete, the system must be tested and commissioned before normal operation. Refer to the outdoor unit manual for startup, addressing, and commissioning instructions.

5 Wiring Work

⚠ WARNING

Disconnect all power before accessing wiring terminals.

NOTICE

(1) The unit must be properly grounded. Poor or missing grounding can cause electric shock.

(2) Read the wiring diagram before wiring the unit. Incorrect wiring can cause malfunction or equipment damage.

(3) The unit must be connected to a properly sized electrical circuit according to the unit nameplate, wiring diagram, and local code.

(4) All wiring must comply with national and local electrical codes.

(5) Install the required circuit breaker or disconnect according to the unit nameplate, wiring diagram, and local code.

(6) Keep wiring away from refrigerant piping, the compressor, and fan motor.

(7) Keep communication wiring separated from high-voltage power wiring.

(8) Set the indoor unit static pressure with the wired controller according to the duct system design and site conditions.

(9) Route and secure low-voltage communication wiring according to the wiring diagram and local code. Use approved conduit and fittings where required. **Communication wires cannot be spliced.**

5.1 Connection of Wire and Patch Board Terminal

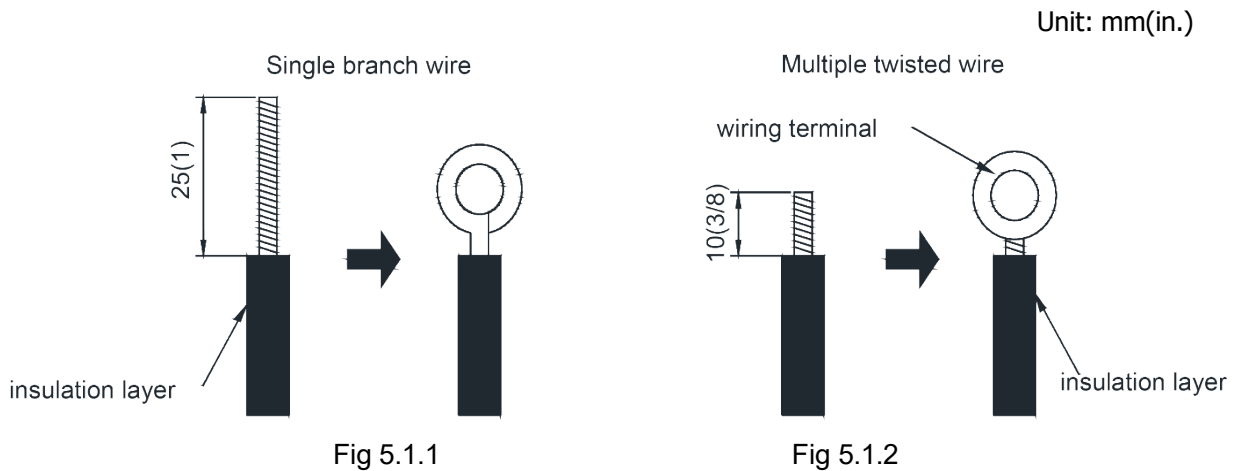
(1) Solid conductor wire

1. Strip approximately 1 in. / 25 mm of insulation from the end of the wire.
2. Remove the terminal screws from the terminal board.

- 3 Use needle-nose pliers to form the exposed wire end into a ring sized to fit the terminal screw.
- 4 Place the wire ring under the terminal screw and tighten securely.

(2) Stranded wire

- Strip approximately 3/8 in. / 10 mm of insulation from the end of the stranded wire.
- Loosen the terminal screws on terminal board.
- Insert the wire into the ring terminal and tighten with a crimping tool.
- Place the ring terminal under the terminal screw and tighten securely.



5.2 Indoor-to-Outdoor Power / Interconnecting Cable

NOTICE!

- ① Every unit should be equipped with a circuit breaker for short-circuit and overload protection.
- ② During operation, all indoor units connected to the same outdoor unit system must remain powered. If an indoor unit loses power, the system may not operate normally.

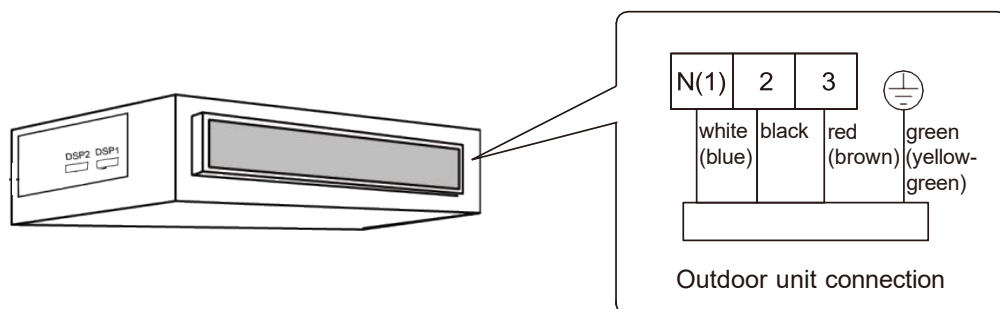


Fig 5.2.1

NOTICE!

The number of indoor units connected must match the outdoor unit capacity and system design.

For single-phase units:

- (1) Remove the electrical box cover.
- (2) Route the indoor-to-outdoor interconnecting cable through the wiring knockout.
- (3) Secure the interconnecting cable with the wiring clamp.
- (4) Use copper wire only. Wire size must not be smaller than 18 AWG or the minimum size required by the unit wiring diagram and local code.

5.3 Wiring the Wired Controller Signal Line

- (1) Open the electrical box cover on the indoor unit.
- (2) Route the wired controller signal line through the wiring knockout.
- (3) Connect the wired controller signal line to the 4-core patch cord terminal installed on the indoor unit printed circuit board.

6 Setting External Static Pressure

The working external static pressure range for this series of ducted indoor units is **0–150/200 Pa**.

Set the indoor fan static pressure according to the duct system design and measured external static pressure. The static pressure setting can be adjusted through the wired controller or approved debugging software. Refer to the wired controller manual or debugging software manual for the exact setting procedure.

Applicable to: 09K/12K								
Static pressure notch for indoor fan	2	3	4	5	6	7	8	9
External static pressure (Pa)	0	20	40	60	80	100	120	150
External Static Pressure (in. w.c.)	0	0.08	0.16	0.24	0.32	0.4	0.48	0.6

Applicable to: 18K/24K								
Static pressure notch for indoor fan	2	3	4	5	6	7	8	9
External static pressure (Pa)	0	30	60	90	120	150	180	200
External Static Pressure (in. w.c.)	0	0.12	0.24	0.36	0.48	0.6	0.72	0.8

7 Maintenance Before Seasonal Use

- (1) Check that the indoor and outdoor air inlets and outlets are not blocked.
- (2) Confirm the unit is properly grounded.
- (3) Check that all power wiring and communication wiring are securely connected.
- (4) After power is applied, check whether any error code appears.

7.1 Maintenance After Seasonal Use

- (1) Run the unit in fan mode for about half a day on a dry day to help dry the inside of the unit.
- (2) If the unit will not be used for an extended period, disconnect power to save energy. The wired controller display will turn off after power is disconnected.

8 Table of Error Codes for Indoor Unit

Number	Error code	Error
1	E1	Compressor high pressure protection
2	E2	Indoor anti-freeze protection
3	E3	Compressor low pressure protection, refrigerant lack protection and refrigerant collecting mode
4	E4	Compressor high discharge temperature protection
5	E5	AC over-current protection
6	E6	Communication error
7	E7	Mode conflict
8	E8	Anti-high temperature protection
9	E9	Full water protection
10	F1	Indoor ambient temperature sensor is open/short circuited
11	F2	Indoor evaporator temperature sensor is open/short circuited
12	F3	Outdoor ambient temperature sensor is open/short circuited
13	F4	Outdoor condenser temperature sensor is open/short circuited
14	F5	Outdoor discharge temperature sensor is open/short circuited
15	H6	No feedback of indoor fan motor
16	U8	Zero-crossing protection
17	C5	Jumper cap malfunction protection
18	EE	Loading EEPROM malfunction
19	EA	Refrigerant leakage alarm

Note: If there're other error codes, please contact qualified professionals for service.

9 Troubleshooting

The air conditioner is not intended to be serviced by the user. Incorrect repairs can cause electric shock, fire, or equipment damage. Contact an authorized service provider for service. Before requesting service, the following basic checks may help identify simple issues.

Phenomenon	Troubleshooting
The unit can't start	① Power supply is not connected. ② Circuit breaker tripping caused by leakage of electricity. ③ Input voltage is too low. ④ Defect of main PC-board.
The unit stops after running for a while.	① The inlet or outlet of ODU or IDU are blocked.
Poor cooling	① The filter is dirty. ② Too heavy heat load of room(e.g. too many people) ③ Door or windows is open. ④ Inlet and outlet of IDU are blocked. ⑤ Setting temperature is too high. ⑥ Refrigerant is insufficient (e.g. refrigerant leakage)
Poor heating	① The filter is dirty. ② Door or window is open. ③ Setting temperature is too low. ④ Refrigerant is insufficient (e.g. refrigerant leakage)
Indoor fan doesn't start up during heating	① The indoor fan may not start immediately in heating mode. The fan will start after the indoor coil warms up to help prevent cold air from blowing into the room. ② During defrost, the indoor fan may stop because the system temporarily switches operation to defrost the outdoor unit. This helps prevent cold air from blowing into the room. The indoor fan will resume after defrost is complete.

NOTICE!

If the air conditioner still does not operate normally after completing the checks above, stop using the unit and contact a qualified service technician.

10 SPECIALIST'S MANUAL

Repairs and service work must be performed only by qualified service personnel.

- a. 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.
- b. Servicing shall only be performed as recommended by the equipment manufacturer. Maintenance and repair requiring the assistance of other skilled personnel shall be carried out under the supervision of the person competent in the use of flammable refrigerants.

That pipe-work including piping material, pipe routing, and installation shall include protection from physical damage in operation and service, and be following 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.

• 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 repairs to the refrigerating system, the following precautions shall be complied with prior to conducting work on the system.

• Work procedure

Work 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.

• 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.

• Before starting work, and periodically during the work, check the area with a refrigerant leak detector. This helps alert the technician to a possible refrigerant leak or flammable atmosphere.

• Use leak detection equipment that is suitable for R32/A2L refrigerant and is non-sparking, properly sealed, or intrinsically safe.

• Presence of fire extinguisher

If hot work will be performed on the refrigerant system or nearby components, keep appropriate fire extinguishing equipment nearby. A dry powder or CO₂ fire extinguisher should be available near the charging or service area.

• No ignition sources

Do not use ignition sources while working on refrigerant piping or any part of the refrigerant system. Keep all possible ignition sources, including smoking materials, open flames, sparks, and other fire hazards, away from the installation, service, removal, or disposal area where refrigerant could be released. Before starting work, inspect the area around the equipment and confirm there are no flammable hazards or ignition risks. Display "No Smoking" signs in the work area.

• Ventilated area

Before opening the refrigerant system or performing any hot work, make sure the area is open or well ventilated. Ventilation must continue while the work is being performed. The ventilation should safely disperse any released refrigerant and, when possible, exhaust it outdoors.

• Checks the refrigerating equipment

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

The following checks shall be applied to installations using flammable refrigerants:

- the actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed;
- the ventilation machinery and outlets are operating adequately and are not obstructed;
- if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
- marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
- refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently

resistant to being corroded or are suitably protected against being so corroded.

- **Check electrical devices**

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.

Initial safety checks shall include:

- that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
- that no live electrical components and wiring are exposed while charging, recovering or purging the system;
- Confirm the unit is properly grounded.

- **Repairs to sealed components**

Sealed electrical components shall be replaced.

- **Repair to intrinsically safe components**

Intrinsically safe components must be replaced.

- **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 consider the effects of aging or continual vibration from sources such as compressors or fans.

- **Detection of flammable refrigerants**

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

The following leak detection methods are deemed acceptable for all refrigerant systems.

Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25% maximum) is confirmed.

Leak detection fluids are also suitable for use with

most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

NOTE: Examples of leak detection fluids are

- bubble method,
- fluorescent method agents.

If a leak is suspected, all naked flames shall be removed/extinguished.

If a refrigerant leak 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 clause Removal and evacuation.

- **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 practices 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 must be available.

- **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 in an appropriate position according to the instructions.

- Ensure that the refrigerating system is grounded prior to charging the system with refrigerant.

- Label the system when charging is complete (if not already).

- Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

- **Decommissioning**

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

- 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 refrigerating system unless it has been cleaned and checked.

- **Labelling**

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

- **Recovery**

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 are available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of the flammable refrigerant. 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.

Transportation, marking and storage for units **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.

Avoid other heat sources or direct sun light.

Avoid a place where is possible for flammable gas to leak out.

Storage of packed (unsold) equipment

Storage package protection should be constructed 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.

