

# **VRF Two-way Cassette Indoor Unit** **Instruction Manual**





## Original instructions

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1. This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge of they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved.
2. Children shall not play with the appliance.
3. Cleaning and user maintenance shall not be made by children with supervision.
4. The appliance shall be installed in accordance with national wiring regulations.
5. Disconnect the appliance from its power source during service and when replacing parts.
6. If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or a similarly qualified persons in order to avoid a hazard.
7. The appliance shall not be installed in the laundry.
8. An all-pole disconnection switch having a contact separation of at least 3 mm in all poles should be connected in fixed wiring.
9. Disconnect the power supply before cleaning and maintenance.
10. If the A-weighted sound pressure level is below 70 dB.



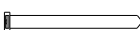


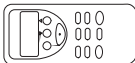


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## Accessories and parts purchased locally

### Accessories

Name of accessories	Numbers	Shape	Application
Installation instruction for indoor unit	1	The manual	(Please be sure to hand it to user.)
Insulating tube	2		To encase single joints of high and low pressure pipes.
Large-sized heat insulating mattress	1		Heat insulation
Ribbon	10		Bind up cables and connecting pipes.
Dome insulated tip	6		Used to connect wires
X-type insulated tip	3		Used to connect wires
Remote controller	1		Control A/C
Battery	2		Supply power to remote controller
Blank valve bag	4		Used to contain accessories.

### Parts Purchased Locally

Cooper pipe	Type	4. 5kW~5. 6kW	7. 1kW~8. 0kW
	Liquid pipe (mm)	Φ 6.35×0.8	Φ 9.52×0.8
	Gas pipe (mm)	Φ 12.7×0.8	Φ 15.88×1.0
PVC drainpipe	For the indoor unit drainpipe. The length is decided according to the actual need.		
Insulation bushing	Assort inner diameter respectively with relevant copper pipe and hard polyethylene plastic pipe. The thickness is usually 10 mm (above). It should be appropriately thickened in closed and wet areas.		

### Correct Disposal of this product



Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.

# 1. Safety Precautionary Measures

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## Warning

- The installation work must be done by the distributor or a professional worker. The installation worker must be equipped with all related knowledge as a wrong operation may cause fire risk, electric shock, injury or water leakage, etc.
- Parts purchased locally should be appointed products of our company. Retailed parts like humidifier should be appointed products of our company, the violation of which may cause fire, electric shock or water leakage, etc. The installation work of retailed products must be installed by professionals.
- If the unit has to be installed in a small room, suitable measures shall be done to make sure any refrigerant leakage concentration if happened in the room will not exceed the critical level.
- For detailed measures, please consult with the distributor.
- Connection of power supply must be complying with rules specified by the local electrical authority.
- Required by law, must be reliable ground works. If the ground is not perfect, it may result in electric shock.
- If the air conditioner need to be moved or reinstalled, please let the distributor or a professional worker operate.
- Incorrect installation will cause fire risk, electric shock, injury or water leakage, etc.
- The user is not permitted to rebuild or repair the unit by themselves. Incorrect repairing will cause fire risk, electric shock, injury or water leakage, etc, so repairing must be performed by the distributor or a professional worker.

## Notice

- Make sure the water drainage pipe is useable. Incorrect installation of water drainage pipe will cause water leakage and furniture wetting, etc.
- Make sure a current leakage protection switch is equipped. The current leakage protection switch must be equipped or there may be an electric shock.
- It mustn't be installed in any position with potential leakage of inflammable gas. If any inflammable gas leaks, there may be a fire risk around the indoor unit.
- Make sure the foundation installation or suspending installation is firm and reliable. If the foundation or suspension is not firm and reliable enough, there may be a fall accident.
- Make sure all electric cables are correctly connected. If any electric cable is incorrectly connected, any electrical part may be damaged.
- Exposure of this machine to water or other moisture before installation will cause short-circuit of electrical components. Don't store it in humid basement or expose it to rain or water.
- If the refrigerant leaks during installation, the room must be ventilated at once. The leaked refrigerant may generate some toxic gas if it contacts any flame.
- After installation, make sure there is no refrigerant leakage. If the refrigerant gas enters and contacts some flame source such as a heater, a stove or an electric cooker, it may generate some toxic gas.

## 2. Selection of Installation Site

### 2-1 Selection of Installation Site for Indoor Unit

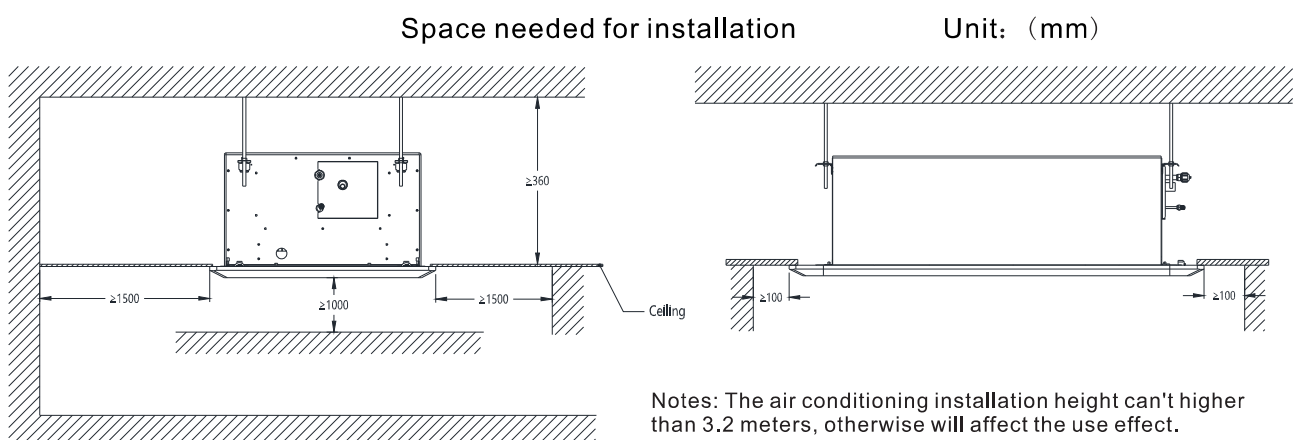
- 1 Provide enough space for installation and maintenance.
- 2 The ceiling is horizontal and the building construction can support indoor unit.
- 3 Ventilation is accessible and the site suffers from the minimal impact of extraneous air.
- 4 Air stream can spread to everywhere of the room.
- 5 Connecting pipe and drainpipe are easy to be extracted.
- 6 No direct radiation of heat.
- 7 The appliance must be installed 2,5m above floor.
- 8 The operating temperature for the unit are 23~32°C(Indoor).

#### ⚠ Attention

- It may result in faults (if it's inevitable, please consult) if the unit is installed in the following places:
- Places where there is mineral oil like cutting oil.
- Places like seaside where there is much salt in the air.
- Places where there is aggressive gas like sulfur gas.
- Places like factory where power supply voltage severely fluctuates.
- In car or cabin.
- Places like kitchen which is full of oil gas and oil bloom.
- Places where there is strong electromagnetic wave.
- Please where there is inflammable gas or material.
- Please where acidic or alkaline gas evaporates.
- Other special environments.
- This series of air conditioning of comfort air conditioning, do not use computer, precision instrument, food, animals and plants, art and other special places.

### 2-2 Space Needed for Installation

As to space needed for installation of ceiling-style indoor unit, please refer to the following figure.



Notes: Actual sizes are subject to real products.

### 3. Installation of Indoor Unit

#### ⚠ Warning

- The air conditioner must be installed in a place of enough strength to support the machine weight.
- If it lacks of strength, the machine may fall down and cause some personal injury.
- For specific installation work, in order to prevent winds or earthquakes.
- Incorrect installation may cause some accident because of machine falling down.

#### 3-1 Preparation before Installation

3-1-1 For the position relation between ceiling opening and hanging screw bolt, please refer to the following figure

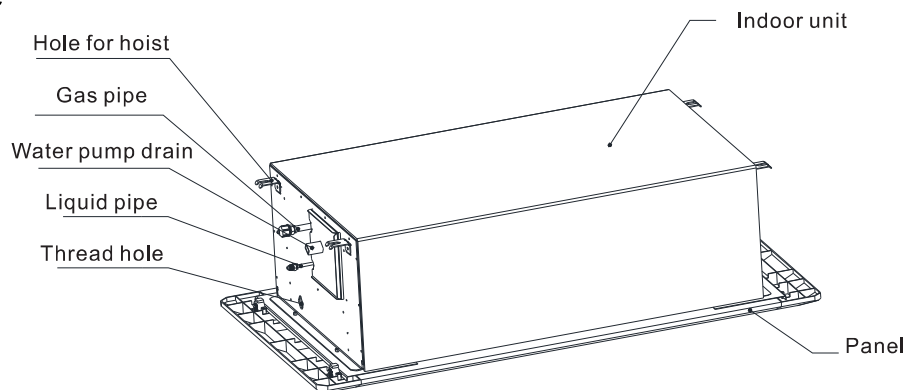


Figure 3.1

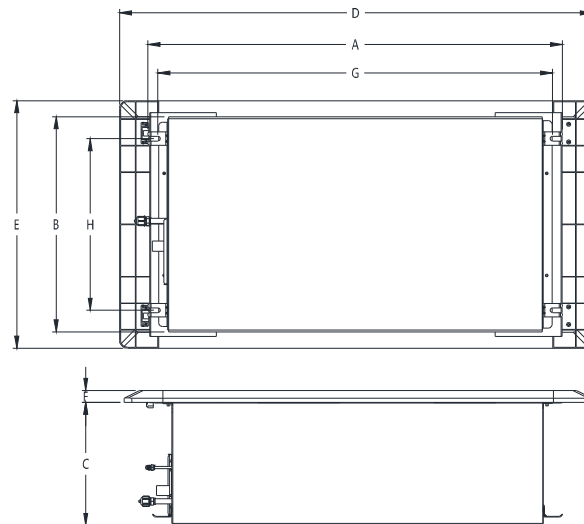


Figure 3.2

Unit: mm

Size code Model of indoor unit	Body size			Panel size			Installing size	
	A	B	C	D	E	F	G	H
4. 5kW~5. 6kW	1092	548	315	1178	630	44	1006	437
7. 1kW~8. 0kW	1332	548	315	1420	630	44	1246	437



### 3. Installation of Indoor Unit

#### 3-1-2 In the proper place of the ceiling opening

1) Opening of the ceiling: The opening size is based on panel size. For the difference of the building structure, please consult with the indoor decoration personnel for the details.

2) Treatment of Ceiling: In order to ensure the levelness of the ceiling and prevent the ceiling from the vibration, it is necessary to reinforce the framework of the ceiling.

3) Cut off and remove the framework of the ceiling.

4) Reinforce the end face after the ceiling is removed, and reinforce the framework that is used to fix the ceiling at both ends further.

5) After the main body is lifted, it is necessary to carry out the piping and wiring operation in the ceiling. Determine the route direction of the piping after the installation site is selected. Especially on the occasion with existing ceiling, pull the refrigerant piping, drain pipe, indoor and outdoor connection cable to the connection location.

6) Please use the lifting bolt with  $\phi 10$ .

For the position relation between ceiling and air conditioning, please refer to the following figure.

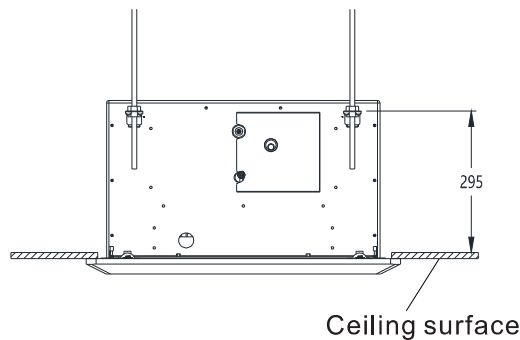


Figure 3.3

#### 3-2 Hanging of Indoor Unit

1) Adjust the location of the nut, and determine the space between the washer (lower side) and the ceiling according to the actual construction situation. Refer to Figure 3.4.

2) Hang the nut of the lifting bolt in the long round hole to install the lug.

3) Confirm the levelness of the main body by the level meter (strictly prohibit the declination toward the non-drain side. It had better decline toward the drain side). Refer to Figure 3.5.

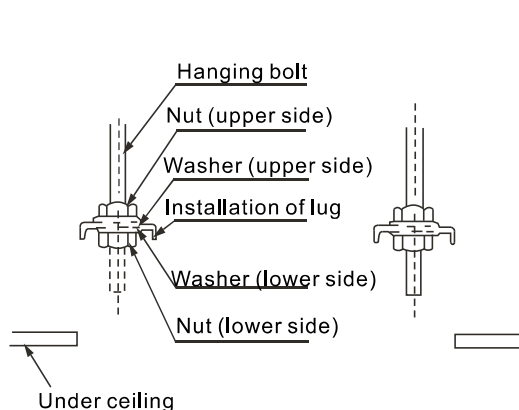


Figure 3.4

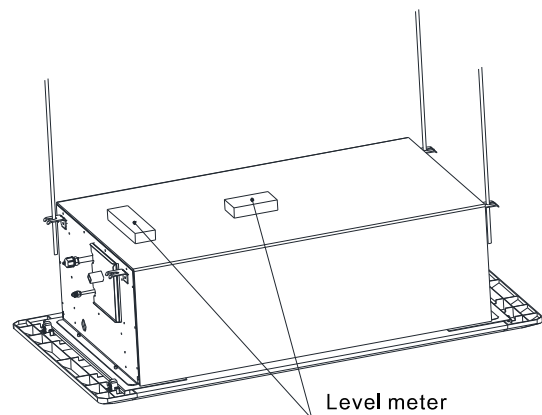


Figure 3.5

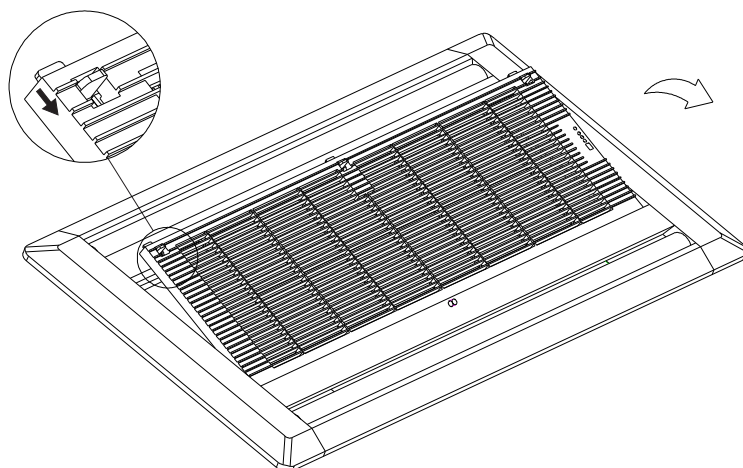
## 3. Installation of Indoor Unit

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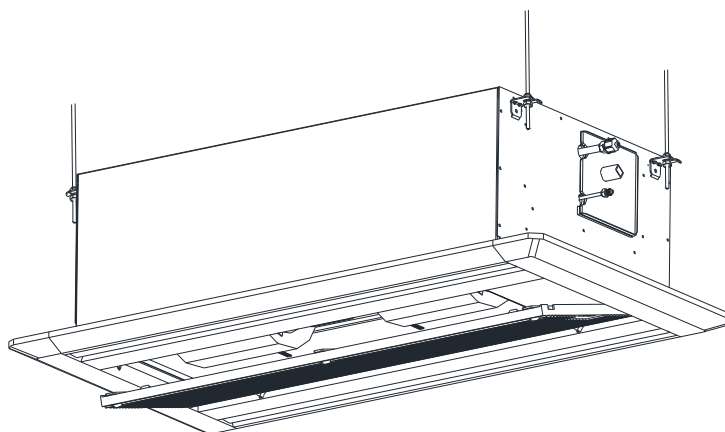
### 3-3 Installation of Panel Component

#### 3-3-1 Remove the air return grille, filter, screw cap

- 1) As the grille switch arrow indication direction to pull the lock catch, remove the air return grille.



#### 3-3-2 Install the screw



#### **Warning**

- Before installation please check the connecting cable between panel and air conditioning whether has clamped, if clamped, the panel will be unfairness after fastening the screws and damage the wires.

## 4. Drain Pipe Layout

### 4-1 Installation of Drainpipe of Indoor Unit

1) PVC pipe (external diameter 30~32mm, inner diameter 25mm) can be used as drainpipe. Users can purchase drainpipe of appropriate length from distributor, local air conditioning service center or market according to actual installation.

2) Encase the mouth of drainpipe into the root of pumping pipe of main part and fasten together the drainpipe and insulating bushing with hoops (accessory).

#### ⚠ Notice

- Don't exert too much strength to avoid destruction of pumping pipe; insulating bushing of pumping pipe and drainpipe should be encased evenly in order to prevent water condensation.

3) Evenly bind up the pumping connecting pipe and drainpipe (especially indoor part) with insulation bushing, and tighten them with tightening belt to avoid air inflow and condensation.

4) In order to prevent water from flowing back into air conditioner when it stops, drainpipe should decline outside(water drain side) the room with an angle of 1/100 or above. Avoid expansion, water storage, etc., or abnormal noise will occur(see figure 4.1a) .

5) When connecting drainpipe, don't pull it hard, in case the pumping connecting pipe gets loose and comes off. Set a supporting point in every 0.8 to 1.0 m, in case that drainpipe may flex. (See Figure 4.1b)

6) When connecting lengthened drainpipe, wrap the indoor part of it so as to prevent lengthened drainpipe from getting loose.

7) If the exit of drainpipe is higher than pumping connecting pipe of main body, drainpipe should be kept vertical upwards as it is possible. The connecting pipe part of water exit has the function of bending vertically and the drainpipe should be set within 600 mm from water tray. Otherwise, when it stops, too much water that flows back will cause overflow. (See Figure 4.2)

8) Set 1-2 exhaust pipe on the highest position of drainpipe so as to avoid the occurrence of gas sealing in drainpipe which may cause poor drainpipe.

#### ⚠ Notice

- Seal all connections of drainpipe system so as to prevent leakage.

9) The distance between the end of drainpipe and the bottom of sink must be more than 50 mm, and don't put drainpipe into water. When directly pouring condensed water into drainage ditch, use upward bent drainpipe into a U-shape water seal to prevent bad smell from entering room through drainpipe. (See Figure 4.3)

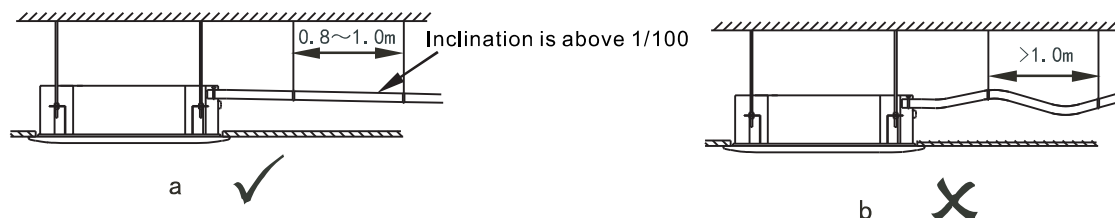


Figure 4.1

## 4. Drain Pipe Layout

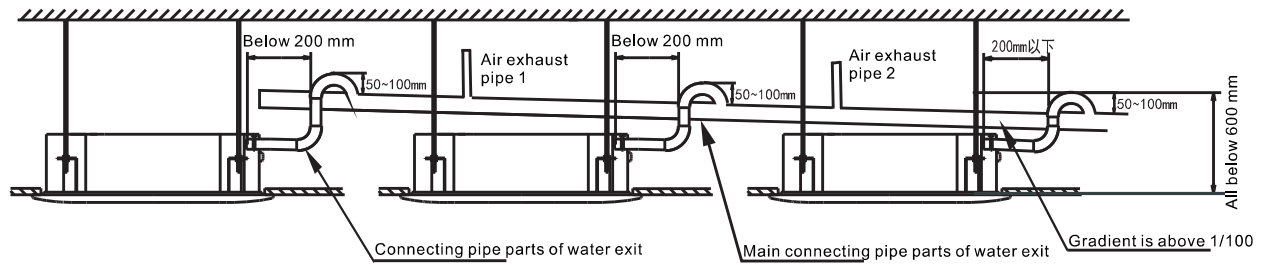


Figure 4.2 Drainpipes of Several Unites Connect with Sewer through Main Drainpipe

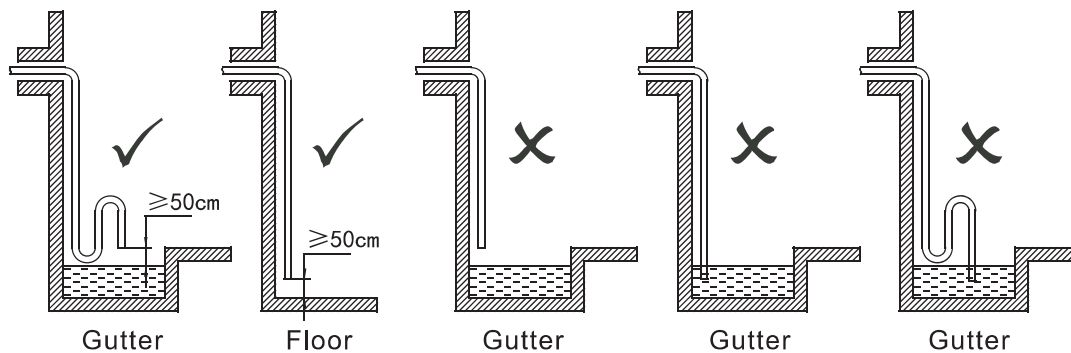


Figure 4.3

### 4-2 Drainage Test

4-2-1 Drainage test is needed for new room before paving the ceiling.

1) Remove water pump installation components, through water trying mouth; inject about 2000 mL of water into water tray through injection pipe. (See Figure 4.4)

2) Turn on the power. Operate the air condition in cooling mode. Check the operation noise of draining pump and check if the outfall can drain normally (in accordance with the different length of drainpipes, it may need about 1 minutes to drain ) and if the interfaces leak.

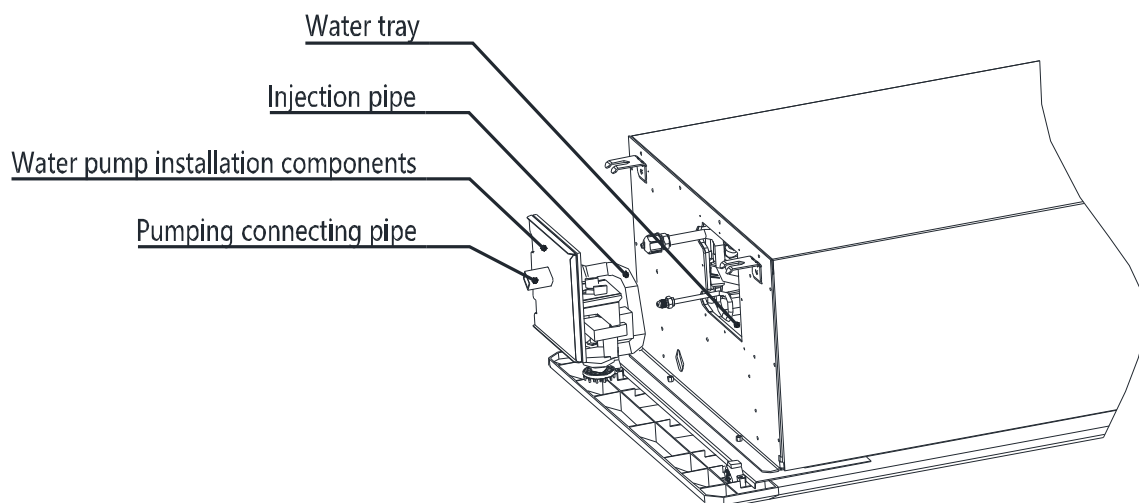


Figure 4.4

## 4. Drain Pipe Layout

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### Notice

- Fault (if any) should be removed immediately.

3) Stop the air conditioner. Check if there are any abnormal conditions after 3 minutes. If drainpipe is arranged unreasonably, too much water will flow back, which will cause alarming of control box, flashing of indicator and even overfall of water tray.

4) Continue to add water and it will alarm due to high water level. Check if draining pump drains water immediately. If water level can't drop down under warning level after 3 minutes, the unit will stop. At this time, turn off the power and drain water before turning it on normally.

5) Turn off the power, drain water and install the water testing cover back to the original place.

## 5. Install Connecting Pipes and Electronic Throttle

### 5-1 Requirements for the connecting length and drop height of the tubing of both indoor and outdoor units

- 1) Please refer to the allowed length of tubing in the instruction of outdoor unit.
- 2) Please refer to the allowed drop height of tubing in the instruction of outdoor unit.

#### ⚠ Notice

- During the installation process, keep the air, dust and other impurities from getting into the pipeline system.
- Fix indoor and outdoor units before installing the connecting pipe.
- Keep dry while installing the connecting pipe and keep the water from getting into the pipeline system.
- Connecting pipe must be wrapped by heat insulator. (Usually, the thickness is more than 10 mm, and it is even thicker in closed humid area.)

### 5-2 Material and Size of Tubing

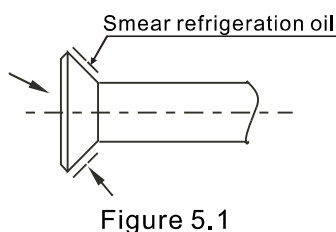
Table 5.1

Type	4. 5kW~5. 6kW	7. 1kW~8. 0kW
Liquid pipes (mm)	Φ 6.35×0.8	Φ 9.52×0.8
Gas pipes (mm)	Φ 12.7×0.8	Φ 15.88×1.0

### 5-3 Procedures for Connecting Pipes

5-3-1 Measure the needed length of connecting tubing, and make connecting tubing according to the flowing methods. (For details, see the "Tubing Connection" column)

- 1) Connect the indoor unit before connecting the outdoor unit.
  - a. Pay attention to the configuration of winding tubing so as not to damage the tubing and its insulation layer.
  - b. Smear the refrigerator oil (it must be engine oil which is compatible with the cooling medium of this type) on the outside surface of flared joint and the conical surface of connecting nut and screw it 3 or 4 rounds with your hand (Fig. 5.1) before screwing the flared nut up.
  - c. Use two spanners at the same time when connecting or taking the tubing down.
  - d. The interface of indoor unit can't bear all the weight of the connecting tubing, because if the interface is over-burdened, it will affect the cooling or heating effects of indoor unit.
- 2) The stop valve of outdoor unit should be completely shut down (as the default state when leaving the factory). Unscrew the nut from the stop valve and connect the flared tube at once (within 5 minutes).
- 3) After connecting the refrigerant tubing to both indoor and outdoor units, eliminate the air according to the column of "Vacuum Supply", then screw the nut up.
  - a. Notes for flexible coupling:
    - ① The winding angle should be less than 90° (Fig. 5.2).
    - ② Its sinuosity had better be in the centre of the pipe range, its bending radius should be more than 3.5 D (the diameter of pipeline).
    - ③ Don't bend the flexible coupling pipe for more than 3 times.



Bend pipe with thumbs



## 5. Install Connecting Pipes and Electronic Throttle

b. Bending thin-wall connecting pipe (Fig. 5.3).

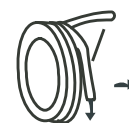
Cut away a notch of a required size in the insulated tubing at the place of sinuosity when operating with the sinuosity, then expose the pipeline (wrap it up with binder after it gets bent).

② Bend radius as much as possible so as to avoid squash or destruction.

③ Use pipe bender to make close sinuosity.

c. Use copper pipe sold in the market:

When using the copper pipe purchased in the market, you must use the same type insulating material (thickness is often more than 10 mm, and it is even thicker in closed humid area.).



Remove coil methods  
make pipe end straight

Figure 5.3

### 5-3-2 Pipe Arrangement

1) It is necessary to bend pipe or drill holes on the wall. The section surface of bending pipe should not exceed 1/3 of original section surface. When drilling wall or board, ensure to set protection bushings. Welding lines are not allowed to be made within the protection bushings. When drilling external wall for the pipe, ensure to seal it tightly with binder so as to prevent impurities from entering the pipe. The pipe should be insulated by appropriate and suitable insulating tube.

2) The encased connecting pipe should get through the hole on the wall from outside and enter into the room. Arrange pipes carefully. Don't destroy pipes.

## 5-4 Connection of Pipe

### 5-4-1 Flaring

1) Cut off pipe with a pipe cutting knife (See Figure 5.4).

2) Insert the pipe into the connected flared nut (Table 5.2).

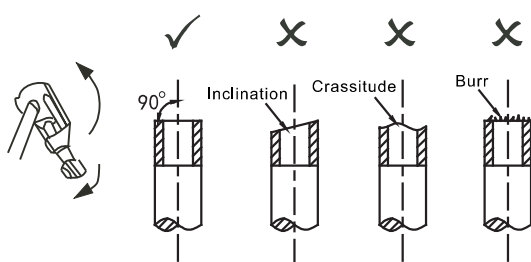
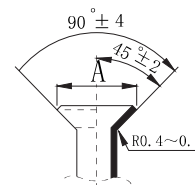


Figure 5.4

Table 5.2

External diameter (mm)	A(mm)	
	Maximum	Minimum
φ 6.35	8.7	8.3
φ 9.52	12.4	12.0
φ 12.7	15.8	15.4
φ 15.88	19.0	18.6



### 5-4-2 Fasten Nuts

Aim at the connecting pipe and screw up nuts with hand and then screw them up with wrenches as shown in Figure 5.5.

#### Notice

- In accordance with installation conditions, too large torque will break loudspeaker while too small torque will cause leakage of air. Please ensure that the torque has been screwed up according to Table 5.3.

Table: 5.3

pipes size (mm)	Tightening torque (N.m)
φ 6.35	10 ~ 12
φ 9.52	15 ~ 18
φ 12.7	20 ~ 23
φ 15.88	28 ~ 32

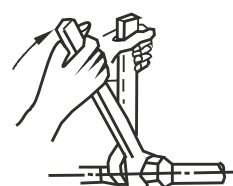


Figure 5.5

## 5. Install Connecting Pipes and Electronic Throttle

### 5-5 Installation of Electronic Throttle Component and Connecting Pipe Assembly

#### 5-5-1 Schematic Diagram for Installation of Electronic Throttle Component

The electronic expansion valve has been welded in the evaporator of the body inside. It isn't necessary the connecting nut of the electronic expansion valve during the installation of the entire unit.

### 5-6 Leakage Test

After having installed refrigerant pipe, connect it before outdoor unit. Inject nitrogen with certain pressure (4.0MPa) from gas pipe side and liquid pipe side at the same time to take leakage test for 24 hours.

### 5-7 Vacuum Supply

Connect refrigerant pipe with the two sides of gas pipe and liquid pipe of outdoor, use vacuum pump to vacuumize from the two sides of gas pipe and liquid pipe of outdoor at the same time.

#### ⚠ Notice

- Never use refrigerant sealed in outdoor unit to vacuumize.

### 5-8 Valve Switch

Use 5 mm hex socket to open and close the valve of outdoor unit.

### 5-9 Leak Detection

When detecting leakage, detect leak in the valves at the interface of the pipe joints with soap bubbles.

### 5-10 Insulated Treatment

Insulate gas pipe side and liquid pipe side. When refrigerating, the temperature of gas pipe side and liquid pipe side should be low. To prevent condensation, please fully insulate (See Figure 5.6).

1) Gas pipe must be made from insulated material which can resist more than 120°C.

2) Please seamlessly insulate the connecting parts of indoor unit single joints with accessorial insulating tube.

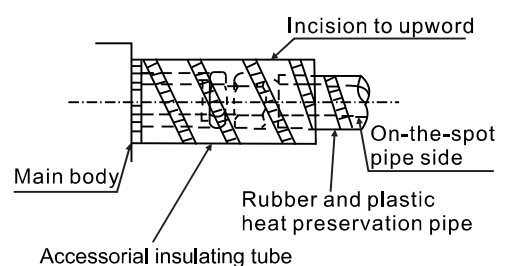


Figure 5.6



## 6. Connection of Electricity

### 6-1 Electric Wiring

#### ⚠ Notice

- Air conditioning applies special power supply and power supply voltage should conform to the rated voltage.
- The external power supply circuit of air conditioning must have ground wire. Power supply's ground wire of indoor unit should be connected accurately with external circuit.
- Wiring should be installed by professional technicians according to labeling of circuit diagram.
- The connected fixed circuit must be furnished with an all-pole disconnection equipment with at least 3mm trigger distance.
- Install protective equipment of creepage in accordance with standard of national electrical equipment technology.
- Power and signal lines should be appropriately arranged in good order, and can not interfere with each other.
- Meanwhile, they cannot connect with connecting pipes and valve body. At the same time, two wires cannot be connected, unless they are welded firmly and wrapped with insulating tapes.
- After installation has done, before connecting to power supply, please check carefully and make sure everything is fine.
- 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, such as: 8A/250VAC, etc.

### 6-2 Specification of Power Supply

The specification of power supply wires recommends the following Figure 6.1. Wirings may be overheated and the machine will break down if the capacity is too small.

Table 6.1

Project  Mode	Power supply of indoor part					Connecting wire		Ground wire
	Power supply	Power switch		Power Cord		Signal wire of indoor and outdoor units		
		Capacity	Fuse	Below 20 m	Below 50 m	Number	Wire diameter	
4.5~8.0kW	Single-phase	15A	15A	2.5mm <sup>2</sup> ×2	4mm <sup>2</sup> ×2	1	Two-core shielded cable 0.75mm <sup>2</sup>	Single wire 2.5mm <sup>2</sup>

#### ⚠ Warning

- As you review this manual, along with the wiring instructions presented in this section, keep in mind that: all field-installed wiring must conform to National Electric Code (NEC) guidelines, and any applicable state and local codes. Be sure to satisfy proper equipment grounding requirements per NEC.

### 6-3 Wiring Suggestion of Signal Wire of Indoor Unit

- 1) Shielded wire should be used as signal wire. Using other wires may cause signal interference and malfunction.
- 2) Wiring shielding layers of shielded wire into one line and then connect it to port E of terminal. (See Figure 6.1)
- 3) It is forbidden to tie the signal wire with refrigerant pipe, power supply wires etc. When power supply wires are paved in parallel with signal wire, they should keep a distance of more than 300mm to avoid interference of signal source.
- 4) Signal wire cannot form a closed circuit.
- 5) Signal wire contains polarity, so be careful when connecting wires. Signal wire of indoor unit should be connected to ports labeled "P, Q, E". And they should conform to ports labeled "P, Q, E" of the main machine of outdoor unit and cannot be connected wrongly.

## 6. Connection of Electricity

6) Please use two-core twisted shielded pair cable (not less than  $0.75\text{mm}^2$ ) as signal wire of indoor and outdoor units. Because it contains polarity, it should be connected properly. Signal wires of indoor and outdoor units can only be led out from the main machine of outdoor unit and connected to all indoor units of a same system.

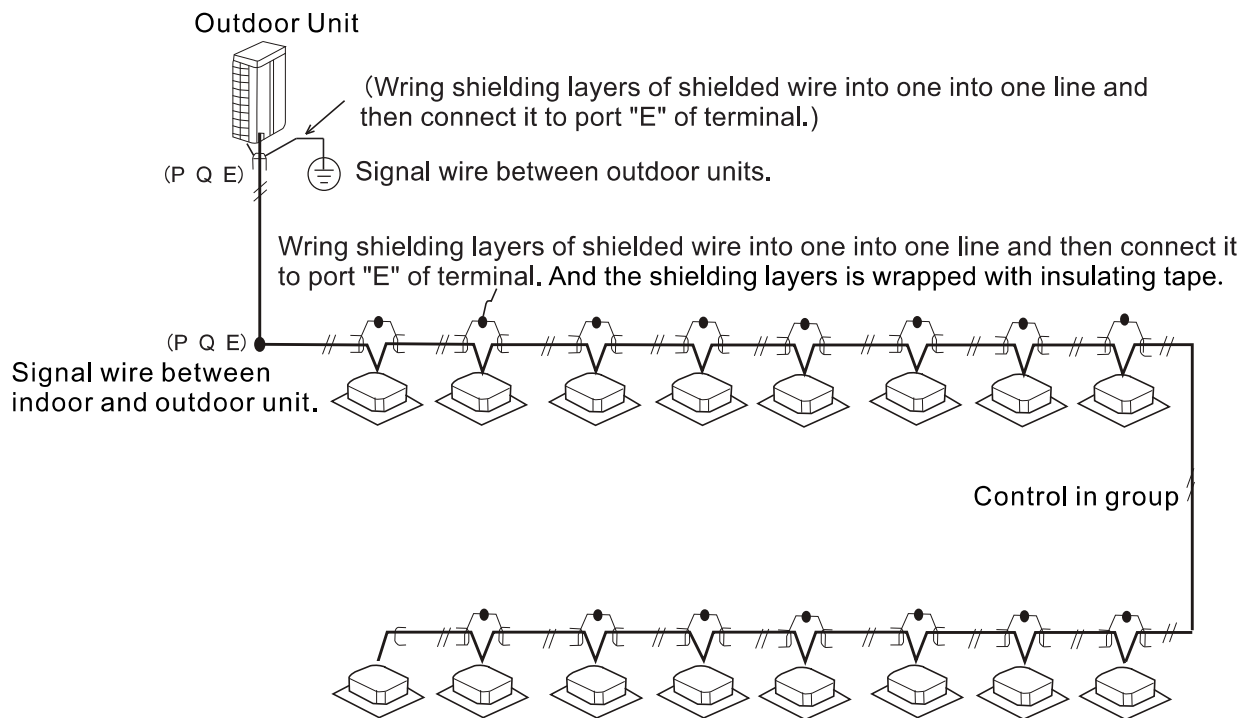
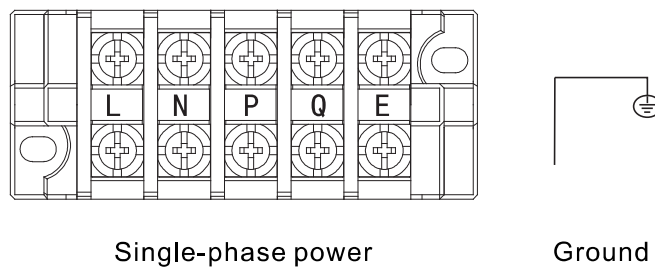


Figure 6.1

### 6-4 Wiring Suggestion of Power Supply of Indoor Unit

- 1) The indoor unit power supply in the same system must be in the same circuit and switched on or off at the same time, or the system service life may be shortened and the machine may fail in starting up.
- 2) Power supply, current leakage protector and manual switch connected to the same outdoor unit must be with the versatility.
- 3) Power supply wires should be connected to the terminal labeled "L, N", ground wire of power supply should be connected to electricity control box "⊕".



### 6-5 Handling of Wiring Interface

Wiring interface should be sealed with insulated material. Failure to seal will cause condensation.

## 7. Fault Code Table

### 7-1 Display with Fault

Definitions of malfunction	Contents appearing
The first time to switch on and there is no address	FE
Errors of phase sequence or fault of losing phase	E0
Communication failure of indoor and outdoor unit	E1
T1 sensor fault	E2
T2 sensor fault	E3
T2B sensor fault	E4
Malfunction of outdoor unit	E5
Testing fault of zero-crossing signal	E6
EEPROM malfunction	E7
Wind testing fault of PG electric motor	E8
Communication fault of wire controller	E9
Alarming fault of water level switch	EE
Model conflict	EF

### 7-2 Display of LED

LED running indicators shine slowly when it is electrified and reset. All of them will go out when it is on standby, while starting up, they will light up. When it is anti-cold or defrost, the preheating light /defrost light will turn on. If timing function is turned on, timing light will light up. When it encounters fault, it manifests the following contents:

Definitions of malfunction	Contents appearing
The first time to switch on and there is no address	LED timing light and running light shine slowly at the same time.
Communication failure of indoor and outdoor unit	LED timing light shines quickly
Fault of indoor temperature sensor	LED running shines quickly
Alarming fault of water level	LED alarming light shines quickly
Mode impact fault	LED defrost light shines quickly
Outdoor unit fault	LED alarming light shines slowly
EEPROM malfunction	LED defrost light shines slowly

It shines slowly with a cycle of 2 seconds and quickly with a cycle of 0.4 second.

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