



# FLOOR STANDING INDOOR UNIT



For Indoor unit models:

TGSS-48HVI3  
TGSS-60HVI3



Ver. 2023


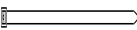


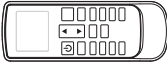


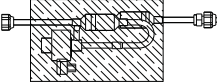
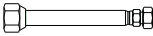

ENG

**OPERATING INSTRUCTION**

Note: All the pictures in this manual are just schematic diagrams, the actual is the standard. Please read this owner's manual carefully and thoroughly before operating the unit! Take care of this manual for future reference.

## 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.
Ribbon	6		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
Drain pipe	1		Used to drain water
Electronic expansion valve component	1		Used for floor-standing unit of the external electronic expansion valve
Switch pipe	1		The $\phi$ 19.05mm pipe switch the $\phi$ 15.88mm pipe
Blank valve bag	3		Used to contain accessories

### Parts Purchased Locally

Cooper pipe	Type	7.1kW~16.0kW
	Liquid pipe (mm)	$\phi$ 9.52 $\times$ 0.8
	Gas pipe (mm)	$\phi$ 15.88 $\times$ 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

## ⚠ 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.  
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 if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
- 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 retail 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  
The appliances that are intended to be permanently connected to fixed wiring, and have a leakage current that may exceed 10mA, shall state that the installation of a residual current device (RCD) having a rated residual operating current not exceeding 30mA is advisable.
- 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.  
If the supply cord is damaged, it must be replaced by the manufacturer, its service agent or similarly qualified persons in order to avoid a hazard.

## ⚠ 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

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### 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.

#### 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.

#### Attention

About electromagnetic compatibility order 89/336/EEC.

In order to avoid the trembling caused by compressor starts running (technical program), please install the outdoor unit according to the steps below:

- The unit power supply must be equipped with qualified circuit breaker with earth leakage protection.
- The power supply switch of the unit can not be connected to other electrical equipment.
- If there are restrictions for washing machine, air conditioning or induction cooker, please contact power supply department to obtain detailed license of installation provisions.
- The user power supply must have ground wire .
- Please refer to electricity range on product nameplate about the detailed specification of air conditioning power supply.

### 3. Installation of Indoor Unit

#### 3-1 Installation of Indoor Unit

##### 3-1-1 Installation Diagram of Indoor Unit

- 1) The unit should keep balanced and no vibration.
- 2) The air inlets and outlets of the unit are free and ensure that the air inflow and outflow are unhindered. Besides, it can not be affected with heat and moisture nearby.
- 3) In order to ensure that the unit can run well and it is easy to install and maintain the unit, please leave enough room. (see Figure 3-1 and Figure 3-2)
- 4) When outdoor unit installation place is higher than the indoor one, in order to prevent rainwater from flowing into room along the connecting pipe, arrange a downward arcuate bend before the connecting pipe enters the room, so as to ensure that the apogee is out of the room.

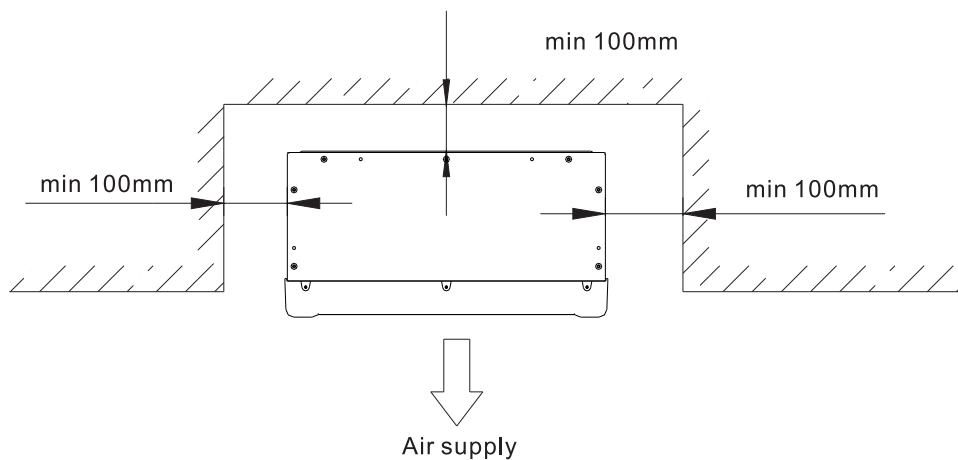


Figure 3-1

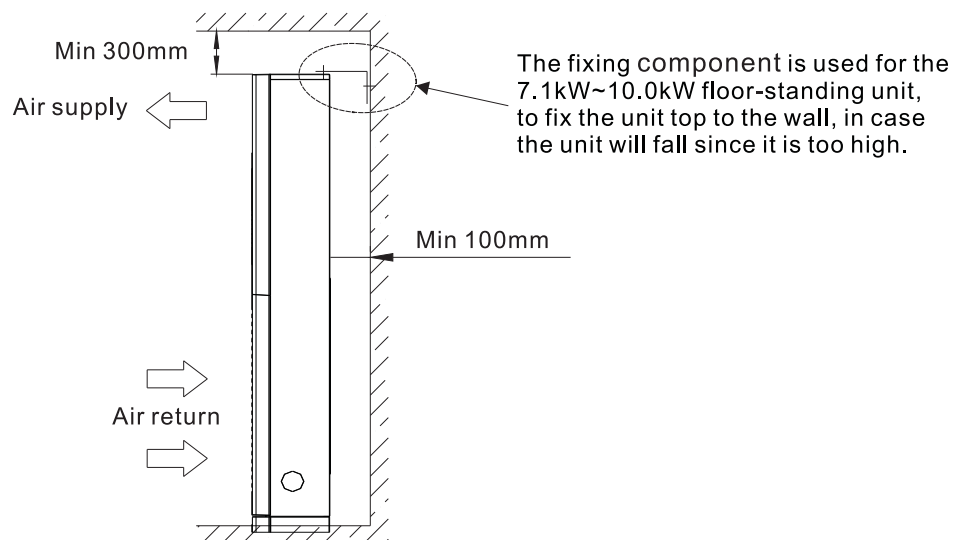


Figure 3-2

## 3. Installation of Indoor Unit

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### 3-1-2 Punch Wall Hole

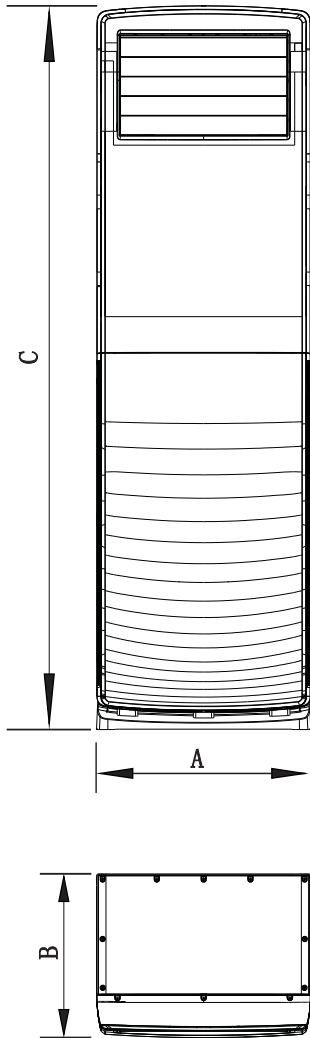
- 1) Choose a place to install.
- 2) Determine the direction of pipeline and the location where pipeline comes out.
- 3) Choose drill according to the machine model. Use electric hammer or hydraulic drill to punch wall hole. Generally, the size of wall hole is: the diameter of wall hole for the 7.1kW~10.0kW unit is recommended to be  $\phi 90$  mm, and the diameter of wall hole for 14.0kW~16.0kW unit is recommended to be  $\phi 150$  mm.
- 4) Try to avoid wall with wire inside and outside or with foreign material, or hard wall when punching holes. The inner side of the hole should be 0.5 cm~1 cm higher than the outer side, so as facilitate drain. The wall hole that exit pipeline from the side of indoor unit should be a little lower than the underside of indoor unit. When punching with hydraulic drill, stick plastic sheet to wall or adopt other methods to prevent water from flowing on the wall. When punching with electric hammer, take measures to prevent dust.

### 3-2 Arrange Pipeline and Bind up

- 1) Bind up power supply lines and signal lines on the upper side, connection pipe on the middle and water pipe on the lower side.
- 2) Determine water-exit place and connect drainpipe.
- 3) Don't over-pull drainpipe while binding up.
- 4) When extending pipe, use ethylene tape to fix 5 to 6 positions.
- 5) Cover heat-insulating materials while extracting pipe widthwise.
- 6) Avoid connected pipe joints for leak detection while binding up.
- 7) When drainpipe is not long enough and needed to be lengthened, note that the indoor part of extended part of drain should be wrapped with protection pipe; Seal drain interface with universal glue, and pipe can't be twisted in any position.

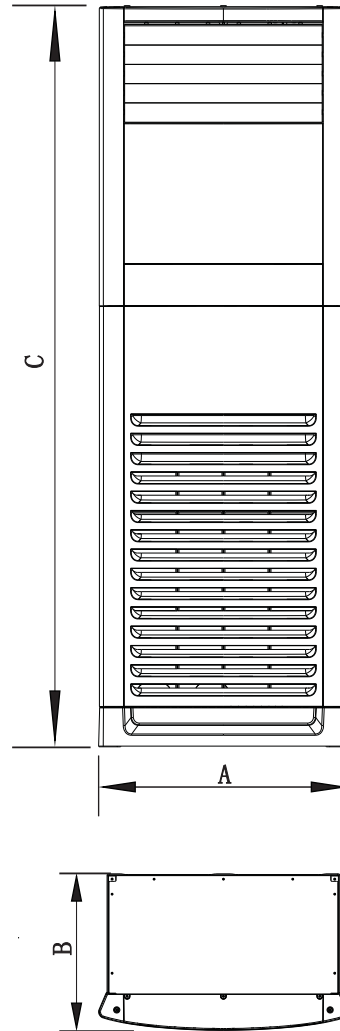
### 3. Installation of Indoor Unit

#### 3-3 Installing Size of Indoor Unit



Unit: mm

Model of indoor unit \ Size code	Body size		
	A	B	C
7.1kW~10.0kW	549	419	1853



Unit: mm

Model of indoor unit \ Size code	Body size		
	A	B	C
14.0kW~16.0kW	648	406	1922



## 4. Drain Pipe Layout

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

#### ⚠ Notice

Be sure to comply with the instruction for installation to connect the Drain pipe, to prevent the condensed water. The insulation of the Drain pipe shall be implemented effectively.

1) The inner diameter of the PVC Drain pipe is 20mm, and users can purchase and arrange the Drain pipe with proper length at the dealer or the local air conditioner after-sales service, or purchase the Drain pipe on the market directly.

2) Connect the Drain pipe in accordance with Figure 4.1.

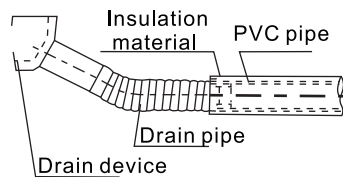


Figure 4.1

#### ⚠ Notice

Don't exert too much force, to prevent the drain pipe from the rupture.

3) The water pump pipe and Drain pipe of the main body (especially for the indoor part) shall be bound by the insulation sleeve and tightened by the tightening belt, to prevent the ingress of air from condensing.

4) To prevent the water from flowing into the air conditioner back during the downtime, the Drain pipe shall decline toward the outdoor side (drain side), and the degree of declination is 1/100 or more. It shall not display any projection or water accumulation (see Figure 4.2a).

5) Don't pull it by force when you connect the Drain pipe, to prevent the stress of the main body. Furthermore, it is necessary to set one supporting point every other 0.8 - 1.0m, to prevent the deflection of the Drain pipe.

6) It is necessary to bind the indoor part when you connect the lengthened Drain pipe, but the lengthened Drain pipe shall not be loosened.

#### ⚠ Notice

Various interfaces of the Drain system shall be sealed, to prevent from the water leakage.

7) The height from the end of the Drain pipe to the floor or the bottom of the Drain groove shall be greater than 50mm, and it shall not be put into the water. When the condensed water is drained into the Drain ditch directly, the Drain pipe shall be bent into one U-shape water seal upward, to prevent the odor from entering into the indoors via the Drain pipe.

Note: The highest point of the U-shape water seal shall be lower than the height of the Drain outlet, to prevent the poor Drain.

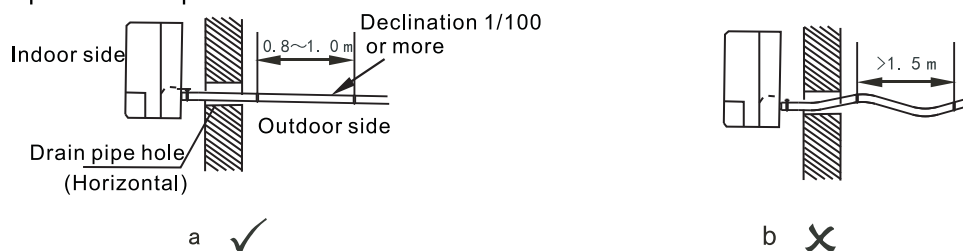


Figure 4.2

## 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	7.1kW~16.0kW
Liquid pipes	$\phi$ 9.52 × 0.8
Gas pipes	$\phi$ 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.

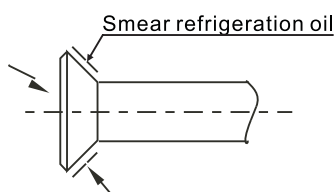


Figure 5.1

Bend pipe with thumbs



Figure 5.2

## 5. Install Connecting Pipes and Electronic Throttle

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

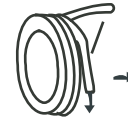
①Cut away a notch of a required size in the insulated tubing at the place of sinuosity when operating with the sinuosity, then expose the pipeline (wrap it up with binder after it gets bent).

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

③Use 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).

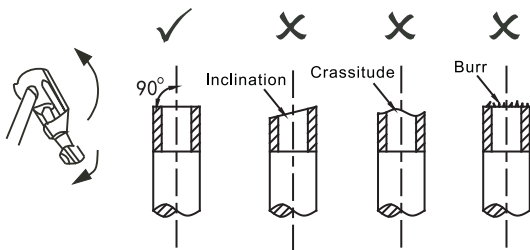


Figure 5.4

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
φ 19.05	23.3	22.9

### 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
φ 19.05	35 ~ 40

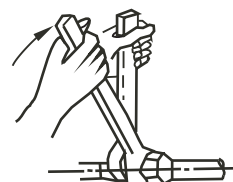


Figure 5.5

## 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

For the external electronic expansion valve component of the floor-standing unit, refer to Figure 5.6 and Figure 5.7. During the installation, the external electronic expansion valve component is connected with the liquid pipe connector of the indoor unit evaporator. Furthermore, it shall be tightened by the torque wrench.

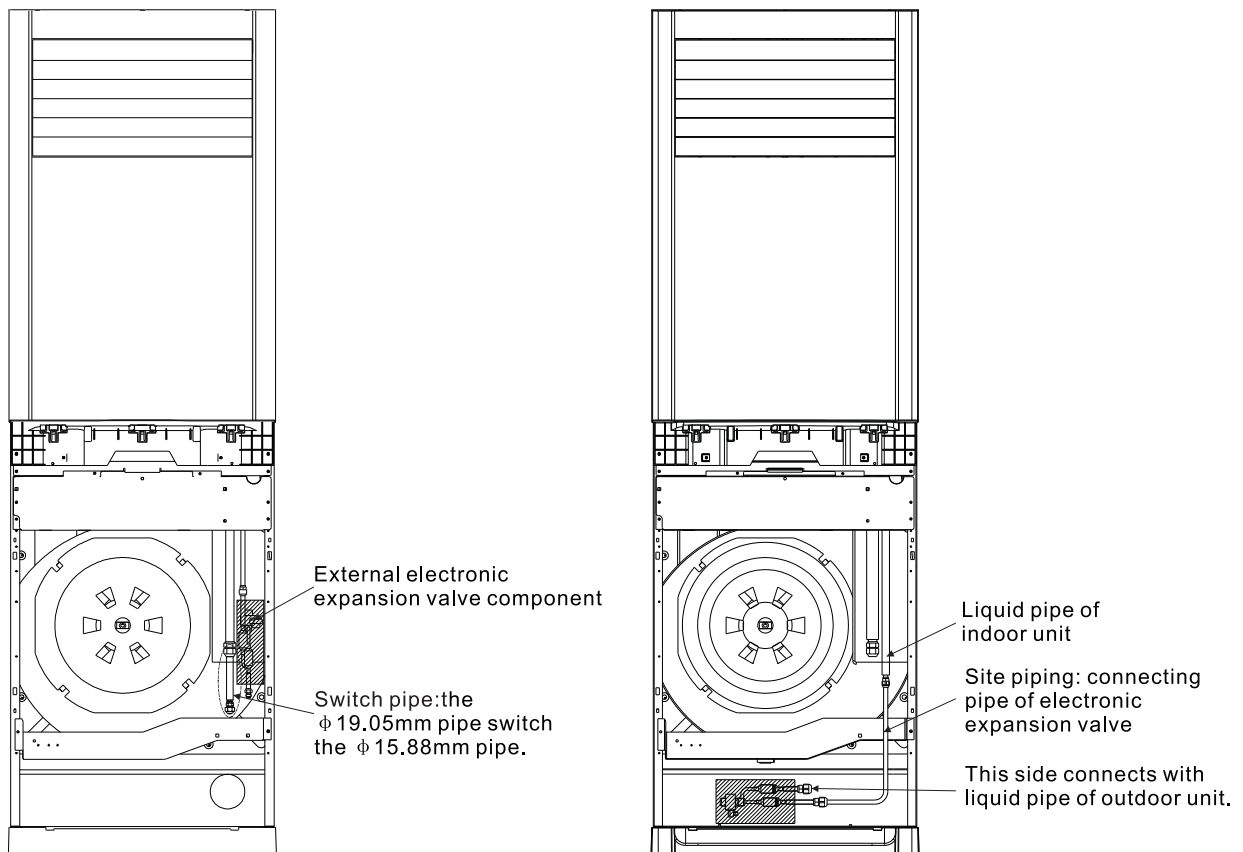


Figure 5.6 The 14.0kW~16.0kW floor-standing unit

Figure 5.7 The 7.1kW~10.0kW floor-standing unit

## 5. Install Connecting Pipes and Electronic Throttle

### 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 5.8).

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 pipe with accessorial insulated materials.

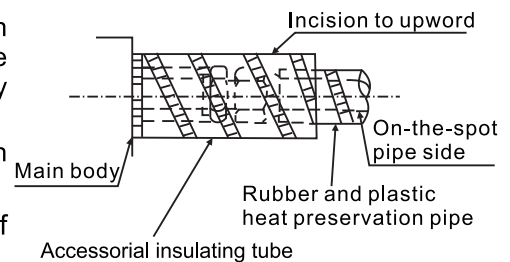


Figure 5.8

## 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.

### 6-2 Specification of Power Supply

The specification of power supply wires is shown in 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
7.1~16.0kW	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.

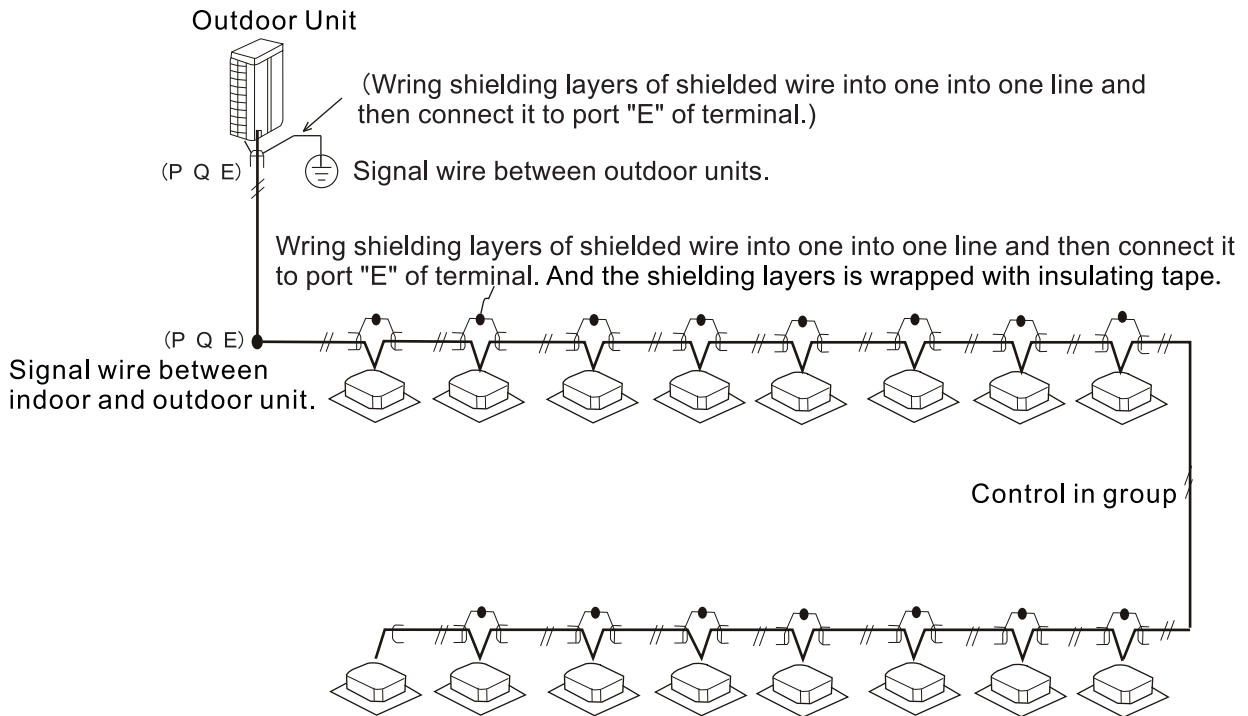
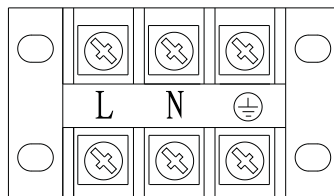


Figure 6.1

### 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 also connected to the terminal labeled "⊕".



### 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.





# FLOOR STANDING OUTDOOR UNIT

A large, empty rectangular box with a thin black border, centered on the page. Inside the box, the words "USER" and "MANUAL" are stacked vertically in a large, black, sans-serif font.

## USER MANUAL

For Outdoor unit models:

TGSS-48HVI3  
TGSS-60HVI3

ENG

Ver. 2023

ENG

**OPERATING INSTRUCTION**

Note: All the pictures in this manual are just schematic diagrams, the actual is the standard. Please read this owner's manual carefully and thoroughly before operating the unit! Take care of this manual for future reference.

# 1 Safety Precaution

## ! WARNING

- \* **This air conditioner is a comfortable unit. Don't use it in some special places for machine rooms, precise instruments, foods, plants, animals, artworks, etc.**
- The installation shall be done by the distributor or the professional staff. The installation staff must have related professional knowledge. Misoperation in the self-installation will result in fire, electric shock, injury, water leak, etc.
- If the air conditioner is installed in a small room, some proper measures shall be taken to make sure that the concentration of refrigerant leak in the room shall not exceed the critical level. For detailed measures, please consult the distributor.
- When connecting the power supply, comply with the regulations specified by the local power company. According to the law, the ground wire must be connected. The misconnection of the ground wire will result in electric shock.
- If the air conditioner needs to be moved or reinstalled, please inform the distributor or the professional staff to operate. Incorrect installation will result in fire, electric shock, injury, water leak, etc.
- The users are not permitted to rebuild or repair the air conditioner by their own. Incorrect repair will result in fire, electric shock, injury, water leak, etc.. Please inform the distributor or the professional staff to repair.

## ! NOTE

- Make sure the water drainage ditch is useable.
- Make sure a current leakage protection switch is equipped. The current leakage protection switch must be equipped. If not, an electric shock will take place.
- It mustn't be installed in any potential leakage location of inflammable gas. In case of the inflammable gas leak around the outdoor unit, a fire takes place.
- Make sure the foundation and hoisting are firm and reliable. If not, it will result in a falling accident.
- Make sure all cables are correctly connected. The misconnection of the cables will result in the damage of electrical components.
- Pre-installation exposure to water or other moistures will result in short circuit of its electrical components.. Don't store it in any damp cellar or expose it to rain or water.
- In case of the refrigerant leaks during installation, the room must be ventilated at once. If the leaked refrigerant is exposed to flame, some toxic gases will be generated.
- After installation, make sure the refrigerant is not leaked.
- If the refrigerant gas in the room is exposed to flame source, such as a heater, a stove or an electric cooker, some toxic gases will be generated..
- A lightning protection device must be equipped according to national laws and regulations against the lightning strike.

# 2 Key Points for Construction Inspection

## 2.1 Arrival of goods and open-case inspection

- 1) When receiving the machine, check if there is any damage in transportation. If any surface or internal damage is found, please inform the transportation agency in a written form.
- 2) After receiving the machine, check if the type, specification and quantity of the machine conform to the contract.
- 3) When unpacking the product, please keep the Manual well and check all accessories.

## 2.2 Refrigerant pipe

- 1) The refrigerant pipe must be installed by the special refrigerant distributor made by our company (purchase).
- 2) The refrigerant pipe must use the pipe with specified diameter and wall thickness.
- 3) The welding of the copper pipe must be performed with nitrogen-filled protection. Before welding, the copper pipe must be filled with the nitrogen of  $0.2\text{kgf/cm}^2$ . After welding, the nitrogen must be cut off until the copper pipe is thoroughly cooled down.
- 4) The refrigerant pipe must be treated with thermal insulation.
- 5) After the refrigerant pipe is installed and before the air tightness test and vacuumization are performed, the indoor unit cannot be power-on.

## 2.3 Air tightness test

After the refrigerant pipe is installed, nitrogen of  $40\text{kgf/cm}^2$  (4.0MPa) must be filled from the gas side and liquid side simultaneously for 24-hour air tightness test.

## 2.4 Vacuumizing

After the air tightness test, vacuumization ( $-0.1\text{MPa}$ ) must be performed from both the gas side and the liquid side simultaneously.

## 2.5 Refilling of refrigerant

- 1) The refilling volume of refrigerant is calculated by the diameter and length (actual length) of the pipe at the liquid sides of the indoor and outdoor units.
- 2) The refilling volume of refrigerant, diameter and length (actual length) of liquid pipe, and height difference of the indoor and outdoor units shall be recorded into the use confirmation table of the outdoor unit (on the cover plate of electronic control box) for future reference.

## 2.6 Electrical wiring

- 1) The power supply capacity and wire diameter shall be selected according to the design manual. Generally, the power line of the air conditioner is thicker than that of the motor.
- 2) To prevent misoperation of the air-conditioner, don't interlace or wind the power line (220-240V-/380V 3N-) with the connecting wires (low-voltage wires) of the indoor and outdoor units.
- 3) The indoor unit is power-on after air tightness test and vacuumization.

## 2.7 Trial Run

- 1) Trial run cannot be performed until the outdoor unit is power-on for more than 12 hours, or the system may be damaged.

## 3 Installation of Outdoor Unit

### ! WARNING

- The air conditioner must be installed in the place, which is strong enough to support the weight of the machine.
- If it is not strong enough, the machine may fall down and cause some personal injury.
- The special installation must be performed against strong wind or earthquake.
- The falling-down because of incorrect installation may cause some accidents.

#### 3.1 Selection of installation position

- 1) Enough space for installation and maintenance.
- 2) No barrier at the air inlet and the air outlet and away from strong wind.
- 3) Dry and ventilated.
- 4) The flat supporting surface is able to bear the weight of the outdoor unit. The outdoor unit shall be horizontally installed, without any noise or vibration.
- 5) Neighbors shall not be influenced by running noise and exhaust gas.
- 6) Without inflammable gas leak;
- 7) Convenient for installation of connecting pipe and electrical connection.

#### 3.2 Dimensional drawing of outdoor unit (Unit: mm)

1) Fig. 3-1 is applicable for models of 12.5kW(200V-220V),14kW,16kW.

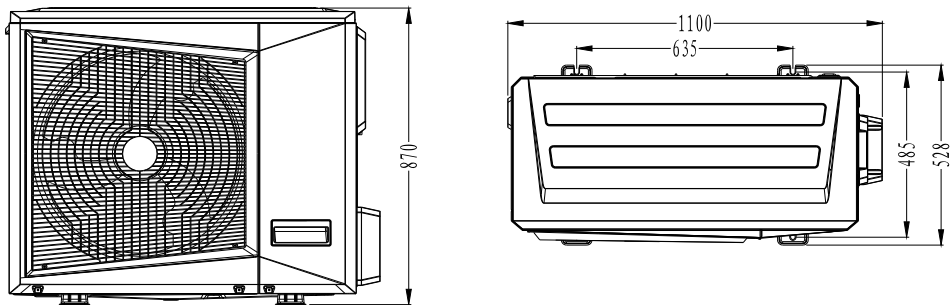


Fig. 3-1 Dimension of Outdoor Unit

2) Fig. 3-2 is applicable for models of 10kW,12.5kW(380V-415V)

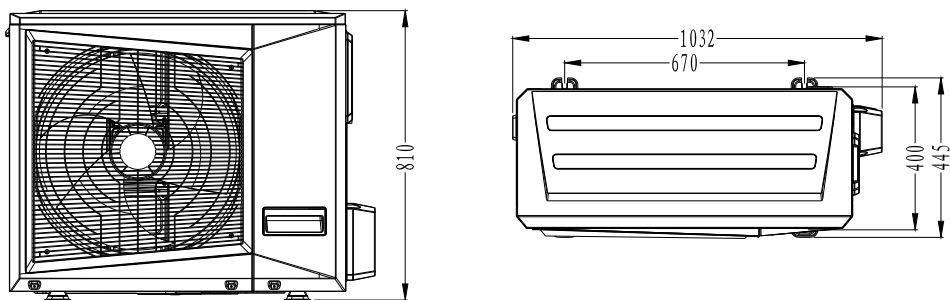


Fig. 3-2 Dimension of Outdoor Unit

3) Fig. 3-3 is applicable for models of 8kW

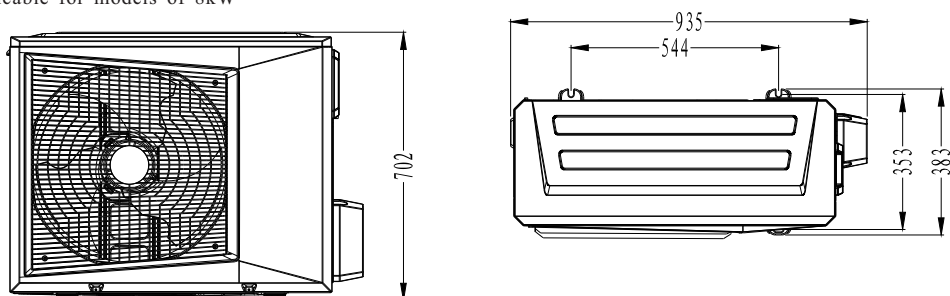


Fig. 3-3 Dimension of Outdoor Unit

3.3 Hoisting of outdoor unit

- 1) Don't remove any package upon hoisting. Two ropes (more than 8cm) shall be used to hoist the well-packaged machine stably and safely. If there is no package or the packaging material is broken, use some backing plates or packaging materials to protect the machine.
- 2) The outdoor unit shall be carried and hoisted vertically, within an inclination of less than 15 degrees. Care should be taken to safety during carrying and hoisting the machine.
- 3) The gravity of the machine is not in the center, so be careful to hoist the machine.
- 4) Don't hold the suction inlet of the housing, or it will be deformed.

3.4 Installation and maintenance space of outdoor unit

- 1) Provide a firm and adequate foundation to:
  - ① Prevent the outdoor unit from being sunken;
  - ② Prevent the outdoor unit from abnormal noise.
- 2) Foundation types
  - ① Steel structure
  - ② Concrete structure (Common practice is shown in the Fig. below)

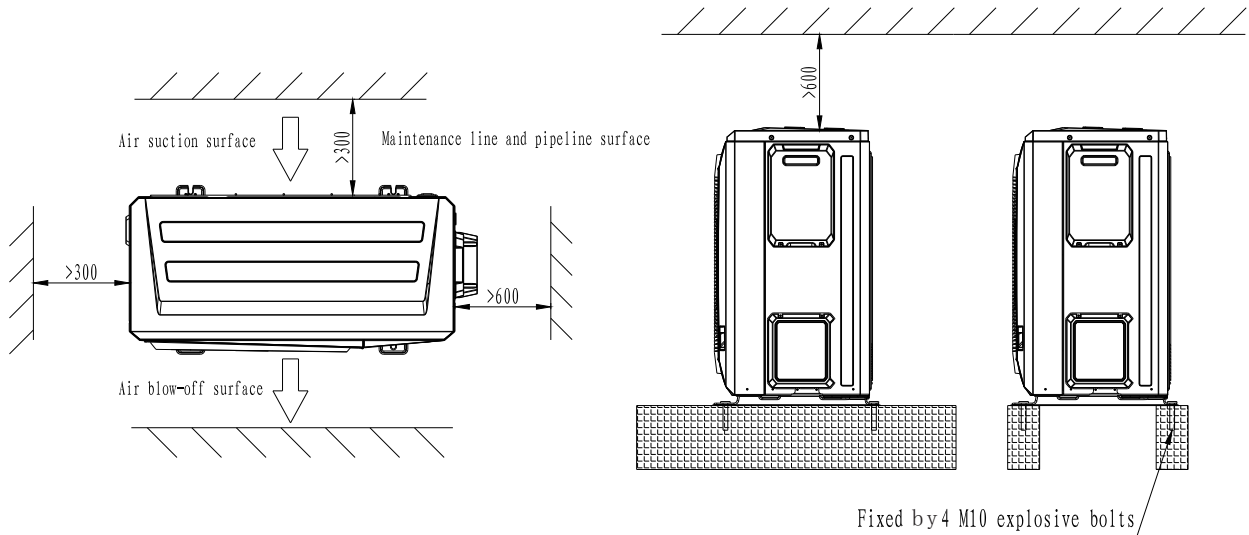


Fig 3-4 Space schematic diagram I for installation and maintenance of outdoor unit

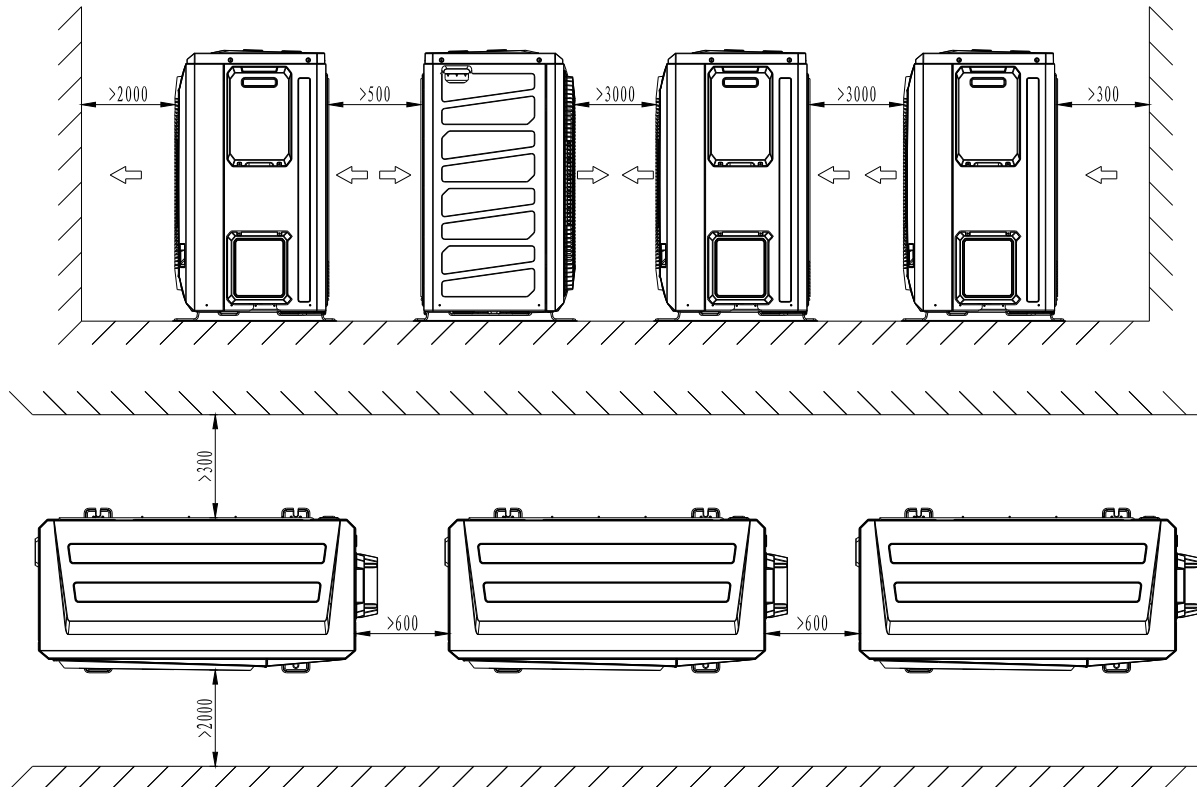


Fig 3-5 Space schematic diagram II for installation and maintenance of outdoor unit

3.5 Position and installation of outlet pipe

- 1) These models of CHV-DH080W/R1, CHV-DH100W/R1, CHV-DH125W/R1, CHV-DH140W/R1, CHV-DH160W/R1, GCHV-D125W/HZR1-D01, GCHV-140W/HZR1-F01 and GCHV-160W/HZR1-F01 directly use the external globe valves to take over.

# 4 Installation of Connecting Pipe

## 4.1 Refrigerant pipe

### 1) Flaring

Use a pipe cutter to cut the refrigerant pipe and a pipe expander to flare

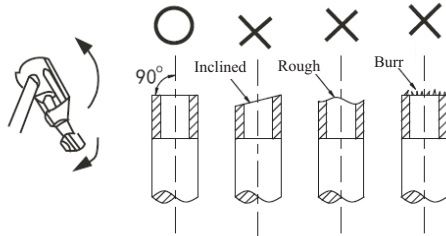


Fig. 4-1 Cutting Pipe of Connecting Pipe

Table 4-1 Flaring Dimension of Connecting Pipe

Outer Diameter (mm)	A (mm)	
	Maximum	Minimum
Φ 6.35	8.7	8.3
Φ9.52	12.4	12.0
Φ12.7	15.8	15.4
Φ15.88	19.0	18.6

### 2) Fastening nut

Align the connecting pipe, tighten it by hand, and then by a wrench.

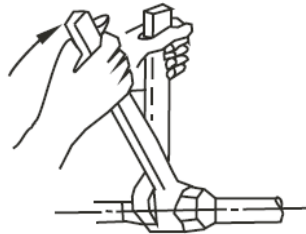


Fig. 4-2 Tightening Schematic Diagram

Table 4-2 Tightening Torque

Pipe Dimension (mm)	Tightening Torque (Nm)
Φ 6.35	14.2~17.2 (144~176 kgf•cm)
Φ 9.52	32.7~39.9 (333~407 kgf•cm)
Φ 12.7	49.5~60.3 (504~616 kgf•cm)
Φ 15.88	61.8~75.4 (630~770 kgf•cm)

## NOTE

- To prevent the copper pipe from internal oxidation upon welding, the copper pipe shall be filled with nitrogen. Otherwise, the oxide skin will block the refrigeration system!
- When fastening the nut, too strong force will damage the flared socket, but too weak force will result in leakage. Please refer to the tightening torque in the table above to fasten the nuts!

## 4.2 Set refrigerant pipe dimension and pipe connecting steps

Table 4-3 Definition of Pipe

Name of Pipes	Connecting Position of Pipe	Code
Main pipe	Pipe between the outdoor unit and the first distributor at the indoor unit side	L <sub>1</sub>
Main pipe of indoor unit	Pipe behind the first distributor at the indoor side and indirectly connected to the indoor unit	L <sub>2</sub> ~L <sub>5</sub>
Branch pipe of indoor unit	Pipe behind the distributor and directly connected to the indoor unit	A,b,c,d,e,f
Distributor components of indoor unit	Pipe components to connect the main pipe, main branch pipe and branch pipe	A,B,C,D,E

### 1) Connecting mode I

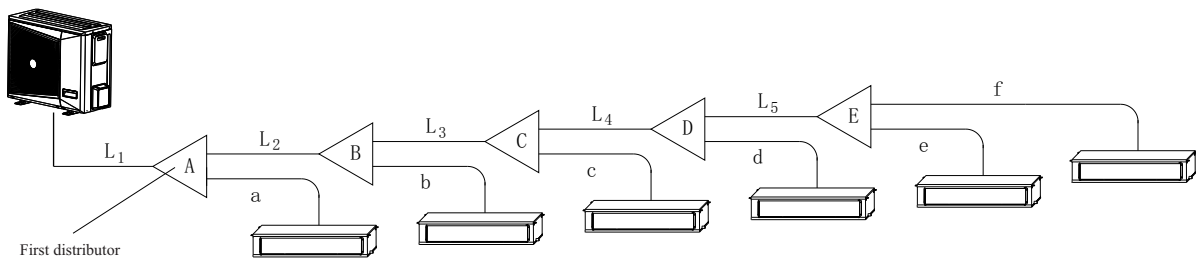


Fig. 4-3 Connecting mode I

2) Connecting mode II

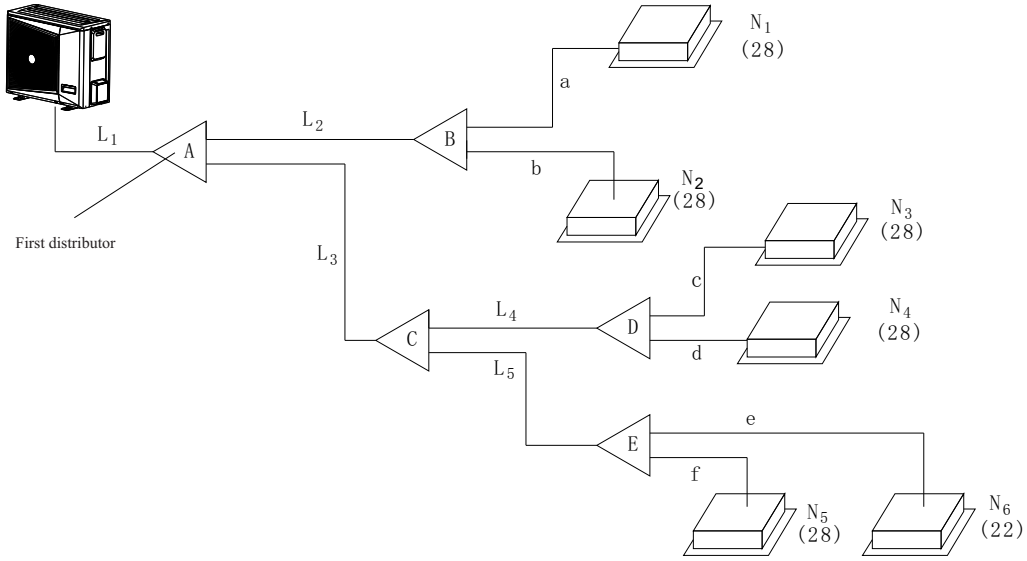


Fig. 4 -4 Connecting mode II

**NOTE**

- All distributors must use our company's special distributors. Otherwise, it may cause severe faults of the system!
- The indoor unit shall be equally installed on both sides of the U-type distributor.

4.3 Determination of main pipe (L1) diameter

Table 4-4 Diameter of Main Pipe

Capacity of Outdoor Unit (kW)	Pipe				
	Dimension of Main Pipe (mm)				
	L <sub>1</sub> < 30m		L <sub>1</sub> ≥ 30m		First distributor
	Liquid pipe	Gas pipe	Liquid pipe	Gas pipe	
8	Φ 9. 52	Φ 15. 88	Φ 9. 52	Φ 19. 05	SP-FQG-N01D
10	Φ 9. 52	Φ 15. 88	Φ 9. 52	Φ 19. 05	SP-FQG-N01D
12. 5/14/16	Φ 9. 52	Φ 15. 88	Φ 9. 52	Φ 19. 05	SP-FQG-N01D

4.4 Determination of main pipe (L<sub>2</sub>-L<sub>5</sub>) diameter

Table 4-5 Diameter of Pipe

Capacity of Downstream Indoor Unit (kW)	Length of Downstream Equivalent Pipe		
	Dimension of main pipe of indoor unit		Applicable to distributor
	Liquid pipe	Gas pipe	
W < 6. 5	Φ 9. 52	Φ 12. 7	SP-FQG-N01D
6. 5 ≤ W < 18	Φ 9. 52	Φ 15. 88	SP-FQG-N01D
18 ≤ W < 22	Φ 9. 52	Φ 19. 05	SP-FQG-N01D

4.5 Allowable length and height difference of the refrigerant pipe

1) Connecting mode I

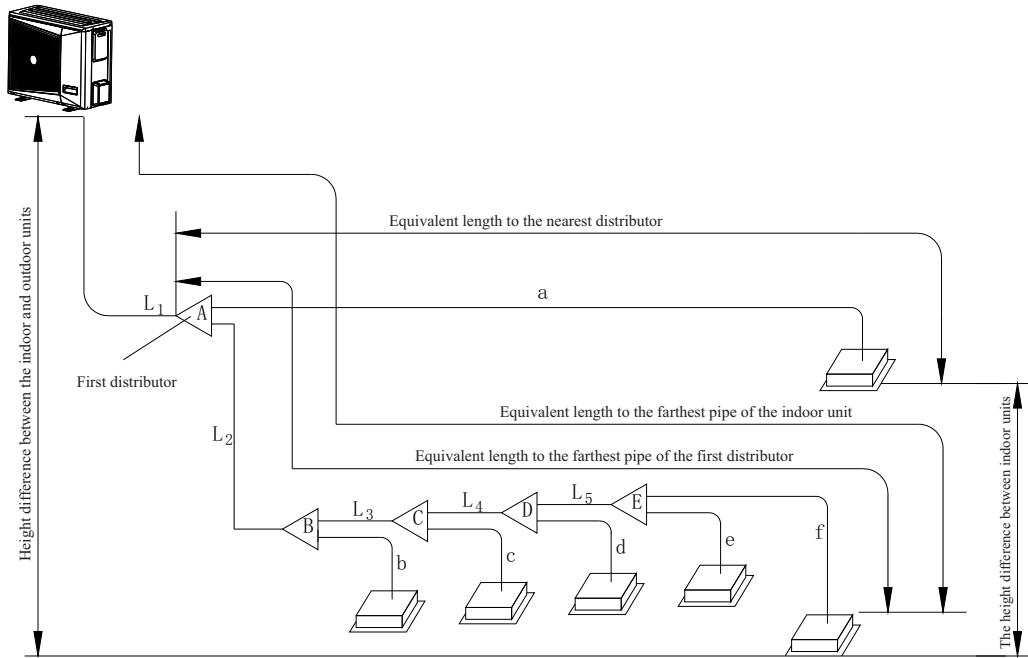


Fig. 4 -5 Connecting Mode I

2) Connecting mode II

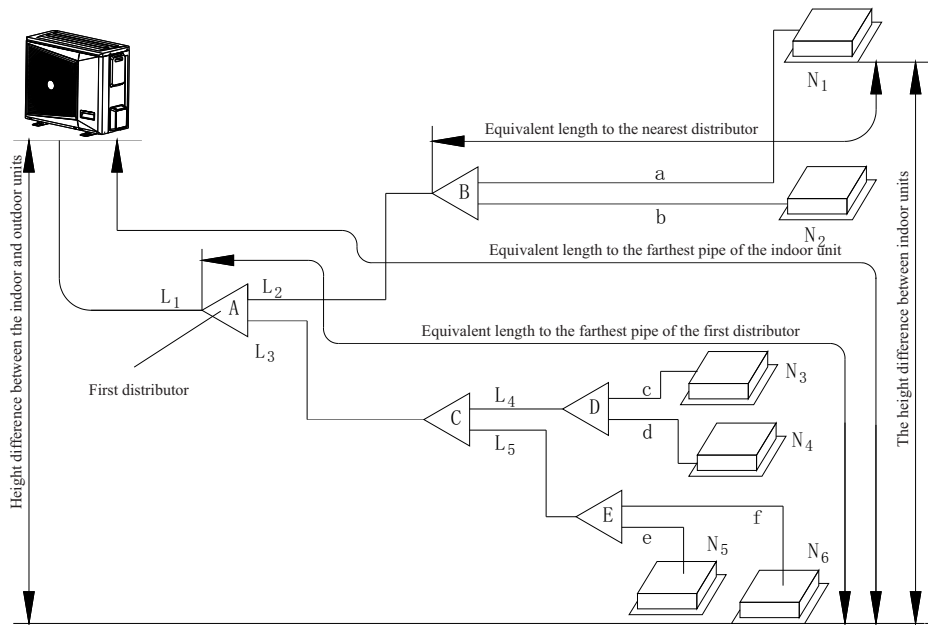


Fig. 4 -6 Connecting Mode II

Table 4-6 Diameter of Pipe

Total Pipe Length		≤ 100m	$L_1+L_2+L_3+L_4+L_5+a+b+c+d+e+f$
Length of the farthest pipe L	Actual length	≤ 60m	$L_1+L_2+L_3+L_4+L_5+f(\text{connecting mode I})$ $L_1+L_3+L_5+f(\text{connecting mode II})$
	Equivalent length	≤ 70m	
Equivalent length to the farthest pipe of the first distributor		≤ 20m	$L_2+L_3+L_4+L_5+f(\text{connecting mode I})$ $L_3+L_5+f(\text{connecting mode II})$
Equivalent length to the nearest distributor		≤ 15m	a, b, c, d, e, f
Height difference between the indoor and outdoor units	Outdoor upper	≤ 30m	-
	Outdoor lower	≤ 20m	-
Height difference between the indoor units		≤ 8m	-



4.6 Installation of distributor

- 1) The distributor shall use U-type or Y-type, instead of T-type.
- 2) The distributor shall be installed horizontally, with the deviation angle of no greater than  $\pm 10^\circ$
- 3) The distributor cannot be turned directly, with the straight pipe of no less than 0.8 meter.

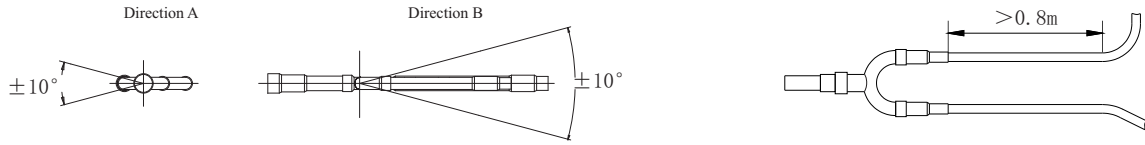


Fig. 4-7 Installation of Distributor

4.7 Oil return bend settings

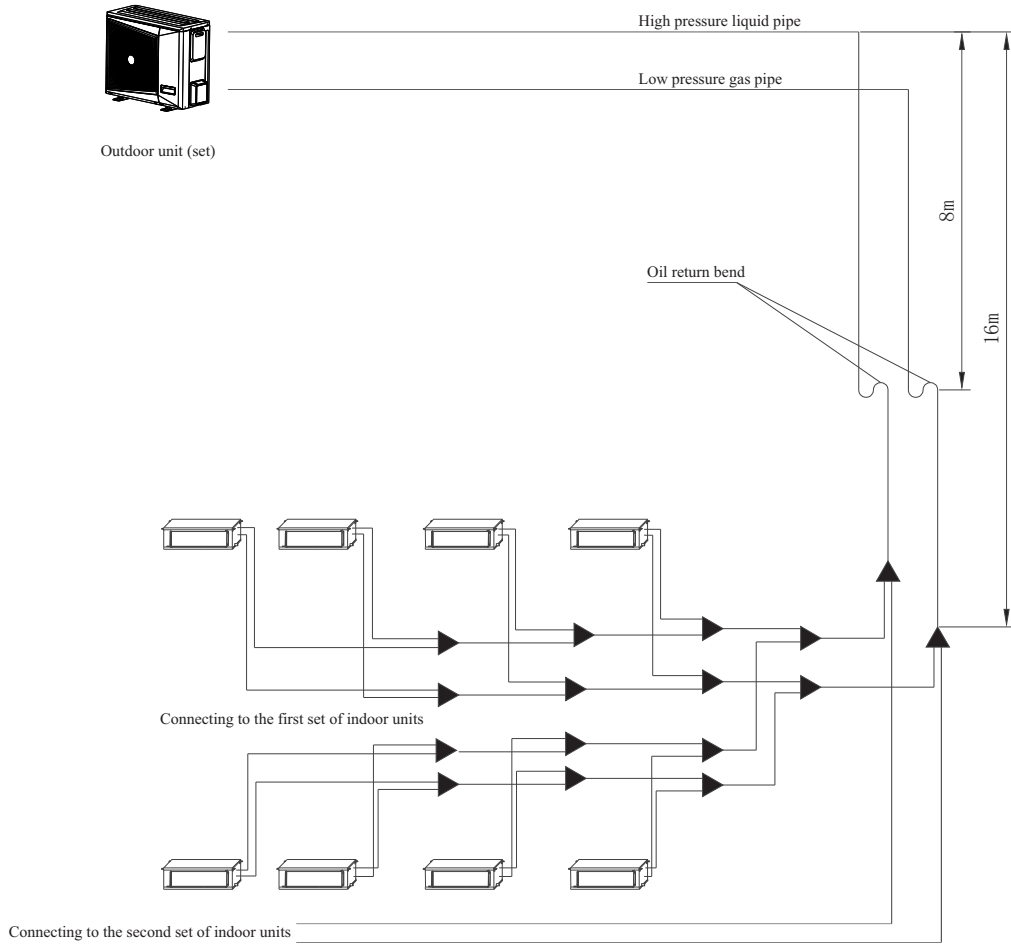


Fig. 4-8 Position of Oil Return Bend at the Height Direction

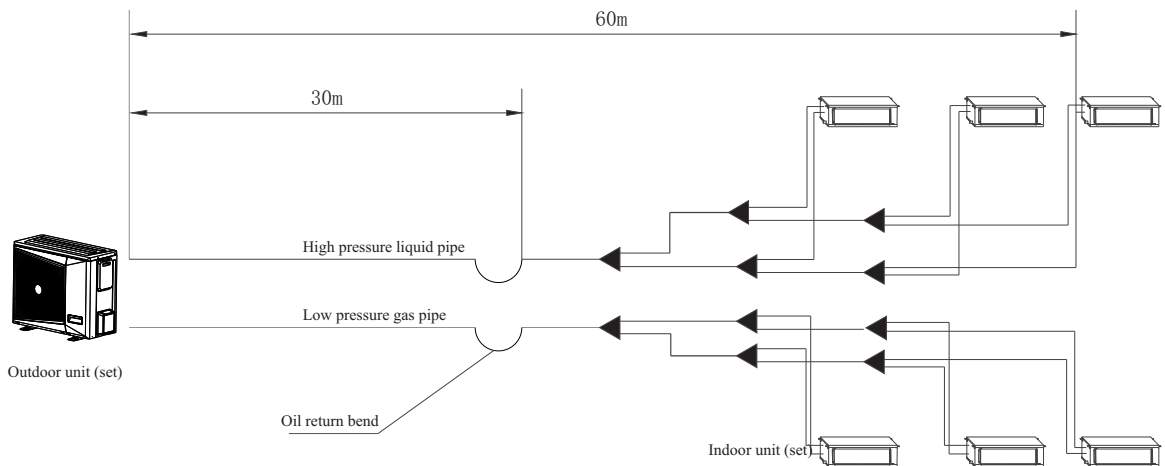


Fig. 4-9 Position of Oil Return Bend at the Horizontal Direction

#### 4.8 Remove foreign materials in the pipeline.

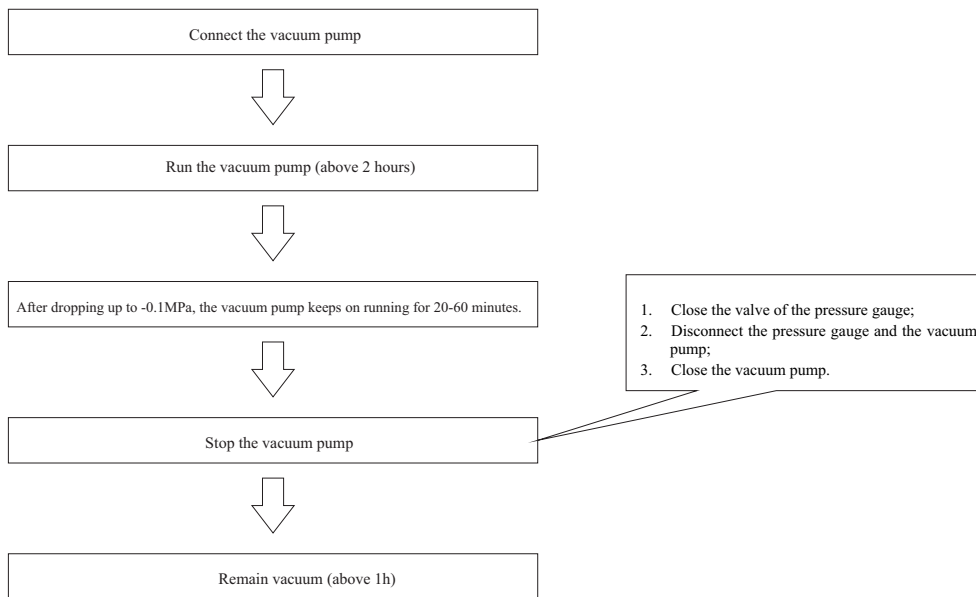
- 1) The foreign materials, which enter the refrigerant pipe during installation, shall be cleaned with high pressure nitrogen.
- 2) Don't connect with the indoor unit upon cleaning.
- 3) Use the nitrogen instead of refrigerant or flammable toxic gases like oxygen.

#### 4.9 Air tightness test

- 1) After the refrigerant pipe is installed and connected to the indoor unit, and before the connecting pipes between the indoor and outdoor units are connected to the valves of the outdoor units, refill the nitrogen with the pressure of 40kgf/cm<sup>2</sup> (4.0MPa) from the gas side and the fluid side simultaneously, mark the pressure value, and then perform 24-hour air tightness test.
- 2) If the pressure drops, recheck the leakage of all interfaces and then maintain the pressure for 24 hours.
- 3) Don't connect with the outdoor unit during maintaining the pressure.

#### 4.10 Vacuumizing

- 1) The vacuum pump has the vacuum degree of less than -0.1MPa and the air displacement of more than 40L/min.
- 2) It is unnecessary to vacuumize the outdoor unit. Don't open the check valves at the gas side and the liquid side of the outdoor unit.
- 3) Make sure the vacuum pump can drop up to -0.1MPa within 2 hours; if it fails to drop up to -0.1MPa after 3 hours, check moisture or air leak.
- 4) The vacuum pump must have a check valve.



#### NOTE

- Don't use tools and measuring apparatus using in different refrigerants or directly contacting the refrigerant.
- Don't exhaust air with refrigerant gas.
- If the vacuum degree cannot reach -0.1MPa, recheck its leakage. If not, keep the vacuum pump on for 1-2h.

#### 4.11 Refilling volume of refrigerant

The refilling volume of refrigerant (R410A) is calculated according to the diameter and length of the pipe at the liquid side of the indoor and outdoor units.

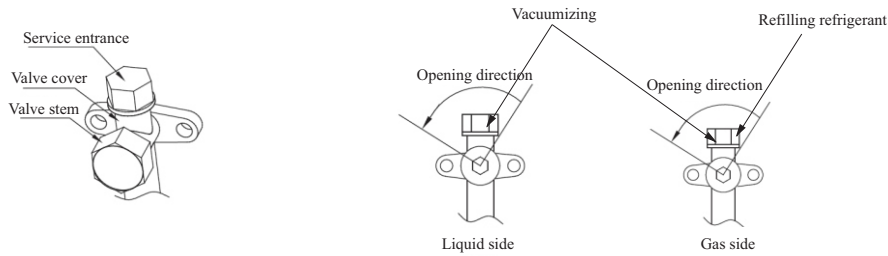
**Table 4-7 Refilling Volume of Refrigerant**

Diameters of pipe at the liquid side (mm)	Refilling volume of refrigerant equal to the length of 1m pipe (unit: kg)
φ 6.35	0.022
φ 9.52	0.054

Note: The R410A refrigerant must be weighed by an electronic scale and filled in the liquid state.

#### 4.12 Stop valve instructions

- 1) It is closed when leaving the factory;
- 2) Open the valve counterclockwise or close the valve clockwise with a 6mm socket head wrench;
- 3) After completing the operation, tighten the valve cover;
- 4) R410A special tool shall be used to vacuumize the valve and fill the refrigerant at the service entrance. Fill the refrigerant at the service entrance at the gas side, and vacuumize the valve at the service entrance at the liquid side and the gas side simultaneously.



**Fig. 4-10 Stop Valve Instructions**

#### 4.13 Thermal insulation of pipe

- 1) Apply thermal insulation to the pipes at the gas side and the liquid side respectively;
- 2) Use closed-cell thermal insulation materials, with the flame retardant grade of B1 and high temperature resistance of 120°C;
- 3) Outer diameter of copper pipe  $\leq \phi 12.7$  and thickness of thermal insulation cotton  $\geq 15\text{mm}$ ; outer diameter of copper pipe  $\geq \phi 15.88$  and thickness of thermal insulation cotton  $\geq 20\text{mm}$ .
- 4) The nut joints of the indoor unit shall be performed thermal insulation



#### NOTE

- The power supplies for the indoor and outdoor units shall be separately designed.
- The power supply must be designed with a sub-circuit, and equipped with a current leakage protector and a manual switch.
- All indoor units in the same system shall be arranged on the same power circuit, and shall be turned on/off the power simultaneously. It is not allowed to equip each indoor unit with a power switch.
- The connecting wire system and the refrigerant pipe system of the indoor unit shall be incorporated into the same system.
- To reduce the interference, the indoor and outdoor communication cables shall use two-core or three-core shielded twisted-pair cables instead of ordinary multi-core cables.
- Conform to related national electrical standards.
- Electrical wiring shall be done by a professional electrician.

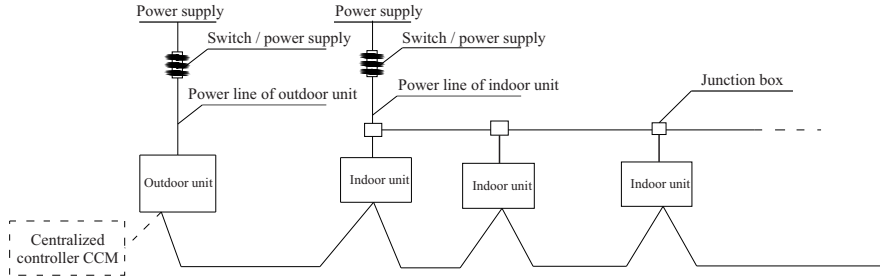
# 5 Electrical Wiring

## 5.1 Outdoor unit wiring

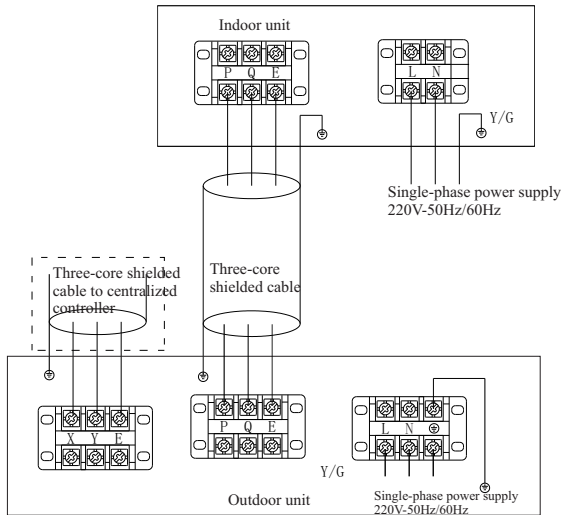
**Table 5-1 Outdoor Unit Wiring**

Power (kW)	Power Supply		Power Line (mm <sup>2</sup> )	Breaker/Fuse (A)	Signal Wire of Indoor/Outdoor Units (mm) (Signal Wire of Weak Current)
8/10	Single-phase	220-240V 50Hz/60Hz	3×4.0	40/30	three-core shielded cable 3×1.0 (two-core shielded cable 2×1.0)
12.5/14/16	Single-phase	220-240V 50Hz/60Hz	3×6.0	63/45	
	Three-phase	380V 50Hz/60Hz	5×2.5	25/20	

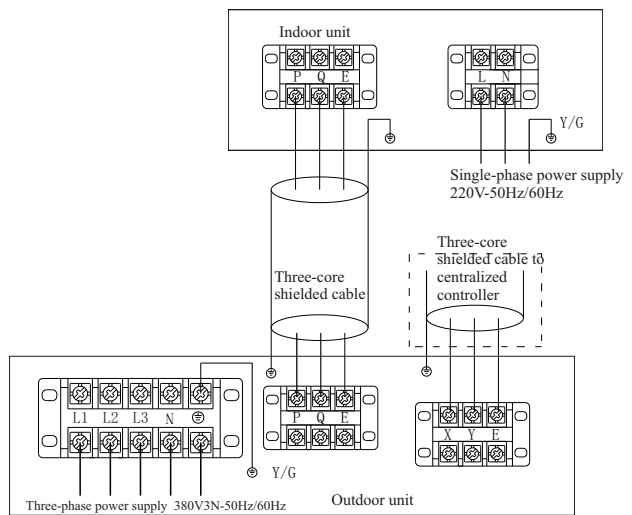
If needed, the user can purchase a centralized controller, as shown in the dashed box. For the specific method of installation, please contact your local supplier.



**Fig. 5-1 Wiring and Control**



**Fig. 5-2 Electrical Wiring of Single-phase Outdoor Units**

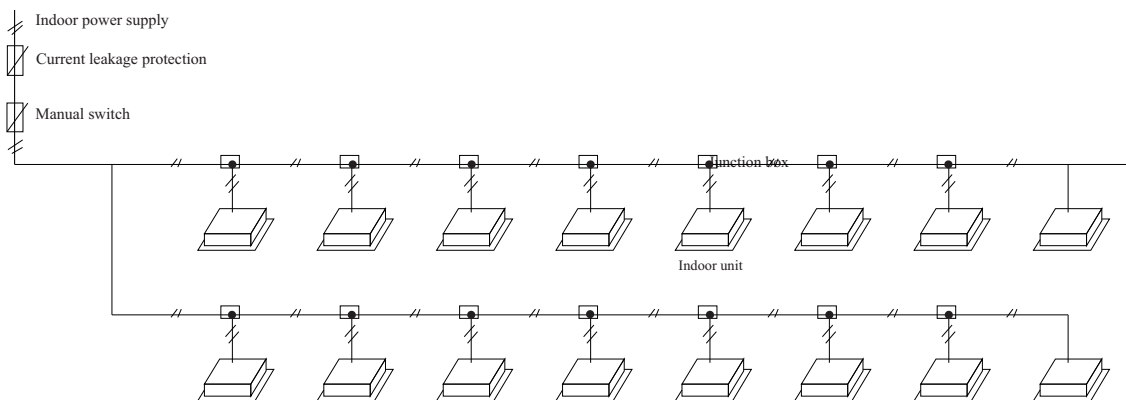


**Fig. 5-3 Electrical Wiring of Three-phase Outdoor Units**

**NOTE**

- When the signal line uses a two-core shielded cable, the shielding net shall be connected to "E" of the terminal block. When the signal line uses a three-core shielded cable, the shielding net shall be connected to the ground.
- Never connect the power line (strong current) to the terminal block of the signal line (weak current). Otherwise, the power board will be burnt out.

## 5.2 Indoor unit power supply wiring

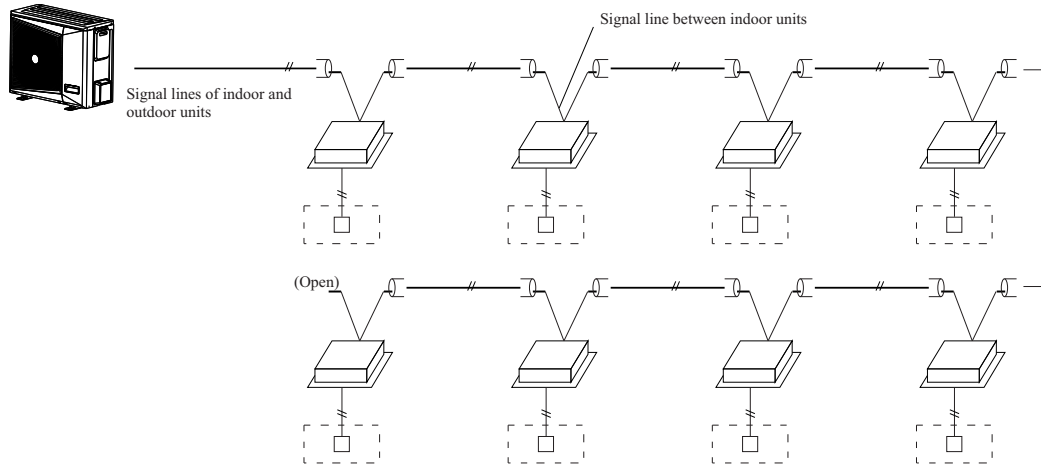


**Fig. 5-4 Indoor Unit Power Supply Wiring**

**NOTE**

When the power line is parallel to the signal line, please put the electrical wires into their own wire pipes, with proper wire spacing (10A or below: 300mm, 50A or below: 500mm).

5.3 Indoor unit signal line wiring



**Fig. 5-5 Indoor Unit Power Supply Wiring**

If needed, the user can purchase a wire controller, as shown in the dashed box.

5.4 Wiring diagram/Dialing setting of main control board

For electrical wiring diagram of outdoor unit, refer to the wiring diagram at the side of the right side plate of the outdoor unit.  
Dialing setting of main control board, refer to the wiring diagram at the side of the right side plate of the outdoor unit.

**Table 5-5 Inspection Instructions of Outdoor Unit for CHV\* Series**

No.		Display contents	Remarks
0	0	Current frequency / number of indoor units	Display number of units turned on when standby
1	1-	Capacity of outdoor unit	80, 100, 125, 140, 160
2	2-	Operation mode	0:off/fan; 2:cooling; 3:heating; 4:forced cooling
3	3-	Total capacity need of indoor unit	
4	4-	Actual capacity needs revised by outdoor unit	
5	5-	Actual running capacity of outdoor unit	
6	6-	Fan status(fan speed)	0-8
7	7-	T2/T2B average temperature	T2B average when cooling, T2 average when heating
8	8-	T3 pipe temperature	
9	9-	T3B condenser temperature	
10	10-	T4 outdoor air temperature	
11	11-	T5 exhaust temperature	
12	12-	T6 refrigerant cooling panel temperature	
13	13-	T7 refrigerant cooling inlet pipe temperature	
14	14-	Electronic expansion valve opening degree	Actual value=display value*8
15	15-	Primary current	
16	16-	Secondary current	
17	17-	Primary voltage	
18	18-	Secondary voltage(DC bus)	Actual value=display value*4
19	19-	Number of indoor units	
20	20-	Number of operating indoor units	
21	21-	Priority mode	0:Auto ; 1:heating priority; 2:coolingpriority; 3:only heating 4:only cooling 5:First priority 6: VIP+auto priority
26	26-	Frequency limit display	0: no frequency limit; 1: T3B limit frequency ; 2: T4 limit frequency 4: T5 frequency limit; 8:voltage limit frequency ;16:current limit frequency 32:T6 limit frequency 64: silent limit frequency(will displaytotal if there are multiple frequency limits)
27	27-	Last failure or protection code	No protection or fault display---
28	28-	Program version	
29	29-	EEPROM version	

The display content is defined as follows:

Normal display: display the number of indoor units in standby mode, or display the operating frequency of the compressor after the capacity is required;

Operation mode: off or fan: 0, refrigeration: 2, heating: 3, forced cooling: 4;

The number of indoor units (indoor units that can normally communicate with outdoor units).

Table 5-6 Outdoor Unit Fault Code

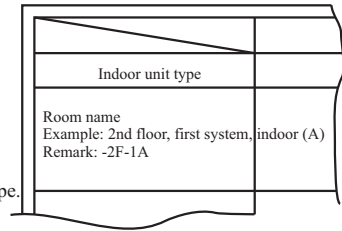
Fault Code	Fault Contents	Remark
E1	Outdoor unit phase-sequence fault	
E2	Communication fault between the indoor unit and the outdoor unit	20-minute break at first or 2-minute break later
E4	T4 outdoor air temperature sensor fault	
E6	T3 Condenser pipe temperature sensor fault (outlet)	
E8	T5 Exhaust temperature sensor fault	
E9	AC over-voltage / under-voltage protection	
E10	EEPROM fault	
EA	T3B condenser temperature sensor fault (middle)	
Eb	T6 refrigerant cooling panel temperature sensor fault or temperature protection	
EC	T7 refrigerant cooling pipe inlet temperature sensor fault	
E.E	Model error(there is no dialing model in the EEPROM)	
H0	Communication fault of master board and driver chip	
H4	Display P6(IPM module protection) for 3 times within 30 minutes	
H5	Display P2 (system pressure is too low) protection for 3 times within 30 minutes	20-minute break at first or 2-minute break later
H6	Display P4 (T5 Exhaust temperature is too high ) protection for 3 times within 100 minutes	Only restore when power on again
H7	The decrease in number of indoor unit	Indoor units are lost for more than 3 minutes. It can't be restored until number of indoor units are restored.
H9	Display P9 (DC fan fault ) protection for 2 times within 10 minutes	Only restore when power on again
H10	Display P3(inverter overcurrent protection) protection for 3 times within 60 minutes	Only restore when power on again
H11	Display P13 protection for 2 times within 10 minutes	Only restore when power on again
P1	High pressure protection	
P2	Low pressure protection	Display H5 after P2 protection for 3 times within 30 minutes
P3	inverter overcurrent protection	
P4	Exhaust overheating protection	Display H6 for 3 times within 100 minutes
P5	T3 or T3B condenser pipe overheating protection	
P6	IPM protection	Display H4 after P6 protection for 3 times within 30 minutes
P9	DC fan fault	Display H9 after P9 protection for 2 times within 10 minutes
P10	Anti-typhoon protection	
P11	T2 high temperature protection when heating	
P12	T3 overheating protection	
P13	Current detection error protection	Effective for12. 5, 14, 16, 18kW ; no such fault for 8 and 10kw
L0	DC compressor module fault	
L1	DC cable bus low voltage protection	
L2	DC cable bus high voltage protection	
L4	MCE fault / sync / closed loop	
L5	Zero speed protection	
L7	Compressor phase loss protection	
L8	Protection when the speed change at the previous moment and the latter moment is greater than or equal to 15HZ	
L9	Protection when the difference of set speed and actual operation speed is greater than or equal to 15HZ	
p <sub>b</sub>	T6 refrigerant cooling panel temperature is too high	

Note:Please refer to the wiring diagram

## 6 Trial Run

### 6.1 Inspection and confirmation before debugging

- 1) Check and make sure the refrigerating pipeline and communication line connecting with the indoor and outdoor units are connected with the same refrigerating system. Otherwise, some running faults occur.
- 2) The power supply voltage is within the rated voltage of  $\pm 10\%$ .
- 3) Check and make sure the power supply line and the control line are correctly connected.
- 4) Before power-on, make sure there is no short circuit.
- 5) Check if all units have passed 24-hour nitrogen pressure-maintaining ( $40\text{kgf}/\text{cm}^2$ ) test.
- 6) Make sure the debugged system is fully vacuumized, dried and filled with the refrigerant as specified.



### 6.2 Preparation before debugging

- 1) Calculate the refilling volume of refrigerant for each set of units according to the length of on-site liquid pipe.
- 2) Prepare the required refrigerant.
- 3) Prepare the system plan, system piping diagram and control wiring diagram.
- 4) Mark the set address codes on the system plan.
- 5) Turn on the power supply switch of the outdoor unit in advance, and make sure it is power-on for more than 12 hours, so that the heater heats the compressor oil.
- 6) Fully open air pipe check valve, liquid pipe check valve and oil balance valve of the outdoor unit. If they are fully opened, the machine may be damaged.
- 7) Check if the power supply phase sequence of the outdoor unit is correct.
- 8) Check if all dialing switches of the indoor and outdoor units are set according to the technical requirements of the product.

Fig. 6-1 Filling of Names of Connecting Systems

### 6.3 Filling of names of connecting systems

When the multiple indoor units are arranged, in order to distinguish the connecting systems of indoor and outdoor units, all systems shall be named respectively and recorded on the nameplate on the electronic control box cover of the outdoor unit.

### 6.4 Precautions against refrigerant leak

- 1) The refrigerant of the air conditioner is harmless and nonflammable.
- 2) The room for the air conditioner shall have an appropriate space. In case of refrigerant leak, it cannot go beyond the critical concentration. In addition, necessary measures can be taken.
- 3) The critical gas concentration harmless to the human body is  $0.3\text{ kg}/\text{m}^3$ .
- 4) Confirm the critical concentration according to the following steps and take corresponding measures.
  - a) Calculate the filling volume of refrigerant (A[kg])  
Volume of refrigerant = filling volume of refrigerant before delivery (see the nameplate) + refilling volume of refrigerant corresponding to the length of pipe
  - b) Calculate the indoor volume (B [ $\text{m}^3$ ]) (by the minimum volume)
  - c) Calculate the refrigerant concentration:  $\frac{A [\text{kg}]}{B [\text{m}^3]} \leq \text{Critical concentration: } 0.3 [\text{Kg}/\text{m}^3]$

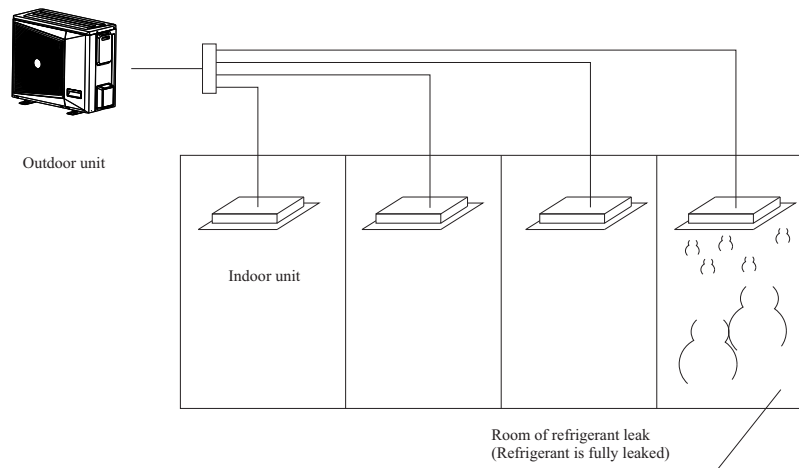
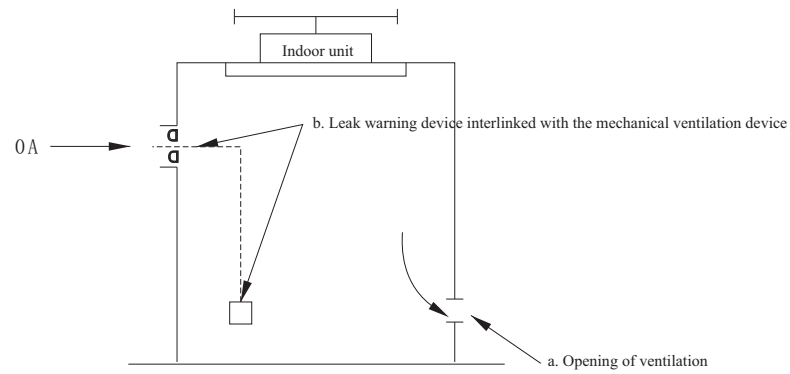


Fig. 6-2 Refrigerant Leak



5) Measures against exceeding the critical concentration

- a) To reduce the refrigerant concentration below the critical concentration, install a mechanical ventilation device (for frequent ventilation).
- b) If frequent ventilation cannot be performed, please install a leak warning device interlinked with the mechanical ventilation device.



(The leak warning device shall be installed in the gathering place of refrigerant.)

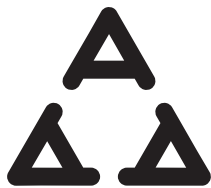
**Fig. 6-3 Mechanical Ventilation Device**

6.5 Hand over to the client

- 1) Hand over the Use Manual for the Indoor Unit and the Installation Manual for the Outdoor Unit to the client.
- 2) Explain the contents of Use and Installation Manual to the client carefully.







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# TESLA

## WIRED CONTROLLER

TGC-XKQ-002

### USER MANUAL

ENG

Ver. 2023

# Acrylic Touch Key Wired Controller Manual

Three/five core communication



## The presentation of function key



### Mode key:

Set the mode of the air conditioner.



### Temperature increase or decrease key(TEMP+ and TEMP-)

Set the set temperature of the air conditioner.



### Fan speed key(FAN+ and FAN-):

Set different fan speeds of air conditioner.



### Energy key:

Short press this key to enter the energysaving state, the temperature is set to 26°C, and the fan speed is the level-2 wind. Press the Energy key for the second time to restore the original setting.



### On/Off key:

Start-up and shut-down of air conditioner.



### Function key:

Set the timing start-up and shutdown, swing, sleep, query, screen cleaning, and key lock of the wired controller.

# 1. Introduction

This is three/five-core communication wired controller with WIFI controlled function.

## 2. Description of the line controller

The wired controller communicates with the system control mainboard through its mainboard, controls the operating state of the system through the keys, and displays the working state of the entire system through LCD.

The appearance of this wired controller is shown in the cover page image.

## 3. Functional description

The wired controller detects communication after power-on. If the communication is successful, it displays normally. Otherwise, the “---” icon will flash. The fault code E9 will appear if communication is not successful within 1 minute.

Functions of keys:

### 3.1 ON/OFF key

(1) Control the ON/OFF state of the system.

(2) When the wired controller enters the function setting, parameter setting or engineering parameter setting, press the “ON/OFF” key to exit the setting and return to the main display interface.

### 3.2 Mode key

Automatic mode → Cooling → Dehumidification → Heating → Fan → Automatic mode

Cycle switching

3.2.1 Dehumidification mode: The temperature of the wired controller can be set, and the fan speed cannot be set.

3.2.2 Fan mode: mandatory display of T1 temperature;

3.2.3 Forced cooling mode: set the 6th item in the engineering parameter setting. In forced mode, press the shutdown or mode key to switch to other modes.

### 3.3 Fan + and Fan -key

Adjust the indoor fan speed. Each time you press the fan speed key, the fan speed will change as below:

Level 6 ← Level 4 ← Level 2 ← Automatic fan (3 Windshield indoor unit)

↑  
Level 4 ← Level 3 ← Level 2 ← Level 1 ← Automatic fan

↑  
| (4 Windshield indoor unit)

Level 6 ←Level 5 ←Level 4 ←Level 3 ←Level 2 ←Level 1 ←Automatic fan  
 ↑ (6 Windshield indoor unit)

### 3.4 Temperature + key

Each time the “TEMP+” key is pressed, Five-core communication set temperature increased by 1°C, Three-core communication set temperature increased by 0.5°C. When the set temperature is increased to 32°C, the temperature will remain at 32°C while pressing this key (the maximum temperature limit).

Note: If the Fahrenheit temperature display is selected: each time the “TEMP+” key is pressed, the set temperature will be increased by 1°FH. When the set temperature is increased to the set maximum temperature, it will be no longer increased.

### 3.5 Temperature - key

Each time the “TEMP-” key is pressed, Five-core communication set temperature reduced by 1°C, Three-core communication set temperature reduced by 0.5°C., and when the set temperature is reduced to 16°C, Press this key to keep the temperature at 16°C (or set the minimum temperature).

Note: If the Fahrenheit temperature display is selected: Each time the “TEMP-” key is pressed, the set temperature will be decreased by 1°FH, and when the set temperature is decreased to the set minimum temperature, it will be no longer decreased.

### 3.6 Energy key

1) Short press this key to enter the energysaving state, the temperature is set to 26°C, and the fan speed is the level-2 wind. Press the Energy key for the second time to restore the original setting.

2) Press and hold the Energy key to enter the query status. The digits “double 8” will appear at the lower right corner of the LCD showing the inspection number, and the query data information will appear in the middle of the LCD. Press the “TEMP+” and “TEMP-” key to switch the query data.

3) To exit the query state, press and hold the Energy key, or press the ON/OFF key, or wait for 10 seconds without operation.

#### Five core communication:

**VRF indoor unit:** Parameter Description → Indoor unit's capacity demand → T1 temperature value → T2 temperature value → T2B temperature value → Average of T2 temperature value → Opening of EXV → Indoor unit's address → Parameter Description, then repeat the cycle.

**ON-OFF seriars:** 1-Indoor temperature T1; 2-Evaporator temperature T2; 3-Condenser temperature T3.



## Checked table for inverter series

Inspection No.	Parameter Description	Inspection No.	Parameter Description
1	Indoor unit capacity	7	T2B temperature value
2	Indoor unit' s capacity demand (Reserved)	8	T3 temperature value
3	Revised demand by T4(Reserved)	9	T4 temperature value
4	Revised demand by T2(Reserved)	10	T5 temperature value
5	T1 temperature value	11	Opening of EXV
6	T2 temperature value	12	Operating frequency of compressor
		13	Primary side voltage/4(Reserved)

**Three core communication:**

## Checked table for inverter split unit

Inspection No.	Parameter Description	Inspection No.	Parameter Description
1	Indoor unit capacity (HP*10)	11	Opening of electronic expansion valve/8
2	Indoor unit's capacity demand	12	Operating frequency of compressor
3	Revised demand by T4	13	Outer fan gear
4	Revised demand by T2	14	Primary current *2
5	T1 temperature value	15	Secondary current *2
6	T2 temperature value	16	Primary side voltage/4
7	T2B temperature value	17	Secondary side voltage/4-50
8	T3 temperature value	18	Last failure(no fault E-)
9	T4 temperature value	19	The second last fault(no fault P-)
10	T5 temperature value/2	20	Humidity
		21~24	Reserved

## Checked table for ON/OFF LCAC (Some Part)

Inspection No.	Parameter Description	Inspection No.	Parameter Description
1	Reserved	7	T4 temperature value
2	Reserved	8	T5 temperature value
3	Reserved	9	Last failure (no fault E-)
4	T1 temperature value	10	The second last failure (no fault P-)
5	T2 temperature value	11	Humidity
6	T3 temperature value	12~15	Reserved

## Checked table for VRF indoor unit

Inspection No.	Parameter Description	Inspection No.	Parameter Description
1	Indoor unit's address	7	Average of T2 temperature value
2	Indoor unit's capacity	8	Opening of EXV
3	Indoor unit's capacity demand	9	Last failure (no fault E-)
4	T1 temperature value	10	The second last failure (no fault P-)
5	T2 temperature value	11	Humidity
6	T2B temperature value	12~15	Reserved

**3.7 Wifi connection key(Only applicable with WiFi wired controller)**


Press "TEAM+" and "ON/OFF" together and keep 2s, it can clear current WiFi information and re-configure user's WiFi account and password.

Relationship between WiFi Icon flashing and WiFi state


WiFi Icon	WiFi state	
Slow flash 3s	Press wifi connection button one time	3 times flashing within 3s, then off 3s
Fast flash	In wifi configuration state	2 times flashing with 1s
Double flash	In LAN state (Reserved)	2 times fast flashing within 1s then off 0.5s
Slow flash	Failed connect to wifi	1 time flashing within 2s
ON	Failed connect to wifi, and failed connect to cloud server	
Fast flash one time every 5s when it is ON	Normal, connect to wifi and cloud server	

**3.8 Function key**


Under any operating states (except query), press the function key to enter the function setting interface.


3.8.1 Press "Function key" , The up and down wind swing will flash. The "intermediate double 8 digital tube" displays the current state: 0-off, 1-open. Press the "TEMP+" "TEMP-" key to switch on and off;


PS: Press the "Fan+" "Fan-" key to adjust the angle gear (lever1-5), adjust the swing wind angle, the up and down wind swing off(Reserved).


3.8.2 Press "Function Key" to enter the next setting,  The left and right wind swing will flash, the "big double 8 digital tube" shows the current state: 0-off, 1-open; Press the "TEMP+" "TEMP-" key to switch on and off.



PS: Press the "Fan+" "Fan-" key to adjust the angle gear (lever1-5), adjust the swing wind angle, the left and right wind swing off(Reserved).



3.8.3 Press “Function Key” to enter the next setting, it will directly enter the “Timing On” setting and the “” icon will flash. The “Left digital tube” indicates the current status, “---” indicates no timing on, “\*\*h” indicates turn on after setting for a few hours. Press “TEMP+” “TEMP-” key to adjust the set time for timing on.

3.8.4 Press “Function Key” to enter the next setting, it will directly enter the “Timing Off” setting and the “” icon will flash. The “Left digital tube” indicates the current status, “---” indicates no timing off, “\*\*h” indicates shut-down after setting for a few hours. Press “TEMP+” “TEMP-” key to adjust the set time for timing off.

3.8.5 Press “Function Key” to enter the next setting, it will directly enter the “Sleep” setting and the “” icon will flash. The “Big double 8 digital tube” indicates the current status, 0-off, 1-open, and press “TEMP+” “TEMP-” key to adjust the on and off.

3.8.6 Press “Function Key” to enter the next setting and directly go to the electric auxiliary heat setting “” will flash. The “Big double 8 digital tube” indicates the current state, 0-manual off; 1-manually on; 2-automatic switch, and press “TEMP+” “TEMP-” key to adjust the setting parameters.


3.8.7 Press “Function Key” to enter the next setting, if screen cleaning reminder icon “” appears, the “Big double 8 digital tube” indicates the current status 1, press the “TEMP+” “TEMP-” key to switch the cancellation and no cancellation; if the “” does not appear, it indicates that the timing cleaning reminder time has not arrived, otherwise jump to the next setting 3.10.8.


3.8.8 Press “Function Key” to enter the next setting and jump directly to the key lock “” , and the icon “” will flash. The “Big double 8 digital tube” displays the current status, 0-off, 1-open; press “TEMP+” “TEMP-” key to switch On and Off.(It will only take effect when you exit the general function setting interface)

3.8.9 Press “Function key” to enter the next setting and jump directly to “WiFi Link Setting” to display the current status, The “Big double 8 digital tube” indicates the current state, 0-Smartconfig configuration status; 1-AP configuration status; 2-WIFI is configured but not connected to the router; 3-WIFI is configured and connected to the router; 4-Connected to the router and connected to the cloud; 5-WiFi device is in low power mode;

PS: Without WiFi controller or When WiFi is abnormal show “--”.

3.8.10 Press “Function Key” to enter the next setting and directly go to the reserved items.

3.8.11 Press “Function Key” to enter the next setting and directly go to the Double-effect health model “” will flash. The “Big double 8 digital tube” indicates the current state, 0-off, 1-open, and press “TEMP+” “TEMP-” key to adjust the setting parameters.

3.8.12 Press “Function Key” to enter the next setting and directly go to the Ultraviolet sterilization mode “” will flash. The “Big double 8 digital tube” indicates the current state, 0-off, 1-open, and press “TEMP+” “TEMP-” key to adjust the setting parameters.

3.8.13 Press “Function Key” to enter the next setting and directly go to the reserved items.

3.8.14 In this case, the line controller is the entry for the function setting. Press and hold the “Query” key on the 3.8.1 interface to enter the user parameter setting interface.

In the user parameters interface, the right digital tube displays the serial number of the setting item, and the middle digital tube displays the numerical value, as shown in the table below. In the user parameter interface: press the “Fan +” , “Fan -” key or function key to select the serial number of the setting item; press “TEMP+” “TEMP-” key to adjust the parameter value.

Serial number	Parameter	Parameter Description	Remarks
1	Fahrenheit/Celsius setting	Default °C; °C->°F->°C	Displayed at set temperature
2	Set the maximum temperature	Default 32°C, with range of 24-45°C Default 88°F, with range of 76°F-88°F	Display set value
3	Set the minimum temperature	Default 16°C, with range of 5-24°C Default 61°F, with range of 61°F-76°F	Display set value
4	Temperature display in the main interface	Display set temperature by default (display indoor temperature)	Display 0/1
5	select prompt tone of press key	0: voiced(Default) 1: silent	Display 0/1
6	Cleaning reminder time setting	2000h/3000h/3500h/4000h / 5000h/6000h (Default 4000h)	Display 20/30/35/40/50/60
7	Remote master/slave settings	Default 0-host; 1- slave(optional)	(This option can only be set when two line controllers are connected, otherwise normal communication will not be realized)
8	Multiple online address settings	0~99	Display set value
9	Constant air flow setting	0: OFF(Default) 1: ON	Only valid for constant air flow ducted units

Note 1: When the slave line controller is set, the engineering parameter settings and queries cannot be used.

Note 2: Multiple online address settings: Press “TEMP+” “TEMP-” key to change, then press “ON/OFF” key to save and exit.

3.8.15 When it is in the user parameter setting interface and in the first item setting (engineering parameter setting entry), press and hold the "Query" key to enter the project parameter setting interface. (This operation can only be performed after the machine is powered on and no operation is performed for 20 seconds)(VRF indoor unit and Five core communication does not have this function)

3.8.16 In the engineering settings interface, the left digital tube indicates the serial number of the setting item, and the middle digital tube indicates the numerical value, as shown in the table below. In the user parameter interface: press the “Fan+”, “Fan-” key or function key to select the serial number of the setting item; press “TEMP+” “TEMP-” key to adjust the parameter value.

Serial number	Parameter	Parameter Description	
1	T1 sensor selection	0-main control board T1; 1-wire controller T1	
2	Static pressure selection (Reserved)	0: low static pressure; 1, 2, 3 high static pressure	Currently only two options are available
3	Heating temperature Compensation(Reserved)	0~8°C (default 6°C)	
4	Reserved	0: (reserved); 1: (reserved)	
5	Motherboard power-down memory function(Reserved)	0: no power-down memory; 1: power-down memory(default)	
6	Forced cooling setting	0: (no setting); 1: (forced cooling)	
7	Cooling 1 speed setting(Reserved)	Real speed Rad/Min / 10	
8	Cooling 2 speed setting(Reserved)		
9	Cooling 3 speed setting(Reserved)		
10	Cooling 4 speed setting(Reserved)		
11	Cooling 5 speed setting(Reserved)		
12	Cooling 6 speed setting(Reserved)		
13	Heating 1 speed setting(Reserved)		
14	Heating 2 speed setting(Reserved)		
15	Heating 3 speed setting(Reserved)		
16	Heating 4 speed setting(Reserved)		
17	Heating 5 speed setting(Reserved)		
18	Heating 6 speed setting(Reserved)		

**Note:** As the static pressure is divided into low static pressure and high static pressure, corresponding to different speeds, when setting as low static pressure, then items 7-18 are set as the low static pressure speed values; when setting as high static pressure, the items are set as the high static pressure values.

## 4. Description of DIP Switch:

	ON	OFF
1	With power-off memory	Without power-off memory
2	Reserved	Reserved

## 5. Fault Code Description

**Note:** If there is a conflict between a wire controller fault and an internal unit fault, please prevail with the internal unit fault.

### Five core communication:

Fault code table for ON-OFF series

Display	Fault Description	Display	Fault Description
F0	Indoor fan stall protection	F9	Three-phase electricity phase sequence failure
F2	Outdoor protection	E0	Communication failure of indoor and outdoor unit
F3	High pressure protection	E1/E9	Indoor unit and wire controller communication failure
F4	Low pressure protection	E2	Room ambient temperature sensor(T1) failure
F5	Water fullfilled protection	E3	Evaporator tube temperature sensor(T2) failure
F7	Outdoor unit over-current protection	E5	Condenser tube temperature sensor(T3) failure
F8	Outdoor unit exhaust temperature over-high protection	P6	Indoor unit EEPROM failure

Fault code table for VRF indoor unit

Display	Fault Description	Display	Fault Description
E1	Communication failure of indoor and outdoor unit	E8	Wind testing fault of PG electric motor
E2	Room temperature sensor failure(T1)	E9	Communication fault of wire controller
E3	Tube temperature midpoint sensor failure(T2)	EA	Outdoor unit current fault
E4	Tube temperature outlet sensor failure(T2B)	Eb	Outdoor unit IPM fault

E5	Malfunction of outdoor unit	EF	Model conflict
E6	Testing fault of zero-crossing signal		
E7	EEPROM malfunction		

Fault code table for inverter series

LED Display	Display	Error Description
Time light flash	E2	Room temperature T1 sensor error
Defrost,run, protection light flash	E3	Evaporator temperature T2 sensor error
Deforst light flash	E4	Evaporator outlet temperature T2B sensor error
Protection light flash	EE	Water full filled error
Run, defrost light flash	E9	<b>Indoor unit and wired controller communication error</b>
Run, time light flash	E7	Indoor EEPROM error
Defrost, time light flash	E8	Indoor fan motor speed lose protection
Defrost warning lights flash	F4	Outside ambient temperature T 4 sensor error
	F5	Discharge temperature T5 sensor error
	P9	Outdoor fan motor protection
	E5	Outdoor unit error
	FE	Outdoor EEPROM error
	F6	Condenser temperature T3 sensor error
	P5	Condenser temperature T3 too high protection
	PA	Anti-typhoon protection
	L1	DC side over-voltage
	PE	DC side over-current
	EF	Mode conflict
	P6	Inverter IPM protection
	H6	3 times P4 protection (Reserved)
	H5	3 times P2 protection (Reserved)
Timing warning lights flash	E1	Communication error between indoor and outdoor unit
Running defrost timing lights flash	P1	High pressure protection
Defrost timing warning lights flash	P2	Low pressure protection
Running timing warning lights flash	P4	Outdoor discharge temperature too high protection
Running defrost timing	E0	Three phase sequence error

**Three core communication:**

Its fault code description:

Display	Fault Description	Display	Fault Description
E0	Sequence fault	F0	Outdoor communication failures
E1	Indoor and outdoor communication failures	F1	Phase sequence error protection
E2	Room temperature sensor failure(T1)	F2	Outdoor or indoor communication failures
E3	Tube temperature midpoint sensor failure (T2)	F3	Exhaust air temperature sensor fault
E4	Tube temperature outlet sensor failure (T2B)	F4	External T4 sensor failure
E5	Outdoor unit failure	F5	T6A sensor failure TP exhaust temperature sensor fault
E6	Zero-crossing protection	F6	External T3 sensor failure
E7	Indoor unit E-party failure	F7	T6B sensor failure
E8	Indoor unit stall protection	F8	Outdoor unit address error T5 exhaust temperature sensor fault
E9	Wire controller communication failure	F9	Voltage ultra-high/ultra-low protection
EA	Compressor overcurrent (four times) fault	FA	Refrigerant cooling copper tube sensor fault. Outdoor unit E-party failure
Eb	Inverter module protection	Fb	T6 sensor failure or temperature protection
EC	Refreshing faults	FC	T7 sensor failure
Ed	Reserved	Fd	reserved
EE	Water level alarm	FE	E-party failure Indoor unit address error
EF	Mode conflict	FF	reserved



Display	Fault Description	Display	Fault Description
P0	(reserved)	H0	Communication failure between external main board and drive board
P1	High pressure protection	H1	Communication failure between master and slave chips
P2	Low pressure protection	H2	The decrease in the number of outdoor failures
P3	Primary side over current protection	H3	The increase in the number of outdoor failures
P4	Ultra-high exhaust temperature protection	H4	3 P6 protection in 60 minutes
P5	T3 /T3B high temperature protection	H5	3 P2 protection in 60 minutes
P6	IPM module protection	H6	3 P4 protection in 100 minutes
P7	The lack of the degree of superheat	H7	The decrease in the number of indoor failures
P8	(reserved)	H8	Pressure sensor failure
P9	Outdoor DC fan failure	H9	3 P9 in 30 minutes
L0	Inverter compressor malfunction	HA	3 P3 in 60 minutes
L1	DC generatrix low voltage protection	PA	IPM module temperature too high protection Anti-typhoon protection
L2	DC generatrix high voltage protection	Pb	Evaporate temperature T2 too high protection Refrigerant cooling temperature T6 too high protection
L3	reserved	PC	Temperature T3 too high protection in heating mode
L4	MCE error/ Synchronization / closed loop		Fan protection in zone A for 5 minutes during heating
L5	Zero speed protection	Pd	Abnormal current protection
L6	reserved	PE	Over current protection in DC side
L7	Wrong phase protection	PF	High pressure protection (High pressure sensor)
L8	Speed difference >15Hz protection between the front and the back clock		
L9	Speed difference >15Hz protection between the real and the setting speed		

## 6. Sabbath function

1) Press and hold the Mode key to enter the Sabbath mode, the default display of the controller is S3 when entering the Sabbath, and then use the “TEMP+” and “TEMP-” key to select the operating level S1, S2, S3...S6 on the Sabbath day. Exit the Sabbath mode, also press and hold the Mode key again to exit, the machine will shut down accordingly, start it again, and turn on the machine according to the normal On/Off key.

2) There are 6 levels for cooling and heating: S1, S2, S3, S4, S5, S6, press the “TEMP+” and “TEMP-” key to adjust. And except for the “TEMP+” and “TEMP-” key or press and hold the Mode key, other keys are invalid.

3) The remote control fails in Sabbath mode (the buzzer does not respond).

4) As long as it is currently in the cooling or heating mode, the latest Sabbath mode setting will be retained. Entering the Sabbath mode again will still run the last set Sabbath mode level, but when running Ventilation mode or other modes, it will enter the Sabbath mode again, running the default class S3.

5) With power-off memory function (indoor unit), after power-off and restart, the Sabbath mode settings before power-off are retained, including Fan speed, mode (cooling or heating), and the level is the same as before power-off.

## 7. WIFI and App function

Wired controller can connect wifi and realize remote control. (Only applicable with WiFi wired controller)

### 7.1 Operation for WIFI configuration and adding device

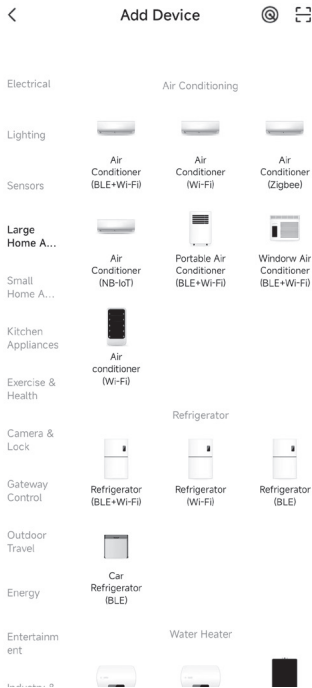
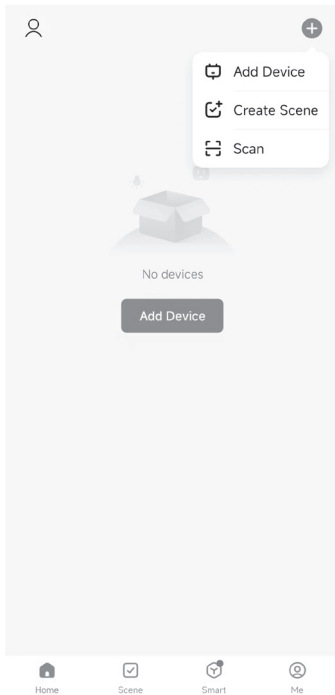
#### 7.1.1 WIFI configuration

Method 1: Press “TEMP+” and “ON/OFF” key together and keep 2s

Method 2: Press “Function” key and enter into 9th setting, press “ON/OFF” key to re-intelligent network distribution.

After that, WIFI icon will flash 3 times slowly, then fast flash.

7.1.2 After it go to configuration statue, open TUYA APP, press the “add device” → “add manually” → “air conditioner” as the following pics;



7.1.3 Input the WIFI name and password to configure;

7.1.4 Select SmartConfig mode to start the network distribution, and the device can be added after the network distribution is completed.

X Wi-Fi Mode **Reset the device**

Press and hold the RESET button for 5 seconds until the indicator blinks (subject to the user manual).

Confirm the indicator is blinking

Reset Device Step by Step

X

**Select 2.4 GHz Wi-Fi Network and enter password.**

If your Wi-Fi is 5GHz, please set it to be 2.4GHz.  
Common router setting method

