



Air source heat pump

(water heating module-18KW)



User Manual

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Catalogue



Before use



Attention

Thank you for choosing our product, we shall be more than glad to service you. For you to better operate this product and to prevent accidents due to misoperation, please read carefully this user manual before carrying out any installation or operation, also please pay special attention to the warning, prohibition and attention instructions. We are continuously supplementing and upgrading this user manual to better service for you!

List of accessories

The below accessories delivered together with the product are for users' convenience. Please check in time. If there is any shortage or damage, please contact local distributor.

AW48.4-IFC list of accessories

Name	Quantity	Remark
User Manual	1 piece	Instruction of installation and operation
Communication connection wire	2 pcs (9m/piece)	Connection between wire controller and indoor unit

Symbol description

The following symbols are very important, please be sure to understand their meaning, which concerns your personal safety and the product.



Warning



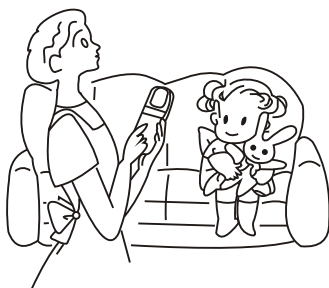
Caution



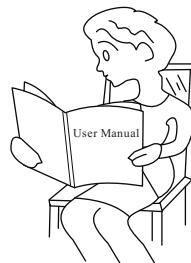
Prohibition

1. Safety precautions

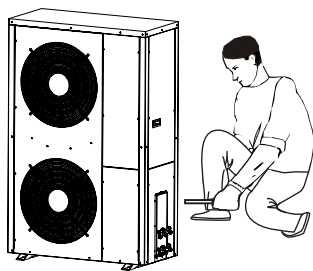
Before use



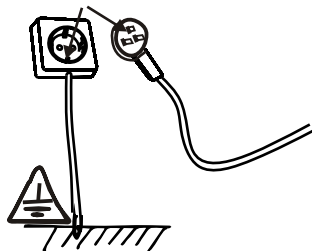
This appliance is not intended for use by persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children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



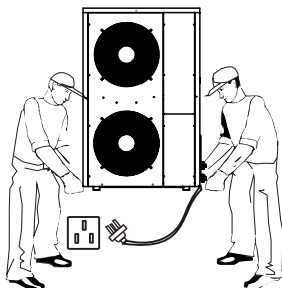
Be sure to read this manual before use.



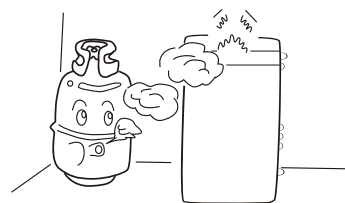
The installation, dismantling and maintenance of the unit must be performed by qualified personnel. It is forbidden to do any changes to the structure of the unit. Otherwise injury of person or unit damage might happen.



The power supply to the unit must be grounded.

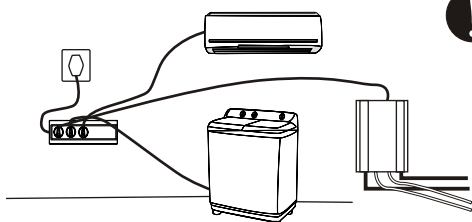


Make sure the power supply to the heat pump unit is off before any operations are done on the unit. When the power cord gets loose or is damaged, always get a qualified person to fix it.

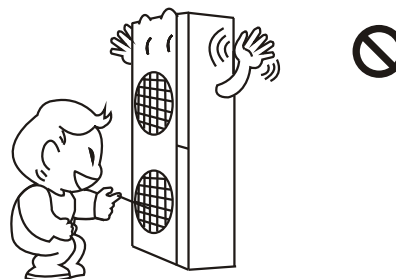


Keep the unit away from the combustible or corrosive environment.

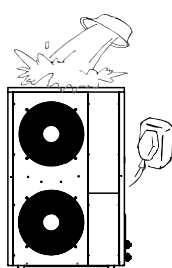
Before use



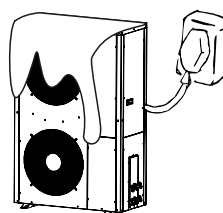
Use a dedicated socket for this unit, otherwise malfunction may occur.



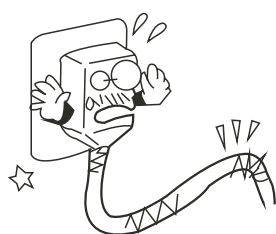
Do not touch the air outlet grill when fan motor is running.



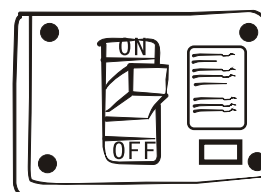
Water or any kind of liquid is strictly forbidden to be poured into the product, or may cause creepage or breakdown of the product.



When running the unit, never cover clothes, plastic cloth or any other material that block ventilation on the product which will lead to low efficiency or even non-operation of this unit.



When the power cord gets loose or is damaged, always get a qualified person to fix it.



It is mandatory to use a suitable circuit breaker for the heat pump and make sure the power supply to the heater corresponds to the specifications. Otherwise the unit might be damaged.



Before use

2. Features and advantages

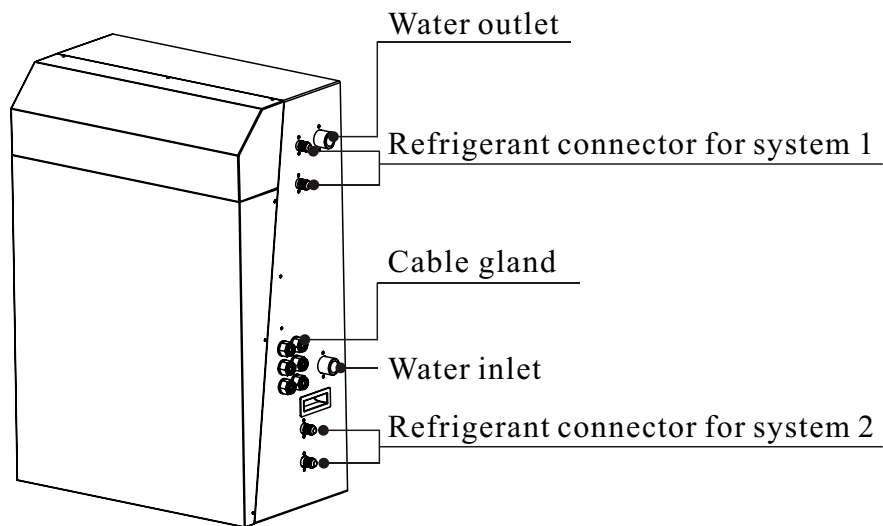
- ◆ With DC inverter technology, the unit can automatically adjust its working frequency to supply the amount of water according to the needs, making it suitable for extremely cold areas with ambient temperature down to -25°C.
- ◆ Optimal combination of indoor unit and outdoor unit, which only occupies a small area in your house, can be applied in families, villa, hospital, plant and premises, quickly and conveniently supplying hot water for shower, underground floor heating, and radiator, also satisfy your cooling needs in summer.
- ◆ This unit uses environment-friendly refrigerant R410A, which reaches the highest energy efficiency rating in the industry. The compressor output and the energy input requirements are constantly monitored and adjusted at the most optimum level for the given indoor and outdoor environmental conditions and the user's demands on the system.
- ◆ Controlling system considers and optimizes working status in different conditions, enabling this system to operate at its most comfortable and optimal status under different condition.
- ◆ The specially designed vibration absorber for compressor significantly lowers the running noise of this system.
- ◆ The controlling system can work with input voltage ranging between 160V-260V.
- ◆ Auto-restart function stores all settings and automatically resume to the running status before power failure.
- ◆ Compressor crankcase heater and bottom plate heater are available as options for extreme cold conditions, enabling the unit to work in very low ambient temperatures with much lessened defrost frequencies. Both these optional heaters are electronically controlled based on the outdoor ambient temperatures and a sophisticated logic.
- ◆ Intelligent auto defrosting function monitors the defrosting needs and automatically adjust defrosting intervals.
- ◆ Timer on/off function provides in time system control for customers.
- ◆ The hydrophilic aluminum coil on the evaporator extends the life-span of the fins, which is anti-corrosion, rain water proof and can shorten the time of defrosting.
- ◆ The copper tubes in the heat exchanger are inner grooved copper tubes which utilize the most advanced technology; this increases the heat exchange area and working efficiency.
- ◆ This product can efficiently work within its working environment temperature range without being limited by seasons or climate.
- ◆ Special refrigeration system ensures compressor lube runs smoothly back to compressor, decreasing the friction of the components in compressor, extending the life-span of compressor.
- ◆ Fan motor of outdoor unit is designed with high air flow and low fan speed, making the whole unit run with lower noise and making users more comfortable.
- ◆ Intelligent control technology controls the output of compressor as per actual demands, making the unit quite energy-saving.
- ◆ Flexible combined modules ensure easy and convenient assembling.



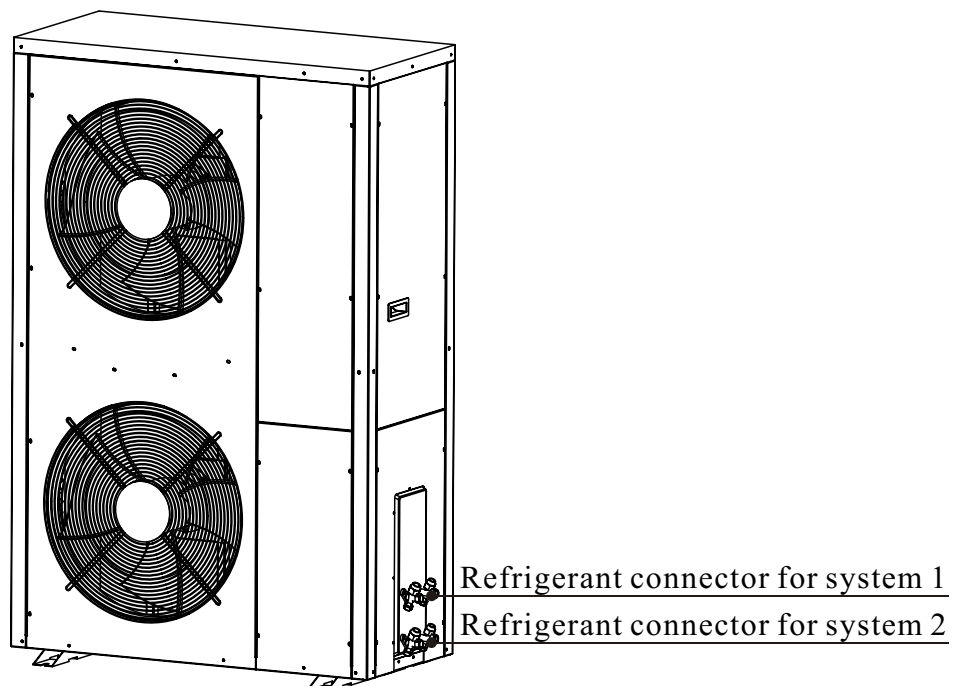
Before use

3. Main components

Indoor unit



Outdoor unit

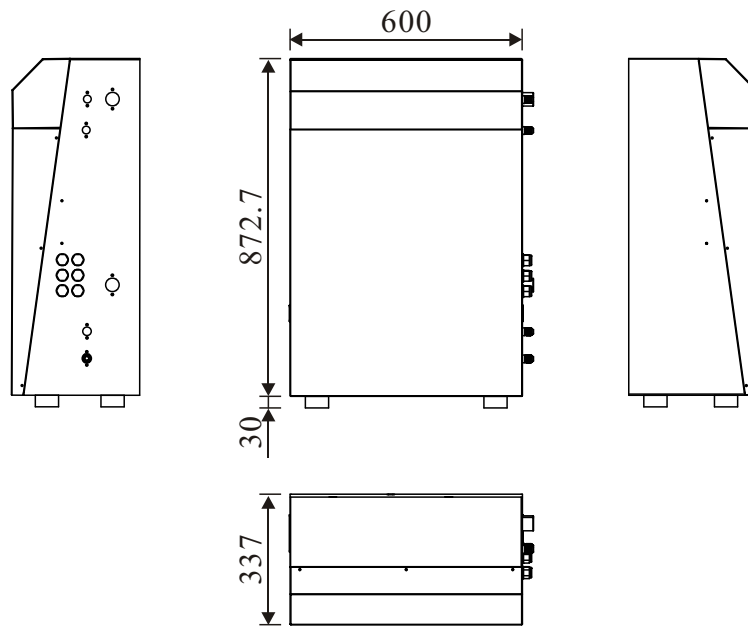




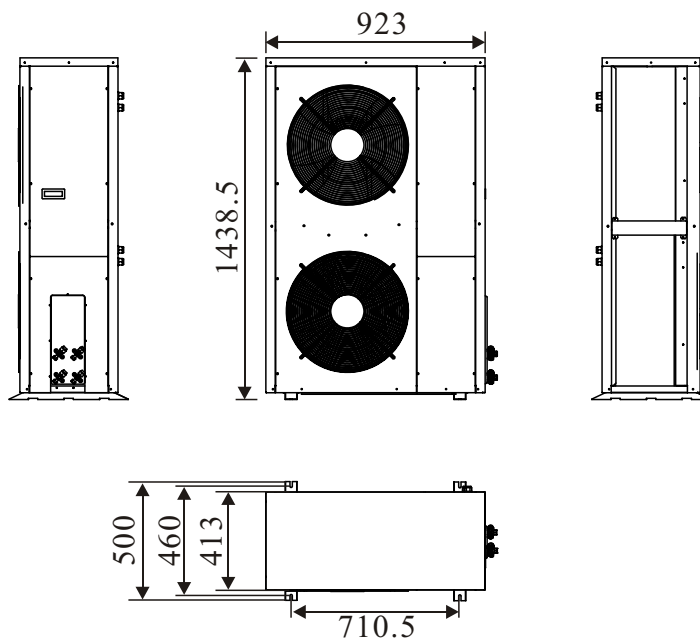
Before use

4. Outlines and dimensions

Indoor unit



Outdoor unit



Liquid pipe O.D. ϕ 9.52
Gas pipe O.D. ϕ 12.7

Before use

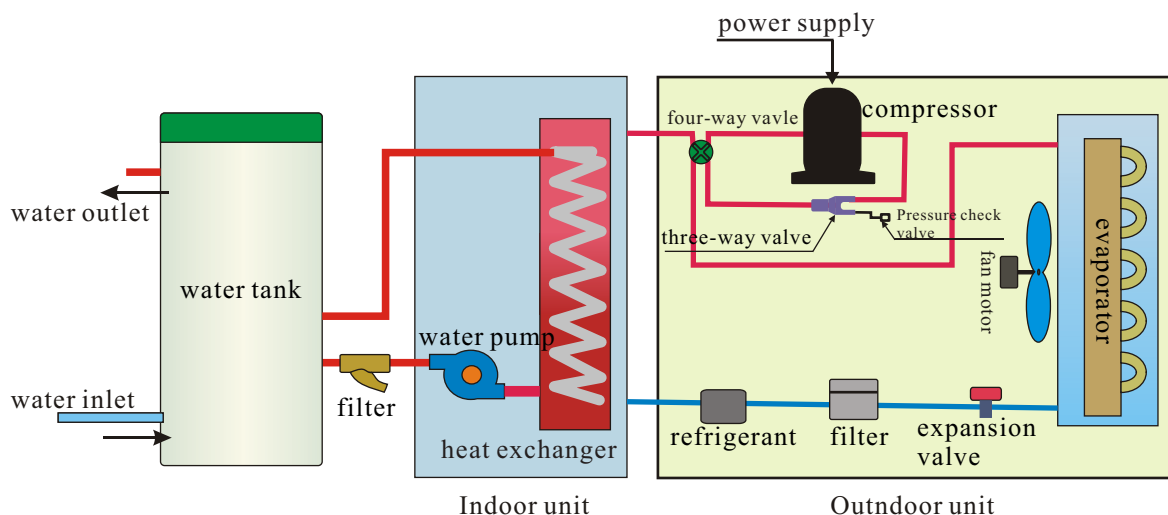
5. Working principles

DC inverter air source heat pump water heating module adopts DC inverter technology, which converts 50HZ AC power into DC power, then send it to power module main circuit, controlled by micro computer. The module delivers DC power at variable voltage and the compressor uses DC motor.

We use electronic expansion valve instead of capillary to control the refrigerant flow, optimizing the ability of evaporator. Besides, the unit won't stop working while defrosting under heating mode by using electronic expansion valve. DC inverter technology will automatically lower the AC power frequency and the speed of compressor when starting up the product, or when water temperature reaches its setting value, the speed of compressor will decrease as well as its input and output, which is energy-saving.

In the heating process, based on reverse Carnot cycle theory, the product only needs a small quantity of electricity as power, refrigerant as carrier, continuously absorbing low grade heat energy($-25^{\circ}\text{C}\sim 35^{\circ}\text{C}$) from air, transferring it to high grade heat energy, then releasing the heat to water, thus meeting customer's hot water demands.

In the cooling mode, the product takes the heat energy from water, and transfers the heat through refrigerant to evaporator, then releases the heat to the air.





Before use

6. Technical data

Outdoor unit			
Model number		AW48.4-IOU-IFC	
Power supply		220V/50HZ/1PH	
Refrigerant volume		2300×2/R410A(2300g for each system)	
Cooling capacity		Btu/h	17600-54600
		W	5200-16000
Heating capacity		Btu/h	23200-61400
		W	6800-19600
Input power(Cooling)		W	2200- 7000
Input power(Heating)		W	2100- 5620
Current(Cooling)		A	(5-13.5)×2
Current(Heating)		A	(4.7-12.5)×2
E.E.R		Btu/h.w	7.8-11.0
C.O.P		W/W	3.5-4.3
Compressor	Type		Twin Rotary
	Quantity	Purchase	2
Fan	Type	Water head	Axial
	Quantity	Purchase	2
	Airflow	M ³ /h	2800×2
	Input power	W	160×2
Air side Heat Exchanger	Type		Tube-Fin
	Face area	M ²	0.72×2
	Row-Fins/in		2 Rows-14
	Tube Diameter	Inch	3/8 O.D.
Noise		DB(A)	56
Net dimension		mm	920×412×1440
Packing dimension		mm	1005×505×1570
Net weight		Kg	100
Gross weight		Kg	115
Indoor unit			
Model number		AW48.4-IIU-IFC	
Waterside Heat Exchanger	Type		Plate heat exchanger
	Water pressure drop	Kpa	60
	Piping connection	Inch	G1 "
	Water head	M	6
	Rated water flow	m ³ /h	3.4
Net dimension		mm	600×330×900
Packing dimension		mm	620×350×950
Net weight		Kg	60
Gross weight		Kg	63



Before use

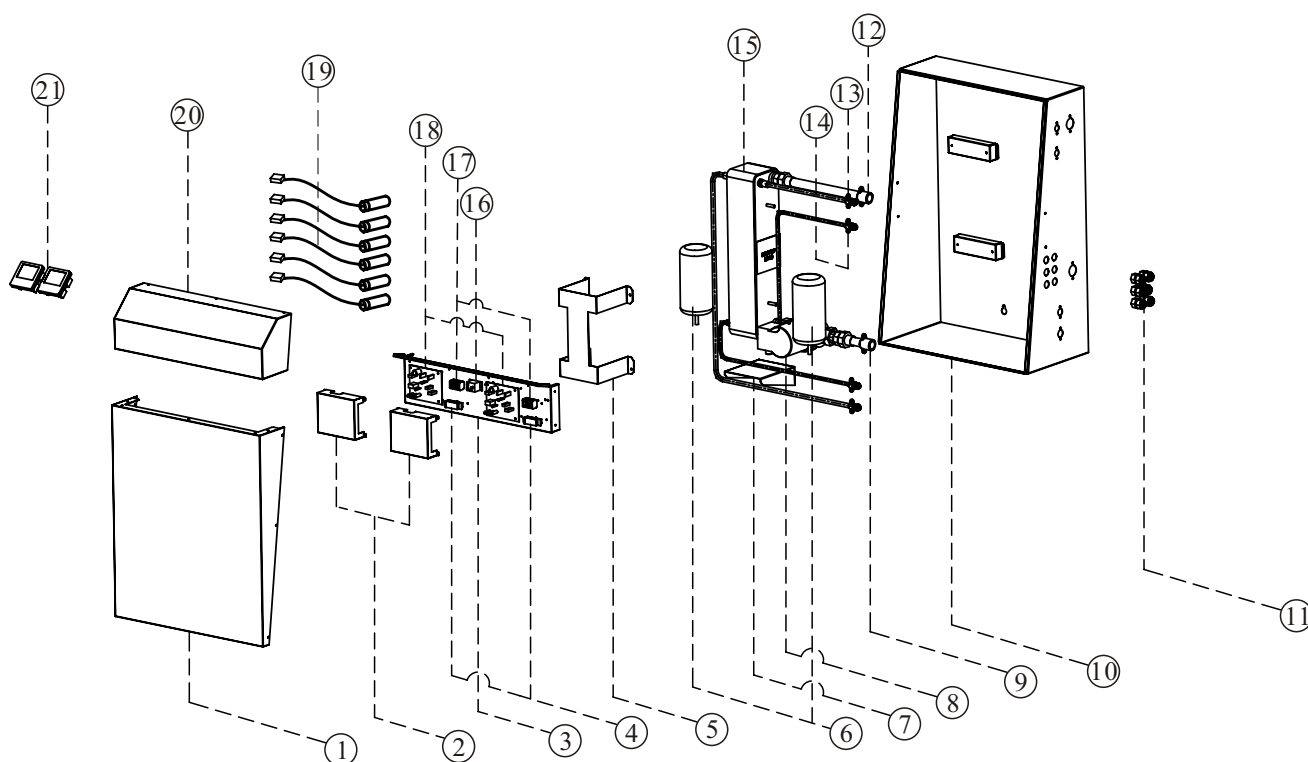
Technical specification	
Ambient temperature range in heating	-25-43℃
Ambient temperature range in cooling	0~+55℃
Outlet water temperature range in heating	20-52℃
Outlet water temperature range in cooling	7-25℃
Operation current in cooling mode	(5-13.5)×2A
Operation current in heating mode	(4.7-12.5)×2A
Max refrigerant pipe length (single return)	12m
Max height difference between indoor and outdoor unit	5m
Refrigerant pipe dimension	Liquid pipe OD12.7(1/2"), Gas pipe OD9.52(3/8")
Connector	Flare Nut

Installation advice	
Max water pressure drop	0.7Mpa
Max setting temperature	52℃
Max outlet water temperature at ambient temperature -15℃	52℃
Cooling mode min water outlet temperature	7℃
Cooling mode max water outlet temperature	25℃
Min water tank volume	100L
Min water volume for underground floor heating	200L

Before use

7. Exploded view

Indoor unit

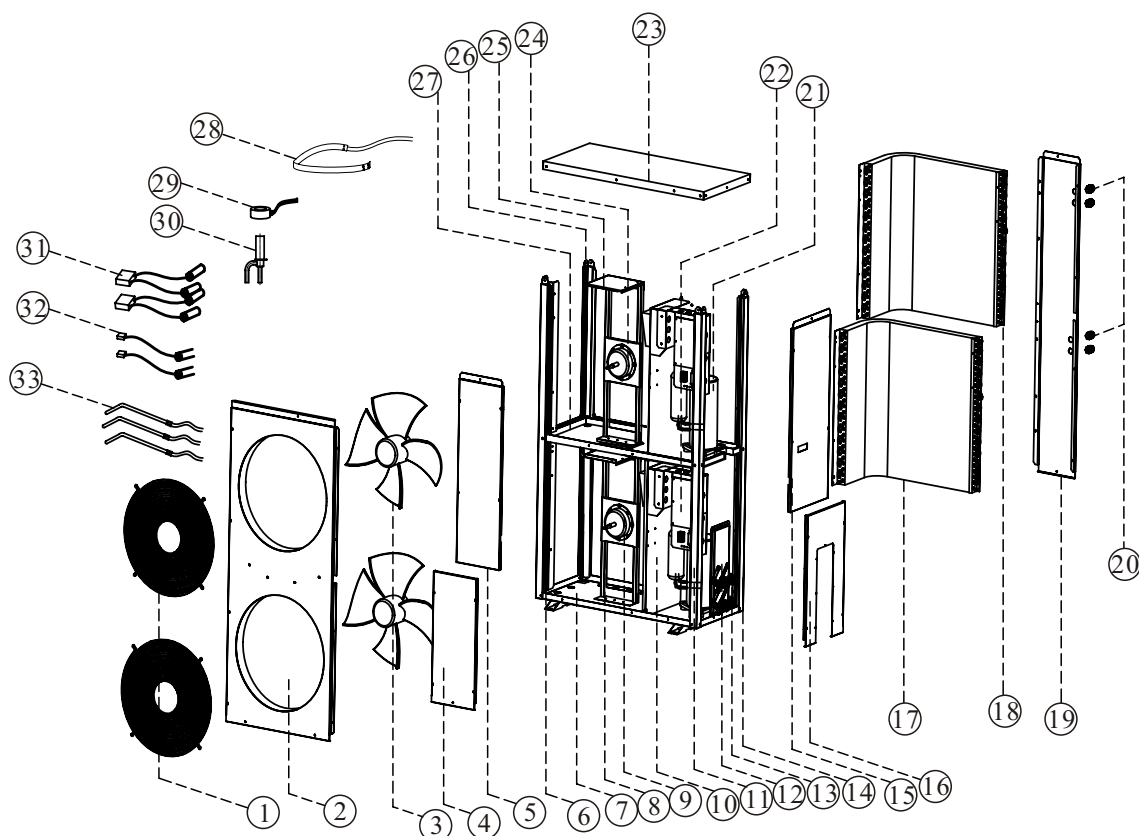


No.	Name	Quantity
1	Front panel	1
2	Electronic box cover	2
3	Electronic box	1
4	Wire clip	1
5	Plate heat exchanger fixture	1
6	Accumulator	1
7	Plate heat exchanger bracket	1
8	Water pump	1
9	G1 " water inlet connector	1
10	Casing	1
11	Cable gland	6

No.	Name	Quantity
12	G1 " water outlet connector	1
13	Refrigerant connector(G3/8 ")	1
14	Refrigerant connector(G1/2 ")	1
15	Plate heat exchanger	1
16	Relay (30A)	1
17	Terminal	1
18	Controller	1
19	Sensor	6
20	Top panel	1
21	Operation panel	2

Before use

Outdoor unit

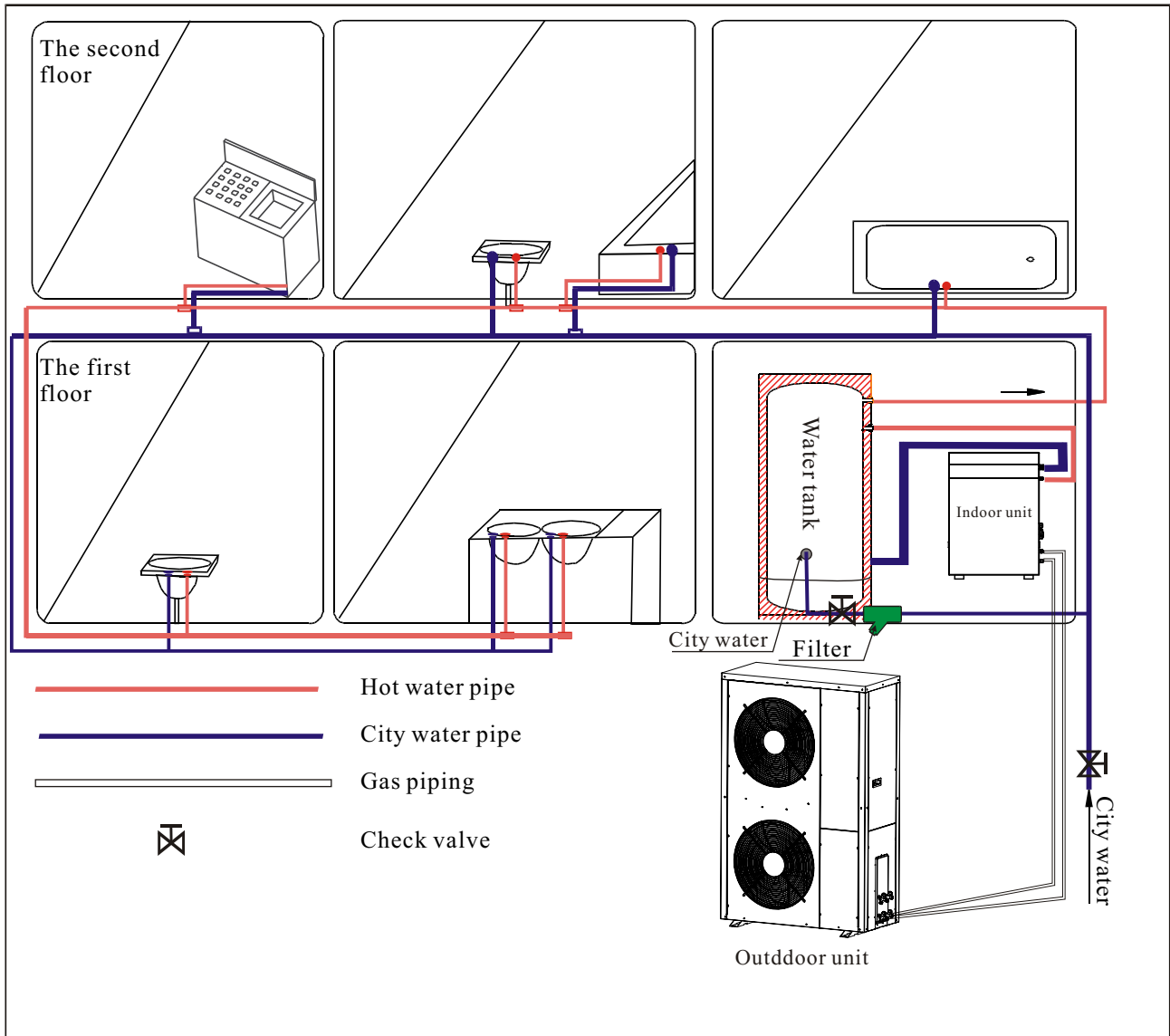


No.	Name	Quantity	No.	Name	Quantity
1	Fan guard	1	18	Upper evaporator	1
2	Front panel	1	19	back side panel	1
3	Fan blade	1	20	Cable gland	1
4	Service panel (down)	1	21	Compressor	1
5	Service panel (up)	1	22	Electric box	1
6	Upright column 3	1	23	Front panel	1
7	Bottom plate	1	24	Motor	1
8	Lower fan motor bracket	1	25	Upper motor bracket	1
9	Fan motor	1	26	Upright column 2	1
10	lower clapboard	1	27	Condensate pan	1
11	Upright column 1	1	28	Crank heater	1
12	Valve kit	1	29	Electronic expansion valve coil	1
13	Valve installation plate	1	30	Electronic expansion valve	1
14	Upright column 1	1	31	Double heads sensor(air and coil temp. Sensor)	2
15	Right service panel 1	1	32	Compressor discharge temp. Sensor	2
16	Right service panel 2	1	33	Bottom plate heater	3
17	Lower evaporator	1			



Installation

1. System figure



The installation of the product should be handled by professional installer or under their instructions.

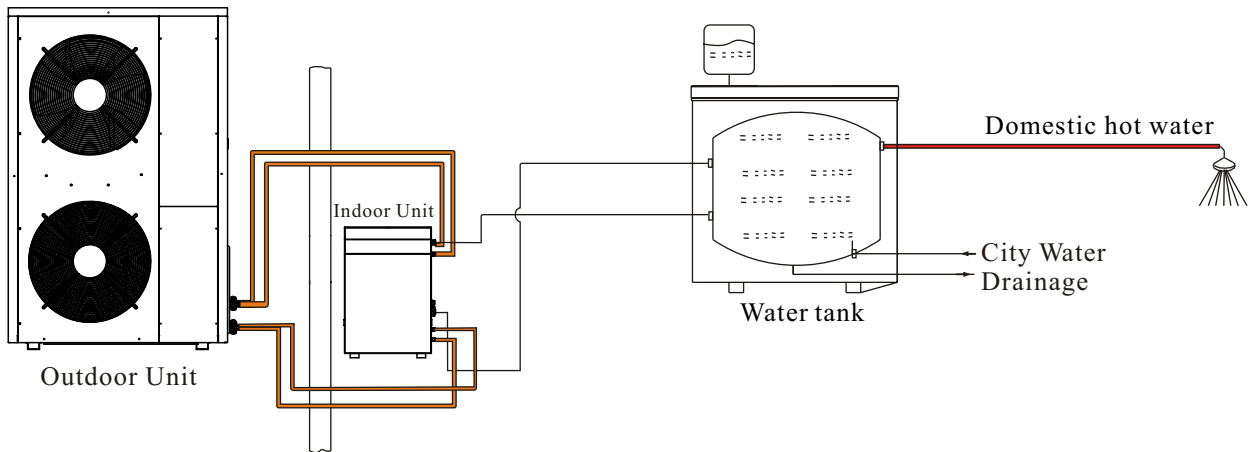


Installation

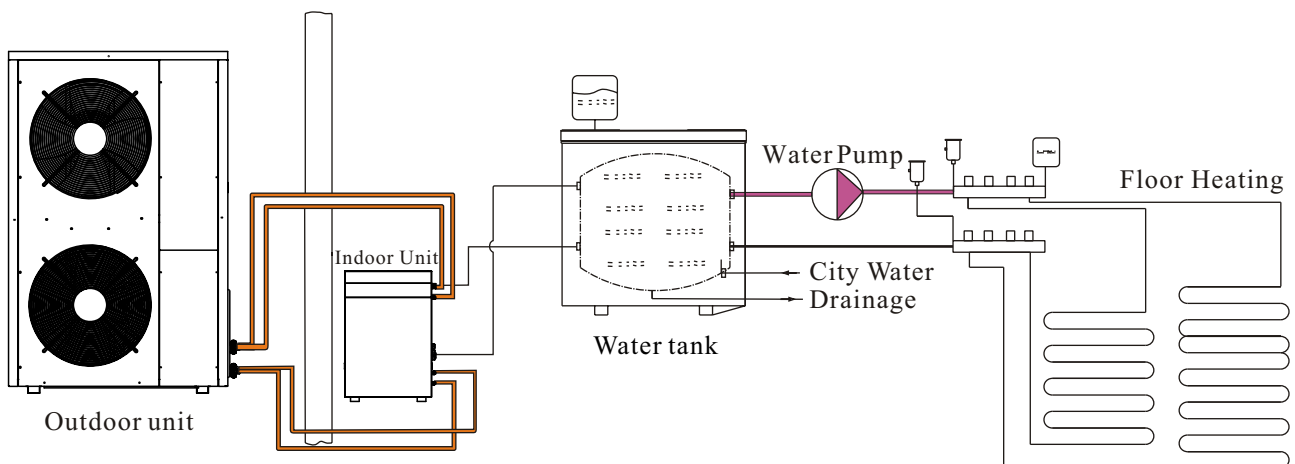
2. Installation methods

Application

Application 1: This is a common application, providing the domestic hot water for shower and washing. This installation is for supplying sanitary hot water only.

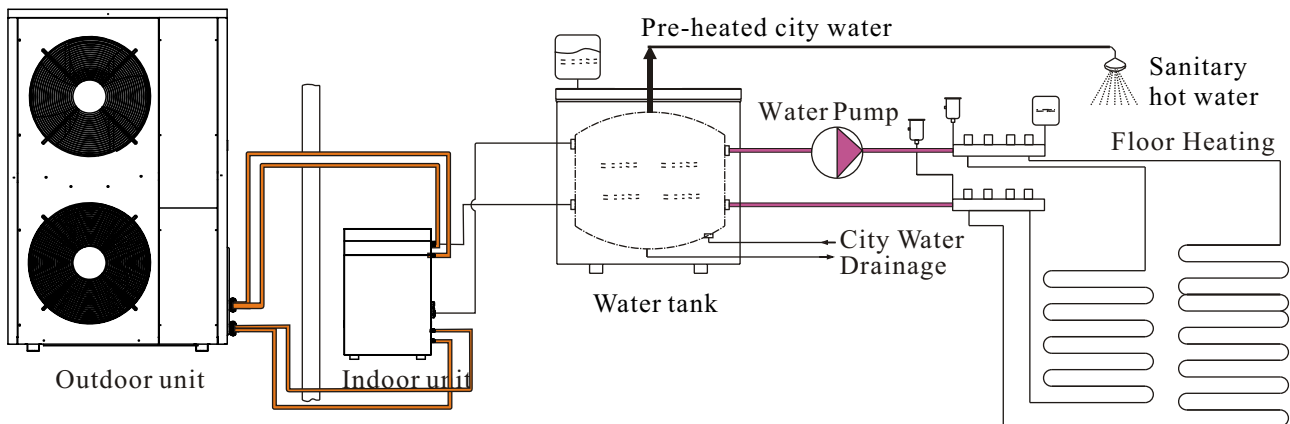


Application 2: The unit only supplies the hot water for floor heating. This installation is for supplying floor heating hot water only.

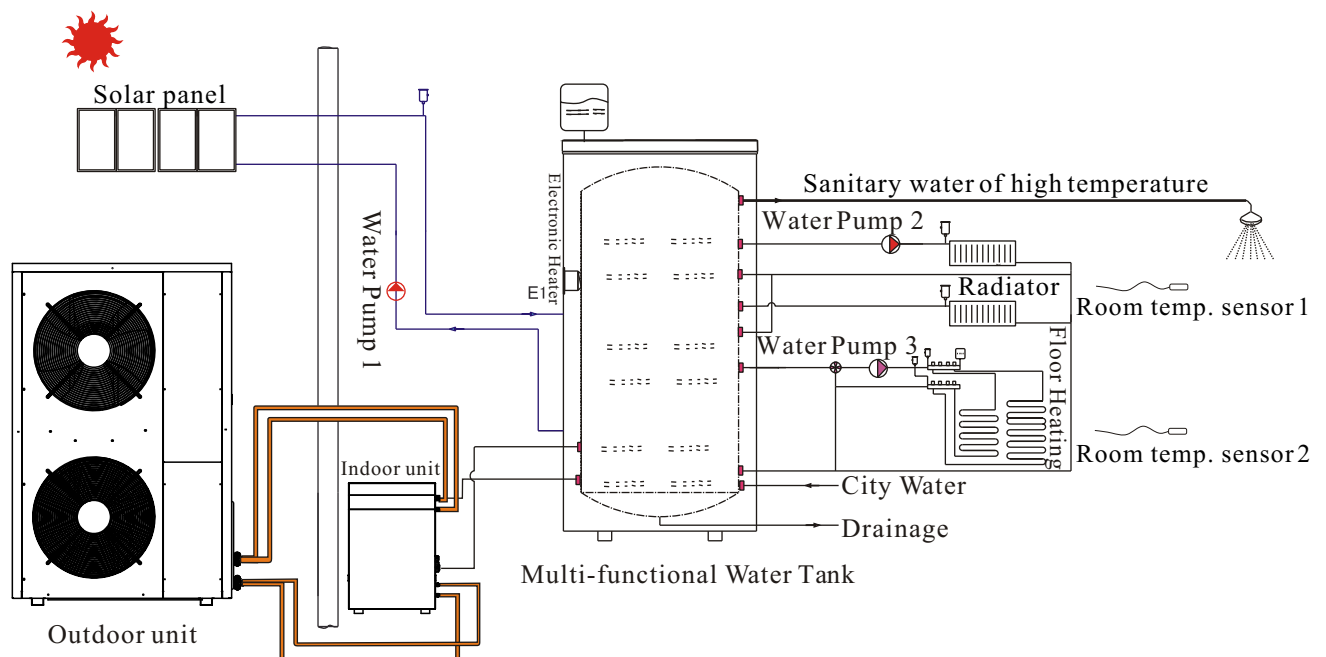


Installation

Application 3: The unit can provide both domestic hot water and floor heating(the application needs special water tank to separate the water supplies). It provides both floor heating hot water and pre-heated sanitary water.



Application 4: This application integrated with solar panel can provide hot water for domestic use, floor heating and radiator (this application needs special multi-functional water tank). It provides hot water for central house heating and hot water system.



Installation

3. Module installation

3.1 Location for indoor unit and attentions

- A. The indoor unit can be located in an room, corridor, balcony, garage or warehouse.
- B. Indoor unit should be placed on flat and solid ground.
- C. Enough space should be left around the indoor unit for futher maintenance.
- D. The outdoor and indoor unit should be placed close, to save the copper tube as well as the energy.
- E. The indoor unit shall be placed in dry and well-ventilated environment.
- F. Indoor unit mustn't be installed in an environment where volatile, corrosive or flammable liquid or gas exists.

3.2 Power cable connection

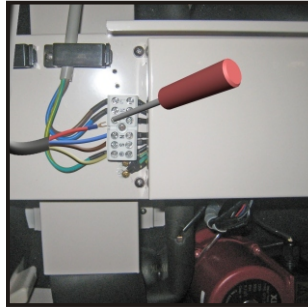
- A. This job should be done by qualified personnel.
- B. Ensure the power supply is off before anything is done to the electric circuit.
- C. Never use wires with insulation layer broken or cracked.
- D. Do not combine several power cables together. It's recommended to use a dedicated power cable to provide power supply for safety.

Please connect the power cable as follows:

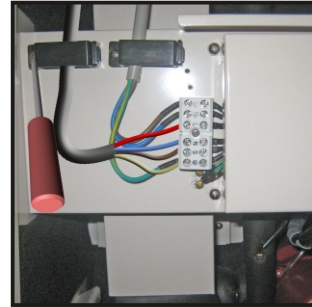
- 1) Take off the screws in the left and right side of the front panel, and then remove the panel. Pass the 5m four-core power cable (in accessories) through the cable gland on the right side of the indoor unit.



Installation

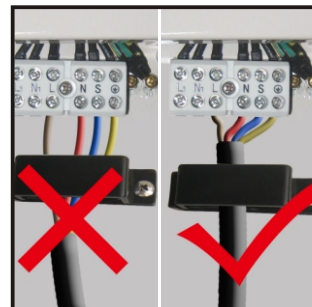


2) Connect the power cable to the terminals on the indoor unit. (Please match the wire colors to the marks on the terminals of both indoor and outdoor units.)



3) Fix the power cable by the wire clip, and then install the front panel back.

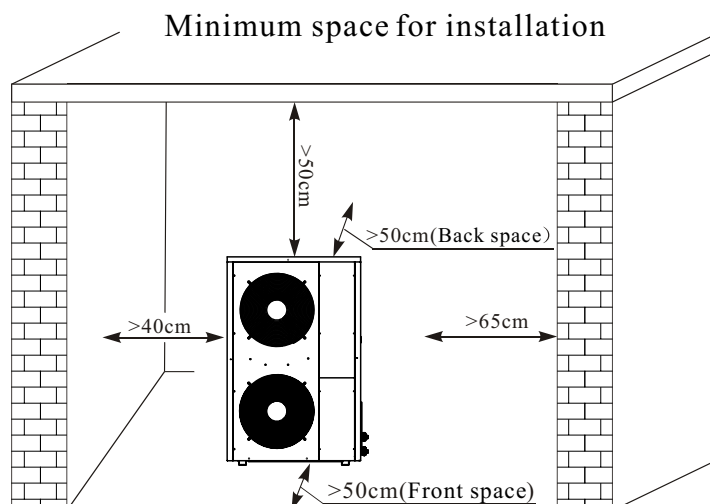
Notice: When fixing the power cable with the wire clip, please be careful to clamp on the insulation of the outer layer, don't clamp on the wires inside, or it may cause damage on insulation layer of one-core wire.



Installation

3.4 Location for outdoor unit and attentions

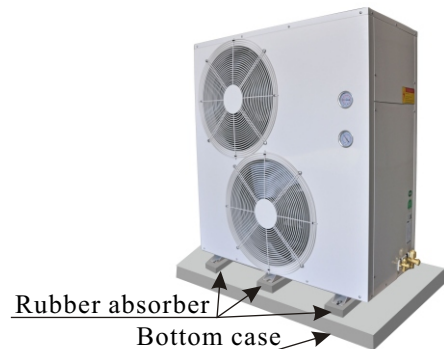
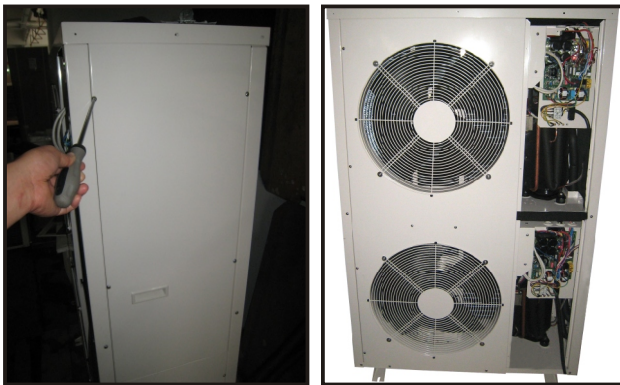
- A. The outdoor unit can be located in an room, corridor, balcony, and roof or hanged on the wall.
- B. Please don't install outdoor unit close to bedroom or living room, because there is some noise when it's running.
- C. The outdoor unit shall be placed in dry and well-ventilated environment.
- D. Outdoor unit mustn't be installed in an environment where volatile, corrosive or flammable liquid or gas exists.
- E. Please cover a protecting roof over the outdoor unit, lest ice or snow blocks the air inlet. Shield the unit from direct sunshine, rain or snow, but never cover the unit which will cause the bad ventilation.
- F. Please ensure there is drainage system around the location, to drain the condensed water under defrosting mode.
- G. Please don't install the indoor and outdoor unit in damp locations, otherwise it may cause short-circuit or corrosion of some components. The unit should be free from corrosive and moisture surrounding. Otherwise the lifetime of the unit might be shortened.
- H. Outdoor unit should be placed on flat and solid ground. When installing the outdoor unit, please ensure enough space around the outdoor unit, for better ventilation and maintenance. Please refer to the illustration below.



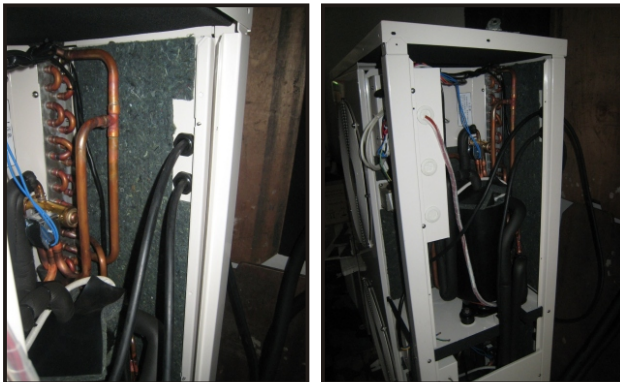
Installation

3.5 Installation of outdoor unit

Please add rubber absorber under the outdoor unit, to reduce the vibration.



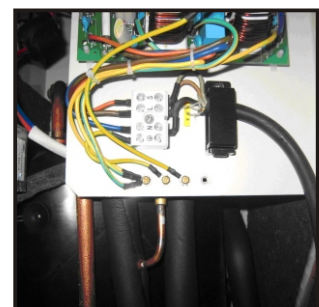
1) Use a screwdriver to remove the screws on the right service panel and front service panel of the outdoor unit, and then remove both the panels.



2) Pass the power cable from the indoor unit through the cable gland on the backside of the outdoor unit, and connect it to the terminals of the outdoor unit.

Attention:

When connecting the power cable between the outdoor unit and indoor unit, cables connected to the terminal block in indoor unit should coincide with that in outdoor unit. For example, if the terminals and power cables are connected as $\text{⏏} \rightarrow$ yellow cable, $L \rightarrow$ red cable, $N \rightarrow$ blue cable, $S \rightarrow$ black cable in indoor unit, the connections in the outdoor unit should be in the same way.



Installation



3) Fix the cable power by wire clip.

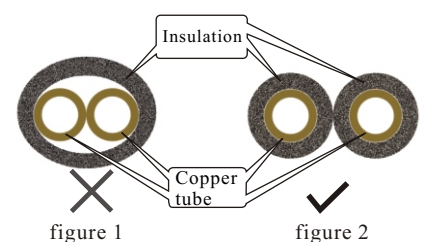
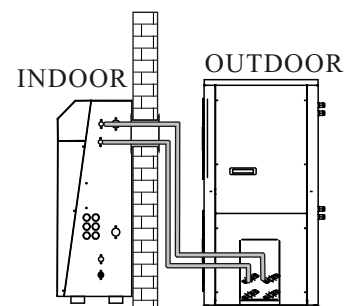


4) Install the service panels back on the unit.

3.6 Refrigerant pipe connection

The refrigerant pipe transfers heat in the whole system. Incomplete vacuum or leakage of refrigeration system will lead to low performance, so please pay special attention to the following:

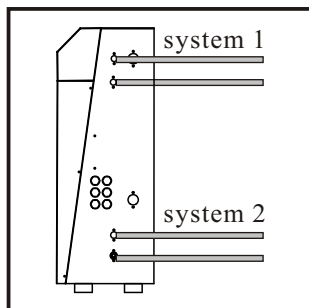
- A. Choose high quality refrigerant pipe, which conforms to the pressure requirements of R410A.
- B. Please well insulate the refrigerant pipe before connection.
- C. Strictly check the joints of refrigerant pipe, to avoid leakage.
- D. Try to avoid excessive bending of the refrigerant pipe, to ensure smooth circulation of refrigerant .
- E. Please dry the refrigerant pipe before connection, to avoid moisture in the pipe.
- F. If there is a wall between indoor and outdoor unit, please drill a hole on the wall, place a wall pipe in the hole and then let the refrigerant pipe go through the wall pipe.
- G. When insulating the refrigerant pipe, please insulate each pipe separately (refer to figure 1 below), don't insulate the refrigerant pipes together (refer to figure 2 below).



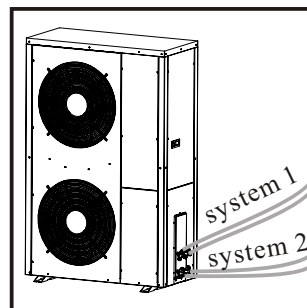
Installation

Please connect the refrigerant pipe as follows:

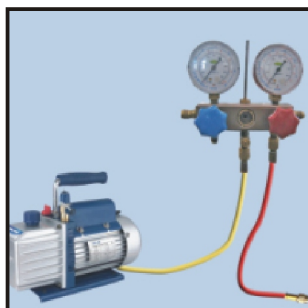
Since there are two systems in the unit, please prepare two refrigerant pipes for each system (Please insulate the refrigerant pipe before connection).



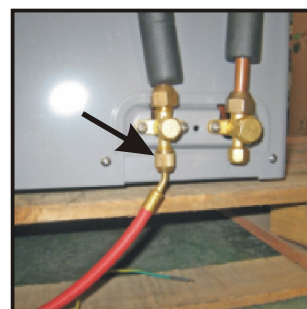
1) Connect one side of refrigerant pipe to the indoor unit (for both system 1 and 2).



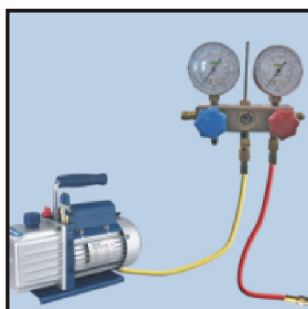
2) Connect the other side of the refrigerant pipe to the outdoor unit.



3) Prepare a vacuum pump and a pressure gauge, connect one tube of the pressure gauge to the vacuum pump.



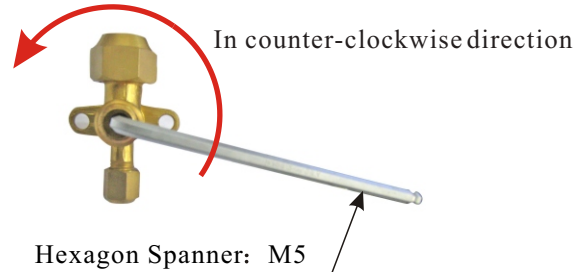
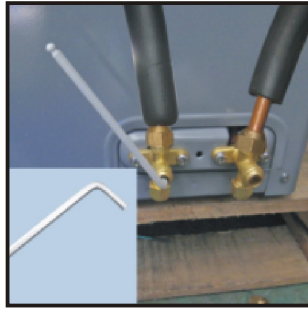
4) Connect the other tube of the pressure gauge to the outdoor unit.



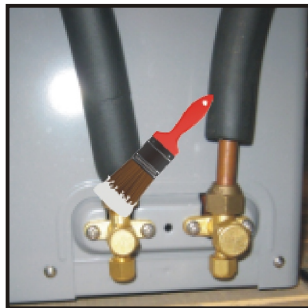
Attention: The liquid valve can't be opened until the vacuumizing has been totally finished.

5) Open pressure gauge, and start the vacuum pump to vacuum the unit for around 10 minutes. When the pressure gauge shows negative pressure, close the pressure gauge and stop vacuuming. (Attention: since there are two systems, please vacuum them separately)

Installation



6) Take off the copper nut of the gas and liquid valves, open the valves with hexagon spanner as much as possible.



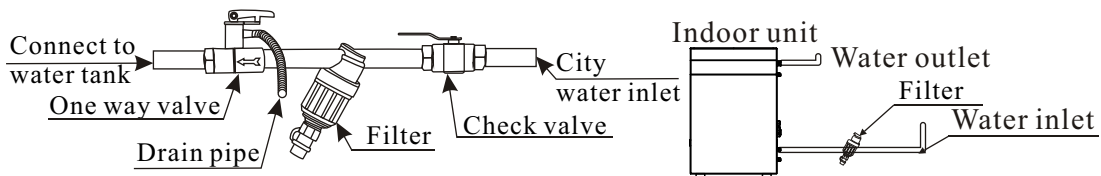
7) Check with leakage detector or soap water if there is any leakage, if not, then put back the copper nuts onto the valves.

3.7 Water pipe connection

After installing the unit, please connect the water inlet and outlet pipe according to the local instructions. Please carefully select and operate the water pipe. After connection, the water piping should be pressure tested, cleaned and disinfected before use.

【Filter】 :

A filter (60-80 μ m) should be installed at the water inlet of water tank as well as that of indoor unit, to avoid sediments and guarantee water quality.



【Insulation】 :

All pipes running hot water should be well insulated. The insulation must be tied up tightly without gap (But please don't wrap up the check valve for future maintenance).

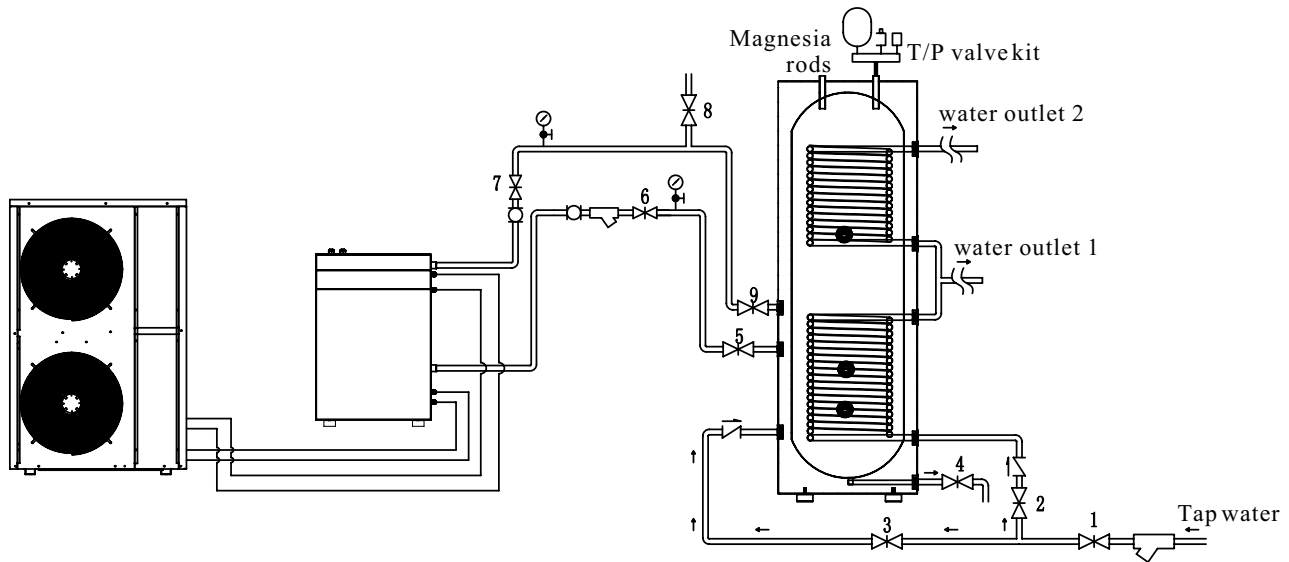


Please ensure enough water pressure to send the water to the required height. If the water pressure is not enough, please add water pump to increase the pumping head.



Installation

4. Air Purging of water system



SYMBOL

Symbol name	Symbol
Ball valve	
Water pressure gauge	
Y filter	
One way check valve	
Soft connector	

Air purging of water system:

1. Open ball valve 3,5,6,7 and 8, close ball valve 2,4 and 9.
2. Open ball valve 1, making the tap water come into the water tank until water come out from ball valve 8 and T/P valve kit.
3. Close ball valve 8 and open ball valve 9, then air purging finishes.

Air purging of hot water piping system:

After finish the air purging of water system, open ball valve 2 until water come out from water outlet 1 and 2.



Installation

5. Pre-start up

5.1 Check before pre-start up

Before start up, please check the follow items:

- A. Check if the water pipes are connected well and if there is any leakage;
- B. Make sure the water supply valves are open and the water flows smoothly;
- C. Check if the power cable is connected well and properly grounded, and if the cable is Broken or not.
- D. Make sure the indoor and outdoor units have been installed in a flat and solid location.
- E. Check if the power supply corresponds with the specs on the label.
- F. In cold area, please ensure the supply water flow is smooth without freezing.
- G. Check if the refrigerant pipe and water pipe are well insulated.



If everything above is OK, the unit can start up. If any of them fails, please improve it.

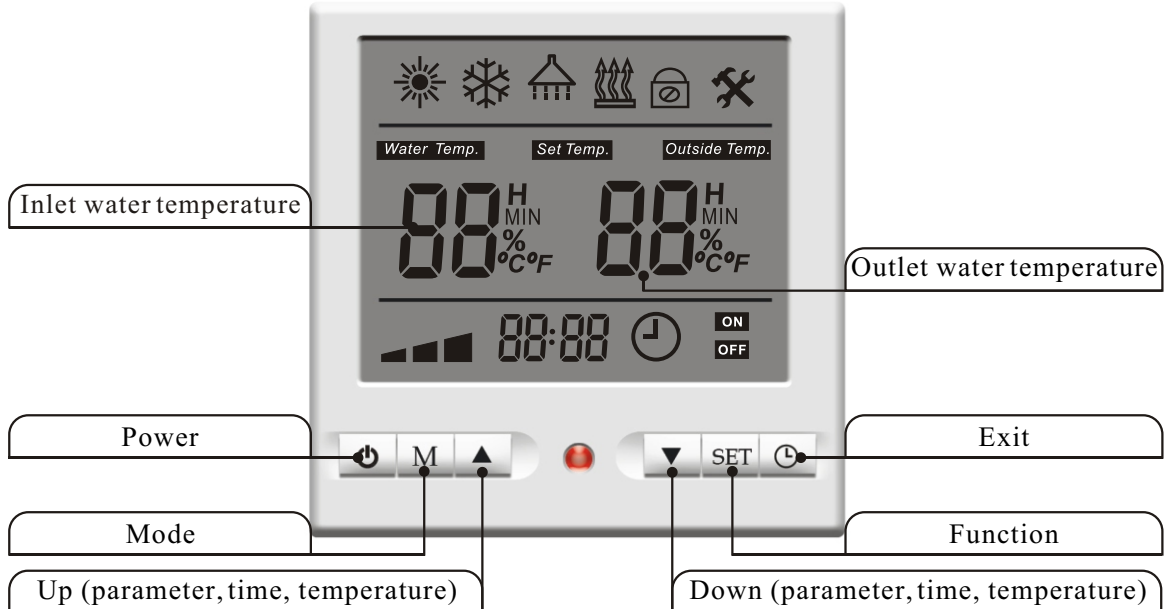
5.2 Pre-Start up

- A. When the installation of unit is completed, water system pipes are well connected and air purging is done, no leakage or other problems, the unit can be powered to start up.
- B. Turn on the unit, press the on-off button on the wire controller to start the unit. Please check carefully if there is some abnormal noise or vibration, or the display of wired controller is normal or not.
- C. After the unit is working properly for 10 minutes, without any problem, then the pre-start up is successfully completed; If not, please refer to the Service and Maintenance chapter in this manual to solve the problems.



Use

1. Introduction of operation panel




Symbol	Name	Instruction
	Heating Mode	Blinks when compressor runs, continuous lights when compressor stops
	Cooling Mode	Blinks when compressor runs, continuous lights when compressor stops
	Hot Water Mode	Continuous lights in heating mode
	Defrosting	Blinks when defrosting
	Keyboard locking	Continuous lights when keyboard is locked
	Parameter Setting	Blinks when setting parameters
	Temperature/Time/ Failure Code	Air temp. display range: 0-75°C Water temp. display range: 0-99°C
	Time	After power failure the time will reset to zero
Water Temp.	Temperature Control	When water temperature is set, the symbol always lights When air temperature is set, the symbol won't display
Set Temp.	Temperature Setting	When setting temperature, this symbol blinks
Outside Temp.	Outdoor Temperature	When wired controller is switched to show outdoor ambient temperature, this symbol lights. This function is not available yet
	Timer	The icon displays when the function is activated
	Frequency display	: frequency < 48Hz, : frequency < 66Hz : frequency ≥ 66Hz

► Use



2. Function of operation panel

2.1 Standby

When unit is powered on, the wire controller enters standby. Once pressing  while the unit is running, the wire controller enters standby again.

The unit will clear its clock time when power failure happens. The customer needs to set the time again in parameter 1.

2.2 ON/OFF

When the unit is standby, press  to turn on the unit. The unit will work in its last working mode. Press  again to turn off the unit.

The unit will recover its latest working settings automatically after power failure.





2.3 Mode selection

After turning on the unit, press " M " to choose the working mode, it comes in the sequence:

→  Heating →  cooling →  hot water → (Attention: the hot water mode is not




available in some model).





2.4 Temperature setting



When the unit is ON, press  once, the set temperature increases by 1°C; press  once, the set temperature decreases by 1°C. Keep on pressing  or , the temperature can be increased or decreased by 5 °C.

When changing the set temperature, " **Set Temp.** " flickers.

2.5 Parameter setting

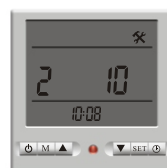
When unit is OFF, press  or  to choose the Parameter you may want to change. Meanwhile  blinks. The value on the left indicates parameter sequence, the value on the right indicates the parameter value.

Press  to activate the parameter you choose to change when parameter sequence blinks. Then the parameter value blinks. Press  or  to adjust the value, then press  again to save the setting, and go back to previous operation to set other parameters in the same way.

If you don't press  again to confirm the setting, it won't be saved. The system will exit this parameter setting program automatically in 10 seconds of non-operation, or by pressing .



Parameter 1:
Parameter 1 indicates the local time. The time is 24-hour system.



Parameter 2:
This parameter has no function in this model.



Parameter 3:
Parameter 3 indicates the duration time for back light. It can be set to 00, 10, 20, and 30. While 00 means the back light is always ON, and 10, 20, and 30 mean the duration time for back light is 10 seconds, 20 seconds and 30 seconds.



Use

2.6 Temperature control mode

When unit is ON, Keep on pressing " M " to choose water temperature or air temperature as the set temperature to control the system.

When " **Water Temp.** " displays, the system regards the outlet water temperature as set temp. ; when " **Water Temp.** " disappears, the system regards the ambient temperature where the wired controller locates as set temp. .

2.7 Timer Setting

To set the ON timer, press button. and **ON** turn on and blink. Press to set the timer in hours, and press to set the time in minutes. After it is done, press button to confirm the ON timer setting and enter the OFF timer setting, with **OFF** blinks. Set the OFF timer by pressing to set the OFF timer in hours and pressing to set OFF timer in minutes. then press button to confirm the OFF timer setting, with 1 **ON** 2 **OFF** shown on the operation panel, indicating that the timer setting is finished.

If the ON timer or OFF timer setting is not confirmed by pressing , the setting value is not saved. The timer setting can be cancelled by keeping on pressing , with 1 **ON** 2 **OFF** disappearing from the operation panel.



Timer ON:

Timer ON setting doesn't function when the unit is working. When the unit is turned OFF, it will be activated and the unit will turn on as the timer setting.



Timer OFF:

Timer OFF settings only functions after the unit starts. It can be activated when the unit is turned on.

2.8 Keyboard lock

When the unit is ON, press for 5 seconds, to lock all the buttons, with shows. Press for 5 seconds again, to unlock all the buttons.



Attention

When the outdoor ambient temperature is above 26°C, the unit is not able to work in heating mode, otherwise, it may be damaged or turn off to protect itself. So the users mustn't set heating mode on the ambient temp. above 26°C.



Service and maintenance

1. Attention



- A. The user mustn't change the structure or wiring inside the unit.
- B. The service and maintenance should be performed by qualified and well-trained technician, when the unit fails to run, please cut off power supply immediately.
- C. The smart control system can automatically analyze various protection problems during daily use, and display the failure code on the controller. The unit may recover by itself. Under normal operation, the pipings inside the unit don't need any maintenance.
- D. The unit is designed so properly that the future maintenance can proceed conveniently, all the maintenance can be done easily by checking the service panel.
- E. Under normal running, the user only needs to clean the surface of the evaporator per month or quarter of a year.
- F. If the unit runs in a dirty or oily environment, please clean the evaporator and heat exchanger by professionals, using specified detergent, to ensure the performance and efficiency of the unit.
- G. Please pay attention to the ambient environment, to check if the unit is installed firmly, or if the air inlet and outlet of the outdoor unit is blocked or not.
- H. Unless the water pump is damaged, no service or maintenance should be taken to the water system inside the unit. It's recommended to clean water filter regularly or change it when it's very dirty or blocked.
- I. If the unit is not used in winter for a long time, please drain all the water inside the system, to prevent the water pipes from damage due to frost.



Service and maintenance

2. Failure code list

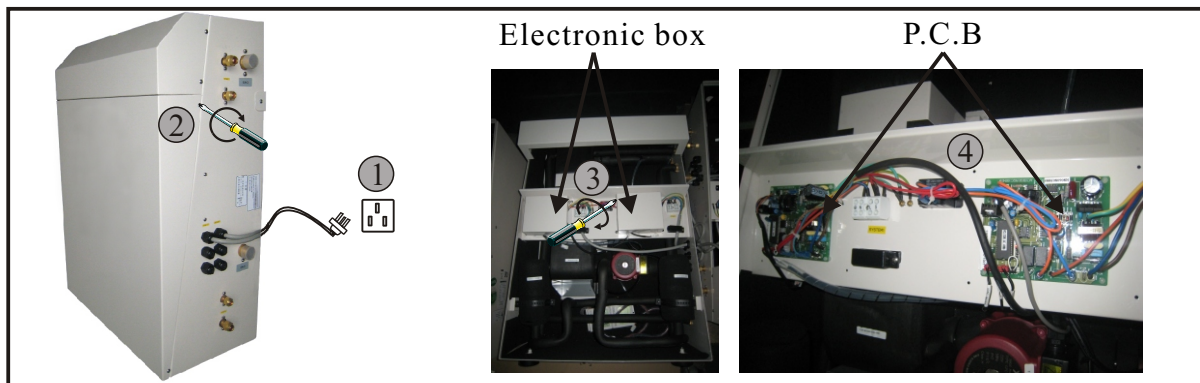
Failure code list (the failure code shows for 5 seconds every 10 seconds)

Code	Trouble	Advice
F1	Communication failure between indoor and outdoor unit	Check if the signal cable is loose or damaged, if so, fasten it or change it.
F2	Indoor temperature sensor failure	Check if the temperature sensor drops off or is broken
F3	Current sensor or voltage sensor failure	Restart the unit, if this doesn't work, please change PCB
F4	Compressor drive fails, malfunction of IPM, IPM module protection (overloading), drive protection	Restart the unit, if this doesn't work, please change a module board
F5	Indoor EEPROM failure	Check if EEPROM is connected well
F6	Overloading protection because of too high temperature of indoor pipe in heating, or too high temperature of outdoor pipe in cooling, or too high operation current)	Check if the water flows smoothly, and if outdoor air inlet is blocked
F7	High or low voltage protection	Check if the power supply is higher or lower than the power limit
F8	Pressure switch failure	Change pressure switch
F9	Outdoor EEPROM fails	Check if EEPROM is connected well
Fb	Malfunction of outdoor sensor	Check if the signal cable is loose or damaged, if so, fasten it or change it.
Fc	Pressure switch protection	Cut off the power, then Restart the power and unit
Fd	Outdoor ambient temperature protection	Normal protecting function, the can be resumed when the outdoor ambient temperature is back to normal
Fe	Indoor anti-freezing protection	Normal protecting function, can be resumed when the temperature is back to normal
Ff	Indoor water pump or flow switch failure	Repair or change water pump or flow switch
E0	Wrong data of wire controller (the wire controller is broken)	Repair or change wire controller
E1	Malfunction of wire controller (four-core signal cable isn't connected well)	Check if the cable connection of wire controller gets loose. Fasten it.

Service and maintenance

3. Service

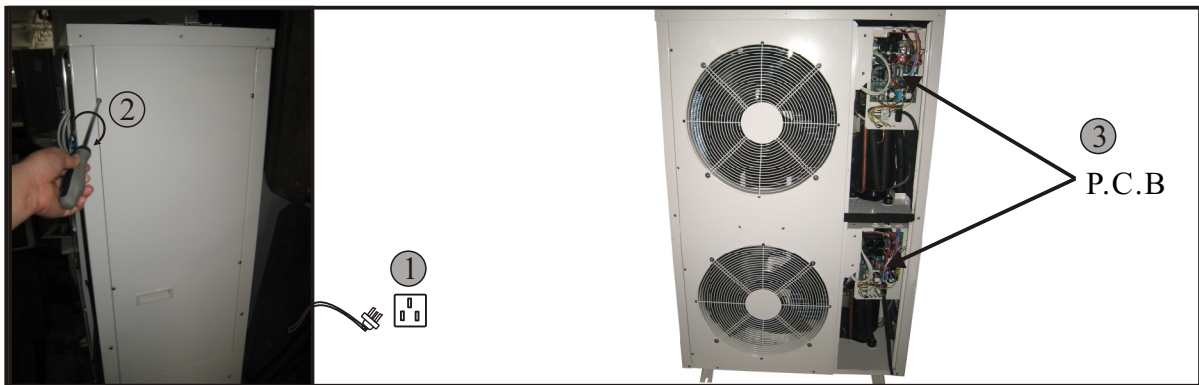
Indoor unit



Please repair the indoor unit as follows: (this operation must be done by qualified personnel)

1. Cut off the power supply
2. Remove the front panel
3. Take off the electronic box cover
4. Check the electric part

Outdoor unit



Please repair the outdoor unit as follows: (this operation must be done by qualified personnel)

1. Cut off the power supply
2. Remove the service panel
3. Check the electric part



Service and maintenance

4. Maintenance

4.1 Cleaning of water filter

The water filter should be cleaned according to the manual of water filter, to ensure the water flow of the water system. It's recommended to be cleaned once in the first month, after one month, once half a year.

4.2 Cleaning of heat exchanger

Heat exchanger should be cleaned once half a year, because after long term running, gap between the fins of heat exchanger may be clogged up by dust, leaves, plastic films or papers, which will affect the efficiency of heat exchange, please clean the heat exchanger as follows:

A. Use a vacuum cleaner to clean the surface of the fins, to get rid of the dust or other rubbish.

B. Use a soft nylon brush to clean the fins, rinse by water at the same time (please don't rinse with high water pressure). If the outdoor unit is located in an oily place and is hard to clean, please ask for professional service to clean it.

C. After cleaning, please leave the unit at a shady and well-ventilated environment to dry the surface of the unit.

①. Avoid splashing water to the electric part when cleaning.

②. Avoid touching the sharp angles of the fins when cleaning, or may scarify your skin, it's recommended to wear rubber gloves before cleaning.

③. The fins of heat exchanger are soft, please don't wipe strongly with hard object, or it may damage the fins.

④. If the unit is working in a salty environment, please clean the heat exchanger more often.

⑤. If the fins have corrosion in surface, please change a better environment to install the unit.

4.3 Gas charging

The refrigerant plays an important role in delivering energy in cooling or heating. Insufficient refrigerant affects directly efficiency of cooling and heating. Please pay attention to the following before adding refrigerant:

①. The work should be done by professionals

②. Please make sure the copper pipe has no leakage before gas charging. If the copper pipes has leakage, please repair or change the pipes firstly.

③. Don't add too much refrigerant than required, or may cause to a lot of failures, such as high pressure and low cooling efficiency.



Service and maintenance

- ④. This system uses R410A refrigerant, whose pressure is about 1.6 times than that of R22, so never use R22 or other refrigerant to replace R410A.
- ⑤. There must be no air in the refrigerant circulation, because the air will cause abnormal high pressure, which will damage the gas piping.
- ⑥. If the refrigerant leaks in indoor environment, once it meets electric spark from electric fan, boiler or electric furnace, it will produce poisonous gas. Please ventilate the room when there is gas leakage.
- ⑦. Copper pipe must be used as gas pipe, never use iron pipe, aluminium pipe or alloy pipe to replace. Please refer the specification of the copper pipe in the table.

Outer dimension (mm)	Thickness (mm)
ϕ 9.52	0.70
ϕ 12.7	0.70



Service and maintenance

5. Troubleshooting

Failure	Cause	Solution
Unit can't startup	1. No power supply	1. Check the power supply
	2. Fuse is broken or circuit breaker is disconnected	2. Check if it's open circuit or if the motor coil is earthed. Then change a fuse and reset the breaker, check if the circuit is stable or the connection is well.
	3. Some kind of protection works	3. Check which protection is working, and clear the protection, then restart the unit.
	4. Wiring is loose	4. Check the wire connection and tighten the screws on the terminal
	5. compressor fails	5. Change a compressor
Fan fails to run	1. Fan motor wire loose	1. Check the wire connections.
	2. fan motor failure	2. Change fan motor.
Low heating performance	1. The coil fins are very dirty	1. Clean the evaporator coil
	2. Air inlet is blocked	2. Remove any object that blocks the air circulation of the unit.
	3. Insufficient of refrigerant	3. Inspect the unit for leakage and fix it if any. Discharge all refrigerant and charge the unit again with correct amount.
Too high noise from the water pump, or no water flow when the water pump is running	1. Lacking of water in water system	1. Check the water filling device. Fill the system with enough water.
	2. Air exists in water system	2. Purging the air out.
	3. Valves in water system are not completely opened	3. Check all the valves to ensure they are fully opened.
	4. Water filter is dirty or blocked	4. Clean the water filter
Too high compressor discharge pressure	1. Too much refrigerant	1. Discharge all refrigerant and charge the unit again with right amount.
	2. Air exists in refrigeration system	2. Discharge all refrigerant and charge the unit again with right amount.
	3. Inadequate water flow	3. Check the water flow of the system. Use a bigger pump to increase the water flow if necessary.
	4. Too high water temperature	4. Check the value of the water temperature sensor, to ensure it works properly.
Too low suction pressure	1. Drier filter is blocked	1. Change a new one
	2. Electronic expansion valve is not opened	2. Repair or change a new one
	3. Leakage of refrigerant	3. Inspect the unit for leakage and fix it if any. Discharge all refrigerant and charge the unit again with right amount.
Unit can not defrost properly	1. Coil temperature sensor failure	1. Check the position and value of the coil temperature sensor. Replace it if necessary.
	2. Air inlet/outlet is blocked	2. Remove any object that blocks the air circulation of the unit. Clean the evaporator coil occasionally.



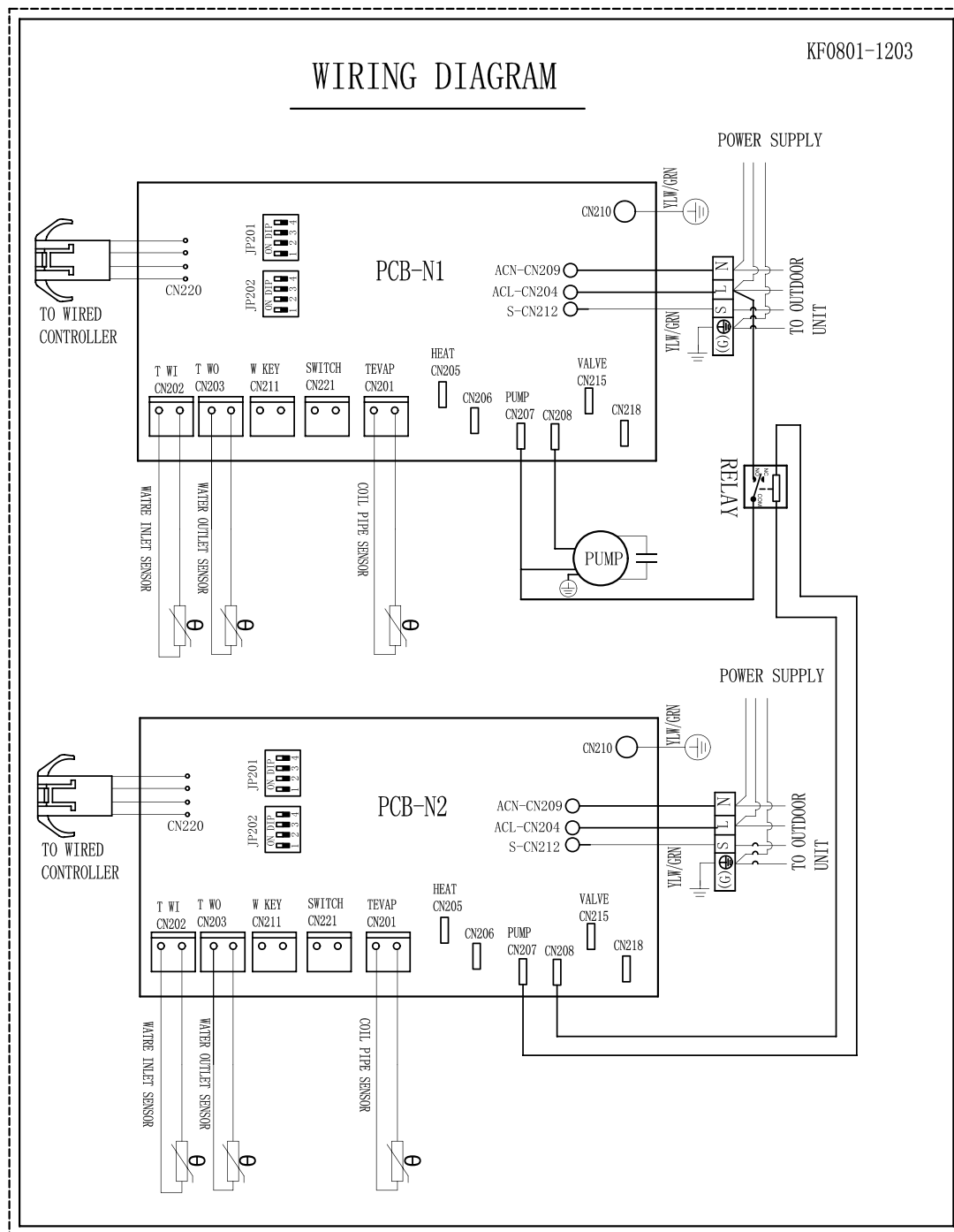
Service and maintenance

The following phenomenon may not be problems of unit itself.
Please contact with a professional maintenance staff for help.

Number	Failure	Solution
1	The unit is not running	When the unit restarts, the compressor will start 3 minutes later (self-protection of compressor), please check if the circuit breaker is disconnected, and if there is normal power supply for the wire controller.
2	Noise	When the unit is running, if sound of the running water can be heard from the system of the unit, it is the sound of running of the refrigerant. This is not a failure.
3	Low capacity	Check if the air inlet or outlet is blocked in outdoor unit; check if the setting temperature is too high in cooling mode, or is too low in heating mode, if there are any heating source; Check if there are too many people in the room or if the room is too big.

Wiring diagram

Indoor unit

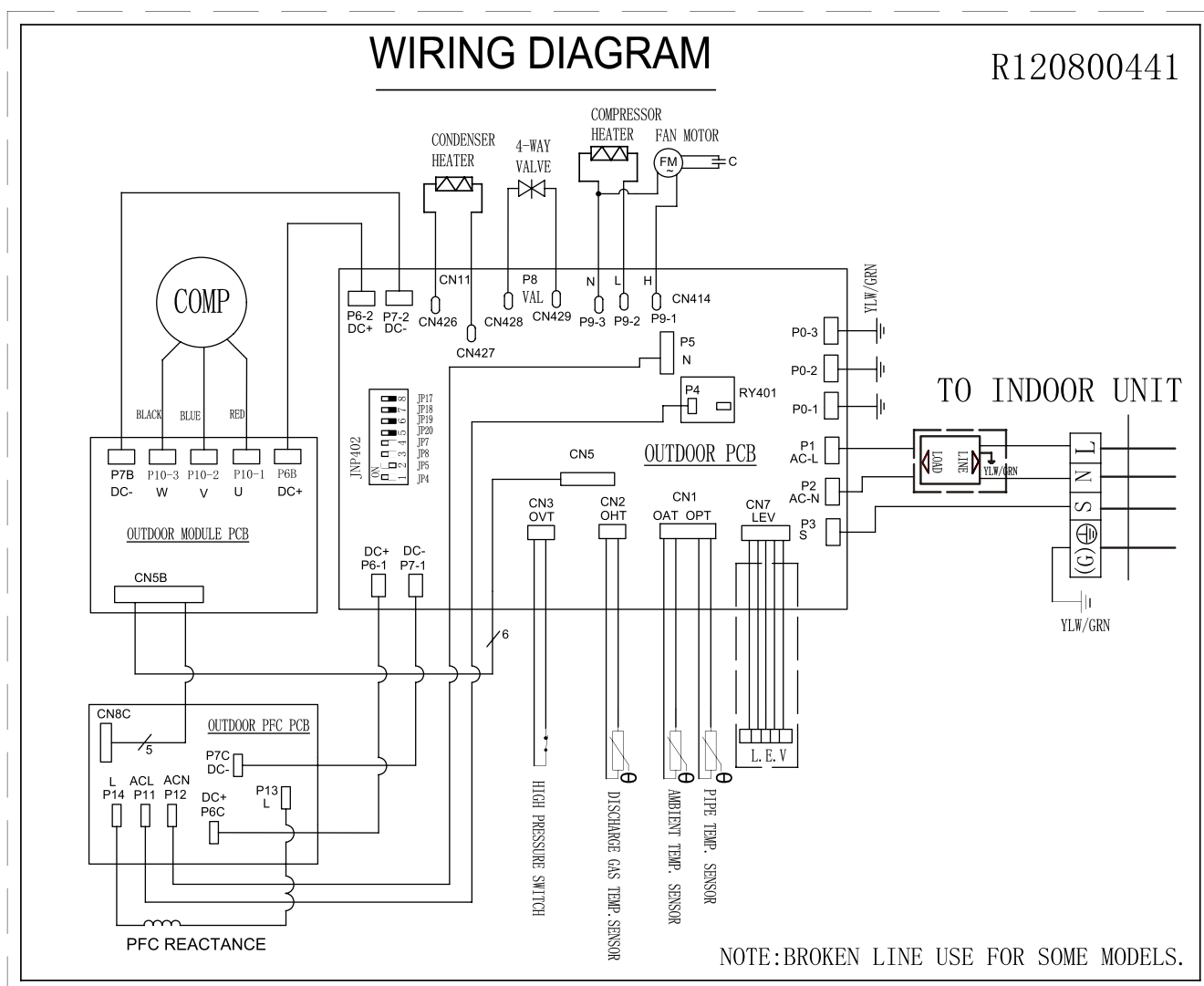


TAKE CARE!

This diagram is subject to change with improvement of the unit. Always refer to the diagram supplied with the product.

Wiring diagram

Outdoor unit



TAKE CARE!

This diagram is subject to change with improvement of the unit. Always refer to the diagram supplied with the product.

