

DC Inverter Heat Pump

Instruction Manual

For models: AVH-10-25S
 AVH-13-25S
 AVH-15-25S
 AVH-18-25S

- ◆ Please read the manual carefully before installation and maintenance.
- ◆ Please keep this manual well for future reference.

CONTENTS

Part I: Important safety instruction	1
1.1 Warnings	1
1.2 Important safety instruction	1
Part II Installation	3
2.1 Transportation	3
2.2 Installation site requirement.....	3
2.3 Minimum distance to wall	3
2.4 Clearance between outdoor module and ground.....	4
2.5 Minimum clearances for the indoor unit.....	5
2.6 Routing the refrigerant lines	5
2.7 Connecting and filling the refrigerant lines	7
2.8 Testing the refrigerant lines for leaks.....	10
2.9 Installation guide.....	10
2.10 Recommended hydraulic connection.....	11
2.11 Electrical connection.....	12
2.12 Trial operation.....	13
Part III Control System	14
3.1 Controller position	14
3.2 Controller introduction.....	14
3.3 Operation introduction	15
Part IV Maintenance	33
Part V Trouble Shooting	34
Part VI Wiring Diagram.....	40
Disposal.....	43

Part I: Important safety instruction

1.1 Warnings

Read the manual carefully before using the product.



Warnings on the refrigerant

The refrigerant used is R32 fluoride. R32 refrigerant is flammable and odorless. In addition, it can cause explosion in particular conditions. However, its flammability is very low. In order to start the flame, a free flame is required.

R32 refrigerant is a less polluting refrigerant than other gases used in refrigeration circuits and causes much less damage to the ozone layer. The influence on the greenhouse effect is also much lower.

The R32 refrigerant has excellent thermodynamic characteristics, which allows a really high energy efficiency. For the same heating capacity, the system therefore needs a lower charge.

1.2 Important safety instruction

-  1. The unit 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 unit in a safe way and understand the hazards involved. Children shall not play with the unit. Cleaning and user maintenance shall not be made by children without supervision.
-  2. The unit must be installed and repaired by qualified technician.
-  3. The unit shall be installed in accordance with national wiring regulations.
-  4. 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.

-  5. Before maintenance, please shut off the power to the unit first.
-  6. Do not operate the unit in a wet room such as a bathroom or laundry room.
-  7. Before obtaining access to terminals, all supply circuits must be disconnected.
-  8. An all-pole disconnection device which has at least 3mm clearances in all poles, and have a leakage current that may exceed 10mA, the residual current device (RCD) having a rated residual operating current not exceeding 30mA, and disconnection must be incorporated in the fixed wiring in accordance with the wiring rules.
-  9. A leakage protection switch must be installed near the unit.
-  10. Do not use any damaged cables and switches to avoid any leakage.
-  11. Do not open the electrical box of the unit without shutting off power supply.
-  12. The unit is designed for outdoor installation. Do not install it in a closed space without good ventilation.
-  13. Do not install the unit near inflammable or explosive goods.
-  14. Do not block the air intake or outlet of the unit.
-  15. When the unit is in off status for more than 5 hours with the ambient temperature lower than 2°C, please drain the unit to prevent the formulation of ice in it.
-  16. Keep safety distance between the unit and other equipment or structures according to local norm, and ensure that adequate space for maintenance or service operations.
-  17. Power supply: the diameter of electrical cables must be suitable for the unit and the power supply voltage must correspond with the value indicated on the units. All units must be earthed in conformity with legislation in force in the country concerned.
-  18. Please attention that hot water produced by the unit is not to be used for drink.

Part II Installation

2.1 Transportation

Along transportation, don't incline the unit more than 45° in any direction

The unit in its packaging can be transported with a lift truck or hand truck.

2.2 Installation site requirement

This unit is designed for outdoor installation, do not install it in an close space.

Please consider the condition as following factors when selecting installation site.

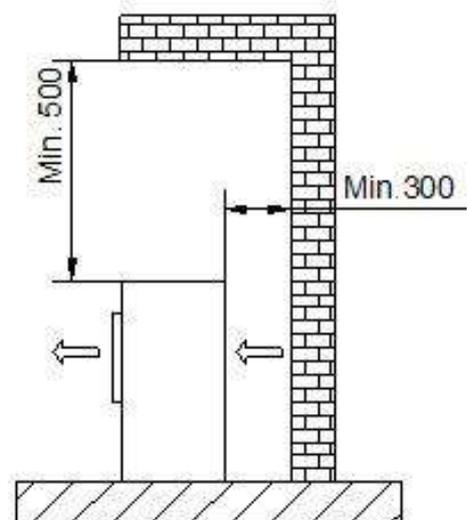
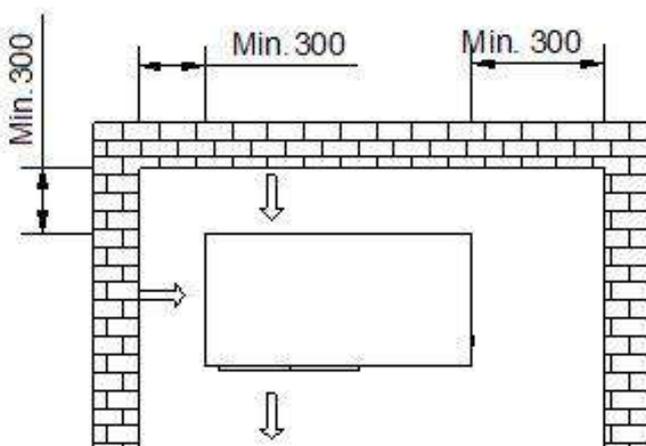
- The installation site should be large enough and well ventilation.
- The installation site should be convenient for water drainage.
- Select a smooth, horizontal site where it can support the weight of the unit.
- Do not install the unit where there is pollution, accumulation, fallen leaves or bad ventilation.
- Don't install the unit near inflammable or explosive goods.

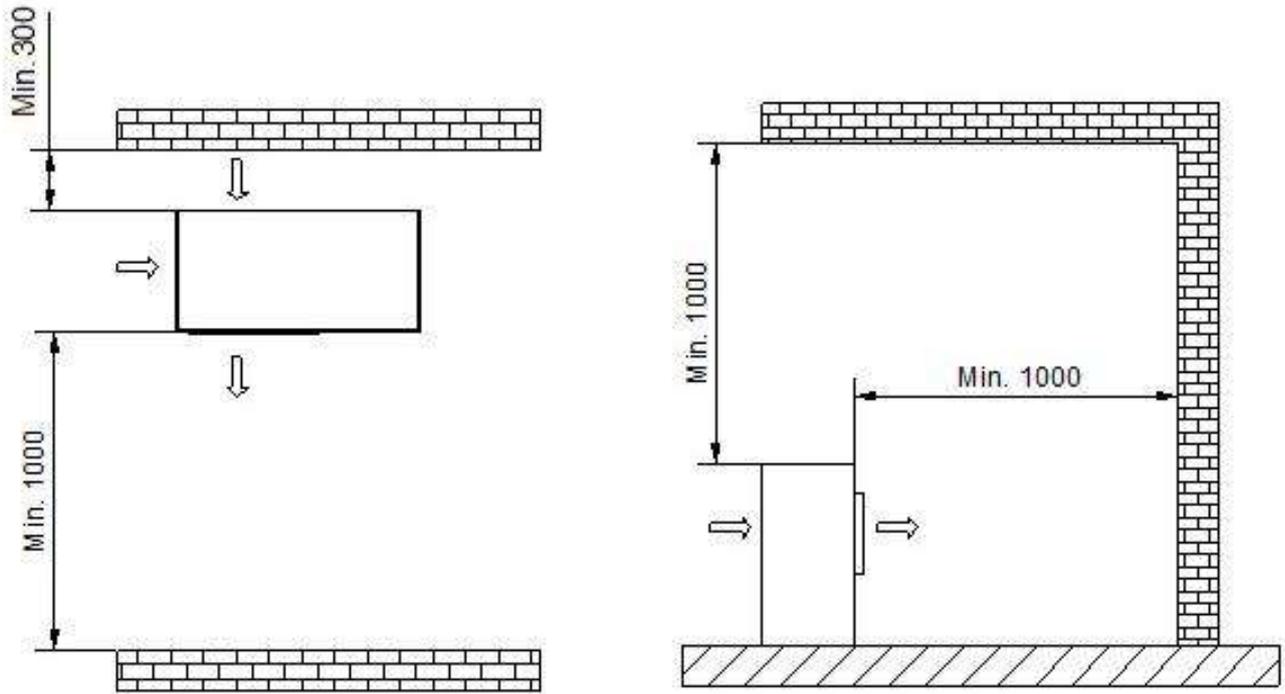
2.3 Minimum distance to wall

Air discharge

Minimum 1000mm to obstacles obstructing the air discharge.

Minimum 3000mm to footpaths and patios due to the formation of ice, even when outside temperatures are above 0 °C

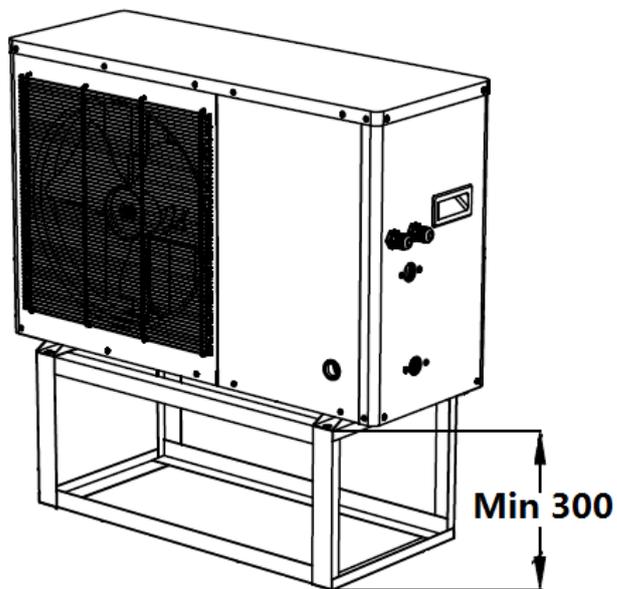




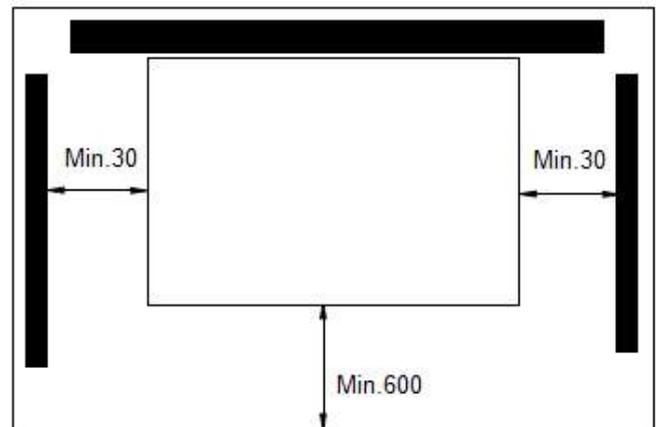
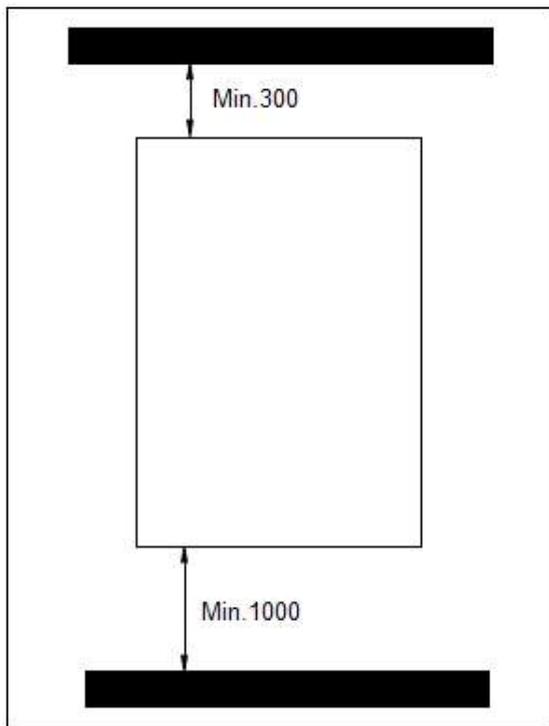
2.4 Clearance between outdoor module and ground

The minimum installation height must be 300mm.

A canopy must be constructed over the outdoor module in areas with heavy snowfall.



2.5 Minimum clearances for the indoor unit



2.6 Routing the refrigerant lines

The outdoor unit is pre-filled with refrigerant R32.

No additional filling is required for lines up to 5 m in length.

Minimum line length : 3 m

Maximum line length : 12 m

Maximum height differential

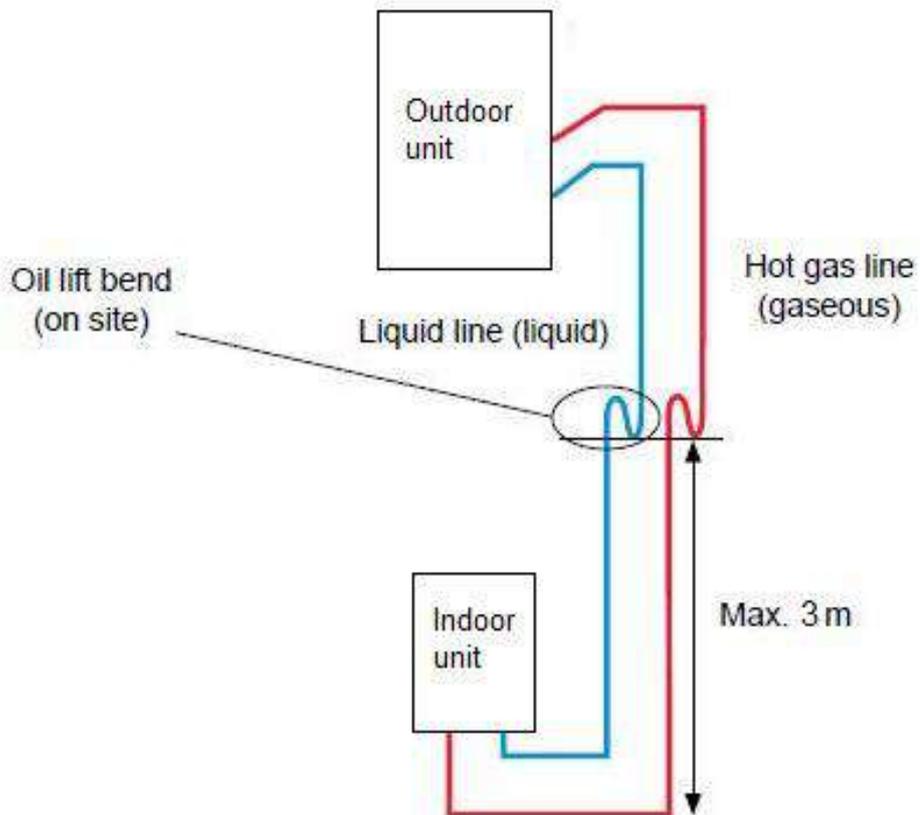
Indoor to outdoor unit : 5 m

Line lengths between 5 and 12 m must be topped up with an additional 40 g/m refrigerant R32.

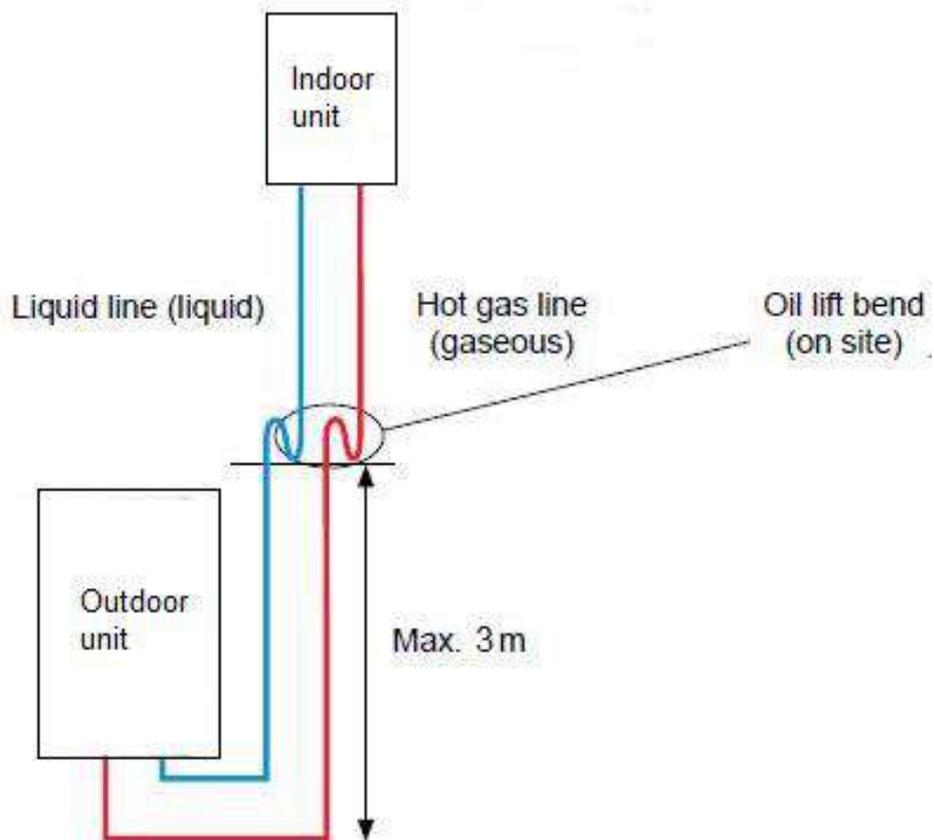
Height differentials

If the height differential between the indoor and the outdoor units is $>3\text{m}$, both refrigerant lines will require oil riser elbows to prevent oil shortages in the compressor.

Outdoor unit higher than indoor unit



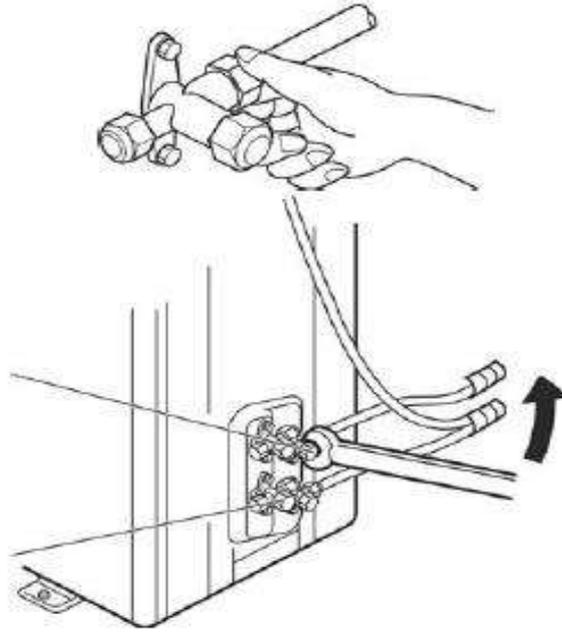
Indoor unit higher than outdoor unit



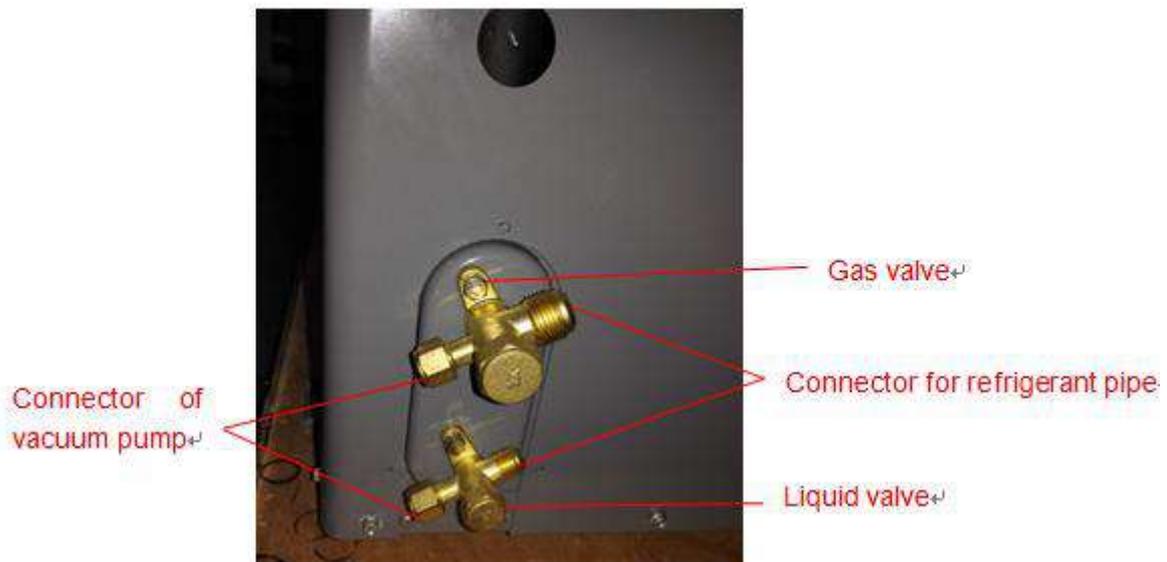
2.7 Connecting and filling the refrigerant lines

1. Connect the copper pipe to indoor unit.

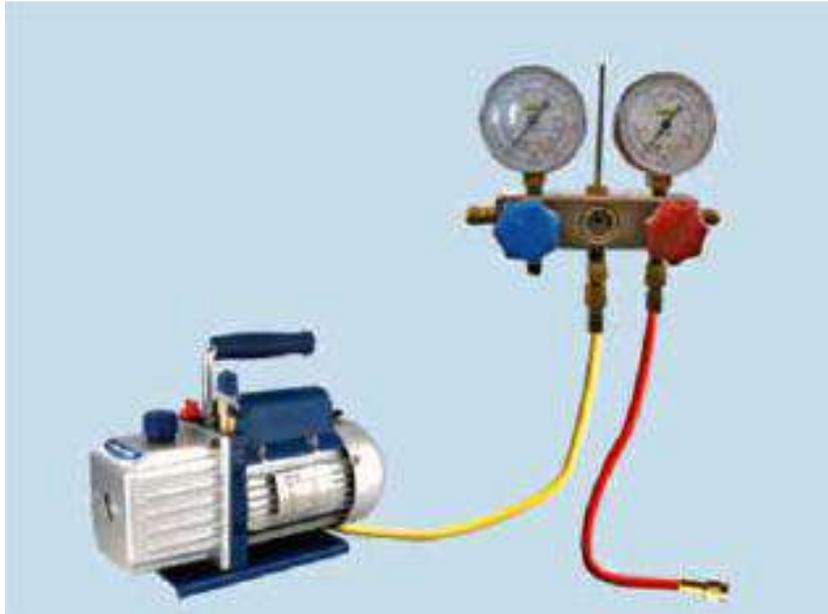
2. Wipe the quick connectors with clean cloth to prohibit dust and impurity entering the pipes. Align the centre of the pipe and fully screw in the angular nuts with finger.



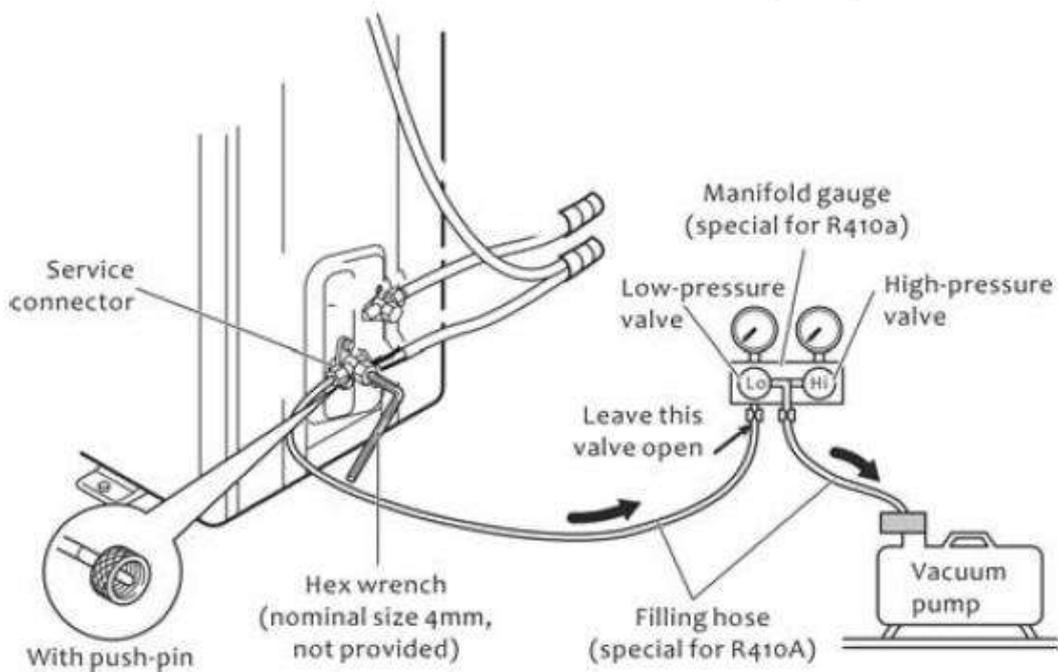
3. Connect other side of copper pipe to outdoor unit.



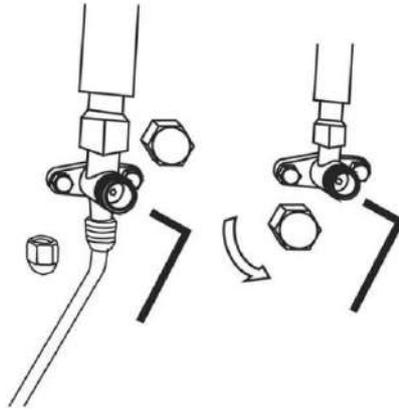
4. A vacuum pump and manifold gauge are needed. Connect the pressure gauge to the vacuum pump. Use vacuum pump to remove the air from indoor unit and copper pipe.



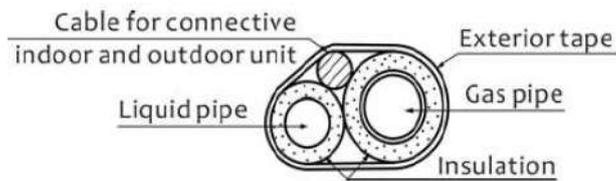
5. When vacuuming the indoor unit and copper pipe, please do not turn on gas / liquid valve, otherwise refrigerant leakage. Vacuum the unit for at least 15 minutes till negative value shown on the pressure gauge, and close the manifold gauge.



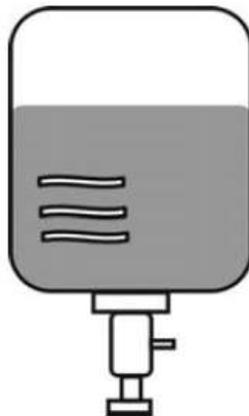
6. Use a 5mm hex wrench to open two valves.



7. Remove the service pipe of pressure gauge. Put copper nut back. Tighten them with a wrench. Connect the electric cable as per wiring diagram, and bundle it with the connecting pipe.



8. After confirming that there is no leakage from the system, when the compressor is not in operation, charge additional R32 refrigerant with specified amount to the unit through the service connector on liquid valve.



2.8 Testing the refrigerant lines for leaks

2.8.1 Checking the refrigerant circuit for leaks

Although R32 has a 'lower than low' flammability rating, it is still flammable under very particular conditions and additional safety considerations need to be taken into account.

2.8.2 Check the connections for refrigerant leaks:

- All flared connections on the refrigerant lines between the indoor and outdoor unit.
- All soldered joints and screw connections on the refrigerant lines in the indoor and outdoor unit.

2.9 Installation guide

2.9.1 Installation

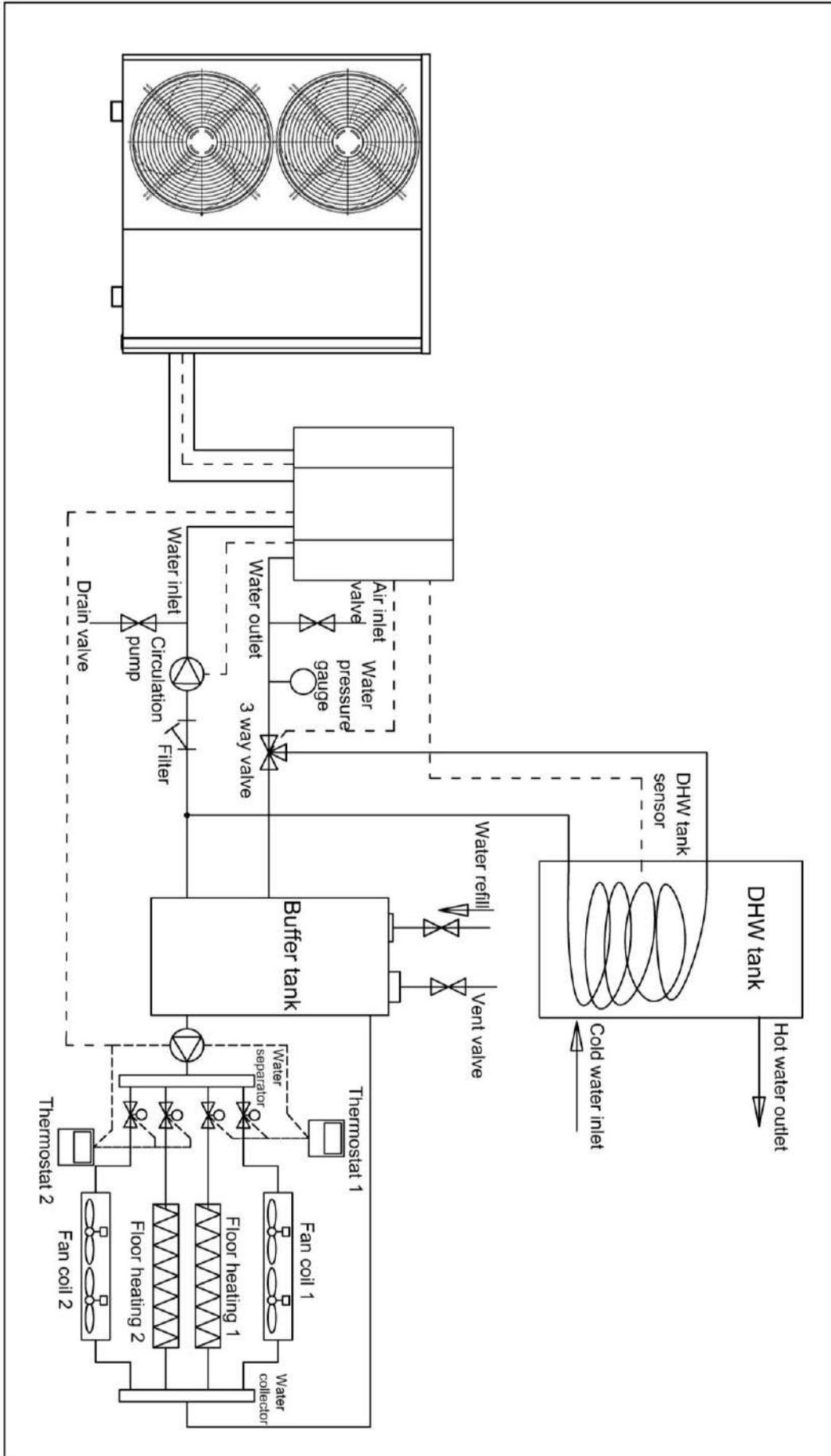
- a. Install 4 pieces shockproof rubber pad under the feet of the unit.
- b. If the unit work with a water tank, the vertical distance between the unit and the water tank should be less than 6m, and the horizontal distance should be less than 20m.
- c. Connect the condensate drainage connector to the hole at the bottom sheet.

2.9.2 Accessories

Accessories inside the package as below table

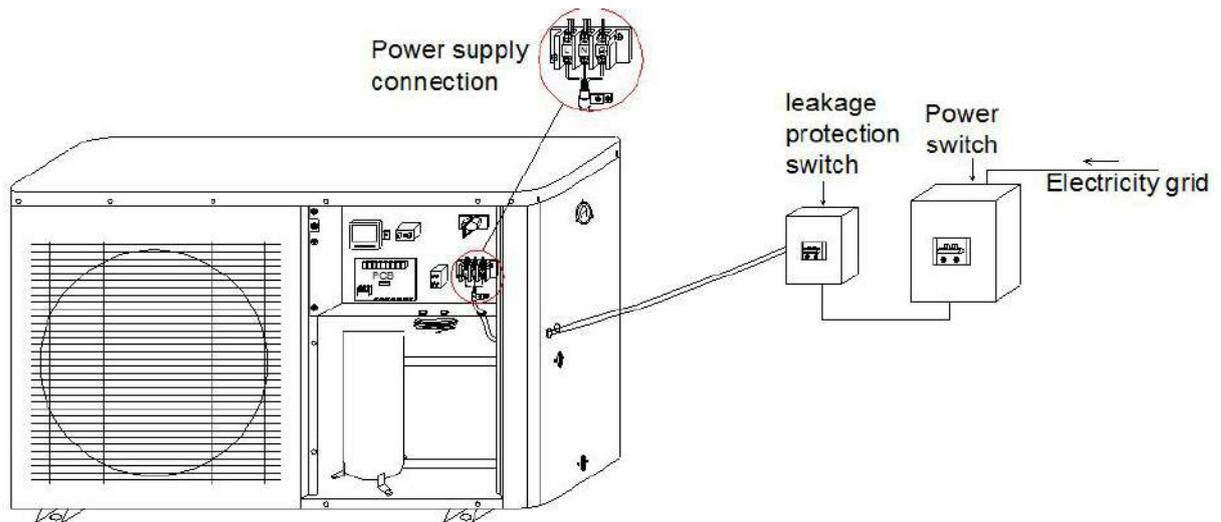
No	Item	Quantity
1	Instruction Manual	1
2	Condensate drainage connector	2
3	shockproof rubber pads	4

2.10 Recommended hydraulic connection



2.11 Electrical connection

1. Ensure proper operation of the unit, the unit must be installed and repaired by qualified technician.
 2. A leakage protection switch must be installed near the unit.
 3. Do not use any damaged cable and switch.
 4. Do not open the electrical box without shutting off all power to the unit.
- All the wiring must meet the local electrical safety norm and performed by qualified electricians.
 - Ensure that the heat pump water heater is well connected to the earth, do not disconnect the earth connection of the power in any condition.
 - Provide a separate power supply which meets rated requirements for the unit.
 - When the unit connects to the electricity network, there must be a short-circuit protection.
 - Choose the suitable cable when use the power outdoor.
 - Do not control the unit on or off by the main power switch.
 - After finish installation, check before connect the unit to the power.



The Specification of Power

Following information is for reference, please subject to the local safety norm.

Type	GT-SKR02 0KBDC-S3 2	GT-SKR03 0KBDC-S3 2	GT-SKR04 0KBDC-S3 2	GT-SKR04 0KBDC-S3 2 (3 PH)	GT-SKR05 0KBDC-S3 2
Power supply	220-240V/ 1Ph/50Hz	220-240V/ 1Ph/50Hz	220-240V/ 1Ph/50Hz	380-415V/ 3Ph/50Hz	380-415V/ 3Ph/50Hz
Circuit Breaker/Fuse(A)	25	32	40	32	32
Min. power wiring (mm ²)	2.5	4.0	4.0	2.5	2.5
Ground wiring (mm ²)	1.5	1.5	1.5	1.5	1.5

2.12 Trial operation

- The unit should only be operated by qualified technician.
- Please drain air inside hydraulic system before operation.
- The unit is designed according to the conditions as follows: the range of ambient temperature is $-20^{\circ}\text{C}\sim 43^{\circ}\text{C}$ and the range of water pressure is $0.15\sim 0.8\text{Mpa}$.

2.12.1 Preparation

The following items should be checked before startup:

- a. The heat pump should be connected completely.
- b. All valves that could impair the proper flow of the heating water in the heating circuit must be open.
- c. The air intake and air outlet paths must be cleared.
- d. The ventilator must turn in the direction indicated by the arrow.
- e. The settings of the heat pump controller must be adapted to the heating system in accordance with the controller's operating instructions.
- f. Ensure the condensate outflow functions.
- g. Drain the air inside hydraulic system.

2.12.2 Trial run

- Turn on the power, start up the unit by the controller, after 30 seconds, the unit (compressor) start to work, then observe whether the unit works normally.
- When you restart the unit, the compressor will start up after three minutes to protect the compressor.

2.12.3 Caution

When following happen during trial operation, please stop the unit immediately and cut off the power and contact with our authorized agent or maintenance technician.

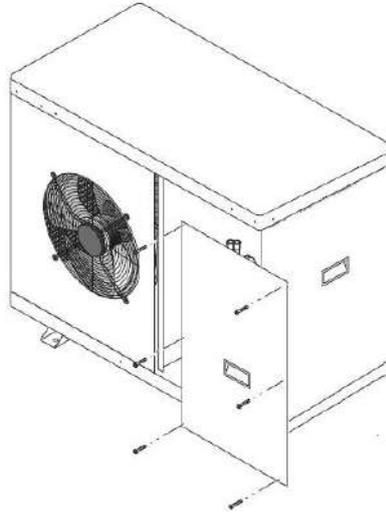
Fuse blown or protection activated frequently

- The wire and switches are heated abnormally
- Abnormal sounds coming from the unit
- Abnormal smell comes out of the unit.
- Electricity leakage.

Part III Control System

3.1 Controller position

The controller is installed inside the unit before factory, open the front panel as following picture, you will find the controller.



There is 8 meters cable for the controller, it is allowable to move the controller to outside the unit, but avoid a place with sunshine and rain.

3.2 Controller introduction



1	Cooling	7	Water pump
2	Heating	8	E-heater
3	DHW	9	Lock the keys
4	Defrosting	10	Clock
5	Compressor	11	Timer on
6	Fan	12	Timer off

3.3 Operation introduction

❖ Lock and unlock buttons

1. In locked status, press  button for 5 seconds, the buzzer will sound and unlock the buttons.
2. If there is no operation for 60 seconds, buttons will be locked automatically, and the backlight will be off.

❖ Turn on/Off the unit

1. When the buttons are locked,  displace on the screen, press  button for 5 seconds to unlock the screen;
2. In unlock status, press  button for 1 second to switch on/off;
3. In unlock status, if there is no operation on the controller for 60 seconds, the buttons will be locked automatically.



Standby status

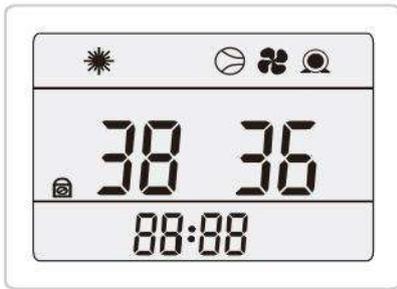
❖ Function button

1. In main menu, press  button to switch working mode.

The units have 5 working modes as below:

(1): Heating mode

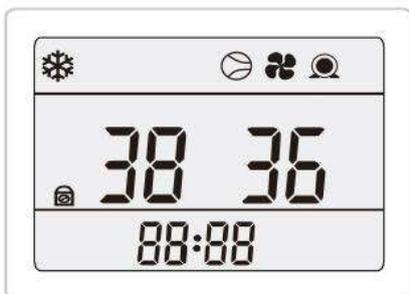
The left side of the screen shows the set water temperature of buffer tank; The right side of the screen shows the measured water temperature of buffer tank. Press  or  to adjust the set water temperature of buffer tank, the maximum water temperature can be set is 60°C.



Heating status

(2): cooling mode

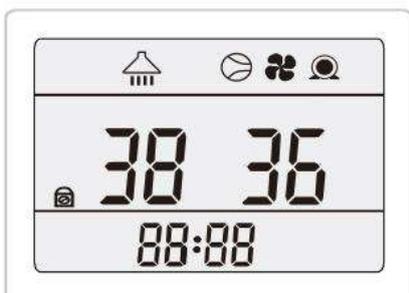
The left side of the screen shows the set water temperature of buffer tank; The right side of the screen shows the measured water temperature of buffer tank. Press  or  to adjust the set water temperature of buffer tank, the minimum water temperature can be set is 8°C.



Cooling status

(3): DHW mode

The left side of the screen shows the set DHW water temperature; The right side of the screen shows the measured DHW water temperature. Press  or  to adjust the set DHW water temperature, the maximum DHW water temperature can be set is 55°C.



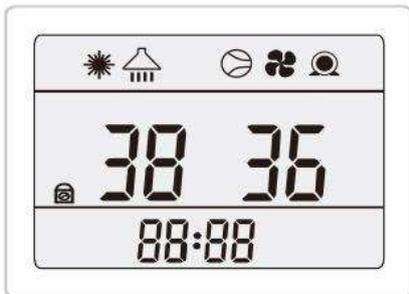
DHW status

(4): heating + DHW mode (DHW priority)

-When the unit is in heating status,  flash on the screen, the left side of the screen shows the set water temperature of buffer tank; The right side of the screen shows the

measured water temperature of buffer tank. Press  or  to adjust the set water temperature of buffer tank, the maximum water temperature can be set is 60°C.

-When the unit is in DHW status,  flash on the screen, the left side of the screen shows the set DHW water temperature; The right side of the screen shows the measured DHW water temperature. Press  or  to adjust the set DHW water temperature, the maximum DHW water temperature can be set is 55°C.

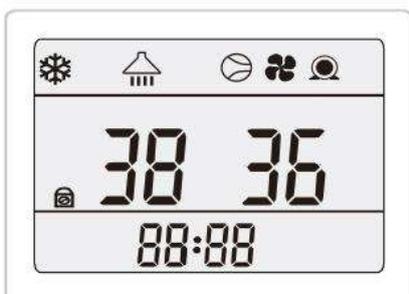


Heating+ DHW status

(5): cooling + DHW (DHW priority)

-When the unit is in cooling status,  flash on the screen, the left side of the screen shows the set water temperature of buffer tank; The right side of the screen shows the measured water temperature of buffer tank. Press  or  to adjust the set water temperature of buffer tank, the minimum water temperature can be set is 8°C.

-When the unit is in DHW status,  flash on the screen, the left side of the screen shows the set DHW water temperature; The right side of the screen shows the measured DHW water temperature. Press  or  to adjust the set DHW water temperature, the maximum DHW water temperature can be set is 55°C.



Cooling+ DHW status

❖ Parameter inquiry

1. In main menu, press  button for 3 seconds to enter user parameter inquiry menu, press  or  button to inquire parameters.
2. In user parameter inquiry menu, if there is no operation for 30 seconds, will automatically exit user parameter inquiry and back to main menu. Or press  button to back to main menu.

Item	Description	Unit	Range	Remark
00	DHW tank temperature	°C	-30~105	
01	Frequency of compressor	Hz	0~99	
02	Current of compressor	A	-30~105	
03	DC bus voltage	V	-30~105	*10
04	Temperature of IPM module	°C	-30~105	
05	AC voltage	V	-30~105	*10
06	AC current	A	-30~105	
07	Current operating power of compressor	W	-30~105	*100
08	Fan speed	RPM	-30~105	*10
09	Target overheating of suction in main circuit	°C	-30~105	/10
10	Actual overheating of suction in main circuit	°C	-30~105	
11	EEV opening in main circuit	P	-30~105	*10
12	EEV opening in injection circuit	P		*10
13	High pressure	Kpa	-30~105	*100
14	High pressure saturated evaporation temperature	°C	-30~105	
15	Current exhaust superheat	°C	-30~105	
16	Low pressure in main circuit	Kpa	-30~105	*100
17	Low pressure saturated evaporation temperature	°C	-30~105	
18	Target overheating in auxiliary circuit	°C	-30~105	
19	Actual overheating in auxiliary circuit	°C	-30~105	
20	Low pressure in auxiliary circuit	KPa	-30~105	*100

21	Inlet temp of auxiliary circuit	°C	-30~105	Low pressure saturated evaporation temperature in auxiliary circuit
22	Outlet temp of auxiliary circuit	°C	-30~105	EVI suction temperature
23	Exhaust temp	°C	-30~140	
24	Outdoor coil temperature	°C	-30~105	
25	Outdoor environment temperature	°C	-30~105	
26	Buffer tank temperature	°C	-30~105	
27	Temperature of after throttling	°C	-30~105	
28	Inlet water temperature	°C	-30~105	
29	Outlet water temperature	°C	-30~105	
30	Suction temperature	°C	-30~105	
31	Casacade switch selection		0: OFF; 1: ON	
32	Casacade switch status		0: OFF; 1: ON	
33	Status of water pump		0:OFF; 1: ON	

❖ **Factory parameters setting (only for technician operate)**

1. In main menu, press  button for 3 seconds to enter parameter setting menu, press  or  button to set parameters. Press  button to save setting.
2. In parameter setting menu, if there is no operation for 30 seconds, will automatically exit parameter setting and back to main menu. Or press  button to back to main menu.

Item	Description	Default value	Unit	Range	Remark
b01	Water difference to start compressor in heating mode	3	°C	0~15	
b02	Water difference to start compressor in cooling mode	3	°C	0~15	
b03	Max. set temperature in heating mode	60	°C	20~60	
b04	Min. set temperature in heating mode	15	°C	10~20	
b05	Max. set temperature in cooling mode	32	°C	20~60	

b06	Min. set temperature in cooling mode	8	°C	7~20	
b07	Water temperature compensation	0	°C	-9~9	
b08	Circulation running mode	2		0~2	0: run 2 mins every b09 mins 1: run as compressor run 2: always run
b09	Circulation pump interval time	5	min	0~99	
b10	Inlet and outlet water temperature difference protection value	40	°C	5~40	
b11	Working mode	3		0~1	0: heating 1: heating+DHW 2: heating+cooling 3: heating+cooling+DHW After setting, it needs to be powered off to take effect.
b12	Power lost memory function	1		0~1	0: off 1: on
b13	Air temperature to start E-heater	-15		-30~20	
b14	Air temperature to enter EVI	8		0~10	
b15	Type of fan	0		0~3	0: DC 1: single speed 2: double speed 3: three speed After setting, it needs to be powered off to take effect.
b16	Water temperature compensation function	1		0~1	0: no 1: yes
b17	Set room temperature	25	°C	15~25	
b18	Initial BTW temperature	20	°C	15~25	
b19	Max. BTW temperature	43	°C	24~50	
b20	Extend defrosting interval 1	0	min	-30~50	
b21	Extend defrosting interval 2	0	min	-30~50	
b22	Defrosting enter temp 1	0	°C	-30~30	
b23	Defrosting enter temp 2	0	°C	-30~30	
b24	Defrosting running time	12	min	6~16	
b25	Defrosting exit temperature 1	EE	°C	12~25	
b26	Defrosting exit temperature 2	5	°C	4~11	
b27	Reserved	0			

b28	Reserved	0			
b29	Reserved	0			
b30	Main valve target exhaust superheat in heating	EE	°C	0~10	
b31	Main valve target exhaust superheat in cooling	EE	°C	0~10	
b32	Main valve regulating interval time	EE	s	30~90	
b33	Min. opening of main valve in cooling	EE	P	50~480	
b34	Min. opening of main valve in heating	EE	P	50~480	
b35	Main valve target return superheat max. value in heating	EE	°C	0~10	
b36	Main valve target return superheat max. value in cooling	EE	°C	0~10	
b37	Reserved	0			
b38	Auxiliary valve target superheat	EE	°C	0~15	
b39	Auxiliary valve regulating interval time	EE	s	30~90	
b40	Reserved				
b41	Reserved				
b42	Reserved				
b43	Reserved				
b44	Reserved				
b45	Max. operating temperature in heating	55	°C	10~60	
b46	Min. operating temperature in heating	-25	°C	-35~10	
b47	Reserved	0			
b48	Reserved	0		1~13	
b49	Reserved	0		1~13	
b50	Reserved	0		1~10	
b51	Reserved	0		1~10	
b52	Reserved	0		0~1	
b53	Reserved	0	°C	0~5	
b54	Reserved	0			
b55	Quantity of machines work in series	1		1~8	

b56	Display machine work in series	1		1~8	
b57	Reserved	0			
b58	Reserved	0			
b59	Reserved	0			cure
b60	Manual debugging mode	0		0~1	0: off 1: on
b61	Manual compressor running frequency	60	HZ	0~95	Default value is current running frequency
b62	Manual main valve opening	300	HZ	0~480	Default value is current running frequency
b63	Manual auxiliary valve opening	100	P	0~480	Default value is current running frequency
b64	DC fan speed	850	P	400~1000	Default value is current running frequency
b65	Reserved				
b66	Reserved				
b67	Reserved				
b68	Reserved				
b69	Reserved				
b70	Reserved				

❖ Defrosting parameters setting (only for technician operating)

1. In main menu, press  button for 3 seconds to enter parameter setting menu, press  or  button to set parameters. Press  button to save setting.

2. In parameter setting menu, if there is no operation for 30 seconds, will automatically exit parameter setting and back to main menu. Or press  button to back to main menu.

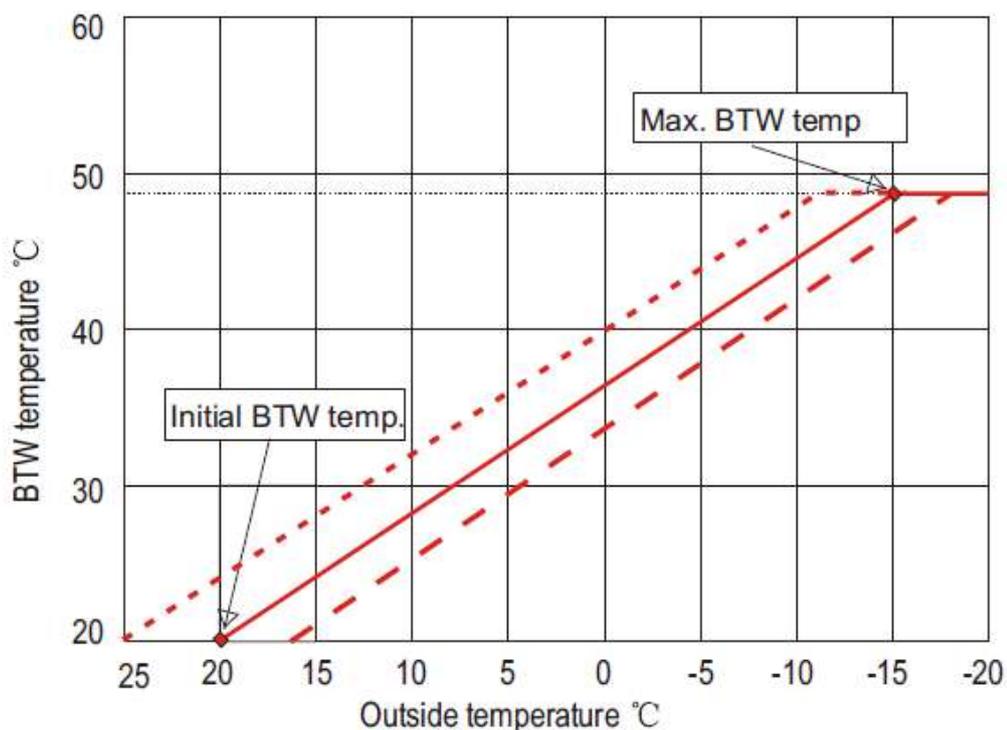
Item	Description	Default value	Unit	Range	Remark
b20	Extend defrosting interval 1	0	min	-30~50	value=x, interval time of defrosting=(60+x) mins.
b21	Extend defrosting interval 2	0	min	-30~50	value=x, interval time of defrosting=(60+x) mins.
b22	Defrosting enter temp 1	0	°C	-30~30	this value is temp difference (environment temp-coil temp)

b23	Defrosting enter temp 2	0	°C	-30~30	this value is temp difference (environment temp-coil temp)
b24	Defrosting running time	12	min	6~16	
b25	Defrosting exit temp 1	15	°C	12~25	
b26	Defrosting exit temp 2	5	°C	4~11	

❖ ECO mode

In ECO mode, the unit runs according to heating curve.

The heating curve is the relationship between the heating system supply temperature and the outside air temperature. In the case of a heating curve, it is done automatically thanks to the weather-based control, which adjusts the supply temperature based on the outside temperature.



1. Press , and buttons simultaneously to enter / exit ECO mode, display on the screen.

The heating curve parameters setting (only for technician operation)

- a. In main menu, press button for 3 seconds to enter parameter setting menu, press or button to set parameters. Press button to save setting.

b. In parameter setting menu, if there is no operation for 30 seconds, will automatically exit parameter setting and back to main menu. Or press  button to back to main menu.

Item	Description	Default value	Unit	Range
b17	Set room temp	25	°C	15~25°C
b18	Initial BTW temp	20	°C	15~25°C
b19	Max. BTW temp	43	°C	24~50°C

Target buffer tank temp = Initial BTW temp + (Max BTM temp - Initial BTW temp) / 35 x (Set room temp - Outside temp)

For example, Set room temp = 25° C, Max BTW temp = 43° C, Initial BTW temp = 20° C

a. When outside temp=20° C, Target buffer tank temp = $20+(43-20)/35 \times (25-20)=23^{\circ}$ C

b. When outside temp=0° C, Target buffer tank temp = $20+(43-20)/35 \times (25-0)=36^{\circ}$ C

c. When outside temp=-15° C, Target buffer tank temp = $20+(43-20)/35 \times (25+15)=46^{\circ}$ C

2. When Air temperature sensor failure, in OFF status, in DHW mode, and in cooling mode, the unit doesn't run according to heating curve.

3. When the unit is working in ECO mode, it only works according to the heating curve, can't set temperature by controller or App.

❖ Clock setting

1. In main menu, press  button for 10 seconds to enter clock setting menu.
2. In clock setting menu, press  button, the hour flashes, press  or  to set the hour.
3. After the hour is set, press  button again, the minute flashes, press  or  to set the minute.
4. After the minute is set, press  button again to save the clock setting and back to main menu.
5. In clock setting menu, if there is no operation for 30 seconds, will automatically save clock setting and back to main menu.
6. In clock setting menu, press  button to save clock setting and back to main menu.

❖ **Timer setting**

1. In main menu, press  button to enter timer 1 setting.
2. In timer 1 setting, press  button again, hour of timer ON flashes, press  or  to set the hour of timer ON.
3. After the hour of timer ON is set, press  button again, the minute flashes, press  or  to set the minute of timer ON.
4. After the minute of timer ON is set, press  button again to enter hour setting of timer OFF, setting as timer ON.
5. After the timer OFF is set, press  button again to save timer 1 ON and OFF setting. And enter timer ON and OFF setting of timer 2. The setting is same as setting of timer 1.
6. In timer setting menu, press  button to cancel the current setting of timer ON/OFF.
7. In timer setting menu, if there is no operation for 30 seconds, will automatically save timer setting and back to main menu.
8. In timer setting menu, press  button to save timer setting and back to main menu.

❖ **Manual defrosting**

In ON status, press  and  simultaneously for 5 seconds to enter manual defrosting,  displace on the screen. Press  button to exit manual defrosting.

❖ **Manual startup auxiliary electrical heating**

In ON status, press  and  simultaneously for 5 seconds to enter / exit forced electric heating.

❖ **Celsius and Fahrenheit**

In ON status, press  and  simultaneously for 5 seconds to switch Celsius and Fahrenheit.

❖ **Check failure of protection 2**

In ON status, press  button for 10 seconds to check failure of protection 2. It displays

“----“ if there is no failure. Press  button to back to main menu.

❖ Restore factory settings

In ON status, press  and  button simultaneously for 3 seconds till there is sound “Di”. Turn off after 10 seconds to save the setting, and turn on again after 10 seconds.

❖ Wi-Fi control

Scan the QR code to install the APP of “Smart Life”, after installing the APP, the software



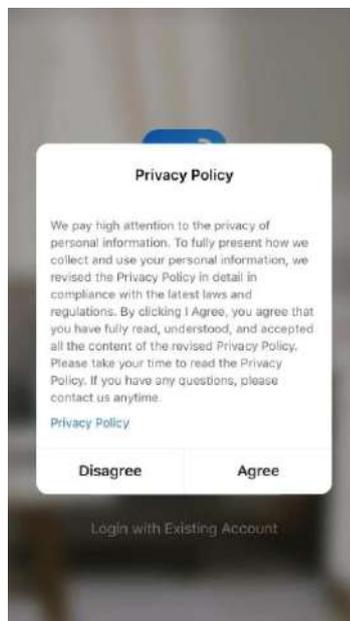
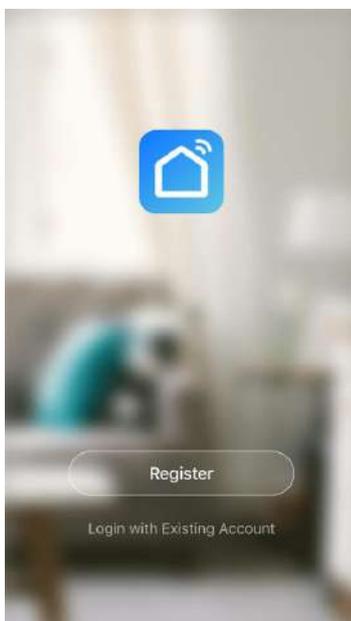
will display on you mobile phone.



1. Software registration

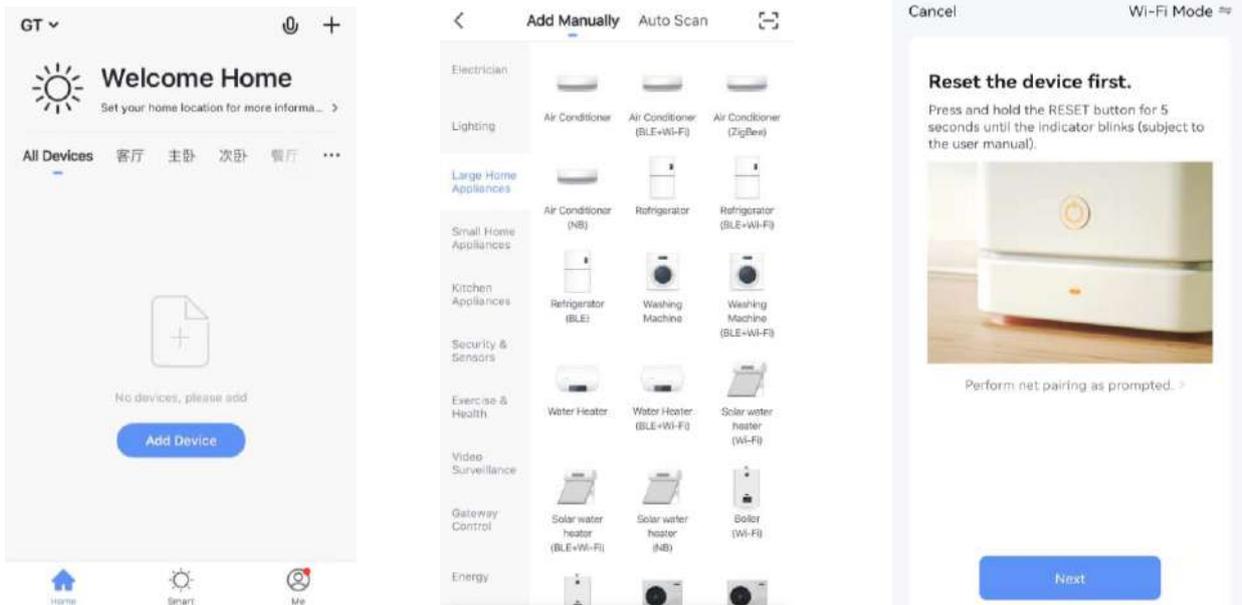
Ensure the unit and mobile phone connected to a Wi-Fi.

Please complete registration step by step if new user.



After registration is complete, please log in to the software by user name and password you have set, the heat pump and mobile phone should be connected to WIFI.

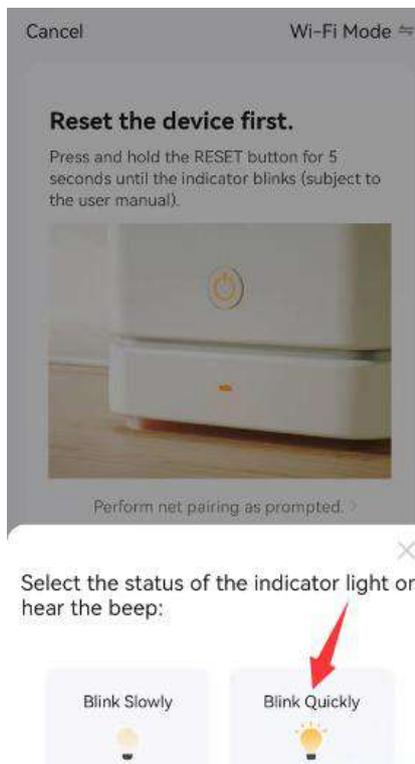
2. Click **Add Device** → **Large Home Appliances** → **Water Heater** → **Next**



3. Connect the heat pump

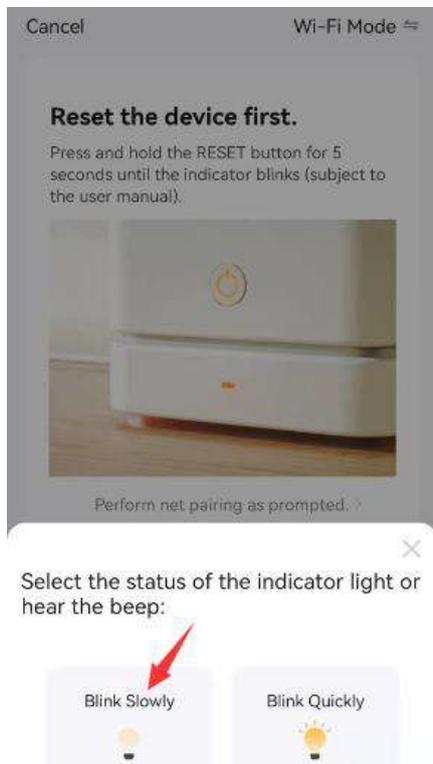
Option 1: On controller of heat pump, press ,  and  simultaneously, to enter Smartconfig mode,  blink quickly on the screen.

On the App, choose **Blink Quickly**

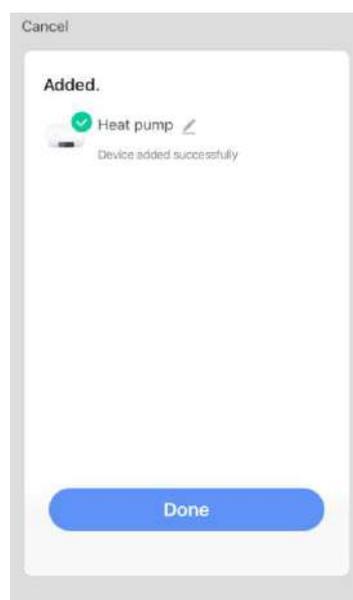
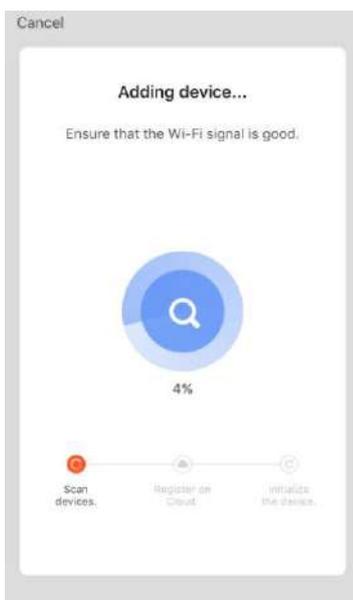


Option 2: On controller of heat pump, press ,  and  simultaneously, to enter AP mode,  blink slowly on the screen.

On the App, choose **Blink Slowly**



4. Add device



After connecting to the heat pump by APP, the unit can be turned on/off by APP, can be set water temperature by APP, can be choose working mode by APP, can set timer by APP.



: Turn on/off the unit



: Set working mode



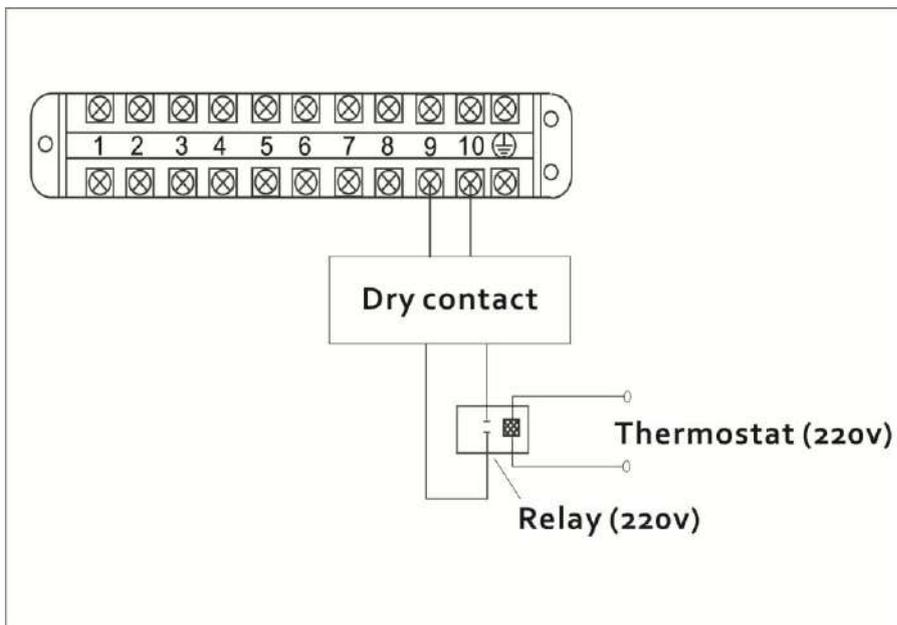
: Set clock

❖ **Dry contact**

The dry contact should be short-circuited when not in use. Otherwise the controller will fail in heating/cooling mode.

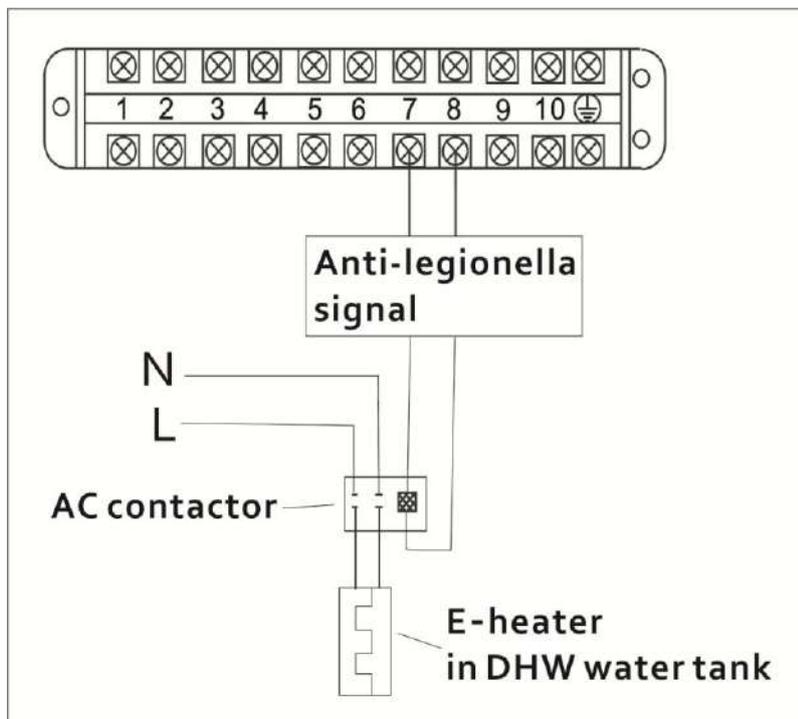
When the dry contact is connected to a thermostat, in heating/cooling mode, the unit will stop or startup according to the signal of the thermostat.

If the thermostat is a live device, installing a relay is required. Otherwise it will burn out the PCB.



❖ **Anti-legionella function**

1. When connect the E-heater in DHW water tank to the Anti-legionella signal port, installing an AC contactor is required. Otherwise it will burn out the PCB.



2. The anti-legionella parameters setting (only for technician operating)

- a. In main menu, press  button for 3 seconds to enter parameter setting menu, press  or  button to set parameters. Press  button to save setting.
- b. In parameter setting menu, if there is no operation for 30 seconds, will automatically exit parameter setting and back to main menu. Or press  button to back to main menu.

Item	Description	Default value	Unit	Range	Remark
b27	Anti-legionella interval time	144	h	0~9999	When set to 0, this function is not available
b28	Anti-legionella temp	70	°C	1~99	

❖ **Work in series function**

Multiple machines can be run jointly with work in series function. The master unit controls all slave units.

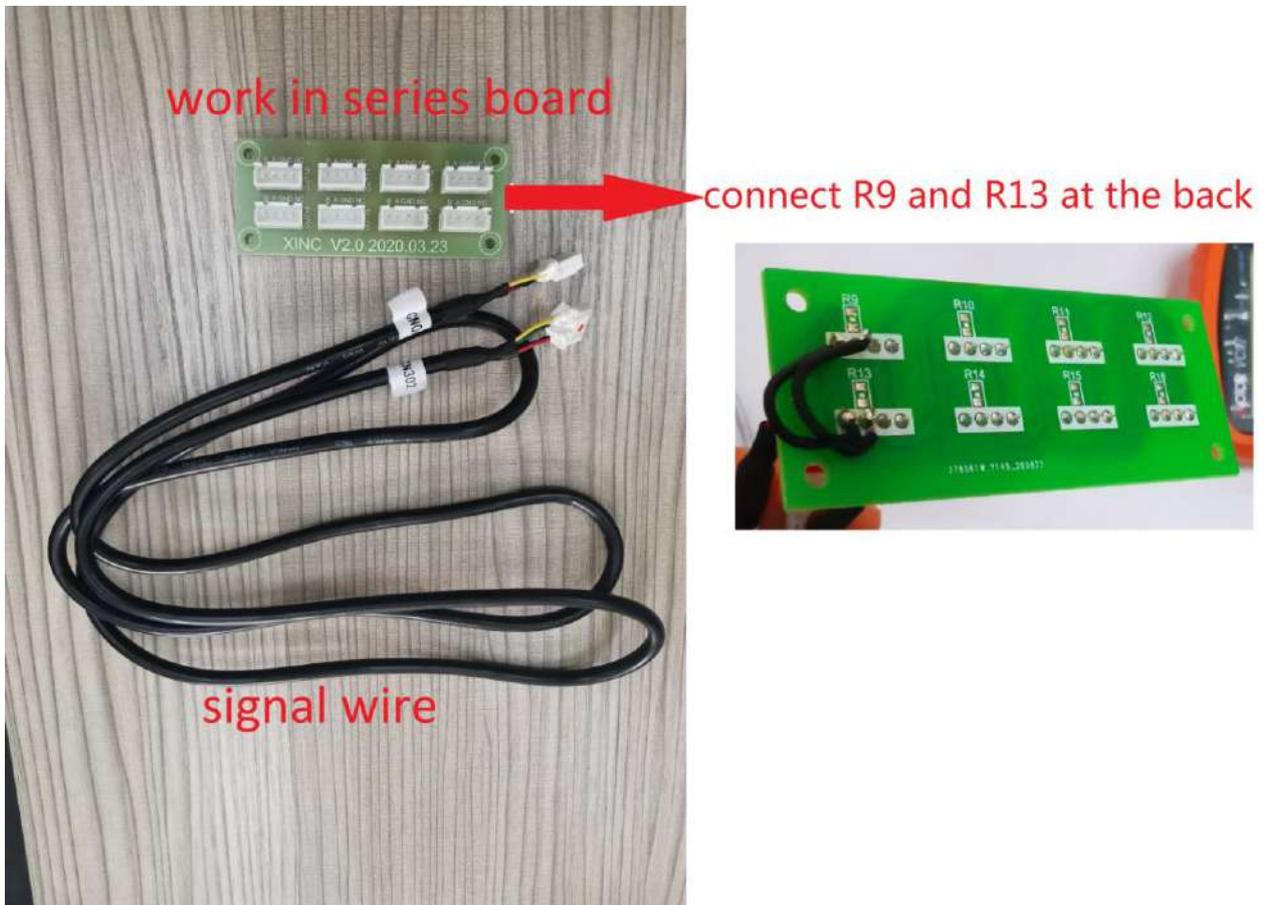
1. Take the controller (of all machines) out from port CN16 on PCB. Connect **signal wire** to CN16.

2. Set address

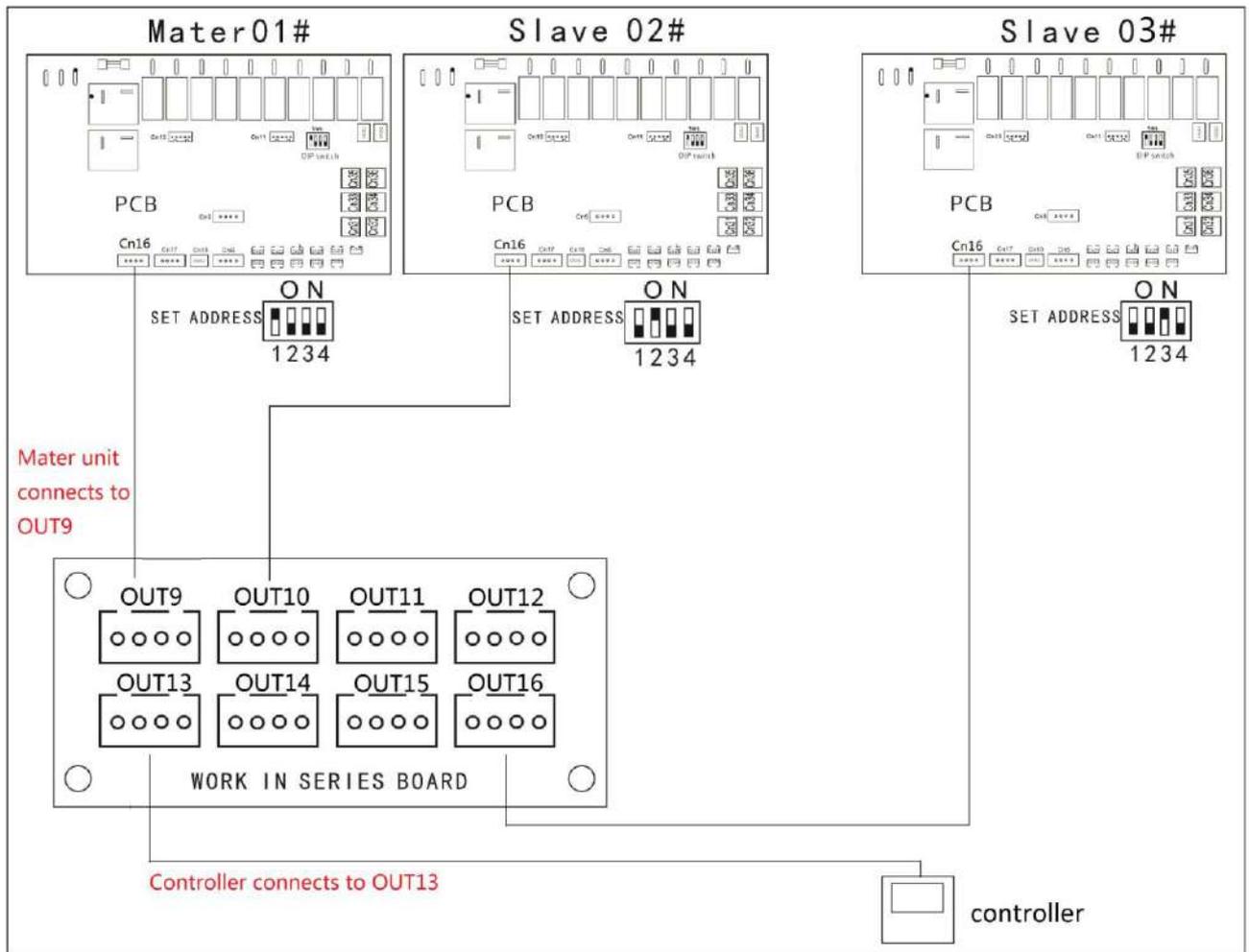
When several units work in series, every unit must be set address by switch bit (SW1) on PCB as following form.

Bit switch	Unit address						
	#1(master)	#2(slave)	#3(slave)	#4(slave)	#5(slave)	#6(slave)	#7(slave)
1	ON	OFF	OFF	OFF	ON	OFF	OFF
2	OFF	ON	OFF	OFF	OFF	ON	OFF
3	OFF	OFF	ON	OFF	OFF	OFF	ON
4	OFF	OFF	OFF	ON	ON	ON	ON

3. Use **signal wire** to connect to **work in series board**.



Master unit should be connected to OUT9, and controller should be connected to OUT13.



4. After wiring connection, set the quantity of machines work in series by controller.

In main menu, press  button for 3 seconds till there is a beep. Enter parameter b55 by pressing  or , press  button, press  or  to set quantity of machines work in series. Press  button to save the setting.

5. Inquire parameters of machines work in series.

In main menu, press  button for 3 seconds till there is a beep. Enter parameter b56 by pressing  or , press  button, press  or  to choose No. of machine. After choose No. of machine, you can check the parameters of that machine by control panel.

Part IV Maintenance

Before performing any maintenance on the unit, you should turn the unit off first and shut off the power.

A well-maintained heat pump could save your energy costs and make the unit durable, but must be done by a qualified technician. Below are some tips for your reference to help your heat pump gives you optimum performance.

1. Turn the power off when the unit is being maintained.
2. Do not use petrol, naphtha, dissolvent and any other chemicals on the unit, otherwise, it may damage the surface. External heat pump parts can be wiped with a damp cloth and domestic cleaner.
3. Avoid leaning or putting objects on the device.
4. Keep dry and drafty round the unit. Clean heat exchangers regularly (usually once per 1~2 months) to keep a good heat exchange efficiency.
5. If the unit will be shut down for a long time, you should drain the water in the pipe, turn the power off and cover it with protective cover, Check it roundly before you start it again.
6. It is advised to use the phosphoric acid whose temperature is about 50~60°C and consistency is 15% to clean the heat exchanger of the unit. First start the circulation pump to clean it for 3 hours, and then flush it with tap water for three times. Do not use any amyctic detergent to clean the heat exchanger and the tank.
7. Change the installation place
If the customer wants to change the site, please contact with the dealer or the local Customer Service for help.

Part V Trouble Shooting

Type	Code	Description	Remark
Failure (Display on screen)	F0	Communication failure between PCB and driver board	<ol style="list-style-type: none"> 1. The signal line between PCB and driver board is open circuit, short circuit or wrong line sequence. Repair or replace the signal line. 2. The PCB is damaged. Replace it. 3. The drive board is damaged. Replace it.
	F1	Communication failure between controller and PCB	<ol style="list-style-type: none"> 1. The signal line between controller and PCB is open circuit, short circuit or wrong line sequence. Repair or replace the signal line. 2. There is interference source near the unit. Remove the interference source or change the installation location of the unit. 2. The controller is damaged. Replace it. 3. The PCB is damaged. Replace it.
	F2	Abnormal start of compressor (Open-phase, phase stagger)	<ol style="list-style-type: none"> 1. Phase stagger of the compressor leads, two phases of them are exchanged. 2. Open-phase of the compressor leads. Reconnect them. 3. The drive board is damaged. Replace it.
	F3	Out of step of compressor	<ol style="list-style-type: none"> 1. Poor connection of compressor leads. Reconnect them. 2. The drive board is damaged. Replace it.
	F4	IPM module failure	The drive board is damaged. Replace it.
	F6	Outdoor DC fan failure	<ol style="list-style-type: none"> 1. The outdoor DC fan is damaged. Replace it. 2. The drive board is damaged. Replace it.
	E0	Inlet water temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	E1	Outlet temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	E2	After throttling temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.

	E3	Air suction temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	E4	Outdoor coil temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	E5	Outdoor environment temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	E6	Exhaust temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	E7	EVI return circuit air return temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	EA	Economizer inlet temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	EB	Indoor environment temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	EC	Economizer outlet temp sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	ED	Buffer tank sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	EH	DHW water tank sensor failure	<ol style="list-style-type: none"> 1. The sensor isn't connected well. Reconnect it. 2. The sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	EE	Main board EE failure	<ol style="list-style-type: none"> 1. The software of the PCB isn't matched. 2. The PCB is damaged. Replace it.
	EF	Driver board EE failure	<ol style="list-style-type: none"> 1. The software of the drive board isn't matched. 2. The drive board is damaged. Replace it.
Protection1 (Display on screen)	P7	High pressure switch protection	<ol style="list-style-type: none"> 1. Insufficient water flow: <ol style="list-style-type: none"> a. The water piping is blocked. Check the water piping and clean the Y-type filter. b. There is air in the water piping. Vacuumize it.

			<p>c. The power of circulation pump is insufficient. Change to a larger one.</p> <p>d. Scaling of heat exchanger. Use a special cleaning agent to clean it.</p> <p>2. The high pressure switch is damaged. Replace it.</p> <p>3. The fluorine system is blocked. Fix it.</p> <p>4. The PCB is damaged. Replace it.</p>
P8	Low pressure switch protection		<p>1. Refrigerant leakage. Check the leakage and repair it, vacuumize it and charge refrigerant as parameter table.</p> <p>2. The refrigerant is insufficient. Charge refrigerant as parameter table.</p> <p>3. The low pressure switch is damaged. Replace it.</p> <p>4. The electronic expansion valve is damaged. Replace the electronic expansion valve.</p> <p>5. The surface of the evaporator is dirty. Clean the evaporator.</p> <p>6. The fan is damaged. Replace the fan.</p> <p>7. The PCB is damaged. Replace it.</p>
PC	Water flow switch off protection		<p>1. Check if the water flow switch is reliably connected.</p> <p>2. There's air in the circulating water inlet pipe. Open the exhaust port of the circulating pump for vacuum.</p> <p>3. The water flow switch is damaged. Replace it.</p> <p>4. The water flow is insufficient. Clean the Y-type filter and ensure that the circulation pipeline is smooth.</p> <p>5. If the circulating pump does not work, check if the power output of the circulating pump on PCB is normal.</p> <p>6. The circulating pump is damaged. Repair or replace it.</p> <p>7. The PCB is damaged. Replace it.</p>
H1	Temp difference between water inlet and water outlet is too large		<p>1. Insufficient water flow:</p> <p>a. The water piping is blocked. Check the water piping and clean the Y-type filter.</p> <p>b. There is air in the water piping. Vacuumize it.</p> <p>c. The power of circulation pump is insufficient. Change to a larger one.</p> <p>d. The circulating pump is damaged. Repair or replace it.</p> <p>2. The temperature sensor falls off or is damaged. Re-fix or replace the temperature sensor.</p>

Protection2 (Check in the background)	F5	Overheat protection of compressor	<ol style="list-style-type: none"> 1. Check if the refrigerant is sufficient. Check for leakage, and replenish refrigerant. 2. The protection switch is damaged. Replace it. 3. The PCB is damaged. Replace it.
	P1	AC current protection of outdoor unit	<ol style="list-style-type: none"> 1. The fan is damaged. Replace it. 2. The drive board is damaged. Replace it.
	P2	Current protection of compressor	<ol style="list-style-type: none"> 1. Open-phase of the compressor leads. Reconnect them. 2. The drive board is damaged. Replace it.
	P3	AC voltage too high / too low protection of outdoor unit	<ol style="list-style-type: none"> 1. Check the power supply. 2. The drive board is damaged. Replace it.
	P4	DC bus voltage too high / too low protection	<ol style="list-style-type: none"> 1. Check the power supply. 2. The drive board is damaged. Replace it.
	P5	IPM overheat protection	<ol style="list-style-type: none"> 1. Poor ventilation of the heatsink of drive board. 2. The drive board is damaged. Replace it.
	P6	Overheat protection of exhaust temp	<ol style="list-style-type: none"> 1. Compressor overheat protection. Check if the refrigerant is sufficient. Check for leakage, and replenish refrigerant. 2. The exhaust temperature sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	P9	Overheat protection of outer coil in cooling	<ol style="list-style-type: none"> 1. The air intake of the evaporator is blocked. 2. The fan doesn't work or the speed is slow, check the fan motor or driver board. 3. The coil temperature sensor is damaged. Replace it. 4. 3. The PCB is damaged. Replace it.
	PH	Environment temp is too high in heating	<ol style="list-style-type: none"> 1. The ambient temperature is higher than the protection setting value. 2. The ambient temperature sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.
	PL	Environment temp is too low in cooling	<ol style="list-style-type: none"> 1. Ambient temperature is lower than 0°C when cooling. 2. The ambient temperature sensor is damaged. Replace it. 3. The PCB is damaged. Replace it.

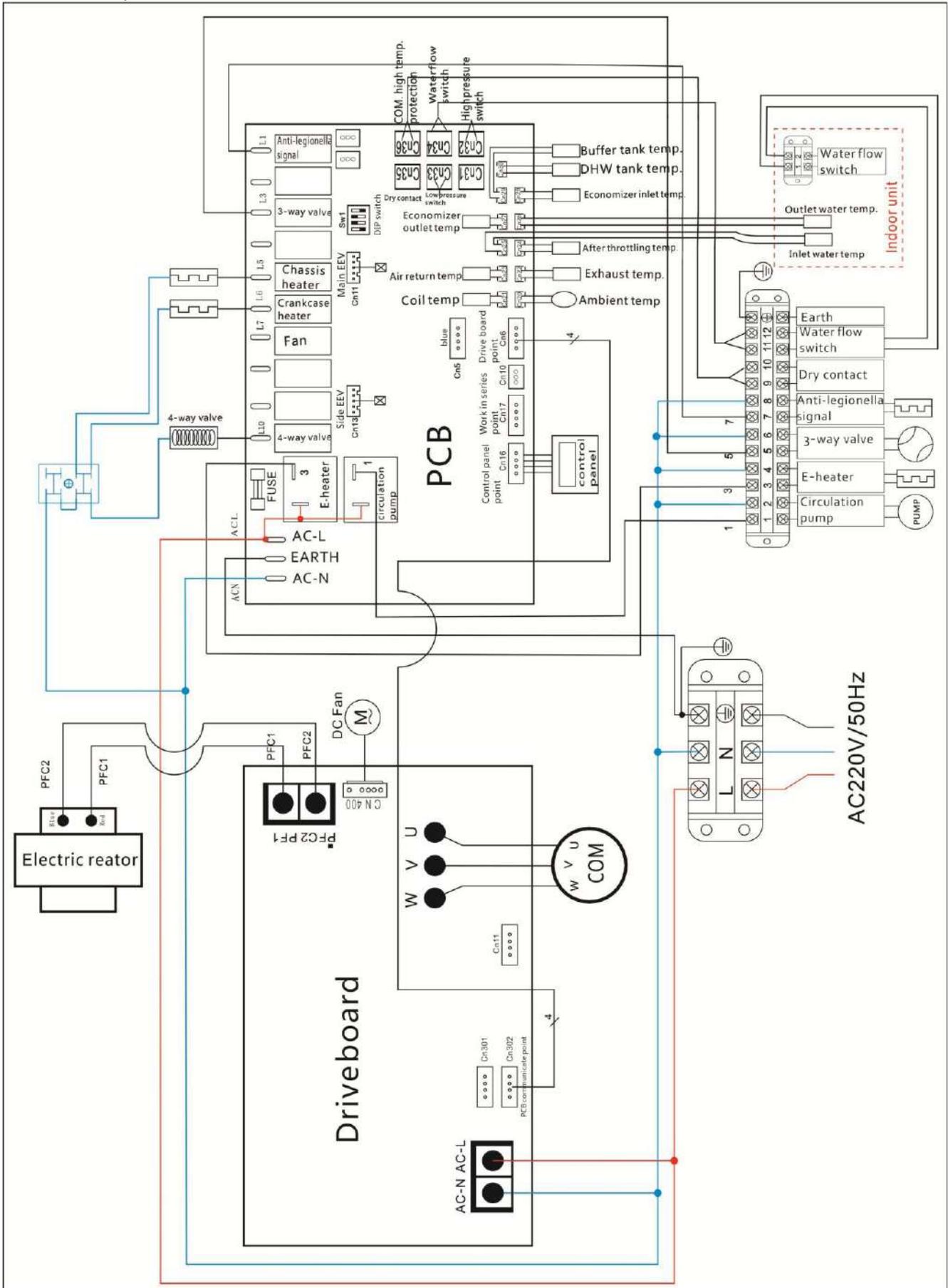
The possible causes and treatment of common failure.

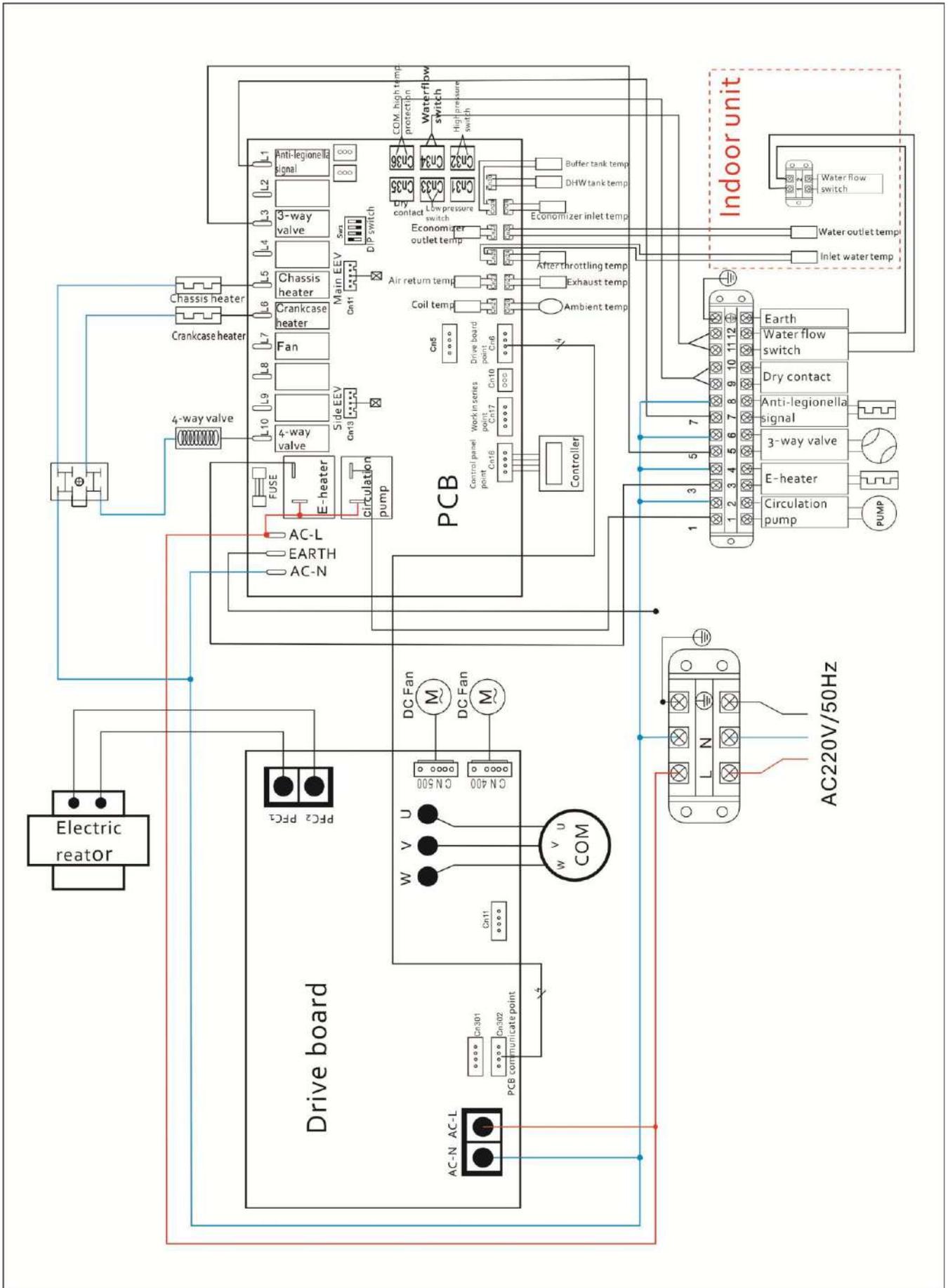
Fault Condition	Possible Causes	Treatment
The unit doesn't work	<ul style="list-style-type: none"> ◇ Power fault ◇ Bad connection to the power ◇ Fuse blow 	<ul style="list-style-type: none"> ◇ Turn off the switch, check the Power source ◇ Find the causes and renovate them ◇ Replace the fuse
The pump is working but too noisy and the water is not cycled	<ul style="list-style-type: none"> ◇ Lack water In the system ◇ There is air in the water circulation ◇ Any valve in the system is not open ◇ Filter stoppage 	<ul style="list-style-type: none"> ◇ Check the water make-up device and fill in with water ◇ Discharge the air in water system ◇ Open all valves ◇ Clean filters
Low heating capacity	<ul style="list-style-type: none"> ◇ Inadequate refrigerant ◇ bad insulation of the water system ◇ Drying filter stoppage ◇ Air side heat exchanger is unefficient ◇ Inadequate water-flow 	<ul style="list-style-type: none"> ◇ Leak hunting and fill in standard quantity of refrigerant ◇ Improve the heat insulation ◇ Replace the drying filter ◇ Clean the heat exchanger ◇ Clean the water filter
The compressor doesn't work	<ul style="list-style-type: none"> ◇ Power failure ◇ Compressor contactor destroyed ◇ Poor connection ◇ Overheating protection ◇ water outlet temperature is too high ◇ Inadequate water-flow 	<ul style="list-style-type: none"> ◇ Check it and solve the problems ◇ Replace contactor ◇ Check and renovate it ◇ Check and solve the problems ◇ Reset a proper temperature ◇ Clean the water filter and discharge the air in the water system
The compressor works but too noisy	<ul style="list-style-type: none"> ◇ Liquid refrigerant goes into the compressor ◇ interior components destroyed ◇ Inadequate refrigeration oil 	<ul style="list-style-type: none"> ◇ Check the expansion valve ◇ Replace the compressor ◇ Add in adequate refrigeration oil

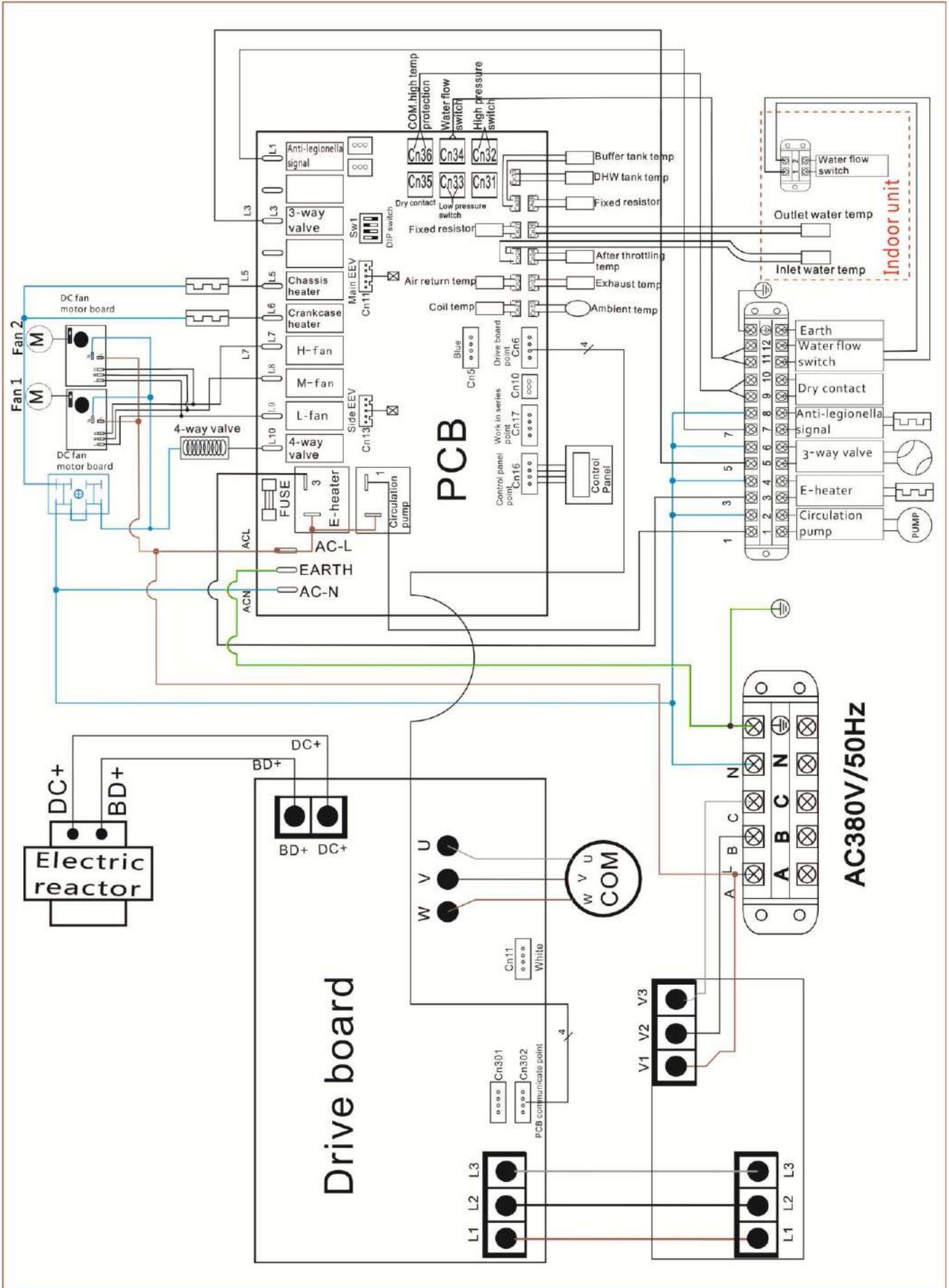
The fan doesn't work	<ul style="list-style-type: none"> ◇ Capacitor damaged ◇ The fans are not fixed well ◇ The electromotor burned out ◇ Contactor destroyed 	<ul style="list-style-type: none"> ◇ Replace it ◇ Fix it well again ◇ Replace the electromotor ◇ Replace the Contactor
Compressor works but not heating	<ul style="list-style-type: none"> ◇ Refrigerant leakage ◇ Compressor fault 	<ul style="list-style-type: none"> ◇ Leak hunting and fill in standard quantity of refrigerant ◇ Replace the compressor
Low water-flow protection	<ul style="list-style-type: none"> ◇ Hydraulic switch destroyed ◇ Inadequate water-flow 	<ul style="list-style-type: none"> ◇ Replace the switch ◇ Clean the filter and discharge the air
Excessive discharge pressure	<ul style="list-style-type: none"> ◇ Too much refrigerant ◇ Non-condensable gas in the Refrigeration cycle ◇ Inadequate water-flow 	<ul style="list-style-type: none"> ◇ Draw off the superfluous refrigerant ◇ Drive the gas out ◇ Check the circulation and increase the flow
Low suction pressure	<ul style="list-style-type: none"> ◇ Drying filter stoppage ◇ Lack of refrigerant ◇ Excessive pressure drop in the heat exchanger 	<ul style="list-style-type: none"> ◇ Replace the filter ◇ Leak hunting and fill in standard quantity of refrigerant ◇ Check the opening of electronic expansion valve

Part VI Wiring Diagram

AVH-10-25S, AVH-13-25S







Disposal

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

Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.

Contact your local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging you health and well-being.



There won't be a further notice if anything changes as the unit improved.

If there is anything difference with rating label, please subject to the rating label on the unit.