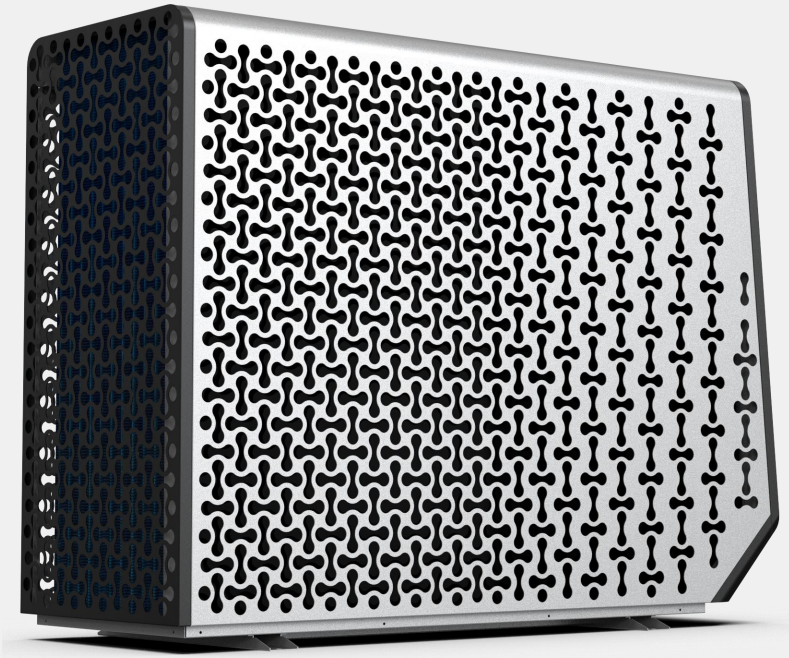
FAIRLAND®

Technical Training

-INVER X7





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1 Product Structure

2 Refrigerant System

3 Electrical System

4 Installation

5 Troubleshooting

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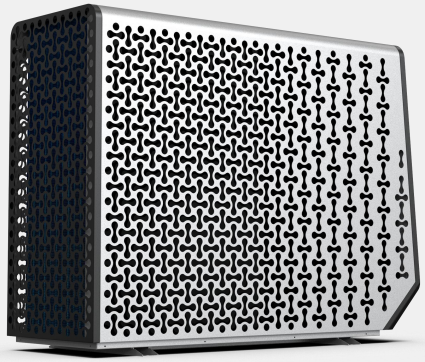
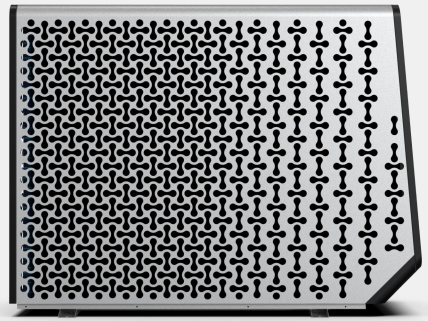
1 Product Structure

1.1 Appearance
1.2 Special Design
1.3 Internal Structure Overview

1.1 Appearance













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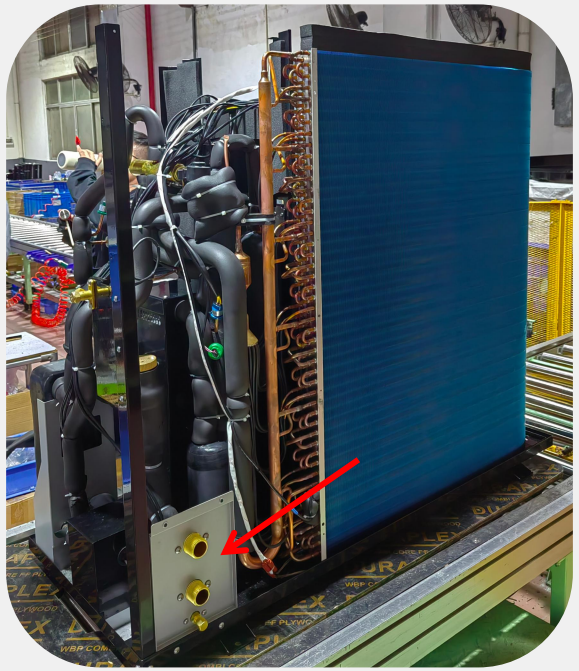
1.2 Special Design

Independent Water Connection Design

This greatly conveniences installer in installing and maintaining the unit





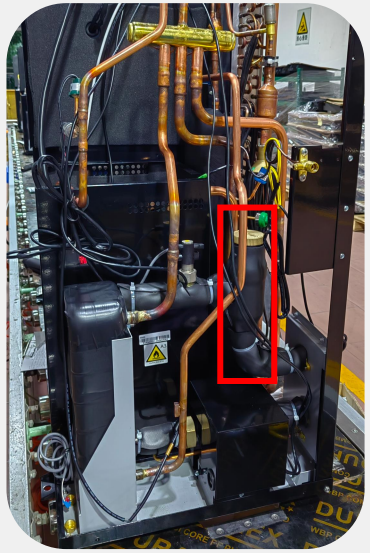


1.2 Special Design

Built-in gas separator

Unlike other manufacturers who supply it as an component, we integrate it directly into the unit.

The primary function of the gas separator is to automatically discharge air from the water circuit system, preventing its impact on the unit. In critical situations, it can discharge refrigerant that has leaked into the water, preventing safety accidents.





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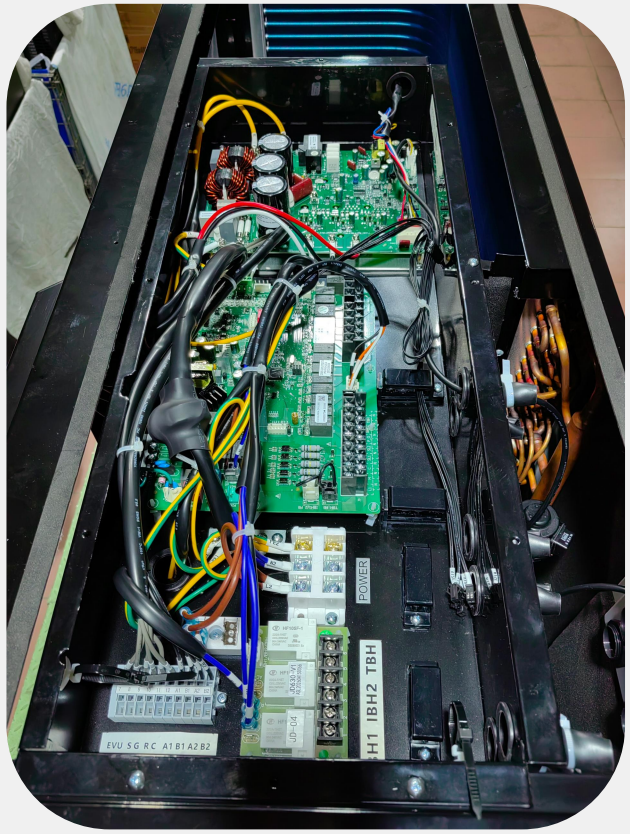
1.3 Internal Structure Overview







1.3 Internal Structure Overview

Accessories



Display



Rubber base



Drainage-related components



Extension Cable for Display(10m)



Temperature Sensor for buffer tank and DHW tank

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2 Refrigerant System

2.1 Components

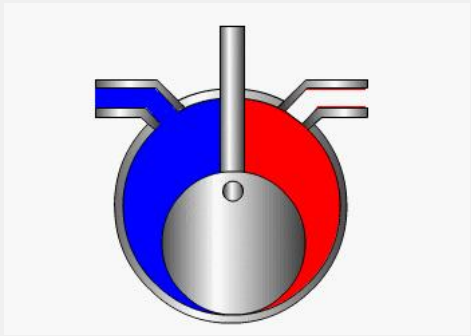
2.2 Refrigeration System Diagram

2.1 Key Components

Compressor

Its function is to turn low-temperature, low-pressure refrigerant into high-temperature, high-pressure refrigerant.

Brand: GMCC
Type: twin rotory compressor
Model: EDTQ580D20EN5B
Oil Charged: PAG VG60*1100ml





2.1 Key Components

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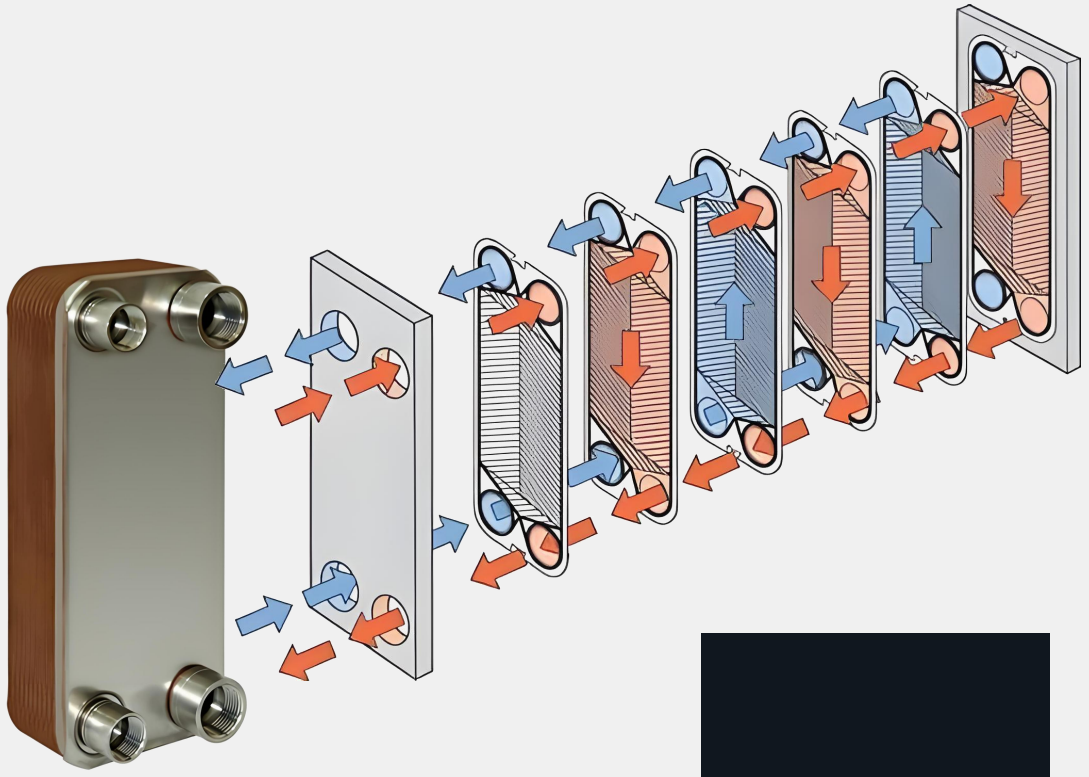
Plate Heat Exchanger

It is the place where heat exchange between the refrigerant and water.
In heating mode, the high-temperature, high-pressure refrigerant will transfer heat to the water.

Brand: Danfoss
Model: H39L-EZU-60



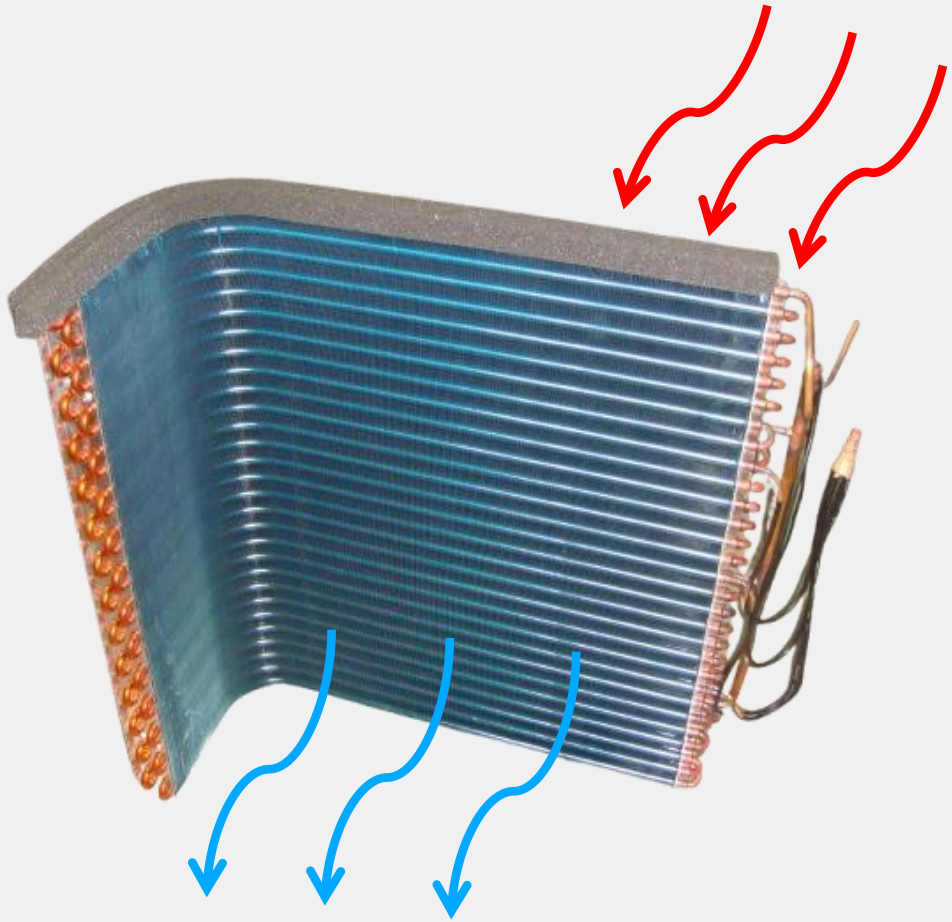


2.1 Key Components

Finned heat Exchanger

It is the place where the refrigerant exchanges heat with the air.

In heating mode, the low-temperature, low-pressure gas-liquid mixture refrigerant absorbs heat from the air here.



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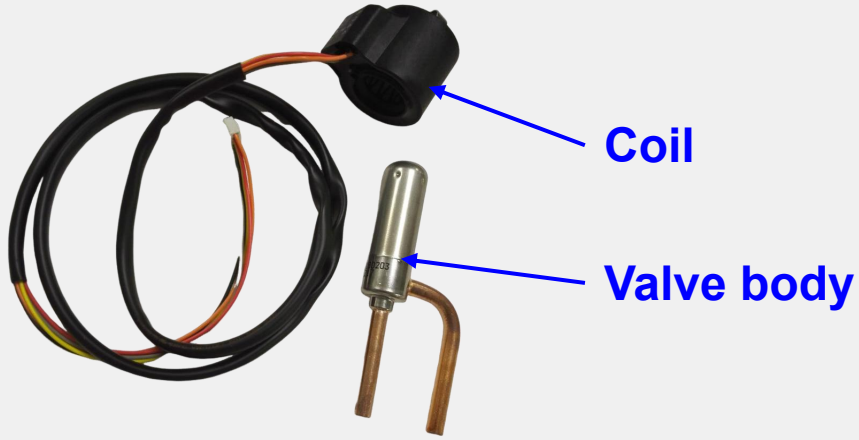
2.1 Key Components

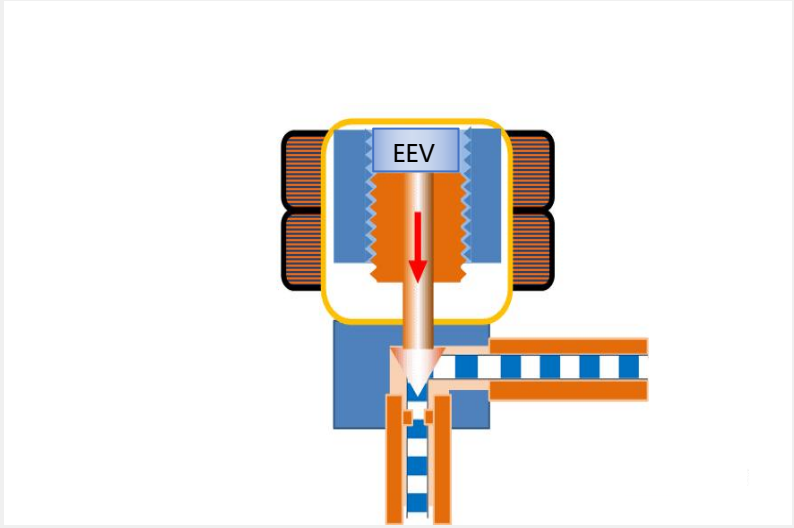
Electronic Expansion Valve

Its function is to reduce refrigerant pressure and regulate refrigerant flow, enabling the heat pump to deliver outstanding performance across a wider range of ambient temp.

Brand: Fujikoki





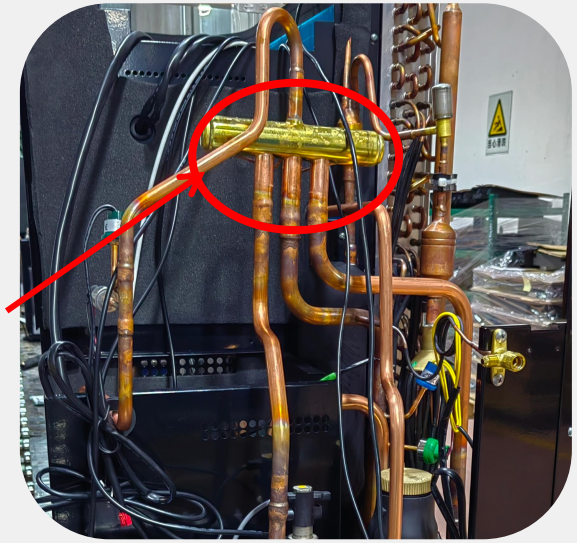


2.1 Components

Four-Way Valve

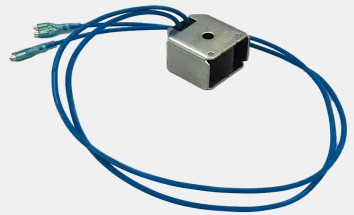
Its function is to change the flow direction of the refrigerant, enabling the heat pump to switch between cooling and heating mode

Brand: Sanhua

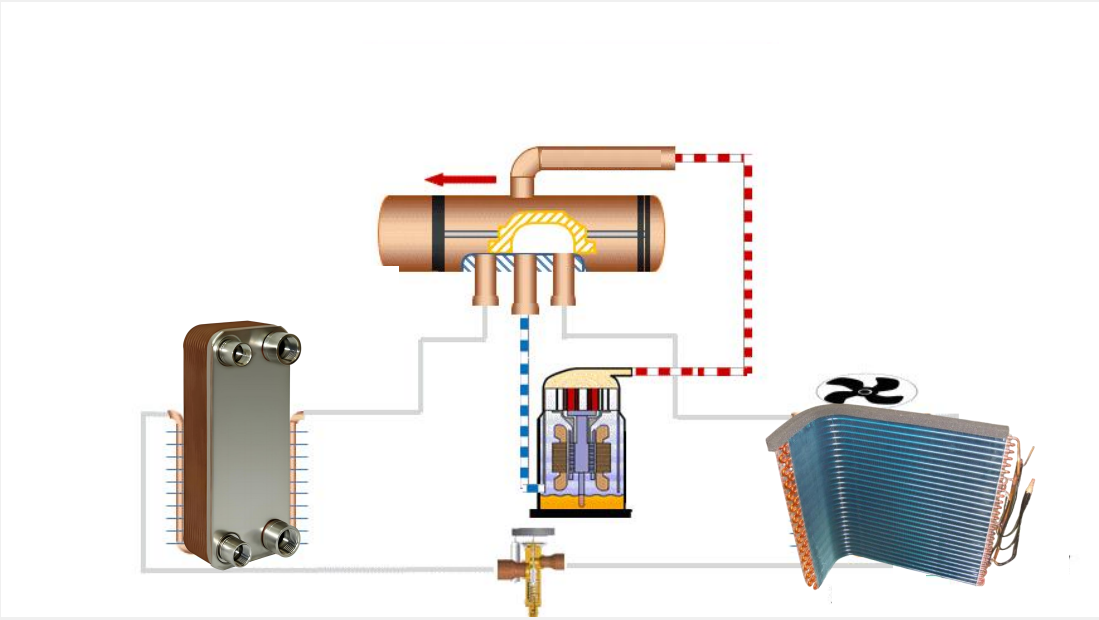




Valve body



Coil



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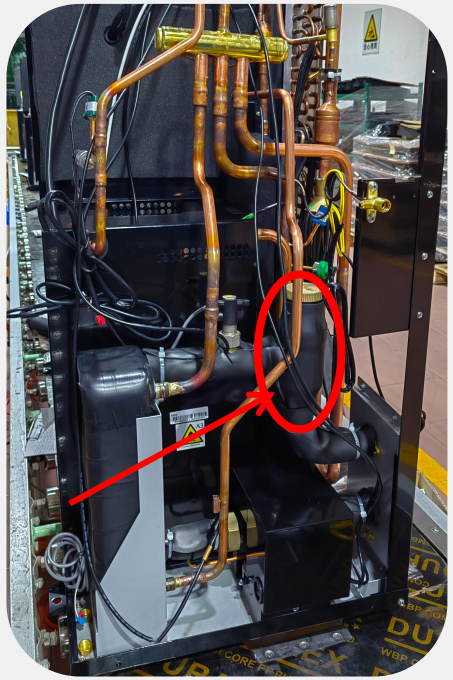
2.1 Components

Gas Separator

Its function is to vent air from the water circuit system, especially in emergency situations where **refrigerant leaks into the water circuit**, allowing all refrigerant to be discharged outdoor.

Brand: ACOL



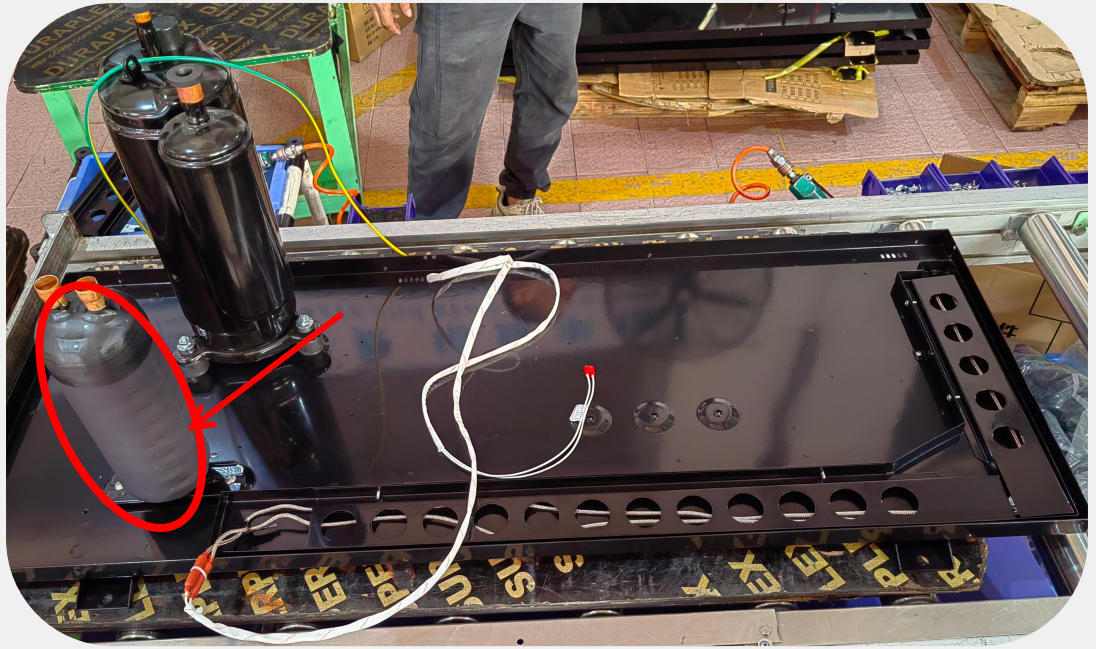


2.1 Components

Refrigerant Storage Tank

Its function is to automatically adjust the refrigerant circulation quantity based on the different demands of heating and cooling mode.





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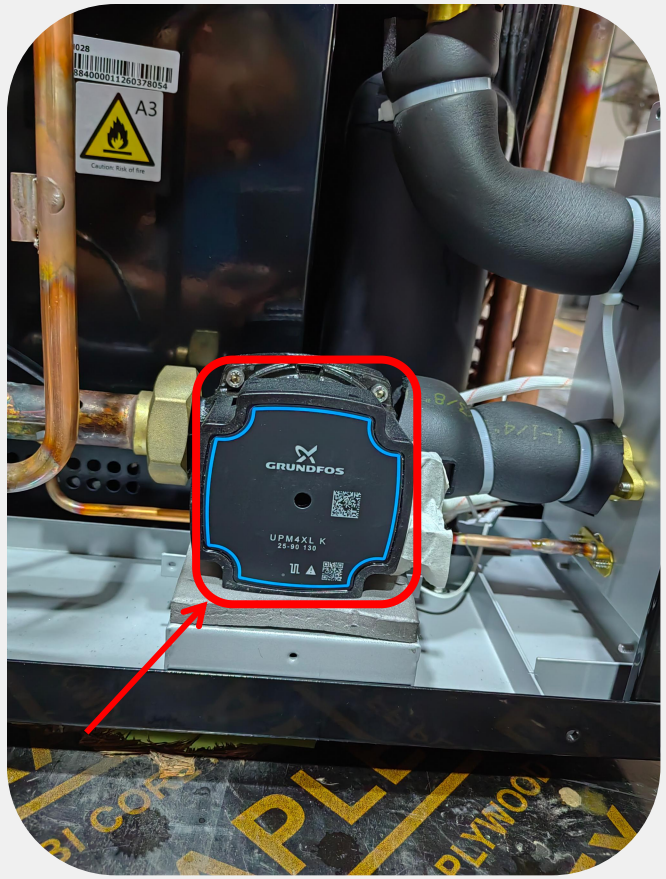
2.1 Components

Main Circulation Pump

Its function is to drive the circulation of water, responsible for the circulation between the heat pump and the end load (such as underfloor heating, radiators, etc.).

Brand: GRUNDFOS
Model: UPM4XL K 25-90 130





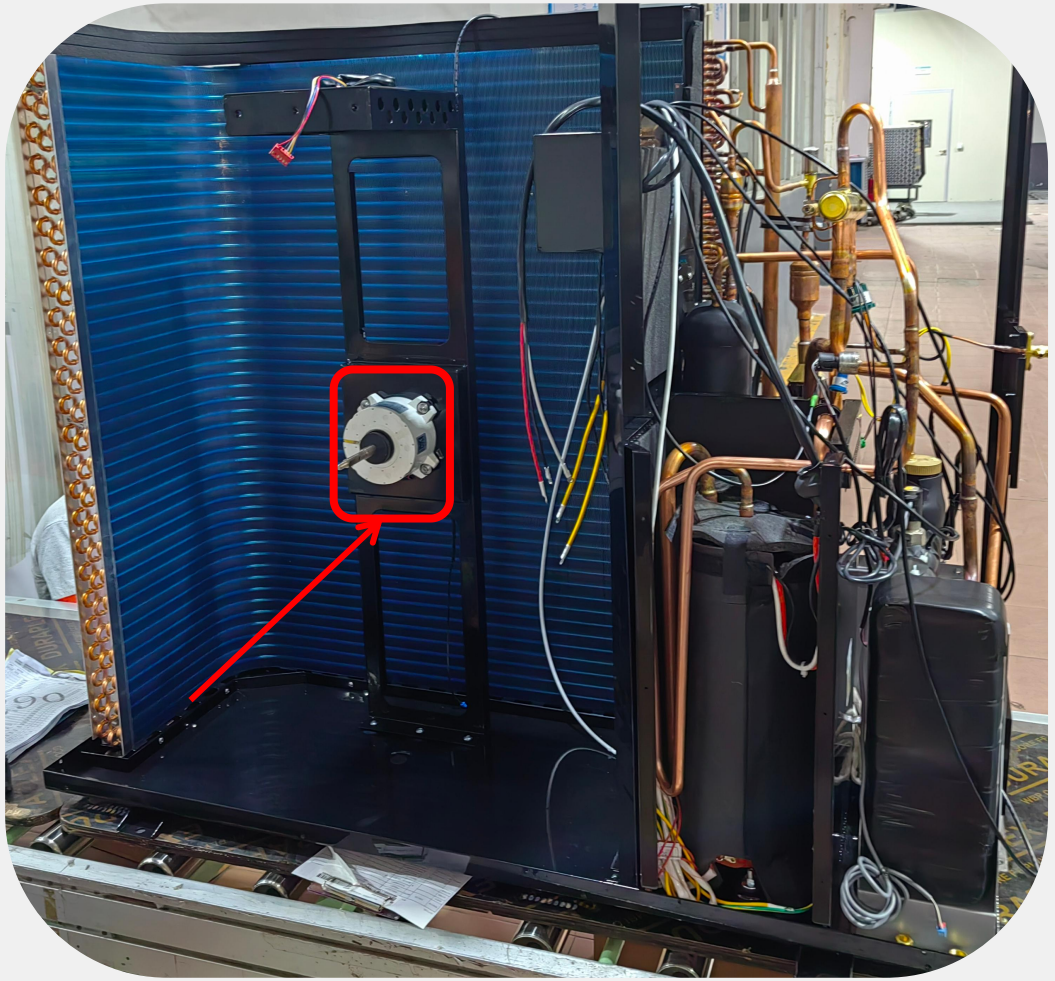
2.1 Components

Fan Motor

Its function is to force the fan blades to operate, driving air circulation and promoting heat exchange between the air and refrigerant within the finned heat exchanger.

Brand: Match-Well





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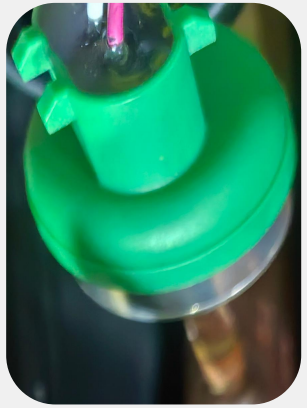
2.1 Components

High/Low Pressure Sensor

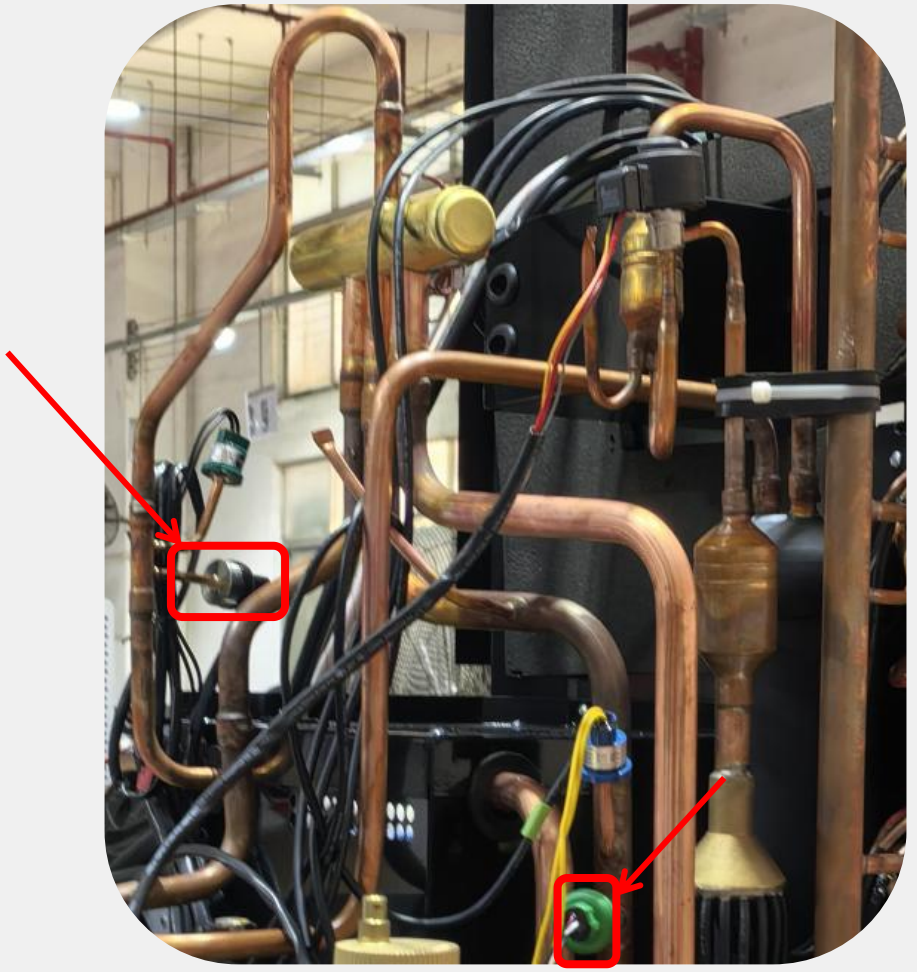
Their function is to monitor the high/low pressure of the refrigerant system, participate in unit control, and ensure the safe operation of the heat pump.



High pressure sensor



Low pressure sensor



2.1 Components

High/Low Pressure Switch

Their function is to monitor refrigerant system pressure and protect the normal operation of heat pump system

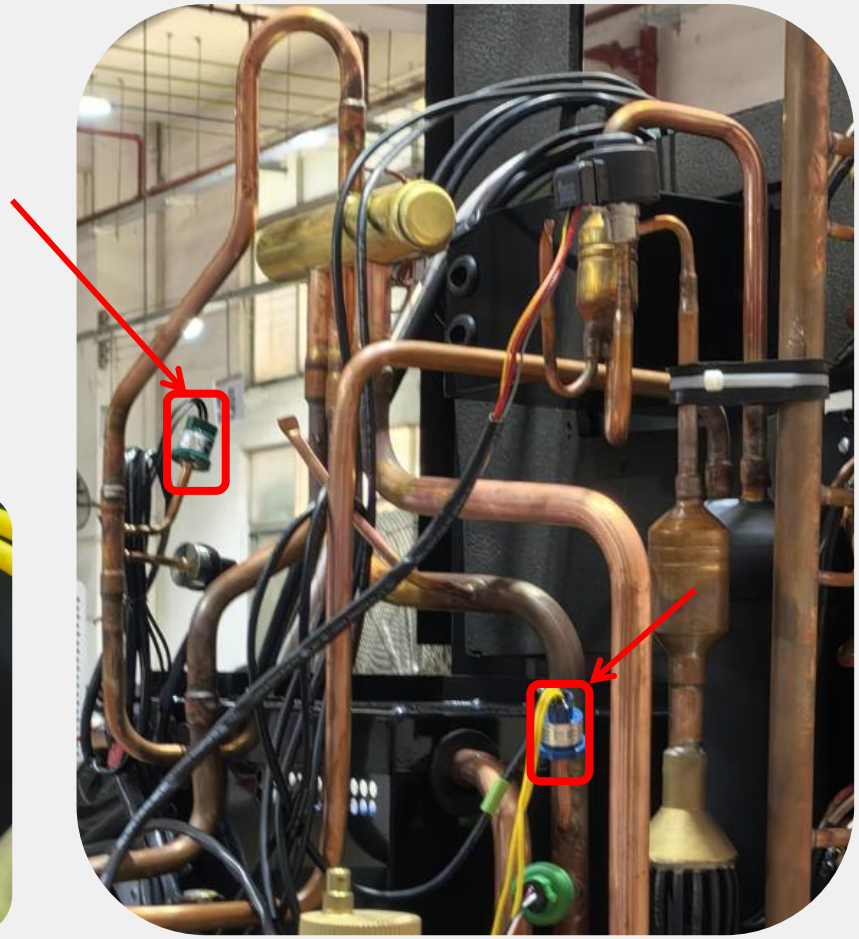
Brand: Match-Well

High pressure:
OPEN: 3.2MPa
CLOSE:2.4MPa

Low pressure:
OPEN: 0.02MPa
CLOSE:0.15MPa







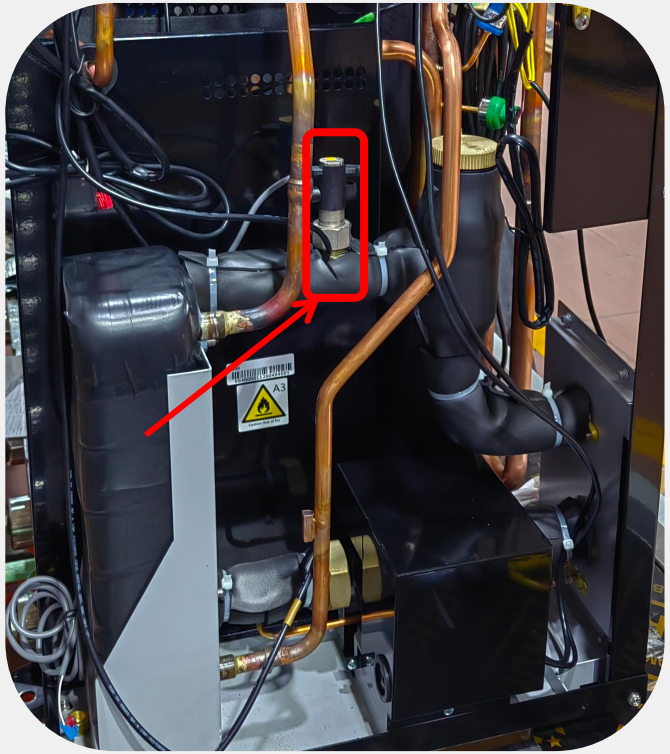
2.1 Components

Flow Switch

Its function is to monitor the water flow during unit operation, ensuring the normal running of the heat pump system.

Brand: ACOL

Model	Rated Water Flow Rate	Minimum Water Flow Rate to be Guaranteed
iGXC08	1.50m³/h	1.05m³/h
iGXC11	1.80m³/h	1.26m³/h
iGXC11T	1.80m³/h	1.26m³/h
iGXC13	2.20m³/h	1.54m³/h
iGXC13T	2.20m³/h	1.54m³/h
iGXC16	3.00m³/h	2.10m³/h
iGXC16T	3.00m³/h	2.10m³/h





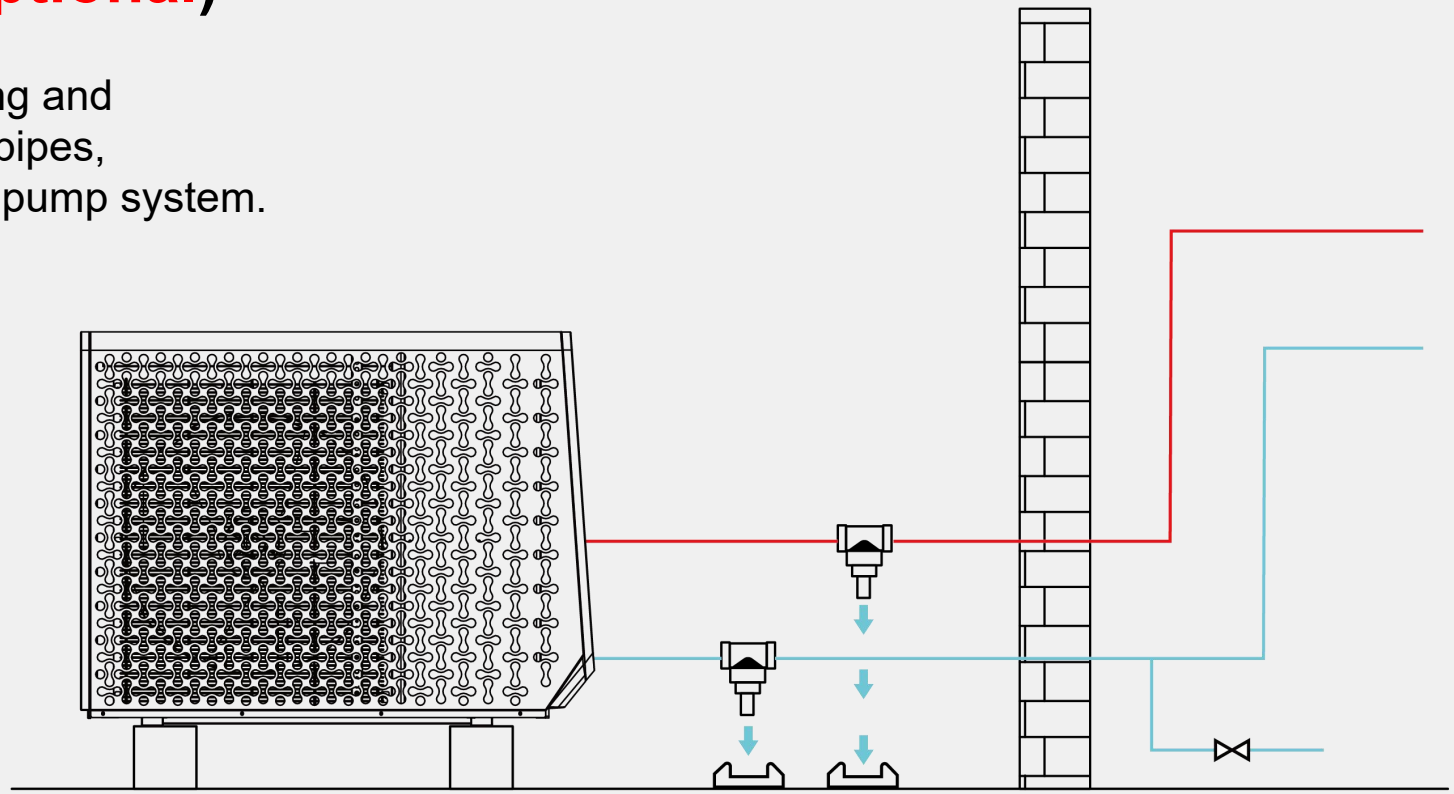
2.1 Components

Anti-freeze Valve(optional)

Its function is to prevent freezing and expansion cracking of units or pipes, ensuring the safety of the heat pump system.

Brand: ACOL





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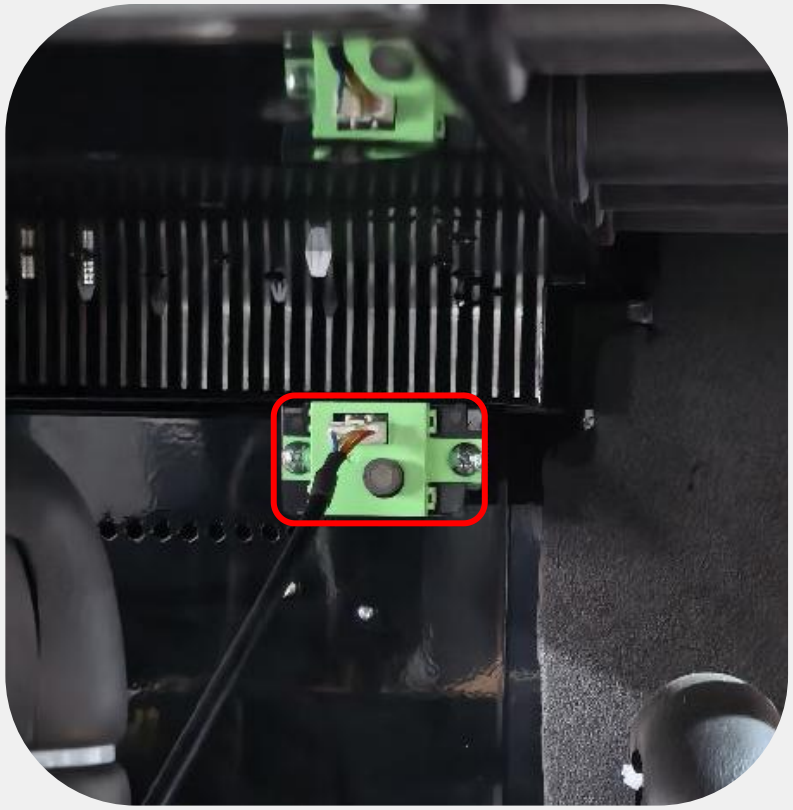
2.1 Components

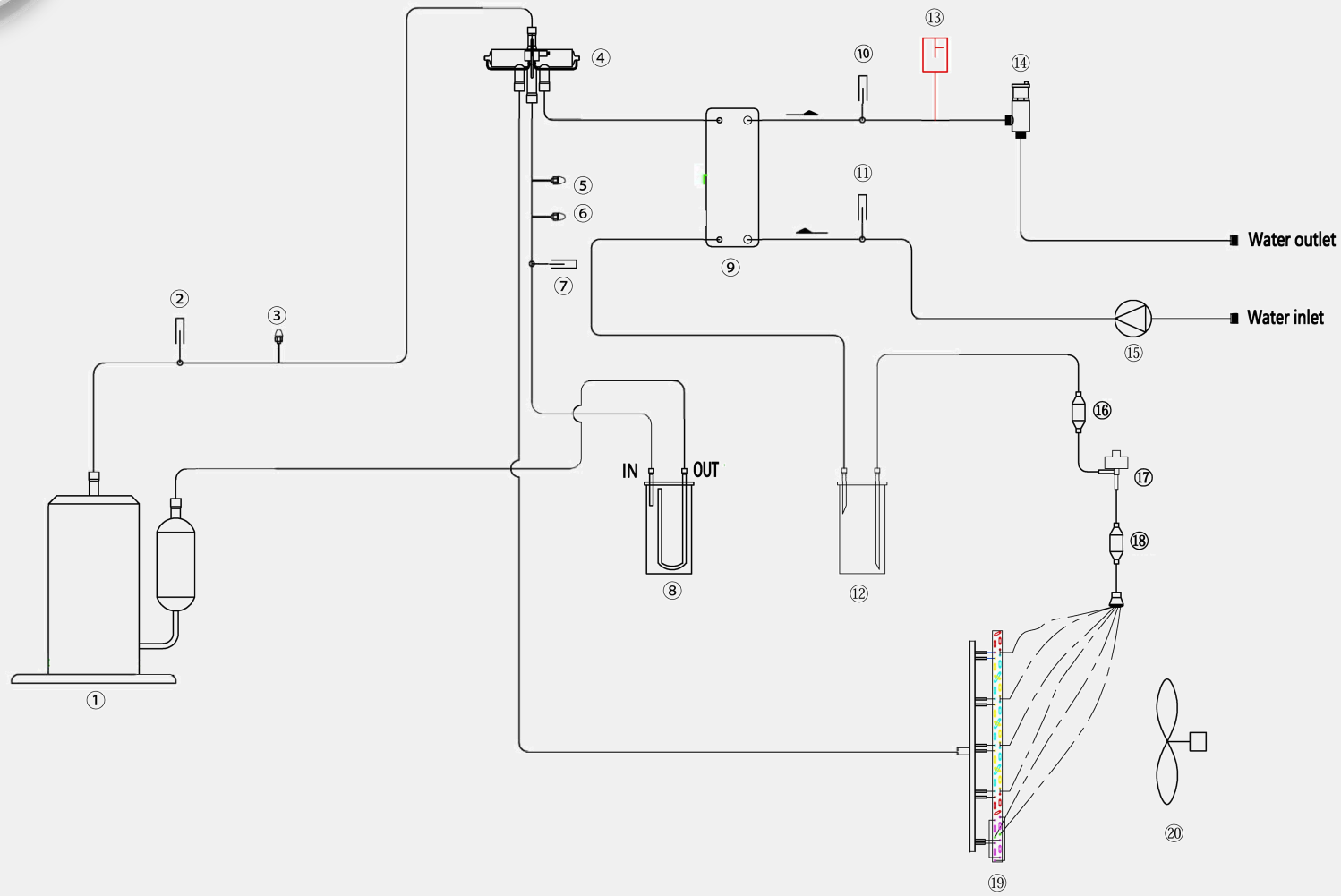
R290 refrigerant sensor(optional)

Refrigerant leak detection sensor real time monitoring of refrigerant leakage. Once leakage risk is detected, the system take corresponding actions to ensure the user safety.





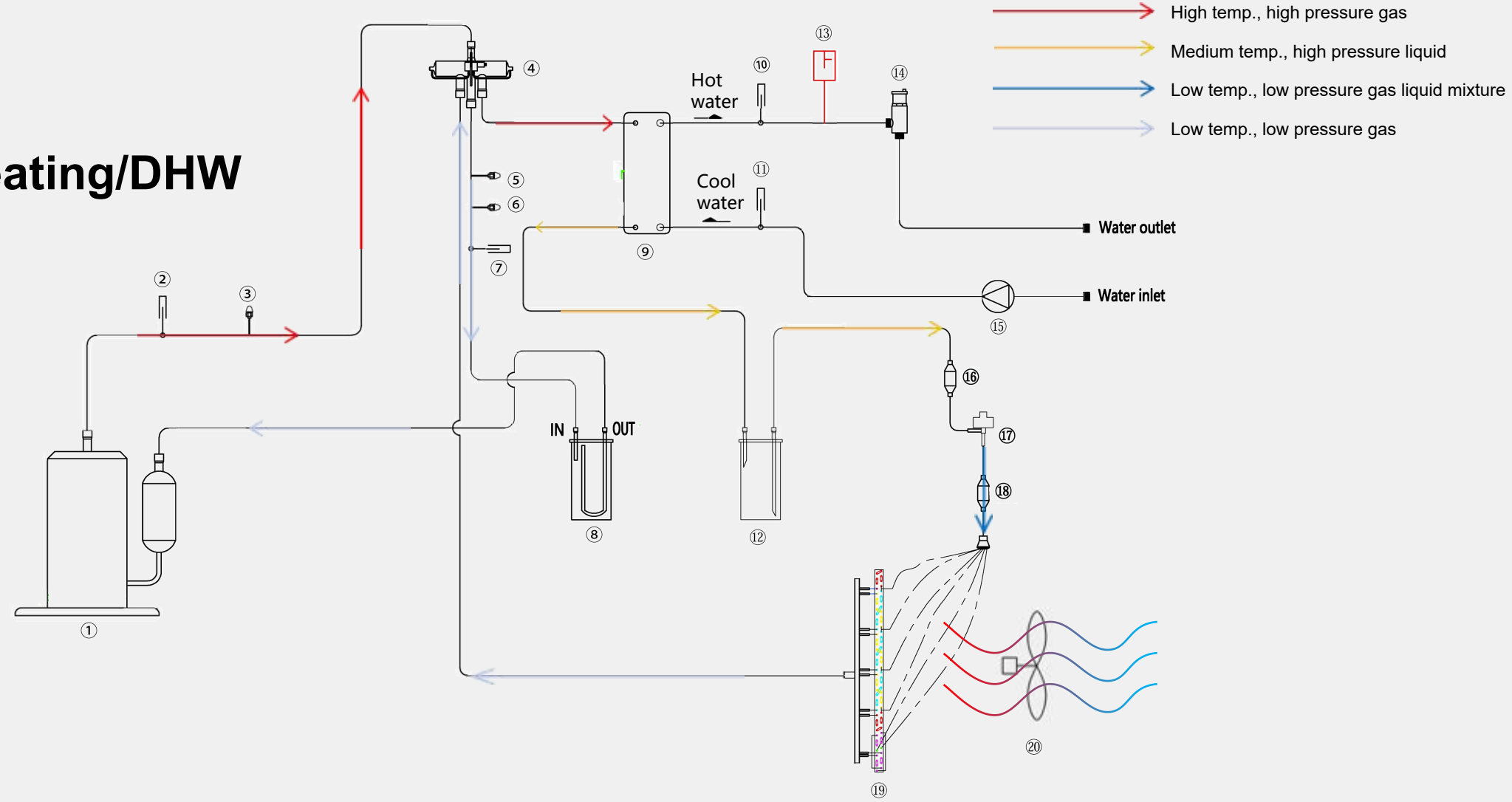
2.2 Refrigeration System Diagram



No.	Part name
①	Compressor
②	Temperature sensor (Compressor exhaust temperature)
③	High pressure sensor/switch
④	4-way valve
⑤	Low pressure switch
⑥	Low pressure sensor
⑦	Temperature sensor (Compressor suction temperature)
⑧	Gas-liquid separator
⑨	Plate heat exchanger
⑩	Temperature sensor (Water outlet)
⑪	Temperature sensor (Water inlet)
⑫	Refrigerant storage tank
⑬	Flow switch
⑭	Gas separator
⑮	Main circulation pump
⑯	Filter
⑰	Electronic expansion valve(EEV)
⑱	Filter
⑲	Finned heat exchanger
⑳	Fan

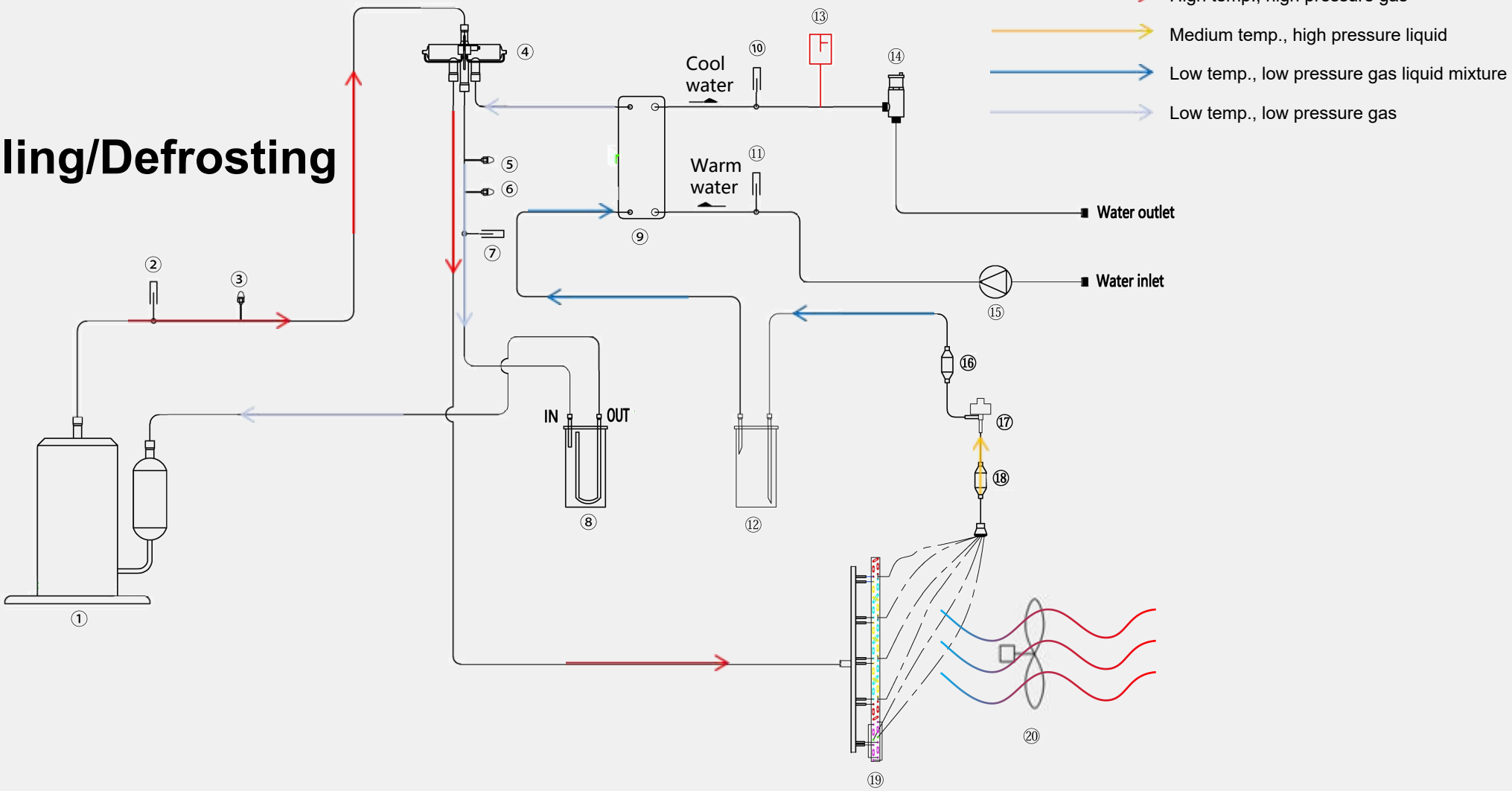
2.2 Refrigeration System Diagram

Heating/DHW



2.2 Refrigeration System Diagram

Cooling/Defrosting



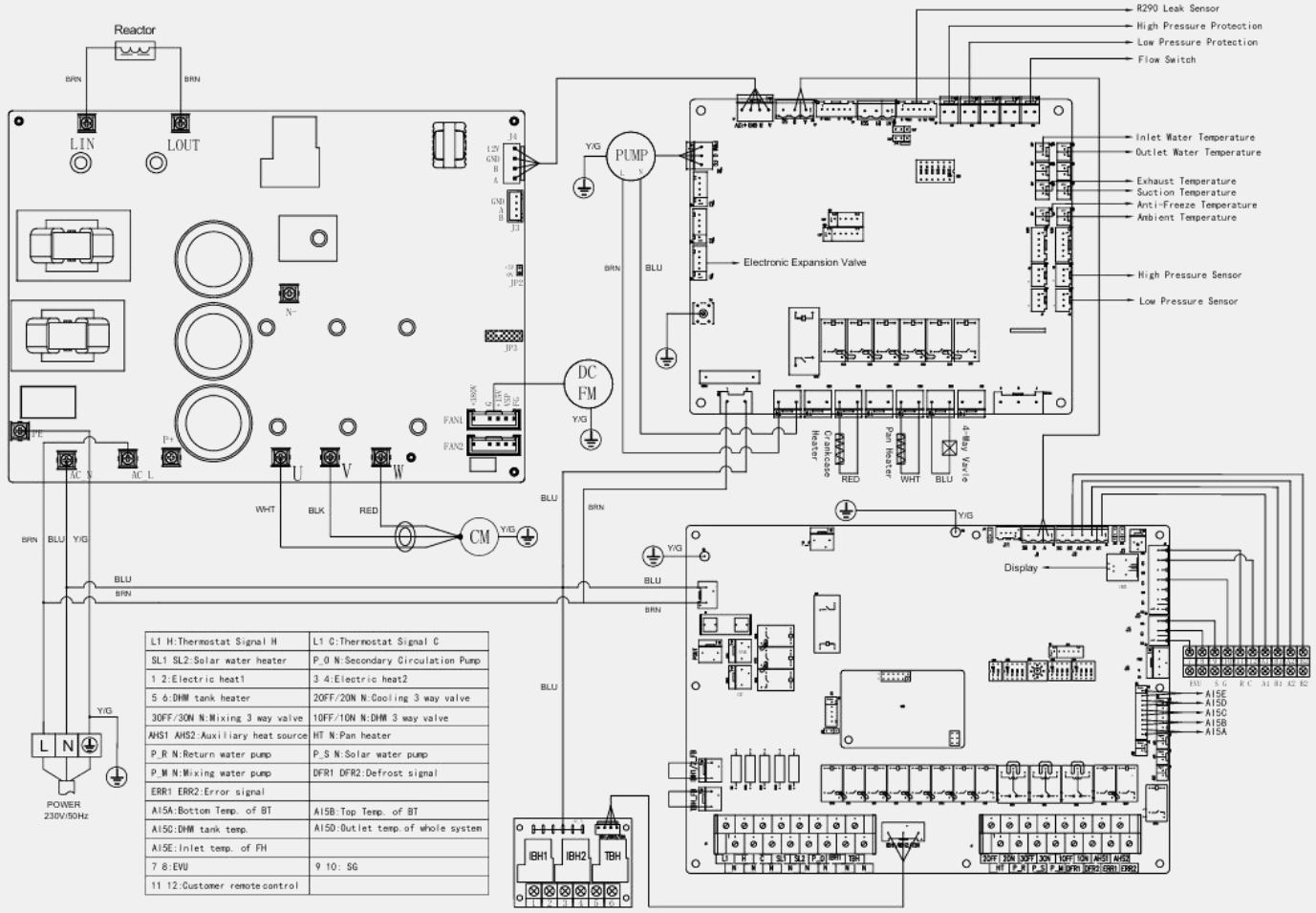


3 Electrical System

3.1 Wiring Diagram
3.2 PCB and Terminals
3.3 Display
3.4 Logic and Function
3.5 APP and IOT Platform

3.1 Wiring Diagram

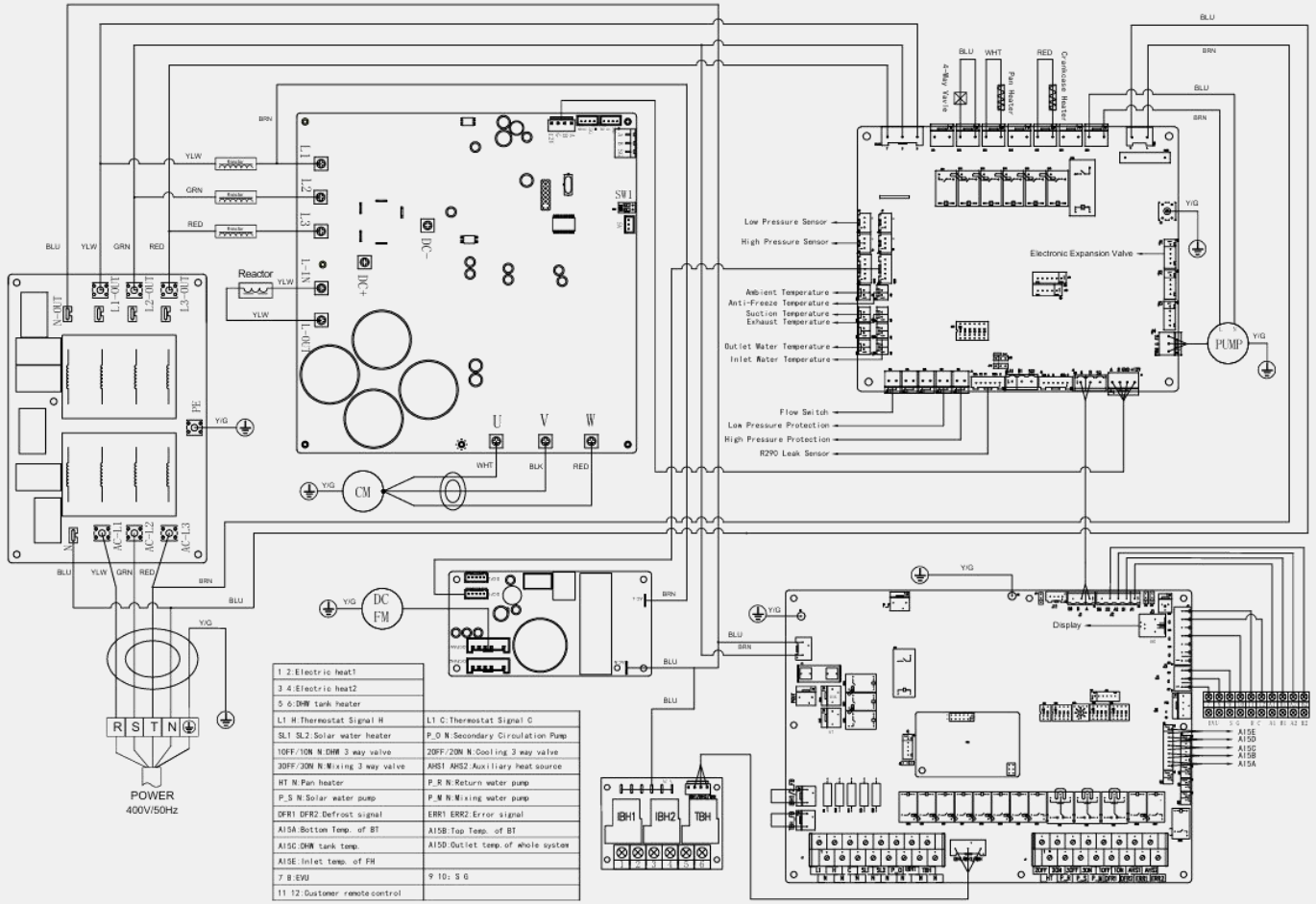
iGXC11



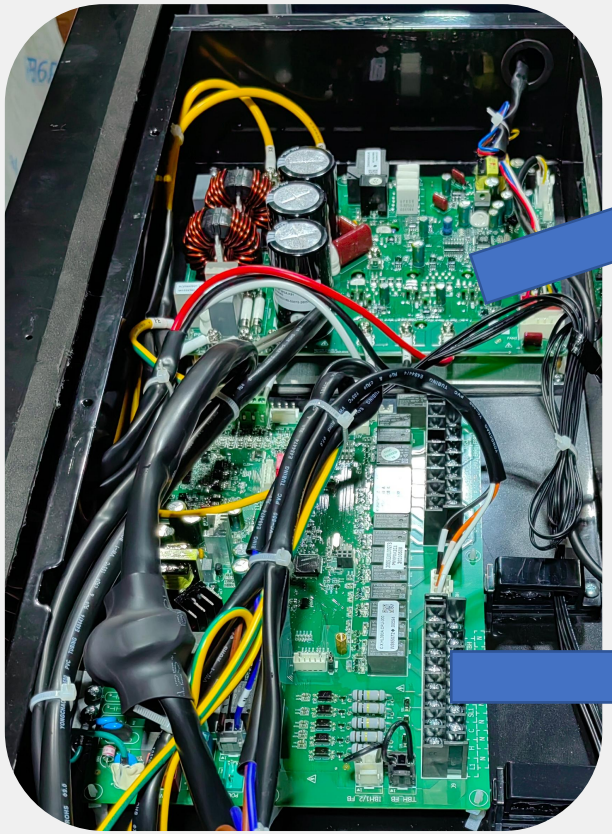
L1 H:Thermostat Signal H	L1 C:Thermostat Signal C
SL1 SL2:Solar water heater	P_O N:Secondary Circulation Pump
1 2:Electric heat1	3 4:Electric heat2
5 6:DHW tank heater	20FF/20N N:Cooling 3 way valve
30FF/30N N:Mixing 3 way valve	10FF/10N N:DHW 3 way valve
AHS1 AHS2:Auxiliary heat source	HT N:Pan heater
P_R N:Return water pump	P_S N:Solar water pump
P_M N:Mixing water pump	DFR1 DFR2:Defrost signal
ERR1 ERR2:Error signal	
AI5A:Bottom Temp. of BT	AI5B:Top Temp. of BT
AI5C:DHW tank temp.	AI5D:Outlet temp.of whole system
AI5E:Inlet temp. of FH	
7 8:EVU	9 10: SG
11 12:Customer remote control	

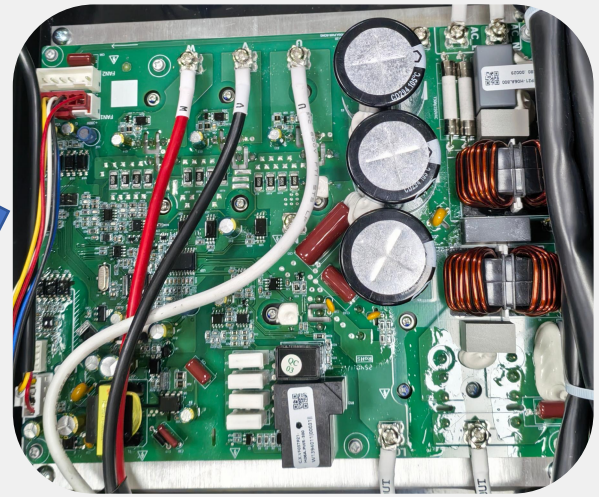
3.1 Wiring Diagram

iGXC11T

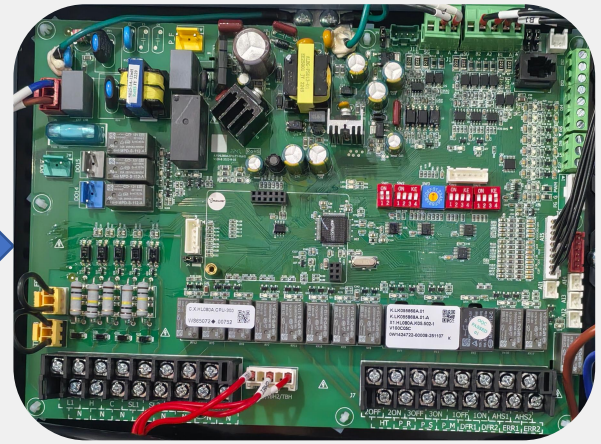


3.2 PCB and Terminals



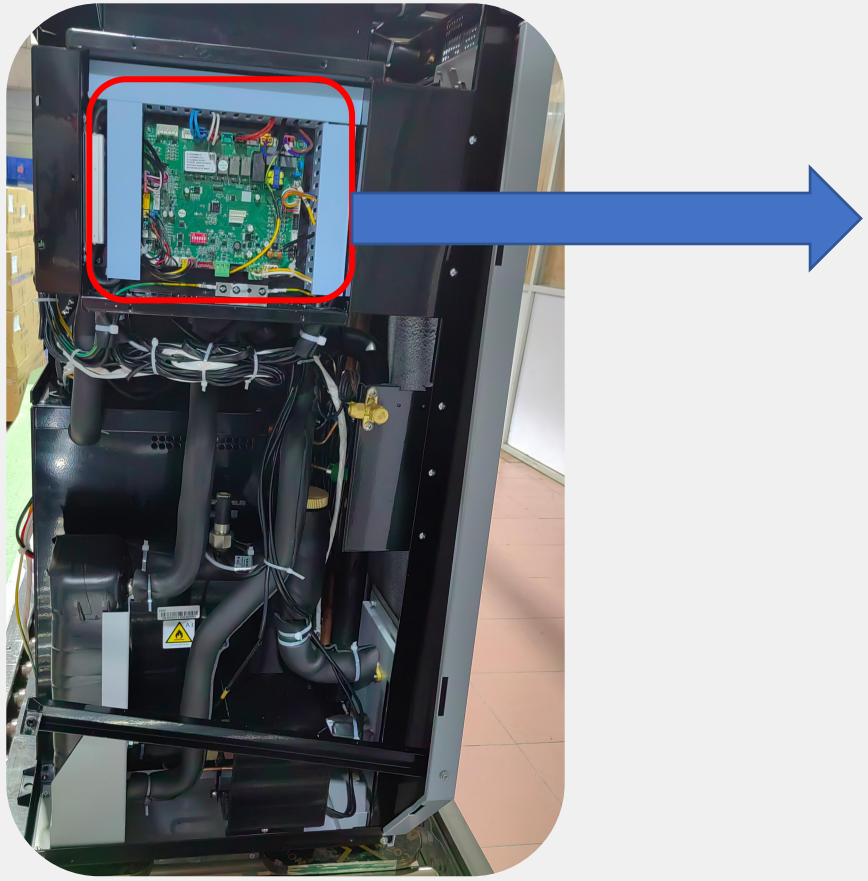


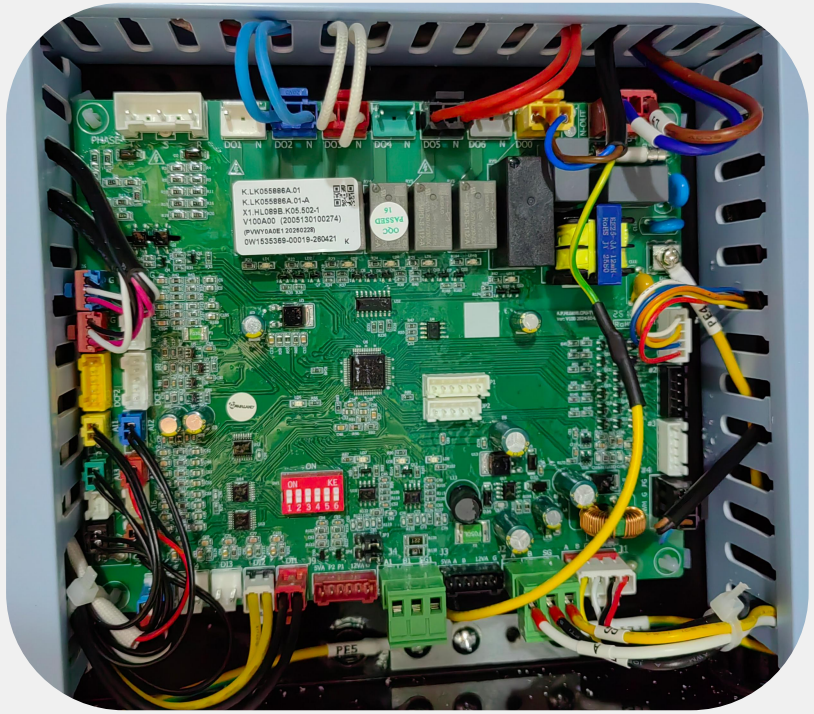
Inverter PCB



Expansion PCB

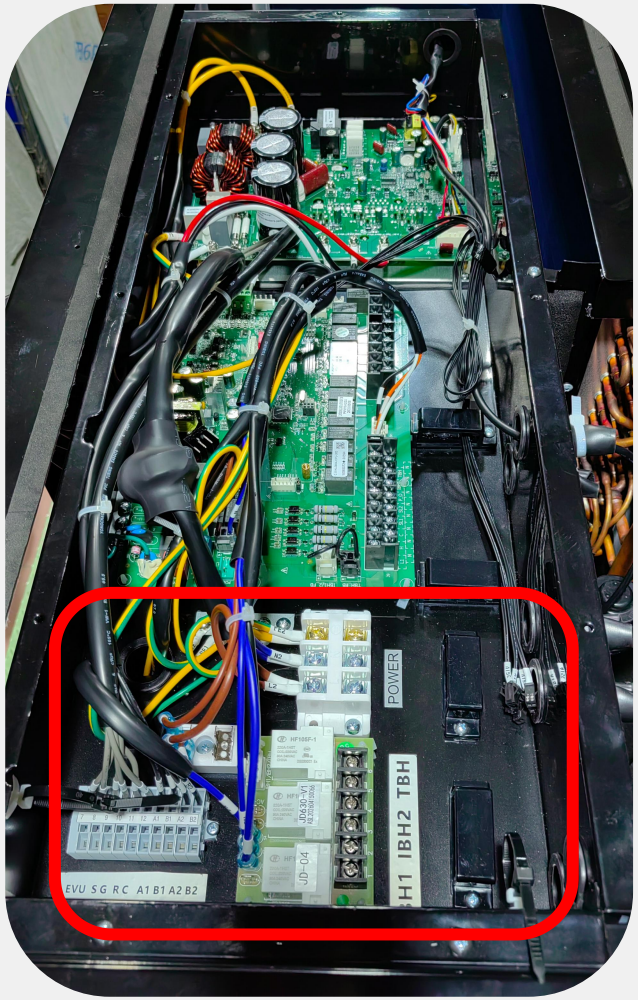
3.2 PCB and Terminals



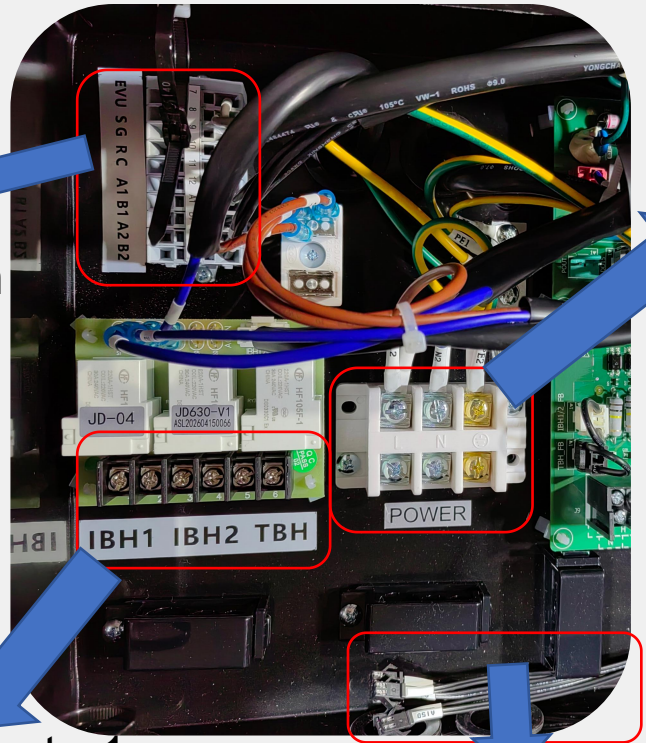


Main Control PCB

3.2 PCB and Terminals



RS485 Communication Port

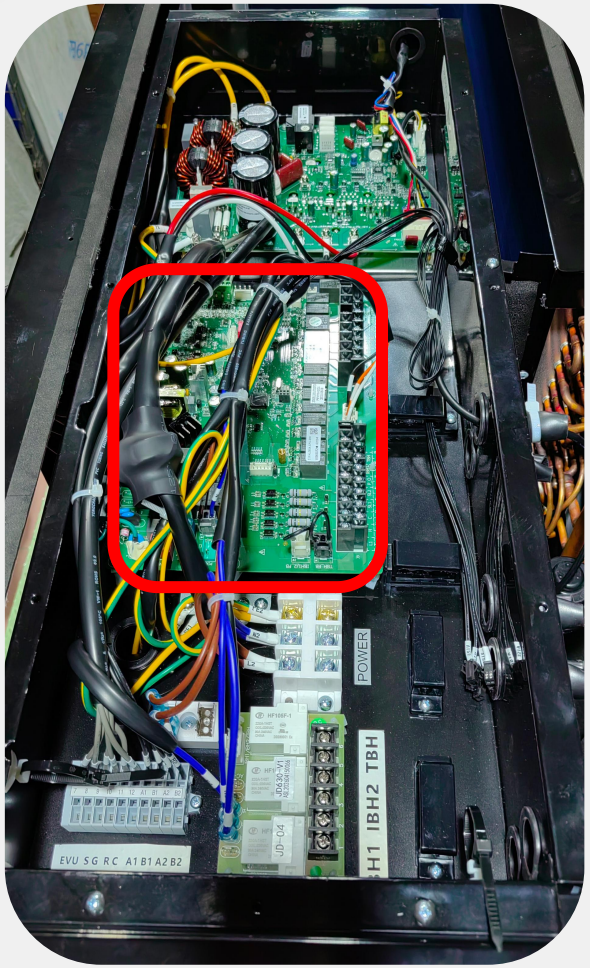


Power Supply

IBH1:Electric heater1
IBH2:Electric heater2
TBH:DHW electric heater

Temperature Sensor:
AI5A:Bottom Temp. of BT(**Reserved**)
AI5B:Top Temp. of BT
AI5C:DHW tank temp
AI5D:Outlet temp.of whole system(**Reserved**)
AI5E:Inlet temp. of FH(**Reserved**)

3.2 PCB and Terminals





L1 H: Thermostat Signal H
L1 C: Thermostat Signal C
P_O: Secondary Circulation Pump
SL1 SL2: Solar water heater
IBH1: Electric heater1 (400W)
IBH2: Electric heater2 (400W)
TBH: DHW tank heater(400W)

2OFF/2ON: Cooling 3 way valve
3OFF/3ON: Mixing 3 way valve
1OFF/1ON: DHW 3 way valve
AHS1 AHS2: Auxiliary heat source
HT: Bottom heater
P_R: Return water pump
P_M: Mixing water pump
P_S: Solar water pump
DFR1 DFR2: Defrost signal
ERR1 ERR2: Error signal

3.3 Display



No.	Meaning	Description
①	Menu	After clicking this button, the unit will enter the function menu interface, where you can configure various custom modes.
②	Mode setting	After clicking this button, you can configure the unit mode settings. There are three modes available: Heating, Cooling, and Auto.
③	Power consumption	The number indicates real-time power consumption, while the bar chart shows hourly power consumption for the current day. If power consumption is not enabled, the main screen will not show.
④	Screen lock	After locking, the display cannot be operated; Press the button again to unlock the screen.
⑤	Operating strategy	After clicking this button, you can select the unit's operating strategy. There are three strategies available: Turbo, Standard, and Silent.

3.3 Display



No.	Meaning	Description
⑥	100% Green enable button	After clicking this button, the unit will operate in conjunction with the solar inverter device. Note: This function requires the installation of Fairland's Inverter to be enabled.
⑦	DHW setting	Upper shows the target DHW temperature. You can slide the ring to set the target temperature or click the target temperature to set it. Lower shows the actual temperature of the hot water tank.
⑧	DHW switch	You can turn the DHW function on or off.
⑨	Fault icon	When a fault occurs, this icon will appear. Clicking it will take you to the fault log interface for viewing.
⑩	WiFi icon	It indicates the current network settings status. Clicking this icon to access the network settings interface.

3.3 Display



No.	Meaning	Description
⑪	SG Ready icon	When the SG Ready function is enabled, this icon will be illuminated, otherwise, it will be dim.
⑫	Defrosting icon	When the Defrosting is enabled, this icon will be illuminated, click can enable the forced defrost.
⑬	Anti-freeze icon	This icon appears when the unit enters anti-freeze mode.
⑭	System time	Shows the date and time. The network time will sync automatically after connecting to Wi-Fi
⑮	100% Green icon	When the 100% Green function is enabled, this icon will be illuminated. Click the icon to access the green power settings

3.3 Display

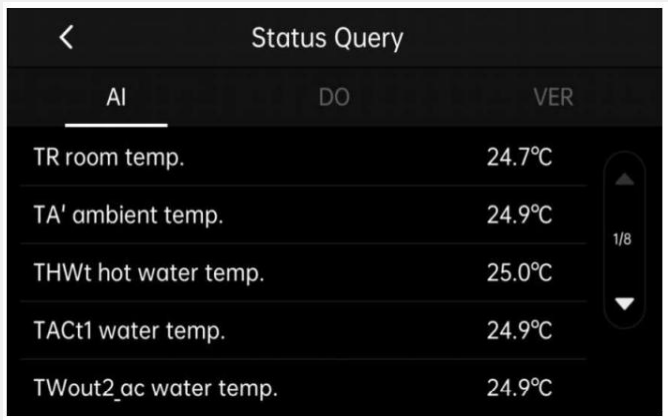


No.	Meaning	Description
⑯	Ambient temp.	It shows the current ambient temperature.
⑰	Electric heater	When the Electric heater is enabled, this icon will be illuminated, otherwise, it will be dim. Click the icon to access the forced opening settings
⑱	Operating strategy icon	It shows the current Operating strategy
⑲	On/off timer icon	When the Timer function is enabled, this icon will be illuminated. Click this icon to access the timer settings interface.
⑳	Heating/Cooling On/Off	You can turn the cooling/heating on or off.
㉑	Cooling/Heating Temperature Setting	It will show the current cooling/heating target temperature. Slide the ring to set the target temperature. You can also set the target temperature by tapping it; after tapping, the device will enter the target temperature setting interface. Current Temperature: shows the current temperature.

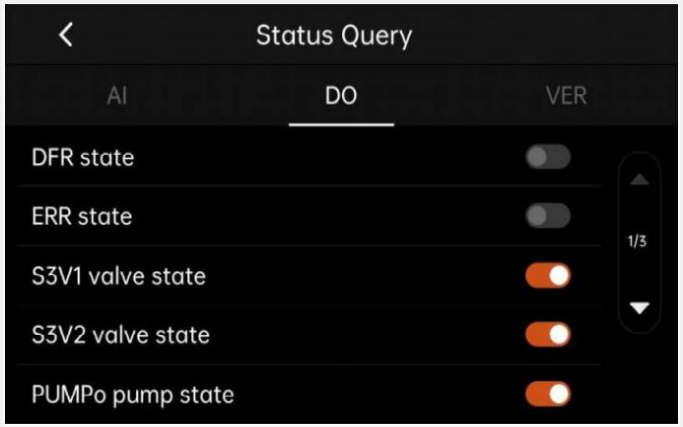
3.3 Display

Parameter checking

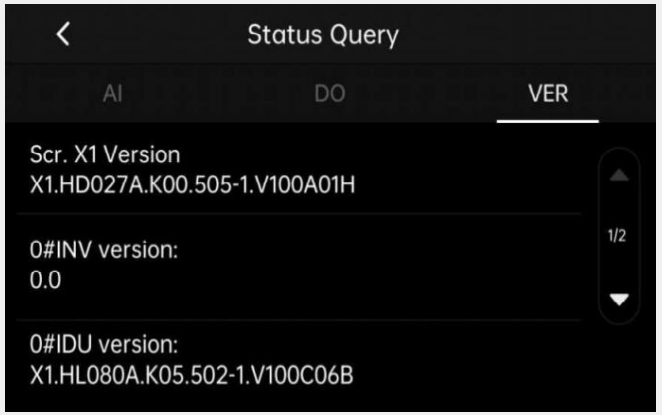
Most important system parameters which are used to diagnose the system state can be get through the “Status Query” interface on the display.



Input parameters



Output parameters



Software version

3.3 Display

Error checking

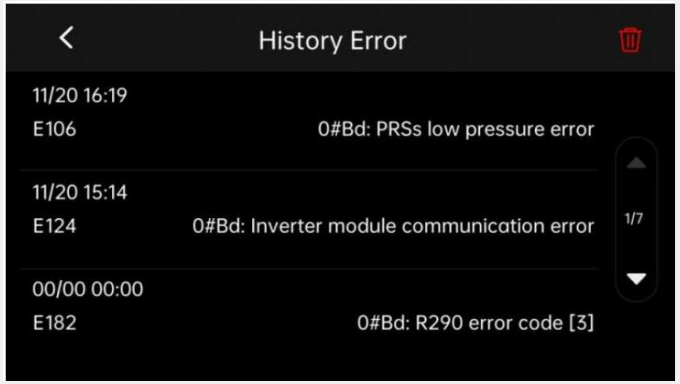
Error code and detail information can be showing on the error interface.



Error interface



Current Error

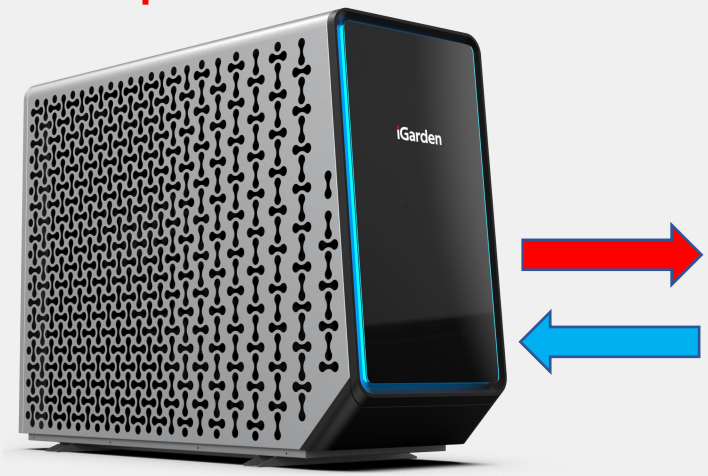


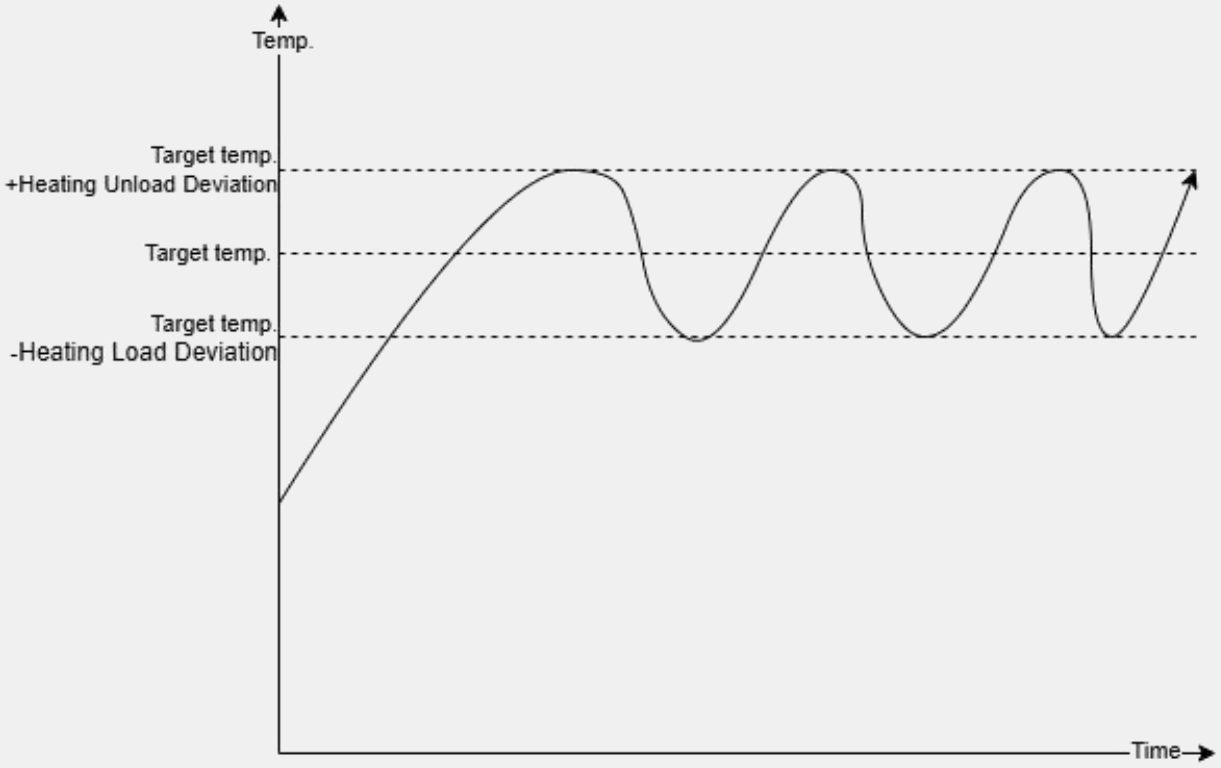
History Error

3.4 Logic and Function

Heating Mode

When the outlet water temperature < target temperature - [HEAT_LOAD_dT], the unit will **start**.
When the outlet water temperature > target temperature + [HEAT_UNLOAD_dT], the unit will **stop**.



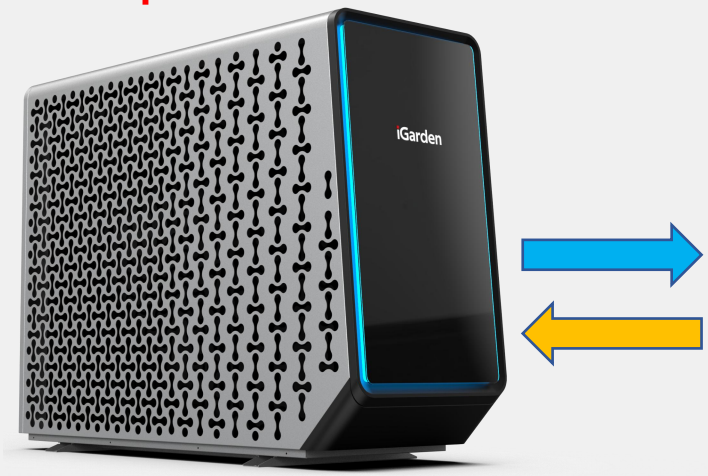


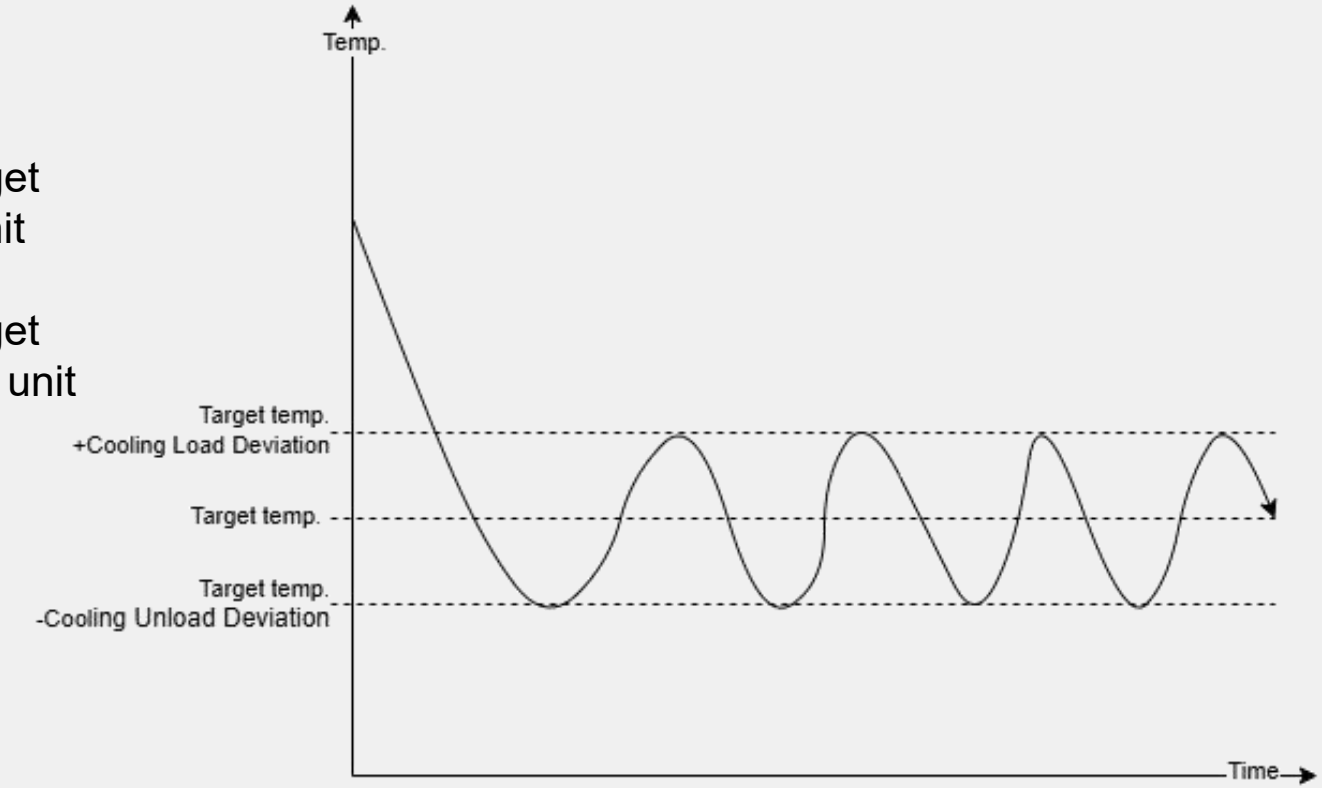
Note: [HEAT_LOAD_dT]=4℃
[HEAT_UNLOAD_dT]=2℃

3.4 Logic and Function

Cooling Mode

When the outlet water temperature > target temperature + [COOL_LOAD_dT], the unit will **start**.
When the outlet water temperature < target temperature - [COOL_UNLOAD_dT], the unit will **stop**.





Note: [COOL_LOAD_dT]=2℃
[COOL_UNLOAD_dT]=2℃

3.4 Logic and Function

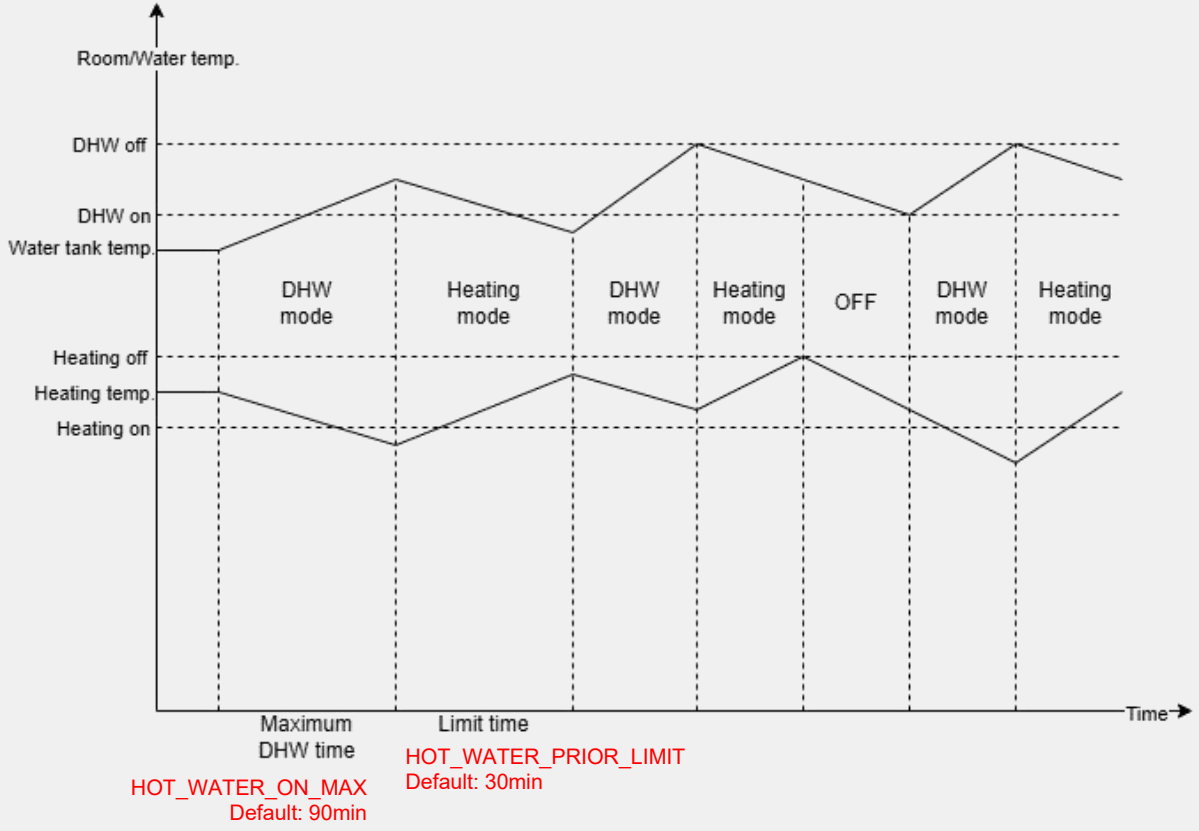
DHW Priority

When the unit is first started, it will operate in DHW mode first. Once any of the following conditions is met, the heat pump will switch to heating/cooling mode,

①DHW tank temperature reaches the target temperature

②Exceeds the maximum DHW time

After reaching the heating/cooling target temperature or exceeding the limit time, the unit will switch back to DHW mode.



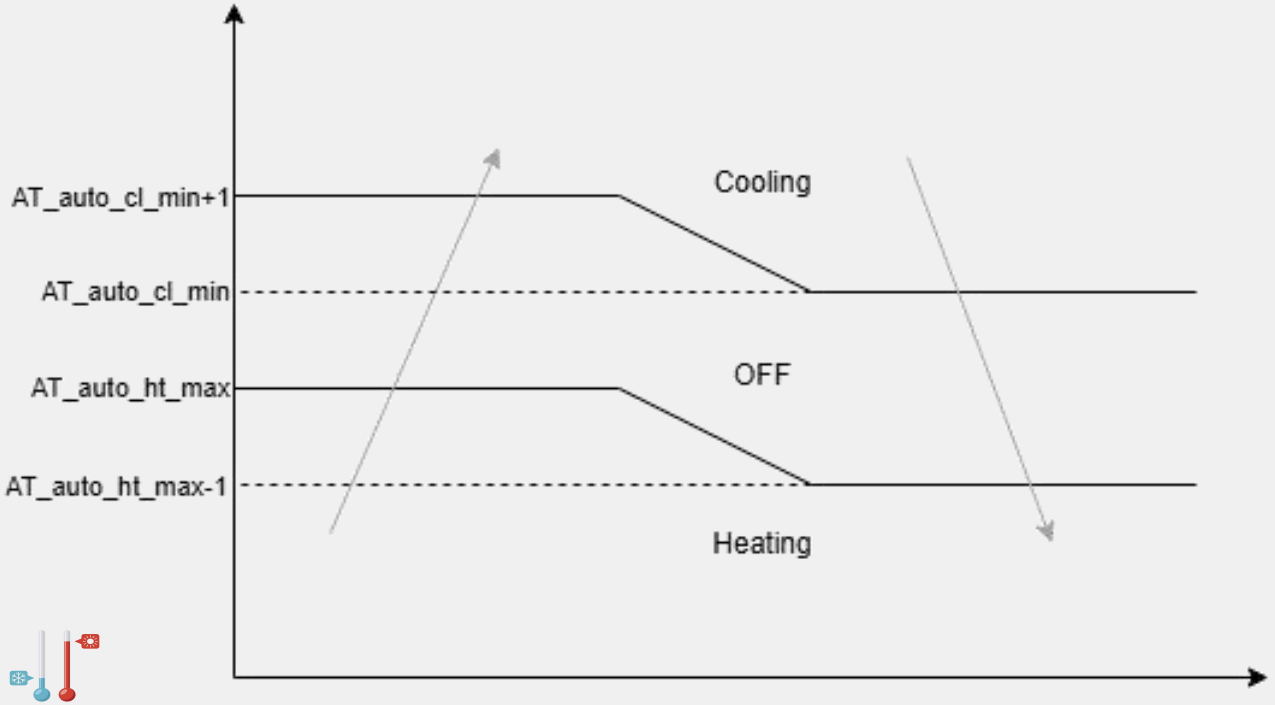
3.4 Logic and Function

Automatic function

When the user selects the automatic mode, the operation mode is automatically switched according to ambient temperature







Note: [AT_auto_cl_min]=25℃
[AT_auto_ht_max]=17℃

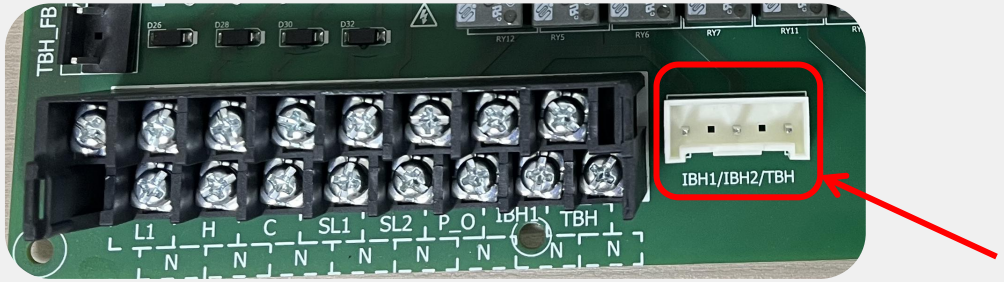
3.4 Logic and Function

Electric heater

Starting Conditions(**AND**):
①Ambient temperature < [IBH_ON_TA] - 1,
②Water temperature < target temp. - [HEAT_LOAD_dT]
③Electric heater shutdown time exceeds [IBH_ON_DLY]

Shutdown Conditions(**OR**):
①Water temperature reaches target temp. + [HEAT_UNLOAD_dT]
②Ambient temperature ≥ [IBH_ON_TA].

Note: [IBH_ON_TA]=-5℃
[IBH_ON_DLY]=30min

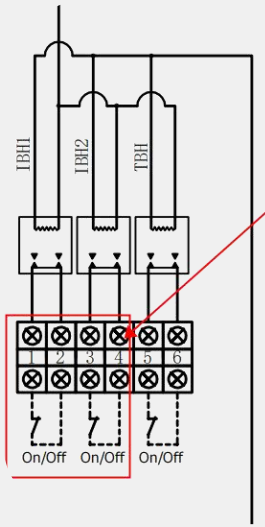


3.4 Logic and Function

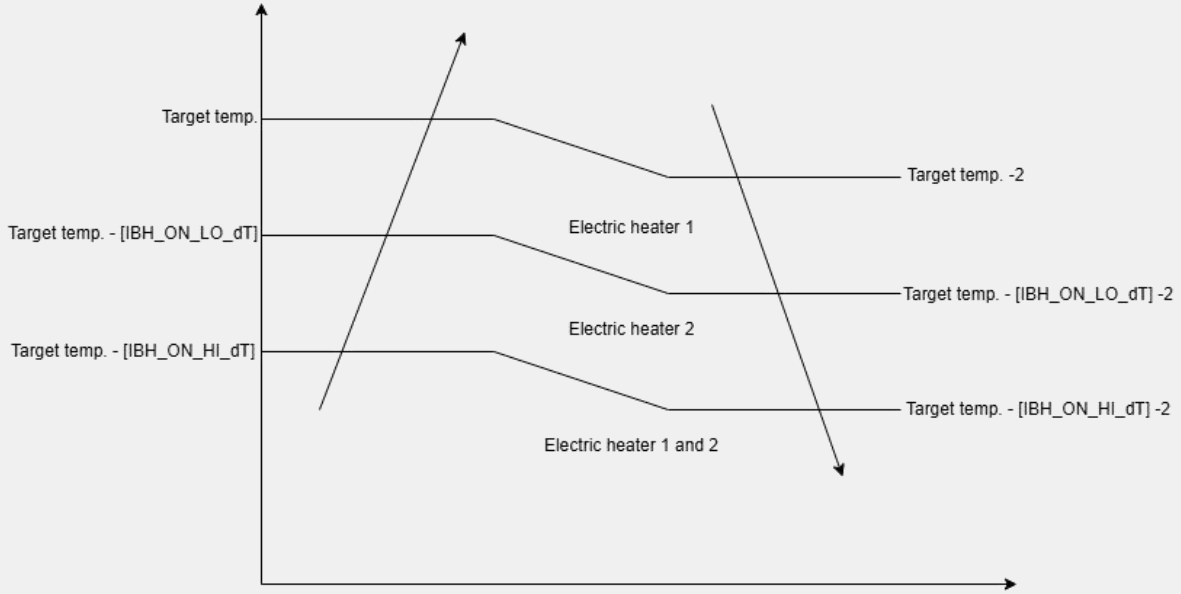
Electric heater level control

Note: [IBH_ON_HI_dT]=5℃
[IBH_ON_LO_dT]=2℃

When you connect two electric heaters, they will activate step by step as below,



L1 H:Thermostat Signal H	L1 C:Thermostat Signa.
SL1 SL2:Solar water heater	P_O N:Secondary Circulat
1 2:Electric heat1	3 4:Electric heat2
5 6:DHW tank heater	2OFF/2ON N:Cooling three
3OFF/3ON N:Mixing valve	1OFF/1ON N:DHW three way
AHS1 AHS2:Auxiliary heat source	HT N:Pan heater
P_R N:Return water pump	P_S N:Solar water pump
P_M N:Mixing water pump	DFR1 DFR2:Defrost signal
ERR1 ERR2:Fault signal	
AI5A:Bottom Temp. of BT	AI5B:Top Temp. of BT
AI5C:DHW tank temp.	AI5D:Outlet temp.of whol
AI5E:Inlet temp. of FH	



Note: If the compressor is in a state where it cannot be started (start-up restricted or FAULT), the electric heater will immediately activate and replace the compressor to heat the water.

3.4 Logic and Function

Rapid DHW Function

Starting Conditions(**AND**):
①Enabled the Rapid DHW function
②Hot water tank temperature < [HOT_WATER_TEMP_SET] - 1°C



Shutdown Conditions(**OR**):
①Hot water tank temperature ≥ [HOT_WATER_TEMP_SET]
②Received DHW mode shutdown command
③Disabled the Rapid DHW function

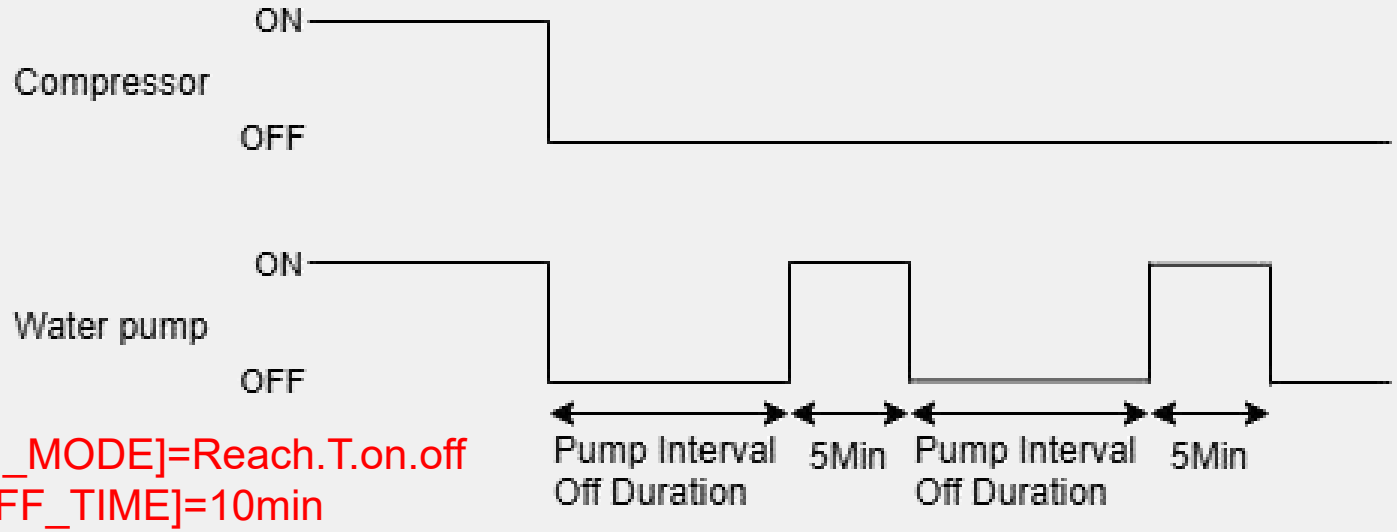
Note: The Rapid Hot Water Function will automatically switch the system to DHW mode. During this time, the heat pump, electric heater, DHW tank heater, and other heat sources will all start up to meet the hot water demand.

Note: [HOT_WATER_TEMP_SET]=60℃

3.4 Logic and Function

Main circulation pump

1. When the mode is set to "KEEP.RUN", the water pump will run continuously after the heat pump off.
2. When the mode is set to "Reach.T.stop", it will stop running once the target temperature is reached.
3. When the mode is set to "Reach.T.on.off", it will follow this cycle during shutdown periods: Run for 5 minutes, then stop for [PUMPf_INTER_OFF_TIME], as shown below.



Note: [PUMP_RUN_MODE]=Reach.T.on.off
[PUMPf_INTER_OFF_TIME]=10min

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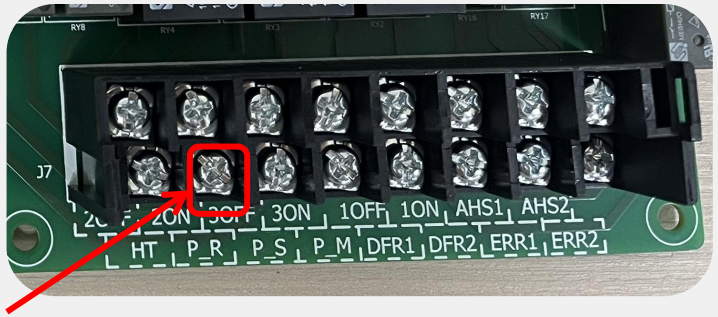
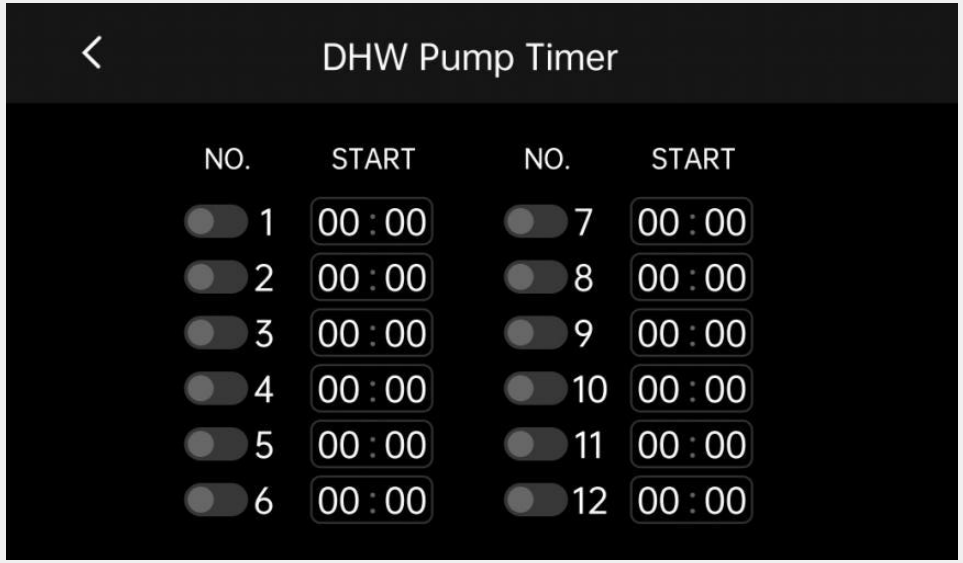
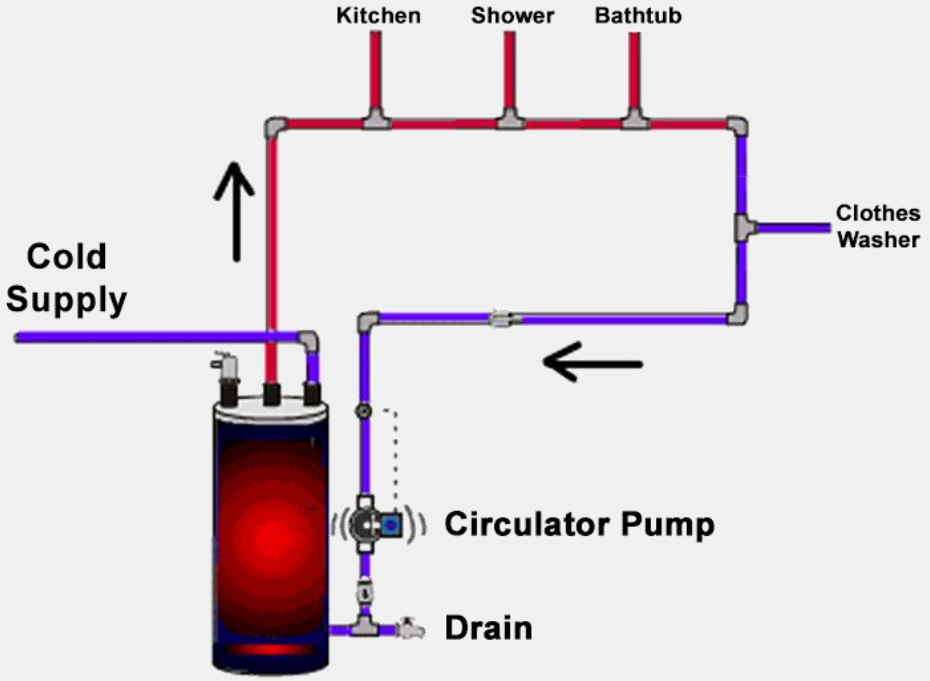
3.4 Logic and Function



DHW Pump

If [DHW Pump Timer] is set to ‘Enabled’
When the time reaches the DHW pump start time, the DHW pump will turn on and run continuously for a set time, then off.



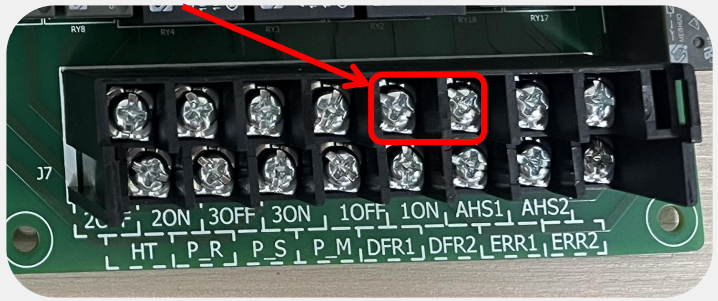


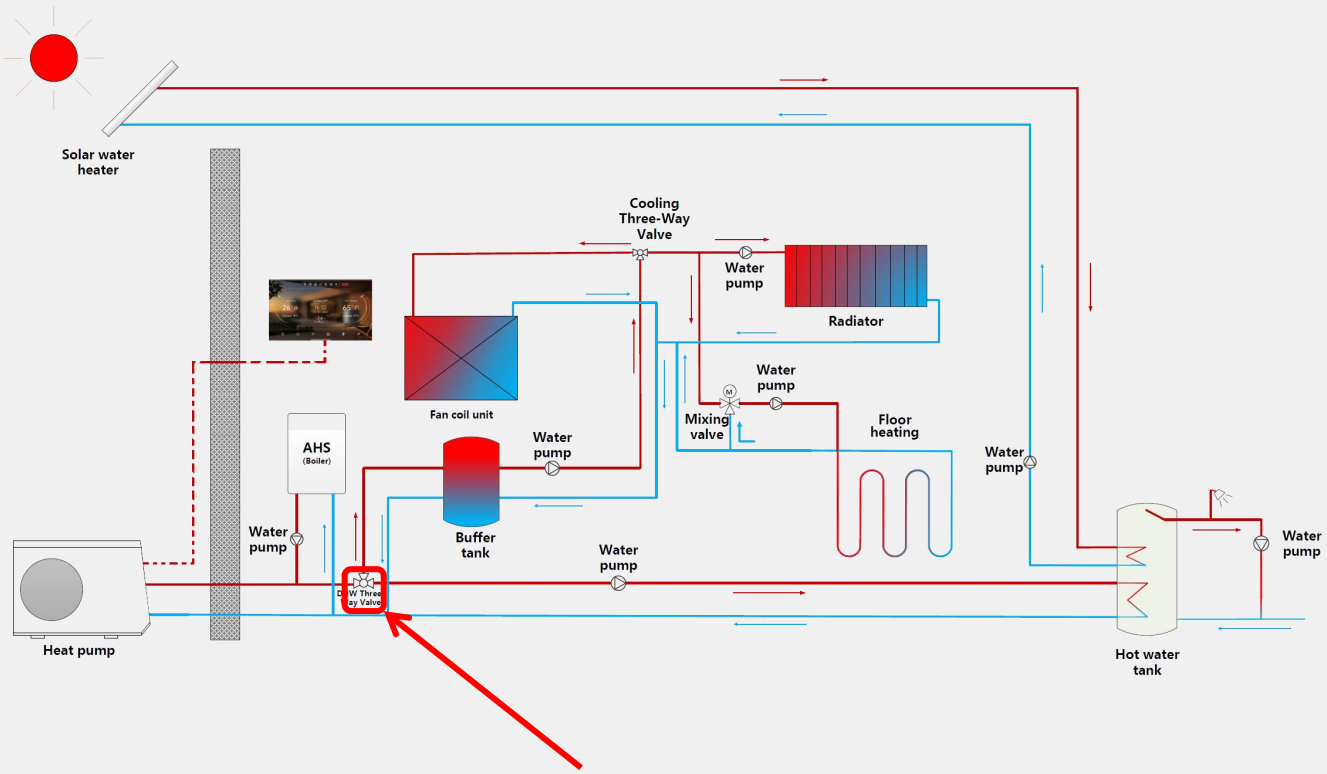
3.4 Logic and Function

DHW three-way valve

When the unit operates in cooling (or heating) mode, the DHW three-way valve maintains an **OFF** output.

When the unit operates in DHW mode, the DHW three-way valve maintains an **ON** output.



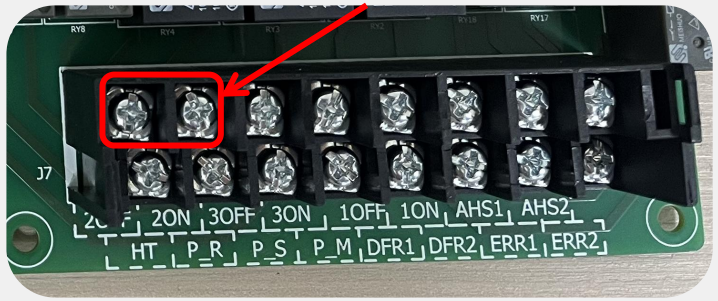


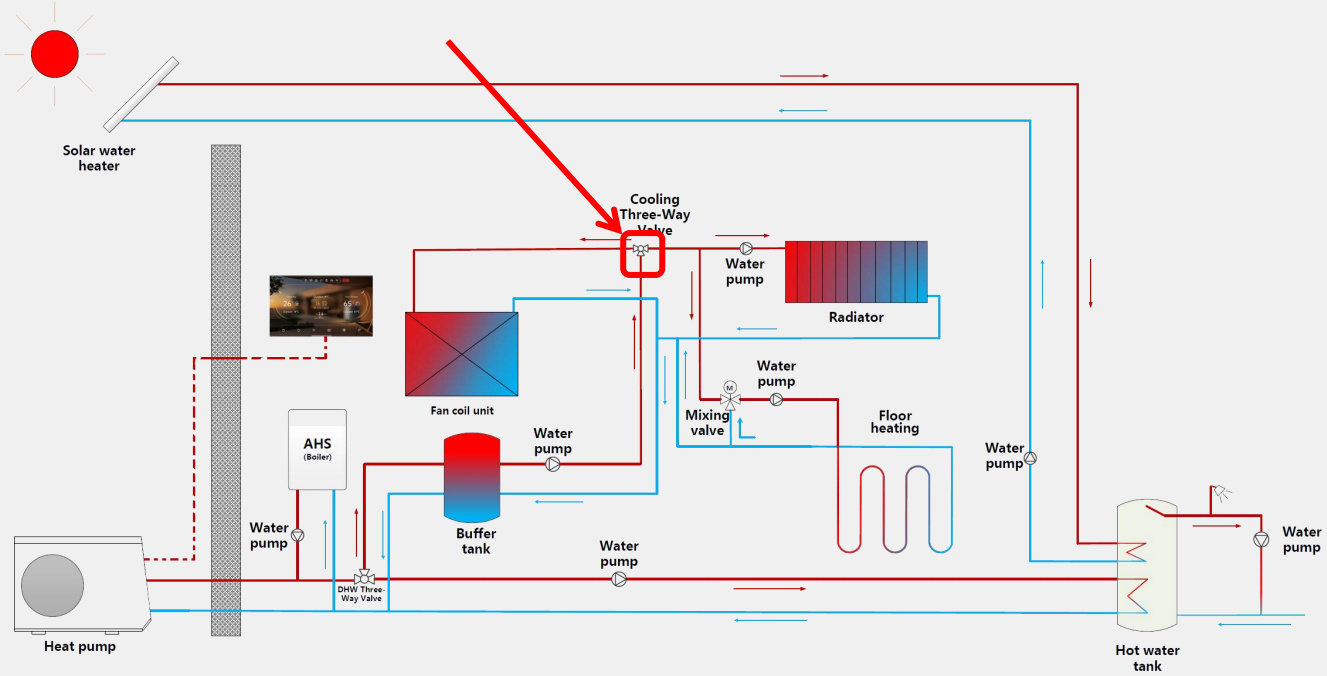
3.4 Logic and Function

Cooling three-way valve

When the heat pump operates in heating (or DHW) mode, the cooling three-way valve maintains an **OFF** output.

When the heat pump operates in cooling mode, the cooling three-way valve maintains an **ON** output



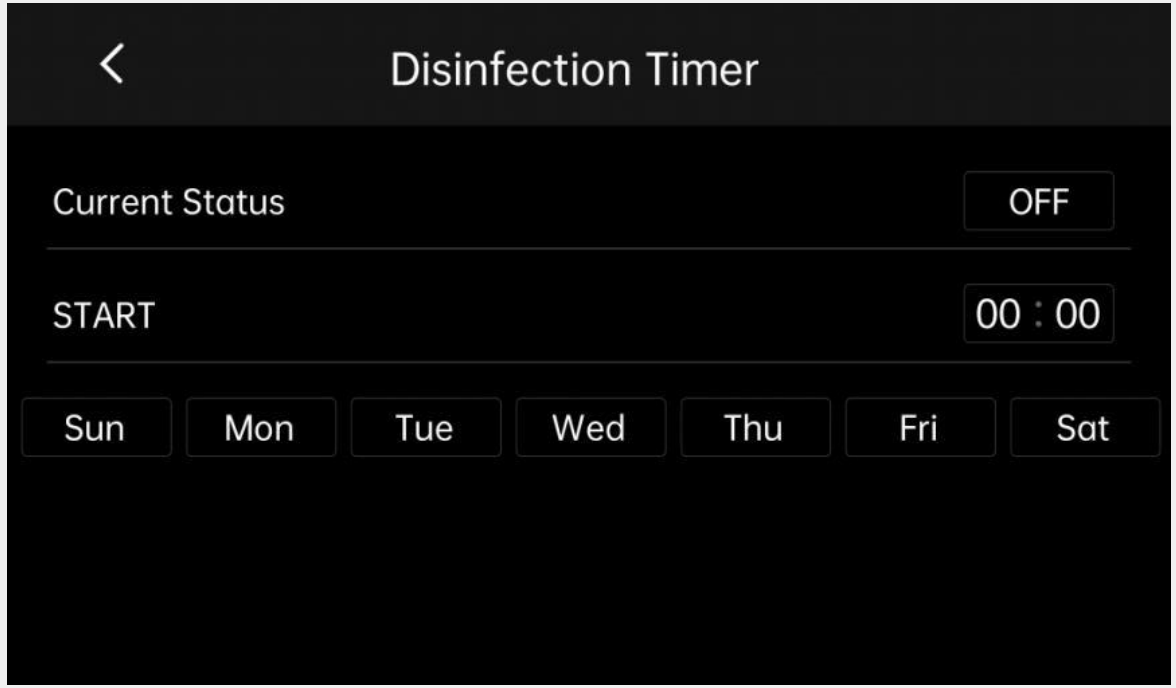


3.4 Logic and Function

Disinfection function

When the current time reaches the "Disinfection Time Point":

The unit will turn on the compressor and DHW electric heater to heat the DHW tank for disinfection until the DHW tank temp. reaches the [STERILIZATION_TEMP] and maintain it for [STERILIZATION_HIGH_TEMP_TIME].



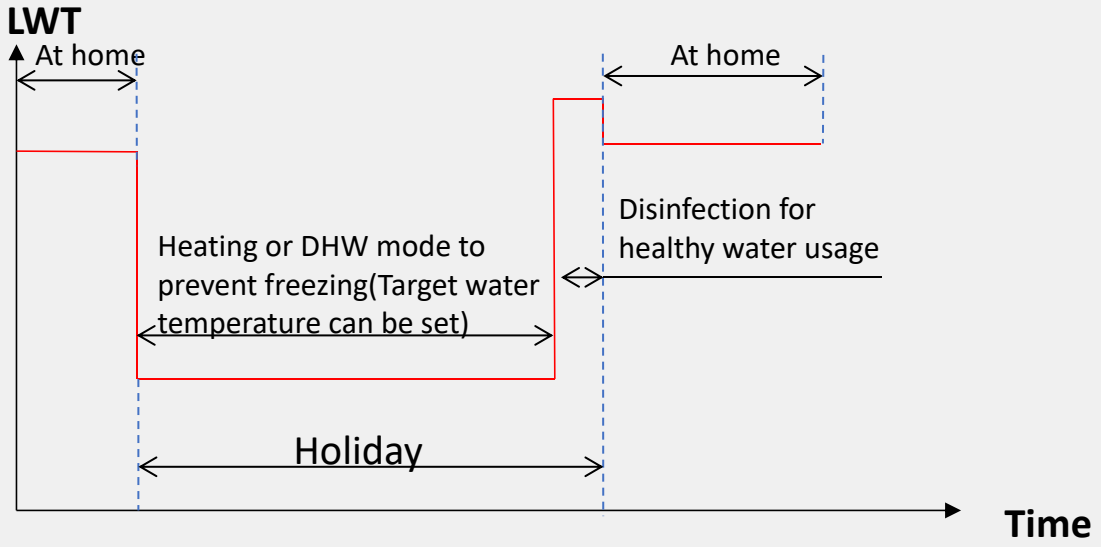
Note: [STERILIZATION_TEMP]=65℃
[STERILIZATION_HIGH_TEMP_TIME]=15min

3.4 Logic and Function

Holiday away mode

During the holiday away period, the unit will operate heating/hot water functions at a **lower target** water temperature to meet water circuit **antifreeze** and **energy-saving** requirements.

In holiday away mode, all the timers will be invalid.
It will perform a single disinfection only on the final day of the holiday away period.



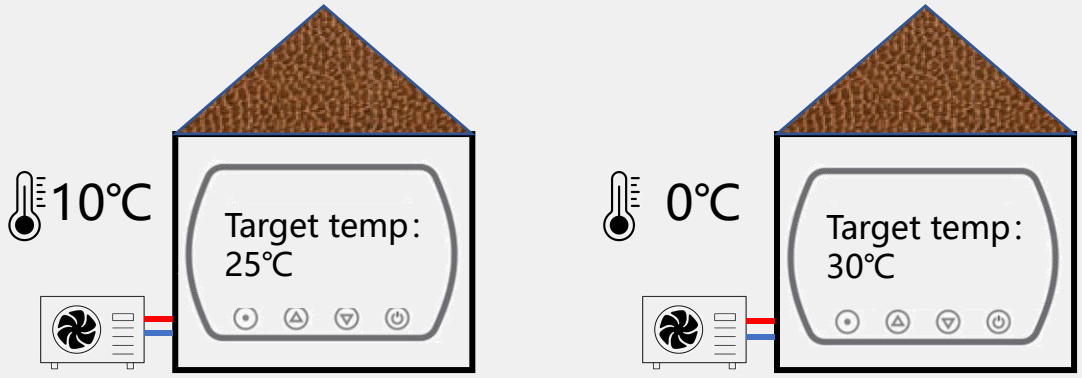


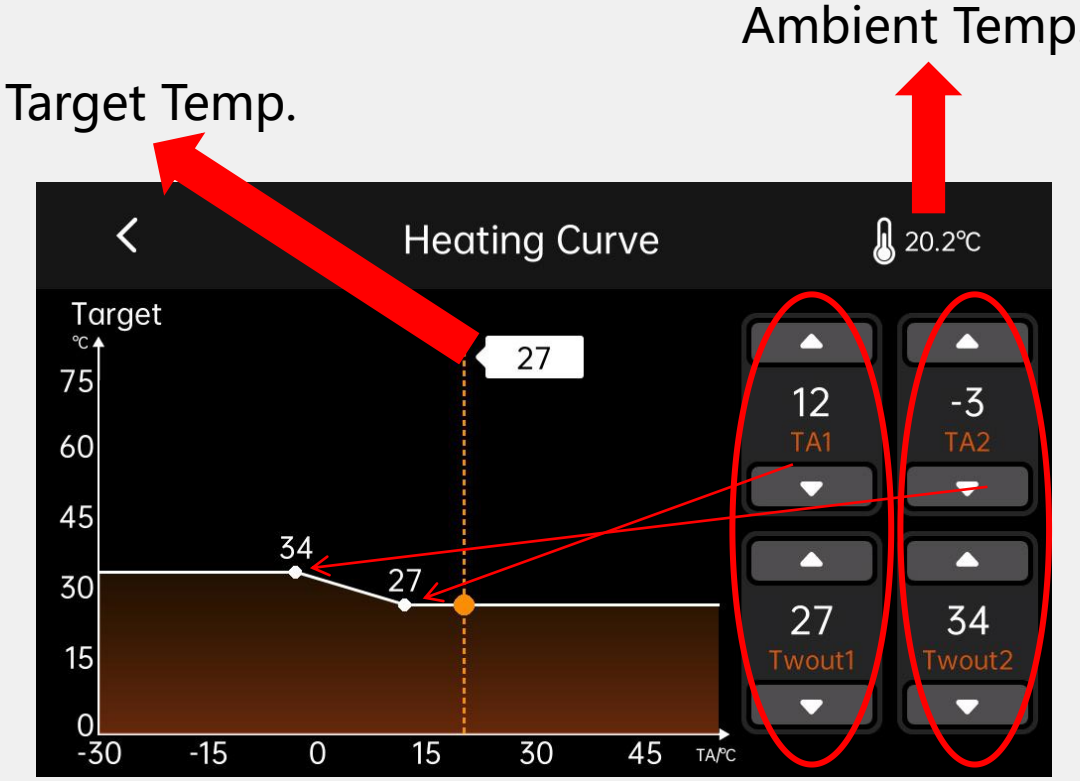
3.4 Logic and Function

AT Compensation Function

Water temperature regulates automatically depending on the outdoor ambient temperature

- 8 standard climate curves for heating/cooling mode to cover common application scenarios.
- 1 customized climate curve(**Curve 9**) for heating/cooling mode to meet diversified requirement.





Curve 9

3.4 Logic and Function

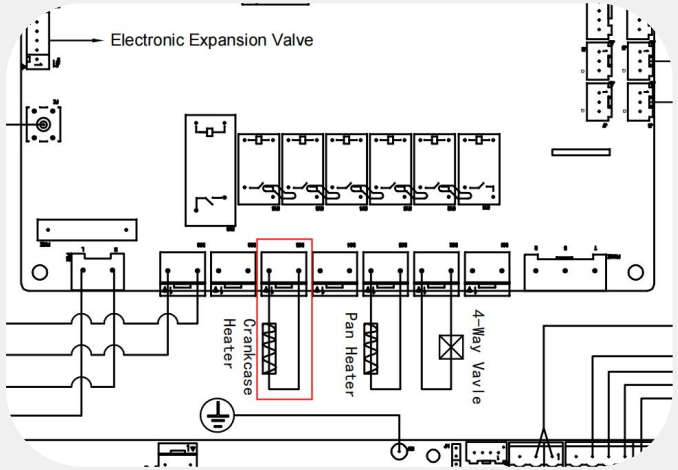
Crankcase heater

If compressor is not running, and the ambient temperature is < [QZH_ON_TA_T] , the unit will turn **on** the crankcase electric heater.

If the compressor is running, or the ambient temperature is ≥ [QZH_OFF_TA_T] , the unit will turn **off** the crankcase electric heater.

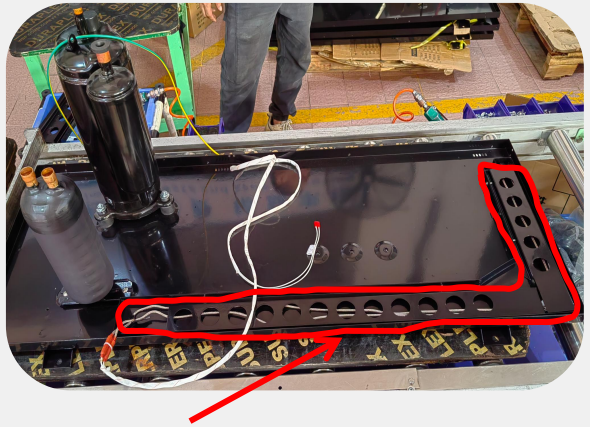
Note: [QZH_ON_TA_T]=12℃
[QZH_OFF_TA_T]=14℃

On 1st winter startup, heat pump runs crankcase heater preheat for ~10–50 min. Only after this cycle will it start normal heating. This operation can protects compressor & extends service life.





3.4 Logic and Function



Bottom heater(Two modes)

Defrost Chassis Electric Heater(Default):
During defrosting:
-If Ambient Temp. ≤ [DPH_ON_TA], the **Bottom** electric heater will turn on.
-If Ambient Temp. > [DPH_ON_TA] + 2, the **Bottom** electric heater will turn off.
After defrosting: The **Bottom** electric heater will turn off after 6min delay.

Low AT Chassis Electric Heater:
When the compressor is running:
- If Ambient Temp. ≤ [DPH_ON_TA], the **Bottom** electric heater will turn on.
- If Ambient Temp. > [DPH_ON_TA] + 2, the **Bottom** electric heater will turn off.
When the compressor is off: The **Bottom** electric heater will turn off after 6min delay.

Note: [DPH_ON_TA]=7℃

3.4 Logic and Function

Anti-freeze protection

When the unit in **standby** and **ambient temp.** < [Atfr.enter.T]

① If heat pump outlet temperature ≤ [Atfr.pump T], the unit will only turn on the main circulation pump.

② If heat pump outlet temperature ≤ [Atfr.Heat T], the unit will turn on the electric heater.

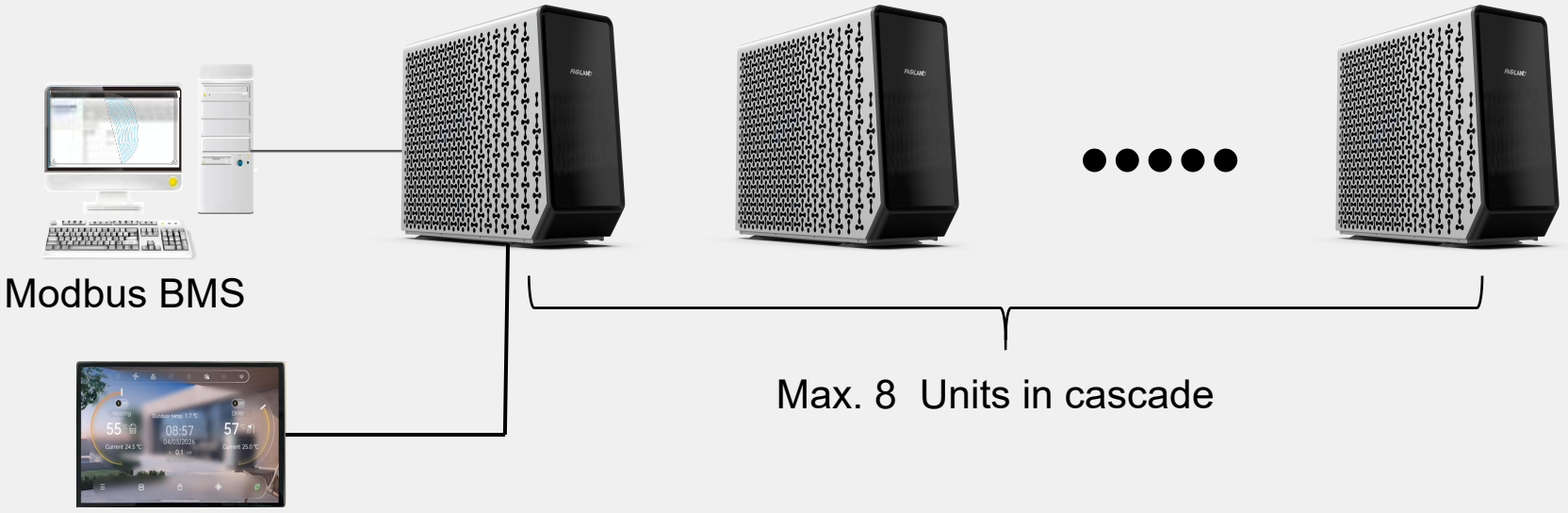
③ If heat pump outlet temperature ≤ [Atfr.comp.T], the unit will run in heating/DHW mode

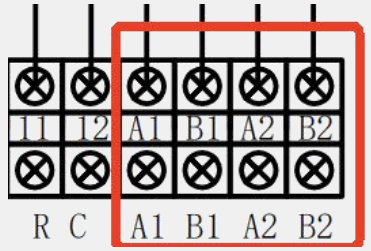
Note: Atfr.enter.T=7℃
[Atfr.pump T]=18℃
[Atfr.Heat T]=12℃
[Atfr.comp.T]=10℃

3.4 Logic and Function

BMS Control and Cascade Function

With MODBUS RTU communication protocol, up to 8 units can be connected to cascade and controlled by BMS(field supplied).





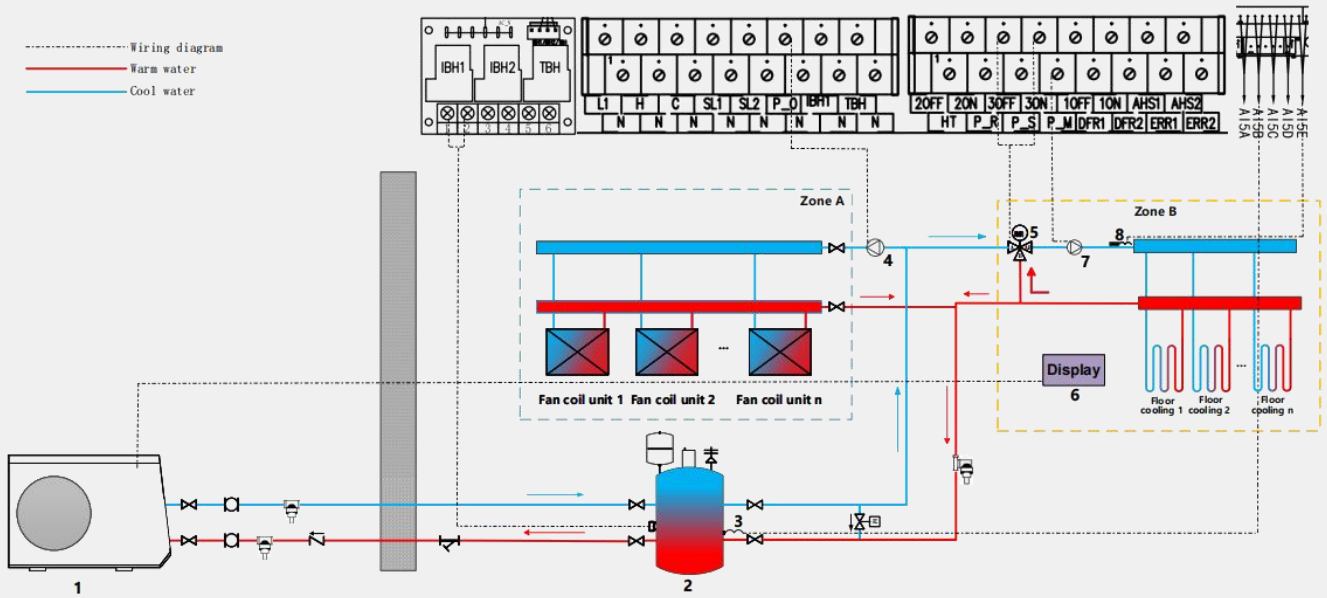
Note:
A1B1 - Cascade
A2B2 - BMS

3.4 Logic and Function

Floor Cooling + Dew Point Temperature Control

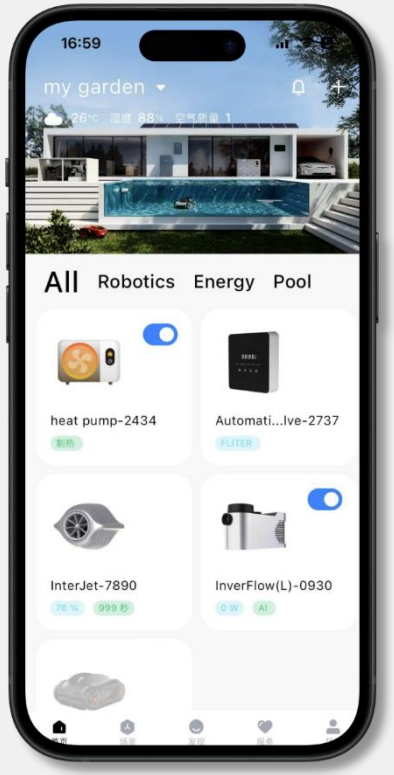
The display has built-in temperature and humidity sensors and supports dew point temperature calculations for floor cooling

Installation Diagram for Two-Zone Cooling Control



Key parts	
1	Heatpump
2	Buffer tank
3	BT Temp.
4	Outside pump
5	Mixing Three-way valve
6	Display
7	Mixing pump
8	Inlet temp. of floor cooling

3.5 APP and IOT Platform



iGarden APP
For user



iGarden Service APP
For installers(**In development**)



AIOT platform
For distributers

3.5 APP and IOT Platform

01

Full Device Integration

iGarden will integrate all categories of devices

02

Scenario Linkage

Collaborate with iGarden's multi-category ecological products to build smart courtyard solutions

03

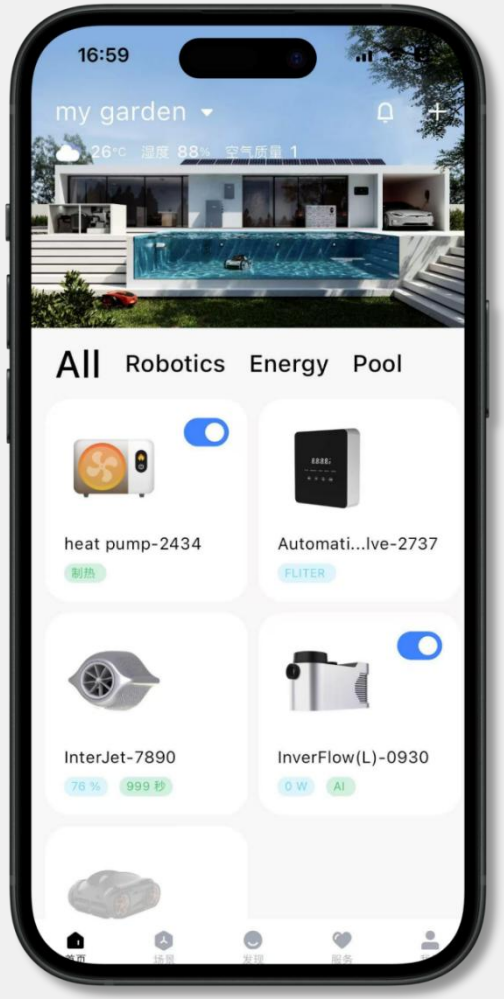
After-Sales Service

Product manuals, guidance videos, and a fully connected after-sales link

04

AI Application

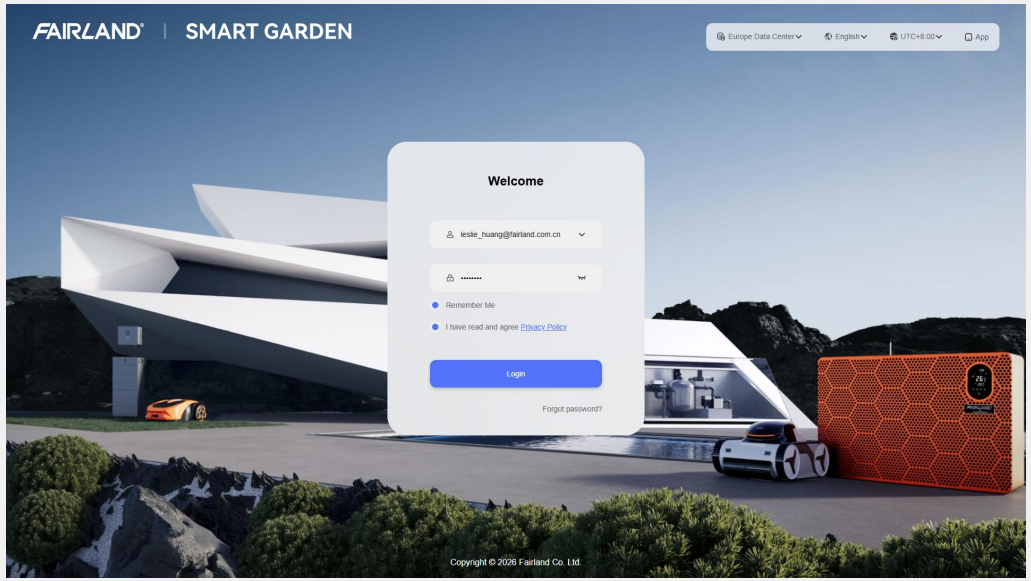
AI voice application that supports device control, weather inquiries, fault solution redirection, etc.

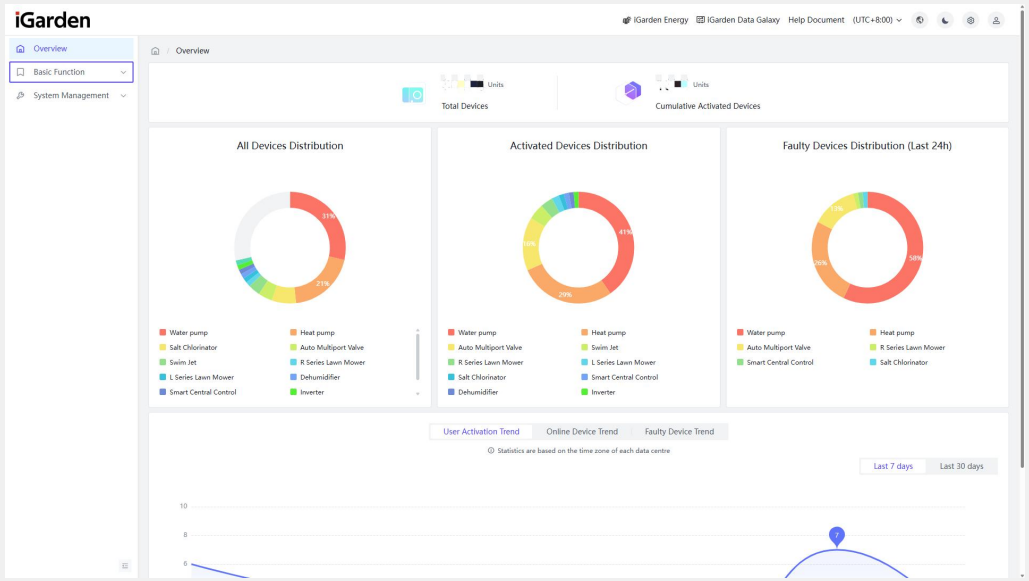


3.5 APP and IOT Platform

IOT Platform

An IoT platform can collect and analyze the operating data of heat pump, achieve remote control and fault check, and protect the normal operation of heat pump.





3.5 APP and IOT Platform

How does AIoT handle privacy and security issues?

AIoT has met the compliance requirements of the General Data Protection Regulation (**GDPR**), which is one of the strictest security and privacy protection standards in Europe and even globally. AIoT has deployed **local data centers in Europe, North America, and China**. All user data is stored locally in the respective regions to ensure data sovereignty and compliance.

What is the difference between AIoT and other companies?

What AIoT provides is not a single module, platform, or App, but a full - link integrated intelligent solution covering device production, sales, after-sales service, platform, and App.

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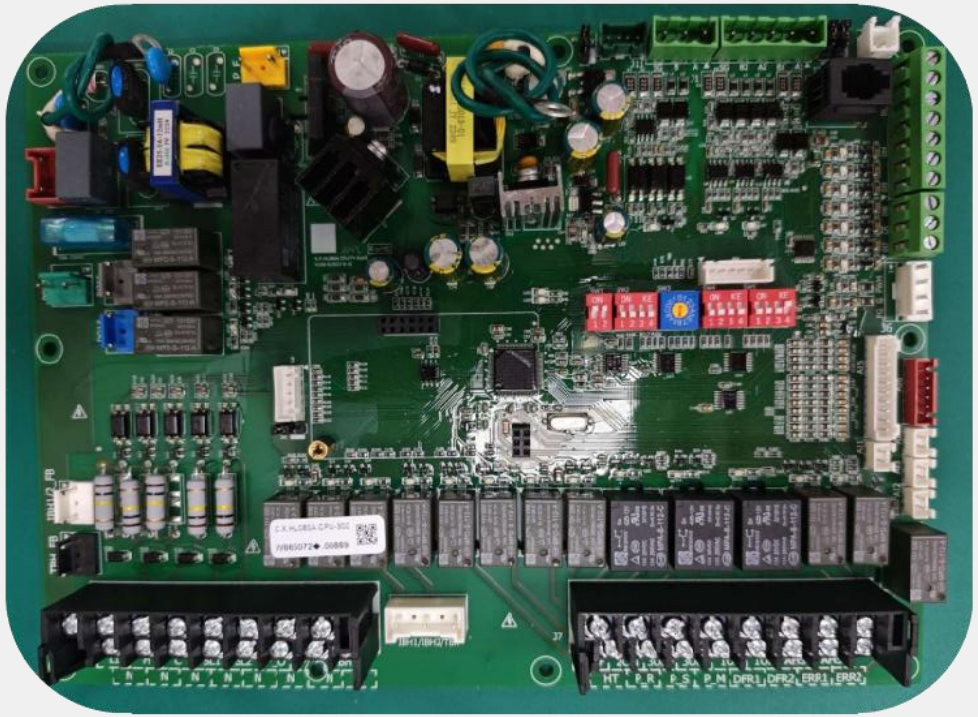
3.6 Software Update

Update PCB by display with SD card

- **Convenient program update**
  Insert the SD card with corresponding program to update expansion board or display program.

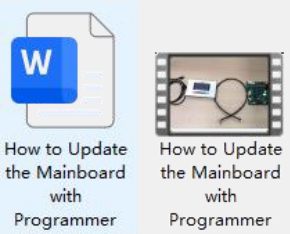


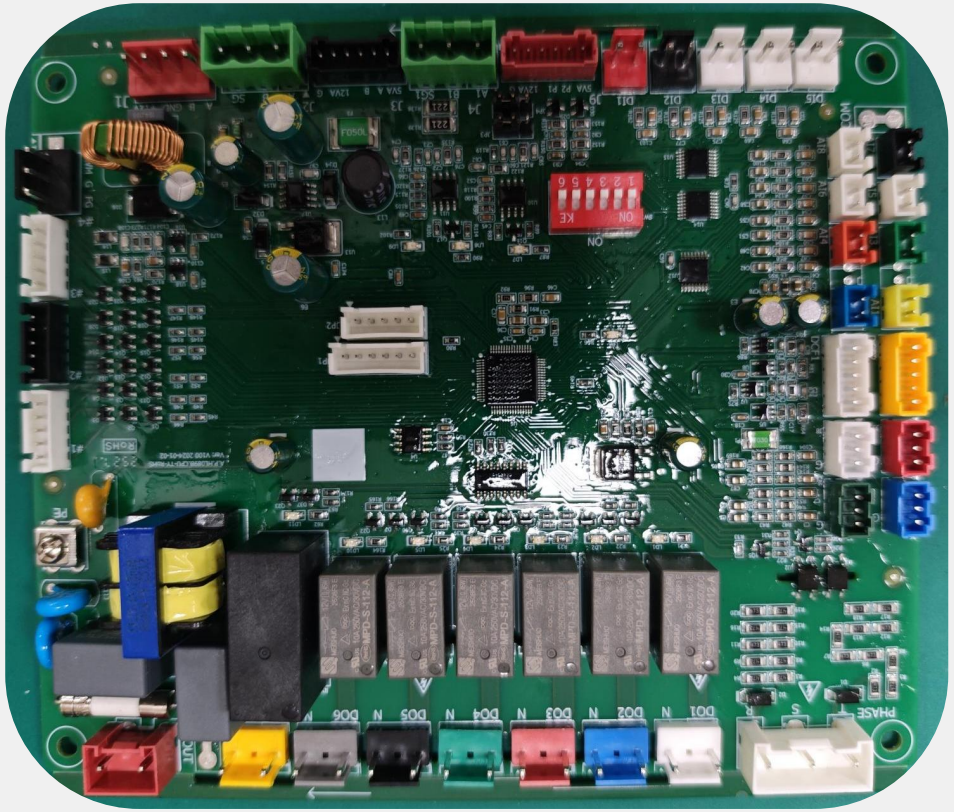


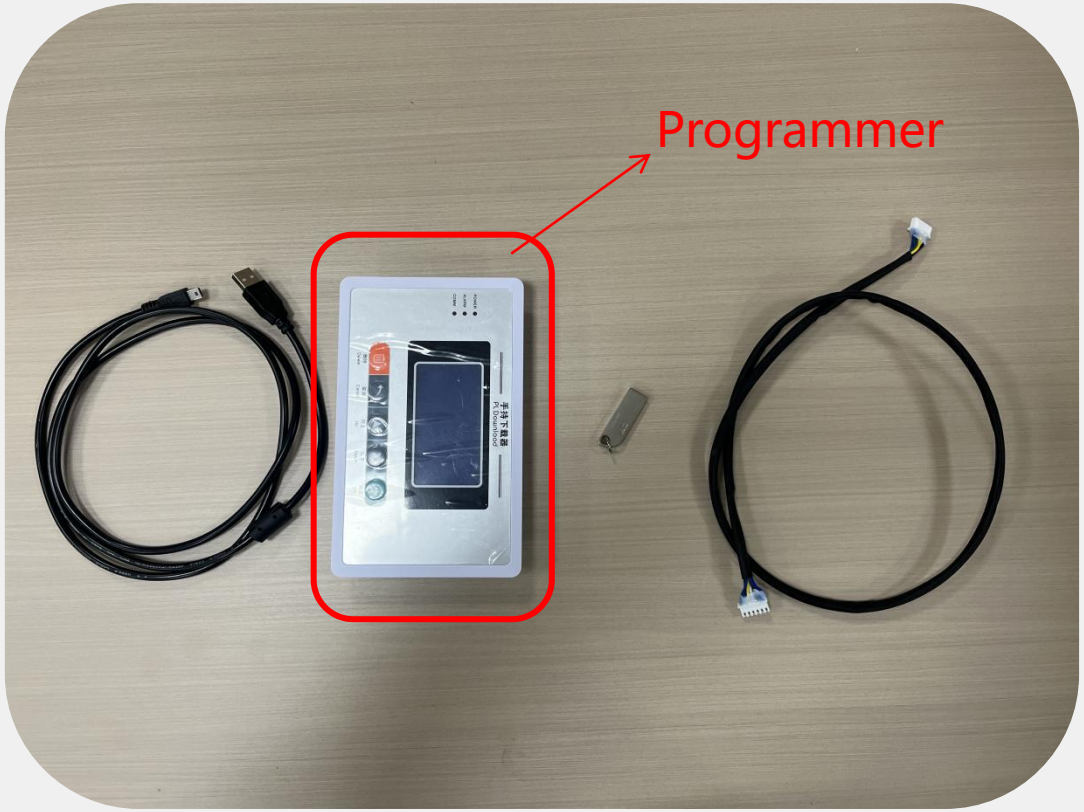


3.6 Software Update

Update PCB by programmer







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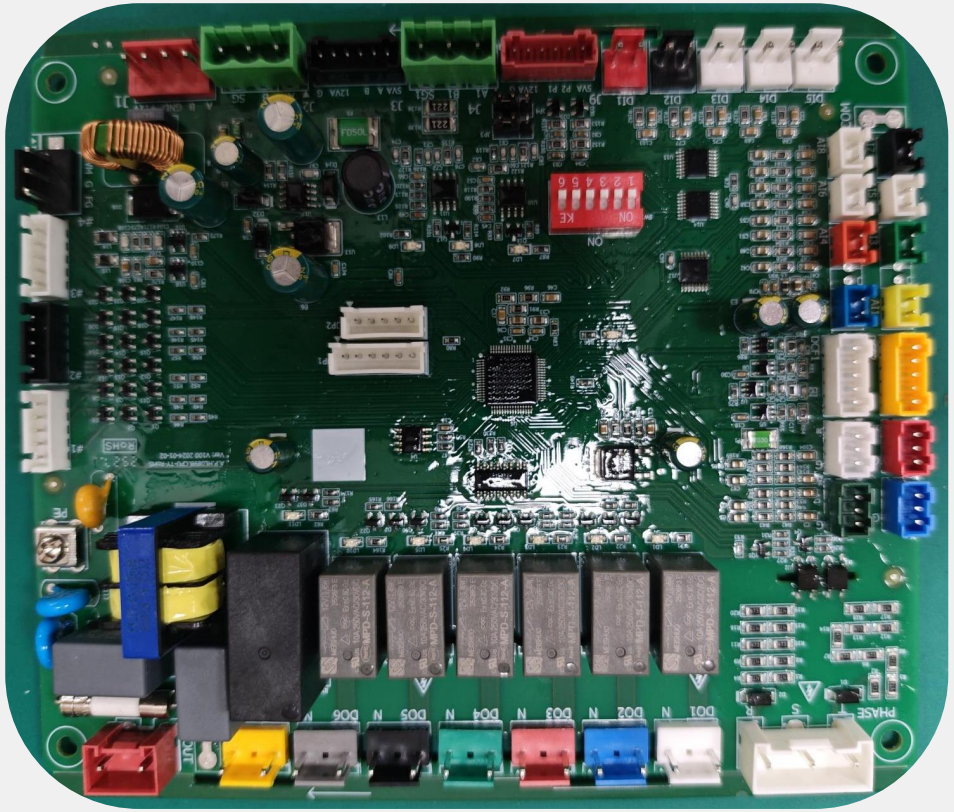
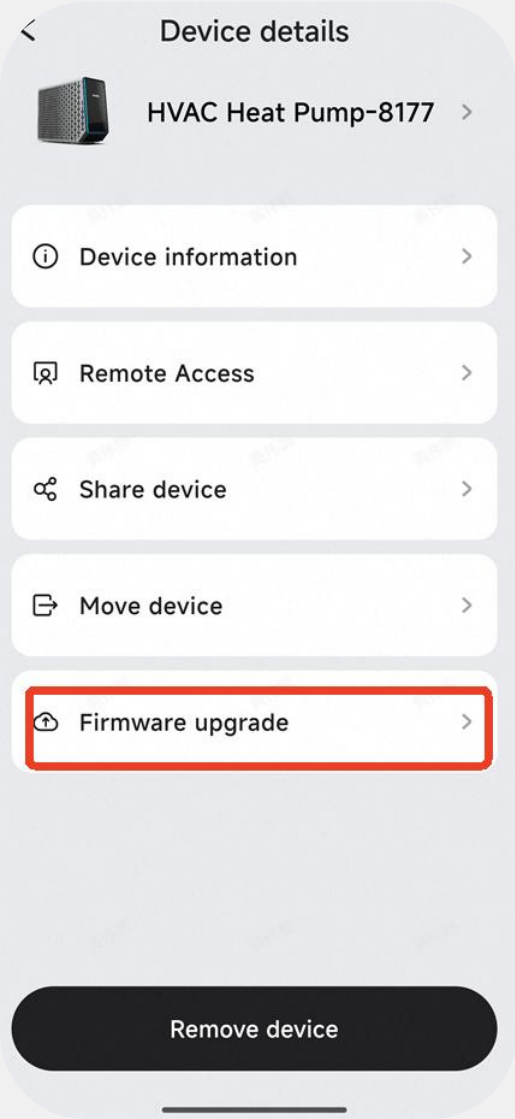
3.6 Software Update

Update PCB by OTA on the APP







4 Installation

4.1 Heat Pump Selection
4.2 Application Installation Diagram
4.3 Installation Notes
4.4 Issue when New Installation

4.1 Heat Pump Selection

Calculate the heating load of building

Factors Affecting Heating Load (Qn)
1) Heat loss through building envelopes, including basic heat loss and additional heat loss;
2) Heat required to warm cold air infiltrating through door and window gaps;
3) Heat required to warm cold air infiltrating through door edges, openings, and adjacent rooms;
.....
$Qn = K \times qn \times S$
Note: Envelope characteristics and cold air infiltration vary across building zones. For greater accuracy, calculations should account for each zone's location (e.g., proximity to exterior walls or windows/doors) and the presence of cold air infiltration through doors/windows.



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4.1 Heat Pump Selection

Confirm the minimum ambient temperature and water temperature requirement

Confirm the unit model based on the performance curve. If the rated capacity of our unit meets the customer's requirements (the previously calculated heat load), it indicates the unit is suitable for the customer. It is advisable to reserve a 10-20% capacity.

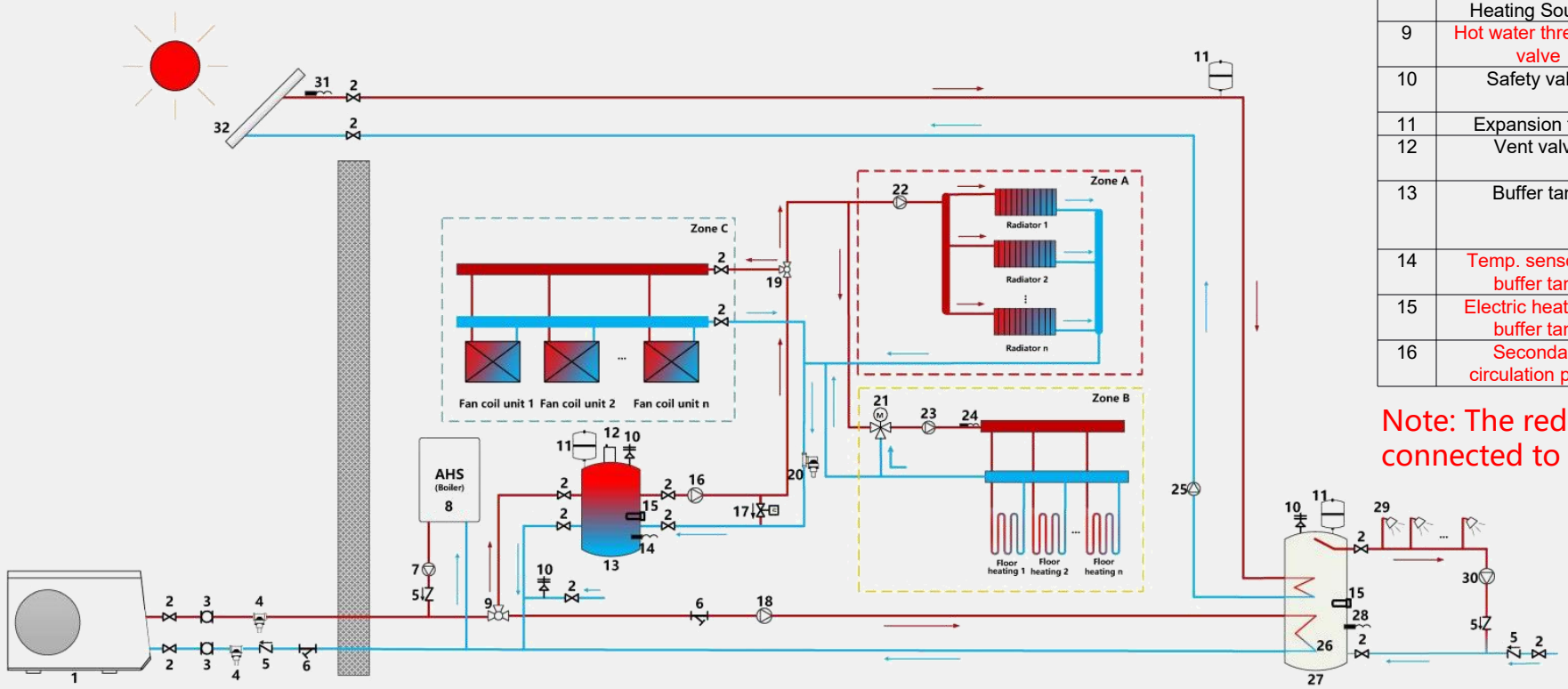
Nominal Heating Capacity (kW)

Ambient temp. / Water outlet(℃)	-25	-20	-15	-10	7	15	25	35	43
35	7.45	9.01	10.21	11.00	11.50	12.35	13.04	14.01	15.33
45	7.02	8.67	9.75	10.20	11.22	12.01	12.55	13.35	14.88
55	6.52	7.73	9.45	10.01	10.87	11.65	12.03	12.74	13.42
65	5.44	7.04	9.03	9.44	10.33	11.12	11.71	12.11	13.05
70	/	6.52	8.15	8.43	9.85	10.37	10.51	/	/
75	/	/	/	7.25	9.03	9.75	/	/	/

COP(kW/kW)

Ambient temp. / Water outlet(℃)	-25	-20	-15	-10	7	15	25	35	43
35	2.31	2.56	2.93	3.05	5.12	6.01	6.85	7.66	8.41
45	1.97	2.07	2.65	2.77	4.09	5.12	5.98	6.53	7.49
55	1.67	1.82	2.41	2.56	3.15	4.03	4.91	5.45	6.37
65	1.26	1.53	1.90	2.01	2.55	2.77	3.35	3.64	4.41
70	/	1.31	1.77	1.78	2.05	2.31	3.02	/	/
75	/	/	/	1.55	1.83	2.07	/	/	/

4.2 Application Installation Diagram



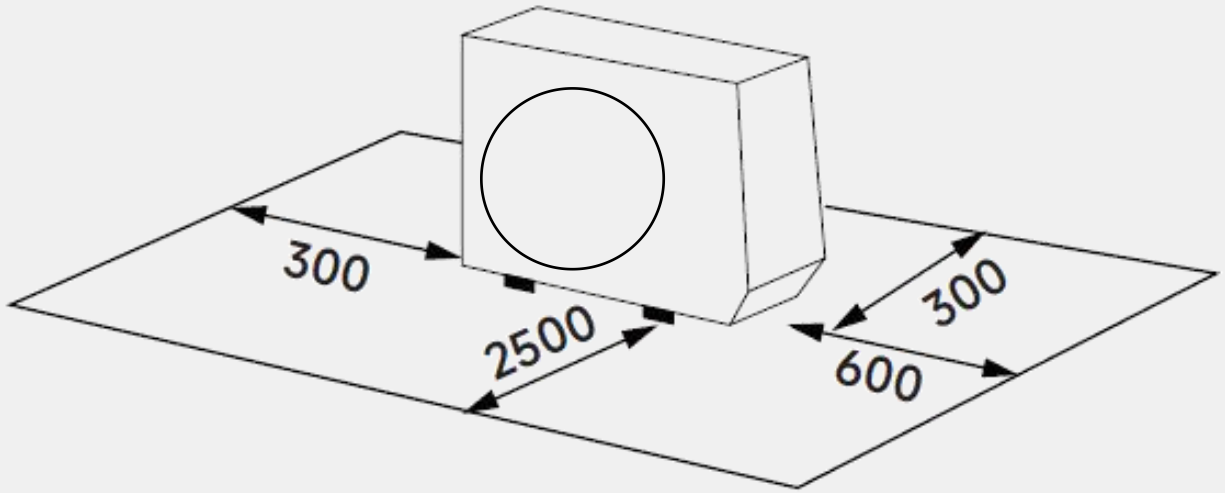
NO.	Item	NO.	Item
1	Heat pump	17	Bypass valve
2	Stop valve	18	Water pump for DHW
3	Flexible pipe	19	Cooling three-way valve
4	Antifreeze valve	20	Magnetic filter
5	Check valve	21	Mixing valve
6	Y-filter	22	Water pump for radiator
7	Water pump for AHS	23	Water pump for floor heating
8	AHS(Auxiliary Heating Source)	24	Temp. sensor for after mixing water outlet
9	Hot water three way valve	25	Water pump for solar heater
10	Safety valve	26	heat exchange coil for hot water tank
11	Expansion tank	27	Hot water tank
12	Vent valve	28	Temp. sensor for hot water tank
13	Buffer tank	29	Domestic hot water, such as for bathrooms, etc.
14	Temp. sensor for buffer tank	30	Return water pump
15	Electric heater for buffer tank	31	Temp. sensor for solar heater
16	Secondary circulation pump	32	Solar heater

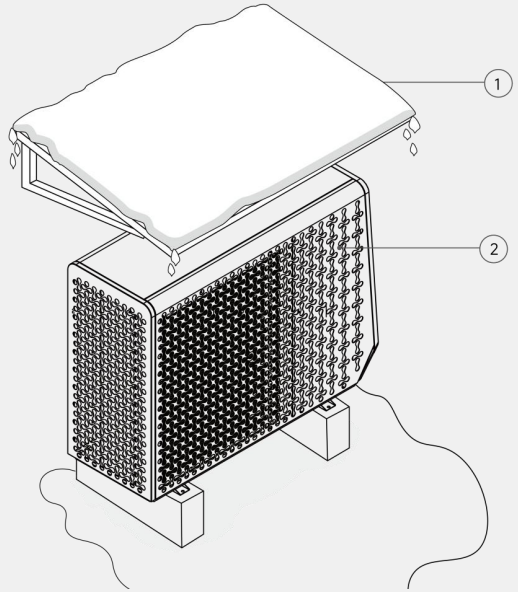
Note: The red components can be connected to the heat pump.

4.3 Installation Notes

Unit Installation-Single

It is recommended to maintain the installation distances shown in the pic. when installing the heat pump

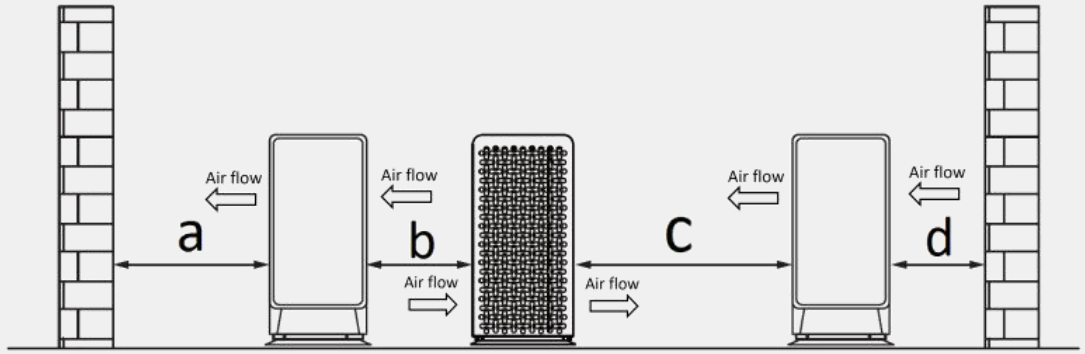


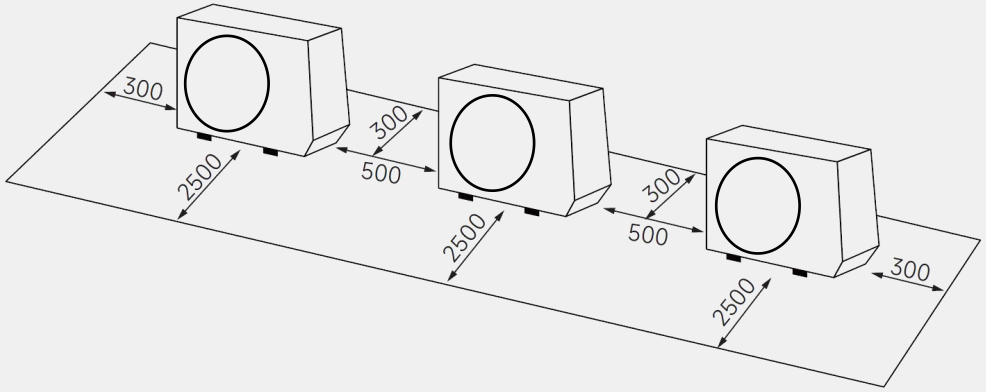


4.3 Installation Notes

Unit Installation-Cascade

It is recommended to maintain the installation distances shown in the pic. when installing the heat pump in cascade





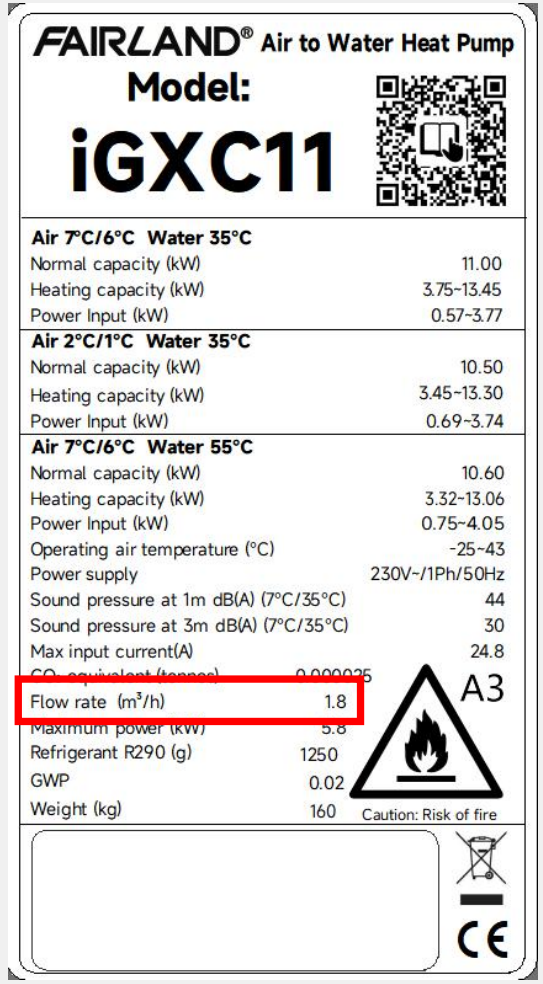
Model	a(mm)	b(mm)	c(mm)	d(mm)
iGXC08	2500	800	5000	300
iGXC11	2500	800	5000	300
iGXC11T	2500	800	5000	300
iGXC13	2500	800	5000	300
iGXC13T	2500	800	5000	300
iGXC16	3000	1000	6000	300

4.3 Installation Notes

Water Flow Rated

Ensure the water flow meets the unit's rated water flow requirement. If not, the unit may be damaged due to long-term operation with insufficient water flow.

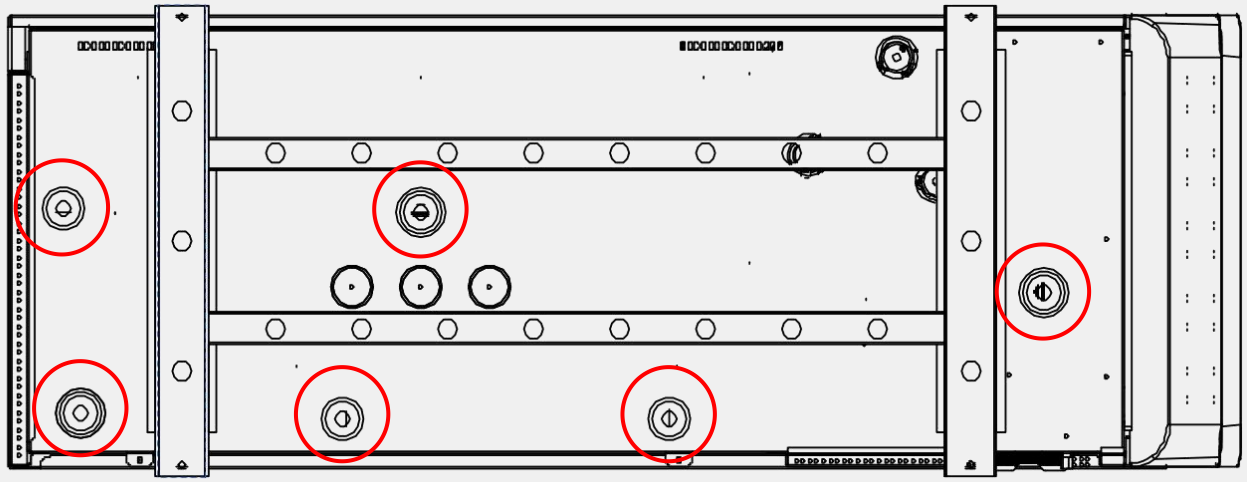
Model	Rated Water Flow Rate	Minimum Water Flow Rate
iGXC08	1.50m³/h	1.05m³/h
iGXC11	1.80m³/h	1.26m³/h
iGXC11T	1.80m³/h	1.26m³/h
iGXC13	2.20m³/h	1.54m³/h
iGXC13T	2.20m³/h	1.54m³/h
iGXC16	3.00m³/h	2.10m³/h
iGXC16T	3.00m³/h	2.10m³/h



4.3 Installation Notes

Rubber plug

If there is no centralized drainage requirement or the local climate is typically cold and humid, we recommend removing all rubber plugs from the bottom panel to prevent condensation water from freezing there.





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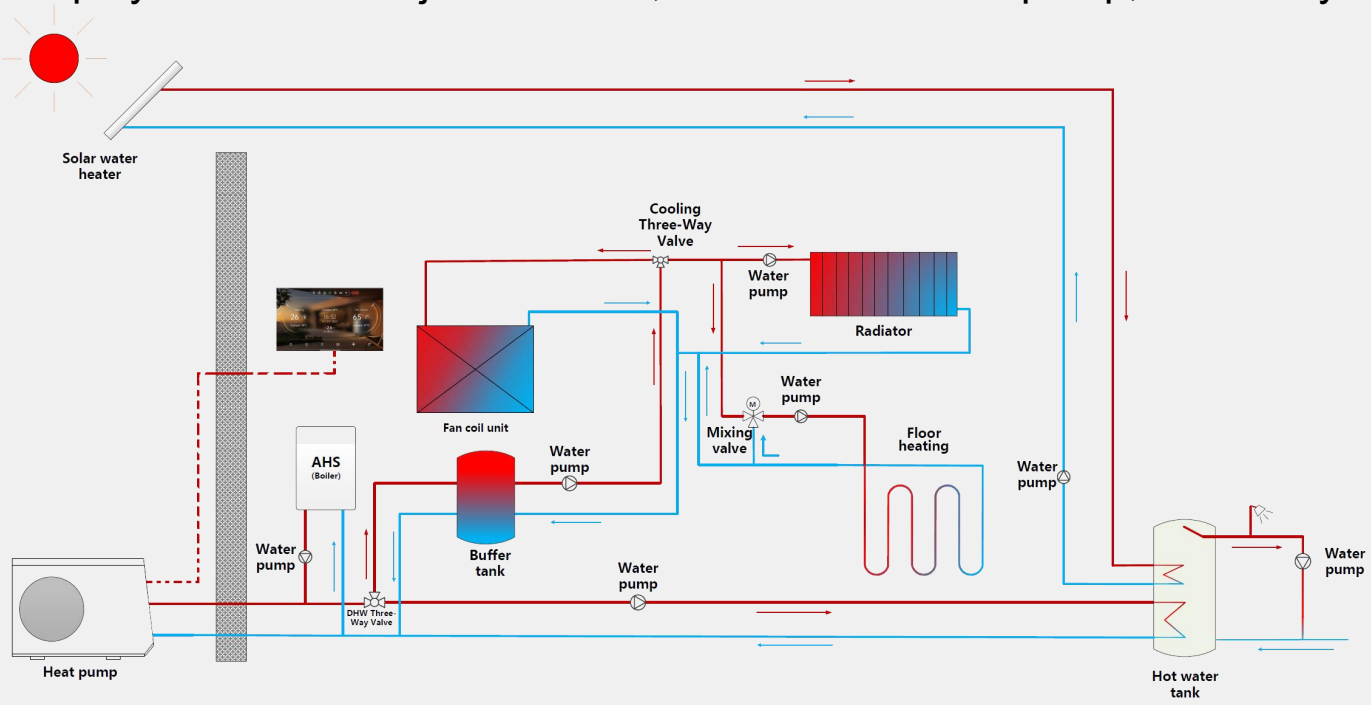
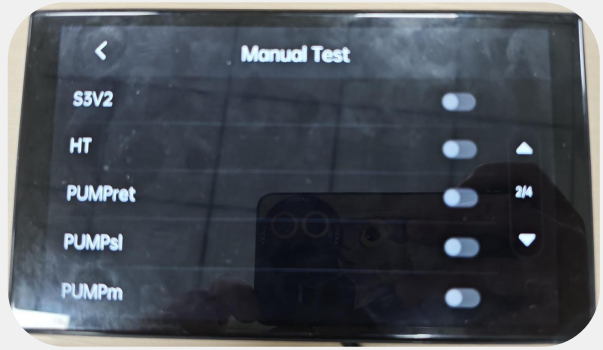
4.3 Installation Notes

Commissioning

After finishing the installation of heat pump, you can use the **manual test function** on the display to test and adjust the load, such as the water pump, three-way valve, etc.



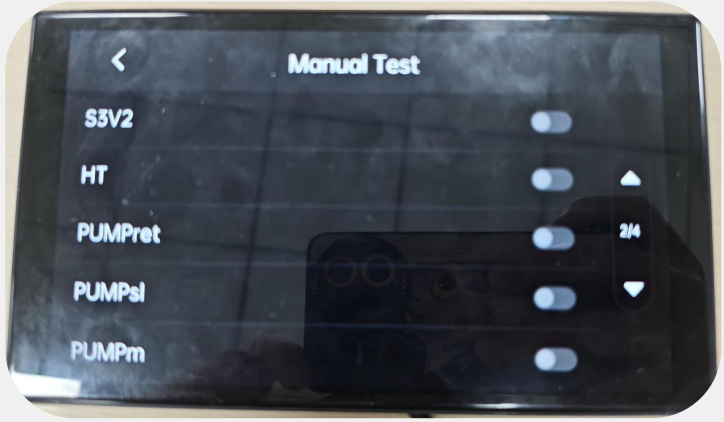


4.4 Issue when New Installation

Water Flow Protection

After a unit is newly installed, there will be a lot of air inside the pipes, water tanks, so it's neccasary to get the air out of the system. Otherwise the water flow will be unstable, and abnormal noise will occur.

Note: you can use the manual test function to activate the water pump for air venting.



4.4 Issue when New Installation

Outlet temp. overheat protection

Due to insufficient water flow, the water temperature rapidly increased within a short time, then triggered the outlet temp. overheat protection.

Note: you need to check whether the water flow is much lower than the rated water flow.

Model	Rated Water Flow Rate	Minimum Water Flow Rate
iGXC08	1.50m³/h	1.05m³/h
iGXC11	1.80m³/h	1.26m³/h
iGXC11T	1.80m³/h	1.26m³/h
iGXC13	2.20m³/h	1.54m³/h
iGXC13T	2.20m³/h	1.54m³/h
iGXC16	3.00m³/h	2.10m³/h
iGXC16T	3.00m³/h	2.10m³/h



5 Troubleshooting

5.1 Issues Without Code
5.2 Issues With Code
5.3 Request Service

5.1 Issues Without Code

1. Unit cannot heating or cooling well

Possible causes	Solution
1.The temperature setting is NOT correct	Check the temperature setting on the remote controller.
2.Mismatch between unit capacity and demand, too small	Re-select the suitable unit
3.Fins are dirty	Clean the evaporator coil
4.Air inlet blocked	Remove any objects blocking air circulation of the unit.

5.1 Issues Without Code

2. The water system is making noises

Possible causes	Solution
1.There is air in the system.	Vent air from the system.
2.Valves in the water system are not fully open	Check all valves to ensure they are fully open
3.Water filter dirty or block	Clean the water filter

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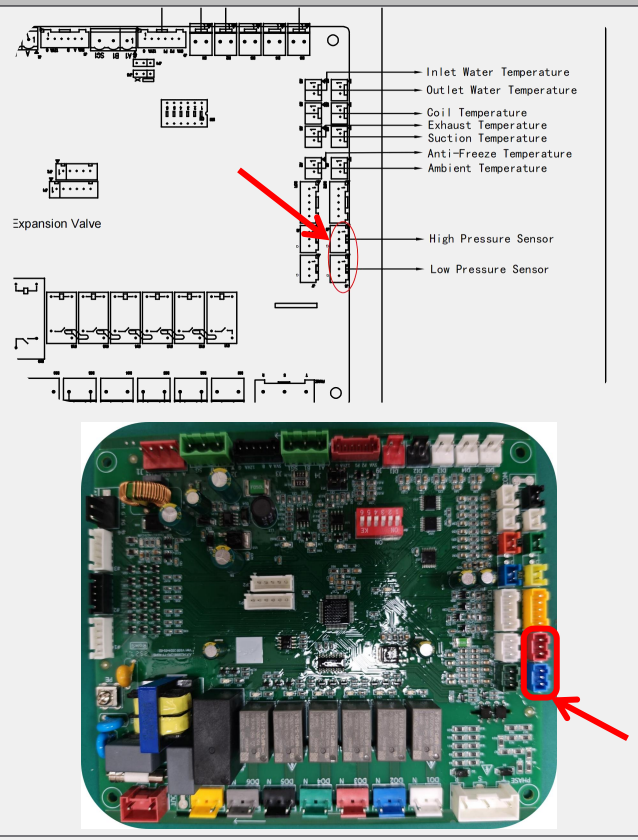
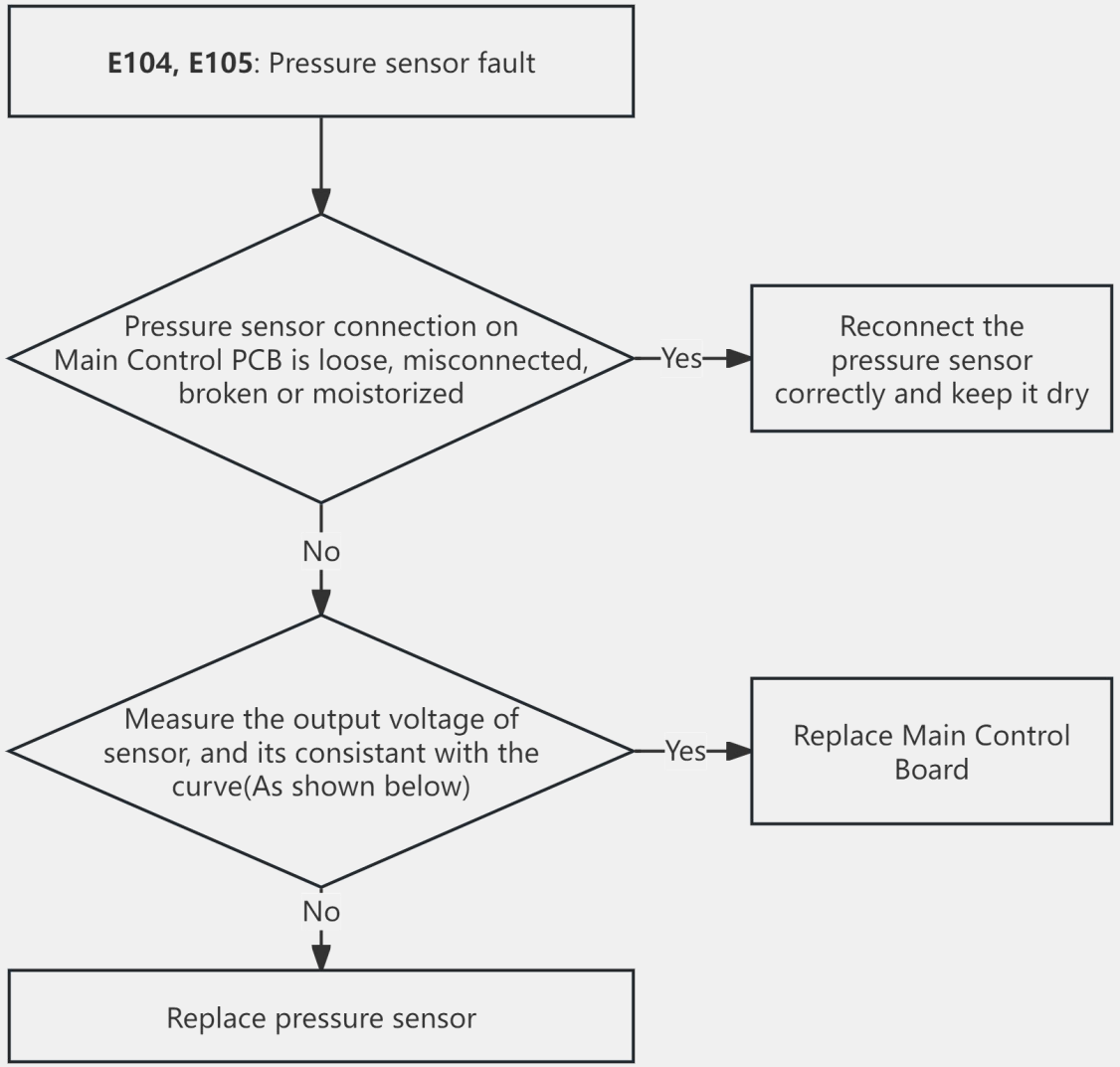
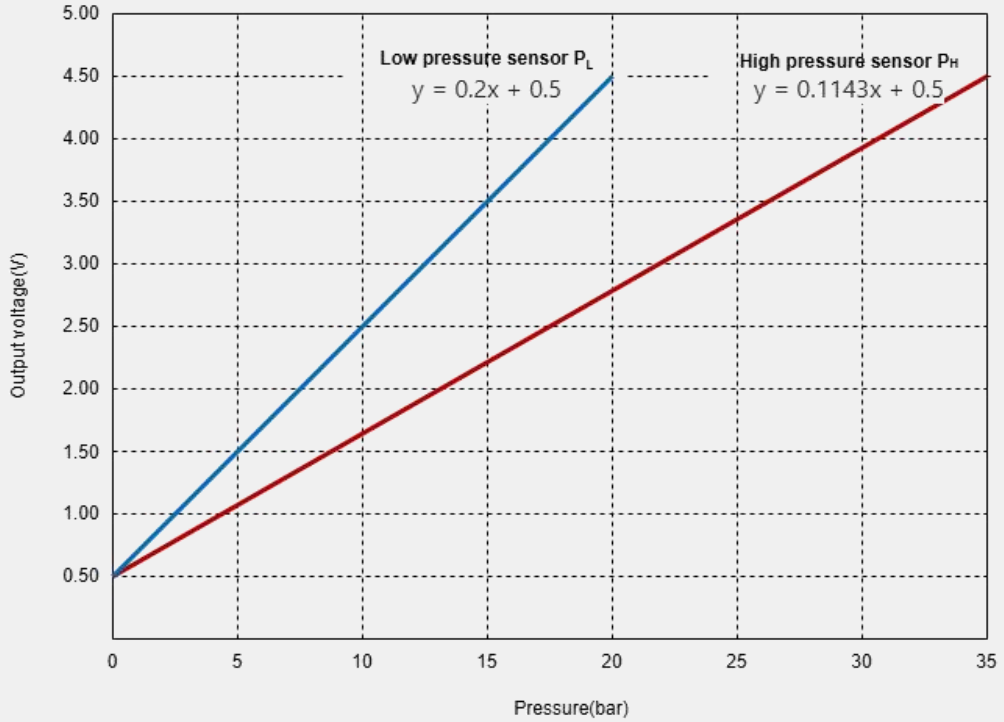
5.2 Issues With Code-E104,E105

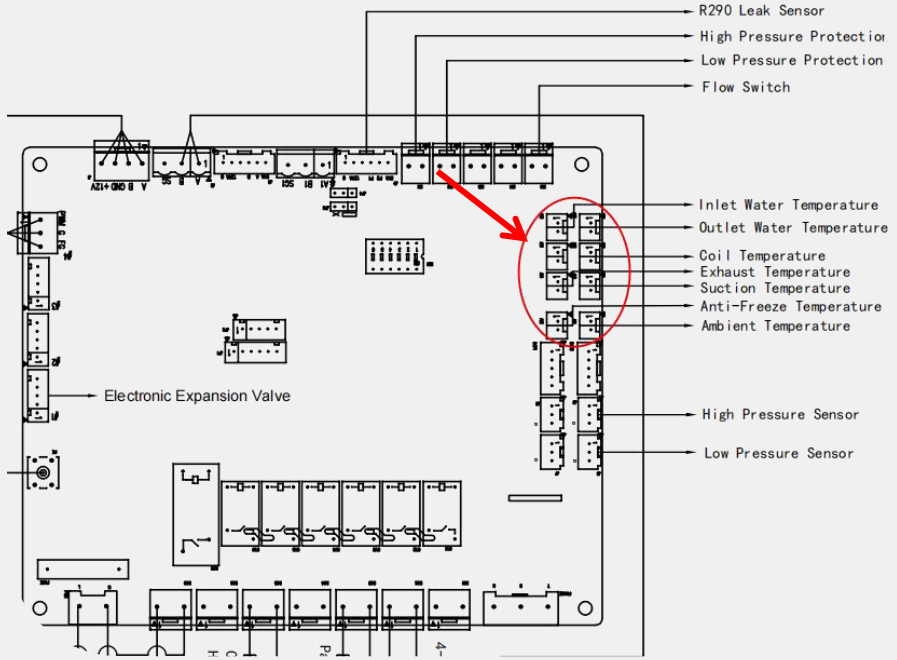
Error code	Description	Port	Location (Main Control PCB)
E104	High Pressure Sensor Fault	J5	
E105	Low Pressure Sensor Fault	J6	

5.2 Issues With Code

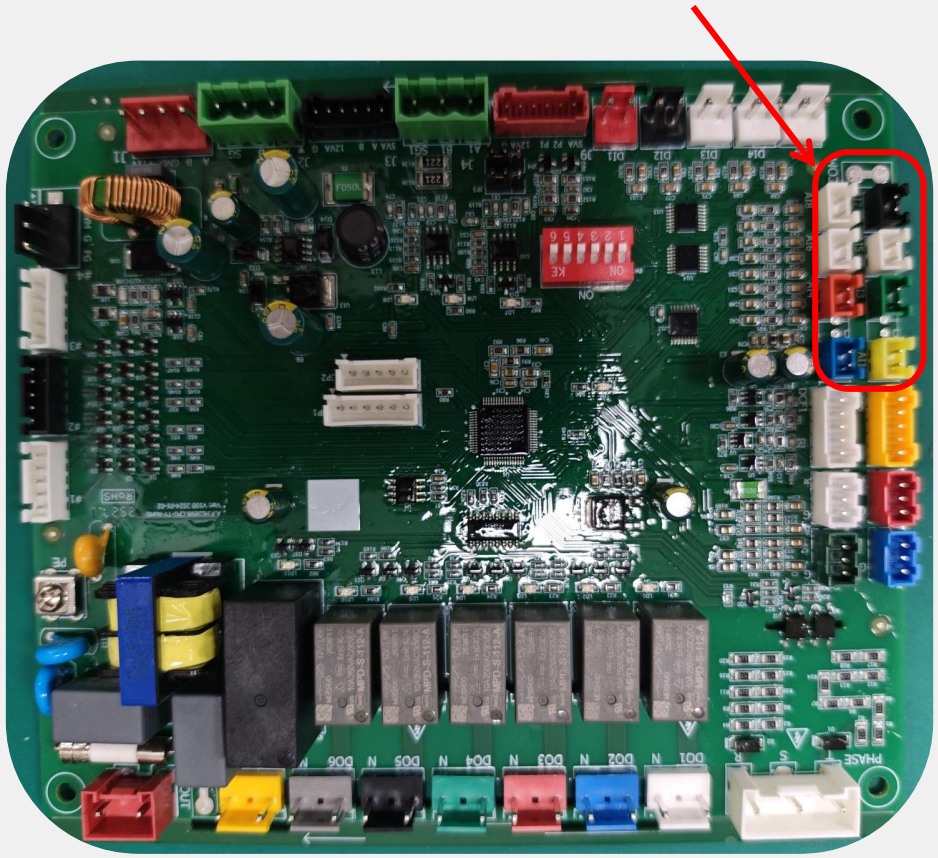




5.2 Issues With Code-E101/2/8/9,E161/8,E171

Error code	Description	Port	Location (Main Control PCB)
E101	Coil Temp. Sensor Fault	AI5	
E102	Exhaust Temp. Sensor Fault	AI4	
E108	Suction Temp. Sensor Fault	AI3	
E109	Anti-freeze Temp. Sensor Fault	AI2	
E161	Ambient Temp. Sensor Fault	AI1	
E168	Plate Heat Exchanger Outlet Temp. Sensor Fault	AI7	
E171	Plate Heat Exchanger Inlet Temp. Sensor Fault	AI8	

5.2 Issues With Code



E101, E102, E108, E109, E161, E168, E171:
Temperature sensor fault

Temperature sensor connection on Main Control Board is loose, misconnected, broken or moistorized

Yes → Reconnect the temperature sensor correctly and keep it dry

No

Pull out temperature sensor, measure the resistance and comprare it with sensor's resistance table, If the resistance is not consistent, the sensor has failed.

Yes → Replace the sensor and it will be back to normal automatically

No

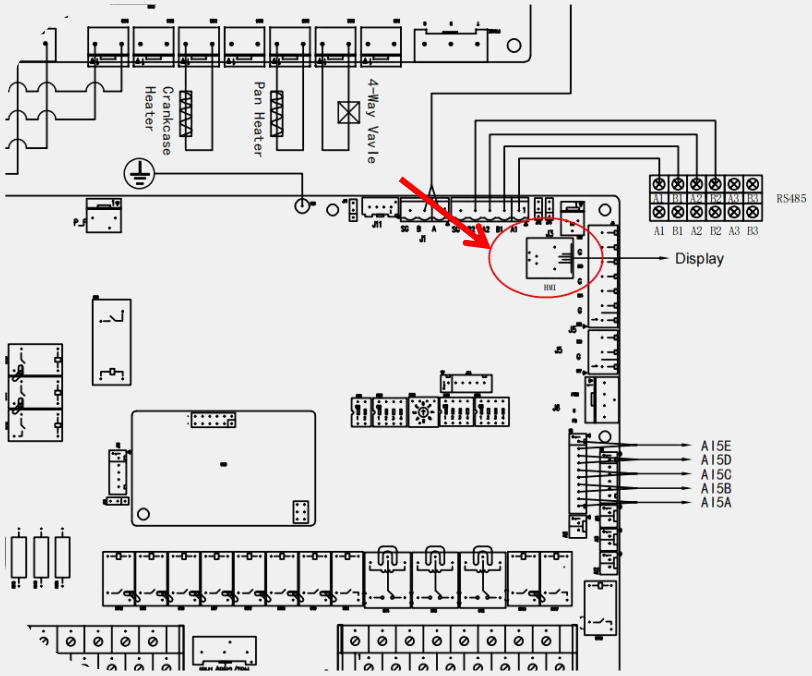
Check the fixed position of the sensor, and the sensor probe falls off

Yes → Refix the sensor firmly to the installation position

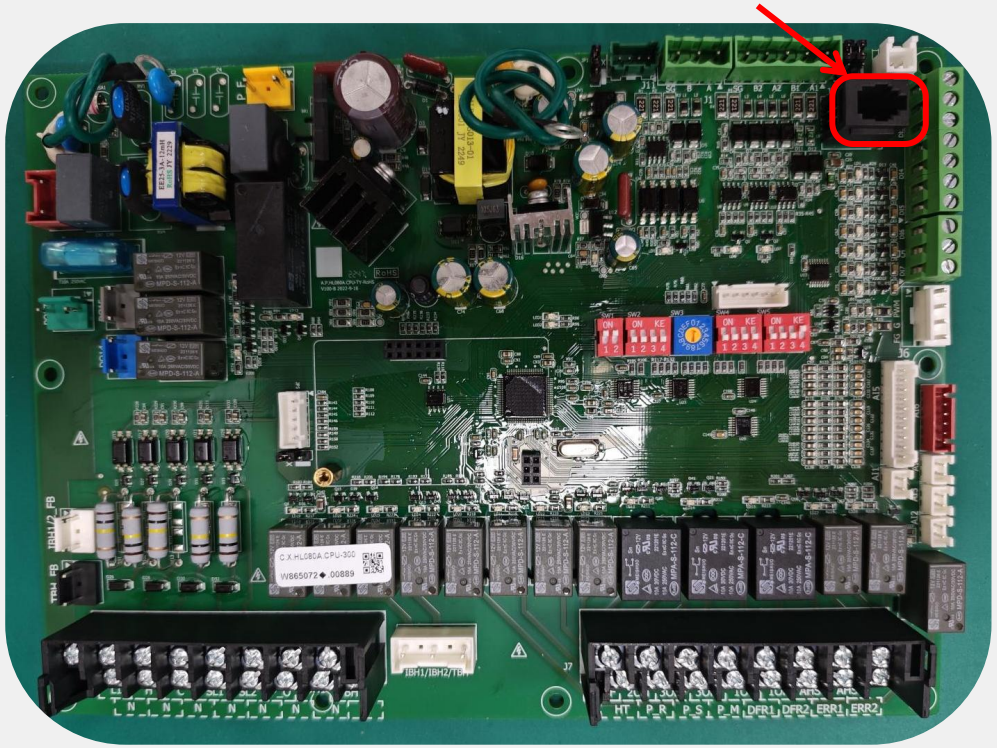
No

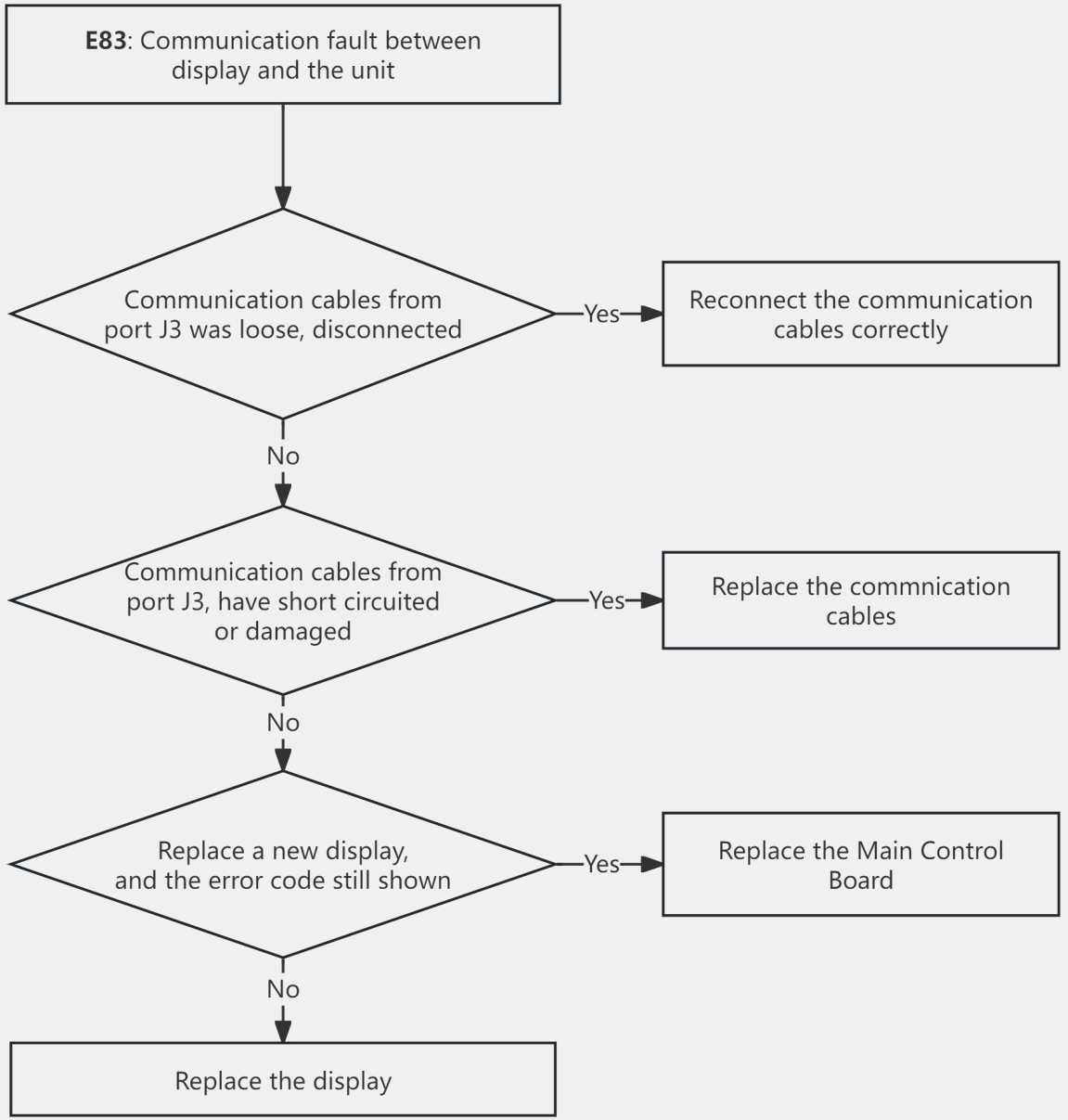
Replace Main Control Board

5.2 Issues With Code-E83

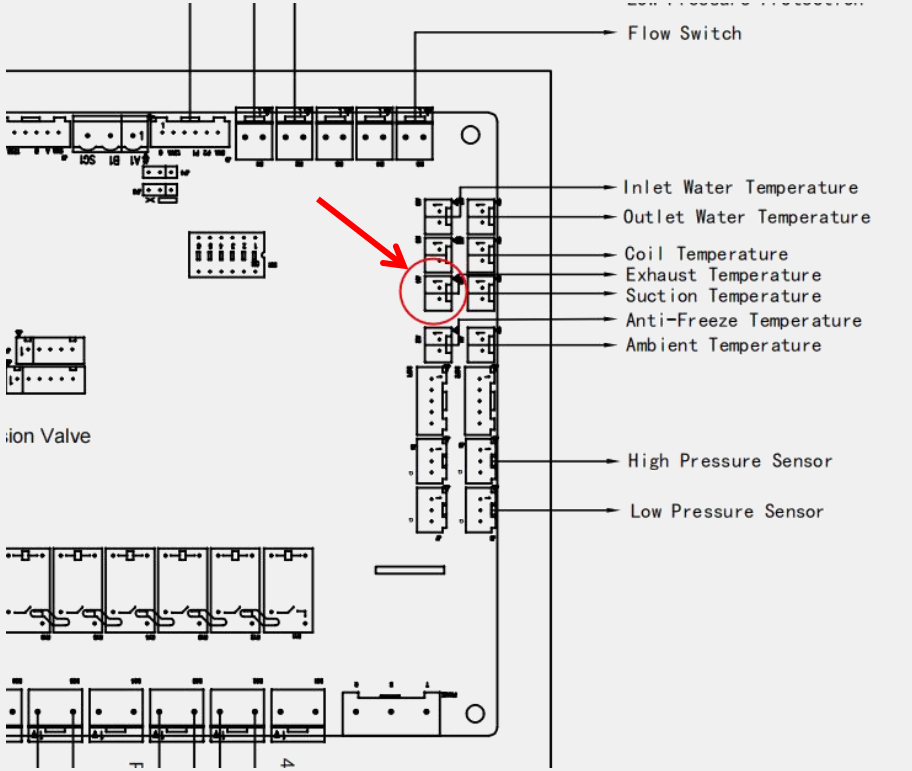
Error code		E83
Description		Communication fault between display and Main Control Board
Triggering		Main Control Board side: Communication failure with display lasts 2 min Display side: No communication reply from Main Control PCB for 1 min
Relative ports and locations	J3	

5.2 Issues With Code

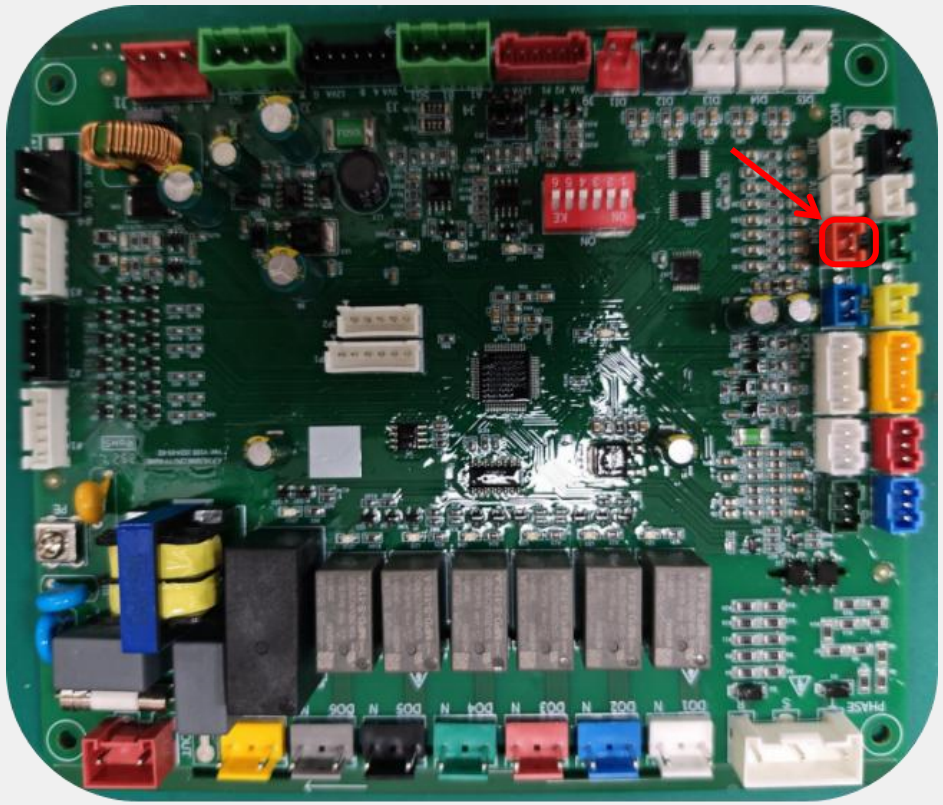




5.2 Issues With Code-E103

Error code		E103
Description		The protection for overheat exhaust temperature of Compressor
Triggering		The Main Control PCB detected that the compressor exhaust temperature was≥110℃
Relative ports and locations	AI4	

5.2 Issues With Code



E103: Exhaust Temp. Overheat Protection

Pull out exhaust temperature sensor from compressure fixed sleeve, leave it in the air for 10 mins, check if the temperature difference between sensor and air is greater than 5℃, or the measured resistance does not match the resistance table

Yes → Replace exhaust temperature sensor

No

Check whether outlet temp./inlet temp. sensor felt out from installation port, or the detected temperature was obviously lower than the actual temperature.

Yes → Install the outlet temp./inlet temp. sensor back to the installation port, so they can detect the actual temperature

No

Check the high pressure value on the display, compare it with the reference value in Discharge/Suction pressure and temperature range, and whether the parameter on the display is lower than the one in strandard

Yes → Refrigerant leakage. Please contact professionals to identify the leak position, vacuum and refill the refrigerant according to the nameplate.

No

Request aftersales service

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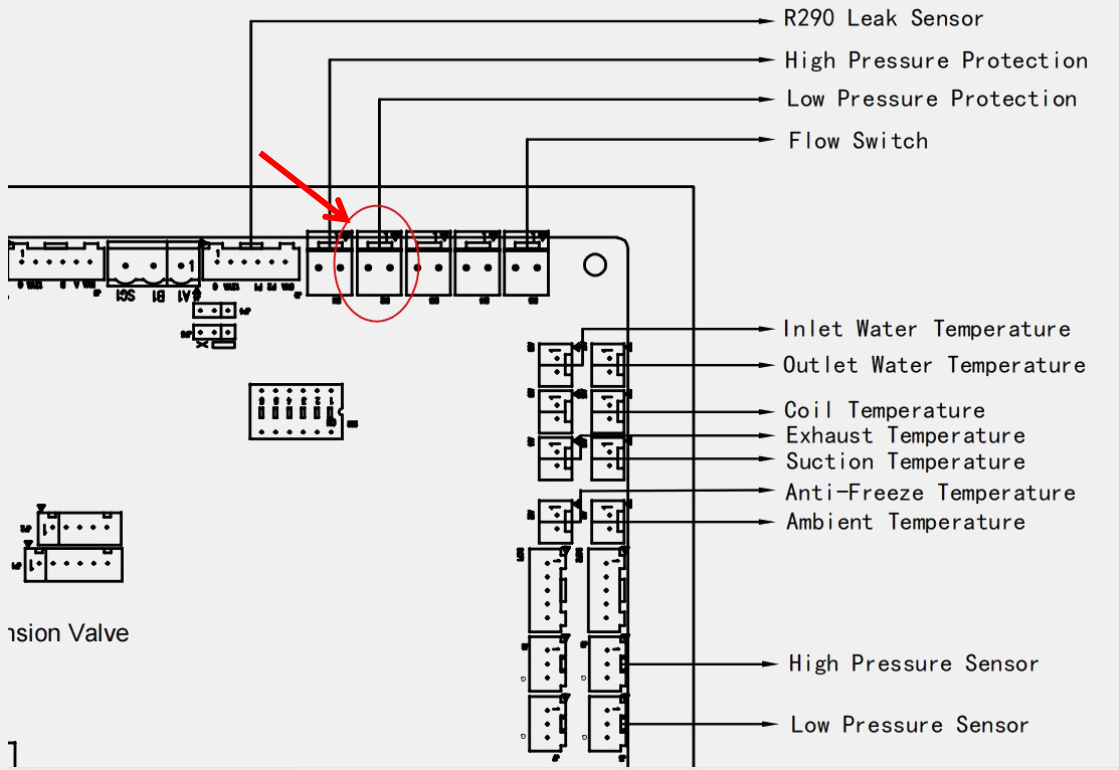
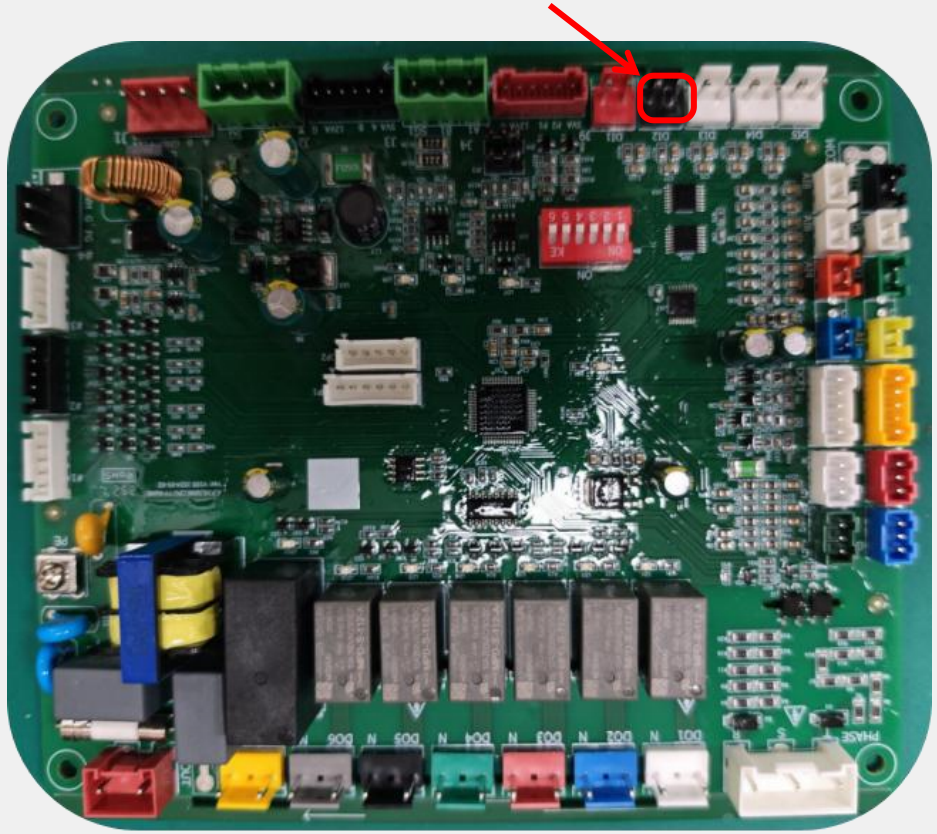
5.2 Issues With Code-E106

Error code		E106
Description		Low pressure protection
Triggering		The Main Control Board detected that the low pressure switch has been triggered.
Relative ports and locations	DI2	

5.2 Issues With Code



E106: Low pressure protection

Check whether the low-pressure switch wiring is normal
- No → Correct the wiring
- Yes ↓

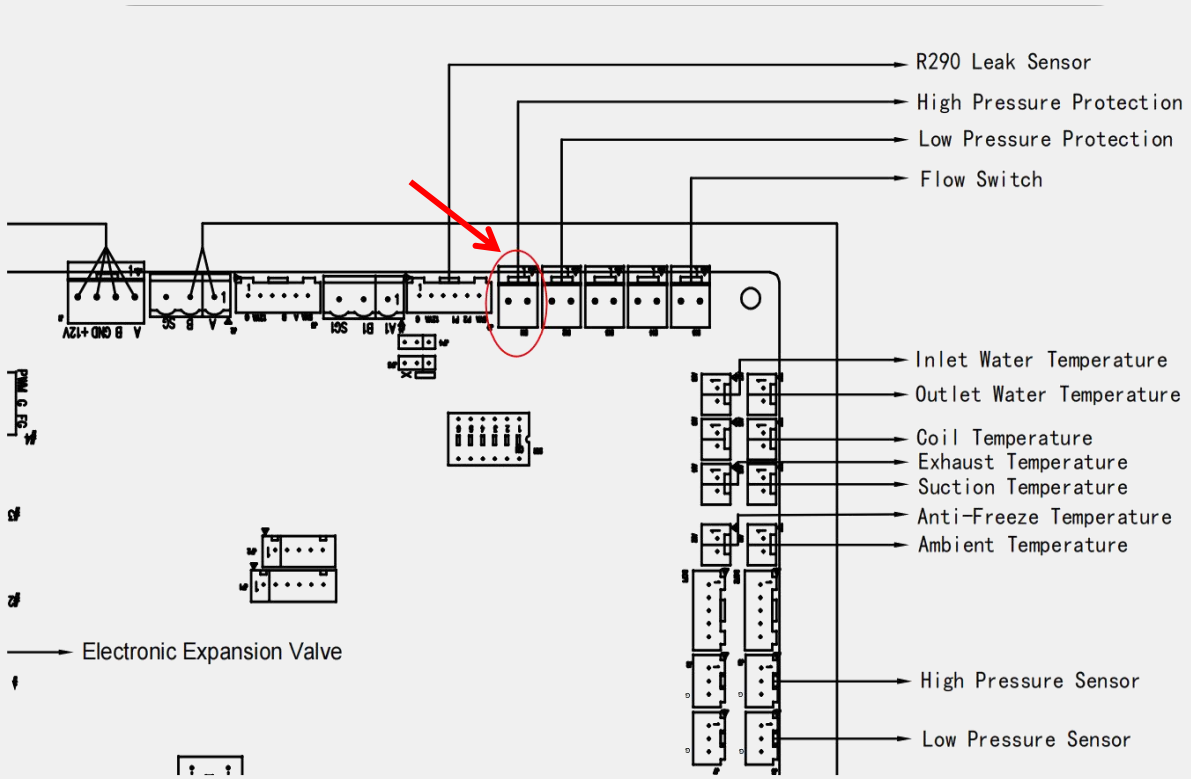
Use a multimeter to test whether the low-pressure switch is functioning properly.
- No → Replace with a new low-pressure switch
- Yes ↓

The unit was installed in a site that is narrow, with bad ventilation, or with thick snow or ice. Or the finned heat exchanger was blocked by dirty.
- Yes → Place the unit somewhere broad, with good ventilation, or without thick snow or ice. Make sure the heat exchanger be not blocked.
- No ↓

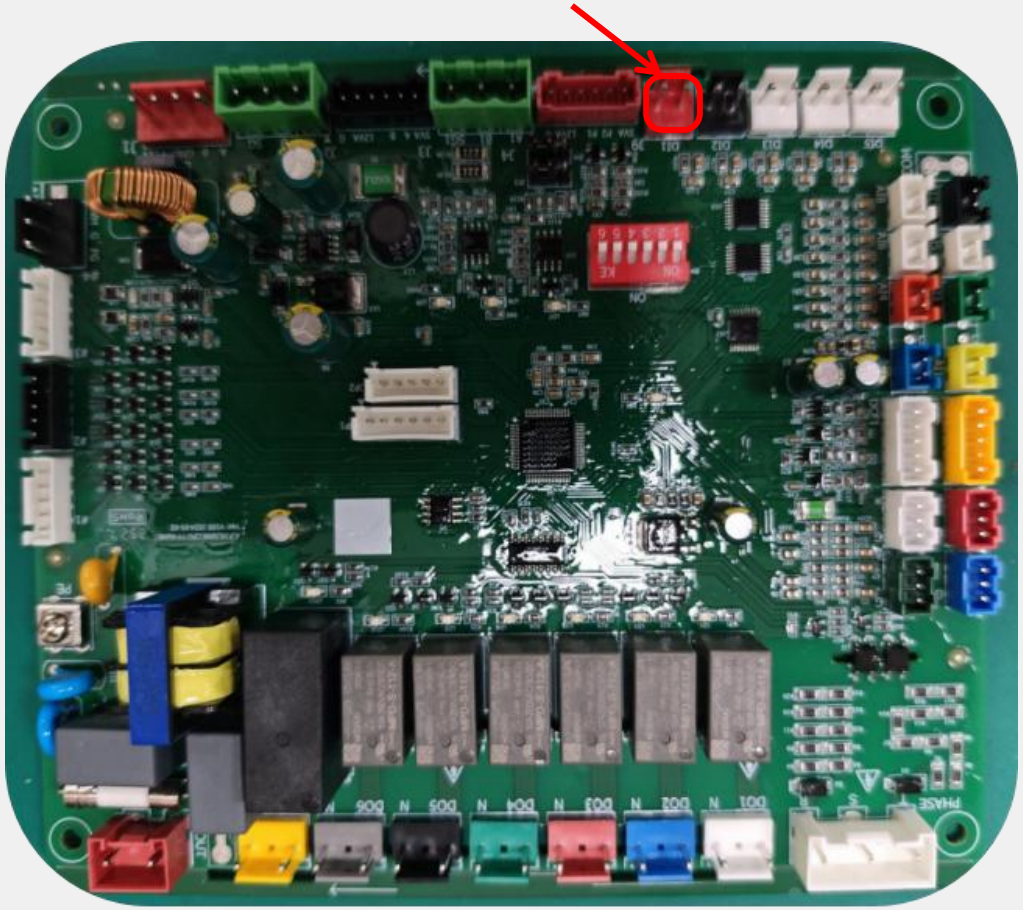
Repower the unit, hold the electronic expansion valve coil to feel whether it is working,listen the "Click" sound when the valve turn on/off.
- No → Request aftersales service to re-clean the unit, and recharge the refrigerant
- Yes ↓

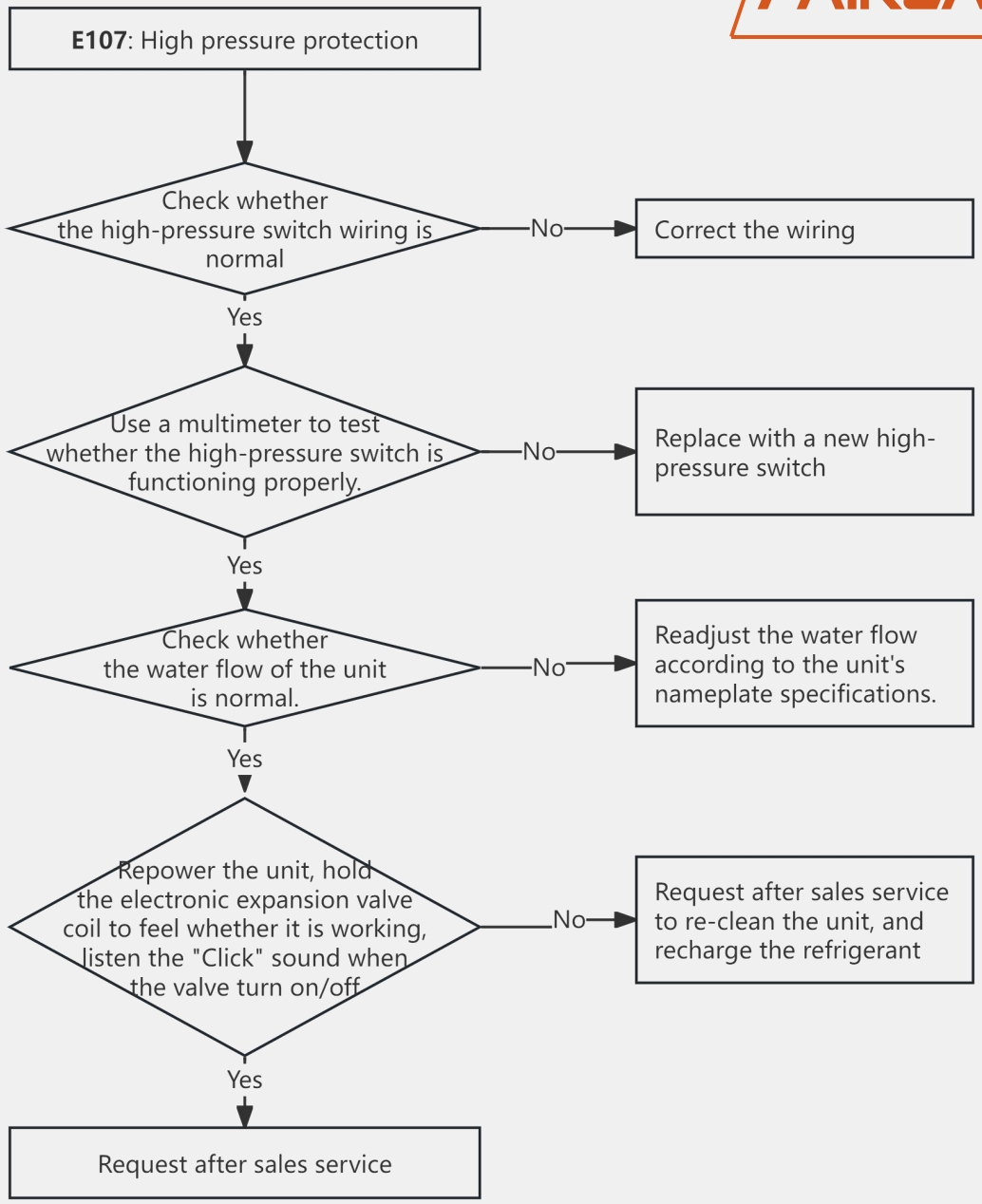
Request aftersales service

5.2 Issues With Code-E107

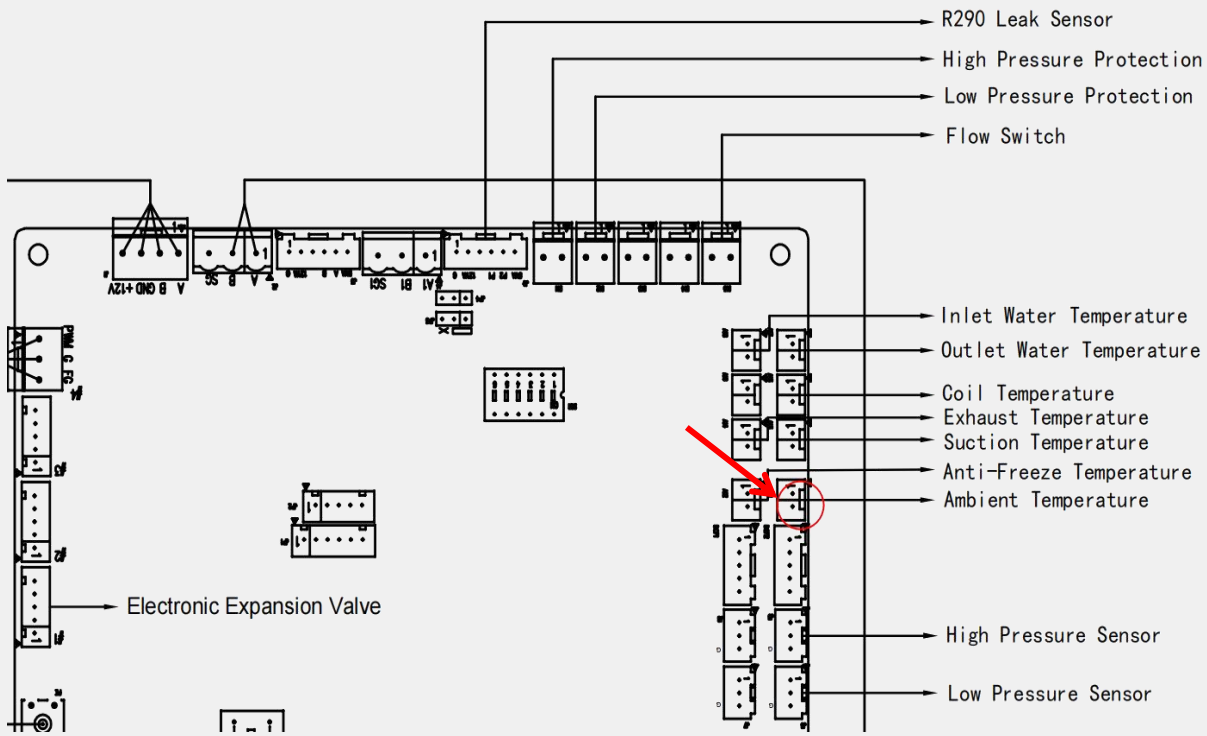
Error code		E107
Description		High pressure protection
Triggering		The Main Control Board detected that the high pressure switch has been triggered.
Relative ports and locations	DI1	

5.2 Issues With Code

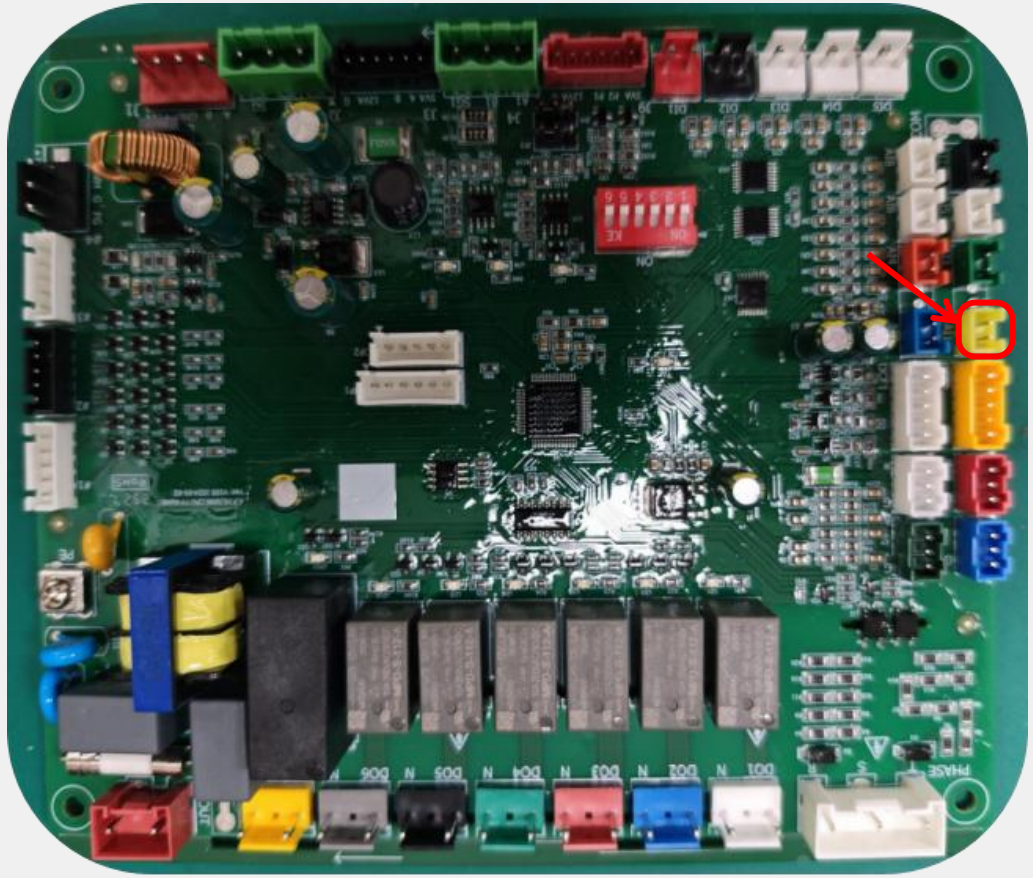


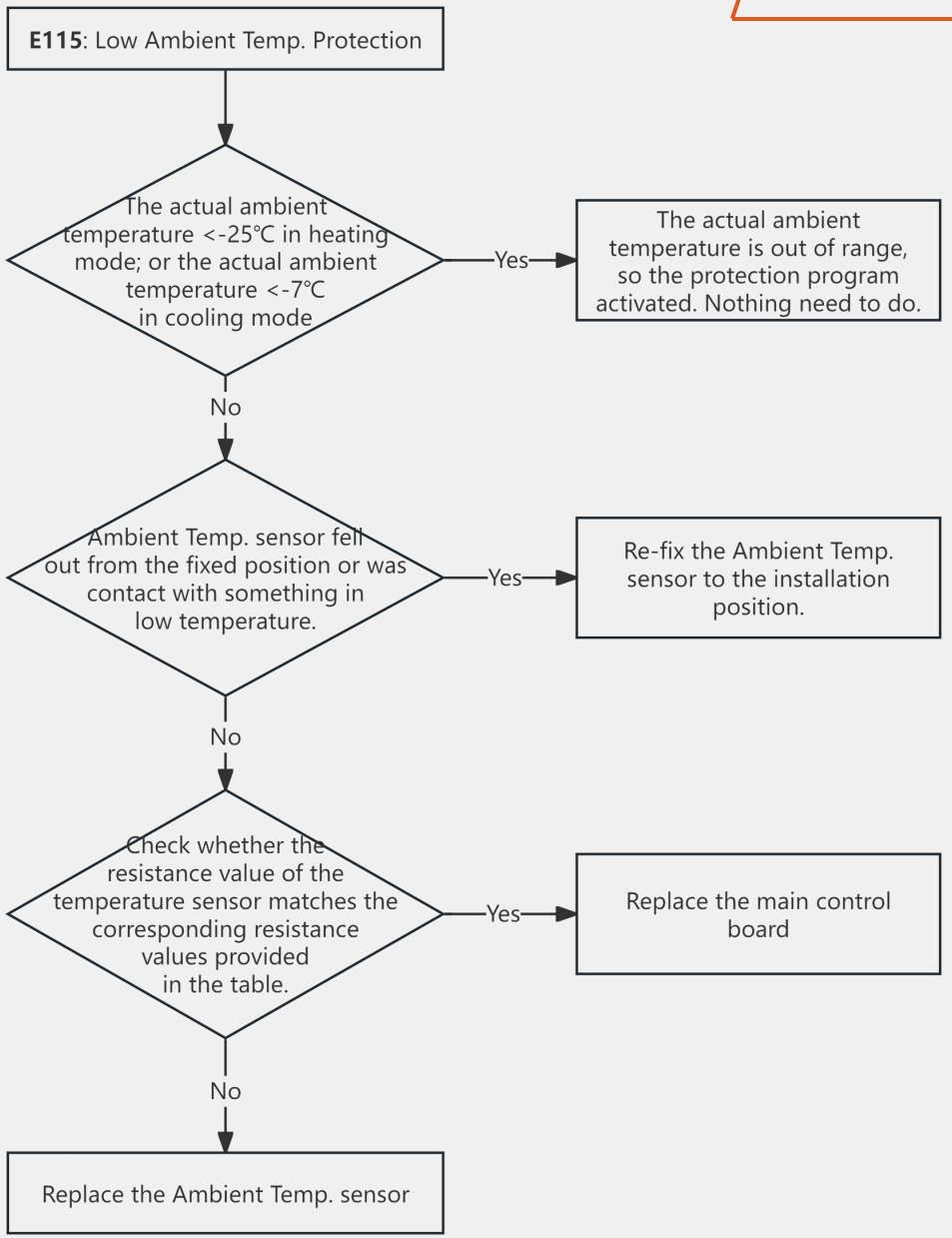


5.2 Issues With Code-E115

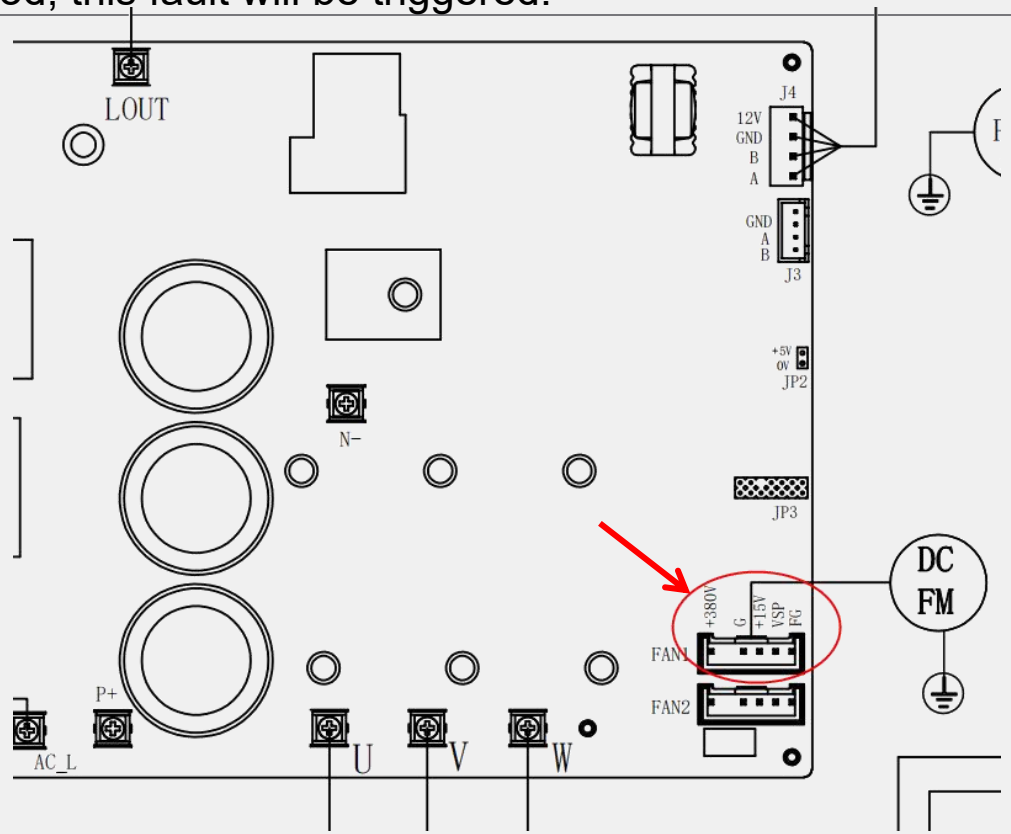
Error code		E115
Description		Low Ambient Temp. Protection
Triggering		In heating/ DHW mode, the error occurs when Ambient Temp.<-25℃ In cooling mode, the error occurs when Ambient Temp.<-7℃
Relative ports and locations	AI1	

5.2 Issues With Code

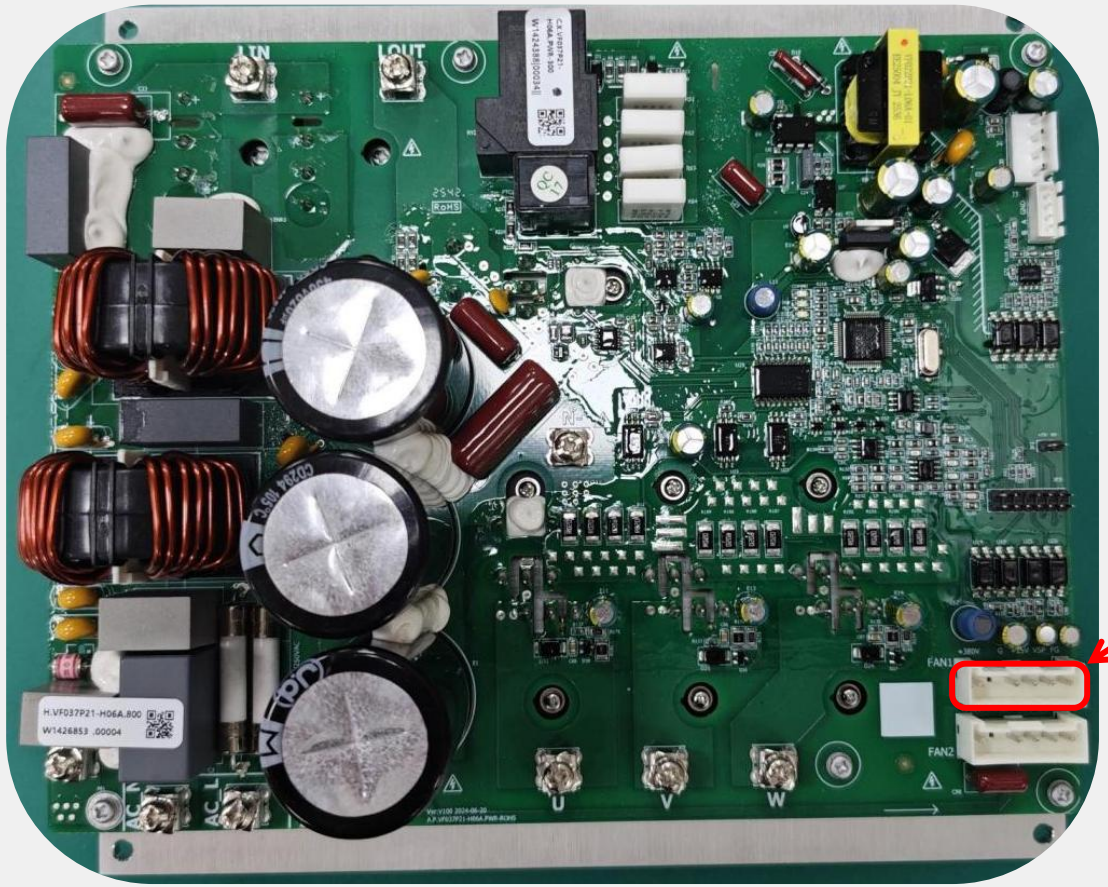


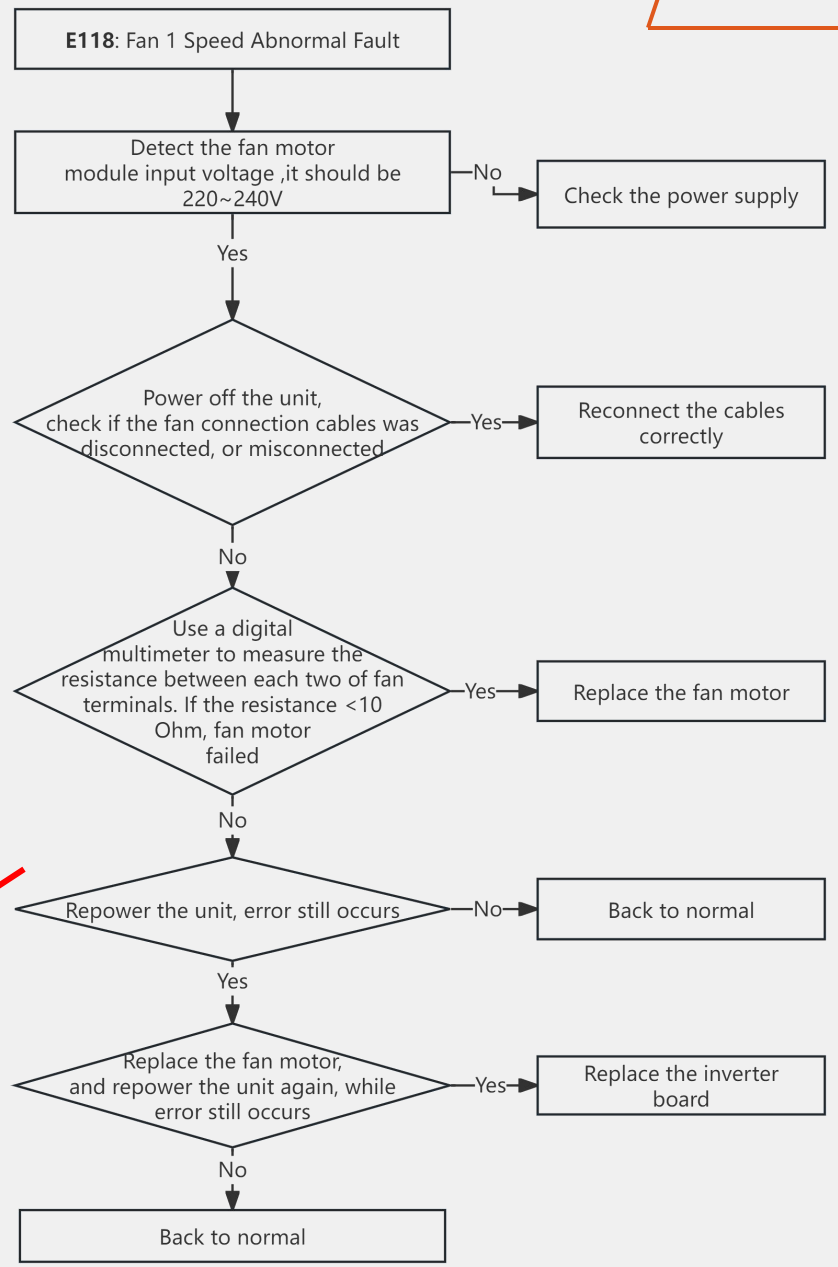


5.2 Issues With Code-E118

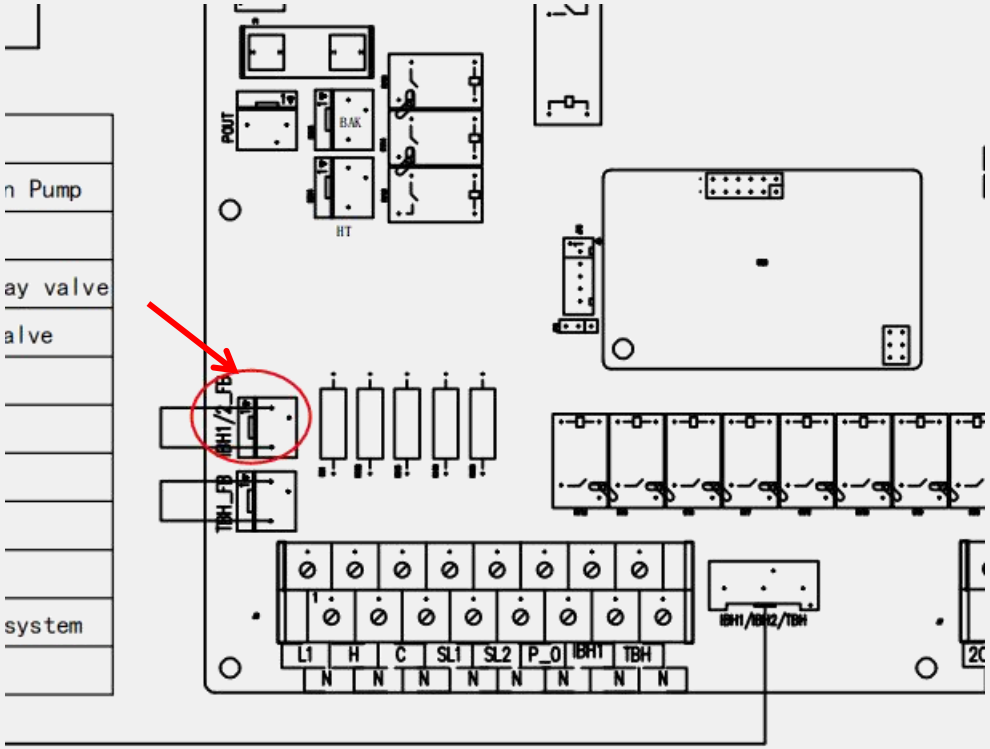
Error code		E118
Description		Fan 1 Speed Abnormal Fault
Triggering		If the heat pump detects that the fan speed remains too low for an period, this fault will be triggered.
Relative ports and locations	FAN1	

5.2 Issues With Code

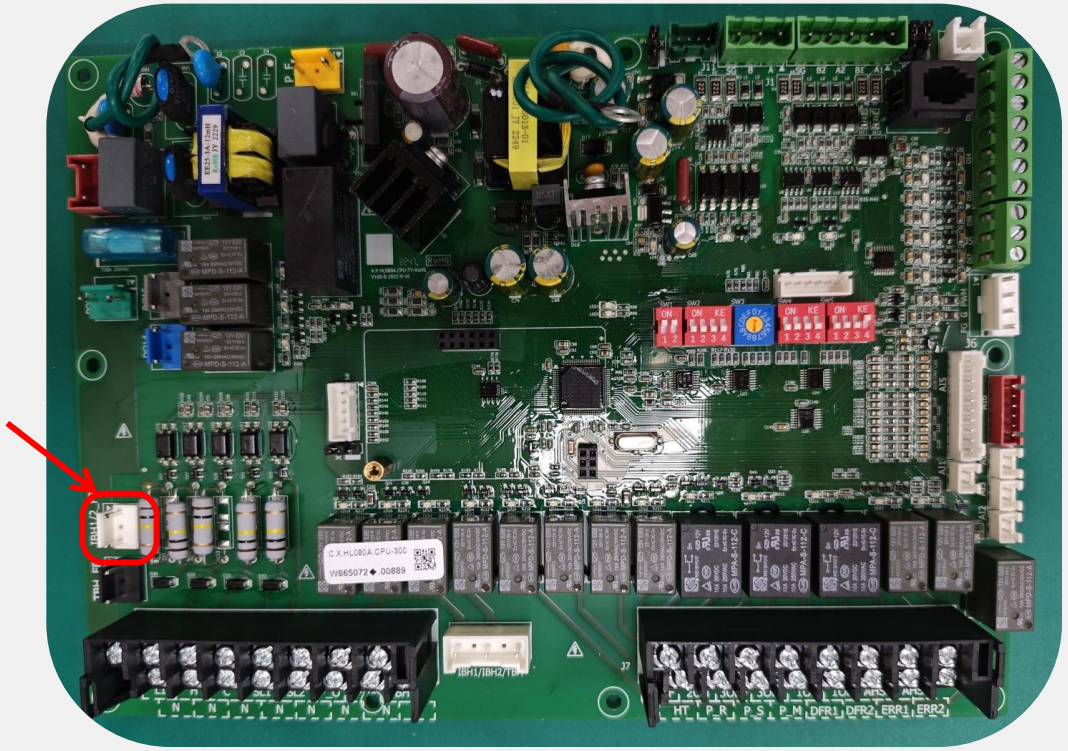


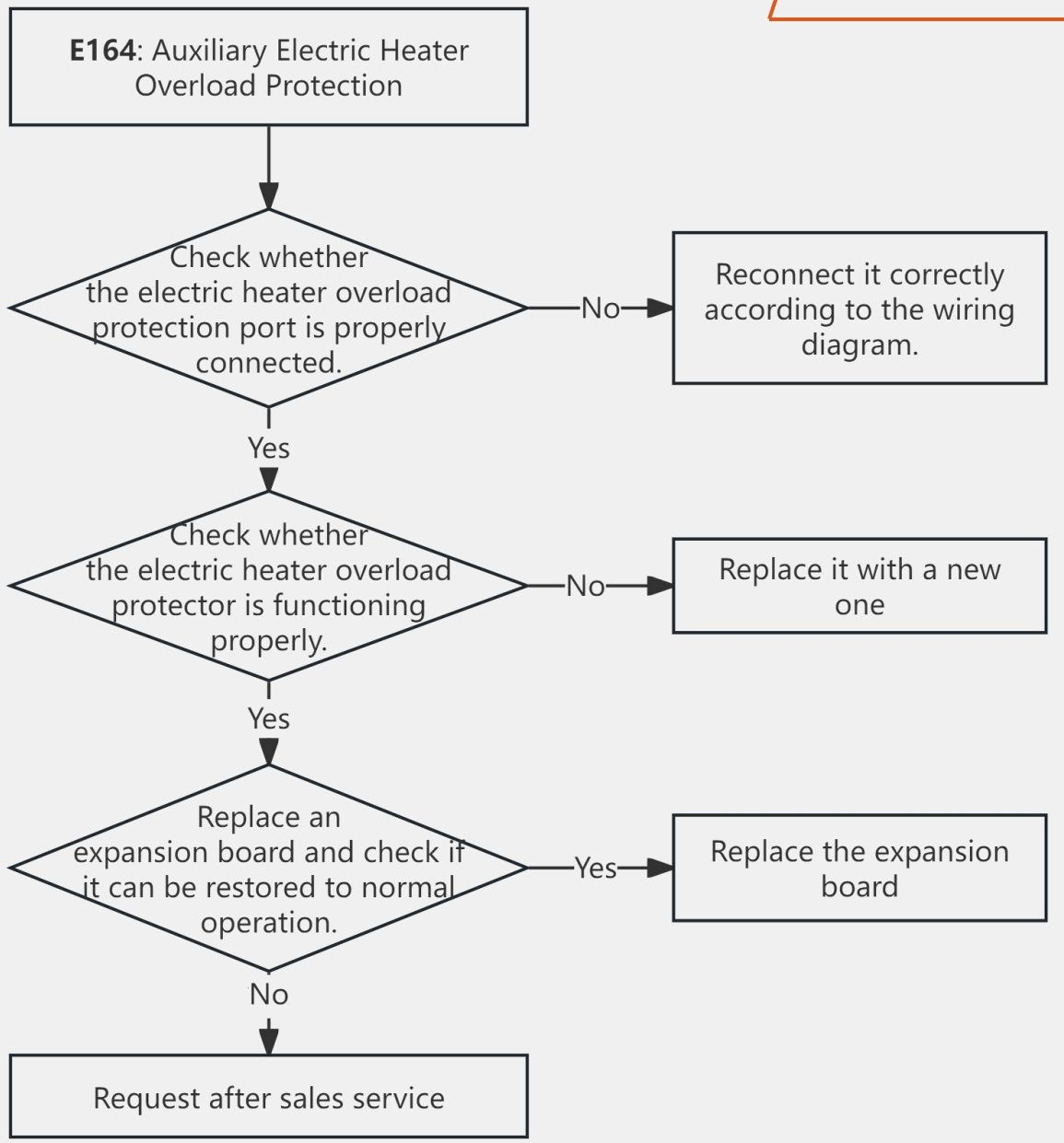


5.2 Issues With Code-E164

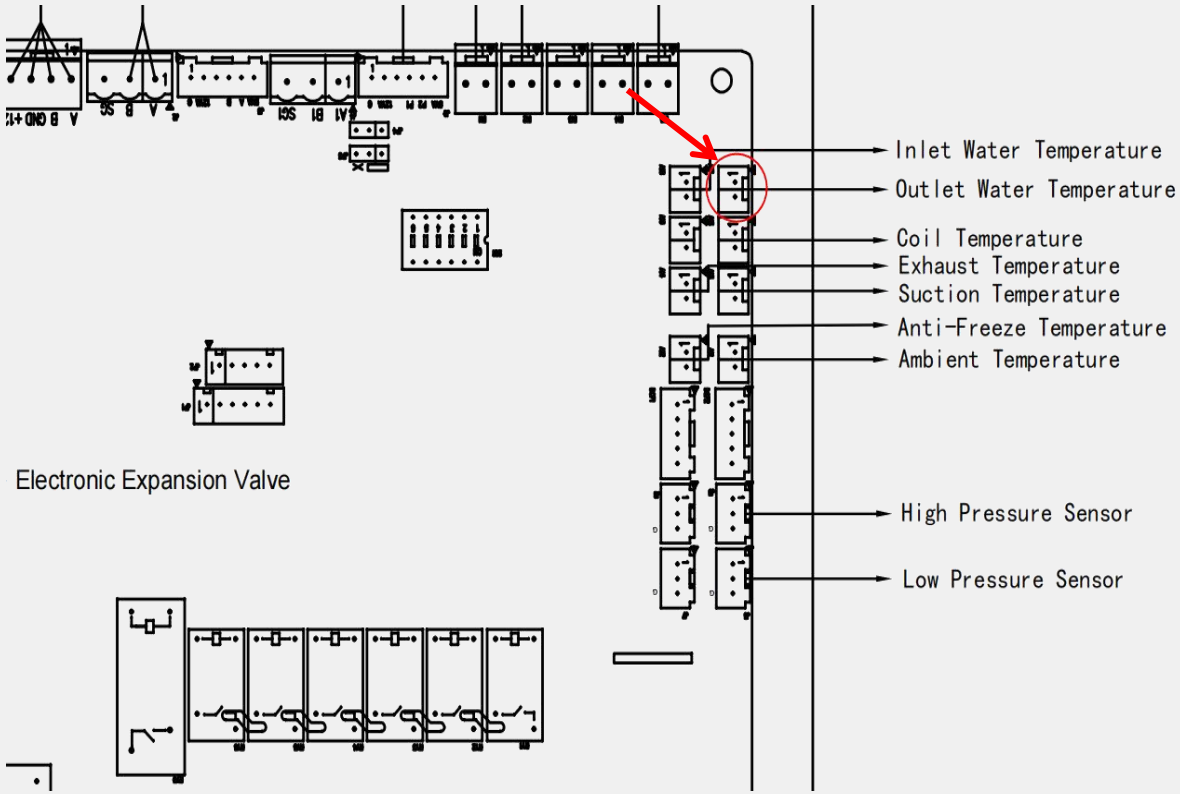
Error code		E164
Description		Electric Heater Overload Protection
Triggering		After enabling the electric heater function, the heat pump will detect the electric heater overload protection port. If it is disconnected, a fault will be reported.
Relative ports and locations	IBH1/2_FB	

5.2 Issues With Code

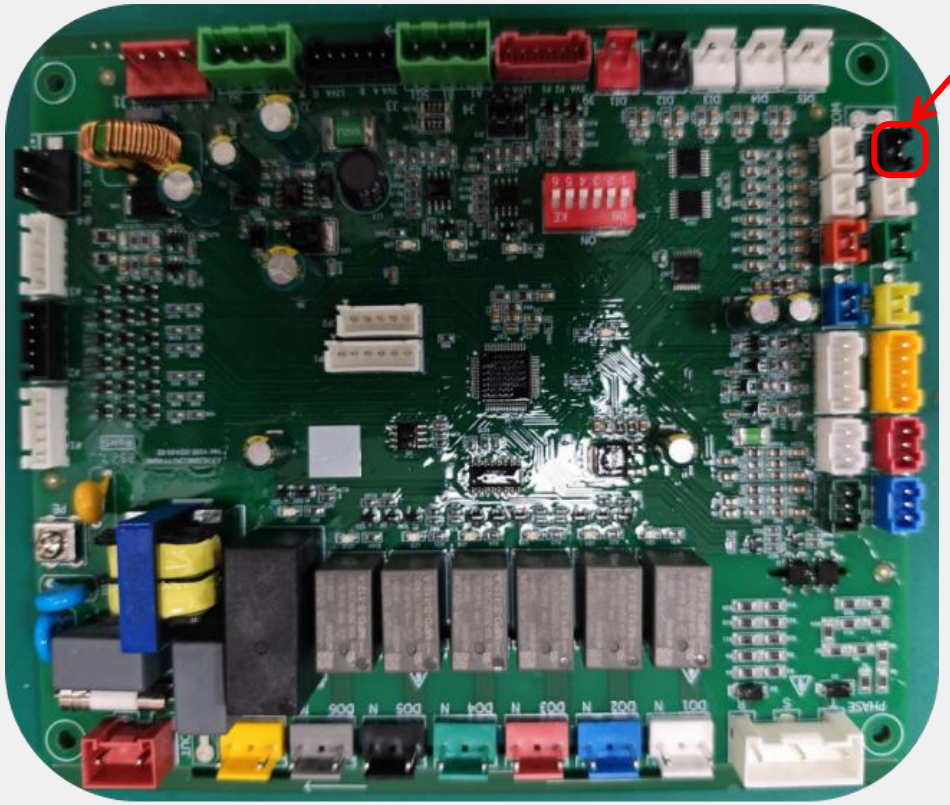




5.2 Issues With Code-E166

Error code		E166
Description		Plate Heat Exchanger Outlet Water Temp. Too Low
Triggering		When the plate heat exchanger outlet water temperature < [Cooling outlet temperature too low], this protection is triggered.
Relative ports and locations	AI7	

5.2 Issues With Code



E166: Plate Heat Exchanger Outlet Water Temp. Too Low

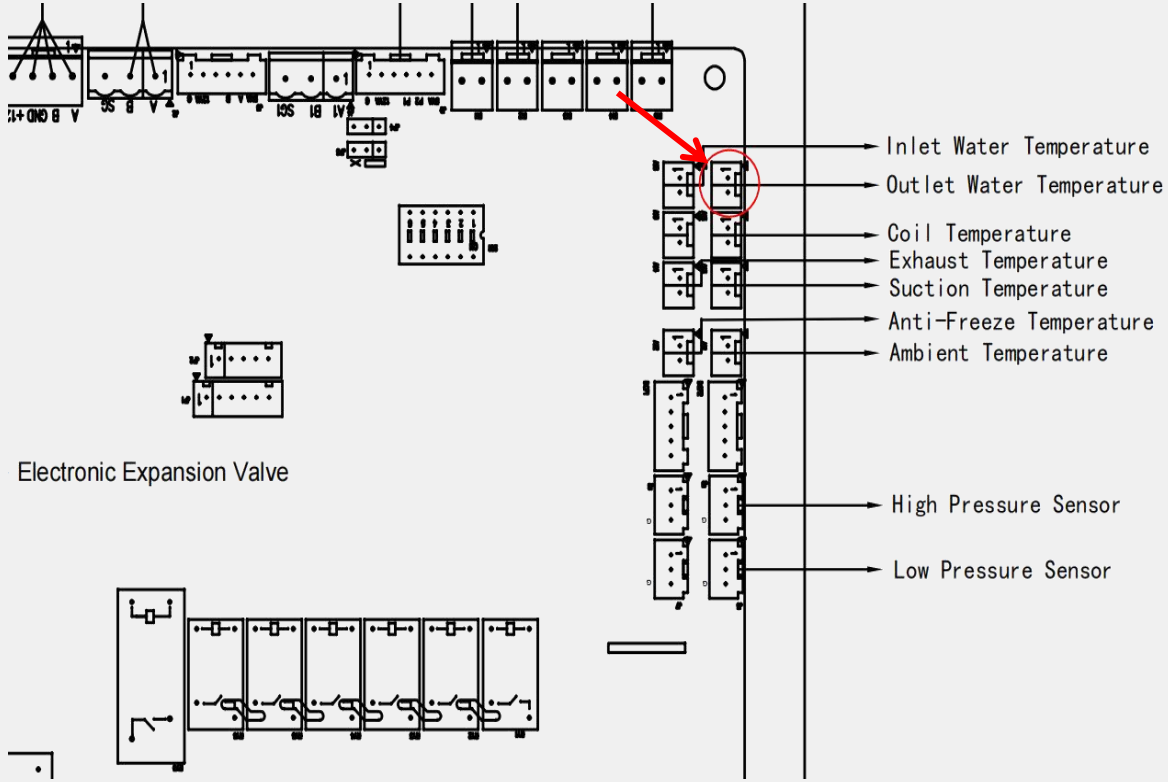
Check whether the cooling target temperature is set too low.
- Yes → Increase the target temperature for cooling mode
- No ↓

Plate Heat Exchanger OutletWater Temp. sensor fell out from the fixedposition or was contact with something in lowtemperature.
- Yes → Re-fix the Plate Heat Exchanger Outlet Water Temp. sensor to the installation position.
- No ↓

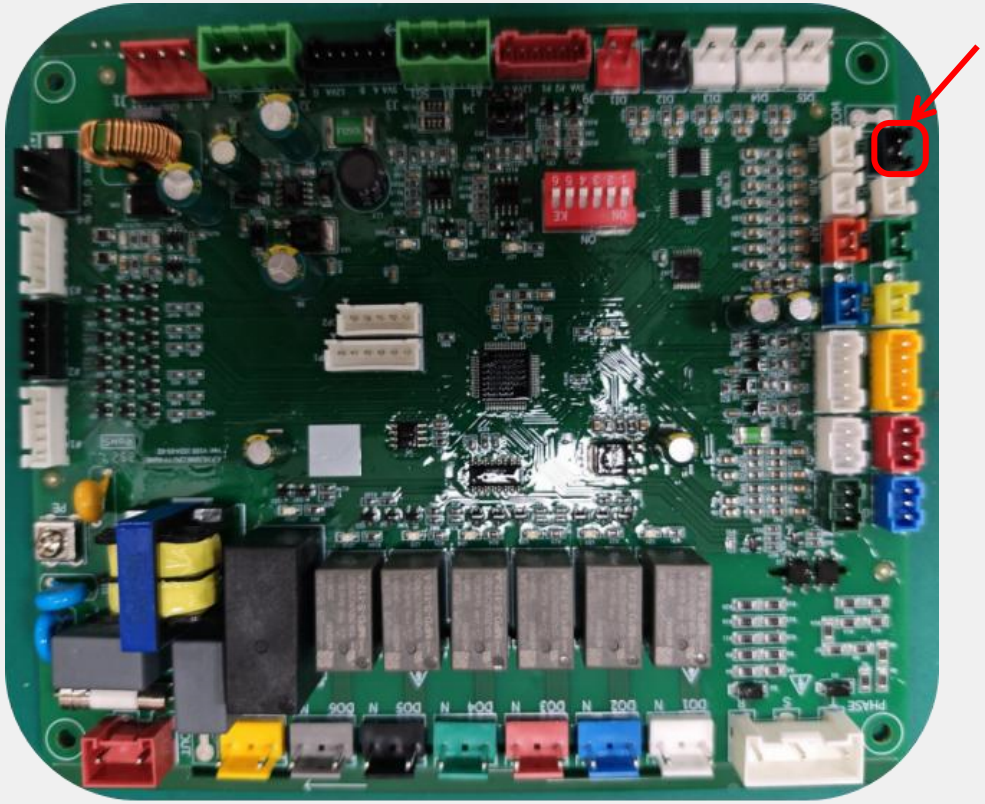
Check whether the resistance value of the temperature sensor matches the corresponding resistance values provided in the table.
- No → Replace the Plate Heat Exchanger Outlet Water Temp. sensor
- Yes ↓

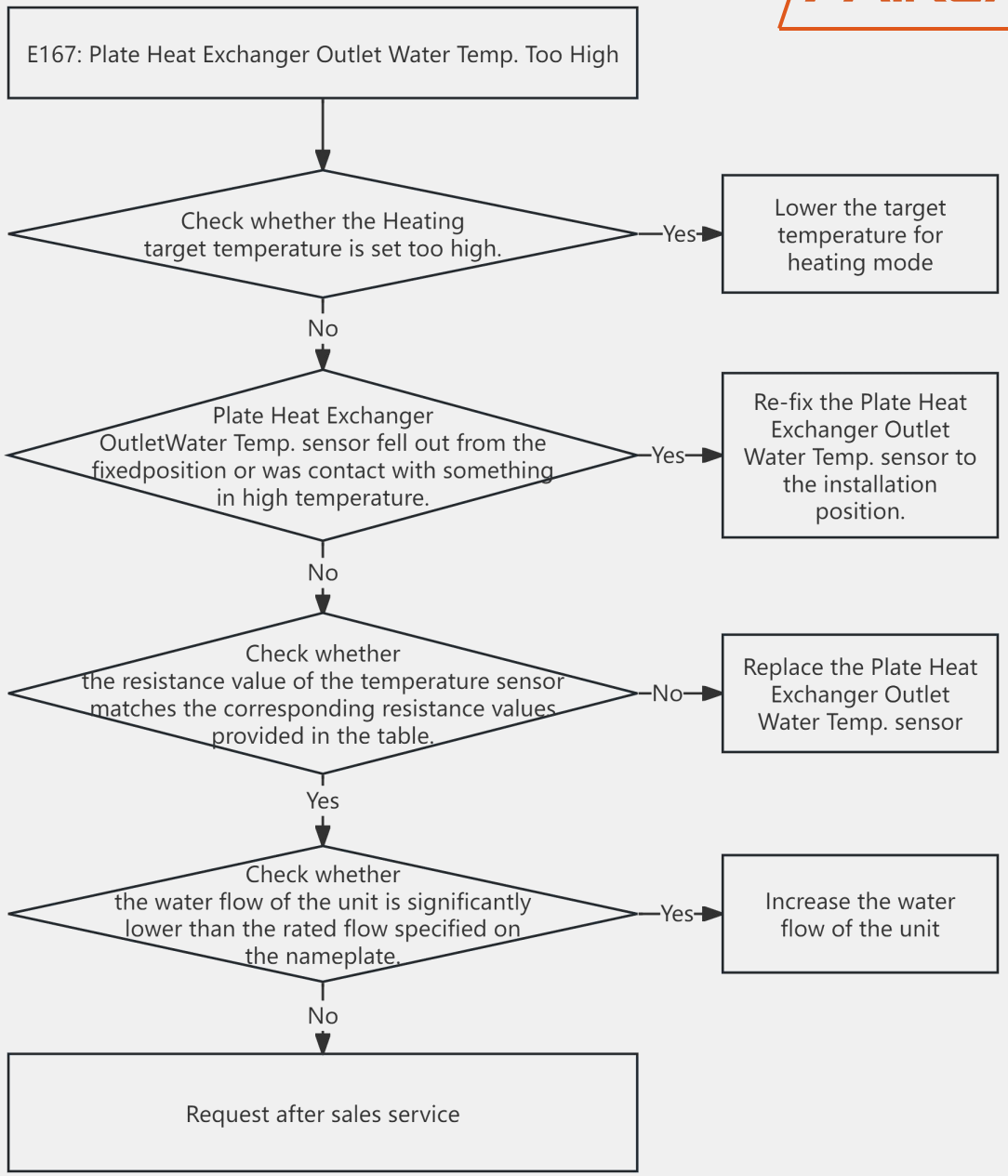
Request after sales service

5.2 Issues With Code-E167

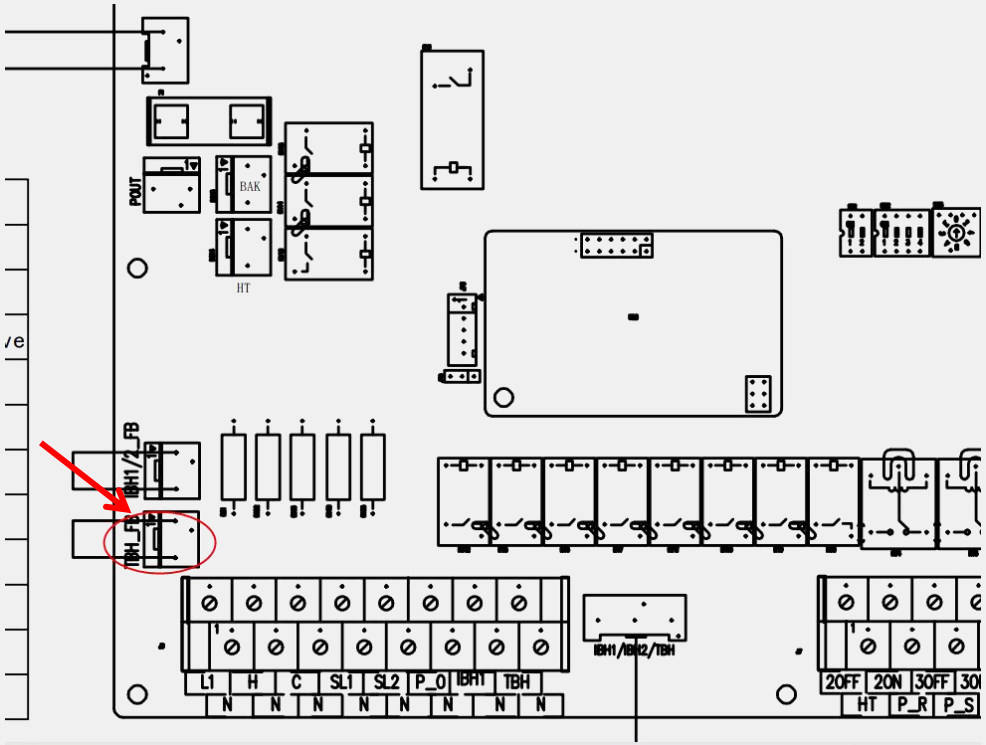
Error code		E167
Description		Plate Heat Exchanger Outlet Water Temp. Too High
Triggering		When the plate heat exchanger outlet water temperature ≥ [Heating outlet temperature too high], this protection is triggered.
Relative ports and locations	AI7	

5.2 Issues With Code

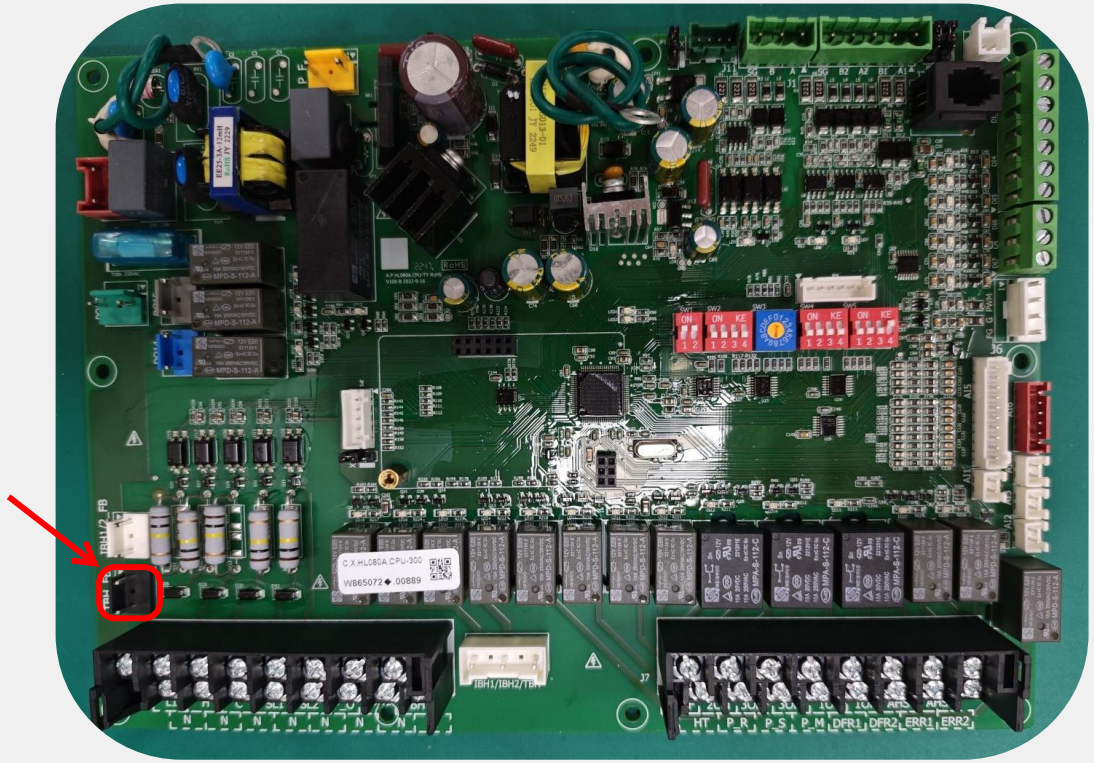


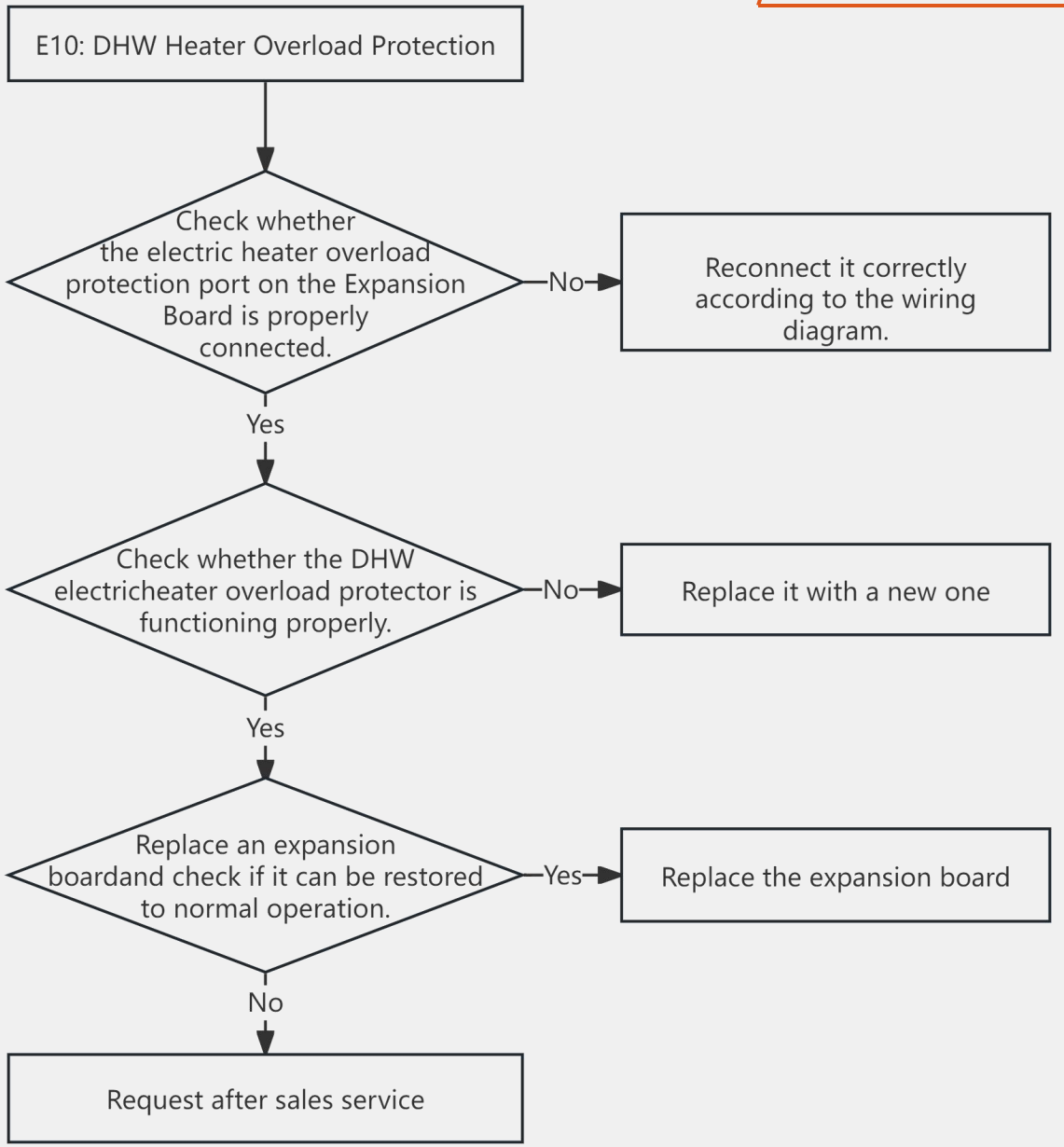


5.2 Issues With Code-E10

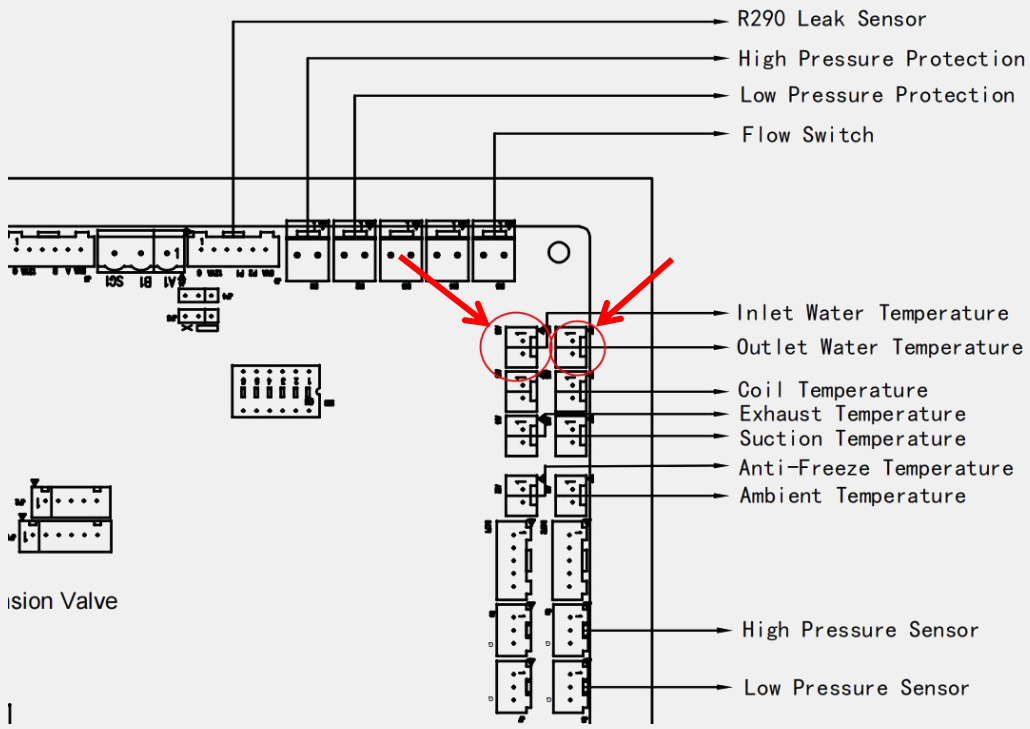
Error code		E10
Description		DHW Heater Overheat Protection
Triggering		After enabling the DHW electric heater function, the heat pump will detect the DHW electric heater overload protection port. If it is disconnected, a fault will be reported.
Relative ports and locations	TBH_FB	

5.2 Issues With Code

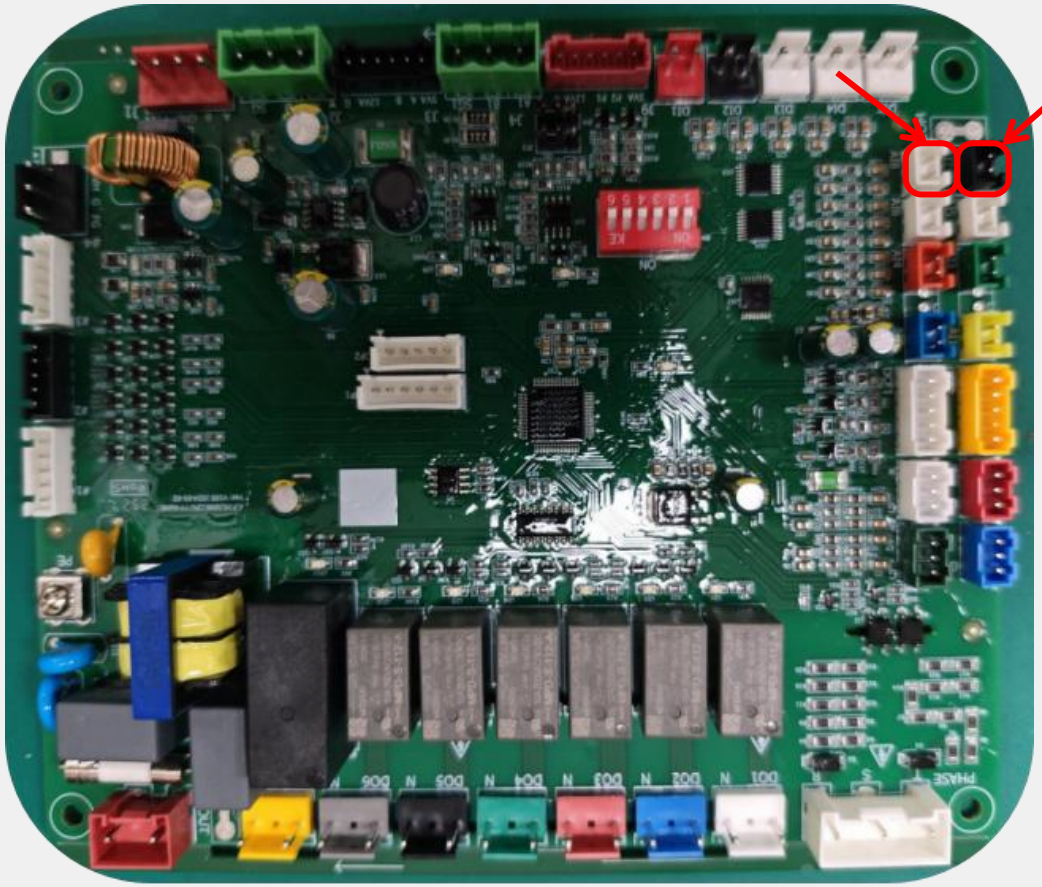


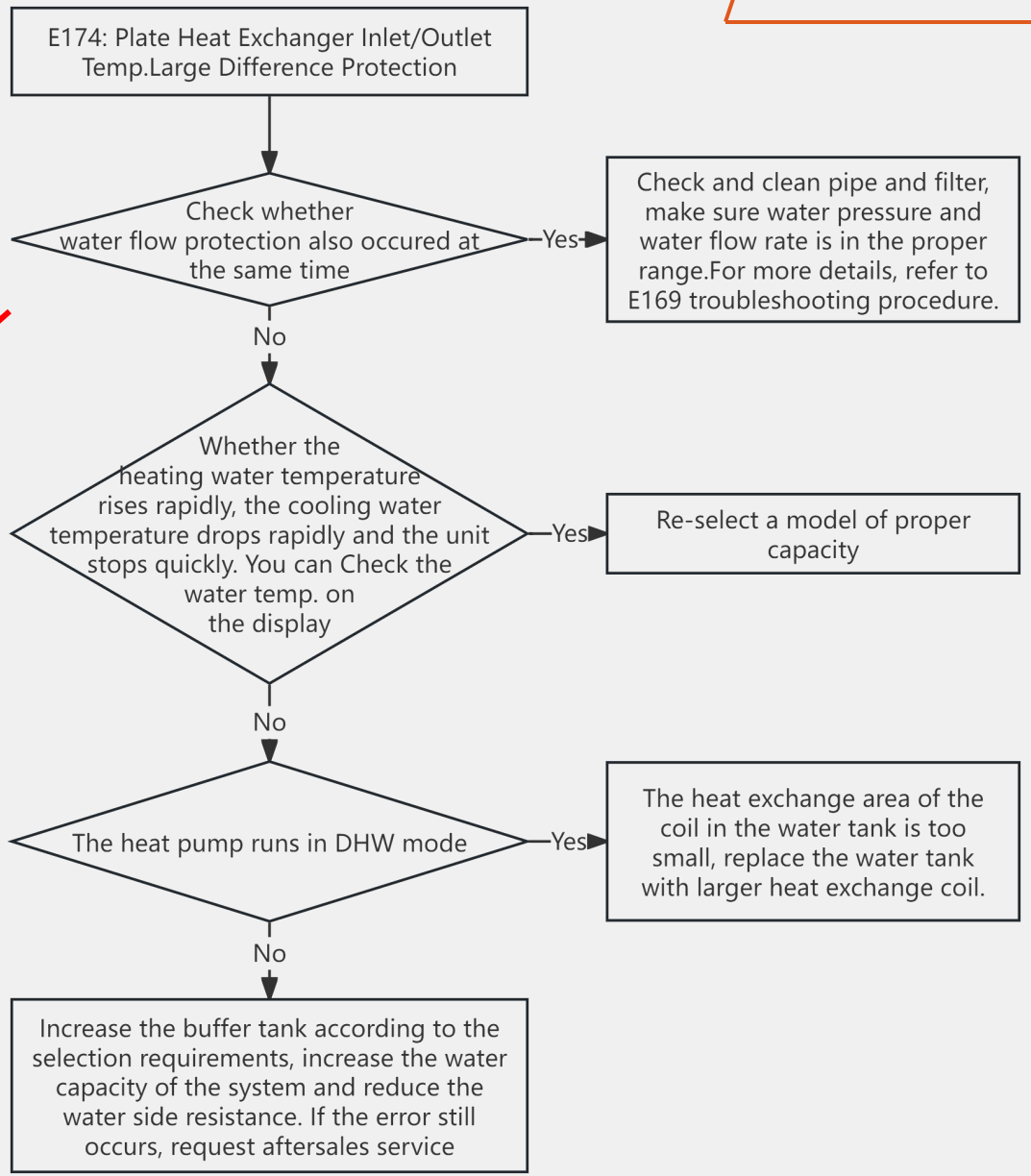


5.2 Issues With Code-E174

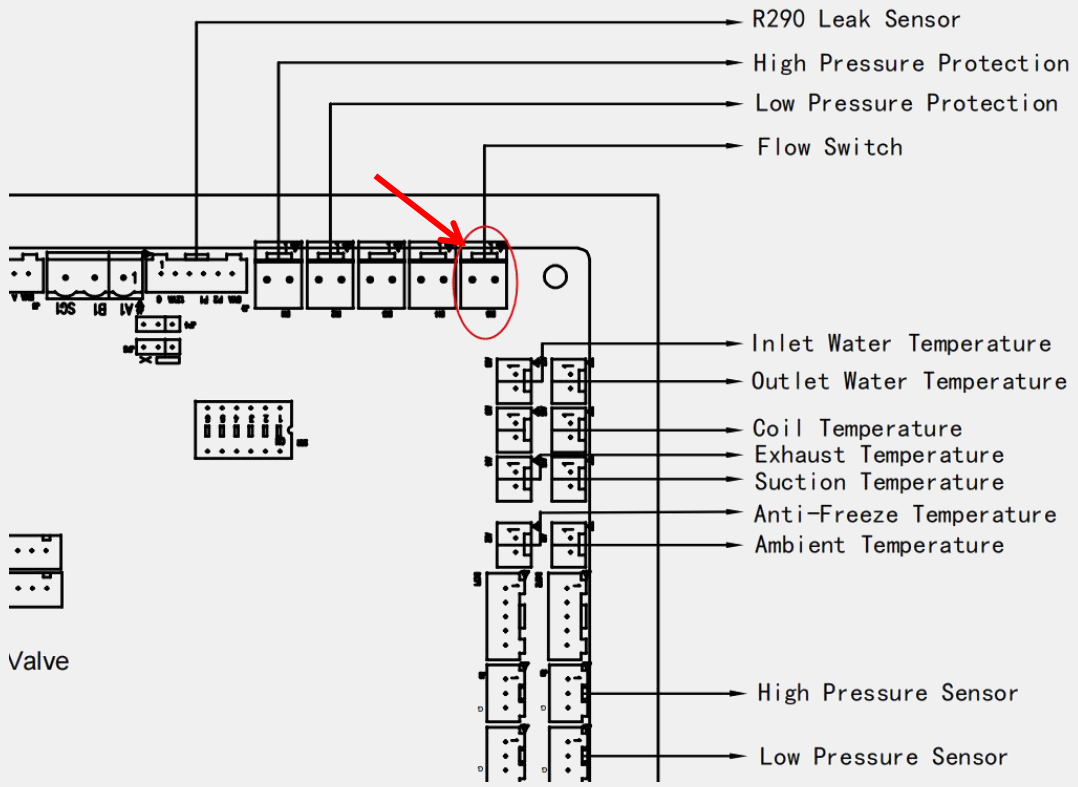
Error code		E174
Description		Plate Heat Exchanger Inlet/Outlet Temp.Large Difference Protection
Triggering		When the inlet-to-outlet temperature difference of the plate heat exchanger exceeds [Excessive Inlet-to-Outlet Temperature Difference], an alarm will be triggered.
Relative ports and locations	AI7&AI8	

5.2 Issues With Code





5.2 Issues With Code-E169

Error code		E169
Description		Water Flow Protection
Triggering		When the flow switch detects insufficient water flow, it will trigger this alarm.
Relative ports and locations	DI5	

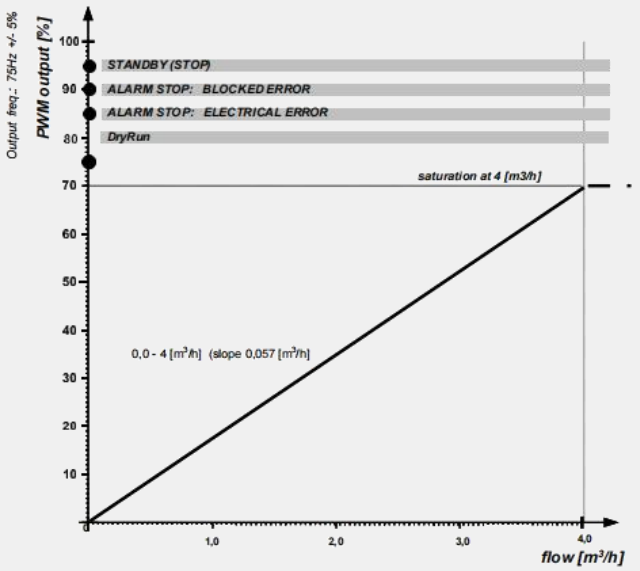
5.2 Issues With Code

Water Flow Protection

Step 1：

If the error code E169(**%) shown on the display, and the percentage is between 0%-100%, please refer to the table below for reference.

PWMOutput [%]	QT[s]	Information	DT[s]	Priority
95	0	Standby (when PWM input is a standby signal)	0	1
90	30	Warning! The pump is blocked and stops. When the fault disappears, it resumes operation.	12	2
85	5-30	Warning! Input voltage is below ~150V, the pump stops due to electrical error. It restarts when the voltage recovers to ~160V.	1-12	3
80	20	Warning, pump is dry running , pump continues operation	1	5
0-70		0,0 - 4 [m3/h] (ratio 0,057 [m3/h] / % PWM)		6

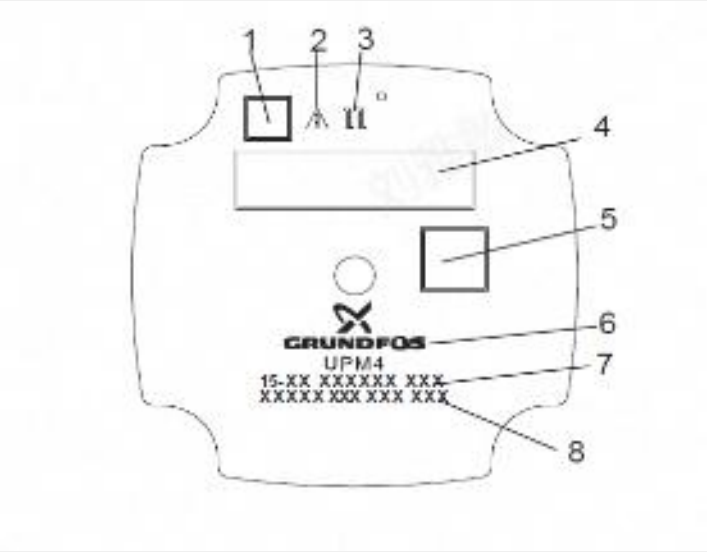


Output Frequency: 75 Hz ± 5 %

QT: Establishment Time, DT: Revocation Time

5.2 Issues With Code

Step 2：
Check the water pump indicator lights, and it will show water pump whether it is normal(green light indicates normal)



2 Error Signal Indication
On: Stuck/Electrical Fault

3 Communication Signal Indication
Off: No Communication
Flashing: PWM Communication

5.2 Issues With Code

Step 3：

Check the possible cause of water pump and process the solution.

Error information of water pump		
Possible cause	**Solution**	**Description**
Water pump leak	Replace the sealing ring	Error occurs at the first time running
Water inlet and outlet pipe connected reversely	Connect the pipe correctly.	
The power cable (DO0) is not connected properly	Connect the power cable correctly.	
The feedback signal cable (#4) is not connected properly	Connect the feedback signal cable correctly.	
Pump stalling	Remove the water pump, Rotate the impeller manually until it can move freely. And then install it back. (If it's too hard to rotate the impeller manually, replace the water pump)	Error occurs at the first time running or after running for a while
Power supply is abnormal	Check the power supply	
E169 occurs after water pump running for a while	Fill the water circuit first and then release the air.	Error occurs after running for a while
Motor stall, and it can not be rotated manually	Replace water pump	Error occurs at the first time running or after running for a while
Water pump connection is correct, the water pump icon on the display is lit. While no indicator lights on water pump is lit.	Replace water pump	Error occurs at the first time running

5.2 Issues With Code

Step 4：

Check whether the water circuit is abnormal,
1. The ball valve which is connected to the unit is not opened
2. Water inlet and outlet pipe connected reversely.
3. Y-type filter is dirty block
4. The power cable or feedback signal cable of water pump is not connected properly
5. The water circuit contains air

Solution:
1. Open the waterway ball valve which is connected to the unit
2. Make sure water inlet and outlet pipe connected correctly.
3. Clean the Y-type filter.
4. Connect the power cable or feedback signal cable correctly.
5. Fill the water circuit first and then release the air. If necessary, we can quickly release the air from the air purge valve by unscrewing black nut

5.2 Issues With Code

Step 5：

Check whether the Water flow switch is damaged,
1. Flow switch(DI5) is not connected properly.
2. The water flow in the pipe is not consistent with arrow on the flow switch.
3. Remove the water flow switch from thepipeline, manually dial the water flow switch rake to closed status, and use a digital multimeter with buzzer to measure. if it does not beep, the water flow switch damaged.

Solution：
1. Insert the plug of the water flow switch correctly
2. Adjust the direction of water flow in the pipe to be the same as the arrow on the flow switch
3. When you manually dial the water flow switch to the closed status, use a digital multimeter with buzzer to measure. If buzzer sounds, the water flow switch is normal. Otherwize, it's damaged and replace with a new water flow switch.

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5.2 Issues With Code

Step 6：

Check the possible cause of water flow switch and process the solution.

The possible causes of water flow switch failure and solutions		
Possible cause	**Solution**	**Description**
The water flow in the pipe is not consistent with arrow on the flow switch.	Adjust the direction of water flow in the pipe to be the same as the arrow on the flow switch	Error occurs at the first time running
Flow switch (DI5) is not connected properly.	Insert the plug of the water flow switch correctly	
External pump starts before internal pump(PUMPI) starts	Start internal pump first, make sure water flow is sufficient for external pump	
Flow switch not installed properly	Reinstall the flow switch correctly	Error occurs at the first time running or after running for a while
Flow switch leak	Replace the sealing ring	
flow switch rake blocked	Clean the obstacles	
flow switch rake damaged	Replace the flow switch	
The flow switch contact can not be completely closed	Replace the flow switch	
The flow switch contact can not be completely open	Replace the flow switch	
The flow switch model did not match	Replace the flow switch	

5.3 Request Service

If there is an issue that cannot be resolved, it would be very helpful if you could provide the following information:

1.Serial number of the heat pump.

2.photos or video of the issue.

Note: If labor costs are included, please kindly provide the heat pump installation documentation.





Thank you very much for listening