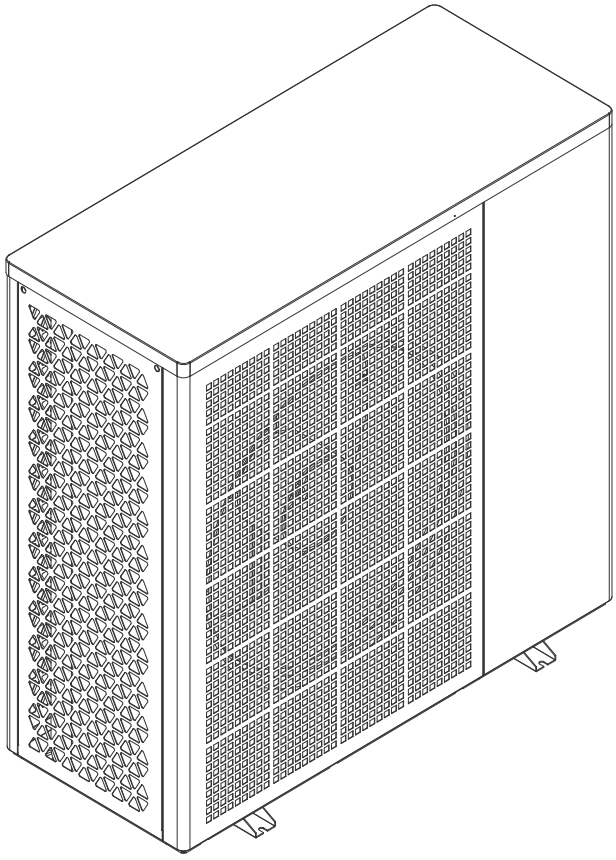
DC Inverter Heat Pump

OPERATING INSTRUCTION MANUAL

R290



IMPORTANT SAFETY INSTRUCTIONS
READ AND FOLLOW ALL INSTRUCTIONS
SAVE THESE INSTRUCTIONS

Table of Contents

IMPORTANT SAFETY PRECAUTIONS

Important Notice:

This guide provides installation and operation instructions for the DC Inverter Air Source Heat Pump. Consult the seller with any questions regarding this equipment.

Attention Installer: This guide contains important information about the installation, operation and safe use of this product. This information should be given to the owner and/or operator of this equipment after installation or left on or near the heat pump.

Attention User: This manual contains important information that will help you in operating and maintaining this heat pump. Please retain it for future reference.

WARNING - Before installing this product, read and follow all warning notices and instructions which are included. Failure to follow safety warnings and instructions can result in severe injury, death, or property damage.

Codes and Standards

The DC Inverter Air Source Heat Pump must be installed in accordance with the local building and installation codes as per the utility or authority having jurisdiction. All local codes take precedence over national codes. In the absence of local codes, refer to the latest edition of the National Electric Code (NEC) in the local government Electric Code (CEC) for installation.

DANGER — Risk of electrical shock or electrocution.

The electrical supply to this product must be installed by a licensed or certified electrician in accordance with the National Electrical Code and all applicable local codes and ordinances. Improper installation will create an electrical hazard which could result in death or serious injury to heat pump users, installers, or others due to electrical shock, and may also cause damage to property. Read and follow the specific instructions inside this guide.

WARNING - To reduce the risk of injury, do not permit children to use this product unless they are closely supervised at all times.

Consumer Information and Safety

The DC Inverter Air Source Heat Pumps are designed and manufactured to provide years of safe and reliable service when installed, operated and maintained according to the information in this manual and the installation codes referred to in later sections. Throughout the manual, safety warnings and

cautions are identified by the " " symbol. Be sure to read and comply with all of the warnings and cautions.

Heat Pump Energy Saving Tips

If you do not plan to use hot water for a prolonged period, then you might choose to turn the heat pump off or decrease the temp. setting of the control several degrees to minimize energy consumption.

We offer the following recommendations to help conserve energy and minimize the cost of operating your heat pump without sacrificing comfort.

1. A maximum water temp. of 60°C is recommended.
2. It is recommended to turn off the heat pump when ambient air temp. is less than -20℃ or if on vacation for longer than a week.
3. To save energy, it is recommended that the heat pump is operated during daytime when the ambient temp. is higher.
4. Try to install the heat pump at the ventilated places outdoor, where possible, shelter the heat pump from prevailing winds, rain and snow. Suggest use a shelter when practical, which will reduce the possibility of frosting and icing.

General Installation Information

1. Installation and service must be performed by a qualified installer or service agent, and must conform to all national, state, and local codes and/or safety regulations.
2. This DC Inverter Air Source Heat Pump is specifically designed for domestic hot water & house heating.

Section 1 Introduction

1.1 Product Overview

DC Inverter Air Source Heat Pumps transfer heat from the ambient air to water, providing high-temp. hot water up to 70°C. The unique high-temp. heat pump is widely used for house warming. With innovative & advanced technology, the heat pump can operate very well at -20℃ ambient temp. with high output temp.s up to 60℃, which ensures the compatibility with normal sized radiator based systems without supplementation. Compared with traditional oil/LPG boilers, DC Inverter heat pump produces up to 50% less CO_2 whilst saves 80% running cost.

Our heat pumps are not only highly efficient, but also easy and safe to operate.

1.2 General Features

1. Low running costs and high efficiency
   ·A high coefficient of performance (COP) of up to 5 results in lower running costs compared with traditional ASHP technology.
   ·No immersion heater supplement is required.
2. Reduced Capital Costs
   ·Simple installation
3. High Comfort Levels
   ·High storage temp. results in increased hot water availability.
4. No potential danger of any inflammable, gas poisoning, explosion, fire, electrical shock which are associated with other heating systems.

5. A digital controller is incorporated to maintain the desired water temp..
6. Long-life and corrosion resistant composite cabinet stands up to severe climates.
7. HIGHLY compressor ensures outstanding performance, ultra energy efficiency, durability and quiet operation.
8. Self-diagnostic control panel monitors and troubleshoots heat pump operations to ensure safe and reliable operation.
9. Intelligent digital controller with friendly user interface and blue LED back light.
10. Separate isolated electrical compartment prevents internal corrosion and extends heat pump life.
11. The heat pump can operate down to ambient air temp. of -25℃.

Section 2 Installation

The following general information describes how to install the DC Inverter Air Source Heat Pump.

Note: **Before installing this product, read and follow all warning notices and instructions. Only a qualified service person should install the heat pump.**

2.1 Placement Considerations

Placement of the outdoor unit should take account of the following considerations:

- Outdoor units should not be exposed to direct radiation from a high-temperature heat source.
- Outdoor units should not be installed in positions where dust or dirt may affect heat exchangers.
- Outdoor units should not be installed in locations where exposure to oil or to corrosive or harmful gases, such as acidic or alkaline gases, may occur.
- Outdoor units should not be installed in locations where exposure to salinity may occur.
- Outdoor units should be installed in well-drained, well-ventilated positions.
- Outdoor units should be installed in positions that are as close as possible to the heat emitters.
- Outdoor units should be installed in positions that are sufficiently close to the desired position of the wired controller that the controller's wiring length limitation will not be exceeded.
- In systems that are configured to heat domestic hot water and/or include an external backup electric heater, outdoor units should be installed in positions that are sufficiently close to the domestic hot water tank and/or backup electric heater that the temperature sensor wiring length limitations will not be exceeded.
- Outdoor units should be installed in locations where the noise from the unit will not disturb neighbors.

2.2 Materials Needed for Installation

The following items are needed and are to be supplied by the installer for all heat pump

installations:

1. Plumbing fittings.
2. Level surface for proper drainage.
3. Ensure that a suitable electrical supply line is provided. See the rating plate on the heat pump for electrical specifications. Please take a note of the specified current rating. No junction box is needed at the heat pump; Connections are made inside of the heat pump electrical compartment. Conduit may be attached directly to the heat pump jacket.
4. It is advised to use PVC conduit for the electrical supply line.
5. Use a booster pump for pumping water in case of low water pressure.
6. A filter on the water inlet is needed.
7. The plumbing should be insulated to reduce its heat loss.

Note: We recommend installing shut-off valves on the inlet and outlet water connections for ease of serviceability.

2.3 Installation Location

CAUTION!

1. DO NOT install the heat pump near to hazardous materials and places

2. DO NOT install the heat pump under deep sloping roofs without gutters which will allow rain water, mixed with debris, to be forced through the unit.

3. Place the heat pump on a flat slightly pitched surface, such as concrete or fabricated slab. This will allow proper drainage of condensation and rain water from the base of the unit. If possible, the slab should be placed at the same level or slightly higher than the filter system/equipment.

2.3.1 Installation Details

All criteria given in the following sections reflect minimum clearances. However, each installation must also be evaluated, taking into account the prevailing local conditions such as proximity and height of walls, and proximity to public access areas. The heat pump must be placed to provide clearances on all sides for maintenance and inspection.

1. The heat pump installation area must have good ventilation and the air inlet/outlet must not be hindered.
2. The installation area must have good drainage and be built on a solid foundation.
3. Do not install the unit in areas accumulated with pollutions like aggressive gas (chlorine or acidic), dust, sand and leaves etc.
4. For easier and better maintenance and troubleshooting, no obstacles around the unit should be closer than 1m. And no obstructions within 2m, vertically, from the unit for air ventilation. (See Figure 1)

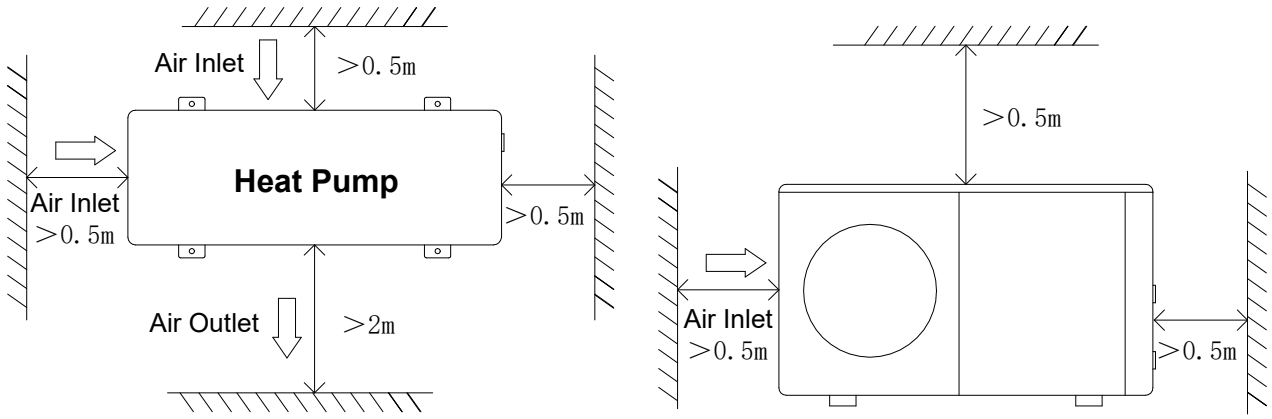


Figure 1

5. The heat pump must be installed with shockproof bushes to prevent vibration and/or imbalance.
6. Even though the controller is waterproof, care should be taken to avoid direct sunlight and high temp.. In addition, the heat pump should be placed to ensure quality viewing of the controller.
7. The plumbing pipes must be installed with proper support to prevent possible damage due to vibration.Running water pressure should be kept over 196kpa. Otherwise, booster pump should be installed.
8. The acceptable operating voltage range should be within ±10% of the rated voltage.
   - The heat pump unit must be grounded /earthed for safety purposes.

2.3.2 Drainage and Condensation

Condensation will occur from the evaporator when the unit is running and drain at a steady rate, depending upon ambient air temp. and humidity. The more humid the ambient conditions, the more condensation will occur. The bottom of the unit acts as a tray to catch rainwater and condensation. Keep the drain holes, located on the bottom pan of the unit base, clear from debris at all times.

2.3.3 Suggested Installation Methods

DC Inverter Heat Pump can provide heating/cooling and domestic hot water. Floor heating loops and Radiator are used for space heating and fan coil units are used for space cooling. Domestic hot water is supplied from the domestic hot water tank connected to the heat pump.

DC Inverter Heat Pump with a main circulation pump built inside. When install the unit, installers should connect the heat pump with other parts including the buffer tank (for space heating/cooling), storage water tank (for domestic hot water) . External fittings are also needed including a safety valve, a water charge valve, Three-way valve. Temperature sensor should be added in the storage water tank. An additional electric heater can be installed in the DHW tank or the buffer tank which can get the control signal from the heat pump.

1) System installation diagram to see Figure 2, Figure 3, Figure 4, Figure 5.

2) The hot water tank with coil for domestic hot water should be specially customized.

3) The heat exchange capacity of the coil should be ≥ the rated heating capacity of the heat pump.

4) **The unit is delivered ready for operation and is filled with R290 refrigeant.**

5) **The refrigerant R290 are flammable and explosive, It's prohibited from installing in one environment which have operating or potential ignition sources.**

2.4 Application

Application 1

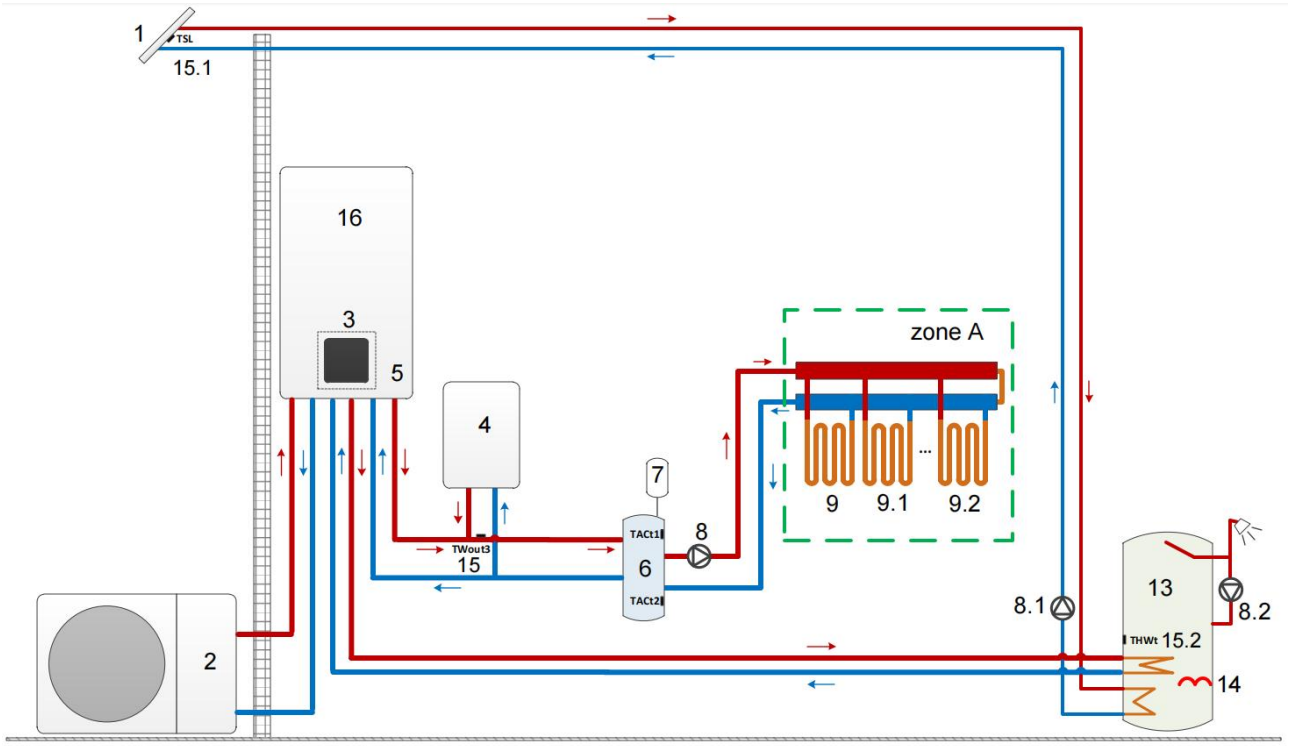


Figure 2

Legend			
1	solar panel	9	Floor heating coil 1（Field supply）
2	Outdoor unit	9.1	Floor heating coil 2（Field supply）
3	User interface	9.2	Floor heating coil 3（Field supply）
4	AHS: Auxiliary heat source (Field supply)	13	Domestic hot water tank (Field supply)
5	SV1:3-way valve (Inside the indoor unit)	14	TBH: Domestic hot water tank booster heater (Field supply)
6	Balance tank (Field supply)	15	T3: Water flow temperature sensor (Optional)
7	Expansion vessel(Field supply)	15.1	Tsolar: Solar temperature sensor (Optional)
8	P_o: Zone A circulation pump (Field supply)	15.2	T10: Water tank temperature sensor (Accessory)
8.1	P_S: Solar pump (Field supply)	16	Indoor unit
8.2	P_R: DHW pipe pump (Field supply)		

Notes:

The example is just for application illustration; please confirm the exact installation method according to the installation manual.

Space heating

The ON/OFF signal and operation mode and temperature setting are set on the user interface. P_O (8) keeps running as long as the unit is ON for space heating, SV1(5) keeps ON.

Domestic water heating

The ON/OFF signal and target tank water temperature (HOT_WATER_TEMP_SET) are set on the user interface. P_O (8) stops running as long as the unit is ON for domestic water heating, SV1(5) keeps OFF.

AHS (auxiliary heat source) control

The AHS function is set on the indoor unit

1) When the AHS is set to be valid only for heating mode, AHS can be turned on in the following ways:

a. Turn on the AHS via Force AHS function on the user interface;

b. AHS will be turned on automatically if initial water temperature is too low or target water temperature is too high at low ambient temperature.

P_O(8) keeps running as long as the AHS is ON, SV1(5) keeps ON.

2) When the AHS is set to be valid for heating mode and DHW mode. In heating mode, AHS control is same as part 1); In DHW mode, AHS will be turned on automatically when the initial domestic water temperature T5 is too low or the target domestic water temperature is too high at low ambient temperature. P_O (8) stops running, SV1(5) keeps OFF.

3) When the AHS is set to be valid,AHS1AHS2 can be set to be valid on the user interface. In heating mode and DHW mode, AHS will be turned on if AHS1AHS2 dry contact closes.

TBH (tank booster heater) control

The TBH function is set on the user interface.

When the TBH is set to be valid, TBH can be turned on via For open TBH heat function on the user interface;

In DHW mode, TBH will be turned on automatically when the initial domestic water temperature T5 is too low or the target domestic water temperature is too high at low ambient temperature.

When the TBH is set to be valid, TBH can be set to be valid on the user interface. TBH will be turned on if TBH contact closes.

Solar energy control

Hydraulic module recognizes solar energy signal by judging Tsolar or receiving SL1SL2 signal from user interface. The recognition method can be set via SOLAR on the user interface.

Advanced>01Paraments>02System Parameters>30 SOLAR

When Tsolar is set to be ON, Solar energy turns ON when Tsolar is high enough, P_S(8.1) starts running; Solar energy turns OFF when Tsolar is low, P_S(8.1) stops running.

Advanced setting > 01 Paraments config > 11 Input & Sensors >26 TSL_SENSOR

2)When Tsolar is set to be OFF, Solar energy turns ON after receiving Solar SL1SL2 signal from user interface, P_S(8.1) starts running; Without solar SL1SL2 signal. Solar energy turns OFF, P_S(8.1) stops running.

Application 2

ROOM THERMOSTAT Control for Space heating or cooling need to be set on the user interface.

It can be set in three ways: MODE SET(ZONE.A.MODE.SW) /ONE ZONE(ZONE.A.SW)/DOUBLE ZONE(DUAL.ZONE.SWITC).

One zone control

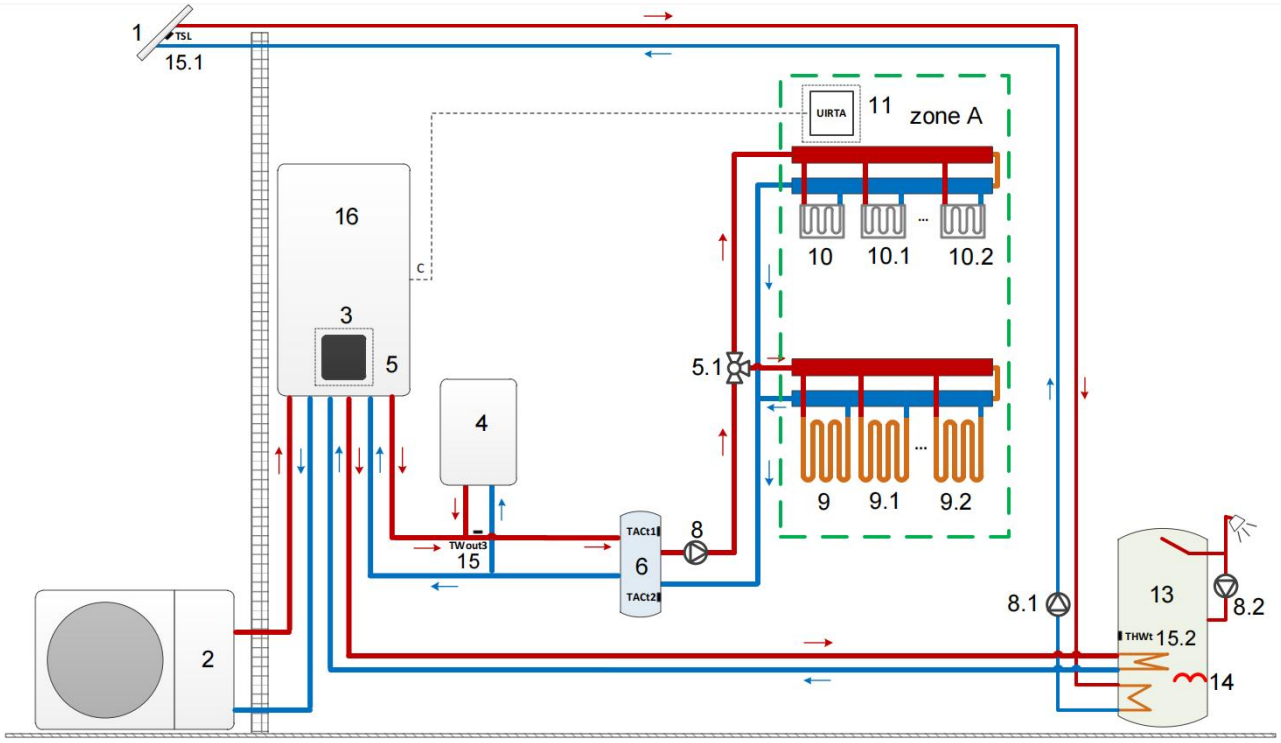


Figure 3

Legend			
1	solar panel	9.1	Floor heating coil 2（Field supply）
2	Outdoor unit	9.2	Floor heating coil 3（Field supply）
3	User interface	10	fan coil 1（Field supply）
4	AHS: Auxiliary heat source (Field supply)	10.1	fan coil 2（Field supply）
5	SV1:3-way valve (Inside the indoor uni)	10.2	fan coil 3（Field supply）
5.1	SV2:3-way valve (Field supply)	11	Low voltage room thermostat (Field supply)
6	Expansion vessel(Field supply)	14	TBH: Domestic hot water tank booster heater (Field supply)
8	P_o: Zone A circulation pump (Field supply)	15	T3: Water flow temperature sensor (Optional)
8.1	P_S: Solar pump (Field supply)	15.1	Tsolar: Solar temperature sensor (Optional)
8.2	P_R: DHW pipe pump (Field supply)	15.2	T10: Water tank temperature sensor (Accessory)
9	Floor heating coil 1（Field supply）	16	Indoor unit

Space heating

One zone control: the unit ON/OFF is controlled by the room thermostat, cooling or heating mode and outlet water temperature is set on the user interface. System is ON when any “CL1” of all the thermostats closes. When all “CL1” open, system turns OFF.

The circulation pumps operation

When the system is ON, which means any “CL1” of all the thermostats closes, P_O (8) starts running; When the system is OFF, which means all “CL1” open, P_O (8) stops running.

Application 3

Mode set control

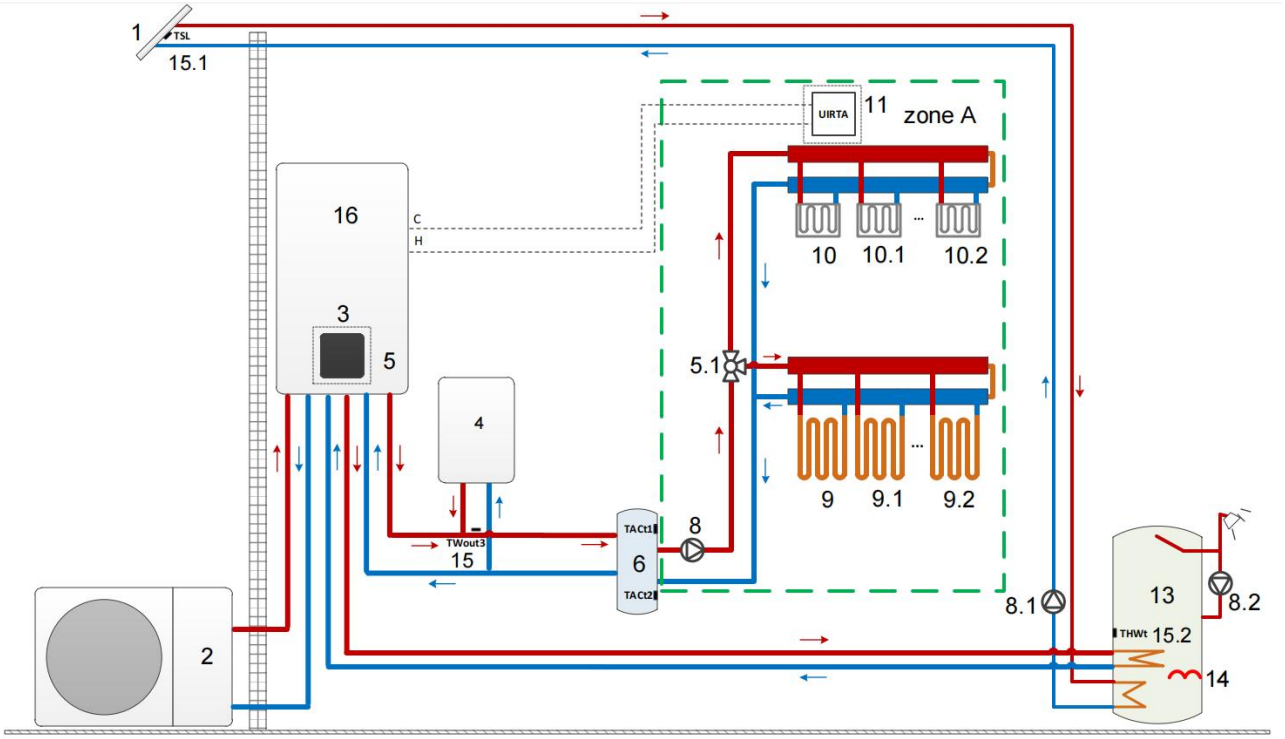


Figure 4

Legend			
1	solar panel	9.1	Floor heating coil 2（Field supply）
2	Outdoor unit	9.2	Floor heating coil 3（Field supply）
3	User interface	10	fan coil 1（Field supply）
4	AHS: Auxiliary heat source (Field supply)	10.1	fan coil 2（Field supply）
5	SV1:3-way valve (Inside the indoor uni)	10.2	fan coil 3（Field supply）
5.1	SV2:3-way valve (Field supply)	11	Low voltage room thermostat (Field supply)
6	Expansion vessel(Field supply)	14	TBH: Domestic hot water tank booster heater (Field supply)
8	P_o: Zone A circulation pump (Field supply)	15	T3: Water flow temperature sensor (Optional)
8.1	P_S: Solar pump (Field supply)	15.1	Tsolar: Solar temperature sensor (Optional)
8.2	P_R: DHW pipe pump (Field supply)	15.2	T10: Water tank temperature sensor (Accessory)
9	Floor heating coil 1（Field supply）	16	Indoor unit

Notes:

The example is just for application illustration; please confirm the exact installation method

according to the installation manual.

Space heating

Cooling or heating mode is set via the room thermostat, water temperature is set on the user interface.

1）When any “CL1” of all the thermostats close, system will be set at cooling mode.

2）When any “HL1” of all the thermostats close and all “CL1” open, system will be set at heating mode.

The circulation pumps operation

1） When the system is in cooling mode, which means any “CL1” of all the thermostats closes, SV2(5.1) keeps ON, P_O (8)starts running;

2）When the system is in heating mode, which means one or more “HL1” close and all “CL1” open, SV2(5.1) keeps OFF, P_O (8)starts running.

Application 4

Double zone control

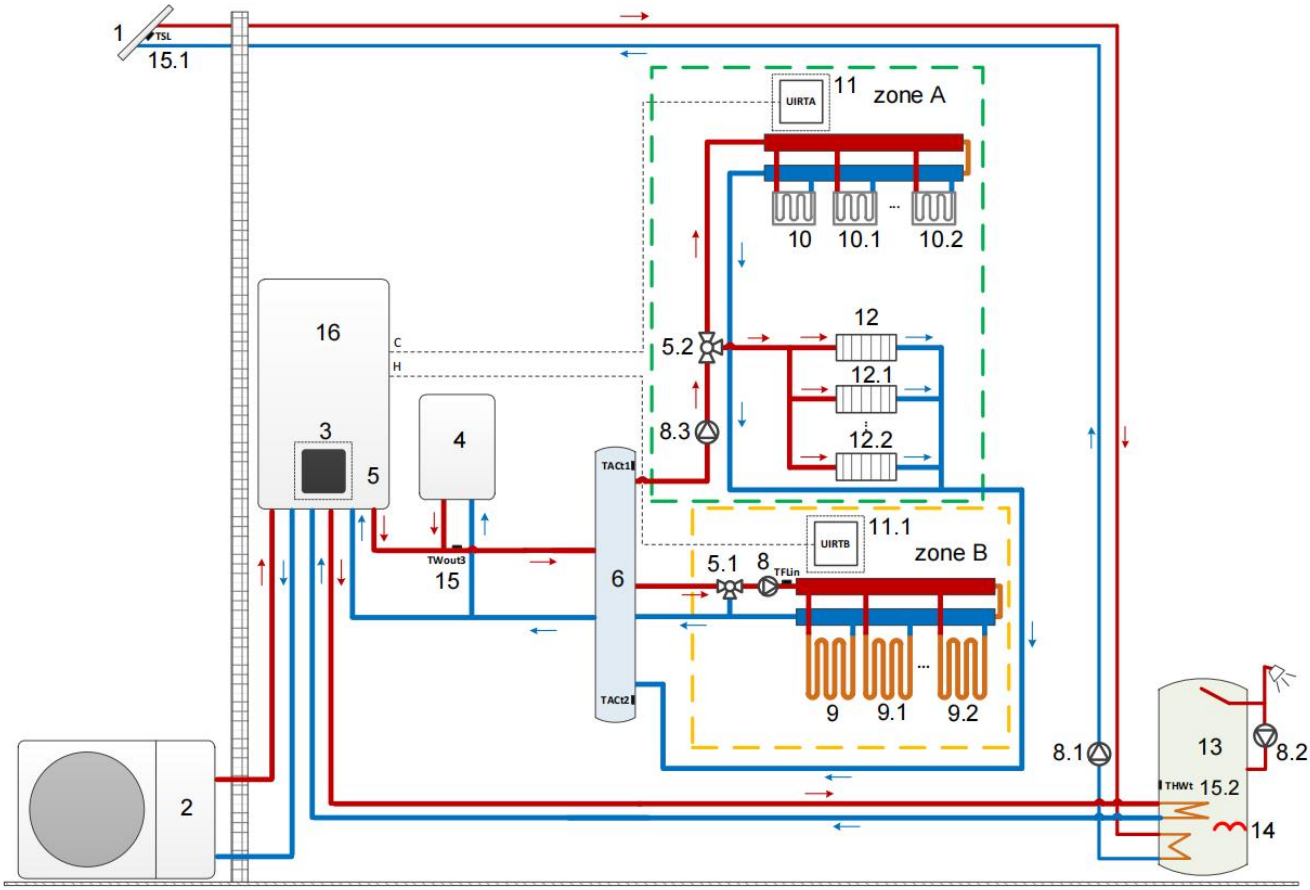


Figure 5

Legend			
1	solar panel	10	fan coil 1（Field supply）
2	Outdoor unit	10.1	fan coil 2（Field supply）
3	User interface	10.2	fan coil 3（Field supply）
4	AHS: Auxiliary heat source (Field supply)	11	zone A Low voltage room thermostat (Field supply)
5	SV1:3-way valve (Inside the indoor uni)	11.1	zone B Low voltage room thermostat (Field supply)
5.1	SV2:3-way valve (Field supply)	12	heating radiator 1 (Field supply）
5.2	SV3:3-way valve (Field supply)	12.1	heating radiator 1 (Field supply）
6	balanced reservoir(Field supply)	12.2	heating radiator 1 (Field supply）
8	P_O: Zone A circulation pump (Field supply)	13	Domestic water tank(Field supply)
8.1	P_S: Solar pump (Field supply)	14	TBH: Domestic hot water tank booster heater (Field supply)
8.2	P_R: DHW pipe pump (Field supply)	15	T3: Water flow temperature sensor (Optional)
8.3	P_M:Zone B circulation pump(Field supply)	15.1	Tsolar: Solar temperature sensor (Optional)
9	Floor heating coil 1（Field supply）	15.2	T10: Water tank temperature sensor (Accessory)
9.1	Floor heating coil 2（Field supply）	16	Indoor unit
9.2	Floor heating coil 3（Field supply）		

Notes:

The example is just for application illustration; please confirm the exact installation method according to the installation manual.

Space heating

Zone A can operate in cooling mode or heating mode, while zone B can only operate in heating mode; While installation, for all thermostats in zone A, only“C、L1”terminals need to be connected. For all thermostats in zone B, only“H、L1”terminals need to be connected.

1) The ON/OFF of zone A is controlled by the room thermostats in zone A. When any “CL1” of all thermostats in zone A closes, zone1 turns ON. When all “CL1” turn OFF, zone A turns OFF; Target temperature and operation mode are set on the user interface;

2) In heating mode, the ON/OFF of zone B is controlled by the room thermostats in zone B. When any ”HL1” of all thermostats in zone B closes, zone B turns ON. When all “HL1” open, zone B turns OFF. Target

temperature is set on the user interface; Zone B can only operate in heating mode. When cooling mode is set on the user interface, zone B keeps in OFF status.

2.5 Water Connections

2.5.1 Water Connections at the Heat Pump

Quick Connect fittings are recommended to be installed on the water inlet and outlet connections. It is recommended to use stainless steel or PPR pipes for the heat pump plumbing. The water inlet and outlet connection to the heat pump accepts stainless steel or PPR pipe fittings.

CAUTION — Make sure that flow requirements and tap water turnover rates can be maintained with the installation of additional heat pumps and plumbing restrictions.

2.5.2 Plumbing Installation Requirements

1. When water pressure exceeds 490Kpa, please use reducing valve to reduce the water pressure below 294Kpa.
2. Each part connected to unit needs to be connected with method of loose joint and installed with intermediate valve.
3. Ensure that all plumbing has been properly completed and then proceed to do a water leakage and pressure test.
4. All the pipelines and pipe fittings must be insulated to prevent heat loss.
5. Install a drain valve at the lowest point of the system to enable the system to be drained during freezing conditions (winterizing).
6. Install a check valve on the water outlet connection in order to prevent back siphoning when water pump stops.
7. In order to reduce the back pressure, the pipes should be installed horizontally
8. And minimize the elbows (90 degrees connections). If a higher flow rate is required, install a bypass valve

2.6 Specification

Outdoor unit

Technical data				
BOM code	**CP-RW0300111**	**CP-RW0400081**	**CP-RW0500121**	**CP-RW0600058**
Model	PW030-DKZLRS-E/S (ODU)	PW040-DKZLRS-E/S (ODU)	PW050-DKZLRS-E(ODU)	PW060-DKZLRS-E(O DU)
Heating Condition - Ambient Temp.（DB/WB）: 7/6℃，Water Temp.（In/Out）：30/35℃				
Heating Capacity Range (kW)	3.3~8.3	4.5~11.4	5.9~14.8	8.8~22.0
Heating Power Input Range(kW)	0.64~2.18	0.85~2.95	1.13~3.83	1.68~5.77
COP Range	3.81~5.17	3.86~5.29	3.86~5.22	3.81~5.24
DHW Condition-Ambient Temp.（DB/WB）: 7/6℃，Water Temp.（In/Out）：15/55℃				
Heating Capacity Range (kW)	3.7~7.4	5.2~10.2	6.6~13.2	7.8~17.6
Heating Power Input Range(kW)	0.79~2.10	1.10~2.87	1.41~3.73	1.67~5.01
COP Range	3.52~4.69	3.55~4.71	3.54~4.67	3.51~4.66
Cooling Condition - Ambient Temp.（DB/WB）:35/24℃，Water Temp.（In/Out）：12/7℃				
Cooling Capacity Range (kW)	2.4~5.8	3.3~8.2	4.3~10.8	6.2~15.3
Cooling Power Input Range(kW)	0.79~2.19	1.08~3.07	1.39~3.99	1.99~5.60
EER Range	2.65~3.04	2.67~3.06	2.71~3.10	2.73~3.12
Refrigerant	R290/1.0kg	R290/1.15kg	R290/1.45kg	R290/1.4kg
Power supply	230V/1Ph/50Hz/60Hz		380V/3Ph/50-60Hz	
Diameter of pipe (mm)	DN25	DN25	DN25	DN25
Noise dB(A)	≤47	≤50	≤52	≤53
Net Weight (kg)	105	116	130	166
Net Dimension (L/W/H) mm	1080×460×820	1080×460×960	1080×480×1060	1080×480×1372
Operation Ambient Temp.	-25~43℃			
Operating water temperature (℃)	20~65℃（DHW ）			
Operating water temperature (℃)	20~70℃（Heating）			
Operating water temperature (℃)	7~35℃（Cooling）			

Indoor unit

BOM code	CP-RW0400011	CP-RW0600021	CP-RW0400012	CP-RW0600022-01
Model	PW030/040-E/S(IDU)	PW050/060-E(IDU)	PW030/040-E/S(IDU)	PW050/060-E(IDU)
Hot water tank	-	-	200L	250L
3-Way Valve	ACOL/DN25	ACOL/DN25	ACOL/DN25	ACOL/DN25
Electric Heater	3kW/220V	3kW/220V	3kW+3kW/220V	3kW+3kW/220V
DC Inverter Water Pump	Shimge/APM25-9	Shimge/APF25-12	Shimge/APM25-9	Shimge/APF25-12
Max water head(m)	9	12	9	12
Expansion Tank(L)	8L	8L	8L	8L
Diameter of pipe (mm)	DN25	DN25	DN25	DN25
Safety valve(MPa)	0.3	0.3	0.3	0.3
Leakage Switch(A)	Schneider/40A	Schneider/32A	Schneider/40A	Schneider/32A
Cabinet	Galvanized powder coated steel		Galvanized powder coated steel	
Package	Splint/Carton		Splint/Carton	
Power Supply	230V/1Ph/50-60Hz	380V/3Ph/50-60Hz	230V/1Ph/50-60Hz	380V/3Ph/50-60Hz
Net Weight(kg)	43	43	150	185
Gross Weight(kg)	55	55	175	215
Net Dimension(mm)	740*520*300	740*520*300	645*645*1745	645*645*2035
Packing Dimension(mm)	800*580*450	800*580*450	710*710*1880	710*710*2170
Applicable Models	PW030/PW040(Single phase)	PW050/PW060(Three-phase)	PW030/PW040(Single phase)	PW050/PW060(Three-phase)

Indoor unit

BOM code	CP-RW0400013	CP-RW0600023-01
Model	PW030/040-E/S(IDU)	PW050/060-E(IDU)
Hot water tank	300L	500L
3-Way Valve	ACOL/DN25	ACOL/DN25
Electric Heater	3kW+3kW/220V	3kW+3kW/220V
Solar coil	φ25mm*10m	φ25mm*10m
DC Inverter Water Pump	Shimge/APM25-9	Shimge/APF25-12
Max water head(m)	9	12
Expansion Tank(L)	8L	8L
Diameter of pipe (mm)	DN25	DN25
Safety valve(MPa)	0.3	0.3
Leakage Switch(A)	Schneider/40A	Schneider/32A
Cabinet	Galvanized powder coated steel	
Package	Splint/Carton	
Power Supply	230V/1Ph/50-60Hz	380V/3Ph/50-60Hz
Net Weight(kg)	220	280
Gross Weight(kg)	250	320
Net Dimension(mm)	735*735*2035	885*885*1935
Packing Dimension(mm)	800*800*2170	950*950*2070
Applicable Models	PW030/PW040(Single phase)	PW050/PW060(Three-phase)

Note:

The above design and specifications are subject to change without prior notice for product improvement.

Detailed specifications of the units please refer to nameplate on the units.

Correct installation is required to ensure safe operation. The requirements for heat pumps include the following:

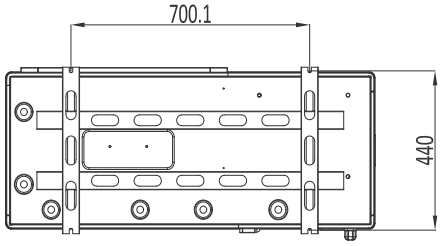
1. Dimensions for critical connections.
2. Field assembly (if required).
3. Appropriate site location and clearances.
4. Proper electrical wiring.
5. Adequate water flow.

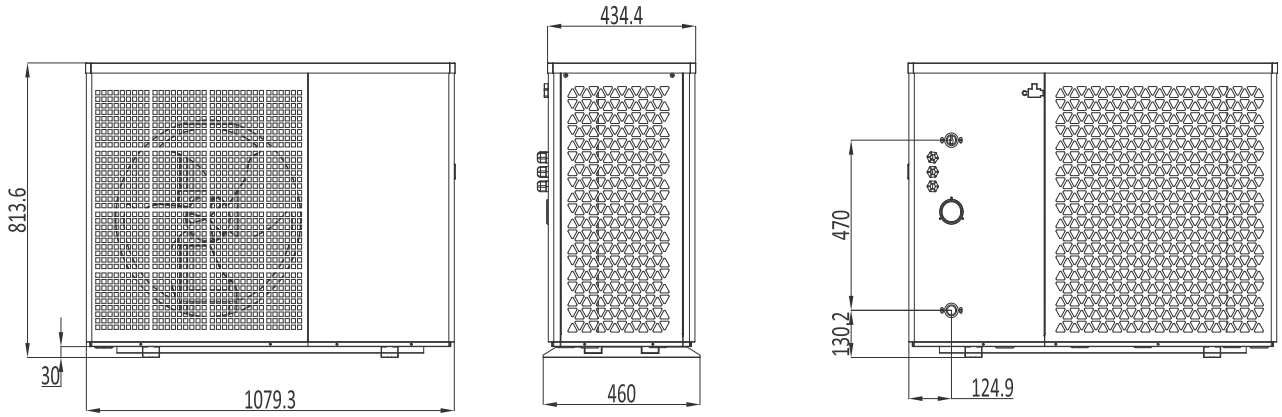
This manual provides the information needed to meet these requirements. Review all application and installation procedures completely before continuing the installation.

Dimension:

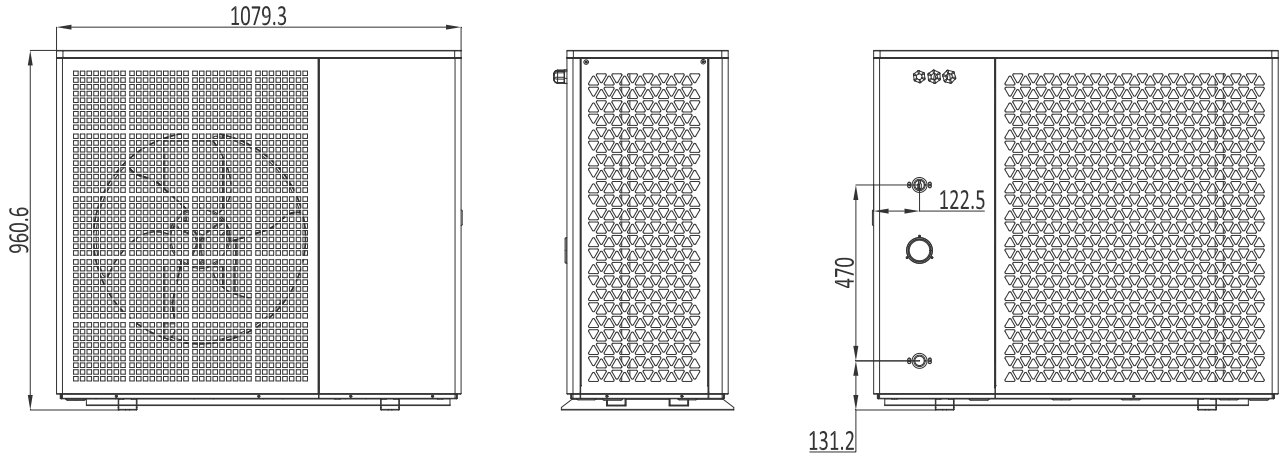
Unit:mm

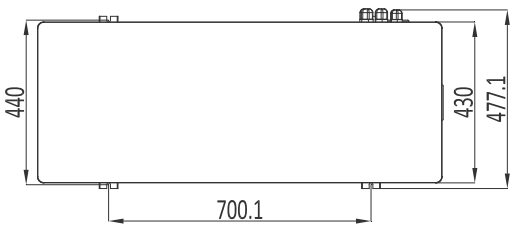
PW030-DKZLRS-E/S(ODU)



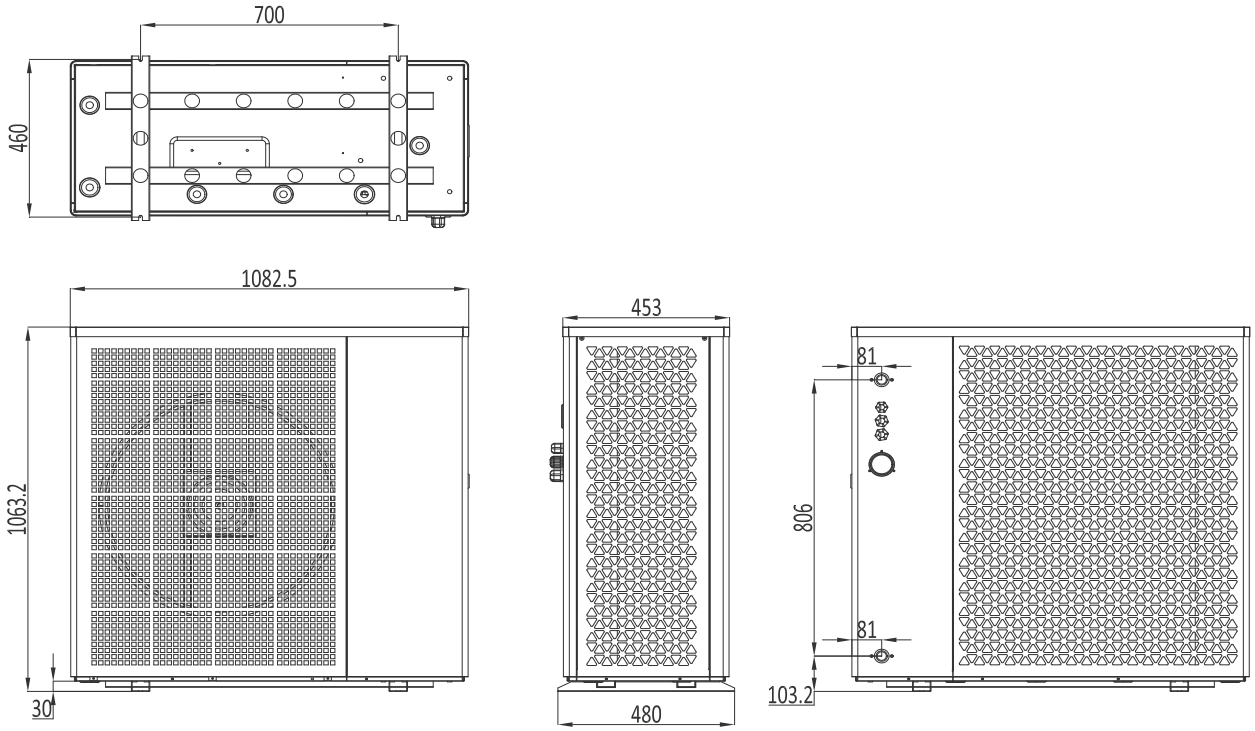


PW040-DKZLRS-E/S(ODU)

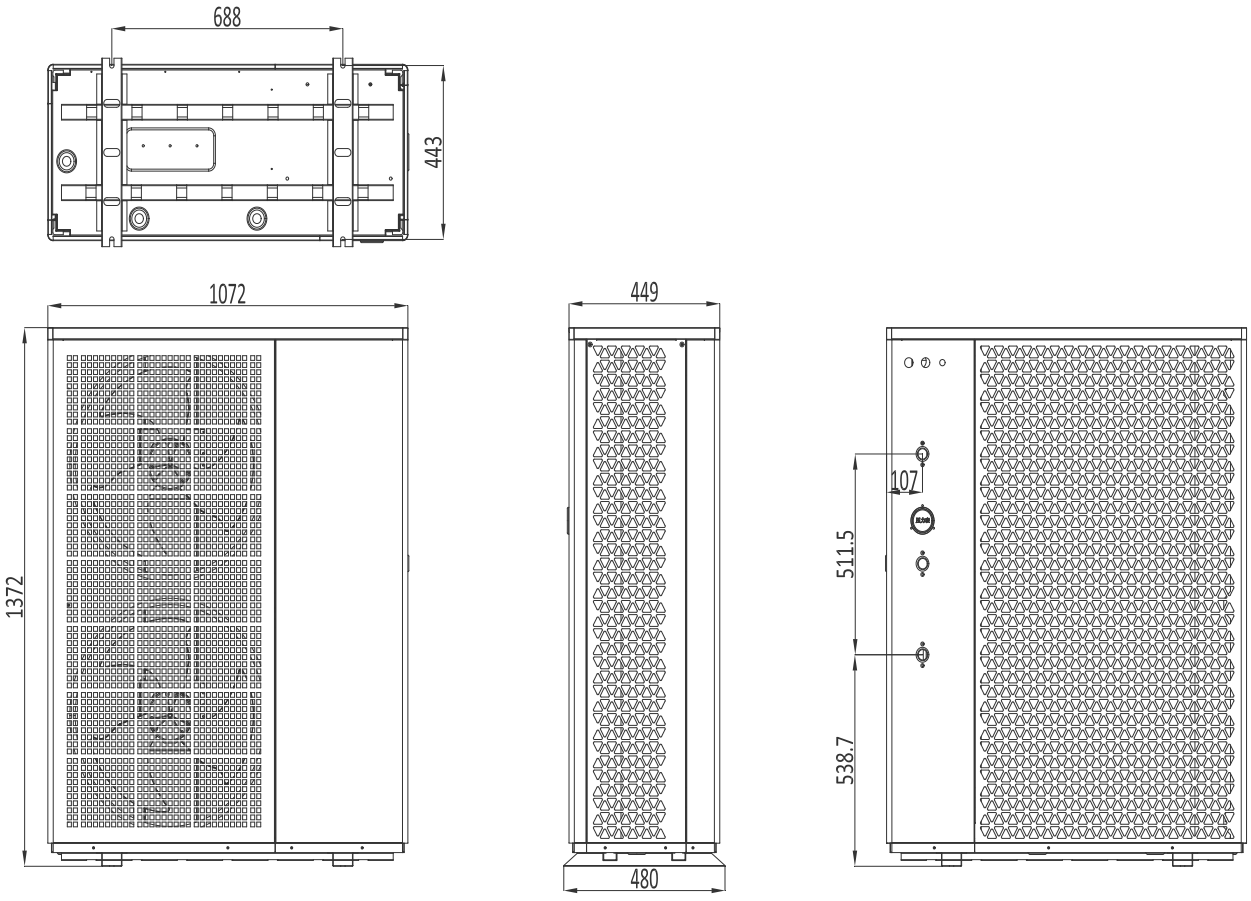




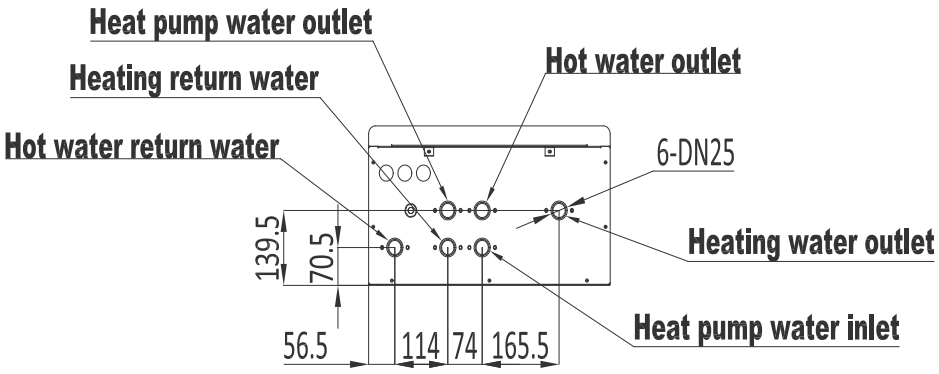
PW050-DKZLRS-E(ODU)

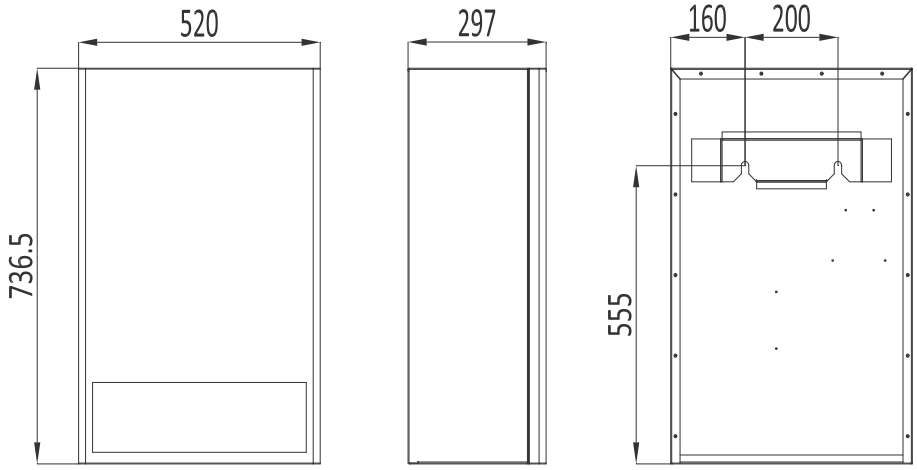


PW060-DKZLRS-E(ODU)

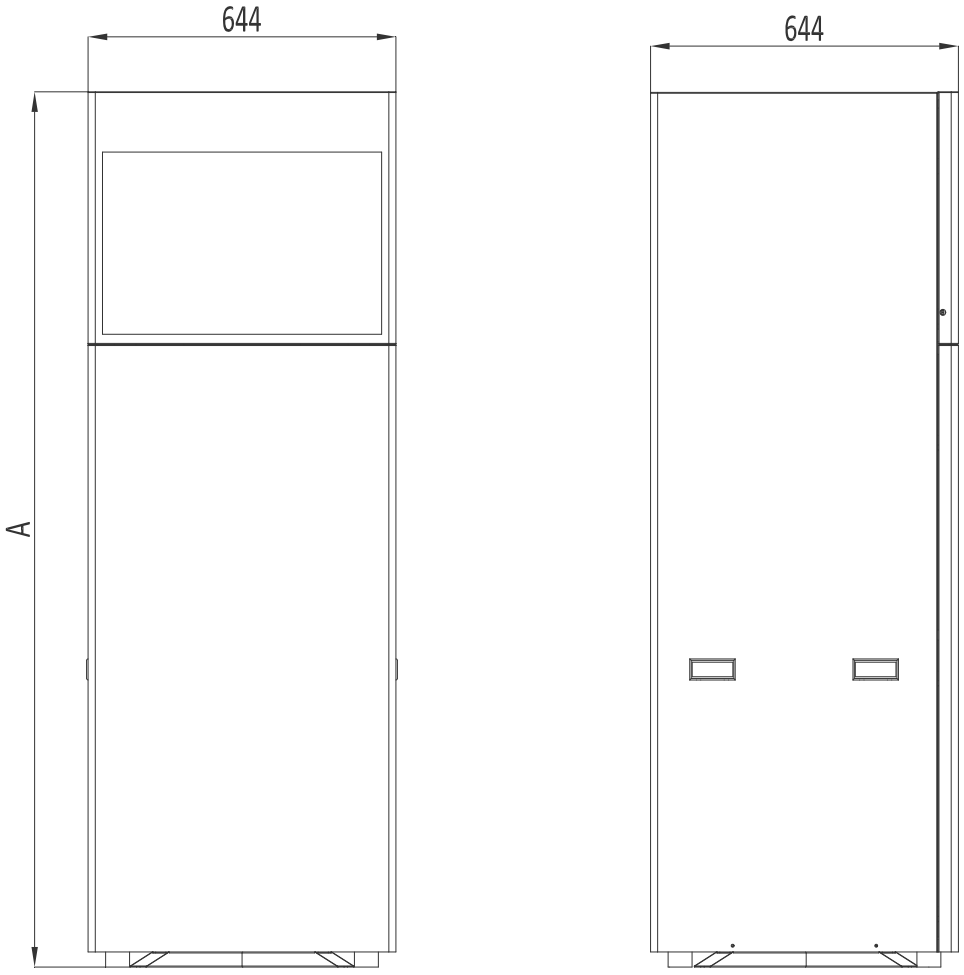


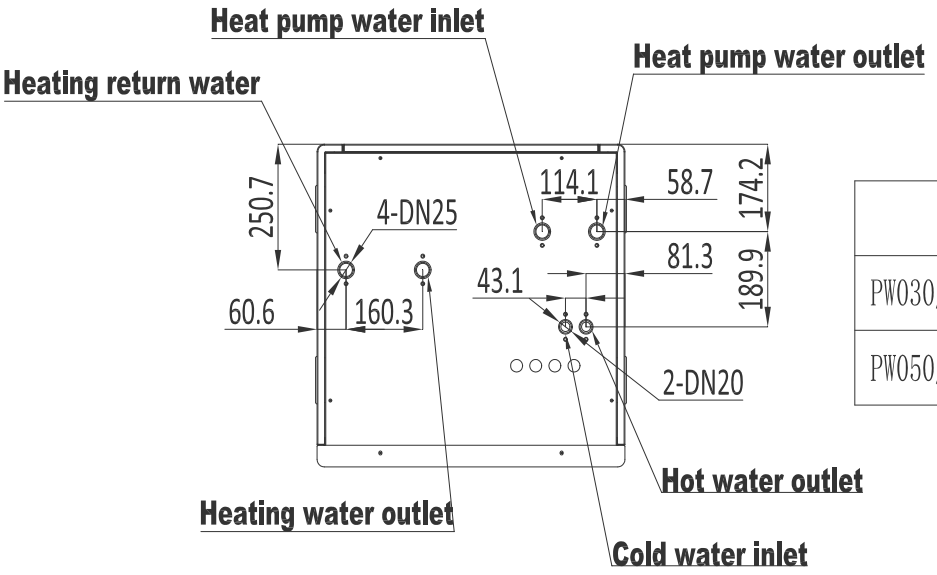
PW030/040-E/S(IDU)、PW050/060-E(IDU)





PW030/040-E/S(IDU)、PW050/060-E(IDU)

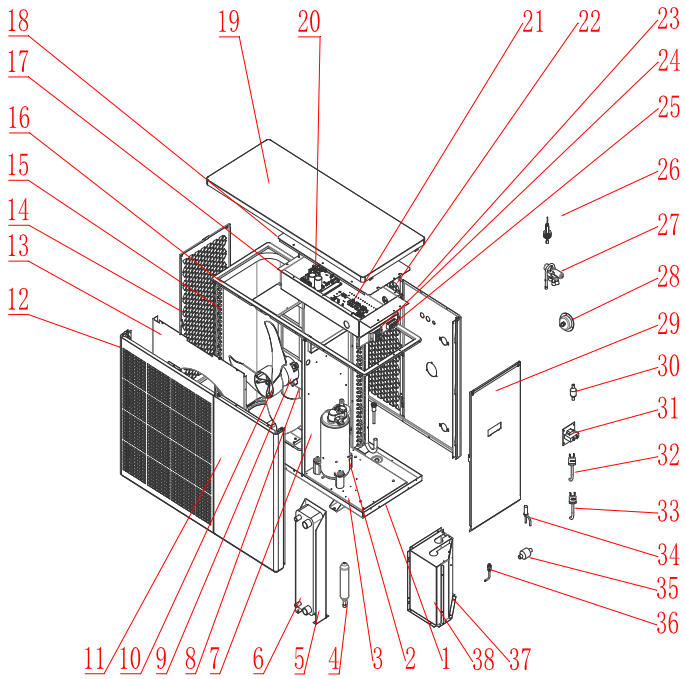




	A
PW030/040-E/S(IDU)	1745
PW050/060-E(IDU)	2035

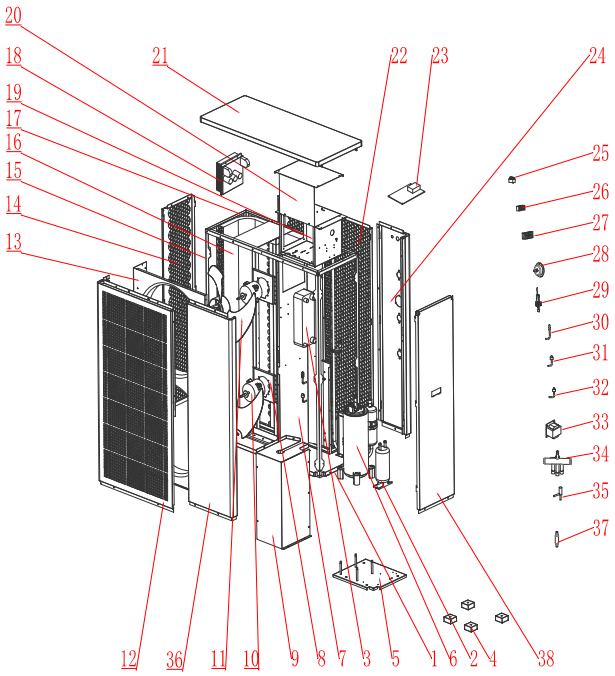
Exploded view

PW030/040-DKZLRS-E/S(ODU)、PW050-DKZLRS-E(ODU)



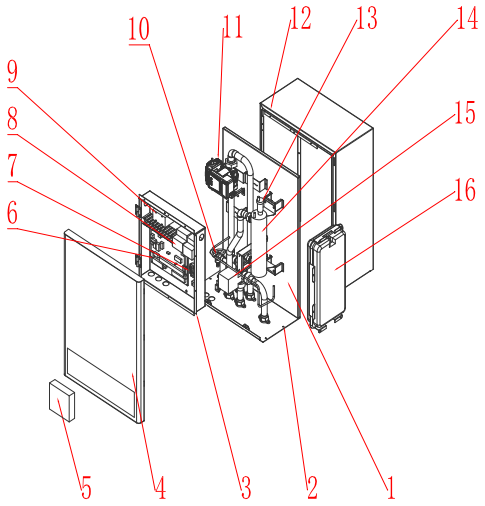
NO	Spare parts	NO	Spare parts
1	chassis	21	external motherboard
2	compressor	22	back net
3	damping plate	23	rear side panel
4	liquid storage tank	24	terminal block
5	plate replacement support	25	terminal block
6	plate heat exchanger	26	water flow switch
7	center spacer	27	4-way valve
8	motor bracket	28	pressure gauge
9	motor	29	right side panel
10	fan blade	30	drying filter
11	front right panel	31	reactance
12	front panel	32	high voltage switch
13	Air guide panel	33	low voltage switch
14	left net	34	electronic expansion valve
15	fin heat exchanger	35	filter
16	top frame	36	needle valve
17	electric box	37	compressor hood 1
18	electric box cover	38	compressor hood 2
19	top panel		
20	driver board		

PW060-DKZLRS-E(ODU)



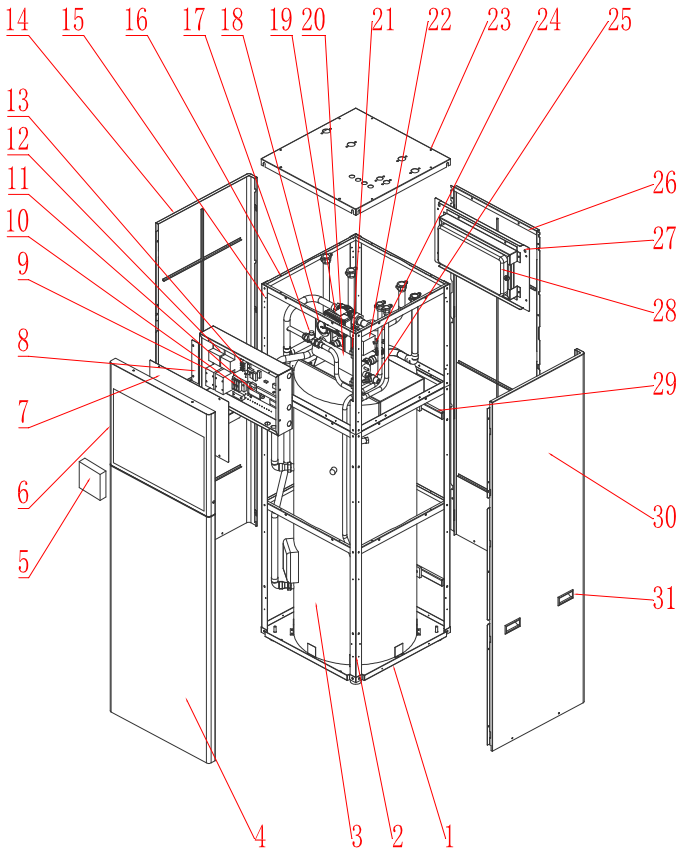
NO	Spare parts	NO	Spare parts
1	chassis	21	top panel
2	liquid storage tank	22	back net
3	plate heat exchanger	23	control board
4	rubber pad	24	rear side panel
5	damping plate	25	transfer terminal block
6	compressor	26	transfer terminal block
7	center spacer	27	transfer terminal block
8	motor bracket	28	pressure gauge
9	compressor cover	29	water flow switch
10	motor	30	needle valve
11	fan blade	31	high voltage switch
12	front panel	32	low voltage switch
13	Air guide panel	33	reactor
14	left net	34	4-way valve
15	post	35	electronic expansion valve
16	fin heat exchanger	36	front panel
17	top frame	37	check valve
18	driver board	38	right side panel
19	electric box		
20	electric box cover		

PW030/040-E/S(IDU)、PW050/060-E(IDU)



NO	Spare parts	NO	Spare parts
1	Rear panel	12	coaming
2	Chassis	13	exhaust valve
3	electric box	14	electrical heating
4	front panel	15	three-way valve
5	Line controller	16	Expansion tank
6	motherboard	17	
7	Terminal blocks	18	
8	Air Switch	19	
9	Contactor	20	
10	safety valve	21	
11	water pump	22	

PW030/040-E/S(IDU)、PW050/060-E(IDU)



NO	Spare parts	NO	Spare parts
1	chassis	17	one-way valve
2	column	18	pressure gage
3	water tank	19	water pump
4	front panel	20	electrical heating
5	line controller	21	exhaust valve
6	display panel	22	three-way valve
7	electric box cover	23	top cap
8	electric box	24	water flow switch
9	contactor	25	safety valve
10	terminal blocks	26	rear panel
11	motherboard	27	support plate
12	air switch	28	expansion tank
13	terminal blocks	29	water tank bracket
14	left panel	30	right panel
15	uper pillar	31	handle
16	support		

2.7 Electrical Connections

WARNING —Risk of electrical shock or electrocution.

Ensure that all high voltage circuits are disconnected before commencing heat pump installation. Contact with these circuits could result in death or serious injury to users, installers or others, due to electrical shock and may also cause damage to property.

CAUTION — Label all wires prior to disconnection when servicing the heat pump. Wiring errors can cause improper and dangerous operation. Check and ensure proper operation after servicing.

2.7.1 Power Supply

1. If the supply voltage is too low or too high, it can cause damage and/or result in unstable operation of the heat pump unit, due to high in rush currents on start up.
2. The minimum starting voltage should be above 90% of rated voltage. The acceptable operating voltage range should be within ±10% of the rated voltage.
3. Ensure the cable specifications meet the correct requirements for the specific installation. The distance between the installation site and mains power supply will affect the cable thickness. Follow the local electrical standards to select the cables, circuit breakers and isolator breakers.

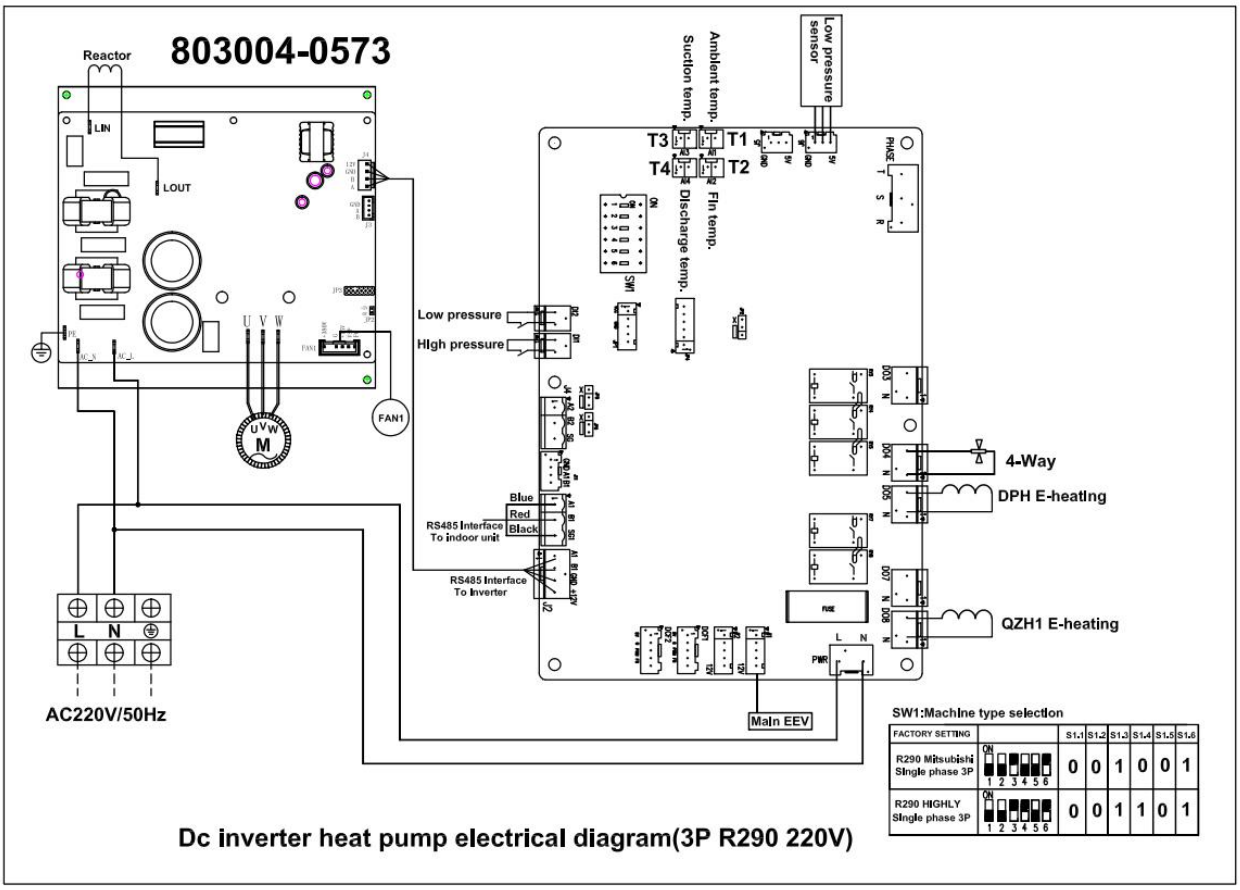
2.7.2 Grounding and Over Current Protection

In order to prevent electrical shock in case of leakage from unit, install the heat pump according to local electrical standard.

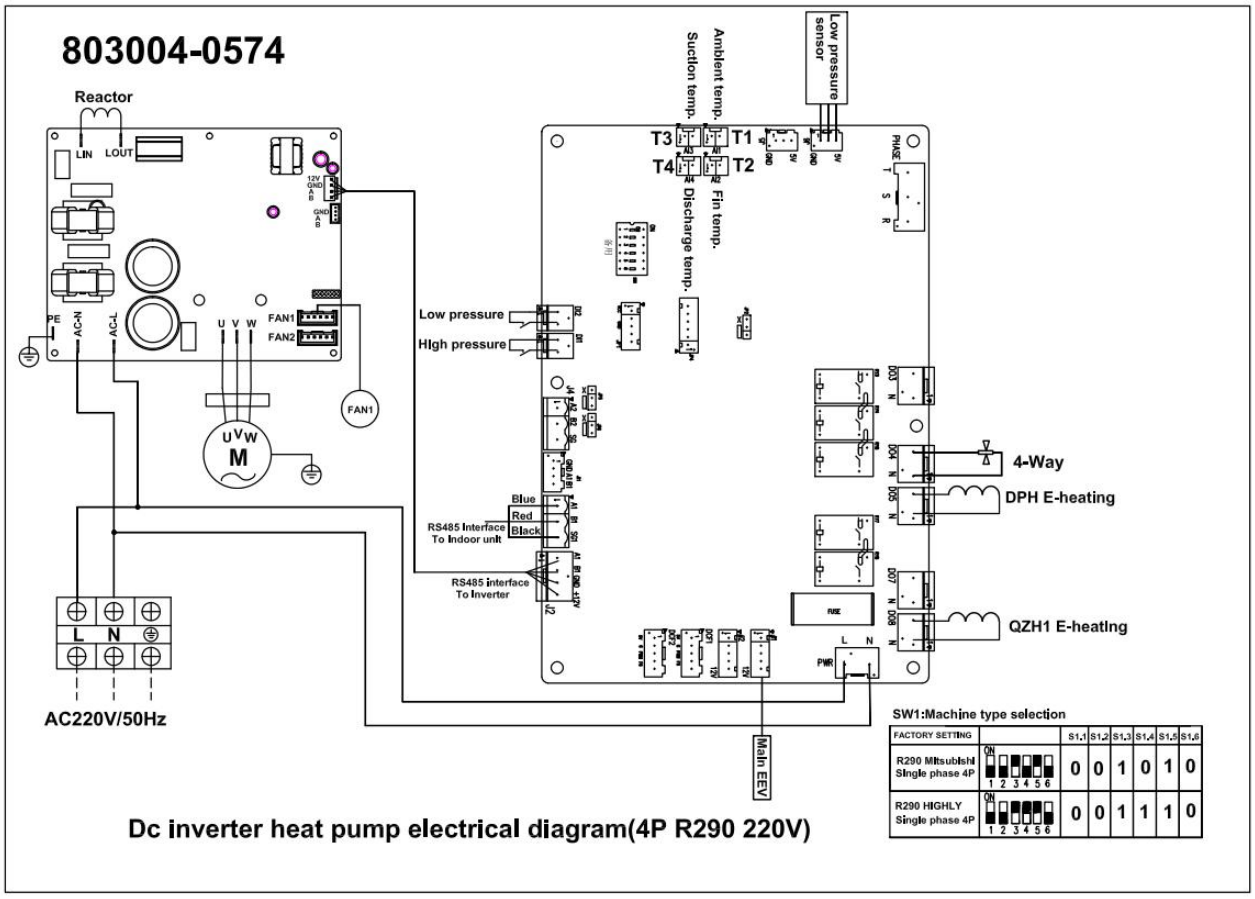
1. Do not interrupt the voltage supply to the heat pump frequently as this may result a shorter life expectance of the heat pump.
2. When installing over current protection, ensure that the correct current rating is met for this specific installation.
3. If an additional auxiliary heater is need to be controlled by the heat pump controller, the relay (or power) of the aux-heater must be connected to the relevant output of the controller.

2.8 Electrical Wiring Diagram

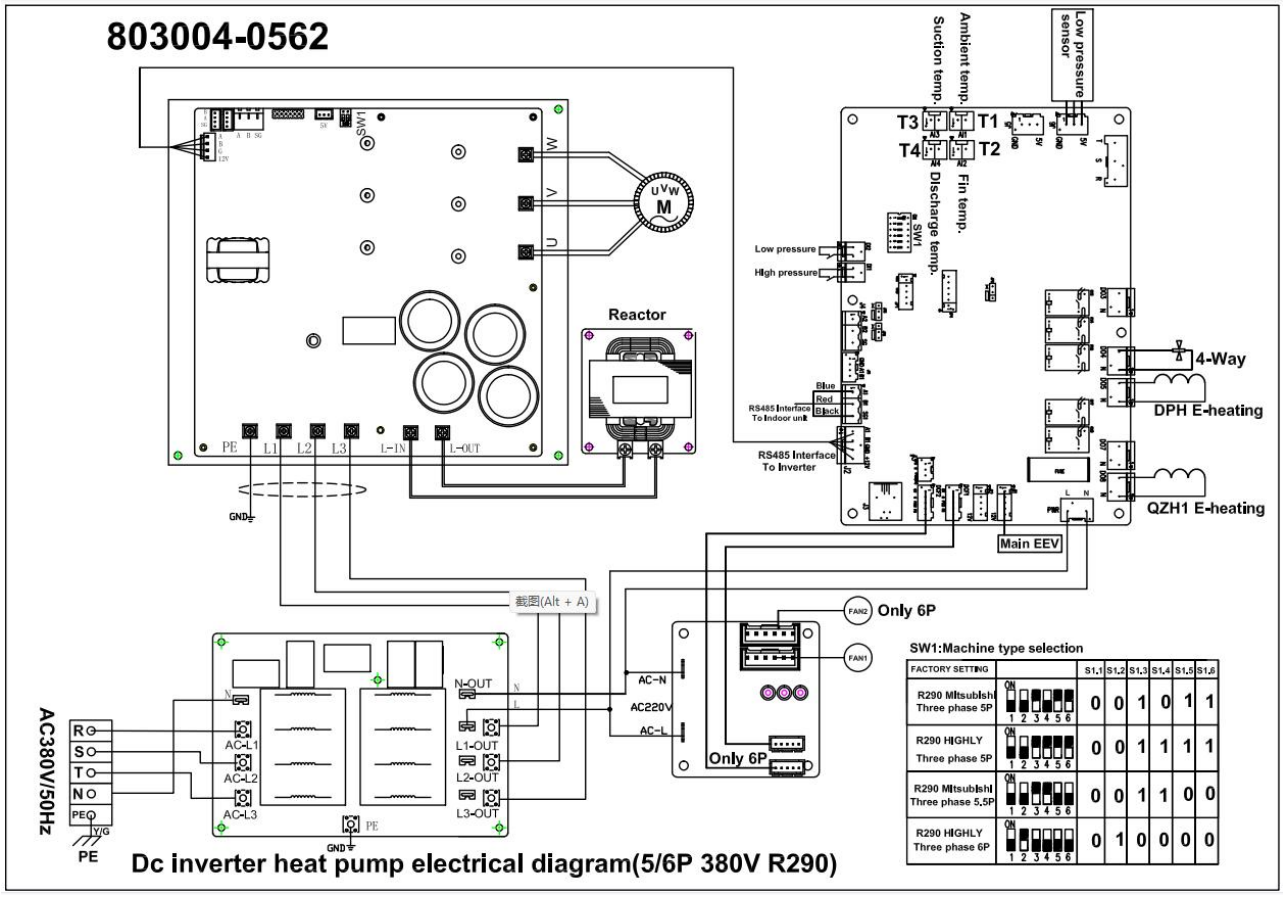
Single phase system (PW030-DKZLRS-E/S(ODU)) Outdoor unit



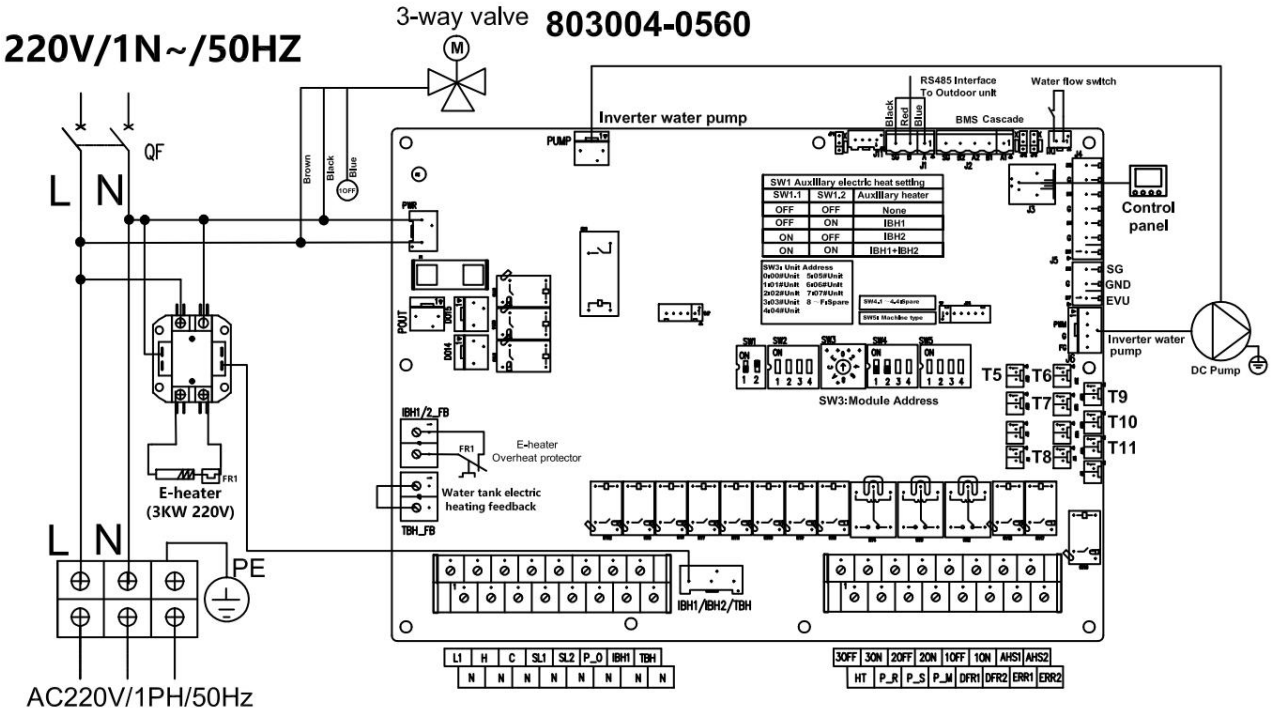
Single phase system (PW040-DKZLRS-E/S(ODU)) Outdoor unit



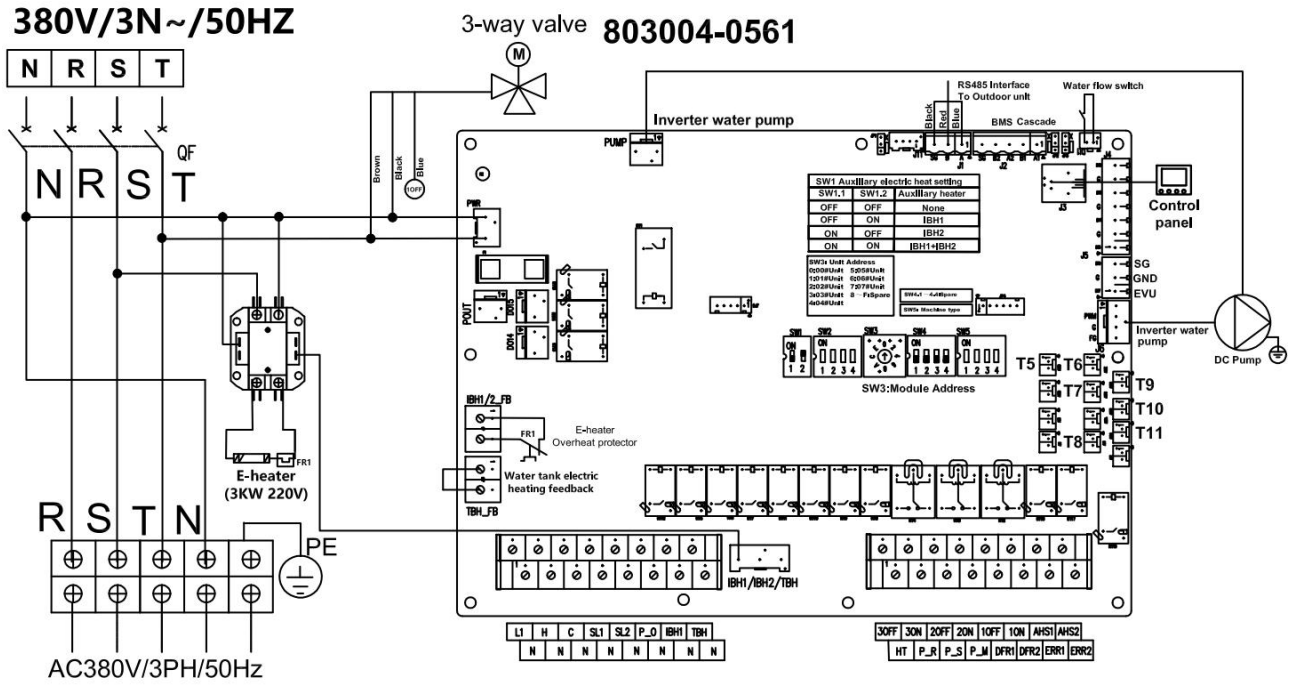
Three phase system (PW050/060-DKZLRS-E(ODU)) Outdoor unit



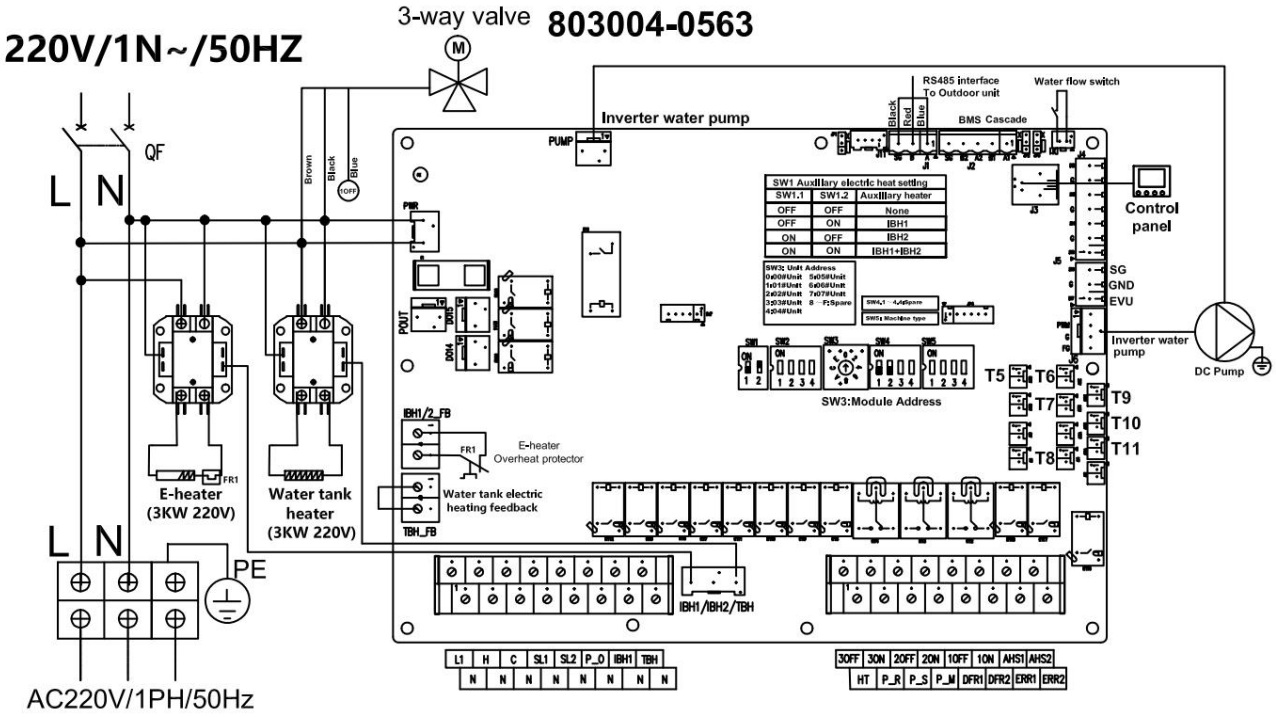
Single phase hydraulic module



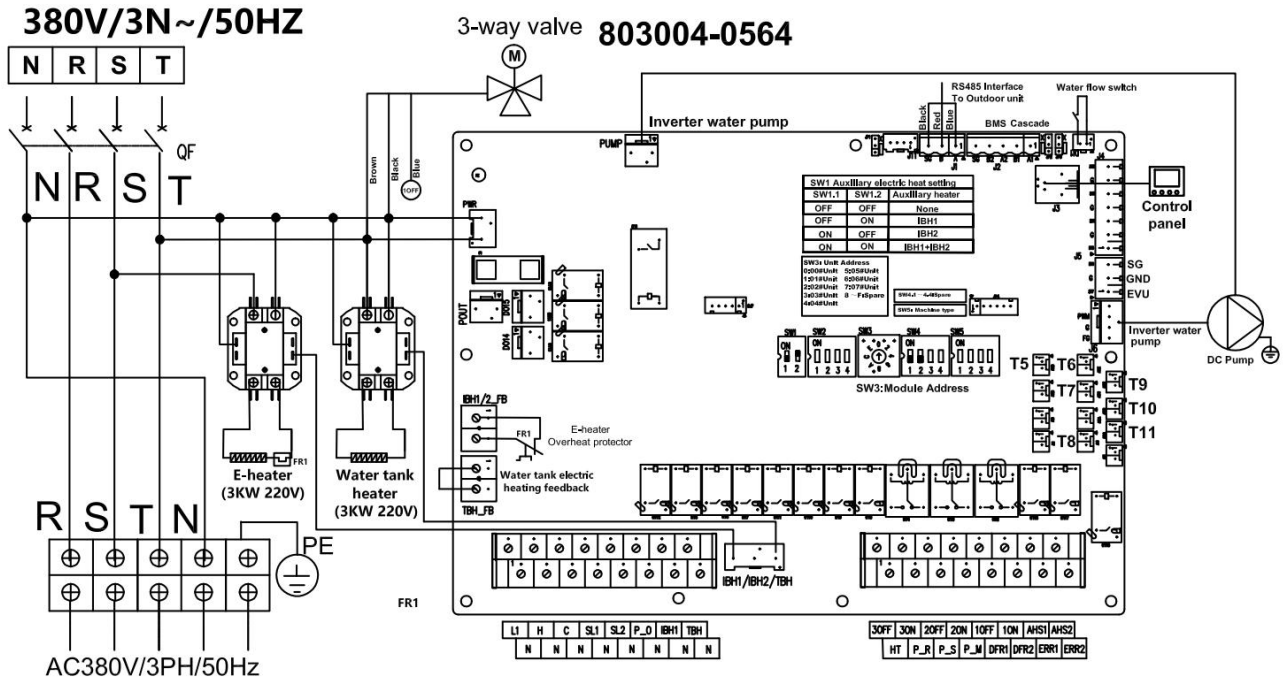
Three phase hydraulic module



Single phase hydraulic module(Built in water tank)



Three phase hydraulic module(Built in water tank)

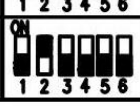


Model selection (adjust the corresponding dialing code for the internal unit based on the external unit model)

SW4 SW5:Machine type selection

FACTORY SETTING		S4.3	S4.4	S5.1	S5.2	S5.3	S5.4
R290 Mitsubishi Single phase 3P		0	0	1	0	0	1
R290 HIGHLY Single phase 3P		0	0	1	1	0	1
R290 Mitsubishi Single phase 4P		0	0	1	0	1	0
R290 HIGHLY Single phase 4P		0	0	1	1	1	0

SW5:Machine type selection

FACTORY SETTING		S4.3	S4.4	S5.1	S5.2	S5.3	S5.4
R290 Mitsubishi Three phase 5P		0	0	1	0	1	1
R290 HIGHLY Three phase 5P		0	0	1	1	1	1
R290 Mitsubishi Three phase 5.5P		0	0	1	1	0	0
R290 HIGHLY Three phase 6P		0	1	0	0	0	0

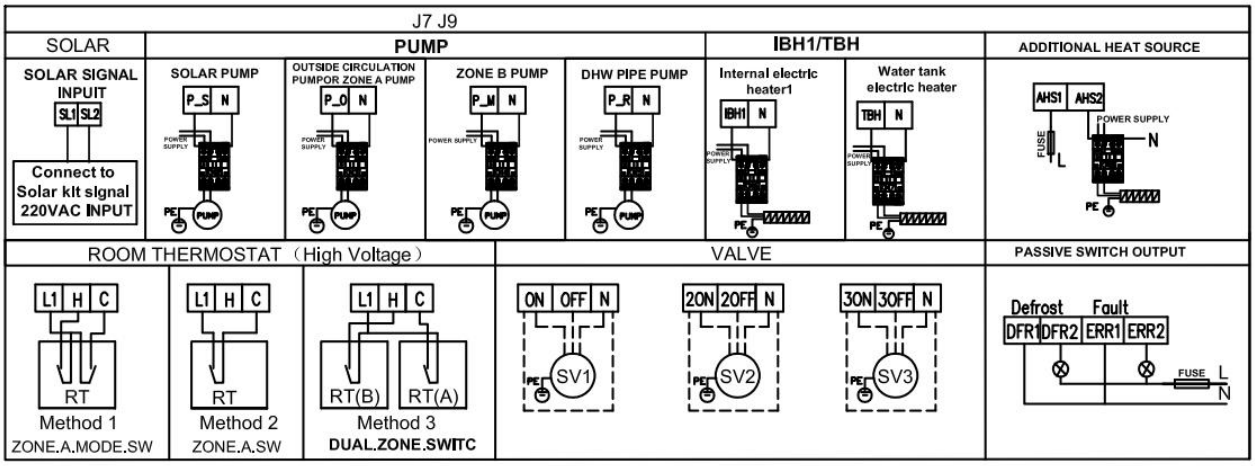
Code introduction

Code	Part name
T5	TWout1 water temp.(Plate exchanger)
T6	Water inlet temp.
T7	TWout2 water temp.(Total)
T8	Solar temp.（Accessories）
T9	Floor water temp.（Accessories）
T10	Water tank temp.
T11	TWout3 water temp.(Accessories)

DI6/DI7-SAMRT GRID		
Operating behavior	EVU	SG
Increased operation output	ON	ON
	ON	OFF
Normal Operation	OFF	ON
Decreased operation output	OFF	OFF

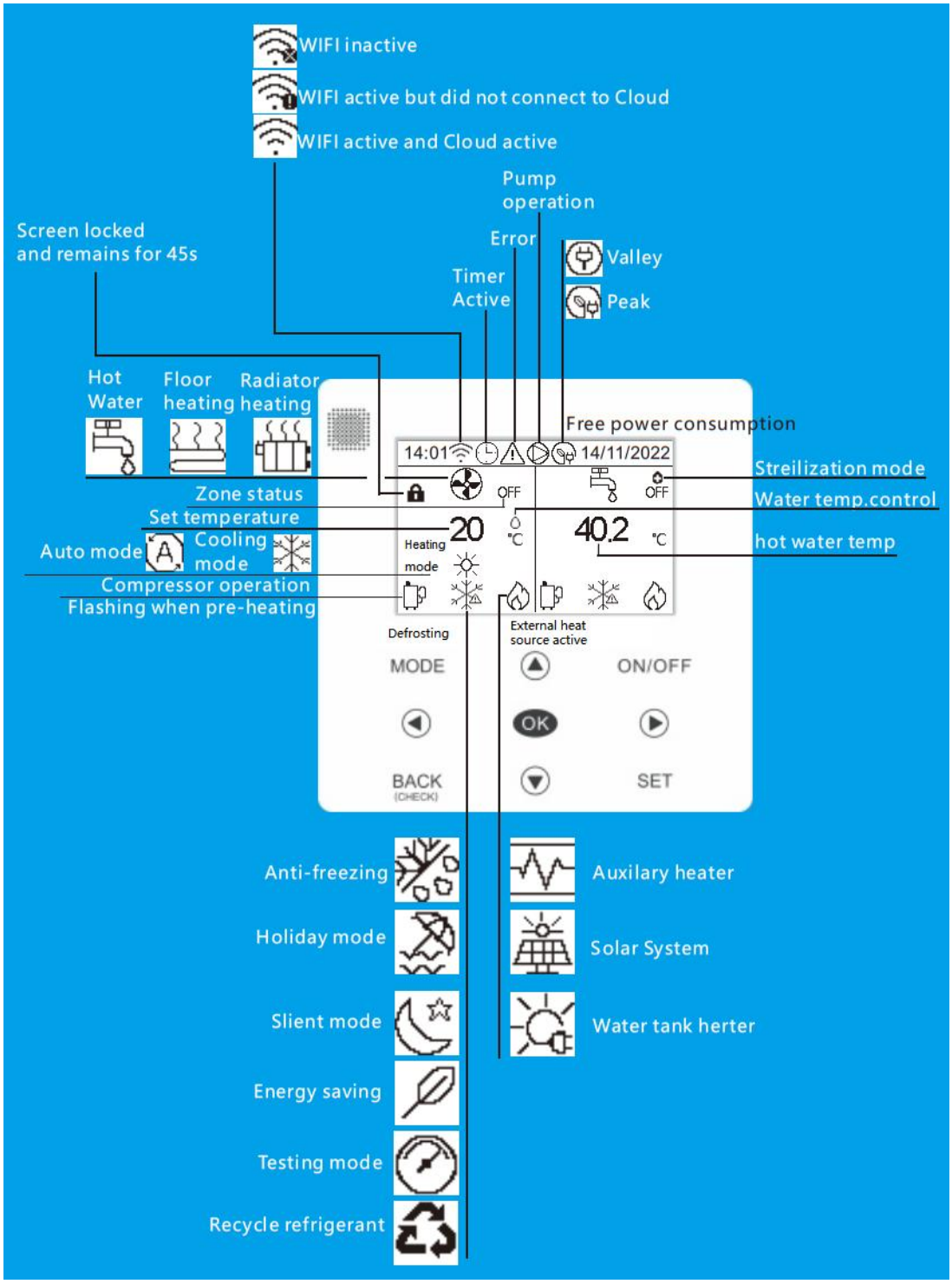
Code	Part name
AHS	Auxiliary heat source(Field supply)
DHW	Domestic hot water
H/C	Heat mode/Cool mode(Thermostat)
P_O	Outside circulation pump (field supply)
IBH	Internal electric heater1
TBH	Immersion heater in DHW tank
HT	Anti-freeze Electric heating
P_R	DHW pipe pump(Field supply)
P_S	Solar pump(Field supply)
P_M	Zone B circulation pump(Field supply)
SV1-3	3-way valve(Field supply)
KM1-KM8	AC Contactor(Field supply)

Load wiring diagram



Section 3 Operating Heat Pump

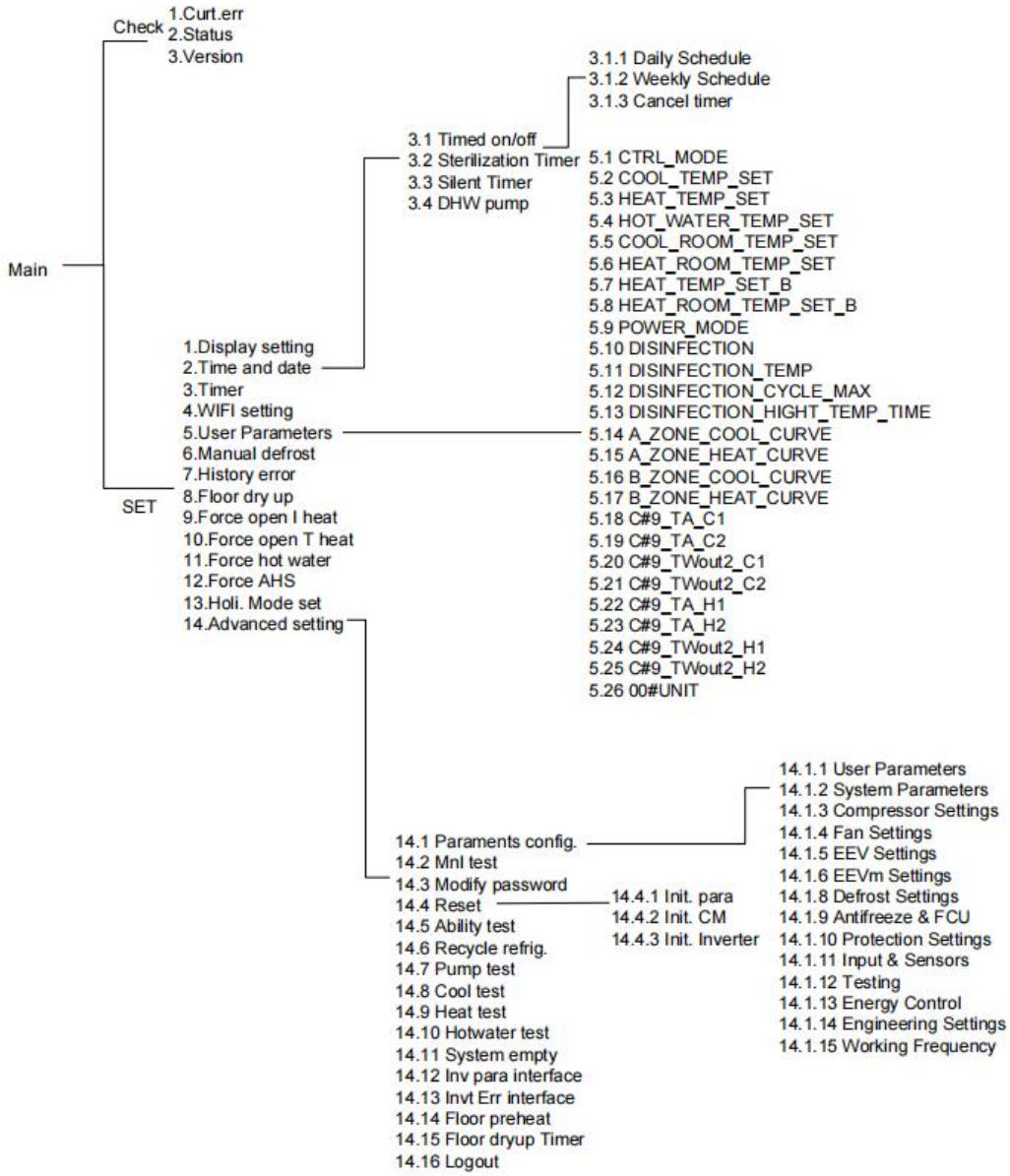
3.1 Controller Panel



3.2 Definition of Buttons

Button icon	Meaning	Name
ON/OFF	Power on/ Power off	ON/OFF
MODE	Mode setting	MODE
BACK (CHECK)	Back	BACK(CHECK)
SET	Set/Modify	SET
OK	Confirm/Enter	OK
▲	Move cursor up, flip pages, adjust parameter values, etc	Up
▼	Move cursor down, flip pages, adjust parameter values, etc	Down
◀	Move cursor to the left, flip pages, etc	Left
▶	Move cursor to the right, flip pages, etc	Right

3.3 Interface overview

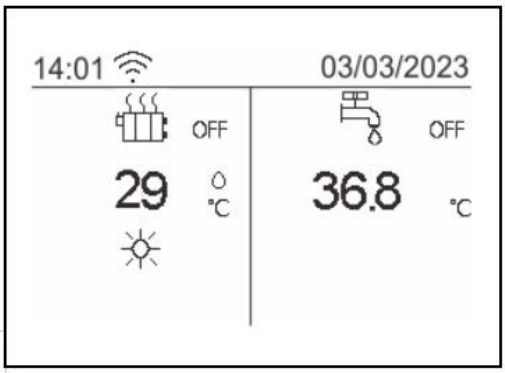


3.4 Wire Controller Operation

3.4.1 Main interface description

According to different application scenarios, the main interface may also vary. The following are several possible situations that may occur:

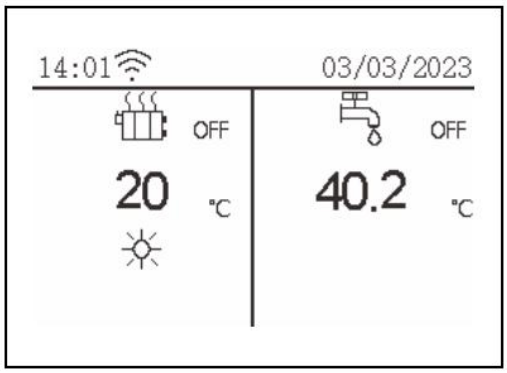
Main interface 1 (single zone water temperature+hot water):



This system includes single area air conditioning water temperature control and domestic hot water control.

Tip: All icons in the manual are for illustration purposes and may differ from the actual content on the screen.

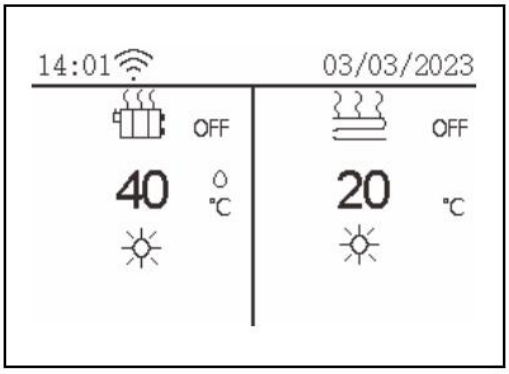
Main interface 2 (single zone room temperature+hot water):



This system includes single area air conditioning room temperature control and domestic hot water control.

Tip: The wire controller should be installed indoors to detect indoor temperature.

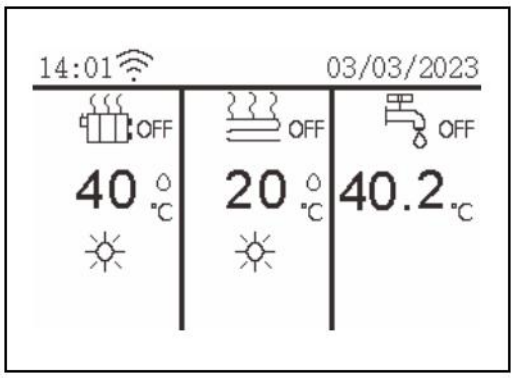
Main interface 3 (Dual zone mixing):



This system includes dual zone air conditioning control (A zone water temperature+B zone room temperature).

Tip: The wire controller should be installed indoors to detect indoor temperature. The heating mode can activate both zones simultaneously, while the cooling mode can only activate Zone A.

Main interface 4 (Dual zone water temperature+hot water)



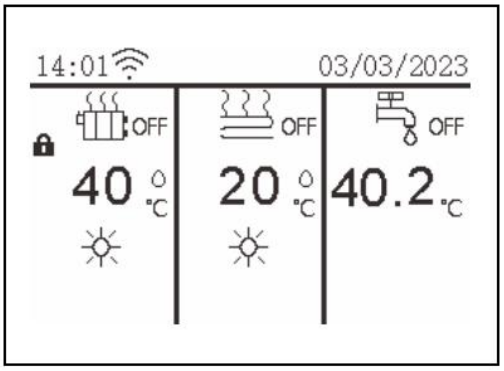
This system includes dual zone air conditioning control (A zone water temperature+B zone water temperature) and domestic hot water control.

Reminder: The heating mode can activate both zones simultaneously, while the cooling mode can only activate Zone A.

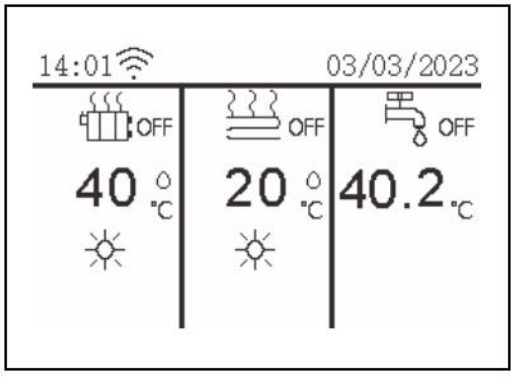
Attention: When using a temperature controller for control, the unit can only control the water temperature. When the user's end is underfloor heating, the target temperature in the corresponding area should not be set too high.

3.4.2 Lock screen

If a lock screen icon appears on the screen, the remote control will not be able to operate, as shown in the figure:

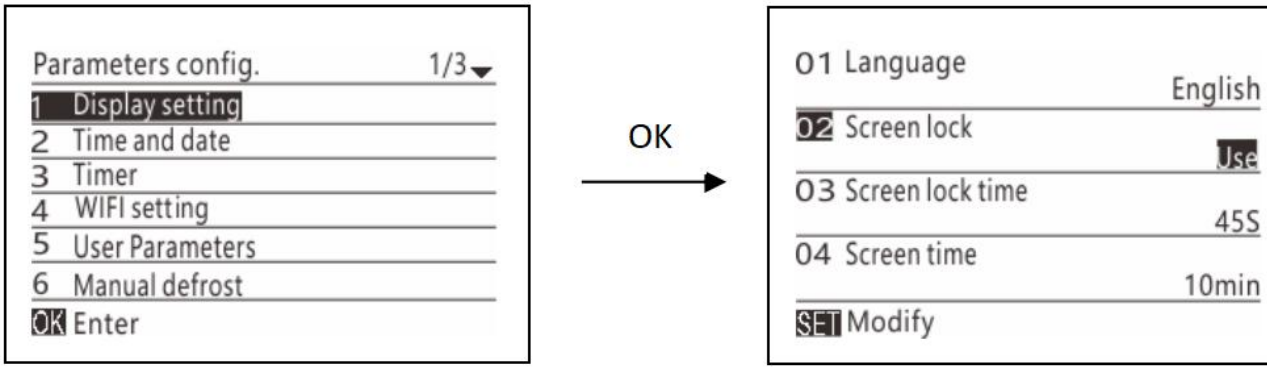


Long press the "OK" button for three seconds, the lock screen icon will disappear, and the remote control can be operated, as shown in the figure:



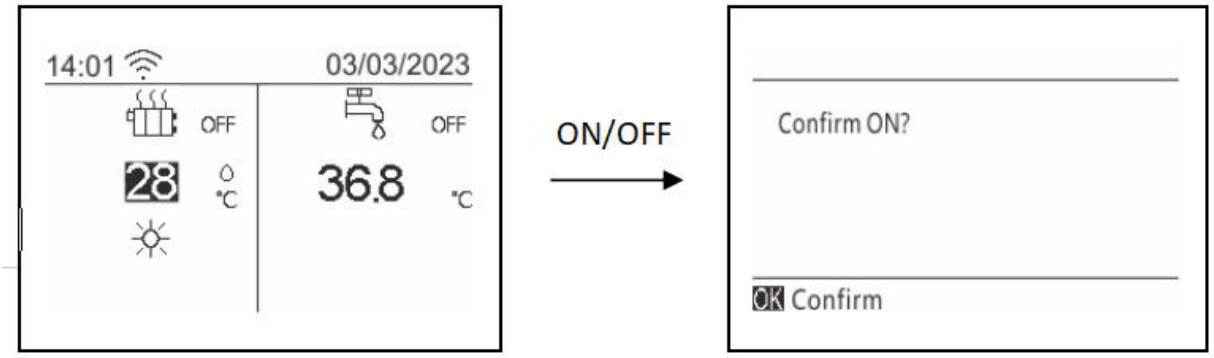
Lock screen function enable/disabling settings:

Click the "SET" button on the main interface to enter the settings menu interface. Find "Display Settings" and click the "OK" button to enter. Use the "SET" button to adjust the "Lock Screen Function Settings".



3.4.3 START / STOP THE HEAT PUMP

Click the "left" or "right" button on the main interface, select the air conditioning area that needs to be turned on/off, then press the "ON/OFF" button and click the "OK" button to confirm whether the corresponding air conditioning area's cooling or heating is turned on/off.



ON: means opening the mode; OFF: means closing the mode

3.4.4 Thermostat switch air conditioning area

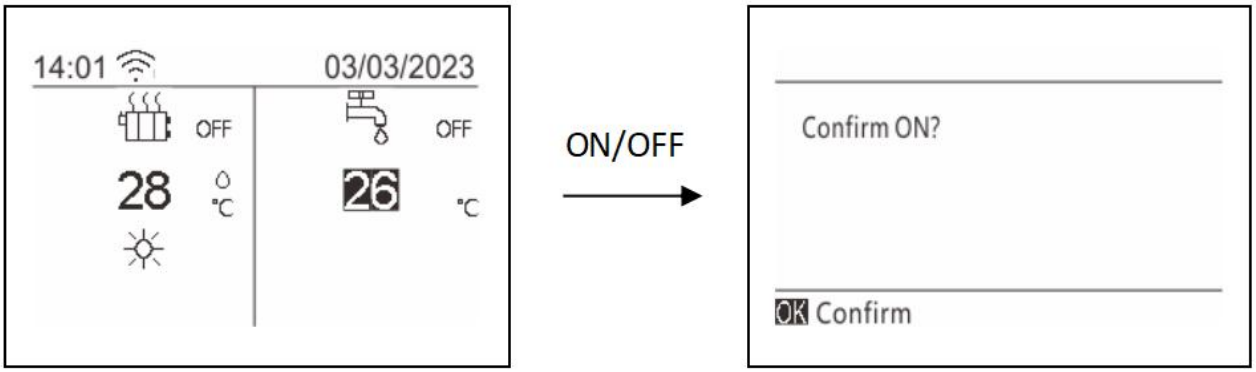
【**Thermostat control**】When selecting “single zone switching”, the thermostat will control A zone operation mode and turn on or turn off the A zone.

【**Thermostat control**】When selecting "single zone switch" or "dual zone switch", the on/off of the air conditioning area is controlled by the thermostat, and the operating mode of the air conditioning area is set by the wire controller.

3.4.5 Wired controller control domestic hot water

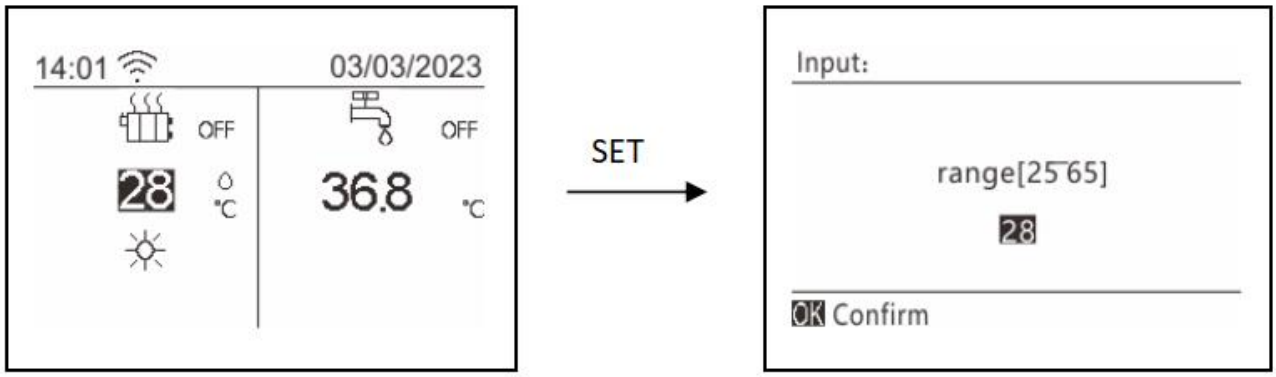
Firstly, it is necessary to ensure that the [Hot Water Function] is set to 'Enable', otherwise the hot water cannot be turned on.

Click the "left" or "right" button on the main interface, select the hot water area, then press the "ON/OFF" button and click the "OK" button to confirm whether the hot water is turned on/off.



3.4.6 Adjusting temperature

Click the "left" or "right" button on the main interface, select the area where the temperature needs to be adjusted, and click the "SET" button to display the temperature adjustment box.

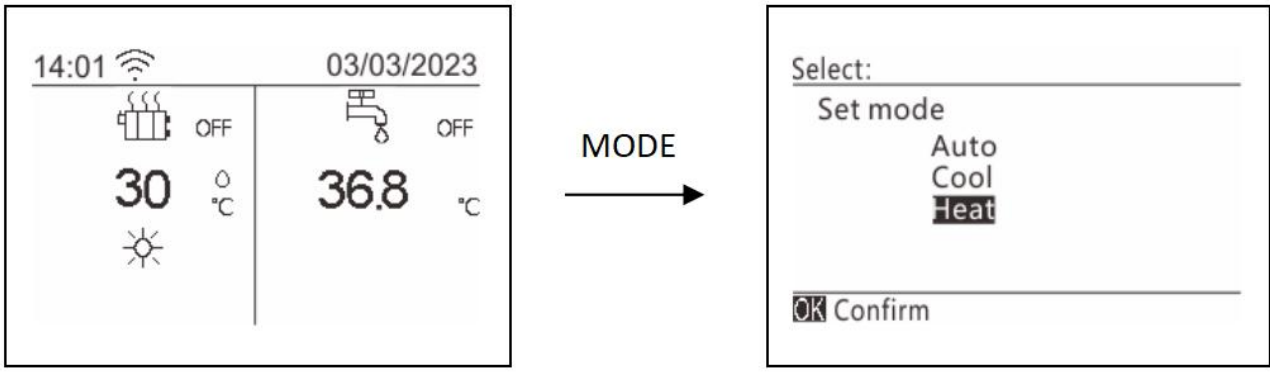


At this time, adjust the temperature value by clicking the "Up" or "Down" button, and then click the "OK" button to save the adjusted temperature value.

3.4.7 RUNNING MODE SETTING

There are three spatial modes in total:
1. Cooling mode
2. Heating mode
3. Automatic mode

Click the "MODE" button on the main interface to pop up the space mode setting window, as shown in the figure:



Click the "Up" or "Down" button to select the desired mode, then click the "OK" button to confirm successful setting. If you click the "Back" button, the interface will be closed directly and the current mode setting will be cancelled.

3.4.8 High-temperature sterilization

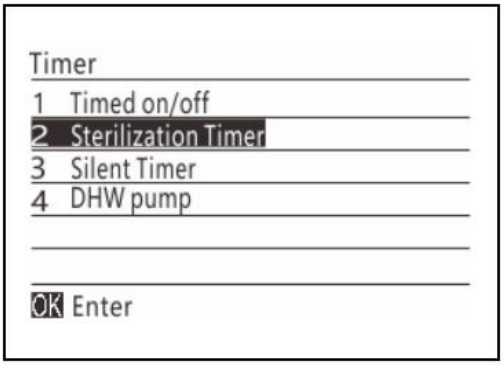
There are two ways to activate the sterilization function:
1. Timed activation
2. Manual activation

The timed sterilization function is used to kill bacteria and bacteria in the hot water tank. The temperature of the hot water tank will be forced to reach 61-70 degrees (the specific value is determined by the parameter sterilization temperature), and the sterilization temperature can be set in the advanced settings.

Before using the sterilization function, please ensure that the "User Parameter">"Timed Sterilization Function" parameter is set to enable (see parameter table in 7.6 User Parameters for details). If the parameter value is disabled, the sterilization function cannot be used.

1. Timed start sterilization

Select 'Timed Sterilization' in the 'Timed Settings' interface.

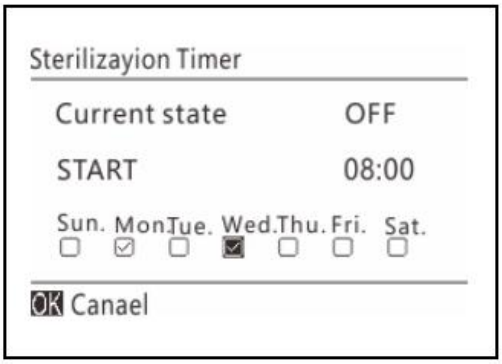


Click the "OK" button to enter the timed sterilization setting.

First, use the "Up", "Down", "Left", and "Right" keys to move the cursor and select the starting time point where timed sterilization needs to be enabled. Click "SET" to set it.

Then click the "Up", "Down", "Left", and "Right" keys to move the cursor and select a certain number of days in each week that require scheduled sterilization. Click the "OK" key to check or cancel.

As shown in the following figure, scheduled sterilization will be activated on Monday and Wednesday at 08:00:



2. Manually start sterilization (manual control has priority over timed control)

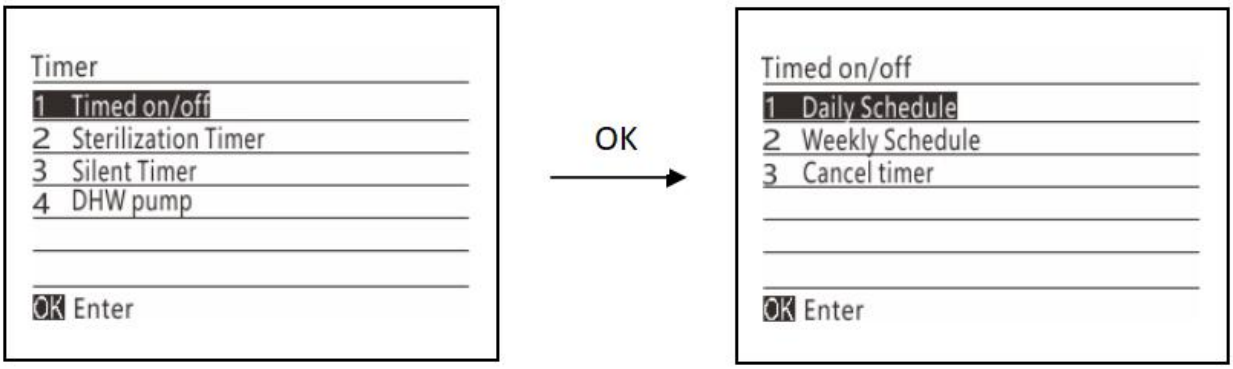
Click the "Up", "Down", "Left", and "Right" keys to move the cursor to the "Current Status":

If the current status is 'off ', clicking the 'OK' button will manually activate the sterilization function (the set timed sterilization is still effective).

If the current status is 'enabled', clicking the 'OK' button will manually exit the sterilization function (the set timed sterilization is still effective).

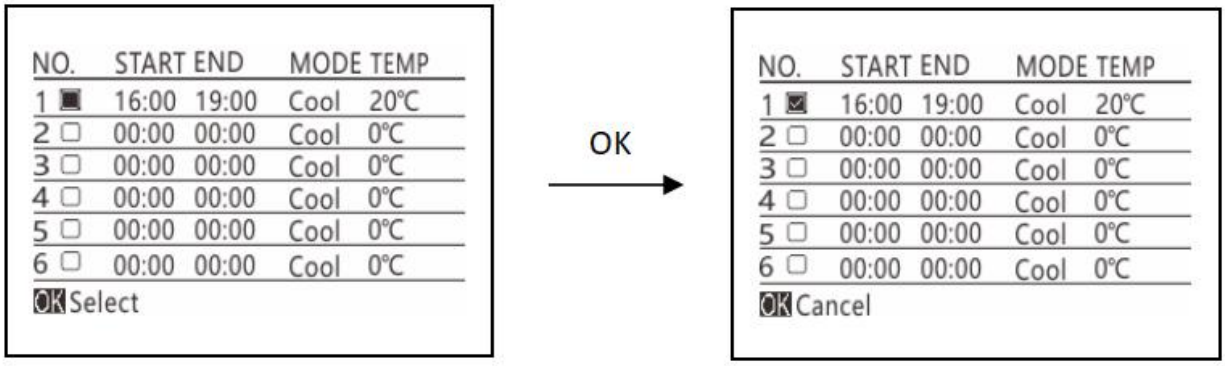
3.4.9 TIMER SETTING

Select 'Timer On/Off ' in the 'Timer Settings' interface and click the 'OK' button to enter the timer on/off settings.



3.4.9.1 Daily scheduled power on/off

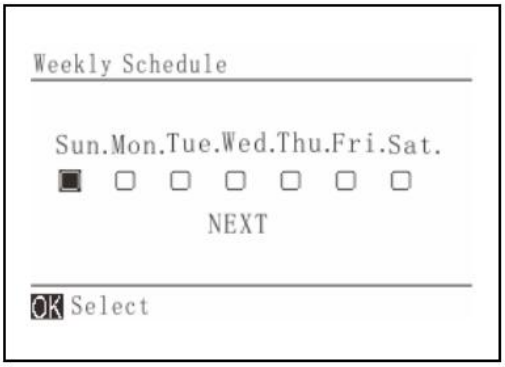
Select 'Daily Schedule' and click the 'OK' button to enter the daily schedule setting interface.
At this point, you can move the cursor to select a group by clicking the "up" or "down" button, and click the "OK" button to use or cancel the group timer.



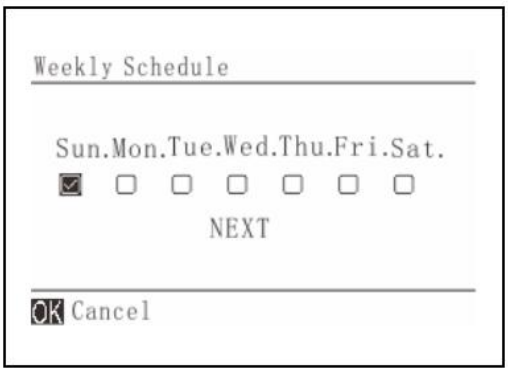
Click the "left" and "right" keys to move the cursor to the start time, end time, mode, and temperature of the group timer.
When the cursor selects the corresponding position, the corresponding value can be modified by clicking the "Up" and "Down" keys.

3.4.9.2 Weekly scheduled power on/off

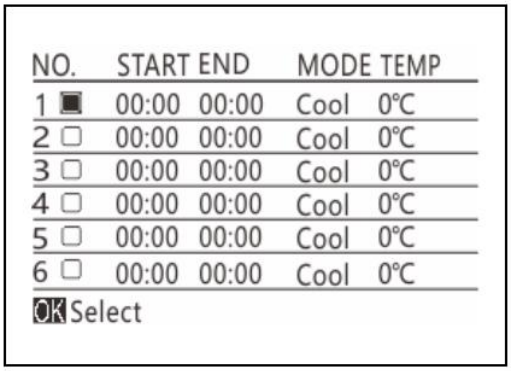
Select 'Weekly Schedule' and click the 'OK' button to enter the weekly schedule setting interface.



Click "Up", "Down", "Left", "Right" to move the cursor and select a certain number of days in a week that require scheduled power on/off. Click "OK" to check or cancel.

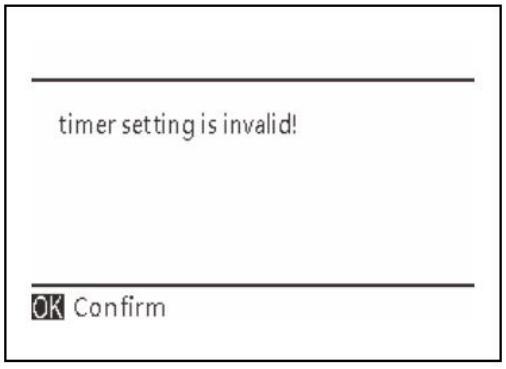


Click "up", "down", "left", "right" to move the cursor to "next item", and click "OK" to enter the timed group interface.



Note: This operation is the same as the daily scheduled power on/off operation, and will not be repeated here.

Tip:
If the start time is later than the end time, cross day setting, or the temperature exceeds the allowable range of this mode, the timing setting of this group will be invalid, and the following interface will appear.



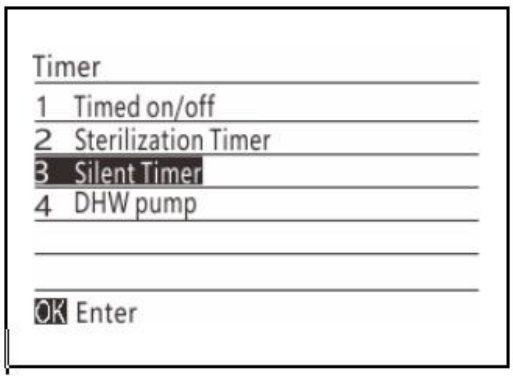
3.4.10 Silent function setting

There are two ways to use silent mode:
1. Timed use
2. Manual use

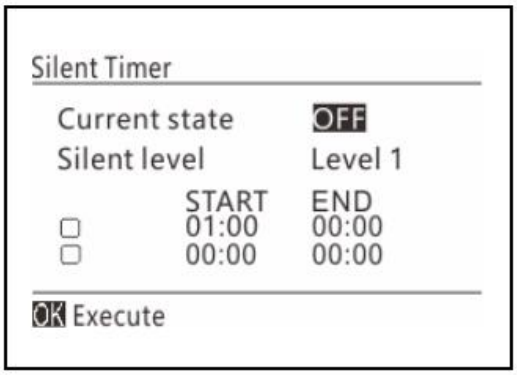
There are two levels in silent mode, level 1 and level 2. The maximum speed of fan and compressor in level 2 mode is smaller than that in level 1.

1. Timed use of silent mode

Select 'Silent Timer' in the 'Timed Settings' interface.



Click the "OK" button to enter the scheduled silent setting (there are two sets of scheduled silent).

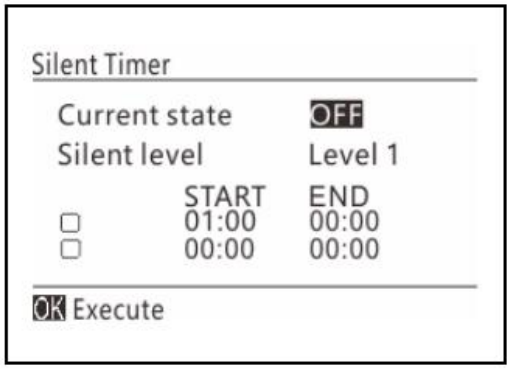


First, use the "Up", "Down", "Left", and "Right" keys to move the cursor and select the silent level, silent mode start time, and end time. Click "SET" to set.

Then click the "Up", "Down", "Left", and "Right" keys to move the cursor to the box, and click the "OK" key to check or cancel the group timer.

2. Manually use silent mode (manual control has priority over timed control)

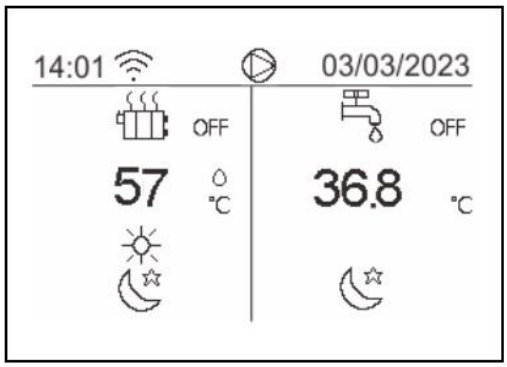
Click the "Up", "Down", "Left", and "Right" keys to move the cursor to the "Current Status":



If the current status is 'off ', clicking the 'OK' button will manually turn on the silent mode (the set timed silent is still valid).

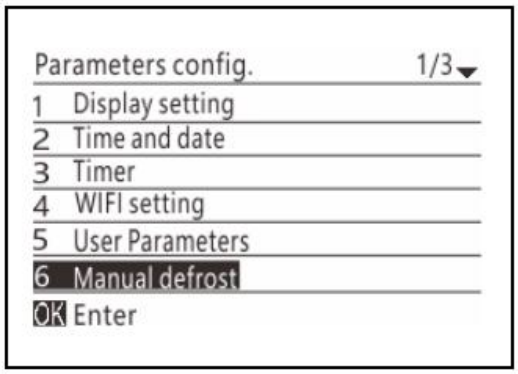
If the current status is 'ON', clicking the 'OK' button will manually exit the silent mode (the set timed silent is still valid).

Check if there is a silent icon on the main interface to confirm if the unit has entered silent mode, as shown in the figure:

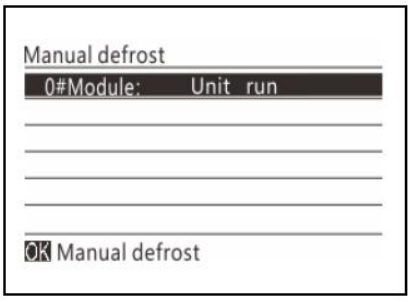


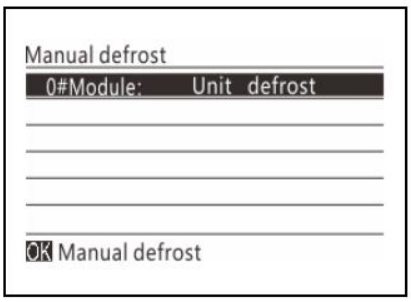
3.4.11 Manual defrosting

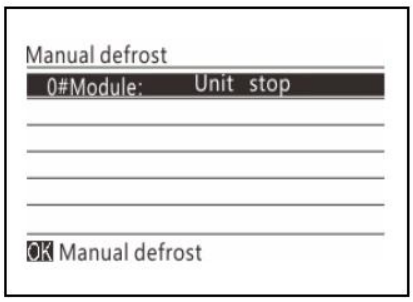
The unit is equipped with automatic defrosting function during normal operation, but in some cases, manual defrosting function may be required.
Enter the manual defrosting interface through the following path:
Main interface>SET>Manual defrosting



Click the "OK" button to enter the manual defrosting setting interface, which will display the current status of each module: running, defrosting, and stopping.





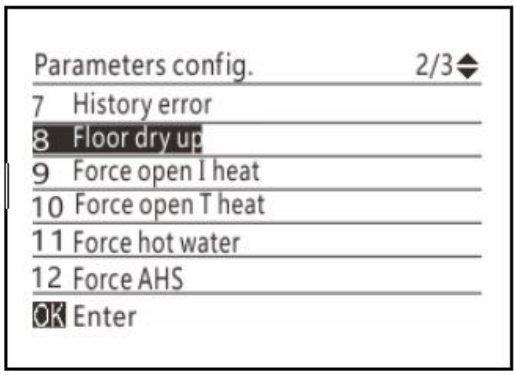


Only when the module is in operation and the water temperature, fin temperature, and other conditions are met, can the "OK" button be clicked to successfully enter defrosting. At this time, the current state of the module will switch to defrosting.

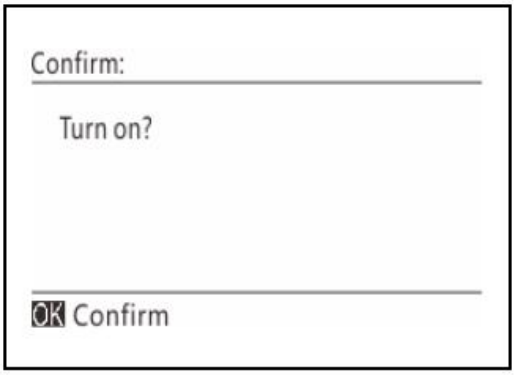
3.4.12 Floor heating and drying function

This function can only be activated when the 'underfloor heating water inlet temperature probe' is in use and the unit is in standby mode.

Find the underfloor heating and drying function through the main interface>SET>Floor dry up function.



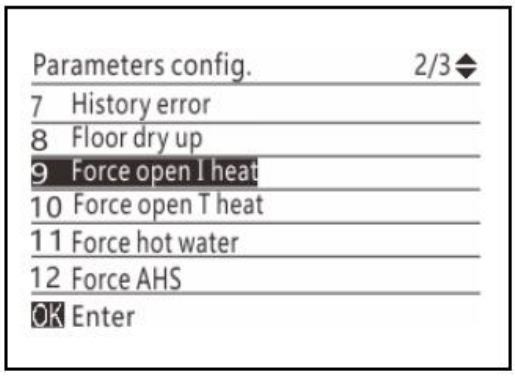
Click the "OK" button to pop up the confirmation interface. Click the "OK" button again to confirm the use of this function and close the interface. Click the "Back" button to cancel and close the interface.



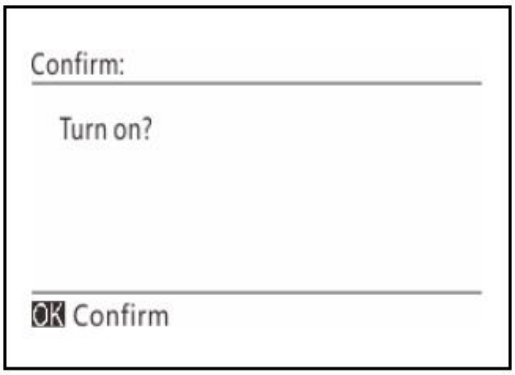
If the underfloor heating and drying function has been enabled, click the "OK" button in the "underfloor heating and drying function" option to pop up a confirmation interface to close the function. Click the "OK" button again to confirm the shutdown of the underfloor heating and drying function and close the interface. Click the "Back" button to cancel and close the interface.

3.4.13 Forced turn on auxiliary electric heating

Find the forced open auxiliary electric heating through the path 'Main interface'>'SET'>'Force open I heat'.



Click the "OK" button to pop up the confirmation interface. Click the "OK" button again to confirm the use of this function and close the interface. Click the "Back" button to cancel and close the interface.

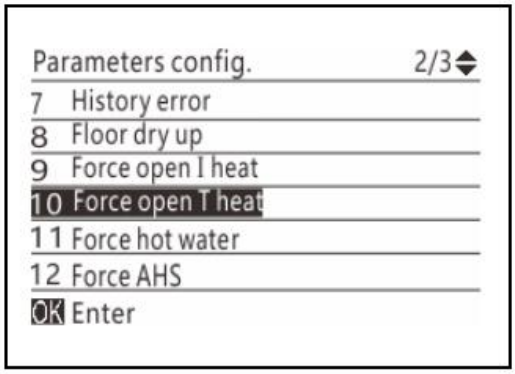


If the forced opening auxiliary electric heating function has been enabled, click the "OK" button in the "Forced opening auxiliary electric heating" option to pop up a confirmation interface to close the function. Click the "OK" button again to confirm the closure of the forced opening auxiliary electric heating function and close the interface. Click the "Back" button to cancel and close the interface.

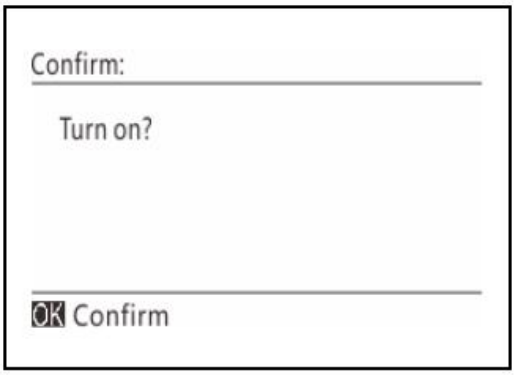
3.4.14 Forced turn on water tank electric heating

Forced opening of water tank electric heating is used to forcibly turn on the electric heating in the water tank to produce hot water.
When there is a cooling or heating demand in the system and the heat pump is in cooling or heating mode, there may be a demand for hot water. The electric heating function of the forced open water tank can be used for hot water production.

Find the electric heating of the forced water tank through the path 'Main Interface'>'SET'>'Force open T heat'.



Click the "OK" button to pop up the confirmation interface. Click the "OK" button again to confirm the opening and closing of the water tank electric heating interface. Click the "Back" button to cancel and close the interface.

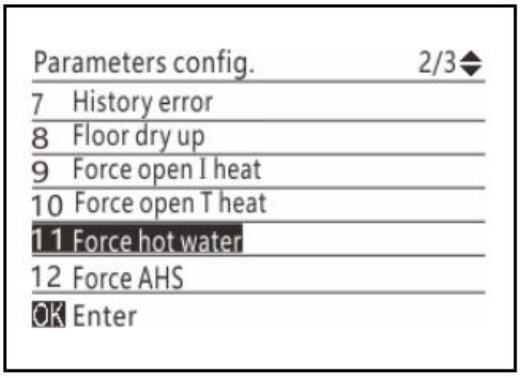


If the forced opening water tank electric heating function has been enabled, click the "OK" button in the "Forced opening water tank electric heating" option to pop up a confirmation interface to close the function. Click the "OK" button again to confirm the closing mode and close the interface, and click the "Back" button to cancel and close the interface.

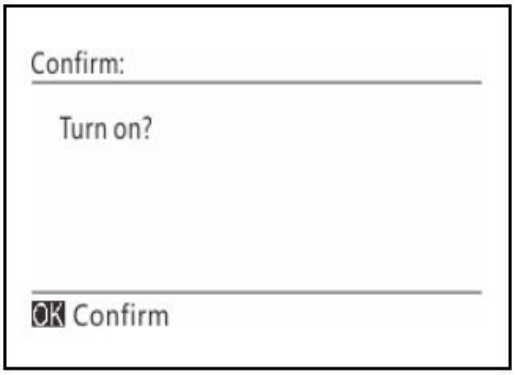
3.4.15 Forced turn on domestic hot water

The forced hot water mode function forces the system to operate in the hot water production mode. The heat pump, auxiliary electric heating, water tank electric heating, and external heat sources will all operate in the forced hot water mode.

Find the forced hot water mode through the path 'Main Interface'>'SET'>'Forced Hot Water'.



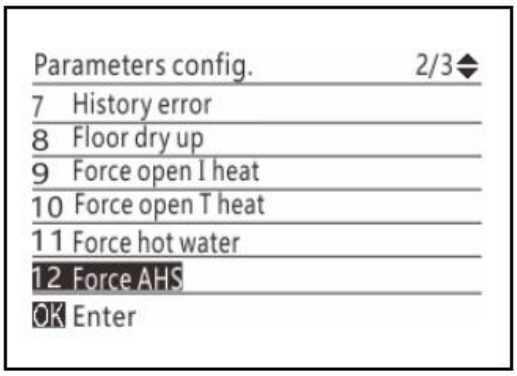
Click the "OK" button to pop up the confirmation interface. Click the "OK" button again to confirm the forced hot water mode and close the interface. Click the "Back" button to cancel and close the interface.



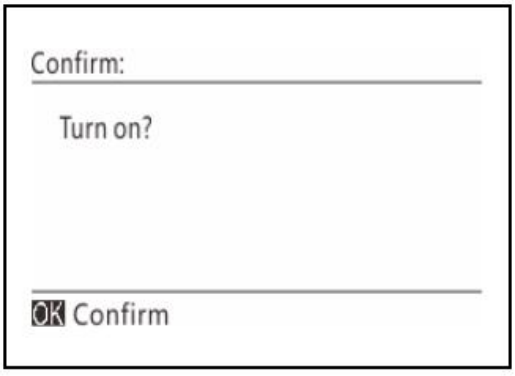
If the forced hot water function has been enabled, click the "OK" button in the "Forced Hot Water Mode" option to pop up a confirmation screen to turn off the function. Click the "OK" button to confirm turning off the forced hot water function and closing the interface. Click the "Back" button to cancel and close the interface.

3.4.16 Forced open external heating

In heating or hot water mode, heat can be provided by manually forcing the external heat source on. Find the forced external heat source through the path 'Main Interface'>'SET'>'Force AHS'.



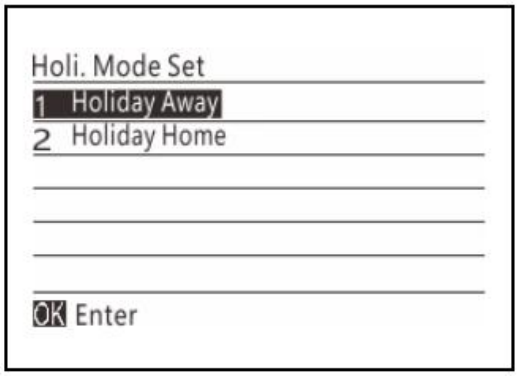
Click the "OK" button to pop up the confirmation interface. Click the "OK" button again to confirm the opening and closing of the external heat source interface. Click the "Back" button to cancel and close the interface.



If the forced external heat source function has been enabled, click the "OK" button in the "Forced External Heat Source" option to pop up a confirmation screen to turn off the function. Click the "OK" button again to confirm turning off the forced external heat source function and closing the interface. Click the "Back" button to cancel and close the interface.

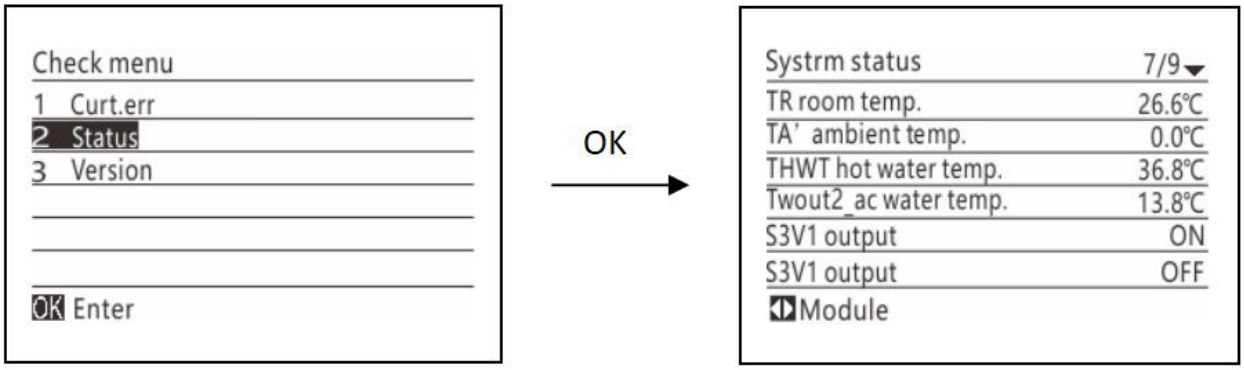
3.4.17 Vacation mode

Enter the holiday mode setting interface through the following path:
Main interface>SET>Holiday mode settings



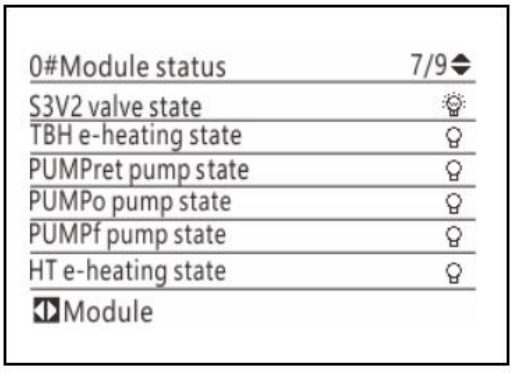
3.4.18 Operation parameter query

When you need to view the current information of the unit (such as temperature, opened electrical components, etc.), you can enter the status query interface to view it.



lick the "left" and "right" buttons to switch and view the status information of different modules, and click the "up" and "down" buttons to turn pages.

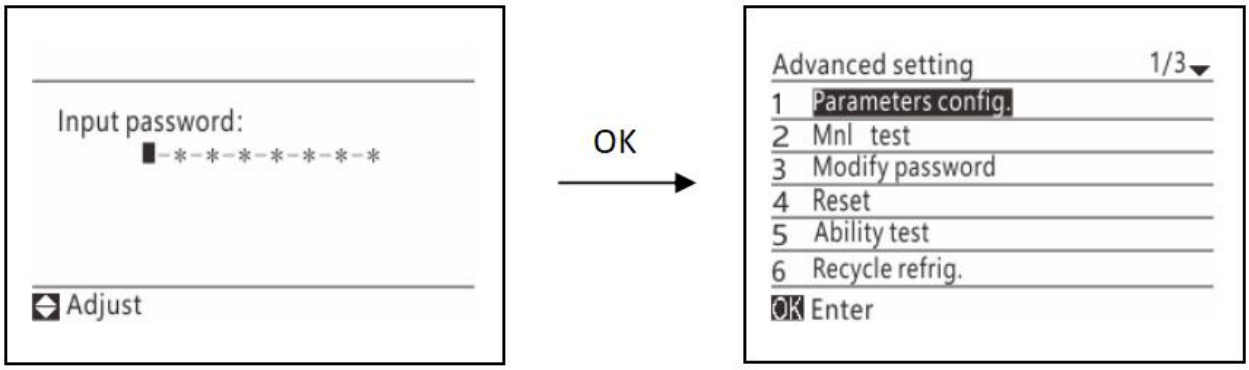
The light bulb on the right side of the switch status indicates that the component has an output, while the light bulb on the right side of the electromagnetic three-way valve indicates that there is an output corresponding to OFF:



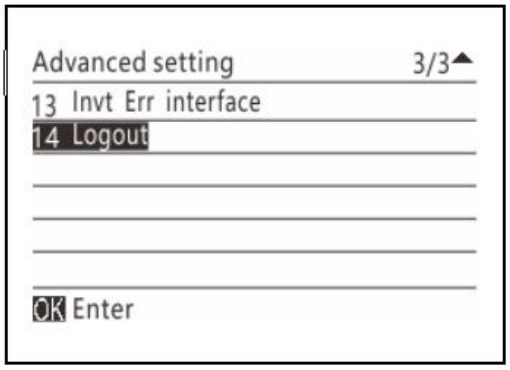
3.4.19 Advanced setting

For installation, service, and other needs, authorized engineers or service personnel can modify the parameters of the controller through the following path and enter a password.

Main interface>"SET">"Advanced settings", enter the correct password in the following interface and click the "OK" button to enter the advanced settings:



After setting up, you can choose to log out of this password login:
Find the 'Logout' option in the advanced settings interface and click the 'OK' button. The next time you re-enter the advanced settings interface, you need to re-enter your password.

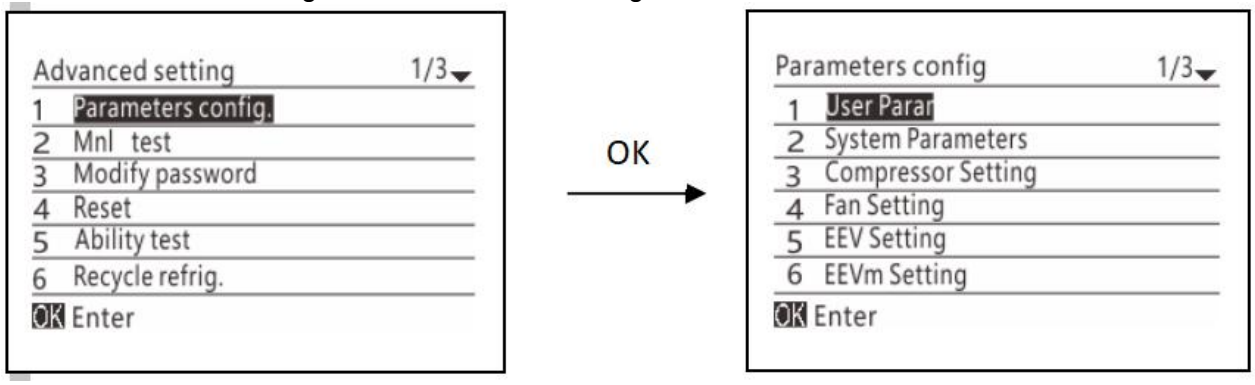


If you have not selected to log out, you do not need to enter a password for the next time you re-enter the advanced settings interface (unless you power on again or there is no operation for a long time).

3.4.20 Smart grid

When entering advanced settings, you can obtain permission to set up smart grid functions by entering a password with high-level permissions.

Select 'Parameter Settings' in the' Advanced Settings' interface and click the 'OK' button to enter:



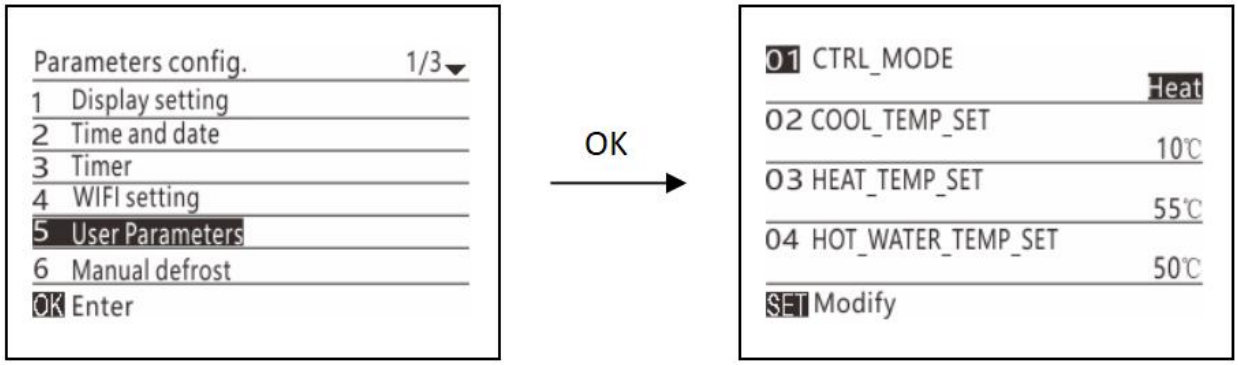
Use the "Up" or "Down" keys to select the "System Parameters" option, and click the "OK" key to enter.

Use the "up" or "down" keys to find the "Smart Grid Function". If the 'smart grid function' is disabled, click the 'SET' button to change it to use. If the 'Smart Grid Function' is in use, clicking the 'SET' button will change it to disabled.

3.4.21 User PARAMETERS QUERY & SETTING

Enter the user parameter setting interface through the following path:

Main interface>SET>User parameters



For more user parameters, please refer to the table below (actual parameters are based on the display of the line controller):

Set the item		Set the scope	Windows defaults
01	CTRL_MODE	Cool、Heat、Auto	Heat
02	COOL_TEMP_SET	min …max	7
03	HEAT_TEMP_SET	min …max	45
04	HOT_WATER_TEMP_SET	min …max	50
05	COOL_ROOM_TEMP_SET	16…30	26
06	HEAT_ROOM_TEMP_SET	16…30	20
09	HEAT_TEMP_SET_B	40…60	40
10	HEAT_ROOM_TEMP_SET_B	16…30	20
11	POWER_MODE	standard powerful energy conservation	powerful
13	DISNFECTION	Disable, use	forbidden
14	DISNFECTION_TEMP	60…70	70
15	DISNFECTION_CYCLE_MAX	90…300	210
16	DISNFECTION_HIGH_TEMP_TIME	5…60	30
26	A_ZONE_COOL_CURVE	forbidden Low temperature curve 1 Low temperature curve 2 Low temperature curve 3	forbidden

Set the item		Set the scope	Windows defaults
		Low temperature curve 4 Low temperature curve 5 Low temperature curve 6 Low temperature curve 7 Low temperature curve 8 High temperature curve 1 High temperature curve 2 High temperature curve 3 High temperature curve 4 High temperature curve 5 High temperature curve 6 High temperature curve 7 High temperature curve 8 Curve 9	
27	A _ZONE_HEAT_CU RVE	forbidden Low temperature curve 1 Low temperature curve 2 Low temperature curve 3 Low temperature curve 4 Low temperature curve 5 Low temperature curve 6 Low temperature curve 7 Low temperature curve 8 High temperature curve 1 High temperature curve 2 High temperature curve 3 High temperature curve 4 High temperature curve 5 High temperature curve 6 High temperature curve 7 High temperature curve 8 Curve 9	forbidden
28	B_ZONE_COOL_C URVE	forbidden Low temperature curve 1 Low temperature curve 2 Low temperature curve 3 Low temperature curve 4 Low temperature curve 5 Low temperature curve 6 Low temperature curve 7 Low temperature curve 8 High temperature curve 1 High temperature curve 2 High temperature curve 3 High temperature curve 4 High temperature curve 5 High temperature curve 6 High temperature curve 7 High temperature curve 8 Curve 9	forbidden
29	B_ZONE_HEAT_C URVE	forbidden Low temperature curve 1 Low temperature curve 2 Low temperature curve 3 Low temperature curve 4 Low temperature curve 5 Low temperature curve 6 Low temperature curve 7 Low temperature curve 8 High temperature curve 1 High temperature curve 2 High temperature curve 3	forbidden

Set the item		Set the scope	Windows defaults
		High temperature curve 4 High temperature curve 5 High temperature curve 6 High temperature curve 7 High temperature curve 8 Curve 9	
30	C#9_TA_C1	-5…46	35
31	C#9_TA_C2	-5…46	25
32	C#9_TWout2_C1	5…25	10
33	C#9_TWout2_C2	5…25	16
34	C#9_TA_H1	-25…35	7
35	C#9_TA_H2	-25…35	-5
36	C#9_TWout2_H1	25…65	28
37	C#9_TWout2_H2	25…65	35
38	00#UNIT	Disable, use	make use of

3.4.22 Climate Related Curves

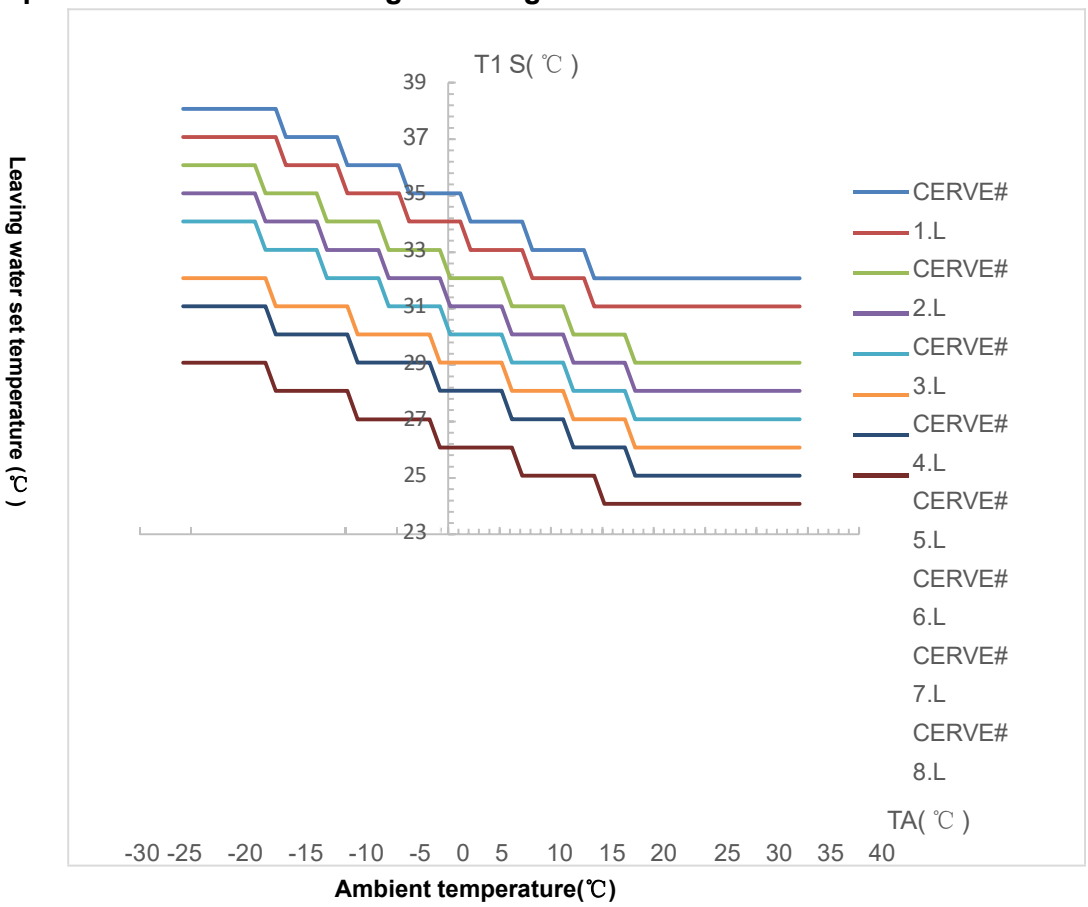
(1) The climate related curves can be selected in the user interface , 05 User parameters > 26 A_ZONE_COOL_CURVE 、 27 A_ZONE_HEAT_CURVE 、 28 B_ZONE_COOL_CURVE 、 29 B_ZONE_HEAT_CURVE

(2) Once the curve is selected, the leaving water set temperature (T1s) is determined by the outdoor temperature. In each mode, each curve from the Sixteen curves in the user interface can be selected.

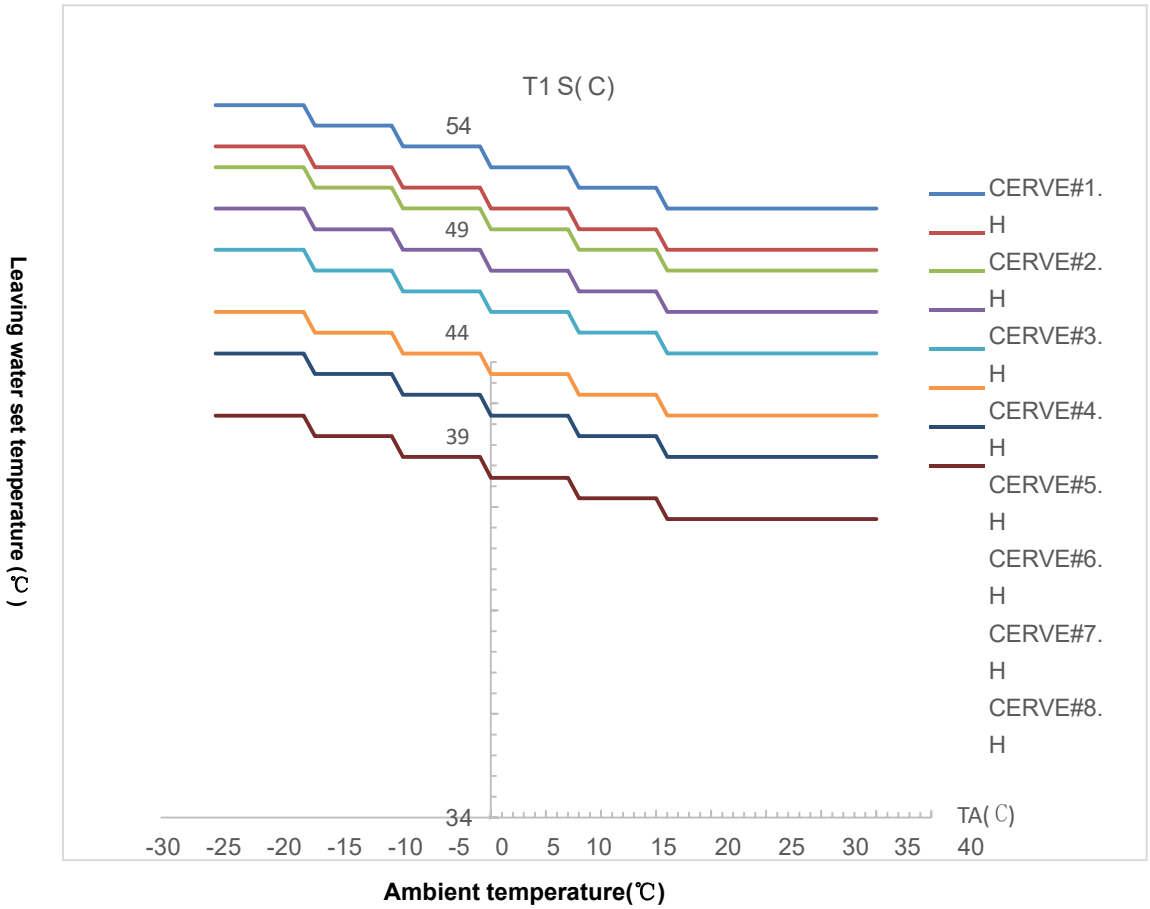
(3) The relationship between outdoor ambient temperature (TA) and leaving water set temperature (T1s) is described as in Figure 3-17.1, Figure 3-17.2, Figure 3-17.3 and Figure 3-17.4.

The automatic setting curves are the ninth curve for cooling and heating mode, the ninth curve can be set as in Figure 3-17.5 and Figure 3-17.6.

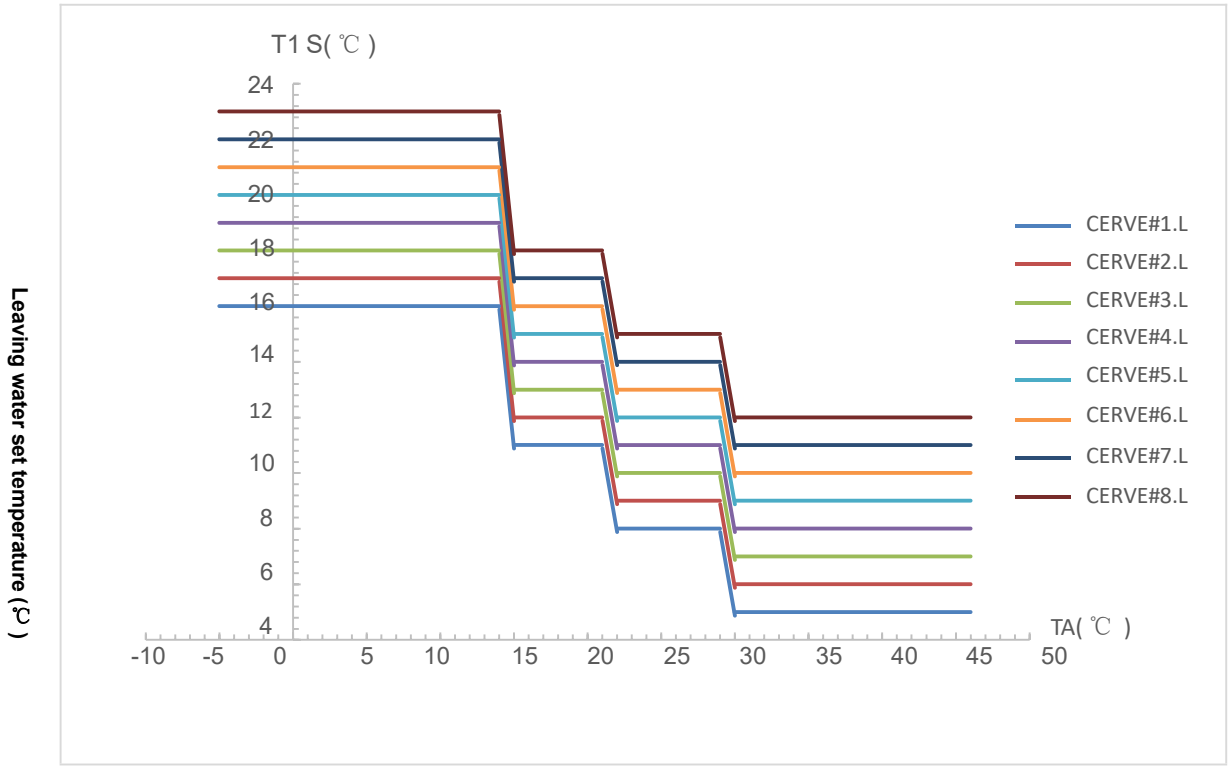
1.Low temperature curves for heating mode Figure 3-17.1



2.High temperature curves for heating mode Figure 3-17.2

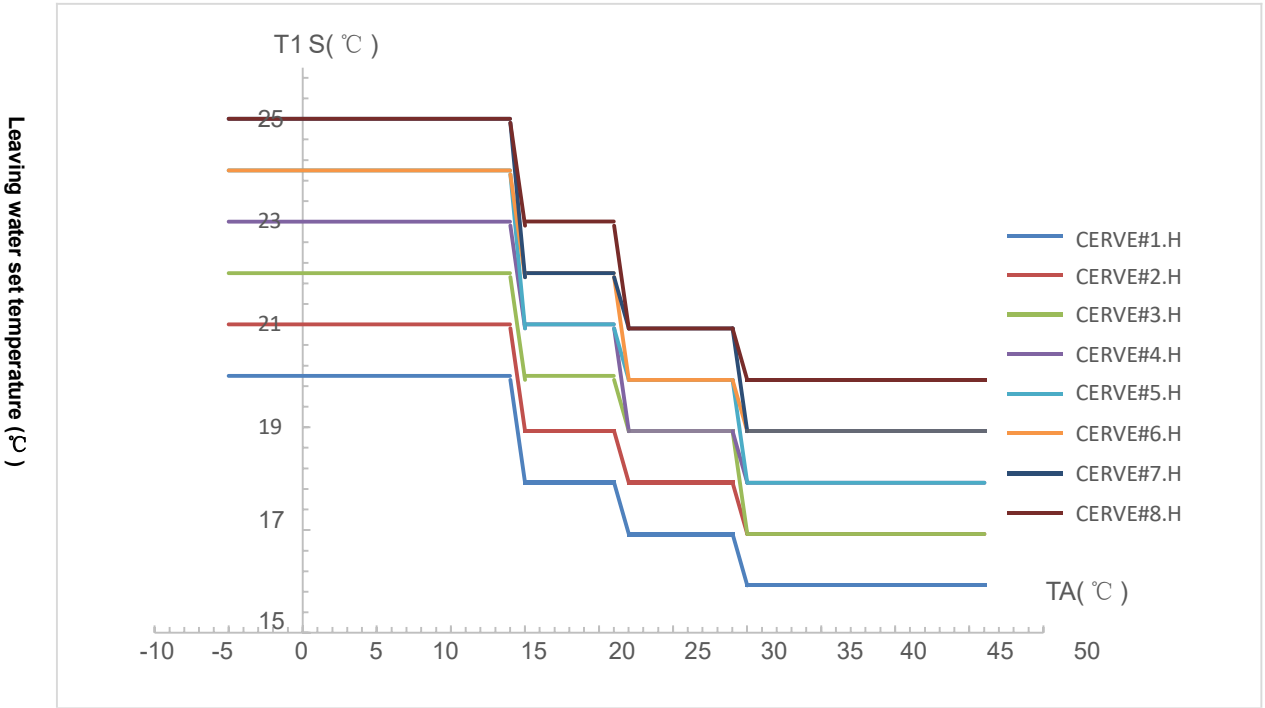


3.Low temperature curves for cooling mode Figure 3-17.3



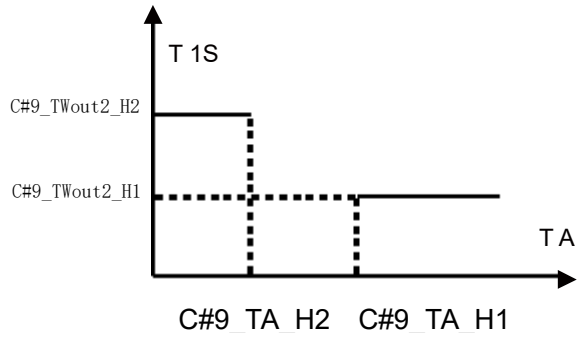
Outdoor ambient temperature (℃)

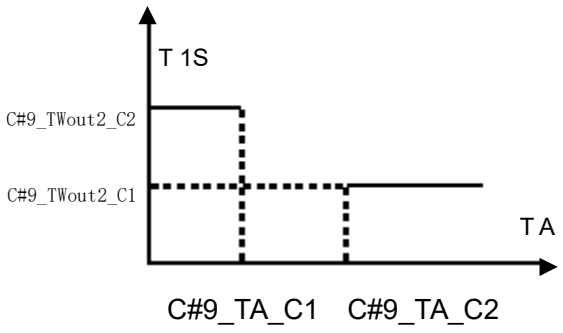
4.High temperature curves for cooling mode Figure 3-17.4



Outdoor ambient temperature (℃)

Figure 3-17.5: Automatic setting curve for heating mode *Figure 3-17.6: Automatic setting curve for cooling mode*





3.5 General Operating Guide

Initial Start-up Precautions

First boot-strap and Running state checks

1. To ensure the power same as the product nameplate required power.
2. Unit electrical connections: Check if power supply wire track and connection is ok; if ground wire is properly connected; Check if water pump and other chain device is properly connected
3. Water pipe and pipe: water pipe and pipe must be washed two and three times, ensure clean and no any pollution.
4. Check water system: If the water is enough and no any air, ensure no leakage
5. First boot-strap or starting up again after long time stop, ensure power on ahead and heating at least 12 hours for crankcase (local loop temp.is zero).Water pump start up first, last a while, fan start up, compressor start up, unit regular work.
6. Running checks (according to the following data to check if the unit running is normal)
   After unit normal running, check the following item:
   a.Input and output water temp.
   b.cycle water flow of the side
   c.running electric current of compressor and fan
   d.High and low pressure value when heating running.

⚠ **CAUTION** — Refrain from using this heat pump if any electrical components have been in contact with water.Immediately call a qualified service technician to inspect the heat pump.

⚠ **CAUTION** — Keep all objects clear above the heat pump.Blocking air flow could damage the unit and may void the warranty.

3.6 Users' Guide

1. Rights and Responsibility

1.1 To ensure you have the service in guarantee period, only the professional server and technology staff can install and repair the unit.If you infract this request and cause any loss and damage, our company will not be claimed any responsibility.

1.2 After receiving the unit, check if have damage on shipment and all parts are complete; any damage and lack of parts please notice the dealer in written.

2. User Guide

2.1 All safety protection device are set in unit before leaving factory, don't adjust by yourself.

2.2 Unit have enough refrigerant and lubricating oil, don't fill or replace them; if need fill owing to leak, please refer to the quantity on nameplate (if refill refrigerant, need re-vacuum).

2.3 External water pump must connect with the message of unit, or else easy show various water lack alarm.

2.4 Regular clean water system according to maintenance request.

2.5 Pay attention to antifreeze when the environment temp.is less than zero in winter.

A The software contains special functions using the heat pump to protect the entire system against freezing.

When the temperature of the water flow in the system drops to a certain value, the unit will heat the water, either using the heat pump, the electric heating tap, or the backup heater.The freeze protection function will turn off only when the temperature increases to a certain value.

B In event of a power failure, the above features would not protect the unit from freezing.

Since a power failure could happen when the unit is unattended, the supplier recommends use anti-freeze fluid to the water system.

2.6 Safety Precautions

A User can't self-install the unit, ensure agent or specialized install company to do, or else maybe cause safety accident and affect the use effect.

B When install or use the unit, please check if the power is corresponding with unit power.

C The main power switch of unit should install leakage protector; the power cord must meet unit power request and national standard and local Fire & Safety Regulations.

D Unit must have ground wire; don't use the unit if no ground wire; forbid connect the ground wire to null line or water pump.

E The main power switch of unit should set much higher 1.4 meter (child don't touch it), to prevent child play it and cause danger.

F More than 52℃ hot water can cause damage, hot and cold water must be mixed then use it.

G When unit is soaking, please contact the factory or maintain department, you can use it

again after maintain.

H Forbid insert any tools into fan fence of unit, fan is dangerous.(child special care)

I Don’t use the unit if turn off the fan fence.

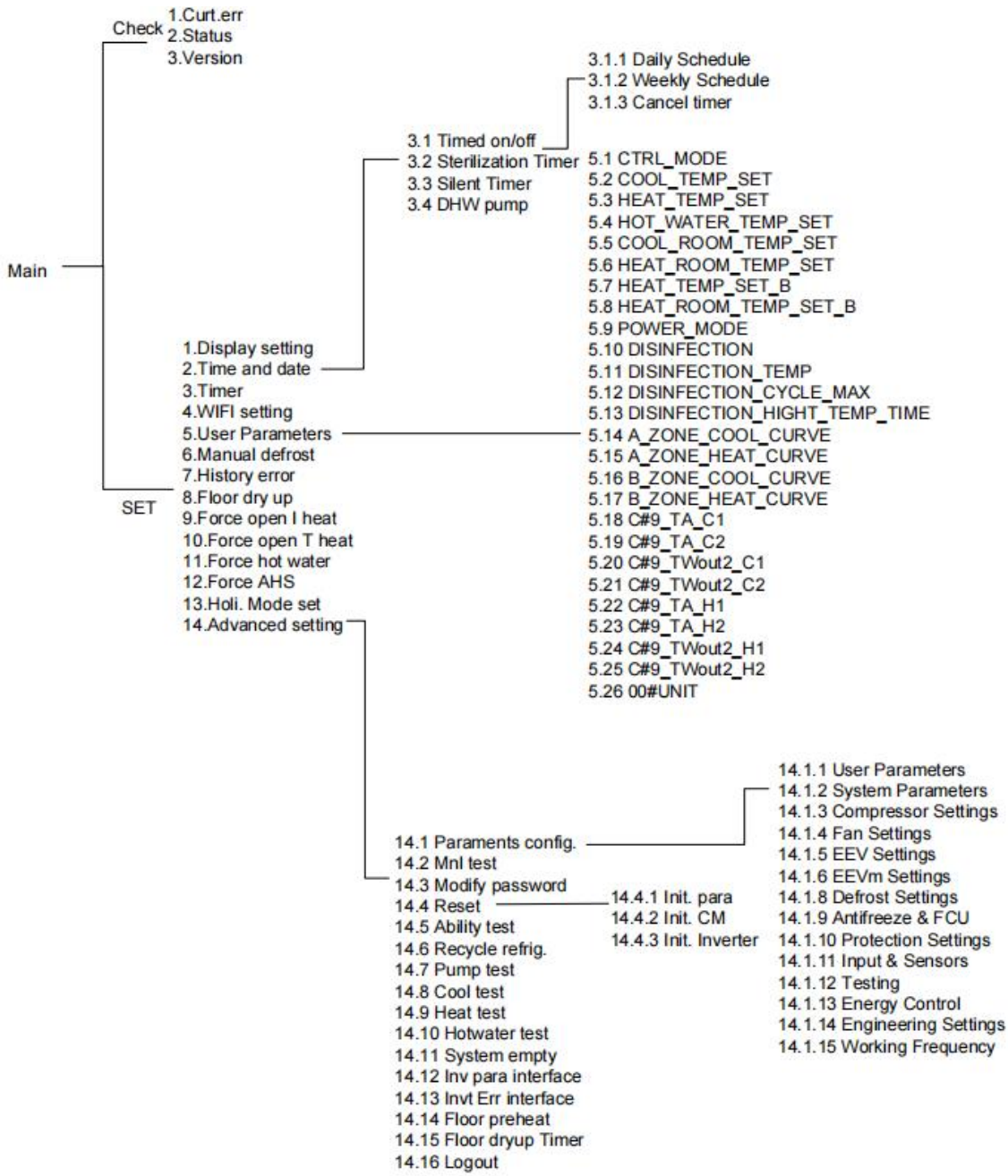
J To avoid electric shock or cause fire, don’t store and use fixture, oil paint and petrol etc.combustible gas or liquid around the unit; don’t throw the water or other liquid on the unit and don’t touch the unit by wet hand.

K Don’t adjust the switch, valve, controller and internal data except company server or authorized staff.

L If safety protection device often start up, please contact factory or local dealer.

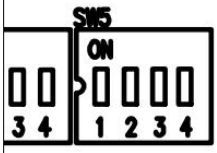
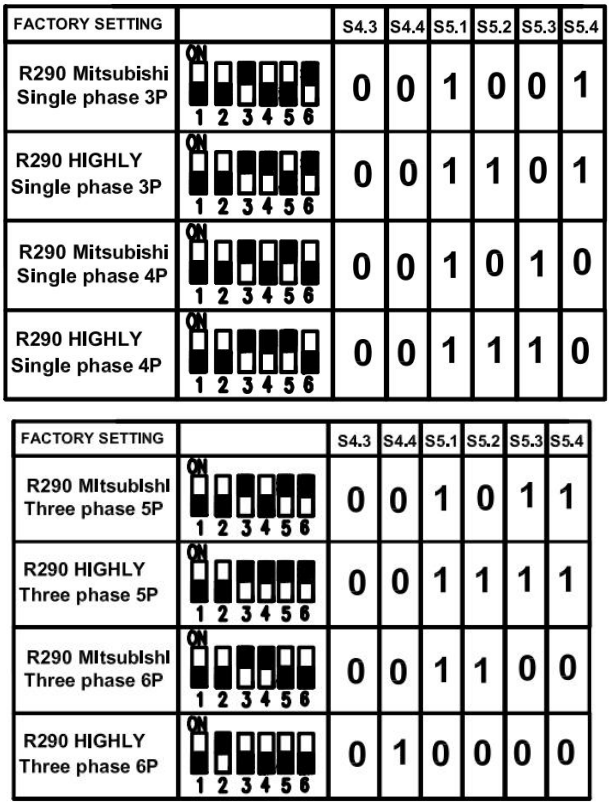
Section 4 Control Introduction

4.1 Control Functions Overview



4.2 DIP Switch Setting

DIP switch is located on the hydraulic module main control board and allows configuration of additional heating source installation, the second inner backup heater installation, etc.

<table>
<tr><th colspan="2">Switch</th><th colspan="2">ON=1</th><th>OFF=0</th><th>Default factory setting</th></tr>
<tr><td>S1
  </td><td>1/2</td><td colspan="2">00=Without IBH
01=With IBH1
10=With IBH2
11=With IBH1 and IBH2</td><td></td><td>01</td></tr>
<tr><td>S3
  </td><td>1</td><td colspan="2">Unit Address
0:00#Unit 5:05#Unit
1:01#Unit 6:06#Unit
2:02#Unit 7:07#Unit
3:03#Unit 8～F:Spare
4:04#Unit</td><td></td><td>0</td></tr>
<tr><td>S4 S5
  </td><td>S4 3/4
S5 1/2/3/4</td><td colspan="2">Machine type selection:
 
</td><td></td><td>By unit model When the user installs, the model dial code must correspond to the heat pump, and the responsible unit will prompt the online controller</td></tr>
</table>

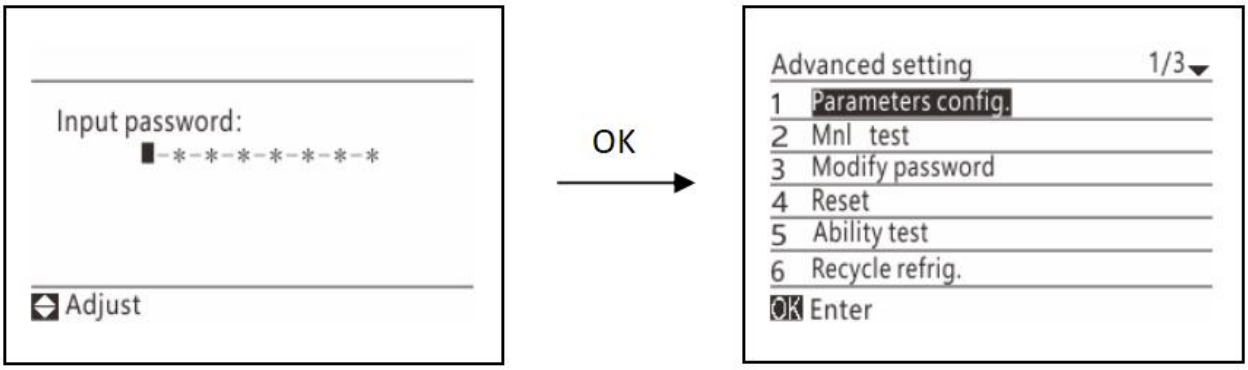
FACTORY SETTING		S4.3	S4.4	S5.1	S5.2	S5.3	S5.4
R290 Mitsubishi Single phase 3P		0	0	1	0	0	1
R290 HIGHLY Single phase 3P		0	0	1	1	0	1
R290 Mitsubishi Single phase 4P		0	0	1	0	1	0
R290 HIGHLY Single phase 4P		0	0	1	1	1	0

FACTORY SETTING		S4.3	S4.4	S5.1	S5.2	S5.3	S5.4
R290 MItsubIshI Three phase 5P		0	0	1	0	1	1
R290 HIGHLY Three phase 5P		0	0	1	1	1	1
R290 MItsubIshI Three phase 6P		0	0	1	1	0	0
R290 HIGHLY Three phase 6P		0	1	0	0	0	0

4.3 FOR Advanced Settings

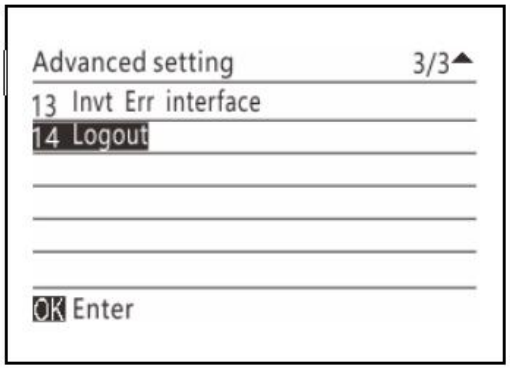
For installation, service, and other needs, authorized engineers or service personnel can modify the parameters of the controller through the following path and enter a password.

Main interface>"SET">"Advanced settings", enter the correct password 1234 in the following interface and click the "OK" button to enter the advanced settings:



After setting up, you can choose to log out of this password login:

Find the 'Logout' option in the advanced settings interface and click the 'OK' button. The next time you re-enter the advanced settings interface, you need to re-enter your password.



If you have not selected to log out, you do not need to enter a password for the next time you re-enter the advanced settings interface (unless you power on again or there is no operation for a long time).

4.3.1 Setting of hot water mode

In HOT_WATER mode the following parameters should be set.
1.HOT_WATER enables or disables HOT_WATER mode.For installations with DHW tanks, select YES to enable DHW mode.For installations without DHW tanks, select NON to disable DHW mode.
Advanced>01Paraments>02System Parameters>17HOT_WATER
2.HOT_WATER_ON_MAX ： In DHW PRIORITY mode, set the maximum running time of DHW.
Advanced>01Paraments>13Energy Control>36 HOT_WATER_ON_MAX
3.HOT_WATER_PRIOR_LIMIT :Set the minimum running time of heating/cooling mode in DHW priority mode
Advanced>01Paraments>13Energy Control>37 HOT_WATER_PRIOR_LIMIT

4.3.2 COOL MODE SETTING

In COOL MODE SETTING the following parameters should be set .
Advanced>01Paraments>13Energy Control>02COOL_LOAD_dT
1.COOL_LOAD_dT:sets the minimum temperature difference between the heat pump leaving water temperature (TWout1) and the heat pump leaving water set temperature (TS)
at which the heat pump provides chilled water to the space cooling terminals.
When TWout1–TS ≥COOL_LOAD_dT + 5 the heat pump provides chilled water to the space cooling terminals and whenTWout1 ≤ TS + COOL_UNLOAD_dT the heat pump does not provide chilled water to the space cooling terminals.

Remark:

TWout1: Heat pump leaving water temperature
TS: Heat pump leaving water set temperature

4.3.3 HEAT MODE SETTING

In HEAT MODE SETTING the following parameters should be set.
Advanced>01Paraments>13Energy Control>4HEAT_LOAD_dT、5HEAT_UNLOAD_dT：
4HEAT_LOAD_dT:sets the temperature difference between the heat pump leaving water temperature (TWout1)and the heat pump leaving water set temperature (TS) above which the heat pump provides heated water to the space heating terminals.
When TS–TWout1≥ 4HEAT_LOAD_dT +5 the heat pump provides heated water to the space heating terminals and when TWout1≥TS + 5HEAT_UNLOAD_dTthe heat pump does not provide heated water to the space heating terminals.
When the room temperature control heat pump is selected (no water temperature control icon in the area of the main interface)
6ROOM_TEMP_dT sets the temperature difference between the actual room temperature (TR) and set room temperature (TS) above which the heat pump provides heated water to the space heating terminals.
When TS–TR≥ 6ROOM_TEMP_dT the heat pump provides heated water to the space heating terminals and when TR≥TS the heat pump does not provide heated water to the space heating terminals.
TR: Room temperature
TS: Heat pump room set temperature

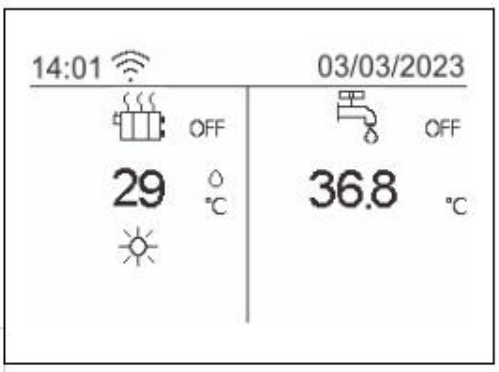
4.3.4 AUTO MODE SETTING

In AUTO MODE SETTING the following parameters should be set.
11Advanced>01Paraments>13Energy Control>17AUTO_CL_TA_MIN and 18AUTO_HT_TA_MAX
17AUTO_CL_TA_MIN sets the ambient temperature below which the heat pump will not provide chilled water for space cooling in auto mode.
18AUTO_HT_TA_MAX sets the ambient temperature above which the heat pump will not provide heated water for space heating in auto mode.

4.3.5 Control Panel Selection

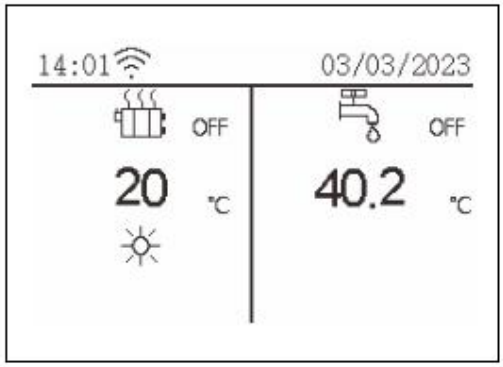
35 PANEL_CTRL is used for selecting whether the water flow temperature or room temperature is used to control the ON/OFF of the heat pump.
For installations without room thermostats, space heating and cooling modes can be controlled in one of two different ways:
according to the heat pump's leaving water temperature alone
according to the room temperature detected by the control panels built-in temperature sensor alone
11Advanced>01Paraments>02System Parameters>35 PANEL_CTRL

1) When 35 PANEL_CTRL Select 1ZONE.TW, the water flow temperature is used to control the ON / OFF of the heat pump.the user is able to set the heat pump unit's leaving water temperature set temperature on the user interface's main screen.

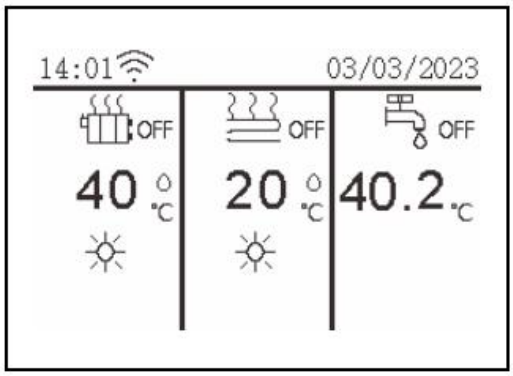


2) When 35 PANEL_CTRL Select 1ZONE.TA,room temperature is used to control the ON/OFF of the heat pump.the user is able to set the room temperature set temperature on the user interface's main

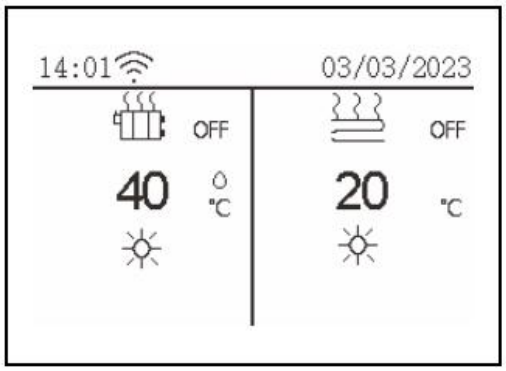
screen



3) When 35PANEL_CTRL Select 2ZONE.TW，the following pages will be displayed.In this case, the setting value of zone A is 02COOL_TEMP_SET/03HEAT_TEMP_SET, the setting value of zone B is 09HEAT_TEMP_SET_B,the zone B can only run in heating mode.



4) When 35PANEL_CTRL Select 2ZONE.TW&TA，the following page will be displayed.In this case, the setting value of zone A is 02COOL_TEMP_SET/03HEAT_TEMP_SET, the setting value of zone B is 10HEAT_ROOM_TEMP_SET_B，room temperature is used to control the ON/OFF of the zone B，the zone B can only run in heating mode.



4.3.6 ROOM THERMOSTAT

If the user has a room thermostat installed, the the following parameters should be set.
Advanced>01Paraments>02System Parameters>34RT_CTRL

The RT_CTRL sets whether the room thermostat is installed. If a room thermostat is installed, select the type of room thermostat. For installations without room thermostats, select OFF.

RT_CTRL = OFF ： No room thermostat.

RT_CTRL = ZONE.A.MODE.SW ： Room thermostat can control heating and cooling individually.

RT_CTRL = ZONE.A.SW：Room thermostat provides the switch signal to unit.

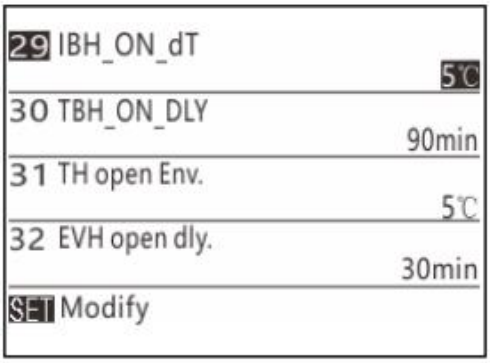
RT_CTRL = DUAL.ZONE.SWITC：Indoor unit is connected with two room thermostat.

4.3.7 OTHER HEATING SOURCE

(1) Auxiliary electric heating(IBH)
In IBH the following parameters should be set.

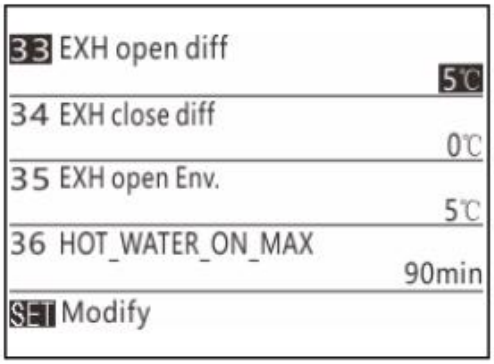
29IBH_ON_dT sets the temperature difference between the water outlet setting temperature (T1S) of the heat pump and the water outlet temperature (TW2), beyond which the heating element of the standby electric heater turns on.
27IBH_ON_DLY sets the delay between compressor start and opening of the backup electric heater.
28 The IBH_ON_TA sets the ambient temperature, below which the backup electric heater will be used. If the ambient temperature is higher than IBH_ON_TA, no spare electric heater is used.

(2) Water tank electric heating(TBH)
In TBH the following parameters should be set.



30TBH_ON_DLY sets the delay between the compressor start and the backup electric heater start.
31TH open Env. Set the ambient temperature, below which the backup electric heater will be used. If the ambient temperature is higher than TH open Env. The backup electric heater is not used.

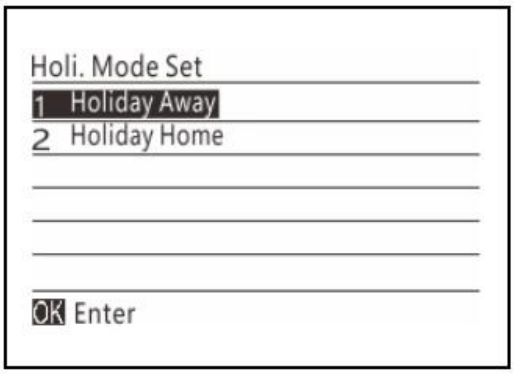
(3) Additional heating source(AHS)
In AHS, the following parameters should be set.



23AHS: Enables or disables the external heat source functions
32EXH open dly. Set the delay between compressor start and opening of the additional heating source.
The 33EXH open diff sets the temperature difference between the set water outlet water temperature (T1S) of the heat pump and the heat pump water outlet water temperature (TW2), above which the external heat source turns on
35EXH open Env. Set the ambient temperature, below which an additional heating source is used. If the ambient temperature is higher than EXH open Env. No additional heating source is used.

4.3.8 HOLIDAY AWAY SETTING

The HOLIDAY AWAY SETTING menu settings are used to set the outlet water temperature to prevent water pipes freezing when away from home in cold weather seasons.In HOLIDAY AWAY SETTING the following parameters should be set.
10Holi.Mode Set > 01 Holiday Away



11Advanced>01Paraments>13Energy Control

19HOLIDAY_AWAY_ThS sets the heat pump's leaving water set temperature for space heating mode when in holiday away mode.

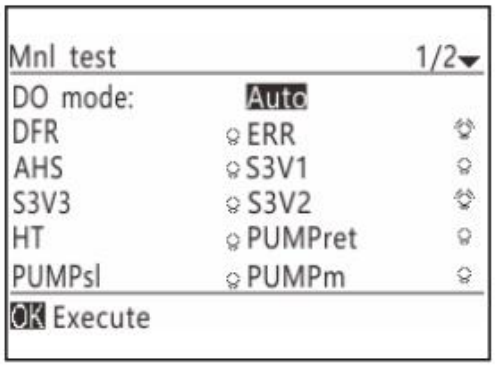
20HOLIDAY_AWAY_ThwS sets the heat pump's leaving water set temperature for DHW mode when in holiday away mode.

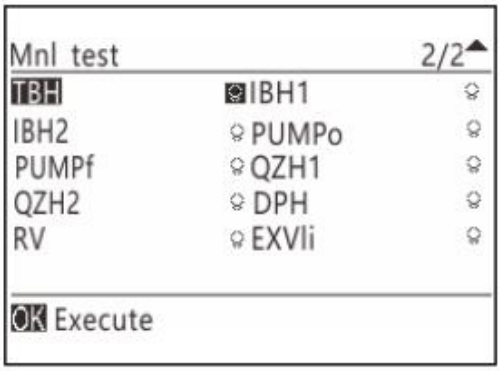
4.3.9 RESTORE FACTORY SETTINGS

11Advanced > 04Reset is used to restore all the parameters set in the user interface to their factory Errors.

4.3.10 POINT CHECK menu

11Advanced >02Mnl test menu is used to check the operation of individual components. Use ▼▲ to scroll to the components you want to check and press ON/OFF to toggle the on/off state of the component. If a valve does not turn on/off when its on/off state is toggled or if a pump/heater does not operate when turned on, check the component's connection to the system main PCB.

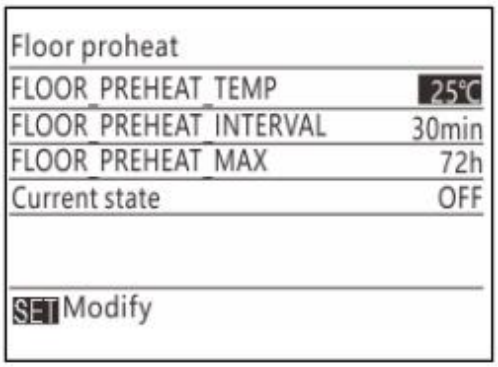




4.3.11 PREHEATING FOR FLOOR

11Advanced > 14 Floor preheat

Before floor heating, if a large amount of water remains on the floor, the floor may be warped or even rupture during floor heating operation, in order to protect the floor, floor drying is necessary, during which the temperature of the floor should be increased gradually.



FLOOR_PREHEAT_WATER_TEMP sets the heat pump 's leaving water set temperature in preheating for floor mode.

FLOOR_PREHEAT_MAX sets the duration of preheating for floor mode.

4.3.12 FLOOR DRYING UP

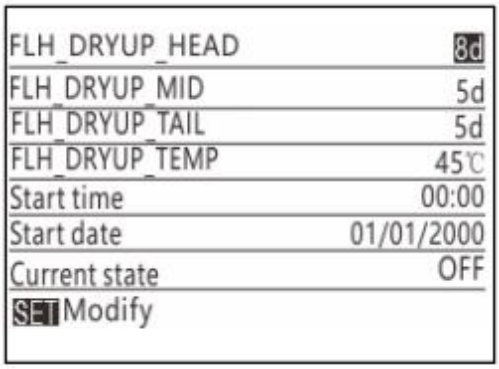
11Advanced > 15 Floor dry up Timer

For newly-installed under-floor heating systems, floor drying up mode can be used to remove moisture from the floor slab and sub-floor to prevent warping or rupture of the floor during floor heating operation.There are three phases to the floor drying up operation:

Phase 1: gradual temperature increase from a starting point of 25°C to the peak temperature

Phase 2: maintain peak temperature

Phase 3: gradual temperature decrease from the peak temperature to 45°C



FLH_DRYUP_HEAD sets the duration of Phase 1.

FLH_DRYUP_MID sets the duration of Phase 2.

FLH_DRYUP_TAIL is the duration of Phase 3.

FLH_DRYUP_TEMP sets the heat pump's leaving water set temperature for Phase START TIME sets the floor drying up operation start time.

START DATE sets the floor drying up operation start date.

4.3.13 Cascade Instruction

(1) Setting the number of modules

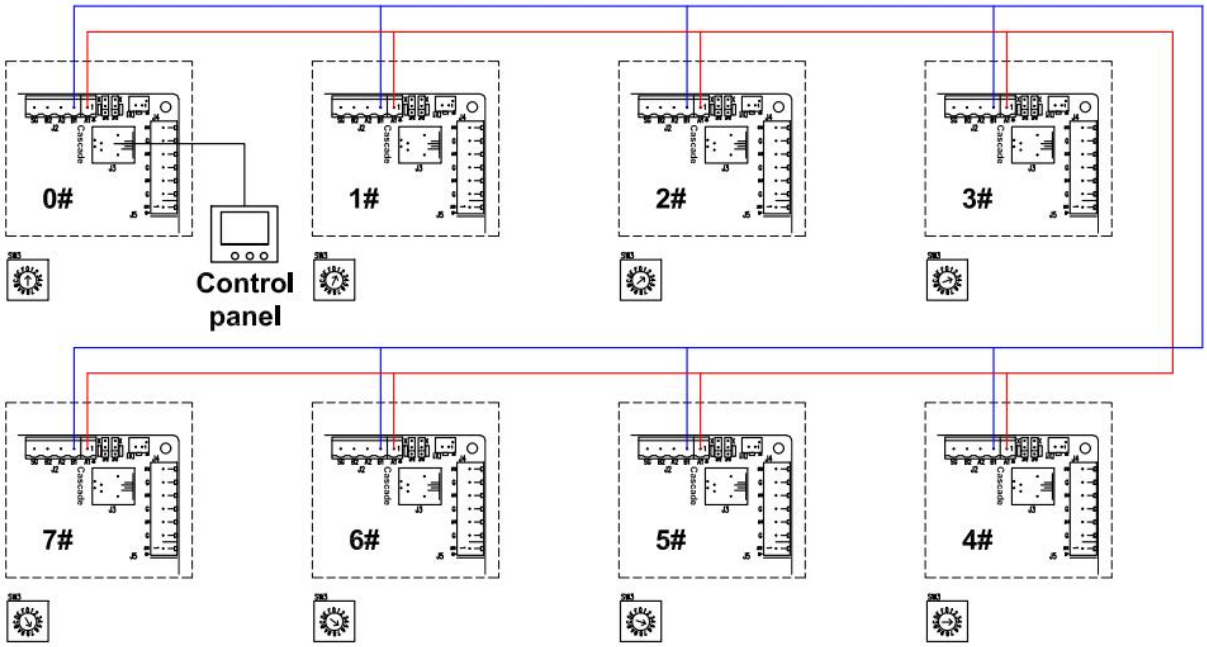
Cascade wiring: In the power-off state, connect the communication lines A1 and B1 of the "cascade" interface of the main module to A1 and B1 of the "cascade" interface of module 2, and so on, and connect them to A1 and B1 of the "cascade" interface of the last module:

(2) **Address dialing**

Set the address of each module of the SW3 dialing switch in the power-off state. Address 0 is the main module, address 1 is the sub module 1, and so on. The display screen and network monitoring only need to be connected to the main module

(3) **Parameter setting**

When cascading multiple modules, the【Number of modules】needs to be set to the corresponding number, and each module can be set to be used or disabled. After changing the parameters on the main module, it will automatically broadcast to the sub modules.



Setting the number of hot water modules

When the hot water function is set to "enable" and the number of modules is greater than 1, the number of modules that can participate in hot water production can be determined by setting the number of hot water modules;

When the number of hot water modules is ≥ [number of modules], all modules can participate in hot water production. The addresses of modules that can participate in hot water production are: 0~[number of hot water modules] -1;

When there is a demand for hot water production, modules 0 to [number of hot water modules] -1 are used for hot water production; When there is no demand for hot water and there is a demand for cooling (or heating), modules 0 to [number of hot water modules] -1 can perform cooling (or heating)

Section 5 General maintenance

5.1 Controller Error Codes

If there's error in the heat pumps, the error code and error definition will be displayed in the main interface, and saved the record in Curt.err column.
The following Common Error Codes will be displayed on the controller panel:

Error code	Error name	Error code	Error name
2	EEPROM data error	113	0 # Low evaporating temp error
5	TWout2 water temp error	115	0 # TA restrict COMPf from turning on
6	System maintenance data error	116	0 # TWin1 plate heat exchanger inlet low water temp error
10	TBH overload	117	0 # TWin1 plate heat exchanger inlet high water temp error
12	THWt water tank fault	118	0 # FANf1 fan motor speed error 1
14	TWout3 system total outlet water temp fault	119	0 # FANf2 fan motor speed error 1
15	TFLin floor heating inlet water temp	124	0#Inverter module communication error
80	TACt1 temp. error	125	0#Inverter module error
81	TACt2 temp. error	126	0#Compressor model setting
82	TSL temp. error	129	0#TRFgas sensor error
83	UI35 communication error	130	0#TRFliq sensor error
85	TR temp. error	131	0#High evaporating temp error
86	PUMPf.ERR error code	161	0#Ambient temp error
97	0 # LDIlp compressor low pressure alarm	164	0#IBH overload
98	0 # LDIhp compressor high pressure alarm	166	0#Plate heat exchanger outlet water temp too low error
101	0 # TF fin temp probe error	167	0#Plate heat exchanger outlet water temp too high error
102	0 # TD exhaust temp probe error	168	0#Plate heat exchanger outlet water temp sensor error
103	0 # TD exhaust temp error	169	0#Water flow error
104	0 # J5 pressure sensor error	171	0#Plate heat exchanger inlet water temp sensor error
105	0 # J6 pressure sensor error	174	0#TWout1_TWin1_DIFF_LARGE
106	0 # PRSs low pressure error	175	0#TWout1_TWin1_DIFF_ERR

5.2 Drive board failure

Error code	Error name	Error code	Error name

Er.ocb（1）	Over current at start	Er.Co1（19）	Motor D-axis over current
Er.ocA（2）	Over current during acceleration	Er.Co2（20）	Motor Q-axis over current
Er.ocd（3）	Over current during deceleration	Er.EEP（21）	Parameter saving failed
Er.ocn（4）	Over current during constant-speed operation	Er.CFE（22）	Communication error
Er.ouA（5）	Over voltage during acceleration	Er.ccF（23）	Current test error
Er.oud（6）	Over voltage during deceleration	Er.ArF（24）	Heat temperature test error for PFC
Er.oun（7）	Over voltage during constant-speed operation	Er.Aco（25）	Motor Lock at start
Er.ouE（8）	Over voltage in standby state	Er.PGo（26）	Motor lock during running during operation
Er.dcL（9）	Under voltage during running	Er.rHo（27）	Heat temperature test error
Er.PLI（10）	Input phase loss	Er.Abb（28）	Stall error
Er.PLo（11）	Output phase loss	Er.Io1（29）	Interrupt overflow 1
Er.FoP（12）	Power device protection	Er.Io2（30）	Interrupt overflow 2
Er.oHI（13）	Inverter overheating	Er.PnL（31）	Rotor shake at start
Er.oLI（14）	Inverter overload	Er.rr1（32）	Rotor shake during running
Er.oLL（15）	Motor overload	Er.PF1（33）	PFC Overcurrent
Er.EEF（16）	PFC startup failure	Er.PF2（34）	PFC peak current over
Er.oLP（17）	Motor load overweight	Er.PF2（35）	PFC rms current over
Er.ULd（18）	Motor over speed		

5.3 Owner Inspection

We recommend that inspections on heat pumps are done frequently, especially after abnormal weather conditions.The following basic guidelines are suggested for your inspection:

1. Make sure the front of the unit is accessible for future service.

2. Keep the top and surrounding areas of the heat pump clear of all debris.
3. Keep all plants and shrubs trimmed and away from the heat pump especially the area above the fan.
4. Keep lawn sprinklers from spraying on the heat pump to prevent corrosion and damage.
5. Ensure that the ground wire is always properly connected.
6. The filter must be maintained on a regular basis in order to ensure clean and healthy water to protect the heat pump from damaging.
7. Keep inspecting power and electrical components' wiring to make sure their normal operation.
8. All the safety protection devices have been set up; please refrain from changing these settings.If any changes are needed, please contact the authorized installer/agent.
9. If the heat pump is installed under roof without a gutter, ensure that all measures are taken to prevent excessive water from flooding the unit.
10. Do not use this heat pump if any electrical part has been in contact with water.Contact an authorized installer/agent.
11. If the increase of power consumption is not due to colder weather, please consult with the local authorized installer/agent.
12. Please turn off the heat pump and disconnect it from the mains power supply, when not in use for a prolonged period of time.

5.4 Troubleshooting

Use the following troubleshooting information to resolve issues/problems with your EVI DC Inverter heat pump.

WARNING — RISK OF ELECTRICAL SHOCK OR ELECTROCUTION.

Ensure that all high voltage circuits are disconnected before commencing heat pump installation.Contact with these circuits could result in death or serious injury to users, installers or others, due to electrical shock and may also cause damage to property.

DO NOT opens any part of the heat pump as this may result to electrocution.

1. Keep your hands and hair clear of the fan blades to avoid injury.
2. If you are not familiar with your heater:

a) **DO NOT** attempt to adjust or service the unit without consulting your authorized installer/agent.

b) **PLEASE** read the complete Installation and/or User's Guide before attempting to operate service or adjust the heater.

IMPORTANT: Turn off the mains power supply to the EVI DC Inverter heat pump prior to attempting service or repair.

5.4.1 Controller Body Error Troubleshooting

Error	Error name	Detected condition/Actions	Troubleshooting

code			
2	EEPROM data error	Detection after power on, shutdown unit after alarm	1.Initialize all parameters to check if it's normal. 2.If the problem cannot be resolved after initialization, please contact us!
6	System maintenance data error	Detection after power on, shutdown unit after alarm	1.Initialize all parameters to check if it's normal. 2.If the problem cannot be resolved after initialization, please contact us!
124	Plate heat exchanger inlet water temp sensor error	Detection after power on. Turn off the compressor after the alarm.	Check if the communication line is connected properly and in good contact.
125	Inverter module error	Detection after power on. Turn off the compressor after the alarm.	1.Check the corresponding code for the driver board fault. 2.For specific fault meanings, refer to the Driver Board error troubleshooting.
126	Compressor model setting	Detection after power on. Turn off the compressor after the alarm.	1.When the variable frequency drive board is first connected, this fault prompt will appear. If the fault cannot be automatically restored, power it on again. 2.If it still cannot be restored, there is no corresponding compressor model in the variable frequency drive. Please check the compressor.
178	IDU and ODU communication error	Detect only when the number of ODU modules is greater than 1.	1.Check the cascade communication wiring. 2.Check the address dialing code
180	0#Water pump failure	1.The real model of water circulation pump and model number doesn't match each other 2.failure of water circulation pump	1.Check if the model number and real model of water circulation pump match each other or not; 2.Diagnose the fault according to the status of malfunction indicator on the display of water circulation pump
181	The 0 # Mac model setting error	Only available when in use: After the unit is powered on, if the setting is abnormal, an alarm will be triggered. Turn off the corresponding ODU modules after the alarm.	Check if the models dialing codes are set normal.

5.4.2 Outdoor Units Error Troubleshooting

Error code	Error name	Detected condition/Actions	Troubleshooting
10	TBH overload：Water tank electric heater overload	Detected electric overload signal of water tank. Alarm only, no shutdown.	Check if the electric heating wiring of the water tank is normal.
12	THWt water tank fault：Hot water tank temperature failure	Detection after power on. Turn off the compressor after the alarm.	1.Check if the probe is connected properly. 2.Check if the temperature probe is functioning properly.
14	TWout3 system total outlet water temp fault：Total effluent temperature of the system fails	Detection after power on. Turn off the outside AHS after the alarm.	1.Check if the probe is connected properly. 2.Check if the temperature probe is functioning properly.
15	TFLin floor heating inlet water temp fault：Floor heating and inlet water temperature failure	Detection after power on. Turn off the compressor after the alarm.	1.Check if the probe is connected properly. 2.Check if the temperature probe is functioning properly.

82	TSL temp. Error：Solar energy temperature failure	Detection after power on. Turn off the solar water pump after the alarm.	1.Check if the probe is connected properly. 2.Check if the temperature probe is functioning properly.
83	UI35 communication error：Line controller communication Error		
85	TR temp. Error：Indoor temperature failure	Detection after power on. Turn off the unit after the alarm.	1.Check if the probe is connected properly. 2.Check if the temperature probe is functioning properly.
101	0 # TF fin temp probe error	Detection after power on. Turn off the compressor after the alarm.	1.Check if the probe is connected properly. 2.Check if the temperature probe is functioning properly.
102	0 #TD exhaust temp probe error	Detection after power on. Turn off the compressor after the alarm.	1.Check if the probe is connected properly. 2.Check if the temperature probe is functioning properly.
103	0 #TD exhaust temp error	Detection after power on. Turn off the compressor after the alarm.	1.Check if the temperature probe is functioning properly. 2.Check if there is a shortage of refrigerant and if there is any leakage in the pipeline.
104	0#J5 pressure sensor error	Start testing after the compressor runs. If defrosting is in progress, exit defrosting without alarm. Turn off the compressor.	Check if the input status of the high-pressure signal of the compressor is normal.
105	0#J6 pressure sensor error	If the compressor is defrosting, do not detect low pressure; After exiting defrosting, the low pressure will be detected again after a delay [defrosting low pressure detection delay];	Check if the input status of the low-pressure signal of the compressor is normal.
106	0#PRSs low pressure error：Low pressure transmission is too low	/	Check the low pressure value and compressor speed to see if the pressure is normal.
107	0#PRSd high pressure error：High pressure transmission is too high	/	Check the high pressure value and compressor speed to see if the pressure is normal.
108	0#TS suction temp error	Detection after power on. Turn off the compressor after the alarm.	1.Check if the probe is connected properly. 2.Check if the temperature probe is functioning properly.
110	0#TS low suction temp error	Detection after power on. Turn off the compressor after the alarm.	Check if there is a shortage of refrigerant and if there is any leakage in the pipeline.
111	0#Defrost error	Emergency defrosting occurs 3 times within 2 hours. Turn off the compressor after the alarm.	Check if the refrigerant amount is normal
112	0#Suction and discharge temp difference error	Not detected during defrosting. After the compressor is turned on [Abnormal suction and exhaust detection delay], if the suction temp TS is greater than the exhaust temp TD+5, an alarm will be triggered to shut down the compressor	Check if the suction temperature and exhaust temperature are normal.
113	0#Low evaporating temp error	Turn off the compressor after the alarm.	Check if the low pressure or temperature behind the valve is normal.
116	0 # TWin1 plate heat exchanger inlet low water temp error	When the temp of the plate inlet water TWin1 ≤ [cooling outlet temp too low]+1, an alarm will be triggered. (Cooling)	1.Check if the return temp sensor is normal. 2.Check if the water flow is too small.

117	0 # TWin1 plate heat exchanger inlet high water temp error	When the temp of the plate return water TWin1 ≥ [heating outlet temp too low]-1, an alarm will be triggered. (Heating)	1.Check if the return temp sensor is normal. 2.Check if the water flow is too large.
118	0#FANf1 fan motor speed error 1	This fault is only detected when the variable fan setting is PWM fan; After the fan is started, if the 【 PWM fan speed detection delay 】 time of the fan speed is less than 【 PWM fan speed too low 】, an alarm will be triggered.	Check if the wiring of the PWM fan is normal.
119	0#FANf2 fan motor speed error 2		Check if the wiring of the PWM fan is normal.
161	0#Ambient temp error	When the compressor is in the ambient temperature shutdown zone, an alarm will sound.	1.Check if the ambient temp sensor is normal. 2.Please contact us to get further solution.
164	0#IBH overload：Auxiliary electric heater overload	End auxiliary electric thermal overload signal detected. Alarm only, no shutdown.	Check if the auxiliary heater wiring is normal.
166	Plate heat exchanger outlet water temp too low error	When the outlet temp TWout1 is ≤ [low cooling outlet temp], an alarm will be triggered. (Cooling)	Check the outlet temp TWout1 and the return water temp TWin1 of the plate heat ex-changer.
167	Plate heat exchanger oulet water temp too high error	When the water outlet temp TWout1 is ≥ [heating outlet temp too high], an alarm will be triggered. (Heating)	Check the outlet temp TWout1 and the return water temp TWin1 of the plate heat ex-changer.
168	0#Plate heat exchanger outlet water temp sensor error	Detection after power on. Turn off the compressor after the alarm.	1.Check if the probe is connected properly. 2.Check if the temperature probe is functioning properly.
169	Water flow error	Detecting insufficient water flow after 30 seconds of starting the water pump, an alarm will be triggered and turn off the compressor.	Check if each input point on the pipeline is closed.
171	0#Plate heat exchanger inlet water temp sensor error	Detection after power on. Turn off the compressor after the alarm.	1.Check if the temp probe is connected properly. 2.Check if the temperature probe is functioning properly.
174	0#TWout1_TWin1_DIFF_LARGE	Detection during compressor startup and non defrosting operation.	1.Check if the water outlet and return temp sensor probes of the plate heat ex-changer are normal. 2.Check if the water flow rate, air flow rate are normal.
175	0#TWout1_TWin1_DIFF_ERR	Detection during compressor startup and non defrosting operation.	1.Check if the water outlet and return temp sensor probes of the plate heat ex-changer are normal. 2.Check if the water flow rate, air flow rate are normal.
179	0#Protocol version mismatch	Detection after power on.	Update the protocol version.

5.4.3 Drive Board Error Troubleshooting

Error code	Error name	Possible reason	Solution
Er.ocb（1）	Over current at start	1.The model parameters of the compressor do not match the actual situation. 2.Restart the rotating compressor. 3.There is a short circuit	1.Check the compressor model and model parameters.. 2.Wait until the compressor stops completely before starting. 3.Check if the UVW output wire is short circuited.

		between the UVW output wires or a short circuit to ground. 4.The inverter module is damaged.	4.Seeking power world's services
Er.ocA（2）	Over current during acceleration	1.The model parameters of the compressor do not match the actual situation. 2.Grid voltage is too low. 3.The power of the frequency converter is too low. 4.Acceleration time is too short.	1.Check the compressor model and model parameters. 2.Check input power supply. 3.Select frequency converter with high power levels. 4.Extend acceleration time
Er.ocd（3）	Over current during deceleration	1.The model parameters of the compressor do not match the actual situation. 2.The power of the frequency converter is too low. 3.Deceleration time is too short.	1.Check the compressor model and model parameters. 2.Select frequency converter with high power levels. 3.Extend deceleration time.
Er.ocn（4）	Over current during constant-speed	1.The model parameters of the compressor do not match the actual situation. 2.Low grid voltage 3.Abnormal load 4.The power of the frequency converter is too low	1.Check the compressor model and model parameters. 2.Check input power supply. 3.Check the load. 4.Select frequency converters with high power levels.
Er.ouA（5）	Over voltage during acceleration	1.Input voltage is too high 2.Restart the rotating compressor 3.The model parameters of the compressor do not match the actual situation	1.Check input power supply. 2.Wait until the compressor stops completely before starting. 3.Check the press model and model parameters.
Er.oud（6）	Over voltage during deceleration	1.Input voltage is too high 2.The model parameters of the compressor do not match the actual situation. 3.The deceleration time is too short	1.Check input power supply. 2.Check the compressor model and model parameters. 3.Extend deceleration time.
Er.oun（7）	Over voltage during constant-speed operation	1.Input voltage is too high 2.The model parameters of the compressor do not match the actual situation. 3.The acceleration time is too short	1.Check input power supply. 2.Check the compressor model and model parameters. 3.Extend acceleration time.
Er.ouE（8）	Over voltage in standby state	1.Input voltage is too high 2.DC bus voltage detection circuit fault	1.Check input power supply. 2.Seeking power world's services.
Er.dcL（9）	Under voltage during running	1.Abnormal input voltage or power failure during operation. 2.Input phase loss. 3.Damaged charging contractor.	1.Check input power supply and wiring. 2.Check input power supply and wiring. 3.Check and replace the contractor.

Er.PLI（10）	Input phase loss	1.Three phase input with missing phase. 2.Input three-phase imbalance. 3.Output severe oscillation.	1.Check installation wiring. 2.Check input voltage. 3.Adjusting parameters to eliminate oscillations.
Er.PLo（11）	Output phase loss	Output U, V, W with phase loss	Check the output wiring, check the motor and cables.
Er.FoP（12）	Power device protection	1.The model parameters of the compressor do not match the actual situation. 2.There is a short circuit between the UVW output lines or a short circuit to ground. 3.The connection between the compressor and the frequency converter is too long. 4.Serious interference or damage to the frequency converter.	1.Check the compressor model and model parameters. 2.Rewiring 3.Add output reactor or filter. 4.Seeking power world’s services.
Er.oHI（13）	Inverter drive board overheating	1.Excessive ambient temperature 2.It malfunctioned just after being powered on, and the temperature probe may be damaged or disconnected. 3.Blocked air duct or damaged fan. 4.Excessive load.	1.Reduce ambient temperature. 2.Seeking power world’s services. 3.Clean the air duct or replace the fan. 4.Check the load or choose high-power frequency converter.
Er.oLI（14）	Inverter drive board overload(PFC)	1.Frequency converter temperature too high. 2.Acceleration time too short. 3.Input voltage too low. 4.The model parameters of the compressor do not match the actual situation.	1.Check the fan, air duct, and ambient temperature. 2.Extend acceleration time. 3.Check input voltage. 4.Check the compressor model and model parameters.
Er.oLL（15）	Motor overload	1.The model parameters of the compressor do not match the actual situation. 2.The compressor is blocked or the load suddenly changes too much. 3.Input voltage too low.	1.Check the compressor model and model parameters. 2.Check the compressor model and model parameters. 3.Check input power supply and wiring.
Er.EEF（16）	PFC startup failed	1.After starting the system, the input grid voltage remained too low for several seconds, causing PFC to fail to start. 2.PFC module self-protection or circuit abnormality.	1.Check input voltage. 2.Please power off for a few minutes before restarting or seeking service.
Er.oLP（17）	Motor load overweight	Current exceeds the detection level of overload and exceeds	Check the compressor model and model parameters.

		the detection time.	
Er.ULd（18）	Motor over speed	The running speed of the press exceeds 1.1 times the upper limit speed	1.The phase sequence of the compressor is reversed, or the compressor is not connected. 2.Check the compressor model and model parameters.
Er.Co1（19）	Motor D-axis over current	1.The model parameters of the compressor do not match the actual situation. 2.Restart the compressor if the shutdown time is too short. 3.Detected abnormal current circuit. 4.PMSM motor demagnetization. 5.Motor stator winding broken.	1.Check the compressor model and model parameters. 2.After a few minutes of shutdown, restart. 3.Seeking services 4.Replace the motor 5.Check the stator resistance of the motor and replace the motor.
Er.Co2（20）	Motor Q-axis over current	1.The model parameters of the compressor do not match the actual situation. 2.Restart the compressor if the shutdown time is too short. 3.Detected abnormal current circuit. 4.PMSM motor demagnetization. 5.Motor stator winding broken.	1.Check the compressor model and model parameters. 2.After a few minutes of shutdown, restart. 3.Seeking services 4.Replace the motor 5.Check the stator resistance of the motor and replace the motor.
Er.EEP（21）	Parameter storage failed	Parameter writing error	After power off, power on again and try again. If the problem persists, please seek service.
Er.CFE（22）	Communication error	1.The communication wire between the PCB and the variable frequency drive board is connected incorrectly or disconnected. 2.Improper setting of communication parameters. 3.Severe communication interference.	1.Check the PCB, variable frequency drive board, and wiring. 2.Check communication parameters. 3.Check the communication wiring and grounding.
Er.ccF（23）	Current detection failure	Current sensor damaged or circuit abnormal.	After power off, power on again and try again. If the problem persists, please seek service.
Er.ArF（24）	The PFC temperature detection error	The PFC temperature measurement probe may be damaged or disconnected, or the circuit may be abnormal due to a malfunction immediately after power on.	After power off, power on again and try again. If the problem persists, please seek service.
Er.Aco（25）	Motor Lock at start	1.Motor rotor rotation fluctuation exceeds the limit, resulting in motor out of step. 2.Restart the motor if the shutdown time is too short. 3.Improper parameters for motor startup and motor stall detection.	1.Check the motor model and model parameters. 2.After a few minutes of shutdown, restart. 3.Check the motor model and model parameters. 4.Replace the motor 5.Check the stator resistance of the motor and

		4.PMSM motor demagnetization. 5.Motor stator winding disconnection. 6.Excessive operating load.	replace the motor. 6.Check motor load.
Er.PGo（26）	Motor lock during running	1.Motor rotor rotation fluctuation exceeds the limit, resulting in motor out of step. 2.Restart the motor if the shutdown time is too short. 3.Improper parameters for motor startup and motor stall detection. 4.PMSM motor demagnetization. 5.Motor stator winding disconnection. 6.Excessive operating load.	1.Check the motor model and model parameters. 2.After a few minutes of shutdown, restart. 3.Check the motor model and model parameters. 4.Replace the motor 5.Check the stator resistance of the motor and replace the motor. 6.Check motor load.
Er.rHo（27）	Heat dissipation temperature detection error	The temperature measurement probe may be damaged or disconnected, or the circuit may be abnormal due to a malfunction immediately after power on.	After power off, power on again and try again. If the problem persists, please seek service.
Er.Abb（28）	Zero speed error	The motor did not run as instructed.	Check the motor model and model parameters.
Er.Io1（29）	Interrupt overflow 1	Internal failure	Seeking power world’s services.
Er.Io2（30）	Interrupt overflow 2	Internal failure	Seeking power world’s services.
Er.PnL（31）	Rotor shake at start	1.Restart the motor if the shutdown time is too short. 2.Improper parameters for motor startup and motor stall detection. 3.PMSM motor demagnetization. 4.Motor stator winding disconnection. 5.Excessive operating load.	1.After a few minutes of shutdown, restart. 2.Check the motor model and model parameters. 3.Replace the motor. 4.Check the stator resistance of the motor and replace the motor. 5.Check motor load.
Er.rr1（32）	Rotor shake during running	1.Restart the motor if the shutdown time is too short. 2.Improper parameters for motor startup and motor stall detection. 3.PMSM motor demagnetization. 4.Motor stator winding disconnection. 5.Excessive operating load.	1.After a few minutes of shutdown, restart. 2.Check the motor model and model parameters. 3.Replace the motor. 4.Check the stator resistance of the motor and replace the motor. 5.Check motor load.
Er.PF1（33）	PFC over current	1.Low input grid voltage and overload operation. 2.There is a short circuit between the PFC inductance wires or a short circuit to ground, or the PFC circuit is faulty.	1.Check input power supply. 2.Check if the PFC inductance lead or inductance coil is short circuited, or seek service.
Er.PF2（34）	PFC peak over current	1.Low input grid voltage and overload operation.	1.Check input power supply. 2.Check if the PFC inductance lead or

		2.There is a short circuit between the PFC inductance wires or a short circuit to ground, or the PFC circuit is faulty.	inductance coil is short circuited, or seek service.
Er.PF2（35）	PFC effective value over current	1.Low input grid voltage and overload operation. 2.Excessive load on the compressor or abnormal refrigerant of the compressor.	1.Check input power supply. 2.Check the system, compressor refrigerant, pipeline etc., or seek service.

5.4.4 Common Errors and Debugging

The user must hire the professional maintenance staff to fix if the unit has any problems during working.The maintenance staff might refer to the chart to debug.

Error Status	**Possible reason**	**Solution**
Heat pump not running	Power Error Wiring loose Fuse blow fused Thermal Overloaded protector off Low pressure too low	Put off the power switch, check the power supply find out the causes and repair Replace the fuse blow test the voltage and current
Water pump is working but without water cycle or water pump high noise	Lack of water in the system with air in the water system the valves are not all open filter is dirty and blocked	Check the system replenishment device and replenish the system discharge the air in the water system Open the water system valve Clean the water filter
Low heating capacity	Lack of refrigerant Bad heat preservation of water system; Dry filter blocked Bad heat dissipation of air heat exchanger Not enough water flow	Leakage detecting and supply refrigerant Reinforce the heat preservation of water system Change the dry filter Clean the air heat exchanger Clean the water filter
Compressor not working	Power failure; Contractor of compressor damage; wiring loose Compressor overheat protection outlet water temp.Too high; Not enough water flow Compressor overload protector tripped	Find out the causes and solve the power failure Change the contractor of compressor Find out the loose point and repair Check the unit pressure and Exhaust gas temp. Reset the outlet water temp Clean the water filter and discharge the air in the system Check the running current and whether overload protector damage
compressor running noise too high	Liquid refrigerant enter the compressor The inner parts of compressor damage Too Low voltage	Check the expansion valve whether out of effect Replace the compressor Check Power Voltage
Fan not working	The fastening screw of the fan loose Fan motor damage Contractor damage	Reinforce the screw Replace the fan motor Replace the contractor
Compressor running but heat pump not heating	Refrigerant is all leaking out Compressor Error Compressor reversal	Check leakage and charging the refrigerant Replace the compressor Exchange the phase order of compressor
Low water flow protection	Not enough water flow in the system Water switch Error	Clean the water filter and discharge the air in the system Check the water switch and replace it

5.5 Maintenance

The EVI DC Inverter air source heat pump unit is highly automation device.If the units are cared and maintained effectively regularly , the operation reliability and the lifetime of the unit will be highly improved.

Important tips below shall be paid more attention to when doing the maintenance:

1. The water filter shall be cleaned termly, to make sure the water is clean, and avoid any damage caused by the filter blockage.
2. All the safety protection device set up already before leaving the factory, forbid to adjust by oneself.We could not take any responsibility for any unit damage caused by the user's self-adjustment.

3. The surrounding of the unit shall be clean, dry and draughty.If the side of the heat exchanger could be cleaned termly(every 1-2 month), the heat exchanging efficiency will be better, and energy saving.

4. The water supplement of water system and air discharge device shall be checked frequently, to avoid the air to enter the system, causing the water circulation decrease, or the water cycle trouble, or it will effect the unit's cooling, heating efficiency and the working reliability .

5. The power of the unit and the electrical wiring shall be checked frequently, make sure the wiring is fastened and the electrical component is normal.If ab normal, it shall be repaired or replaced, the unit shall be connected to the ground reliably.

Check every components during the unit operation frequently.Check whether the working pressure of cooling system is normal or not.Check the pipe splice and the air injection valve whether have greasy dirt.Make sure not any refrigerant leakage in the cooling system.
7. Don't stack any sundries around the unit, in case blocking the air inlet and outlet.The surrounding of the unit shall keep clean, dry and draughty.

9. The water in the water system shall be discharged if the unit need to take a long break after running for a period.And the power shall be off, put a cover on the unit.Only after the water system is replenished full with water and the unit is checked roundly, and the unit is power on to warm up for at lease 6 hours, all is fine, then the unit could be started up again.

Notice:

The unit should be equipped with the dedicated power supply.The voltage range should be within ±10%.The switch should be automatic air switch.The setting electric current should be 1.5 times of the running current, and equipped with lack of phase safeguard.The knife switch is forbidden to use in the unit.

The unit must be power on to warm up for at lease 12 hours before running every season.If the cooling only models haven't been working for long term in winter, make sure to discharge out all the water, in case the pipe and the unit are damaged by frost.The master controller and the unit should be in correspondence and couldn't be power off if the heating only models stop working for long term in winter, to avoid the frost damage.

The heat pump switch couldn't be operated frequently, can not be over 4 times within one hour.The electric cabinet shall prevent to be affected with damp.

Forbid to flush the EVI DC inverter air source heat pump with water, avoid any electric shock or other accidents.

Section 6 WIFI Connection and Operation

6.1 Usage Notice

Dear Customer:
Thank you for choosing our products! For your convenience, please read the manual carefully and follow the steps in the manual.

6.2 APP Download

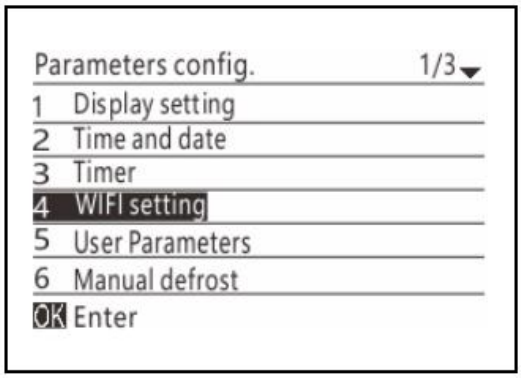
Scan the following QR code or research "huilian smart" in APP STORE or GOOGLE PLAY to install the APP.

6.3 Connect Your Phone to Wi-Fi

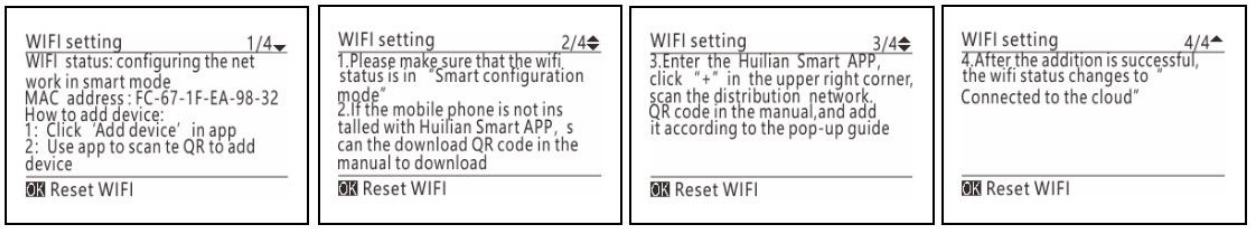
Make sure that the mobile phone and the device to be connected are in the same Wi-Fi environment. Select the 2.4GHz Wi-Fi network on the mobile phone and enter the password to connect the mobile phone to the network.
WIFI.
***Note:** If the Wi-Fi in the current environment is 5GHz, please set the router to 2.4GHz first.

6.4 Check the device WIFI status

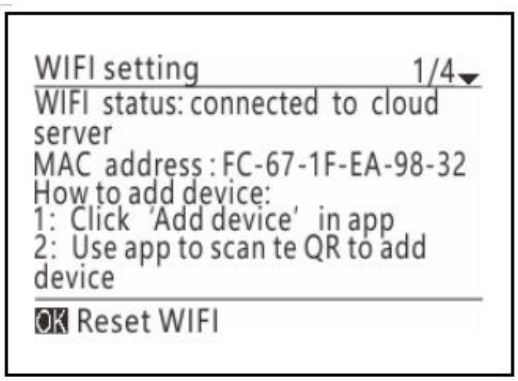
Please check the current WIFI status of the device for Smart Config wiring mode before proceeding with the device wiring operation to ensure the subsequent wiring operation is carried out smoothly.
1. Enter the settings menu interface, select "WIFI setting"；



2. Check if the message "Smart mode is being configured" is displayed in the interface, if other messages are displayed, press and hold the < Reset WIF > key to reset the WiFi。

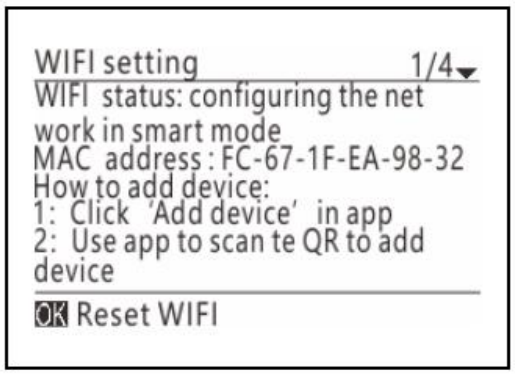


If the WIFI status shows 'Connected to Cloud ', then the remote controller has already undergone network configuration and can be operated on accounts that have completed network configuration before:



If the WIFI status displays other content or if it is necessary to cancel the previously completed distribution network, the following steps can be followed (note: accounts that have completed the distribution network and successfully communicated will no longer be able to operate the crew):

On the first page of the distribution network information interface, click the "OK" button to reset WIFI. When the WIFI status shows "Smart distribution network in progress", you can use the mobile app to perform network distribution and connection operations (note: WiFi used for network distribution currently only supports the 2.4GHz signal frequency band).

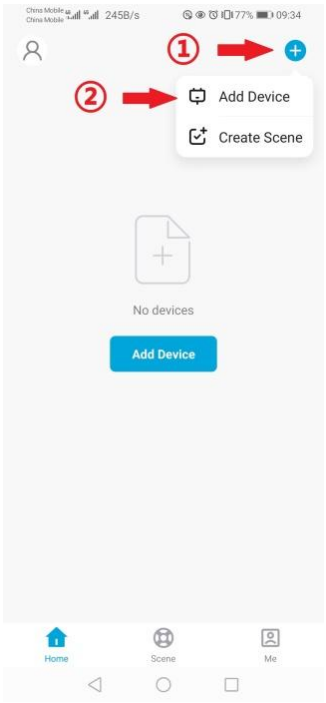


6.5 Add Device

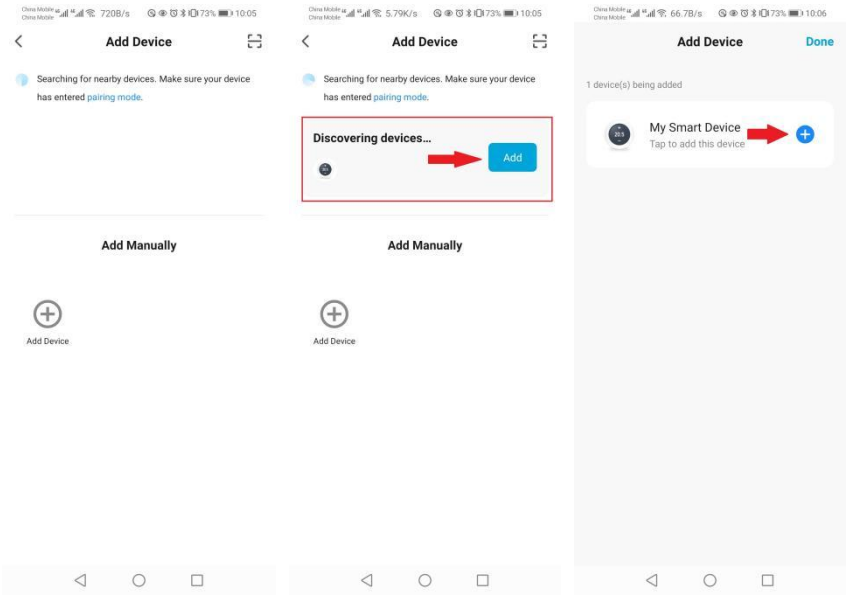
(1) Turn on the mobile phone Wi-Fi and Bluetooth, and enable location access, please make sure that the mobile phone Wi-Fi and Bluetooth are both turned on to obtain the best network configuration test;
(2) Open the **Huilian Smart** APP on the mobile phone, and select **"Home"** in the bottom navigation bar;
(3) Click the **"+"** button in the upper right corner of the home page, or click the **"Add Device"** button in the center of the home page to enter the device adding interface;

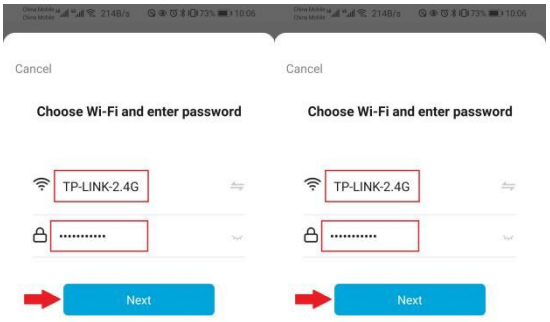
(4) In the device adding interface, please try to add the device in one of the following ways:

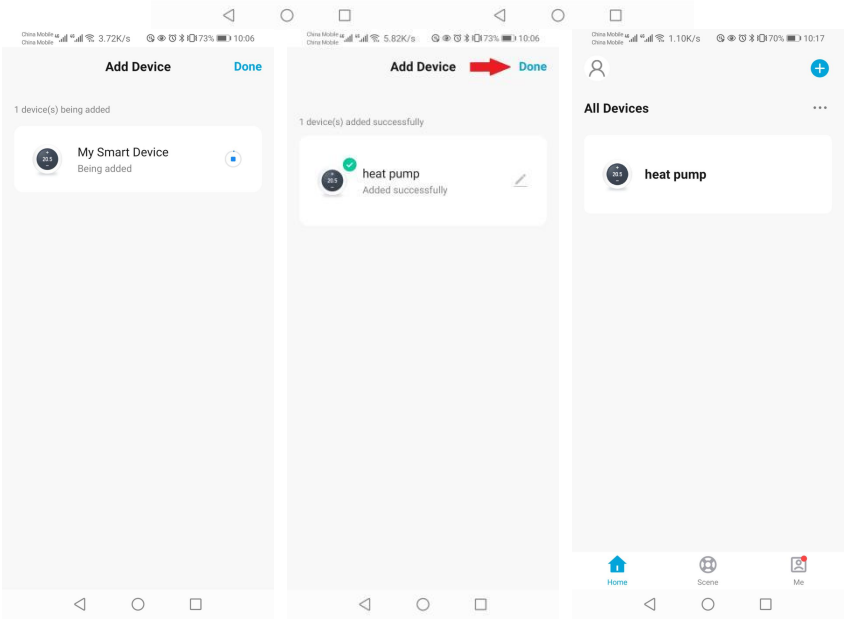
A. Automatic device discovery



The phone will automatically discover available devices nearby. After discovering the device, follow the instructions in the figure below to complete the subsequent network configuration operations.




Cancel
Choose Wi-Fi and enter password
TP-LINK-2.4G
Next
Cancel
Choose Wi-Fi and enter password
TP-LINK-2.4G
Next

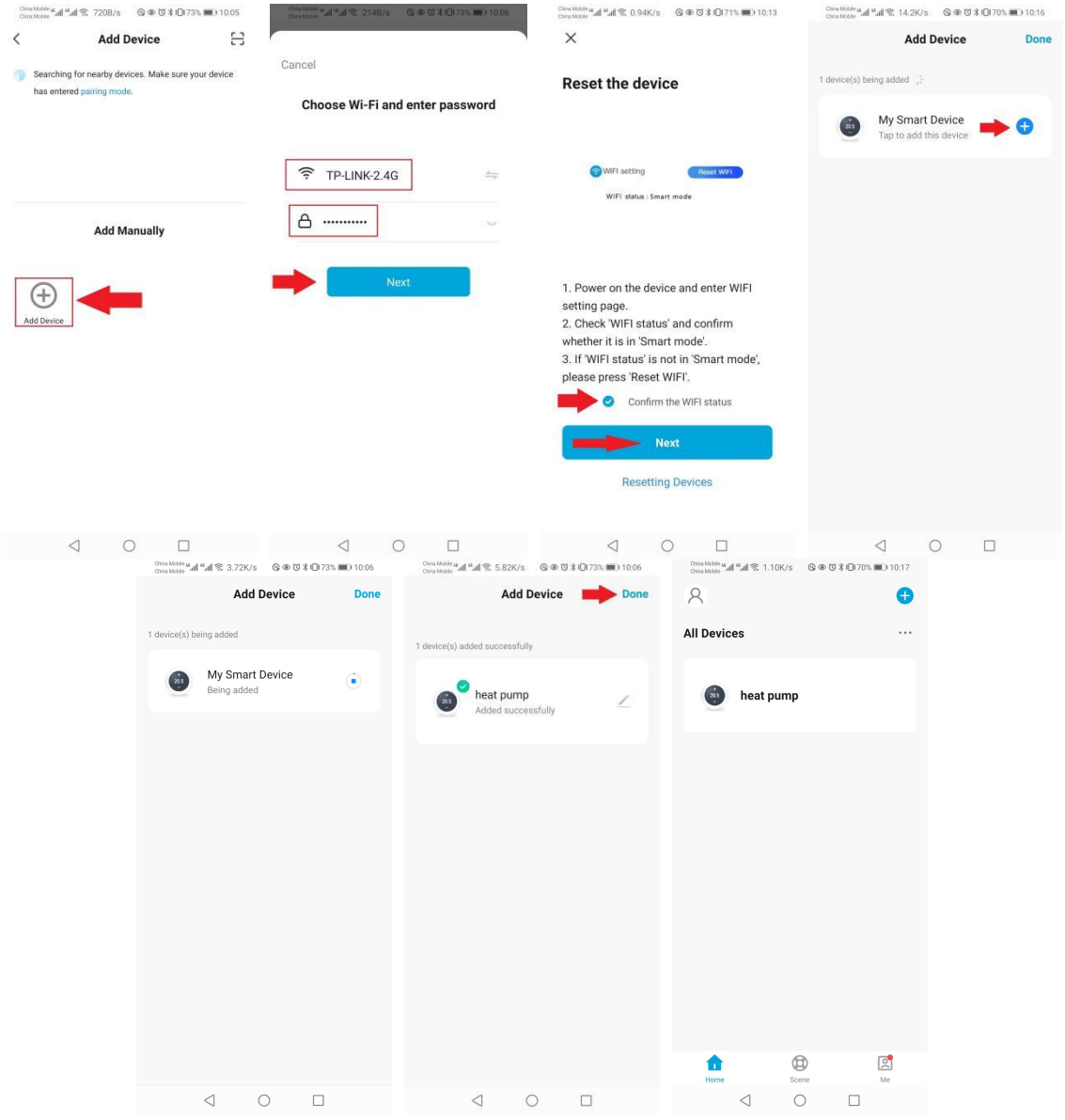

Add Device
Done
1 device(s) being added
My Smart Device
Being added
Add Device
Done
1 device(s) added successfully
heat pump
Added successfully
All Devices
heat pump
Home
Scene
Me

B.Manually adding devices

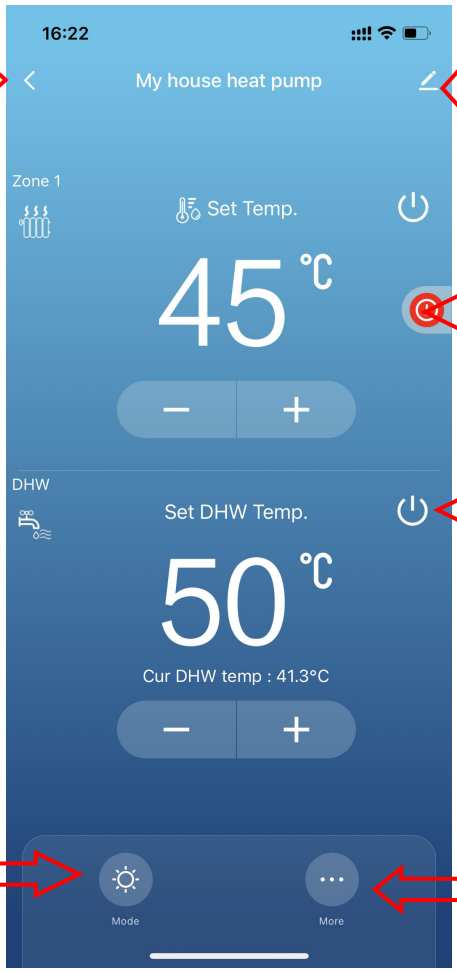
In the tab bar at the top of the device adding interface, select **"Add Manually"**, and select the **"Add Device"** icon button to manually add it.

The following figure guides you to add a device.

***Note**: If you have checked and confirmed that the WIFI status of the device is correct, under the step of **"Reset the device"**, please directly check **"Confirm WIFI status"** and click the **"Next"** button to directly configure the network without the need to reset the device.



6.6 Interface style



Return

More: You can change the device name, select the device installation location, check the network status, add shared users, create a device group, view device information, etc.

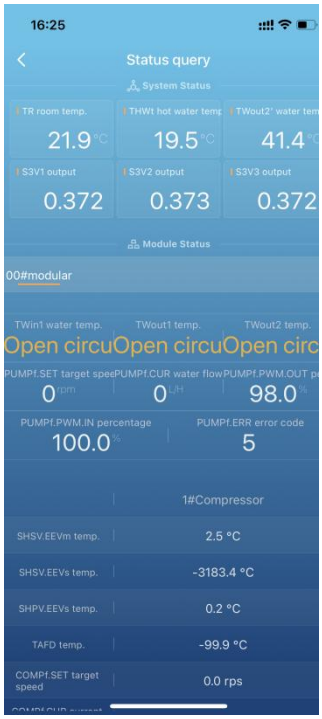
Fault information: display fault information when a fault occurs.

Power button: click to turn on/off

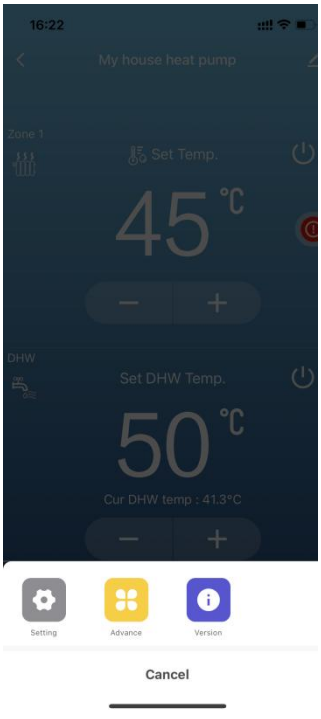
Mode switching: Click to select the mode to be switched

Parameter Query: View unit status data

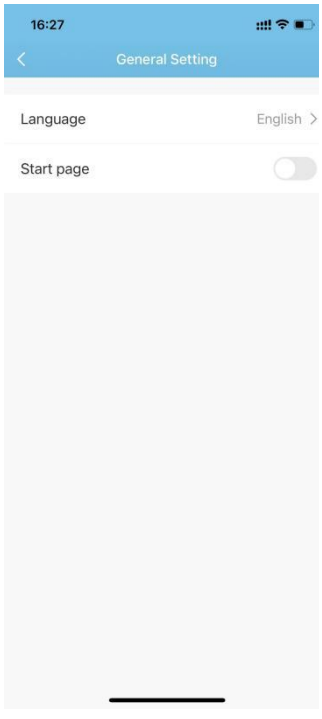
Main Interface



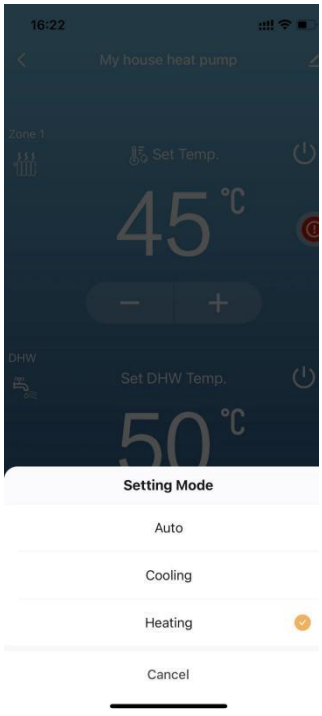
Status Inquiry Screen



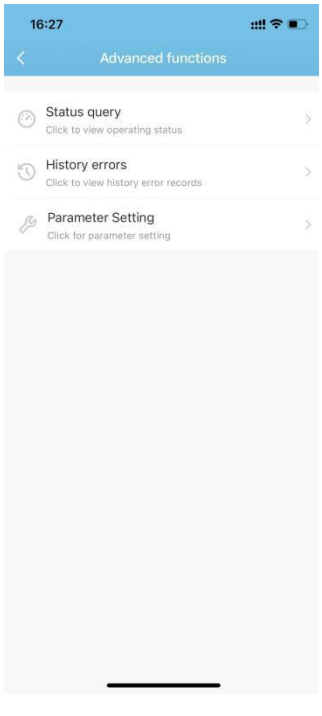
More menu bars



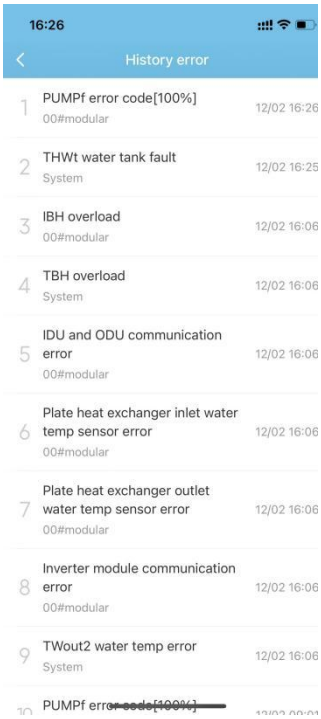
General settings interface



Mode selection interface



Advanced Function Interface



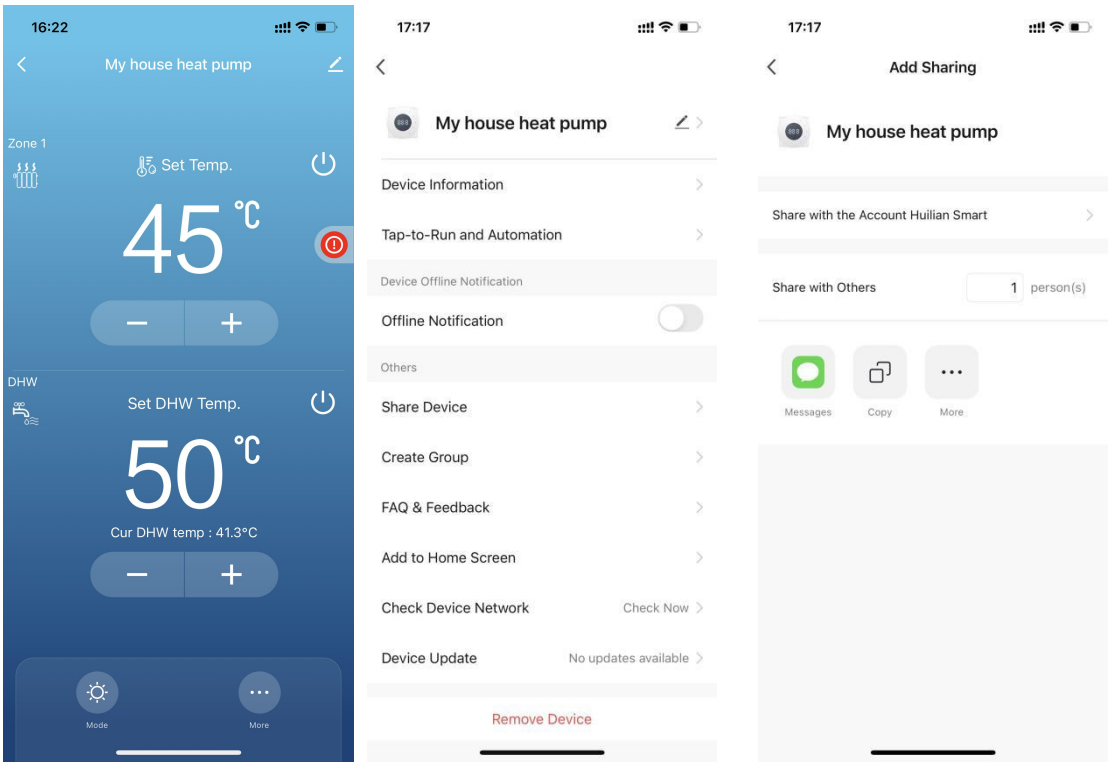
History error Screen

Parameter setting interface

6.6 Equipment sharing

◎Share the bound device, the sharer operates in the following sequence.
◎After successful sharing, the list will be increased and show the shared person.
◎To delete the shared person, long press the selected user, the delete interface will pop up, click "Delete".

◎The operation of the sharing interface is as follows:



◎Input the account of the shared person, click "Done", the shared success list will display the account of the newly-added shared person. The shared person showing the received shared device, click in to operate and control the device.