NOW-e

NOW-e TerraPulse

Air-to-water heat pump

Installation and Instruction Manual

For Models:

NOWE-11TPRE06A01
NOWE-11TPRE10A01
NOWE-11TPRE10B01
NOWE-11TPRE17A01
NOWE-11TPRE17B01

For outdoor installation only

NOW-e

CONTENT

Preface

- In order to provide customers with a high quality, very reliable and versatile product, this heat pump is produced with strict design and manufacture standards.
  This manual includes all the necessary information about installation, debugging, discharging and maintenance. Please read this manual carefully before you open or maintain the unit.
  The manufacturer of this product will not accept responsibility if someone is injured or the unit is damaged, as a result of improper installation, debugging, or unnecessary maintenance which is not in line with this manual.
  The unit must be installed by qualified personnel.
- It is vital that the below instructions are adhered to at all times to keep the warranty.
  - The unit may only be opened or repaired by qualified installer or an authorized dealer.
  - - Maintenance and operation must be carried out according to the recommended period and frequency, as stated in this manual.
  - - Use original spare parts only.

  Failure to comply with these recommendations will void the warranty.
- The inverter air source water heat pump is a high efficiency, energy saving and environment friendly equipment, which is mainly used for domestic heating. It can work with any kind of indoor unit such fan coil, radiator, or floor heating pipe, by providing warm or hot water. One unit of the monobloc heat pump can also work with several indoor units.
  The air source water heat pump unit is designed for heat recovery by using a super heater which can provide hot water for sanitary purpose.

This series of heat pump units has the following features:

1. Advanced controlling
   A PC microcomputer-based controller is available for users to review or set the running parameters of the heat pump. A centralized controlling system can control several units by PC.
2. Quality appearance
   The heat pump is designed with a quality appearance. In the monobloc heat pump the water pump is included, which is very easy for installation.
3. Flexible installation
   The unit has a smart structure with a compact body; just simple outdoor installation is needed.
4. Low noise performance
   A high quality and efficient compressor, fan and water pump are used to ensure a low noise level with insulation.
5. Good heat exchange rate
   The heat pump unit uses a specially designed heat exchanger to enhance the whole efficiency.
6. Large working range
   This series of heat pumps is designed to work under different working conditions as low as -15 degrees for heating.

Safety Precautions

To prevent harm to users and others because of this unit, to avoid damage to the unit or other property, and to use the heat pump properly, please read this manual carefully and make sure the following information is understood correctly.

Mark Notes

Mark	Meaning
 WARNING	Incorrect operation may lead to death or heavy injury to people.
 ATTENTION	Incorrect operation may result in personal injury or loss of material.

Icon notes

Icon	Meaning
	Prohibition. This icon will be near to prohibited points.
	Compulsory implementation. The listed action needs to be taken.
	ATTENTION (includes WARNING) Please pay attention to what is indicated.

Safety Precautions

Warning

Installation	Meaning
 Professional installer is required.	The heat pump must be installed by qualified personnel, to avoid improper installation which can lead to water leakage, electrical shock or fire.
 Earthing is required	Please make sure that the unit and power connection have a good earthing connection, otherwise an electrical shock may be caused.

Operation	Meaning
 PROHIBITION	DO NOT put fingers or other body parts into the fans and evaporator of the unit, this could lead to harm.
 Shut off the power	When there is something wrong or you notice a strange smell, the power supply needs to be shut off to stop the unit. Continued use may cause an electrical short circuit or fire.

Transport and repairs	Meaning
 Instruct	When the heat pump needs to be moved or installed again, please instruct a dealer or qualified person to carry this out. Improper installation will lead to water leakage, electrical shock, injury or fire.
 Instruct	It is prohibited for the user to repair the unit himself; otherwise, electrical shock or fire may occur.
 Prohibited	When the heat pump needs to be repaired, please instruct a dealer or qualified person to carry it out. Improper movement or repair on the unit will lead to water leakage, electrical shock, injury or fire.

Do not use other means than recommended by the manufacturer to accelerate the defrosting process or to clean the heat pump.

The appliance must be stored inside and installed in an environment without continuously operating or potential ignition sources (for example: open flames, an operating gas appliance or an operating electric heater, or an electric spark or hot object)

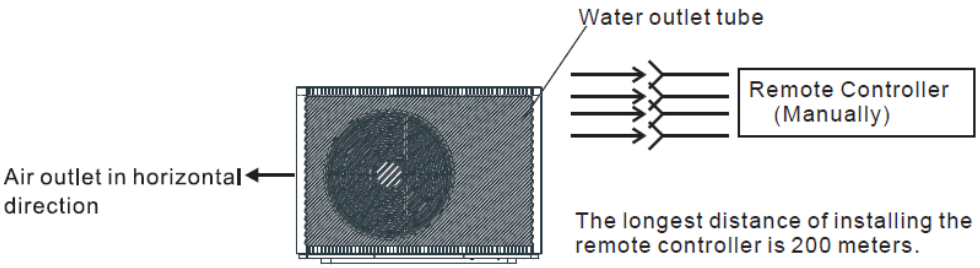
ATTENTION

Installation	Meaning
 Installation Place	The unit MAY NOT be installed near flammable gas. In case of a gas leakage, a fire can occur.
 Attaching the unit	Make sure that the foundation on which the heat pump is placed, is strong enough, to avoid any tilting or falling down of the unit
 Circuit breaker	Make sure that there is circuit breaker for the unit; absence of a circuit breaker can lead to an electrical shock or fire.

Operation	Meaning
 Check the installation foundation	Please check the installation foundation after a period of time (one month), to avoid any tilting or damage of the foundation, which may lead to personal injury or damage the unit
 Switch off the power	Please switch off the power for cleaning or maintenance.
 Prohibition	It is prohibited to use copper or iron as a fuse. The right fuse for the heat pump must be installed by an electrician.
 Prohibition	It is prohibited to spray flammable gas in the direction of or on the heat pump, as it may cause fire.

Specifications

1. Appearance and structure of the heat pump



	Water outlet tube
	Remote Control (Manually)
	Air outlet in horizontal direction
	The longest distance for installing the remote control is 200 meters.

2. Unit data

*** REFRIGERANT: R290

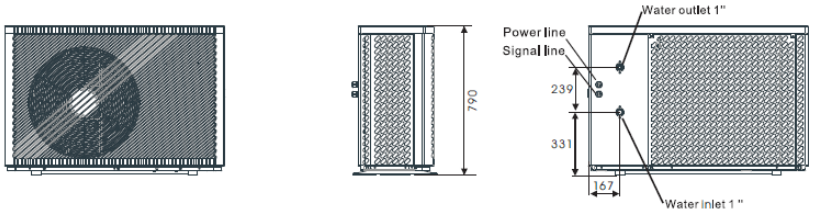
Model		NOWE-11TPRE06A01	NOWE-11TPRE10A01	NOWE-11TPRE10B01	NOWE-11TPRE17A01	NOWE-11TPRE17B01
Heating Capacity	kW	3.10~8.90	5.40~14.95	5.40~14.95	8.00~22.00	8.00~22.00
Heating Power Input	kW	0.65~2.10	1.05~3.85	1.05~3.85	1.60~6.90	1.60~6.90
Cooling Capacity	kW	1.20~5.72	3.60~10.50	3.60~10.50	4.20~15.00	4.20~15.00
Cooling Power Input	kW	0.65~2.40	1.12~4.47	1.12~4.47	1.80~7.30	1.80~7.30
Hot Water Capacity	kW	3.92~10.68	6.50~18.50	6.50~18.50	10.00~27.00	10.00~27.00
Hot Water Power Input	KW	0.78~2.47	1.27~4.65	1.27~4.65	1.90~7.10	1.90~7.10
Max Power Input	KW	3.0	5.30	5.30	7.5	8.3
Max Current Input	A	13.5	24.5	10.5	35.0	15.0
Power Supply		220-240V~/50Hz	220-240V~/50Hz	380~415V/3N~/50Hz	220-240V~/50Hz	380~415V/3N~/50Hz
Compressor Quantity		1	1	1	1	1
Compressor Model		Rotary	Rotary	Rotary	Rotary	Rotary
Fan Quantity		1	1	1	2	2
Fan Power Input	W	150	170	170	75	75
Fan Rotation Speed	RPM	600	600	600	600	600
Water Pump Input	W	60	60	60	160	160
Noise Level	dB(A)	38~52	39~52	39~52	42~54	42~54
Water Connection	inch	1	1	1	1	1
Water Flow Volume	m3/h	1.0	1.7	1.7	2.9	2.9
Internal Water Pressure Drop	kPa	20	30	30	45	45
Water Head	m	5.0	5.5	5.5	6.9	6.9
Unit Net Dimensions (L/W/H)	mm	See drawings of the heat pump				
Unit Shipping Dimensions (L/W/H)	mm	see data on the package				
Net Weight	kg	see data on the nameplate				
Shipping Weight	kg	see data on the package				

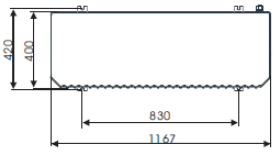
Cooling working condition:(DB/WB)35°C/24°C. (Outlet/Inlet) 7°C/12°C.
Heating working condition: (DB/WB) 7°C/6°C. (Outlet/Inlet) 35°C/30°C.
Hot Water working condition:(DB/WB) 20°C/15°C. Water tank temperature circulation from 15°C to 55°C.

BS EN 14511-1-2013 Air conditioners, liquid chilling packages and heat pumps with electrically driven compressors for space heating and cooling.
Part 2: Test conditions Part 3: Test methods Part 4: Operating requirements, marking and instructions.

3. Unit dimensions

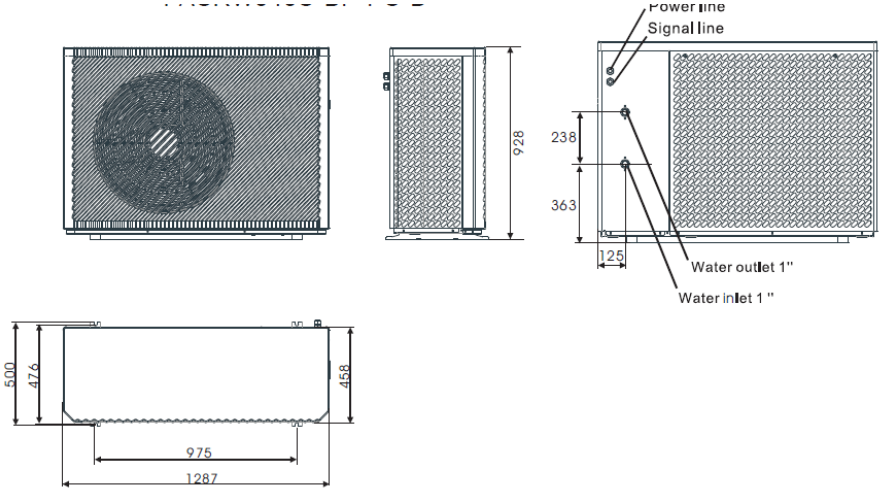
Models:NOWE-11TPRE06A01





	Water outlet 1”
	Power line
	Signal line
	Water inlet 1”

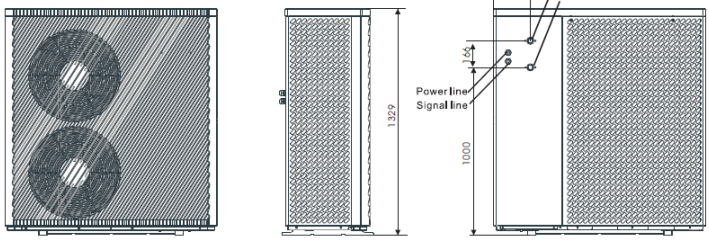
Models:NOWE-11TPRE10A01
NOWE-11TPRE10B01

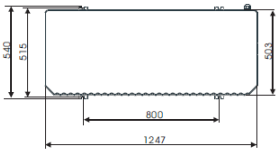


	Water outlet 1”
	Power line
	Signal line
	Water inlet 1”

Specification

Models: NOWE-11TPRE17A01
NOWE-11TPRE17B01





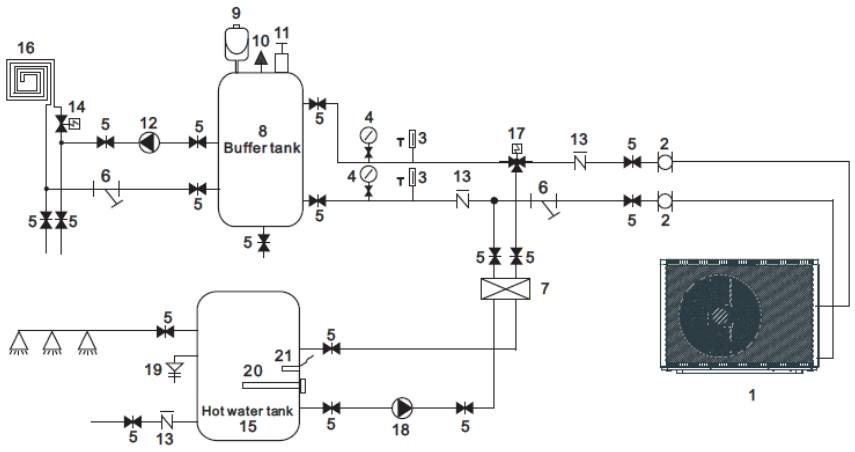
	Water outlet 1”
	Power line
	Signal line
	Water inlet 1”

Unit features

1. Plate heat exchanger
Small sized, highly efficient SWEP efficient heat exchanger.
2. Environmentally friendly refrigerant
New generation of environmentally friendly refrigerant R290, which is harmless to the ozone layer.
3. Heating in low-temperature environments
The optimally designed unit can achieve a normal heating function, even when the ambient temperature is -25°C.
4. Introducing refrigerant
The Heat Pump is not filled with refrigerant and full of high-pressure nitrogen instead when ex-factory. Before operating, remember to follow the Operation Manual for infusing the refrigerant.
5. Installation environment
The refrigerant R290 is flammable and explosive. It's prohibited to install the unit in an environment which has operating or potential ignition sources.

1 Heat pump installation

1.1 House Heating/Cooling + Domestic Hot Water

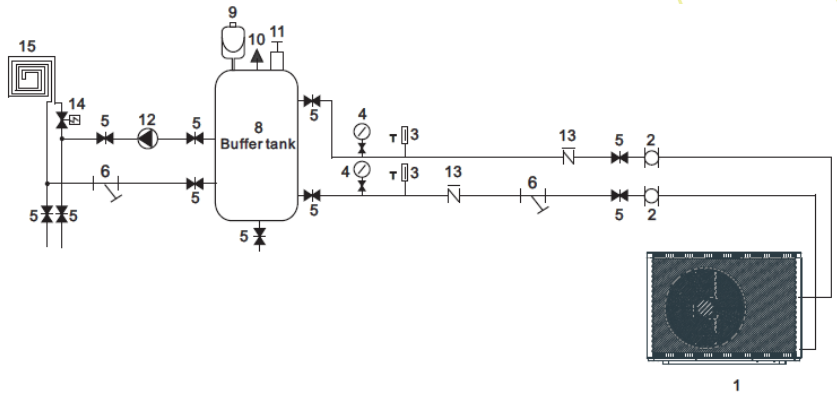


	Buffer tank
	Hot water tank

1	Heat pump	10	Relief valve	19	PT valve
2	Flexible pipe	11	Air vent valve	20	Electrical heater
3	Thermometer	12	Water pump for floor heating	21	Hot water sensor
4	Manometer	13	Check valve		
5	Shut-off valve	14	Floor heating valve		
6	Y-type water filter	15	Hot water tank		
7	Plate heat exchanger	16	Floor heating pipe/fan coil unit		
8	Buffer tank	17	Hot water valve		
9	Expansion tank	18	Hot water pump		

Remark: Items 17, 18, 20, 21 can be connected with the heat pump.

1.2 House Heating/Cooling (including buffer tank)



	Buffer tank

1	Heat pump	7	Plate heat exchanger	13	Check valve
2	Flexible pipe	8	Buffer tank	14	Floor heating valve
3	Thermometer	9	Expansion tank	15	Floor heating pipe/fan coil unit
4	Manometer	10	Relieve valve		
5	Shut-off valve	11	Air vent valve		
6	Y-type water filter	12	Water pump for floor heating		

2 Choosing the right heat pump unit

2.1 Based on the local climate condition, construction features and insulation level, calculate the required cooling (heating) capacity per square meter.
2.2 Determine the total capacity which will be needed by the construction.
2.3 According to the total capacity needed, choose the right model by consulting the heat pump features as below:
Heat pump features

- Cooling only unit: chilled water outlet temp. at 5-15°C, maximum ambient temp. at 43°C.
  Heating and Cooling unit: for cooling, chilled water outlet temp. at 5-15°C, maximum ambient temp. at 43°C. For heating, warm water inlet temp. at 40-50°C, minimum ambient temp. at -25°C.
- Unit scope
  The inverter air source water heat pump can be used for houses, offices, hotels, etc. which need separate heating or cooling, in which with each area needs to be controlled.

3 Installation method

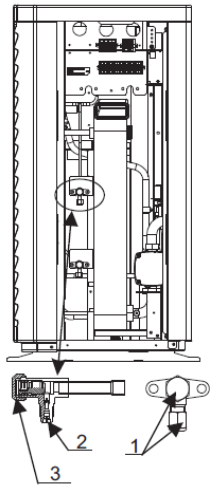
The heat pump can be installed onto a concrete foundation by expansion screws, or onto a steel frame with rubber feet which can be placed on the ground or roof of the building.
Make sure that the unit is placed horizontally.

4 Installation site

- The unit can be installed in any outdoor space which can carry a heavy machine such as a terrace, roof, ground etc.
- The location must have good ventilation.
- The location must be free from heat radiation and other open fire.
- A cover is needed in winter to protect the heat pump from snow.
- There can be not obstacles near the air inlet and outlet of the heat pump.
- The location must be free from strong wind.
- There must be a water channel around the heat pump to drain the condensing water.
- There must be enough space around the unit for maintenance.
- The location must be away from operating or potential ignition sources (for example: open flames, an operating gas appliance or an operating electric heater or electric spark or hot object)

5 Refrigerant filling

The heat pump must be filled with refrigerant R290. If your unit is delivered by air, the heat pump is not filled with refrigerant R290, but with high pressure nitrogen or kept under vacuum. Please follow the steps below to fill with refrigerant R290.



Stop valve signs:
Low pressure

5.1 Preparations:
5.1.1 Please make sure the environment is well-ventilated while filling the refrigerant.
5.1.2 Keep away from open flames or potential sources of fire.
5.1.3 Disconnect the power supply of the heat pump.
5.1.4 Carefully check the nameplate of the heat pump and fill strictly according to the labeled amount.
5.2. Check the nitrogen gas pressure inside the system. The heat pump is charged with about 30 bar nitrogen gas inside the system. Please check whether there is still high-pressure nitrogen in the unit before filling refrigerant, otherwise check the leakage point. (Use a spanner and remove the seal nut 1 and 3, use 5mm inner hexagon spanner to open the valve 2. If high-pressure gas comes blowing out of the unit, then the heat pump is not leaking.)
5.3. Use a 5mm inner hexagon spanner and open the valve 2 and release all the nitrogen gas inside the system.
5.4. Create a vacuum in the heat pump. Connect the vacuum pump with the valve 2, keep vacuum pump running until the absolute pressure is below 30Pa or an operating time of more than one hour.
5.5. Fill with refrigerant. Keep the refrigerant in a liquid state when filling and strictly adhere to the amount on the label.
5.6. Finish the filling, close the valve 2 and screw the seal nut 1 and 3.

	Stop valve signs: Low pressure

6 Water circuit connection

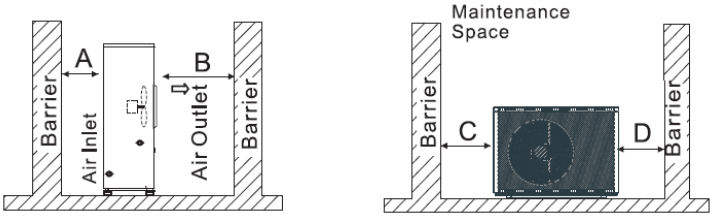
When connecting the water pipe, please ensure the following:

- Make sure that the water flow resistance in the piping is as low as possible.
- The piping must be clear and free from dirt and blockages. A water leakage test must be carried out to ensure there is no water leaking. After that the piping can be insulated.
- Please note that the piping must be pressure-tested separately. DO NOT perform the pressure test with the heat pump connected.
- An expansion tank must be installed at the highest point of the water circuit, and the water level in the tank must be at least 0.5 meter above the highest point of the water circuit.
- The flow switch is installed inside the heat pump. Please check that the wiring and operation of the switch are correct and that it is properly controlled by the controller.
- Make sure that no air remains trapped inside the water piping. An air vent must be installed at the highest point of the water circuit.
- There must be a thermometer and pressure meter at the water inlet and outlet, for easy inspection during operation.

7 Power supply connection

- Open the front panel, and open the power supply access.
- The power supply must go through the wire access and be connected to the power supply terminals in the control box. Then connect the 3 signal wire plugs of the wire controller and main controller.
- If an outside water pump is needed, please also insert the power supply wire into the wire access, and connect to the water pump terminals.
- If an additional auxiliary heater must 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.

8 Location of the unit



	Barrier
	Air Outlet
	Air Inlet
	Mainenance Space

The picture shows the location of horizontal air outlet unit.

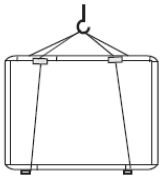
Attention

Requirements
A > 500mm; B > 1500mm;
C > 1000mm; D > 500mm

The minimum ventilation distance is shown in diagram 1.

9 Transport

When the unit has to be suspended during installation, an 8 meters cable is needed, and there must be soft material between the cable and the unit to prevent damage to the heat pump cabinet. (See picture 1)



Picture 1

WARNING
DO NOT touch the heat exchanger of the heat pump with your fingers or other objects!

10 Trial run

Inspection before the trial run

- Check the indoor unit, and make sure that the pipe connection is right and the relevant valves are open.
- Check the water circuit, to ensure that there is enough water inside the expansion tank, the water supply is good, the water circuit is full of water and without any air. Also make sure there is good insulation for the water piping.
- Check the electrical wiring. Make sure that the power voltage is normal, the screws are fastened, the wiring is made in line with the diagram, and the earthing is connected.
- Check the heat pump unit including all of the screws and parts of the heat pump to see if they are in good order. When powering on the unit, review the indicator on the controller to see if there is any failure indication. A gas gauge can be connected to the check valve to see the high pressure (or low pressure) of the system during the trial run.

Trial run

- Start the heat pump by pressing the ' ' button on the controller. Check whether the water pump is running, if it runs normally there will be 0.2 MPa on the water pressure meter.
- When the water pump has run for 1 minute, the compressor will start. Hear whether there are strange sounds from the compressor. If abnormal sounds occur, please stop the unit and check the compressor. If the compressor runs well, please check the pressure meter of the refrigerant.
- Then check whether the power input and running current is in line with the manual. If not please stop and check.
- Adjust the valves on the water circuit, to make sure that the hot (cool) water supply to each valve is correct and meets the heating (or cooling) requirements.
- Check whether the outlet water temperature is stable.
- The parameters of the controller are set by the factory; the user is not allowed to change them himself.

1. Main screen and function

Button	Function
1	Screen lock button: You can perform various operations on the display when the lock is open, but you cannot operate the display when the lock is closed. After locking the screen, press the screen lock button and enter the password “22” to unlock the screen.
4	On/off button: When the button is displayed in blue, it means power on state. It will turn to white when tapped and switch to power off state.
5	Target temperature setting button. When the button is tapped, the unit will enter the target temperature setting interface, allowing you to set the target temperature of the current mode.
17	Mode selection button. When the button is tapped, the unit will enter the mode selection interface, allowing you to set the mode. There are five modes: heating, cooling, hot water, hot water + cooling, hot water + heating.

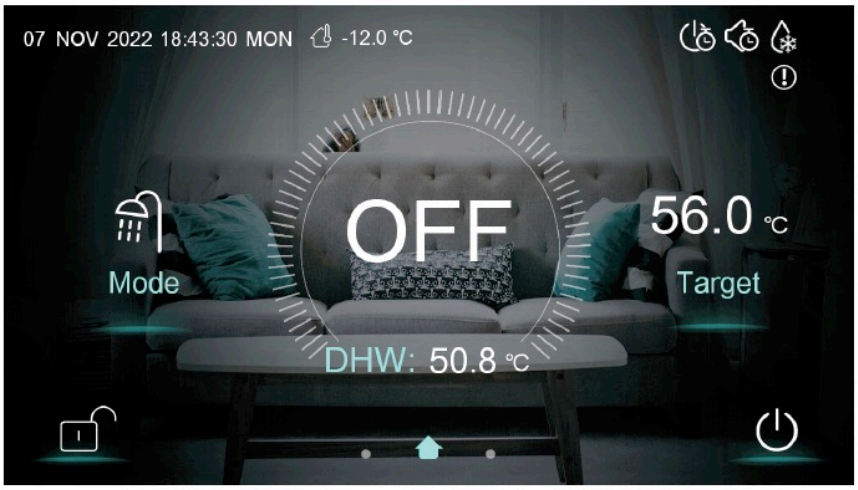
Operation and Use

Icon	Function
2	Main interface icon: It indicates that the current page is the main interface.
3	DHW temperature: The unit is in DHW mode when this icon is shown, otherwise this icon is not shown.
6	Inlet temperature: Displays the temperature control: Outlet, Room, Buffer Tank, Inlet
7	Target temperature: Displays the target temperature of the current mode.
8	Fault icon: This icon will be displayed when there's a failure in the unit. The display will enter the failure record interface after tapping this icon
9	Defrosting icon: This icon will be displayed when the unit enters the defrosting function.
10	Mute timer icon: This icon will be displayed after the mute timer function is enabled.
11	Power on/off timer icon: This icon will be displayed after the power on/off timer function is enabled.
12	Mode & temp. & power timer icon: This icon will be displayed when this timer is entered
13	SG Ready Icon: This icon will be displayed when SG Ready is entered. SG Ready includes five modes: Solar Sleep Mode, Solar Low Mode, Solar Medium Mode, Solar High Mode, Normal Mode
14	Ambient temperature: Displays the current ambient temperature.
15	System time: Displays the current real-time time. The time can be changed as required.
16	Running mode icon: Representing if the unit is currently running in DHW + Heating mode. There are five modes, namely: Heating, Cooling, Hot Water, DHW+ Cooling, DHW + Heating

1.1 On and Off

As the main screen shows

(1) In shut down screen (on/off button is in white status), pressing the on/off vutton can start up the machine.



(2) In running screen (on/off button is in blue status), pressing the on/off button can shut down the machine.

1.2 Mode switch

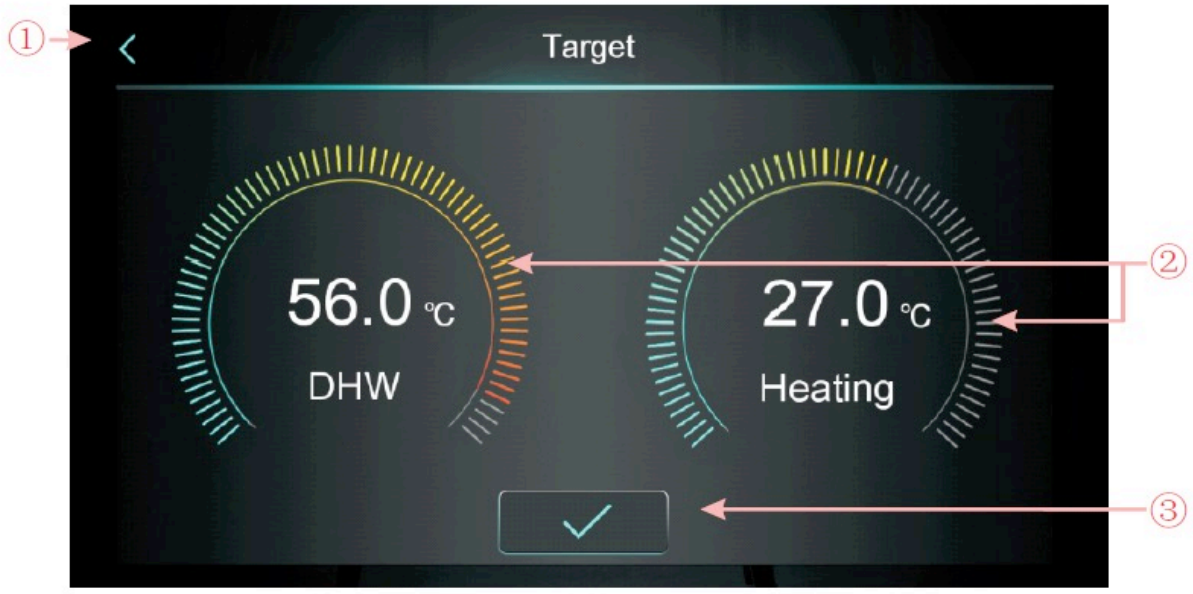
There are five modes that can be selected after sliding the mode icon.

(1) Select the DHW mode icon, then the display will change to this mode screen;
(2) Select the Heating mode icon, then the display will change to this mode screen;
(3) Select the Cooling mode icon, then the display will change to this mode screen;
(4) Select the DHW + Heating mode icon, then the display will change to the DHW + Heating mode screen;
(5) Select the DHW + Cooling mode icon, then the display will change to the DHW + Cooling mode screen;

Note: a) If the machine model you purchased has no cooling function, the button of the Cooling mode will not be displayed.
b) If the machine model you purchased has no DHW function, the button of the Hot water mode function will not be displayed.
c) If the machine model you purchased only has the DHW function, the mode screen only displays the DHW icon.

1.3 Setting of target temperature

1.3.1 Disable zone control



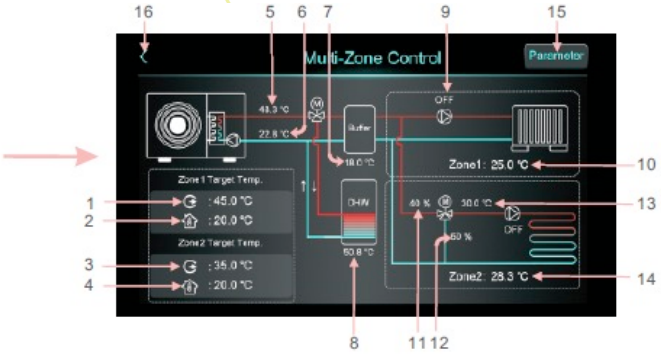
Take DHW + Heating mode for example:
(1) Tap (1), the wire controller returns to the main screen;
(2) Slide (2), the target temperature can be adjusted in the clockwise or counterclockwise direction. The minimum adjustment range is 0.5°C.
(3) Tap (3), the target temperature will be saved.

Note: When in room temperature control, click the room temperature display in the main screen to enter the room target temperature setting page, and slide the adjuster to set the room target temperature.

1.3.2 Enable zone control

1.3.2.1 Heating Mode Multi-Zone Control

When in heating or DHW+ Heating mode, click “  ” to enter the multi-zone function screen:

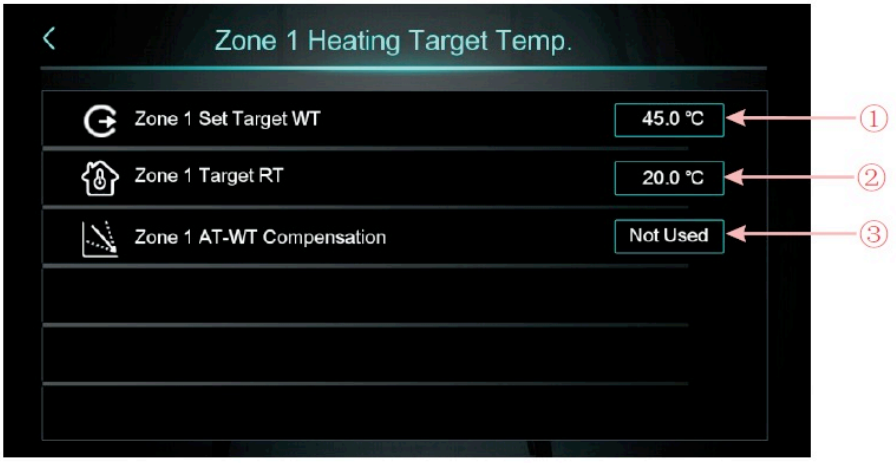


1	Displays the target outlet temperature in zone 1/target outlet water temperature after compensation
2	Displays the room target temperature in zone 1
3	Displays the target outlet temperature in zone 1/target outlet water temperature after compensation
4	Displays the room target temperature in zone 2
5	Displays the outlet water temperature
6	Displays the inlet water temperature
7	When H25=buffer tank control, displays the buffer tank temperature When H25 buffer tank control, displays --- , and Buffer will become “Not used”
8	Displays the Tank temperature
9	When zone 1 pump turns on, display “ON”, otherwise displays “OFF”
10	Displays the zone 1 room temperature. When Z01=7/9, it means the unit is connected to the passive switch thermostat, and the unit will just receive the signal. When the thermostat asks the unit to turn on, then here it will show Zone1: Start, otherwise, it will show Zone1:Stop.
11	Displays the percentage of the zone 2 mixing valve steps.
12	Displays 100 - the percentage of the zone 2 mixing valve steps
13	Displays the zone 2 mixing water temperature
14	Displays the zone 2 room temperature. When Z01=8/9, it means the unit is connected to the passive switch thermostat, and the unit will just receive the signal. When the thermostat asks the unit to turn on, then here it will show Zone2: Start, otherwise, it will show Zone2: Stop.
15	After clicking, enter password “22” to enter the multi-zone function parameter list.
16	Click to return to the main screen.

Operation and Use

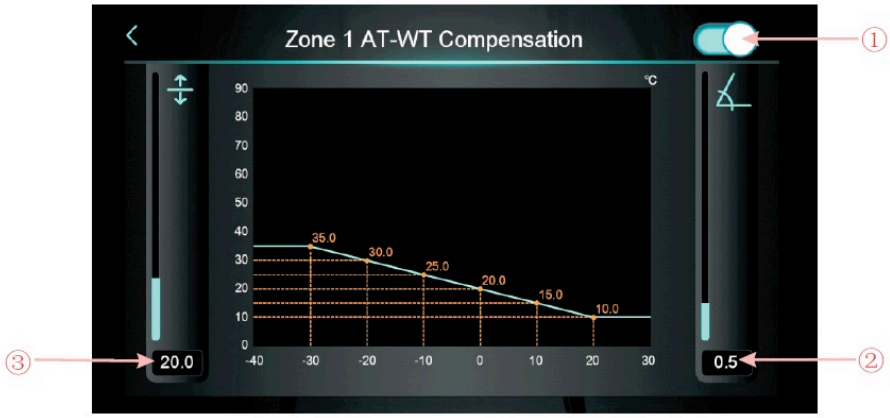
1) Zone 1 target temperature setting screen

Click “  ” to enter the target temperature in zone 1:



Number	Button name	Button function
1	Zone 1 Set Target WT	Click to set the zone 1 target outlet water temperature
2	Zone 1 Target RT	Click to set the zone 1 target room temperature, when Z01=4/5/6/7/8/9, it displays “/”
3	Zone 1 AT-WT Compensation	Click to enter the zone 1 weather compensation curve. When the zone 1 weather compensation is disabled, it will display Not Used. Enable to display the compensated temperature. Enable condition: Z01=1/3/4/6/7/9 and Z16=1

Zone 1 weather compensation curve

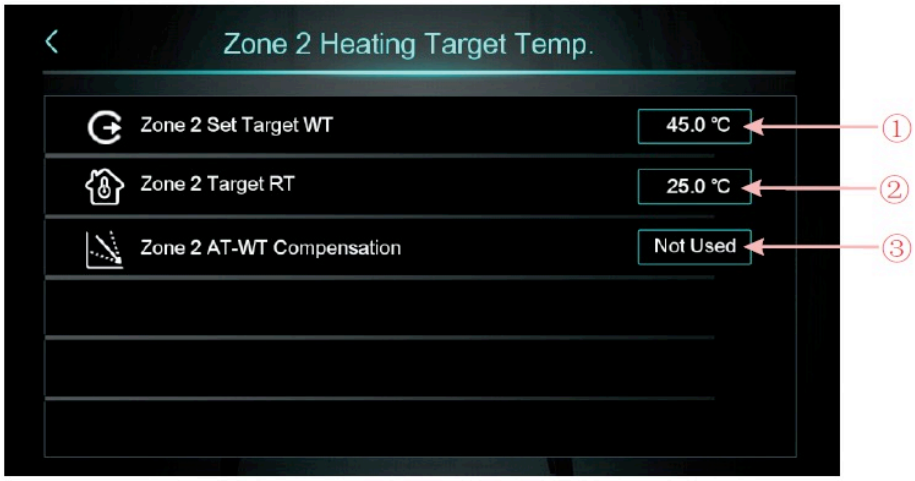


Number	Button name	Button function
1	Enable button	Enable weather compensation button.
2	Slope	Set the slope by sliding up and down or clicking on the value
3	Offset	Set the offset by sliding up and down or clicking on the value

Celsius calculation formula: Compensated temp. = -Slope*Current AT + Offset
Fahrenheit calculation formula: Compensated Target = -Slope*(Current AT-32) + Offset

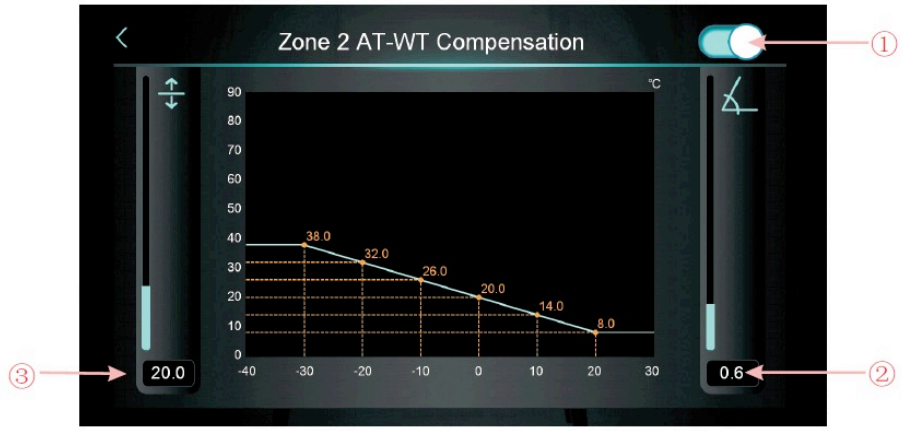
2) Zone 2 target temperature setting screen

Click "  " to enter the target temperature in zone 2:



Number	Button name	Button function
1	Zone 2 Set Target WT	Click to set the zone 2 target outlet water temperature
2	Zone 2 Target RT	Click to set the zone 2 target room temperature, when Z01=4/5/6/7/8/9, it displays "/"
3	Zone 2 AT-WT Compensation	Click to enter the zone 2 weather compensation curve, When the zone 2 weather compensation is disable, it will display Not Used. Enable to display the compensated temperature. Enable condition: Z01=2/3/5/6/8/9 and Z17=1

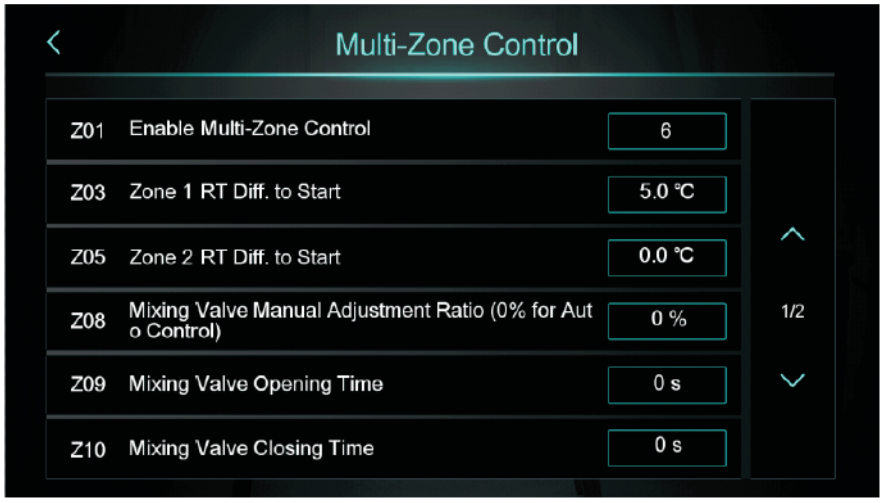
Zone 2 weather compensation curve



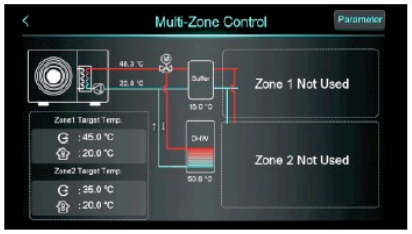
Number	Button name	Button function
1	Enable button	Enable weather compensation button.
2	Slope	Set the slope by sliding up and down or clicking on the value
3	Offset	Set the offset by sliding up and down or clicking on the value

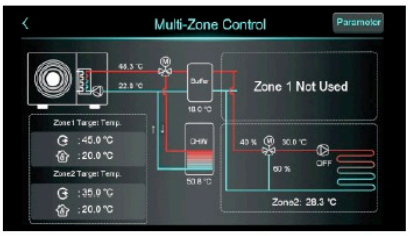
3) Zone control function parameters

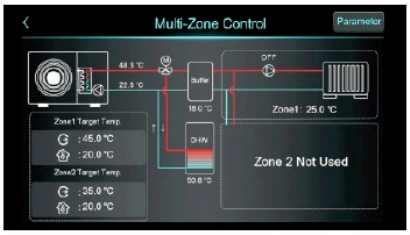
Click “ Parameter ” and enter the password 22, to enter the zone control function parameters

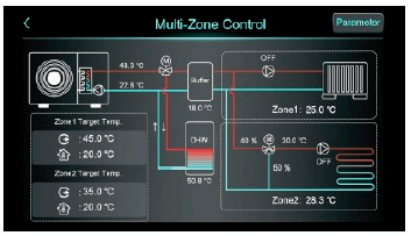


A: Set Z01 to change the main zone control screen
When Z01=0, it means disable zone 1 and zone 2, the screens display Not Used;
When Z01=2/5/8, it means disable Zone 1, Zone 1 will display Zone 1 Not Used;
When Z01=1/4/7, it means disable Zone 2, Zone 2 will display Zone 2 Not Used;
When Z01=3/6/9, it means enable Zone 1 and Zone 2.









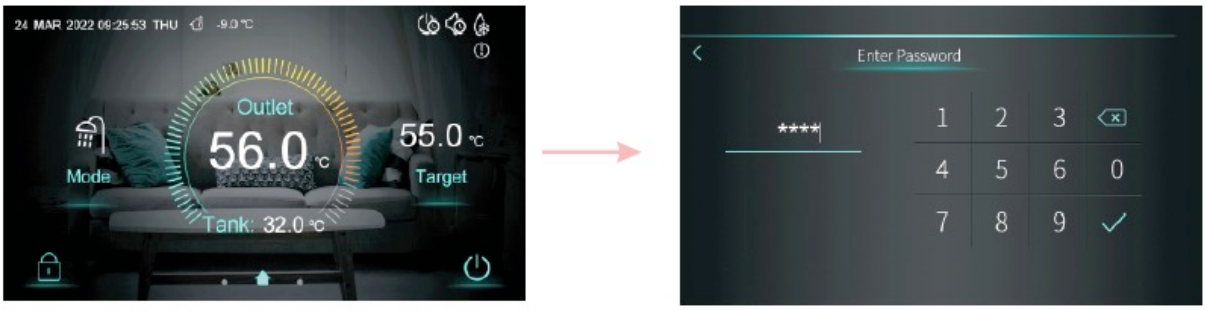
1.3.2.2 Cooling Multi-Zone Control

When in the Cooling or DHW + Cooling mode, click “  ” to enter the multi-zone function screen:

1	Click to set the cooling target temperature
2	Click to set the zone 1 room target temperature
3	Click to set the zone 2 room target temperature

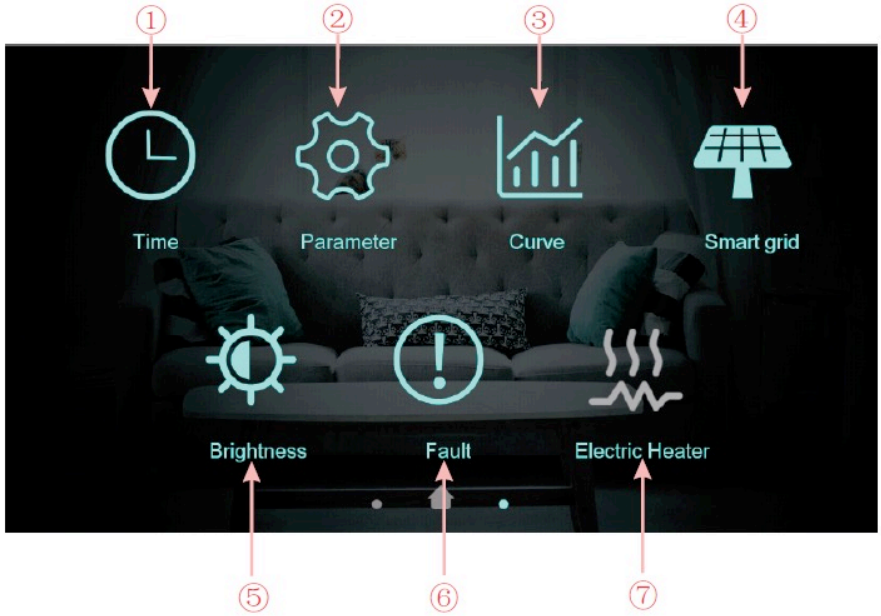
1.4 Unlock screen

After locking the screen, click “ ” to open the following pop-up screen. Enter password "22" to unlock.



2. Settings screen and function

Swipe from right to left on the main interface to enter the function settings screen, and swipe from left to right on the function setting screen to return to the main screen.
The function settings screen is shown in the figure below.

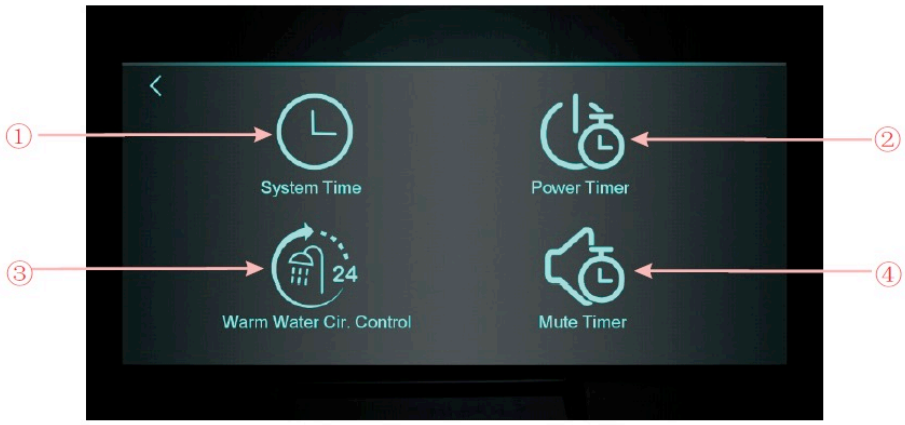


Buttons description

Button number	Button name	Button function
1	Time setting	Click this button to set the time function.
2	Factory parameter	Click the button and enter the password to enter the factory parameter settings and status parameters interface.
3	Curve button	Click this button to view the temperature curve.
4	Smart grid	Click this button to Smart Grid
5	Adjust brightness	Click this button to adjust screen brightness
6	Fault	Click to view fault history
7	Electric Heater	Click to turn on/off the electric heater

2.1 Time setting

In the setup screen, tap the button, then the following screen is shown:



Button number	Button name	Button function
1	System Time	Click to set system time
2	Power Timer	Click to set timed switch on/off
3	Warm Water Cir. Control	Click to set warm water pump timed cycle, hide the icon when H40=0/2, show the icon when H40=1
4	Mute Timer	Click to set timed mute, hide the icon when H22=0, show the icon when H22=1

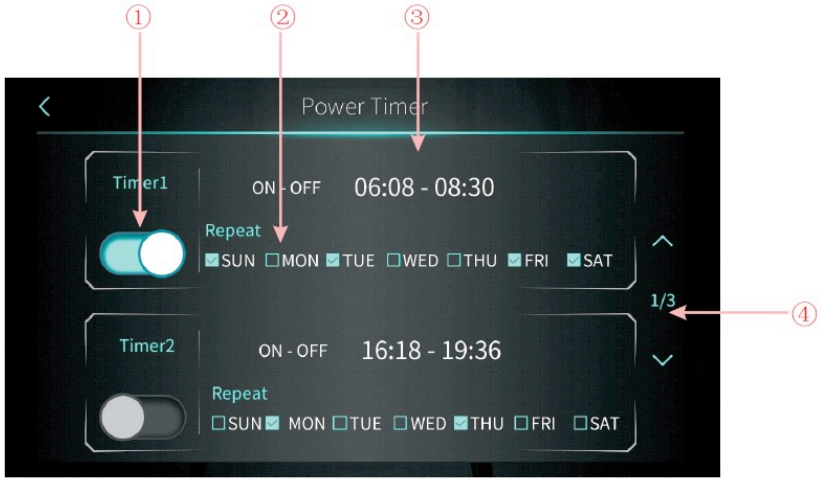
2.1.1 System time setting

In the time setting screen, click (1) to display the following screen:

When entering the system time setting screen, the system time will be initialized to the time at the moment when the system time setting button is pressed, and you can adjust the time by sliding up and down.
Note: When the temperature unit is °F the time format is displayed as:
month-day-year hour : minute : second.

2.1.2 Power Timer setting

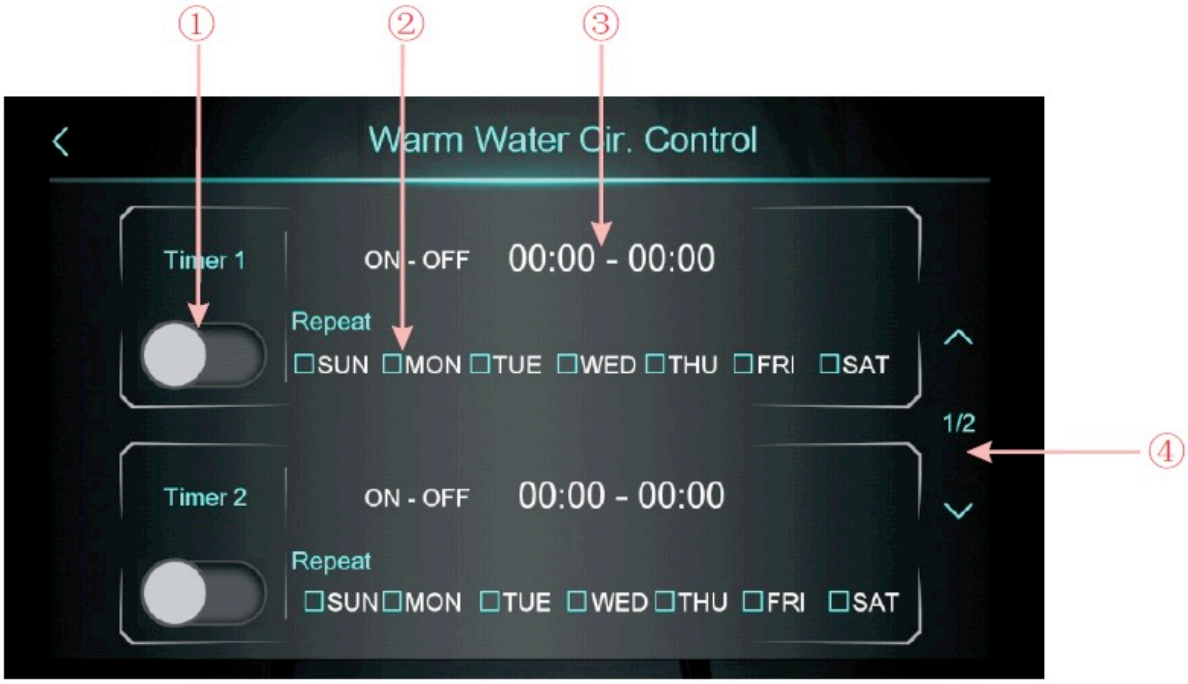
In the time setting screen, click (2) to display the following screen:



NO.	Name	Button function
1	Timing switch function on	Click the button, when the font color is blue, the timing switch is on
2	Week setting	Set the day of the week to activate the timing switch
3	Time period setting	Set the time to turn on and the time to turn off
4	Turn page	A total of 6 timing switch time periods can be set, which can be selected by turning the page

2.1.3 Warm Water Cir. Control

In the time setting screen, click (3) to display the following screen:



NO.	Name	Button function
1	Timing switch function on	Click the button, when the font color is blue, the timing switch is on
2	Week setting	Set the day of the week to activate the timing switch
3	Time period setting	Set the time to turn on and the time to turn off
4	Turn page	A total of 3 timing switch time periods can be set, which can be selected by turning the page

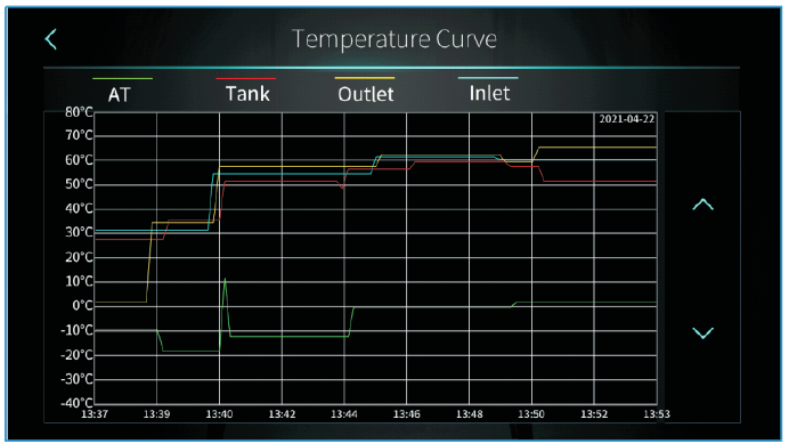
2.1.4 Mute Timer setting

In the time setting screen, click (4) to display the following screen:

NO.	Name	Button color	Button function
1	Enable or disable the mute timer on function	Enabled: Blue Disabled: Gray	Click this button to enable or disable the mute timer on function
	Enable or disable the mute timer off function	Enabled: Blue Disabled: Gray	Click this button to enable or disable the mute timer off function
2	The mute timer on setting point		select from 0:00-23:59
	The mute timer off setting point		select from 0:00-23:59
3	The status of mute timer is on	Enabled: Blue Disable: Gray	The status of mute timer on is shown
	The status of mute timer is off	Enabled: Blue Disable: Gray	The status of mute timer on is shown

2.2 Temperature Curve

In the setup screen, tap the button to display the following screen:



Note:

1) This curve function records the water inlet temperature, water outlet temperature, tank water temperature and ambient temperature;
2) Temperature data are collected and saved every five minutes. Timekeeping is done from the latest data saving. If the power is interrupted when the time is less than five minutes, the data during this period will not be saved;
3) Only the curve for the power-on status is recorded, and that for power-off will not be saved;
4) The value of the x-axis indicates the time from the point on the curve to the current time point. The rightmost point on the first page is the time point of the latest temperature record. The rightmost point on the first page is the latest temperature record;
5) The temperature curve record has a power-down memory function.

2.3 Smart Grid

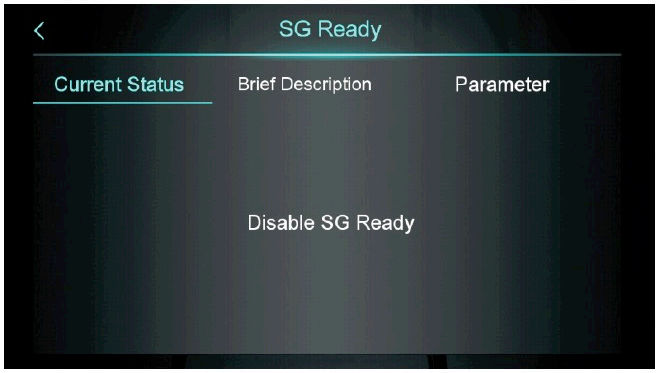
In the setup interface, tap the button to display the following screen:

Button number	Button name	Button function
1	SG Ready	Click to enter SG Ready
2	Mode & Temp. & Power Timer	Click to enter Mode&Temp.&Power Timer

2.3.1 SG Ready Function

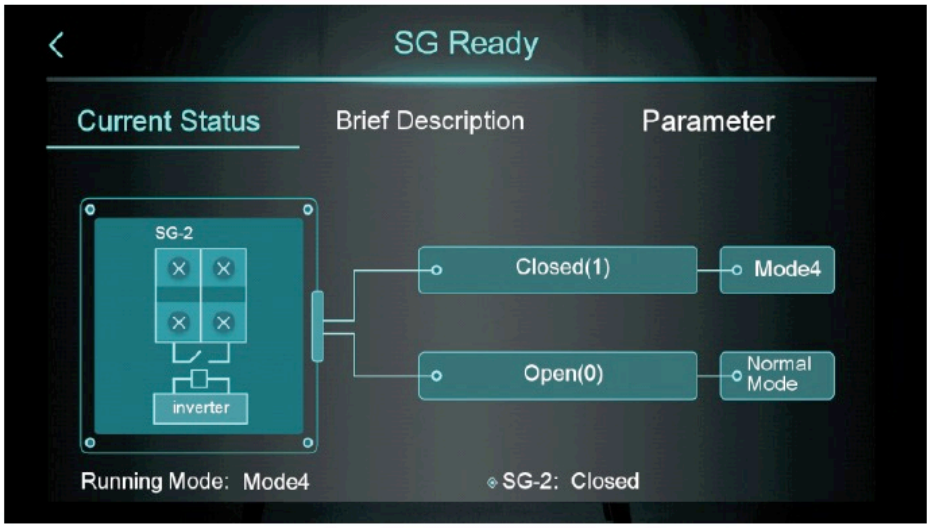
2.3.1.1 Disable SG Ready

When the Smart Grid Ready mode is not yet set, the screen will display:

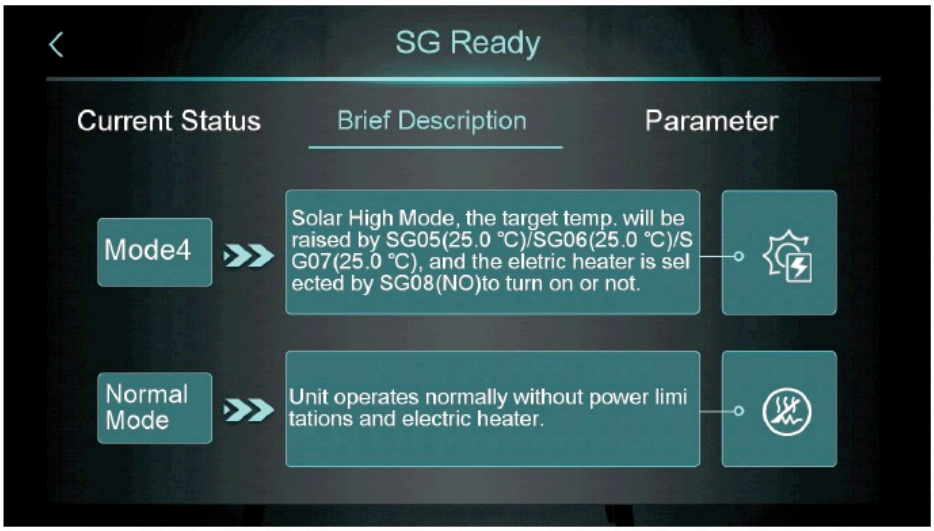


2.3.1.2 Smart Grid Ready=1

When using one dry contact, the screen will display:



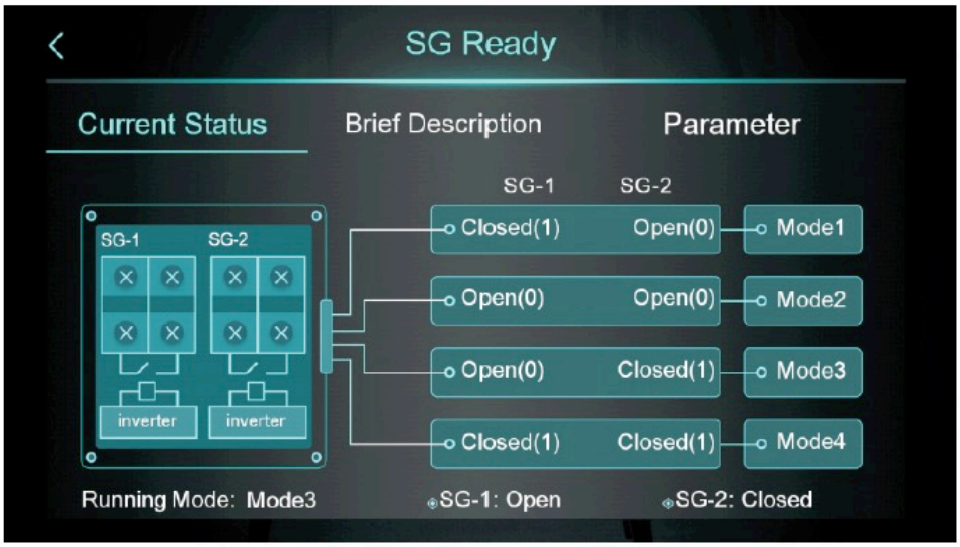
Click “Brief Description” to enter the function description screen:



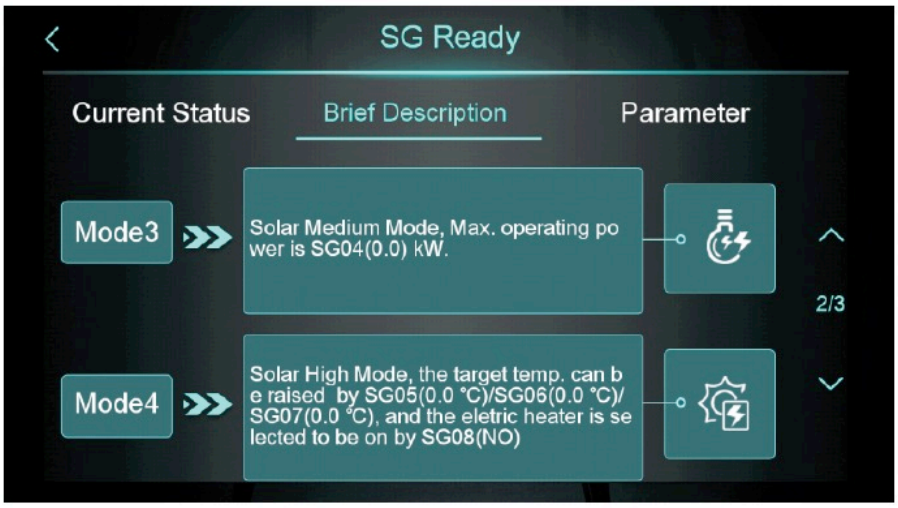
Click "Parameter" and enter the password to enter the parameter settings screen:

2.3.1.2 Smart Grid Ready=2

When using two dry contacts, the screen will display:



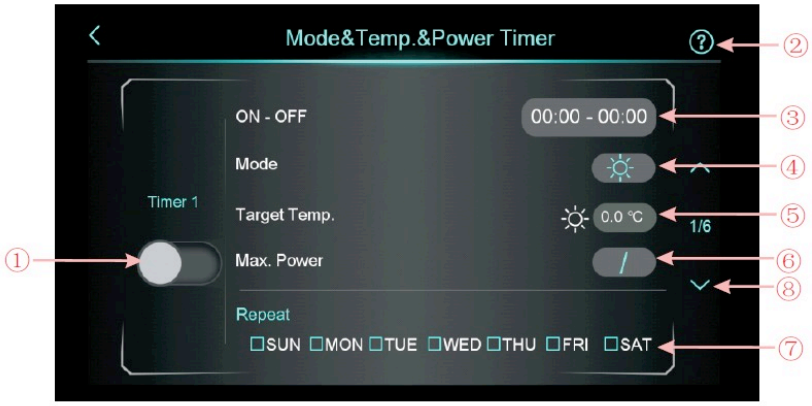
Click “Brief Description” to enter the function description screen:



Click "Parameter" and enter the password to enter the parameter settings screen:

2.3.2 Mode & Temp. & Power Timer

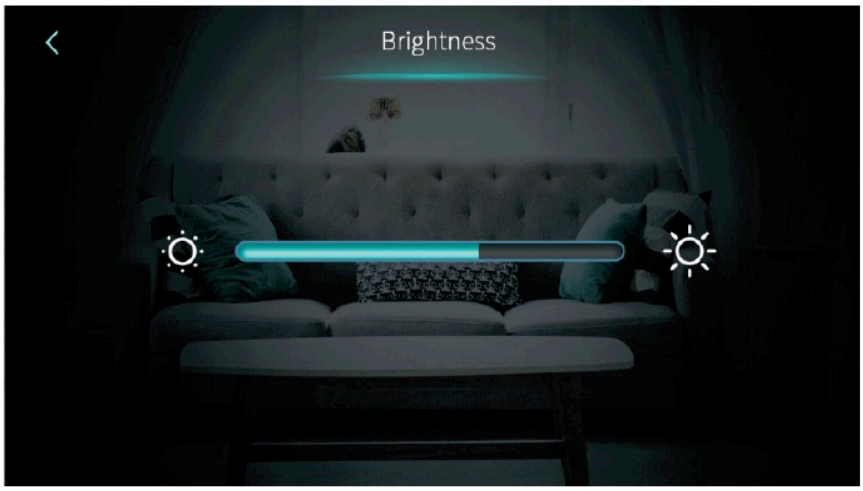
Click “  ” to enter the Mode & Temp. & Power Timer screen:



NO.	Name	Button function
1	Enable button	Enable the timer. When the font color is blue, the timing switch is on
2	Function Description	Click to enter the function introduction
3	Time setting	Set the timer time
4	Mode	Set the target mode. If you don’t need to control the mode, please choose “/”
5	Target Temp.	Set the target temperature
6	Max. Power	Set the power limitation, Setting range 0.0~99.9KW. If you don’t need to limit the power, please set “Max. Power” to 0.
7	Week setting	Set the timer date
8	Turn page	A total of 6 timing switch time periods can be set, which can be selected by turning the page

2.4 Color Calibration screen

In the setup interface, tap the button to display the following screen:



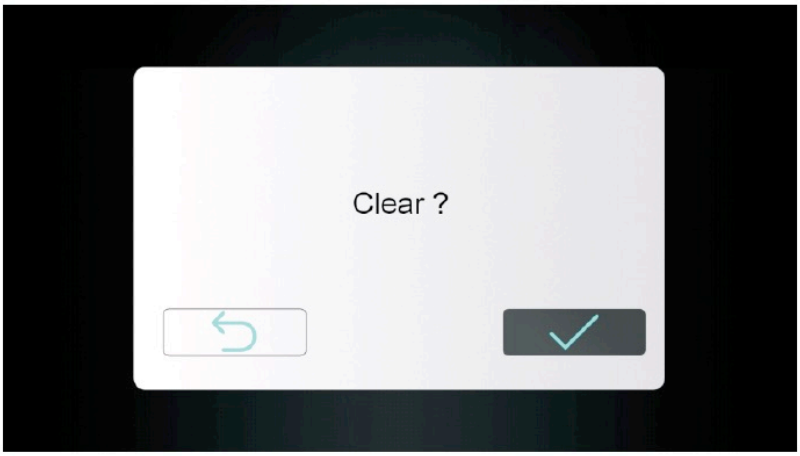
Note:

1) The middle display bar can be dragged or clicked to adjust the brightness of the screen, with power-down memory.
2) Press the back button to return to the previous level and save the brightness setting value.
3) The screen has the function of automatic on and off. If there is no operation for 30s, the screen will enter the half-time screen state.
4) If there is no operation for another 5 minutes, the screen will enter the screen off state.

2.5 Fault screen and function

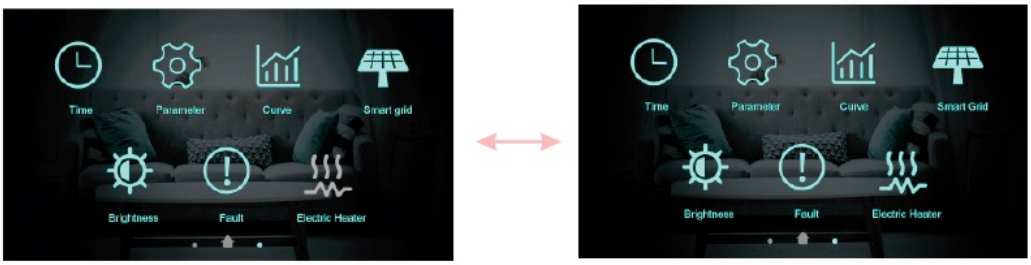
In the setup screen, tap the button to display the following screen:

(1): Fault code
(2): Fault name
(3): Occurrence time of the fault: day-month-year hour:minute:second
Note: If the current temperature is °F, occurrence time of the fault:
year-month-day hour: minute: second
(4): Click this button to clear all fault records, enter the date of the day into the OK screen.



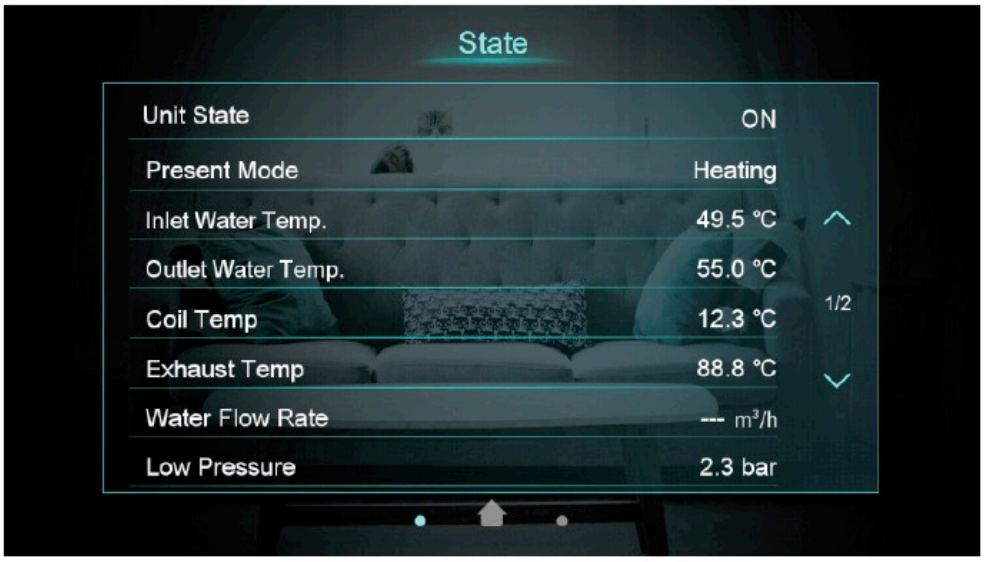
2.6 Electric Heater

In the setup screen, tap the button once to turn electric heater on or off.
On is bright, off is grey.
Note: When electric heating is not enabled, the icon is hidden.



3.State screen

Swipe from left to right on the main screen to enter the main state screen. Swipe from right to left on the main state screen to return to the main screen. The main state screen displays the main state parameters.



4.Parameter list and breakdown table

4.1 Electronic control fault table

Can be judged according to the remote controller failure code and troubleshooting.

Protect/fault	Fault display	Reason	Elimination methods
Inlet Water Temp. Sensor Fault	P01	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Outlet Water Temp. Sensor Fault	P02	The temp. sensor is broken or short circuit	Check or change the temp. sensor
DHW Tank Sensor Fault	P03	The temp. sensor is broken or short circuit	Check or change the temp. sensor
AT Sensor Fault	P04	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Suction Temp. Sensor Fault	P17	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Heatin Returning Water Temp. Sensor Fault	P013	The temp. sensor is broken or short circuit	Check or change the temp. sensor
DHW Returning Water Temp. Sensor Fault	P018	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Heating Leaving Water Temp. Sensor Fault	P023	The temp. sensor is broken or short circuit	Check or change the temp. sensor
DHW Leaving Water Temp. Sensor Fault	P028	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Room Temp. Sensor Fault	P42	The temp. sensor is broken or short circuit	Check or change the temp. sensor
EVI Inlet Sensor Fault	P101	The temp. sensor is broken or short circuit	Check or change the temp. sensor
EVI Outlet Sensor Fault	P102	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Distributor Tube Temp. Sensor Fault	P152	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Coil Temp. Sensor Fault	P153	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Exhaust Temp. Sensor Fault	P181	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Overhigh Exhaust Temp.	P182	The compressor is overload	Check whether the system of the compressor running normally
Anti-freezing Temp. Sensor Fault	P191	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Mix Tube Outlet Water Temp. Sensor Fault	P02a	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Buffer Tank Temp. Sensor Fault	P03a	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Pressure Sensor Fault	PP11	The pressure sensor is broken or short circuit	Check or change the pressure sensor or pressure
High Pressure Sensor Fault	PP12	The pressure sensor is broken or short circuit	Check or change the pressure sensor or pressure
Low AT Protection	TP	The ambient temp. is low	Check the ambient temp value
No Cooling at Low AT Protection	TC	The temp. sensor is incorrectly- detected or the temp. sensor is lower- than the set value A30	Check or change the temp. sensor
Electric Heater Overheat Fault	E04	The electric-heater protection switch is broken	Check whether the electric heater runs at the temperature above 150℃ for a long time
Excess Temp. Diff. Between Inlet & outlet	E06	Water flow is not enough and low differential pressure	Check the pipe water flow and whether water system is jammed or not
Communication Fault	E08	Communication failure between wire controller and mainboard	Check the wire connection between remote wire controller and main board

Operation and Use

Protect/fault	Fault display	Reason	Elimination methods
Primary Anti-freezing Fault	E19	The ambient temp. is low	Check the ambient temp value
Secondary Anti-freezing Fault	E29	The ambient temp. is low	Check the ambient temp value
Insufficient Defrosting Water Flow Alarm	E030	The unit flow rate is less than the minimum flow value of the unit.	Check or change waterway systems to provide unit flow
Flow Switch Fault	E032	No water/little water in water system	Check the pipe water flow and water pump
Overhigh Outlet Water Temp.	E065	No water/little water in water system	Check the pipe water flow and water pump
Low Outlet Water Temp. Temp. Fault	E071	No water/little water in water system	Check the pipe water flow and water pump
Fan Motor 1 and PCB Communication Fault	E081	Speed control module and main board communication fail	Check the communication connection
Fan Motor 2 and PCB Communication Fault	E082	Speed control module and main board communication fail	Check the communication connection
Display and PCB Communication Fault	E084	The wire controller software is not match the mainboard software	Check the wire control software number and the mainboard software number
Communication Fault with Hydraulic Module	E08c	Hydraulic Module and mainboard communication fail	Check the communication connection
HP Fault	E11	The high-pressure switch is broken	Check the pressure switch and cold circuit
LP Fault	E12	The low-pressure switch is broken	Check the pressure switch and cold circuit
Anti-freezing Fault	E171	Use side water system temp. is low	1.Check the water temp. or change the temp. 2.Check the pipe water flow and whether water system is jammed or not
Fan Motor1 Fault	F031	1. Motor is in locked-rotor state 2.The wire connection between DC-fan motor module and fan motor is in bad contact	1.Change a new fan motor 2.Check the wire connection and make sure they are in good contact
Fan Motor2 Fault	F032	1. Motor is in locked-rotor state 2.The wire connection between DC-fan motor module and fan motor is in bad contact	1.Change a new fan motor 2.Check the wire connection and make sure they are in good contact
Zone 1 Room Temp. Sensor Fault	P105	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Zone 2 Room Temp. Sensor Fault	P106	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Zone 2 Mixing Temp. Sensor Fault	P107	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Abnormal Adjustment of Mixing Valve	E122	1. Mixing Valve is incorrectly connected; 2. Mixing Valve is damaged;	1. Plug and unplug terminals; 1. Replace the Mixing Valve;
Zone 1 Thermostat Communication Fault	E08g	1. Thermostat not connected 2. Thermostat failure 3.Wrong parameter setting	1. Check the wiring connection between the thermostat and the unit 2. Replace the thermostat 3.Check the parameters
Zone 2 Thermostat Communication Fault	E08h	1. Thermostat not connected 2. Thermostat failure 3.Wrong parameter setting	1. Check the wiring connection between the thermostat and the unit 2. Replace the thermostat 3.Check the parameters
Low Water Flow Protection	E035	Water flow is too low	Increased water flow

Protect/fault	Fault display	Reason	Elimination methods
DHW Electric Heater Overheat Fault	E042	Overload protection switch disconnected when the electric heating of the hot water tank was activated	Check the wiring of the electric heating overload switch in the hot water tank for proper connection and the condition of the overload switch
Overhigh Outlet Water Temp. after Electric Heater	E07a	High temperature detected at the water outlet of the electric heating during activation	1. Verify if the water outlet temperature of the electric heating exceeds 70°C; 2. Check the wiring of the temperature sensor at the outlet of the electric heating for proper connection
Communication Fault with Indoor Unit	E08i	No successful communication detected with the indoor unit for 70 continuous seconds when the indoor unit control is enabled	1. If no indoor unit is present, modify parameters to disable indoor unit control; 2. If there is an indoor unit, inspect the communication wiring between the indoor unit and the heat pump for proper connection
Communication Fault with Consumption Module	E08j	No successful communication detected with the consumption module for a continuous period of time when the consumption module control is enabled	1. If no consumption module is present, modify parameters to disable consumption module control; 2. If there is a consumption module, inspect the communication wiring between the consumption module and the heat pump for proper connection
Water Pressure Sensor Fault(for IDU)	E034	Short circuit or open circuit detected by the indoor unit's water pressure sensor	1. Inspect the integrity of the indoor unit's water pressure sensor; 2. Check if the voltage at the water pressure sensor port is within the range of 0.5 to 4.5 volts

Operation and Use

Frequency conversion board fault table:

Protect/fault	Fault display	Reason	Elimination methods
IPM Overcurrent Fault	F00	IPM Input current is large	Check and adjust the current measurement
Comp. Driver Fault	F01	Lack of phase, step or drive hardware damage	Check the measuring voltage check frequency conversion board hardware
Pre-Charge Failure	F03	The PFC circuit protection	Check the PFC switch tube short circuit or not
DC Power Bus Overvoltage Fault	F05	DC bus voltage>Dc bus Overload-voltage protection value	Check the input voltage measurement
DC Power Bus Undervoltage	F06	DC bus voltage<Dc bus Underload-voltage protection value	Check the input voltage measurement
AC Power Undervoltage Fault	F07	The input voltage is low, causing the input current is low	Check the input voltage measurement
AC Power Overcurrent Fault	F08	The input voltage is too high, more than outage protection current RMS	Check the input voltage measurement
Input Power Voltage Sampling Fault	F09	The input voltage sampling fault	Check and adjust the current measurement
AC Power Overvoltage Fault	F10	Input voltage>Input Overload-voltage protection value	Check whether the input voltage is higher than 265V
DSP and Comp. Driver Communication Fault	F11	DSP and Inverter board communication failure	Check the communication connection
DSP and PFC Communication Fault	F12	DSP and PFC connect fault	Check the communication connection
IPM Overheat Fault	F13	The IPM module is overheat	Check and adjust the current measurement
Compressor Lacking Phase Fault	F14	The compressor lost phase	Check whether compressor cables are connected properly and reliably
Input Power Lacking Phase Fault	F15	The input voltage lost phase	Check and measure the voltage adjustment
Comp. Weak Magnetic Alarm	F16	Compressor magnetic force is not enough	Check and adjust the current measurement
Comp. Driver Temp. Sensor Fault	F17	The transducer is overheated	Check and adjust the current measurement
IPM Current Sampling Fault	F18	IPM sampling electricity is fault	Check and adjust the current measurement
IGBT Power Device Overheat Alarm	F20	The IGBT is overheat	Check and adjust the current measurement
Overspeed Fault	F21	The compressor is running abnormally	Check whether the compressor cable is normal and whether the compressor is blocked
AC Input Current Frequency Decrease Alarm	F22	Input current is too large	Check and adjust the current measurement
EEPROM Alarm	F23	MCU error	Check whether the chip is damaged Replace the chip
Destroyed EEPROM & No Activated Fault	F24	MCU error	Check whether the chip is damaged Replace the chip
Input Power Current Sampling Fault	F25	The V15V is overload or undervoltage	Check the V15V input voltage in range 13.5V~16.5V or not
IGBT Overheat Fault	F26	The IGBT is overheat	Check and adjust the current measurement
EEPROM Fault	F29	Failed to read the memory chip	Check the frequency conversion board
Comp. Current Frequency Decrease Alarm	F33	The compressor current frequency reduction	Check and adjust the current measurement
Compressor Type Code Fault	F060	Incorrect selection of compressor model code	Contact the supplier to obtain the correct model code
Driver (Fan) Power Lacking Phase Fault	F101	The fan lost phase	Check whether fan cables are connected properly and reliably

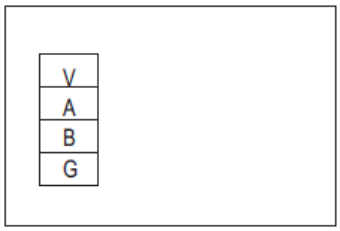
Protect/fault	Fault display	Reason	Elimination methods
Driver (Fan) Start Fault	F102	The fan fails to start	Check whether the fan is blocked
Driver (Fan) External Overcurrent Fault	F105	The fan IPM hardware running current is too large	Check whether the fan is blocked
Driver (Fan)IPM Overheat Fault	F106	The fan IPM drive plate has poor heat dissipation	Check heat dissipation conditions
Driver (Fan) overspeed Fault	F109	The fan speed is too high	Check whether the fan drive board is abnormal
Driver (Fan) Current Sampling Fault	F112	Fan sampling electricity is fault	Check whether the fan drive plate is abnormal
Driver (Fan) Internal Overcurrent Fault	F113	The fan software running current is too large	Check whether the fan is blocked
Driver (Fan)Temp. Sensor Fault	F120	The temp. sensor is broken or short circuit	Check or change the temp. sensor
Comp. Driver and PCB Communication Fault	F151	DSP and Mainboard communication failure	Check the communication connection
Comp. Overcurrent Fault	E051	The compressor is overload	Check whether the system of the compressor running normally

4.2 Parameter list

Meaning	Default	Remarks
Cooling target temperature set point	12℃	Adjustable
Heating the target temperature set point	45℃	Adjustable
Hot water target temperature set point	55℃	Adjustable

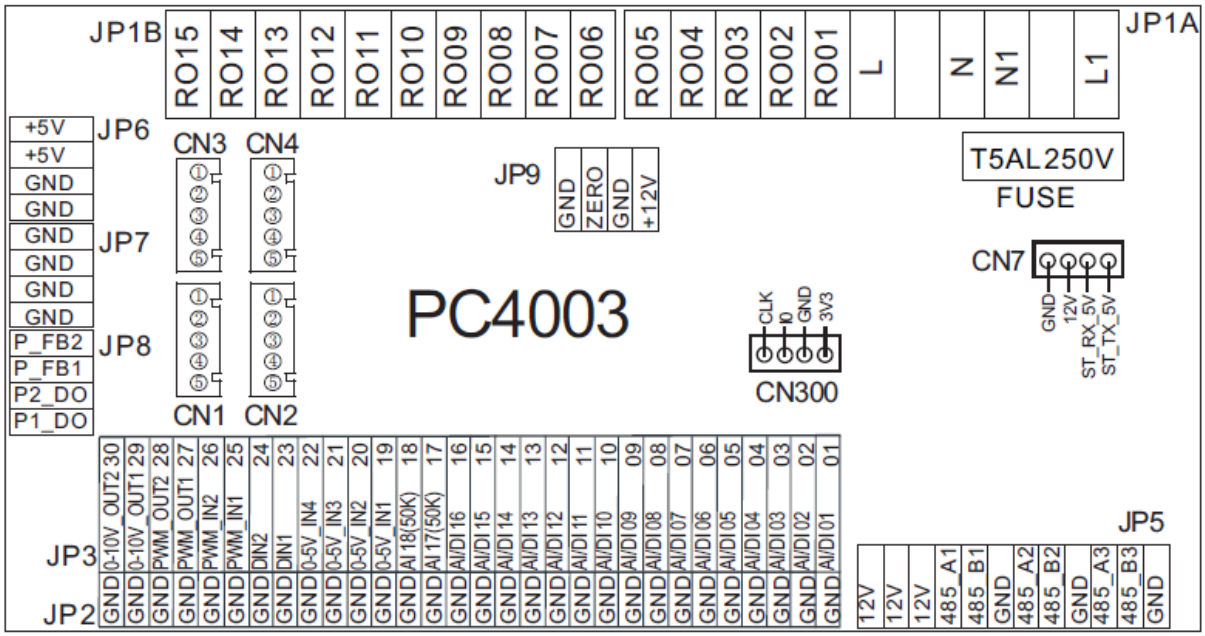
5. Interface diagram

5.1 Wire control interface diagram and definition



Sign	Meaning
V	12V (power +)
A	485A
B	485B
G	GND (power-)

5.2 Controller interface diagram and definition



	GND
	ZERO
	FUSE

Operation and Use

Main board of the input and output interface instructions

Number	Sign	Meaning
01	AI/DI01	Inlet Water Temp.
02	AI/DI02	Outlet Water Temp.
03	AI/DI03	Coil Temp.
04	AI/DI04	Ambient Temp. (AT)
05	AI/DI05	Suction Temp.
06	AI/DI06	Antifreeze Temp.
07	AI/DI07	Zone 1 room temp./Zone 1-P
08	AI/DI08	DHW Tank Temp.
09	AI/DI09	Room Temp. /Buffer Tank Temp.
10	AI/DI10	EVI Inlet Temp.
11	AI/DI11	EVI Outlet Temp.
12	AI/DI12	High Pressure Switch
13	AI/DI13	Low Pressure Switch
14	AI/DI14	Flow Switch
15	AI/DI15	Zone 2 Water Temp. after Mixing
16	AI/DI16	Remote Switch/SG-1
17	AI/17(50k)	DHW Switch/Zone 2 room temp./Zone 2-P
18	AI/18(50K)	Exhaust Temp.
19	0~5V_IN1	Transformer Current 1
20	0~5V_IN2	Transformer Current 2
21	0~5V_IN3	Transformer Current 3
22	0~5V_IN4	Low Pressure
23	DIN_1	Heating & Cooling Function Switch/SG2
24	DIN_2	Heating / Cooling Mode Switch
25	PWM_IN1	Water Flow Rate
26	PWM_IN2	Reserved
27	PWM_OUT1	Heating & Cooling Function Switch Output
28	PWM_OUT2	Heating / Cooling Mode Switch Output
29	0~10V OUT1	Mixing valve output
30	0~10V OUT2	Reserved
31	+5V	5V output
32	+12V	12V output
33	CN1	EEV Steps
34	CN2	EVI EEV Steps
35	CN3	Reserved
36	CN4	Reserved
37	CN300	Program port
38	JP5_1	5 inch color display/DC fan speed regulation module/ Frequency conversion board/Hydraulic module/IDU
39	JP5_2	Centralized control communication port
40	JP5_3	DTU/WIFI/Thermostat 1/Thermostat 2
41	RO01	Alarm

42	RO02	Zone 2 Mixing valve Open
43	RO03	Zone 2 Mixing valve Closed
44	RO04	Main Circulation Pump
45	RO05	DHW Pump
46	RO06	4-way valve
47	RO07	Electric Heater Stage 1
48	RO08	Electric Heater Stage 2
49	RO09	Hot water 3-way valve
50	RO10	Crankcase Heater
51	RO11	Bottom Plate Heater
52	RO12	Cooling 3-Way Valve
53	RO13	DHW Electric Heater
54	RO14	Zone 1 pump
55	RO15	Zone 2 pump
56	JP9	12V input
57	CN7	Reserved
58	P_FB2	Flow Detection
59	P_FB1	Reserved
60	P2_DO	Reserved
61	P1_DO	Water pump speed control

Note:
JP5_1 represents +12V, 485_A1, 485_B1, GND on the JP5 terminal;
JP5_2 represents +12V, 485_A2, 485_B2, GND on the JP5 terminal;
JP5_3 represents +12V, 485_A3, 485_B3, GND on the JP5 terminal.

Appendix 1 Caution & Warning

1. The unit may only be repaired by qualified installer center personnel or an authorized dealer for the European market
2. This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, unless they are supervised or have received instructions concerning the use of the appliance by a person responsible for their safety for the European market
Children should be supervised to ensure that they do not play with the appliance.
3. Please make sure that the unit and power connection have good earthing, otherwise an electrical shock may occur.
4. If the supply cord is damaged, it must be replaced by the manufacturer or our service agent or similarly qualified person in order to avoid a hazard.
5. Directive 2002/96/EC (WEEE):
The symbol depicting a crossed-out waste bin that is underneath the appliance indicates that this product, at the end of its useful life, must be handled separately from domestic waste, must be taken to a recycling center for electric and electronic devices or handed back to the dealer when purchasing an equivalent appliance.
6. Directive 2002/95/EC (RoHs): This product is compliant with directive 2002/95/EC (RoHs) concerning restrictions for the use of harmful substances in electric and electronic devices.
7. The unit MAY NOT be installed near flammable gas. In case of a gas leakage, fire can occur.
8. Make sure that the unit has a circuit breaker. Absence of a circuit breaker can lead to electrical shock or fire.
9. The heat pump located inside the unit is equipped with an over-load protection system. It does not allow the unit to start for at least 3 minutes from a previous stoppage.
10. The unit can only be repaired by qualified personnel of an installer center or an authorized dealer for the North American market
11. Installation must be performed in accordance with the NEC/CEC by an authorized person only for North American market
12. USE SUPPLY WIRES SUITABLE FOR 75°C.
13. Caution: Single wall heat exchanger, not suitable for potable water connection.

Appendix 2 Cable specification

1. Single phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	2x1.5mm2	1.5mm2	20A	30mA less than 0.1 sec	
10~16A	2X2.5mm2	2.5mm2	32A	30mA less than 0.1 sec	
16~25A	2X4mm2	4mm2	40A	30mA less than 0.1 sec	
25~32A	2X6mm2	6mm2	40A	30mA less than 0.1 sec	
32~40A	2X10mm2	10mm2	63A	30mA less than 0.1 sec	
40~63A	2X16mm2	16mm2	80A	30mA less than 0.1 sec	n x 0.5mm2
63~75A	2X25mm2	25mm2	100A	30mA less than 0.1 sec	
75~101A	2X25mm2	25mm2	125A	30mA less than 0.1 sec	
101~123A	2X35mm2	35mm2	160A	30mA less than 0.1 sec	
123~148A	2X50mm2	50mm2	225A	30mA less than 0.1 sec	
148~186A	2X70mm2	70mm2	250A	30mA less than 0.1 sec	
186~224A	2X95mm2	95mm2	280A	30mA less than 0.1 sec	

2. Three phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	3X1.5mm2	1.5mm2	20A	30mA less than 0.1 sec	
10~16A	3x2.5mm2	2.5mm2	32A 30mA less than 0.1 sec		n x 0.5mm2
16~25A	3x4mm2	4mm2	40A	30mA less than 0.1 sec	
25~32A	3x6mm2	6mm2	40A	30mA less than 0.1 sec	
32~40A	3x10mm2	10mm2	63A	30mA less than 0.1 sec	
40~63A	3x16mm2	16mm2	80A	30mA less than 0.1 sec	
63~75A	3x25mm2	25mm2	100A	30mA less than 0.1 sec	
75~101A	3x25mm2	25mm2	125A	30mA less than 0.1 sec	
101~123A	3x35mm2	35mm2	160A	30mA less than 0.1 sec	
123~148A	3x50mm2	50mm2	225A	30mA less than 0.1 sec	
148~186A	3x70mm2	70mm2	250A	30mA less than 0.1 sec	
186~224A	3x95mm2	95mm2	280A	30mA less than 0.1 sec	

When the unit will be installed outdoors, please use a cable that is UV-resistant.

Appendix

Appendix 3 Water quality requirements

1. Corrosion resistance of stainless steel and brazed materials in tap water at room temperature

Attention: +: Good corrosion resistance under normal conditions
0: There may be corrosion problems
-: Not recommended

			Plate material			Brazing material		
Moisture	Concen-tration	Time limit	AISI 304	AISI 316	254 SMO	Cuprum	Nickel	SS
Alkalinity (HCO_3^-)	<70 70 – 300 >70	24h	+ + +	+ + +	+ + +	0 + 0/+	+ + +	+ + +
Sulfate (SO_4^{2-})	<70 70 – 300 >70	unlimited	+ + +	+ + +	+ + +	+ 0/- -	+ + +	+ + +
HCO_3^-/SO_4^{2-}	> 1.0 < 1.0	unlimited	+ +	+ +	+ +	+ 0/-	+ +	+ +
Electrical conductivity	< 10 10 – 500 > 500	unlimited	+ + +	+ + +	+ + +	0 + 0	+ + +	+ + +
pH	< 6.0 6.0 – 7.5 7.5 – 9 > 9	24h	0 + + +	0 + + +	0 + + +	0 0 + 0	+ + + +	0 + + +
Ammonium (NH_4^+)	< 2 2 – 20 > 20	24h	+ + +	+ + +	+ + +	+ 0 -	+ + +	+ + +
Chloride (Cl^-)	< 10 100 – 200 200 – 300 > 300	unlimited	+ 0 - -	+ + + -	+ + + +	+ + + 0/+	+ + + +	+ + + -

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