AirValley

CDI Series

EVI DC INVERTER AIR TO WATER HEAT PUMP (HEATING + COOLING)

Installation & Use Instructions

Notes for users

Dear customers：

First of all thank you very much for choosing our products!

In order to install and use this product correctly, please read this manual carefully before installation and use, also please keep this manual well, for future reference. Thank you for your cooperation!

This unit should have maintenance regularly. The regular maintenance and cleaning will help the product stability, security, and long-term operation. Clean the dust and dirt inside the unit will also help to improve unit heat transfer efficiency, save the energy for you.

If the unit shut down in long time due to some factors, please be sure to drain off the water in pipeline, to prevent rust or as the low temperature in winter may cause the pipe cracking and system running problem again.

If the manual has any shortcoming, please suggestion to us

With the constant progress of science and technology, product has constant update and optimization; please pay attention to the latest product information.

I. Notes

1.1.Dear User: Before install and use this product, please read this manual in details, to avoid the problem of equipment damage, operator injury and property damage, etc.

1.2.If you have any questions about technology when you read the manual, please inquire the local agent or our company as soon as possible.

Warning Means improper handling will cause serious injury or death.

Note Means improper handling will cause injuries or property damage.

Remind Means make further remind and interpretation to the contents stated.

Warning

- Please entrust professional installation, the installation personnel must have the relevant professional knowledge. Prohibited to install it yourself if you are not professional, otherwise, may cause leakage, electric shock, fire and other accidents.
- When the units need to move, repair or reinstall, please entrust dealer or professionals, prohibited to do maintenance or installation yourself if you are not professional, otherwise, can lead to leakage, electric shock, fire and other accidents.
- The unit can't install near the flammable (paint, coating, gasoline, chemical reagent, etc.), in order to prevent fire or explosion.
- Non-professional personnel can not adjust the internal switches, valves, controllers, etc.
- If unfortunately have a fire, the main power supply should be immediately shut down and take the corresponding correct measures to put down the fire.
- Please use the specified capacity of the fuse or overload protector, do not use the iron wire, copper wire instead, otherwise will lead to serious damage or fire to the unit.
- When customers purchase spare parts, choose the specified products of our company, otherwise may cause leakage, electric shock, fire and other accidents.
- During the electrical installation shall comply with the relevant provisions of the state, be sure to consult the electrical wiring diagram.
- Heat pump unit must be reliable grounding, forbid to operate the unit without grounding, it is strictly prohibited to connect ground wire on the zero line or water pipe.
- It is forbidden to put fingers, clubs in heat pump units, don't touch the fan blades to avoid an accident (Children must avoid by all means).

Note

- Confirm whether installed leakage protection switch, must be installed leakage protection switch, otherwise may cause electric shock.
- Correct connection cable. If the cable connection error may damage the electrical components, do not touch the refrigerant exhaust pipe parts with the hand, to prevent burns.
- Do regular maintenance of the unit according to the instruction manual, to ensure the unit running in good condition.
- If the refrigerant leakage, should immediately cut off all the unit's power supply.
- When the fuse fusing repeatedly or leakage protection switch frequently open, should immediately stop running, cut off the power switch manually, and contact the dealer or customer service.
- When choosing to install the heat pump unit, please check whether the corresponding power supply capacity meets the requirements of this unit's power, see details on the nameplate or installation instruction.
- If the unit or water tank is mounted on the roof etc., be sure to take measures against lighting.

II. Characteristics and Parameters:

2.1.Unit features：

◆With built-in international famous brand DC Inverter compressor,super pressure resistance shell condenser,low-noise & big air volume inner rotor fan, etc.,to ensure stable operation of the unit.

◆Unit has multiple protection features: anti-freezing protection, compressor overheat protection, reverse phase protection,lack of phase protection, high and low pressure protection, overload protection,high temperature protection, water flow protection,time delay protection, etc.,to provide water of the project under 100% security.

◆Patented independent defrosting flow path, spiral vortex efficient shell and tube heat exchanger, thus could reduce heat loss in winter defrosting, improve air heat exchange efficiency, enhance automatic descaling ability, improve the comprehensive energy efficiency of the unit.

◆Intelligent operation,power off memory, no need special care,automatic heating, automatic water refilling,free setting of power on/off, could meet water supply of different projects.

2.1. Parameter table

CDl series EVI DC Inverter air to water heat pump for Heating & Cooling Commercial type								
Model			DFC45II/BP	DFC60II/BP	DFC80II/BP	DFC90II/BP	DFC160II/BP	DFC180II/BP
Rated heating	Rated heating capacity (A7 W45)	kW	44.80	59.20	78.80	91.30	162.00	183.00
	Rated power consumption	kW	12.31	16.26	21.60	25.43	44.48	51.12
	COP	W/W	3.64	3.64	3.65	3.59	3.64	3.58
Floor heating	Nominal heating capacity (A-12 W35)	kW	33.00	44.50	56.00	67.00	102.00	135.00
	Nominal power consumption	kW	10.00	13.48	16.97	20.30	31.00	41.16
	COP	W/W	3.30	3.30	3.30	3.30	3.29	3.28
	Low temp. heating capacity (A-20℃ W35)	kW	26.00	35.00	44.00	52.00	80.50	105.00
	Low temp. power consumption	kW	9.63	12.92	16.30	19.33	29.60	39.18
	COP	W/W	2.70	2.71	2.70	2.69	2.72	2.68
Fan coil heating	Nominal heating capacity (A-12 W41)	kW	30.00	40.00	50.00	60.00	100.00	120.00
	Nominal power consumption	kW	11.90	15.69	19.84	24.19	39.84	48.19
	COP	W/W	2.52	2.55	2.52	2.48	2.51	2.49
	Low temp. heating capacity (A-20℃ W41)	kW	24.00	32.00	40.38	48.00	80.00	95.00
	Low temp. power consumption	kW	10.76	14.29	18.78	22.86	37.21	45.24
	COP	W/W	2.23	2.24	2.15	2.10	2.15	2.10
Radiator heating	Nominal heating capacity (A-12 W50)	kW	25.00	34.00	42.00	50.00	83.00	100.00
	Nominal power consumption	kW	11.47	15.60	19.72	22.94	37.73	45.87
	COP	W/W	2.18	2.18	2.13	2.18	2.20	2.18
	Low temp. capacity (A-20 W50)	kW	22.70	30.00	38.00	45.00	72.00	90.00
	Low temp. power consumption	kW	11.88	15.71	19.79	23.56	37.50	47.12
	COP	W/W	1.91	1.91	1.92	1.91	1.92	1.91
Nominal cooling	Nominal cooling capacity (A35 W7)	kW	33.00	43.00	65.00	70.00	130.00	140.00
	Nominal power consumption	kW	11.74	15.30	23.21	25.93	46.59	51.85
	EER	W/W	2.81	2.81	2.80	2.70	2.79	2.70
Refrigerant		Type	R410A					
Compressor		Type	EVI DC Inverter compressor					
Driver cooling		Type	Air cooled		Fluorine cooled			
Air side heat exchanger		Type	High Efficiency Hydrophilic Aluminum Foil Fin Heat Exchanger					
Water side heat exchanger		Type	Shell & tube heat exchanger					
Power supply		/	380V 3N～50Hz					
Heating operating ambient temperature range		℃	-35～48℃					
Cooling operating ambient temperature range		℃	-10～48℃					
Maximum input power		kW	18	24	30	33	61	65
Maximum input current		A	34	45	53	62	115	124
Waterproof level		/	IPX4					
Anti-electric shock type		/	Type I					
Water inlet/outlet pipe		DN	DN40	DN40	DN65	DN65	DN80	DN80
Water flow required		m^3/h	5.6	7.4	11.20	12.10	22.40	24.1
Water pressure drop		kPa	43	45	45	50	52	55
Unit dimensions		mm	854/854/1830	854/854/1830	2347/1100/	2347/1100/	2300/1250/	2300/1250/

				2223	2223	2360	2360
Net weight	kg	350	510	610	690	1250	1350
Noise level	dB(A)	≤66	≤66	≤70	≤73	≤76	≤77

Test conditions:
- Rated heating: Inlet/outlet temperature 40°C/45°C. Dry bulb/wet bulb Temperature 7°C/6°C;
- Floor nominal heating: Outlet Water Temperature 35°C. Dry Bulb/Wet Bulb Temperature -12°C/-13.5°C;
- Floor low temp. heating: Outlet Water Temperature 35°C. Dry Bulb/Wet Bulb Temperature -20℃/--;
- Fan coil nominal heating: outlet water temperature 41℃. Dry bulb/wet bulb temperature -12℃/-13.5℃;
- Fan coil low temp. heating: outlet water temperature 41℃. Dry bulb /Wet bulb temperature -20℃/--;
- Radiator nominal heating: outlet water temperature 50℃. Dry bulb/wet bulb temperature -12℃/-13.5℃;
- Radiator low temp. heating capacity: outlet water temperature 50℃. Dry Bulb/wet bulb temperature -20℃/--;
- Nominal cooling: Inlet/outlet temperature 12°C/7°C. Dry bulb/wet bulb temperature 35°C/24°C.

III.Installing Instruction

3.1.Installation Notes：

1).Installation position of the unit is more flexible, choose well ventilated position as priority.

2).The installation of the unit must be far away from the corrosive place.

3).Unit needs to have a professional installation, installation must comply with the corresponding provisions of the local government and relevant departments.

4).Installation's base height should be not less than 200 mm, need good drainage in installation spot, unobstructed.

5).Occasion for special installation requirements please refer to construction contractors or architects or other related professional consultation.

6).The unit can be installed on the ground, roof or the basement; But the premise should be sure to have adequate ventilation rate, and meet the demand of heat exchange. Need measures against lightning for the whole heat pump system if Install the heat pump on the roof.

7).When the unit is installed on the roof, the roof must have enough strength to support the weight of the unit and related parts, the unit can be placed on the concrete basis or channel steel frame.

8).Don't install the unit where have special request for noise and vibration.

3.2.Build the basis for heat pump：

Concrete basis：

The base is made of concrete, good at shockproof, specific requirements:

a.The surface of concrete basis should be solid and smooth, load-bearing of support surface should be 2 times of the operation weight of the unit.

b.When make concrete base, suggested the following treatment: place on the twisted steel which the diameter ≥9.5 mm, put two layers of the twisted steel up and down, 10cm distance between the two layers, and banding.

c.When do concrete basis on the concrete floor, the surface must be kept rough before construction, do cleaning up and supply enough water before constructing.

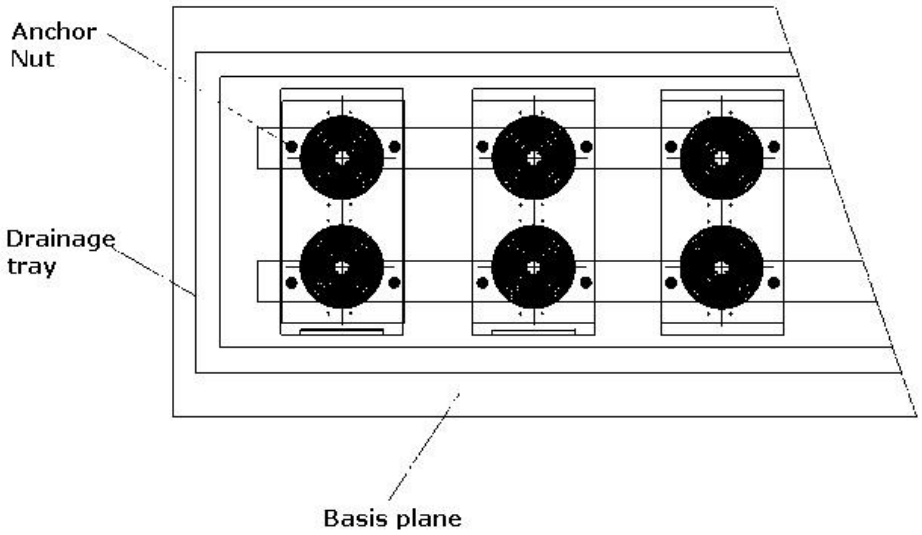
d.The concrete basis is mixed by ratio of 1:2:4, to be solid, and need bury the prescriptive size and quantity anchor bolt according the demand. The finished basis surface should be kept smoothly.

e.Concrete base station surface required waterproof treatment, drains shall be installed around and the slope should be larger than 0.5°, the slope toward to the drain outlet.

f.Concrete of basis must be dry completely before installing the machines.

g.In order to enable the device quietly operating, to avoid vibration and noise impact the floor, between the concrete basis and machine base need be isolated by shockproof pad, and keep horizontal.

h.The unit condensate water is a lot, please consider drainage around the basis, and install damping device between the basis.

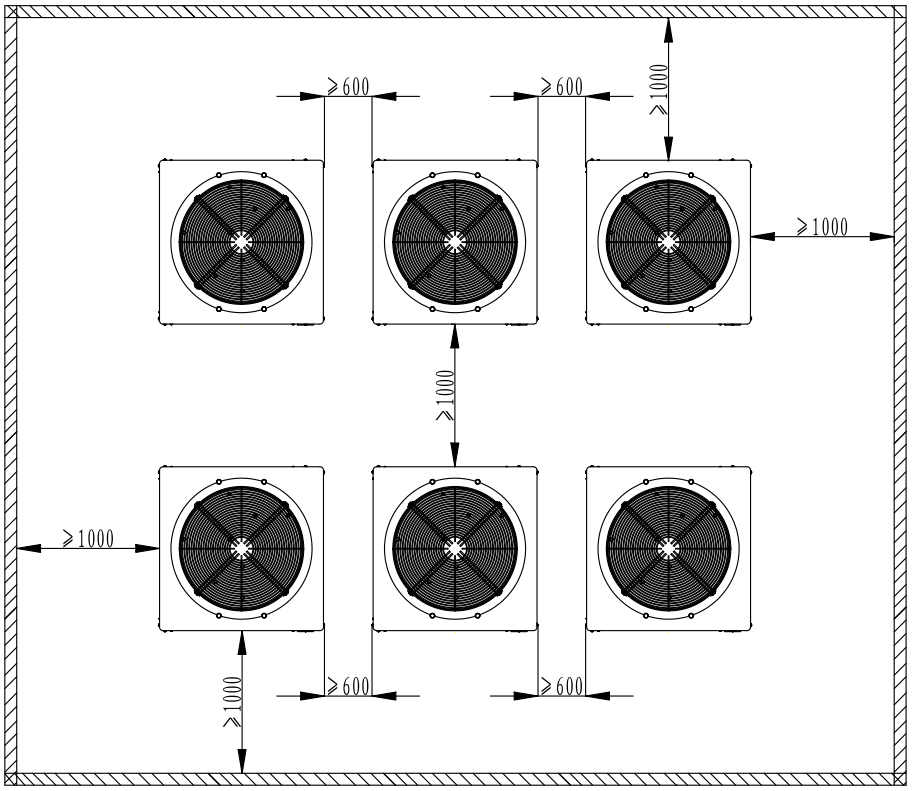


(Picture1)

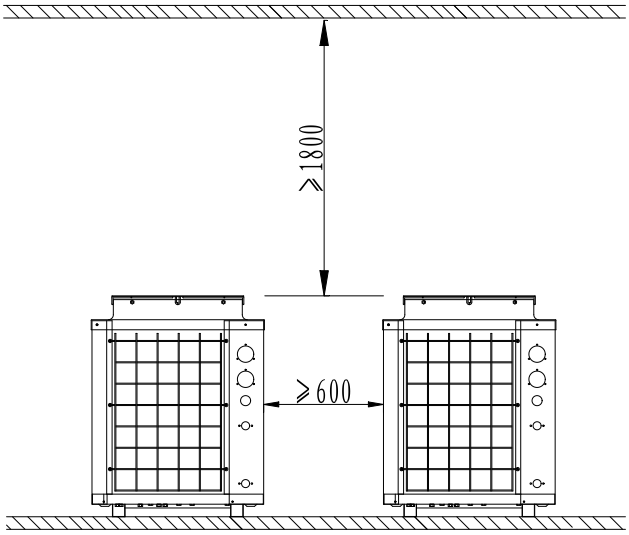
3.3.Installation space requirements：

3.3.1 CDI series

The above products installation layout reference as shown in (Picture 2) requires the reserved space, When the top side of unit have obstructions reference as shown in (Picture 3) required reserve.



(Picture 2)



(Picture 3)

Remind

- **The above diagram for reference only, product appearance may have differences with schematic structure, please refer to our actual product.**

Note

- **If the unit is installed in the basement, should make sure good ventilation.**
- **Set aside enough space for unit installation.**

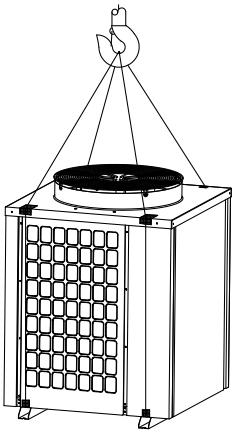
3.4.The hoisting：

1). Recommended taking 2pcs of steel wire rope (≥Φ 12.5 mm) to lift the unit，handling process must be careful, to avoid any damage of the unit.

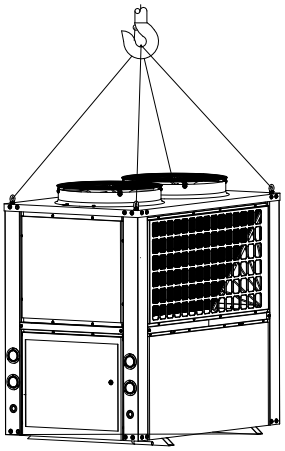
2). In order to avoid the surface scratches, deformation, please add protection sheet between the steel wire rope and the heat pump contact surface.

3). After hoisting, please remove transportation use plate.

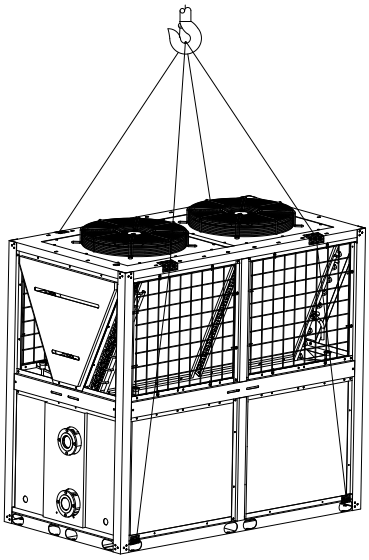
4). According to the structure of unit, hereunder the hoisting picture (4) (5) (6) for your reference.



(Picture 4)



(Picture 5)



(Picture 6)

Note

- Be sure to pay attention to safety when lifting.
- The hoisting illustration above are for reference only, specific lifting should be according to actual circumstances.

3.5.Pipeline installation:

1). Piping system design and construction must conform to the national plumbing pipe design specifications and relevant standards.

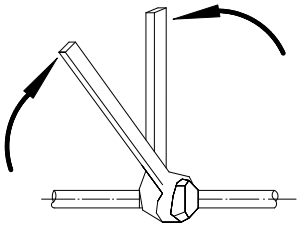
2). When under DN50, priority to choose PPR pipe,above DN50 (including DN50) choose galvanized pipe.

3). The installation process must prevent dust and other debris into the piping system.

4). Only install water pipe after the completion of fixing the unit.

5). Water inlet and outlet pipe, circulation system water pipe must be packed with thermal insulation material for heat preservation.

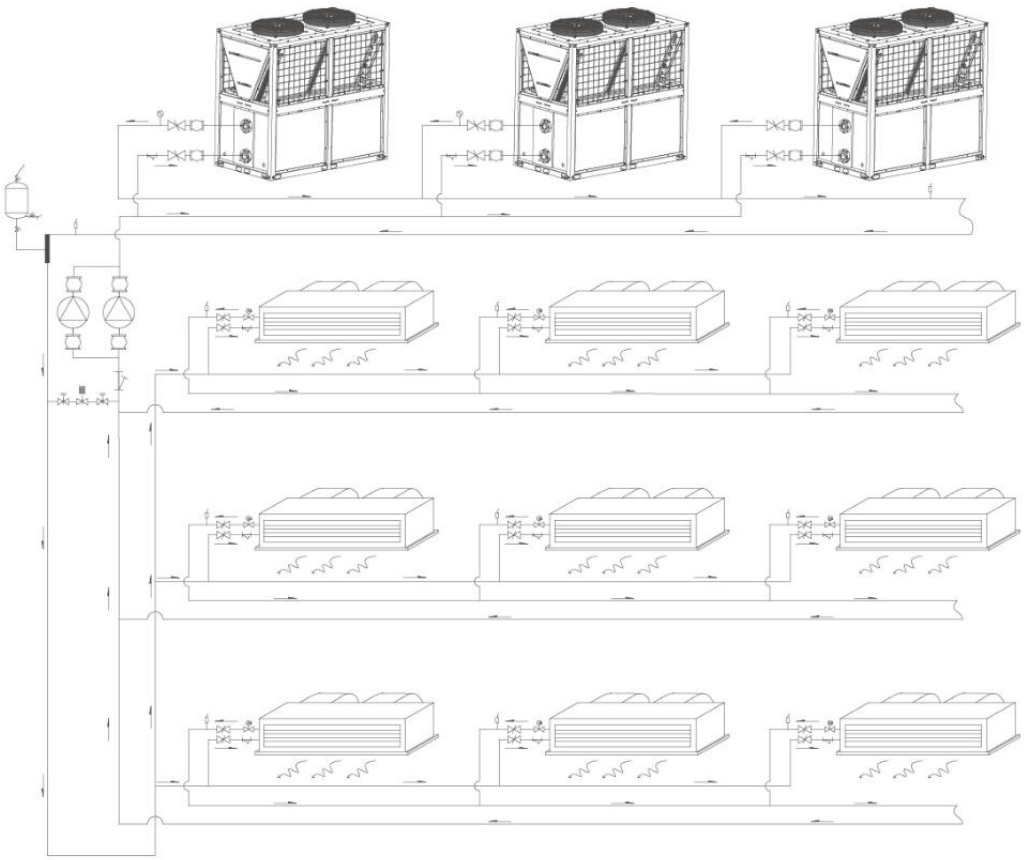
When connecting the water input pipe and water output pipe, Must use two tongs, respectively clamped to connect the two parts, to ensure that water input pipe and water output pipe of the unit can not be turn.As shown in the picture below:



(Picture 7)

3.7. Pipeline connection:

Commercial DC Inverter heat pump pipe connection refer to(Picture 8):



(Picture 8)

Table 2 Symbol descriptions:

Figure	Name	Figure	Name
	Filter		Water pressure meter
	Magnetic valve		Exhaust valve
	Check valve		Flexible joint
	Water pump		Butterfly valve
	Expansion tank		Sand cylinder filter
	Hair filter		P/T safety valve
	Negative pressure valve		Deep-well pump
	Cyclone desander		

3.8.Installation & selection of water pump:

3.8.1 The design & installation of the water booster pump:

1) The design of the system pressure is 0.20 MPa, work pressure range 0.05-0.35 MPa.

2)If the water inlet shall be connected to the tap water pipe network, must be connected to the main pipe of tap water.

①When water pressure≥0.40 MPa, must install pressure reducing valve, adjust the water pressure of the unit water inlet to 0.20 MPa;

②When water pressure < 0.20 MPa, must install automatic constant pressure device.

3) Rated flow design for automatic constant pressure device:

Rated flow = unit rated water producing quantity **x** quantity of units

3.8.2 The design and installation of the hot water circulating pump:

1) Circulating water pump rated head of delivery:

The most unfavorable circulation pipeline (L1 + L2 + L3 +... + Ln) x resistance coefficient + pipeline total local resistance + unit resistance

2) Rated flow of circulating water pump:
Single unit cycle heating rated flow x quantity of units

Note

- When unit cycle heating, specific heat exchange side water flow please refer to performances table.

3.9.Electrical installation:

Electrical installation considerations:

1) The unit should use independent power supply, and power supply circuit must be reliable grounding.

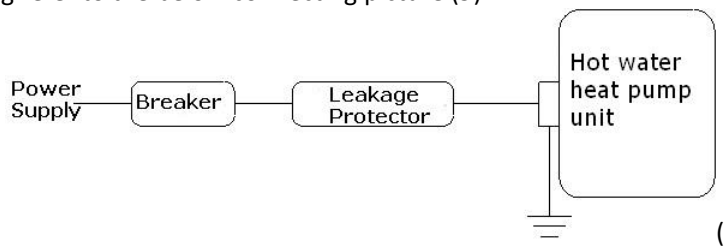
2) Should have protection measures against electric leakage and short circuit, according to the relevant state regulations on electrical equipment standards.

3) When parallel wiring of high voltage and low voltage, please wire into a separate wire tube, to keep a proper distance, bigger distance if possible.

4) After all wiring completed, please check carefully and make sure no mistakes before connecting to power supply.

3.10.Connect to power supply:

Power wiring refer to the below connecting picture (9):



(Picture 9)

Note

- **Choose insulated copper core wire for electrical wiring.**
- **The circuit breaker shall be selected with overload, short circuit protection function, when selected circuit breaker is with three kinds of protection functions of overload, short circuit & leakage, leakage protector can not be installed.**

IV.Operating Illustration

1. Main interface

① : Return water temperature display area

② : Mode display and selection operation area

③ : Outlet water temperature display area

④ : Timing mark display area, displayed when the timing function is enabled, not displayed when the timing function is cancelled.

⑤ : Display sign when the unit's service life is up. When the unit reaches the set service life, the icon will be displayed. Normally it will not be displayed.

⑥ : Set temperature temperature reduction key, used to reduce the set temperature

⑦ : Set temperature display area

⑧ : Set temperature temperature increase key, used to operate to increase the set temperature

⑨ : Unit fault mark, displayed when the unit fails or is protected. Click this mark to enter fault query.

⑩ : Standby antifreeze sign, lights up when the unit is in standby antifreeze

⑪ : Switch operation button, power on state, power off state

⑫ : Clock and date display area

⑬ : Setting button, click to enter the control system setting operation

Click the date and clock area at the top of the screen to enter the clock and date modification interface, as follows:

As shown in the picture above, the user can click the key area that needs to be modified and directly input the real-time date and clock through the numeric keyboard (as shown below) to modify the relevant date and clock. After completion, click the [Enter] button or click [Cancel] to return. On the previous level interface, click the [ ] button on the screen to return to the main interface.

◆ **Numeric keyboard interface**

2. Function selection interface

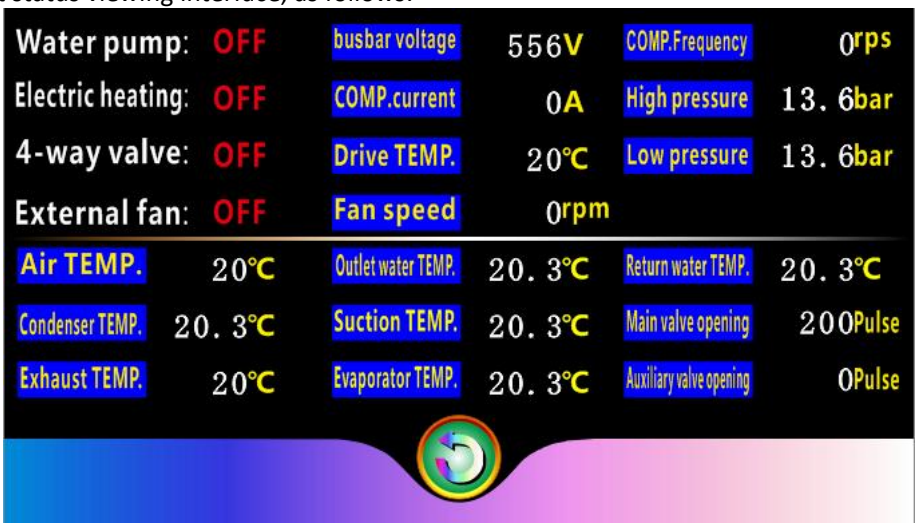
Press settings button  in the main interface to enter the function selection related interface, as follows:

Click the button on the screen to enter the corresponding interface, click the [] button to return to the main interface .

3. Unit status query

at the bottom of the function selection interface to enter the unit selection interface to query the status. The detailed interface is as follows:

As shown above, the unit number that the user can choose to view can be provided. Click the [] button to return to the main interface; click on the relevant unit to enter the relevant unit status viewing interface, as follows:



As shown in the figure above, the upper part of the interface displays the status of the variable frequency drive module and the start and stop status of the unit; the lower part of the interface displays the real-time temperature of each temperature point of the unit and the opening of the electronic expansion valve. Click the [] button to return to the select unit query status interface and choose to view the status of other units.

4. Timing switch operation

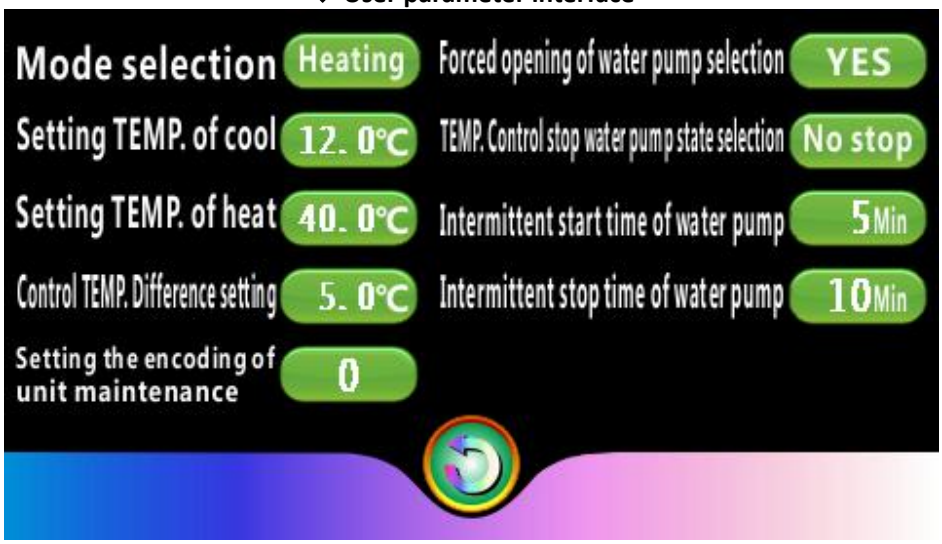
Click Timing [] below on the main interface to enter the interface for selecting unit query status. The detailed interface is as follows:

As shown in the picture above, users can set the scheduled power-on and off times for the DC Inverter heat pumps in three periods, and can choose whether to participate in the scheduled power-on and off functions on Saturdays and Sundays. Click the [] button to return to the main interface.

5. User parameter setting operation

Click the User Parameters [] button on the function selection interface to enter the user parameter modification interface and modify the corresponding parameters according to actual needs. The specific parameters are as follows:

◆ **User parameter interface**



1、 Users can select the unit operating mode: heating, cooling. Switching is only possible **when the machine is turned off and all press frequencies are 0 rps .**

2、 Cooling mode temperature setting: default is 12℃, adjustable range: -48~32℃

3、 Heating mode temperature setting: default is 40 ℃, adjustable range: 8 ~ 90 ℃

4、 Temperature control hysteresis setting: default is 5 ℃, adjustable range: 1 ~1 2 ℃

5、 Unit maintenance code: Default is 0, modify as needed

6、 Forced open circulation pump selection: Default is No, optional Yes (for initial installation and debugging to drain pipeline air)

7、 Temperature control shutdown water pump status: optional non-stop, only heating stop, intermittent start and stop, and both cooling and heating stop

8、 After selecting the intermittent start and stop of the water pump temperature control shutdown, the intermittent opening and intermittent closing time of the water pump can be set: 0 to 60 minutes can be set

6. Unit disable setting operation

Click the Unit Prohibition selection [] button on the function selection interface to enter the user parameter modification interface and adjust the corresponding parameters according to actual conditions. ◆ **Unit Prohibition Selection Interface**

As shown in the picture above, if you want to disable one or more units, just click[] on the black box on the right and change it. After the modification is completed, click the [] button to return to the parameter modification selection interface.

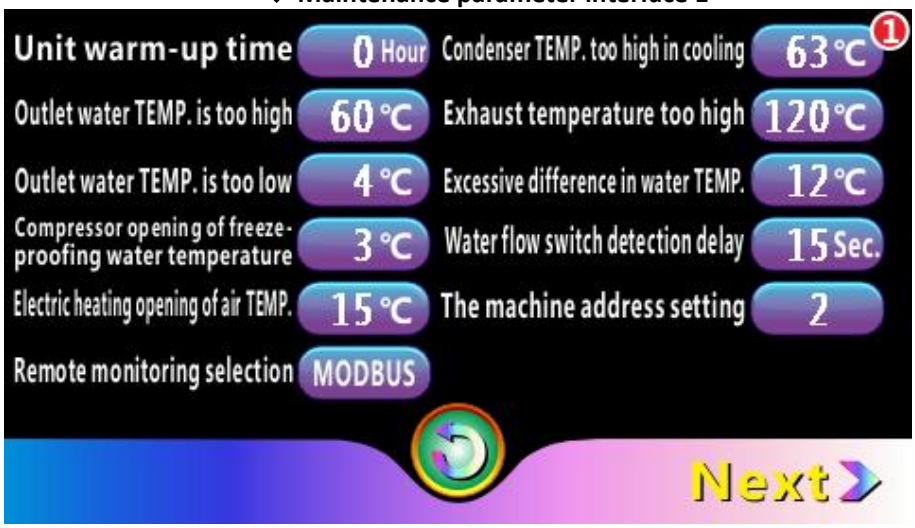
7. Maintenance parameter operation interface

Click the Maintenance parameter[] button on the function selection interface to enter the maintenance parameter modification password interface. Only by entering the correct password can you enter the maintenance parameter modification interface and modify the corresponding parameters according to actual needs.

As shown in the figure above, you must enter the correct password (default is 111) before entering the maintenance parameter setting interface. After the password is correct, you will automatically enter the system parameter interface. There are many maintenance parameters, which are divided into 14 interfaces. You can click [Next] and [Previous] to switch between interfaces, and click the [] button to return to the function selection interface.

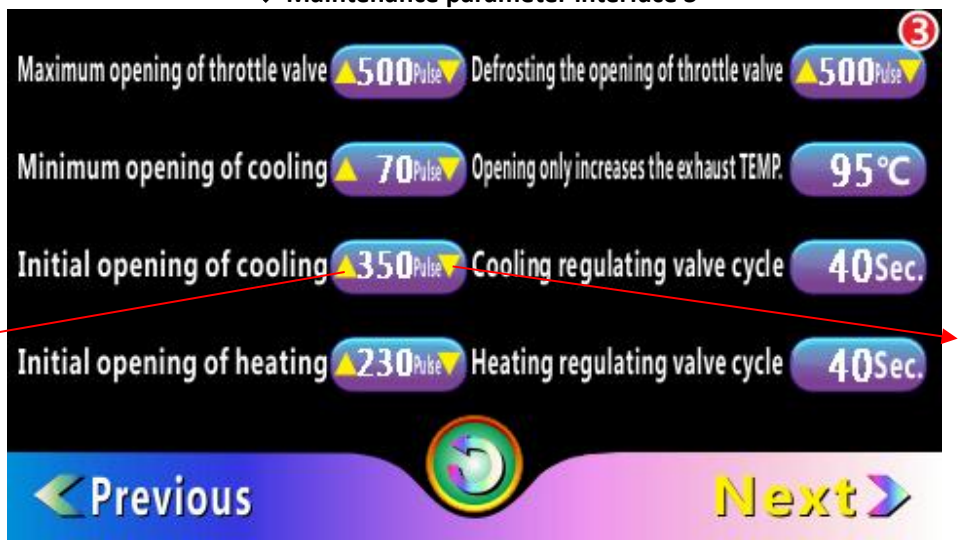
The specific interface is as follows:

◆ **Maintenance parameter interface 1**



◆ **Maintenance parameter interface 2**

◆ **Maintenance parameter interface 3**

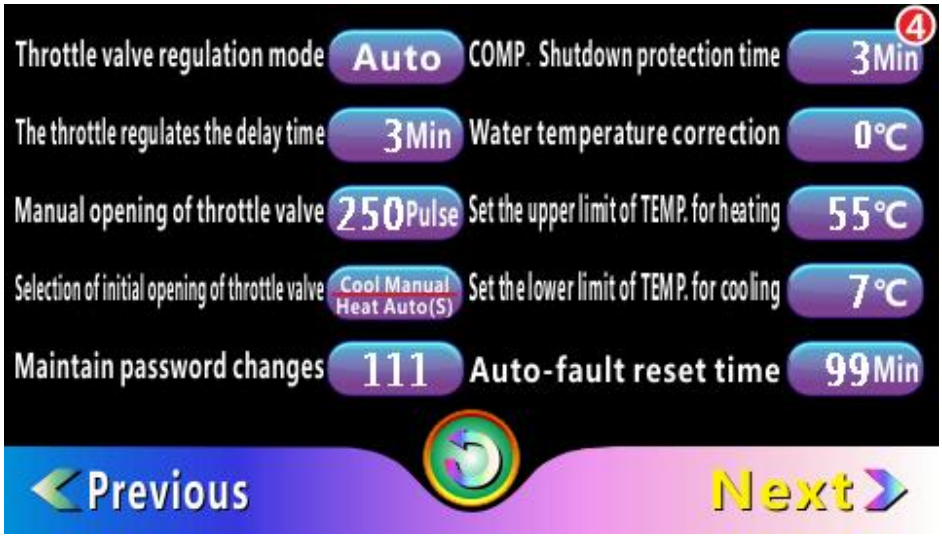


Each click adds 10 steps Max 500 steps

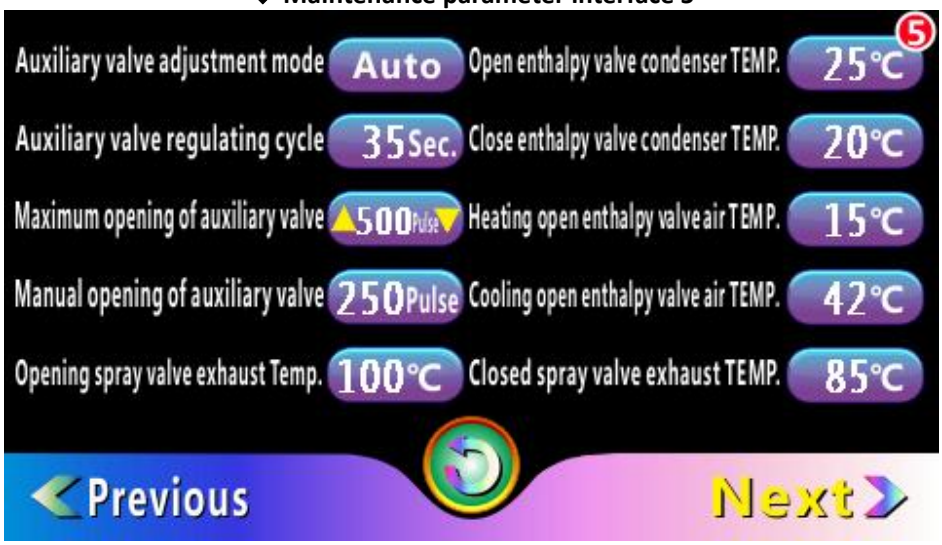
Each click reduce 10 steps Min. 0 steps

Note: When the initial opening is set to automatic judgment, the initial opening cannot be adjusted.

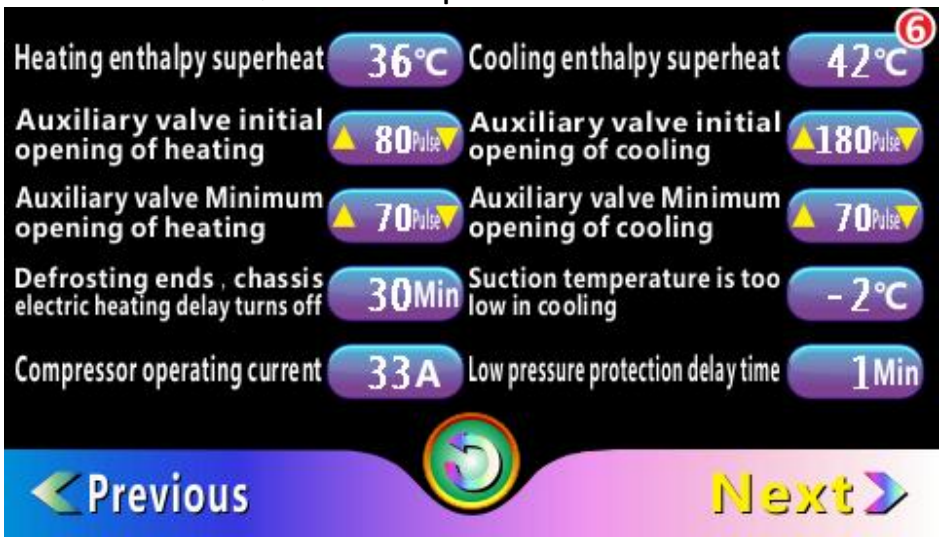
◆ **Maintenance parameter interface 4**



◆ **Maintenance parameter interface 5**



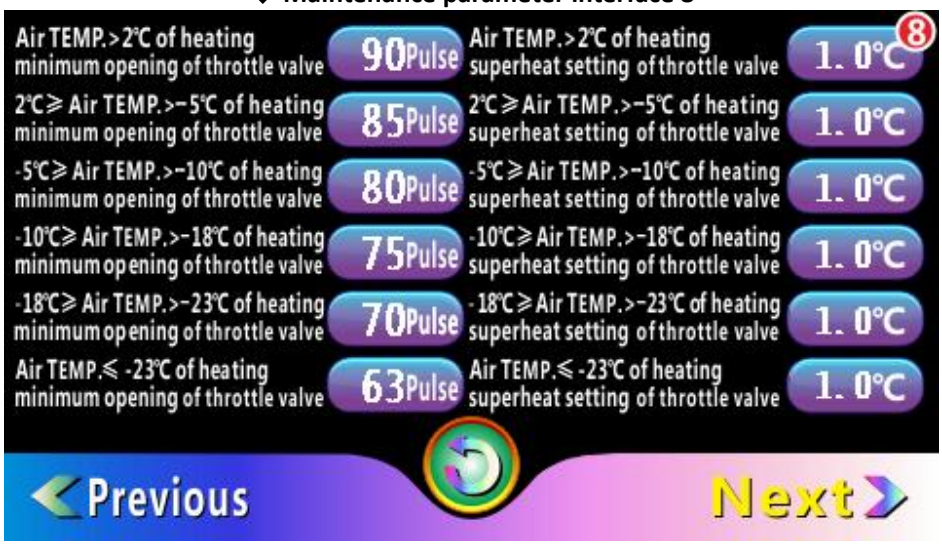
◆ **Maintenance parameter interface 6**



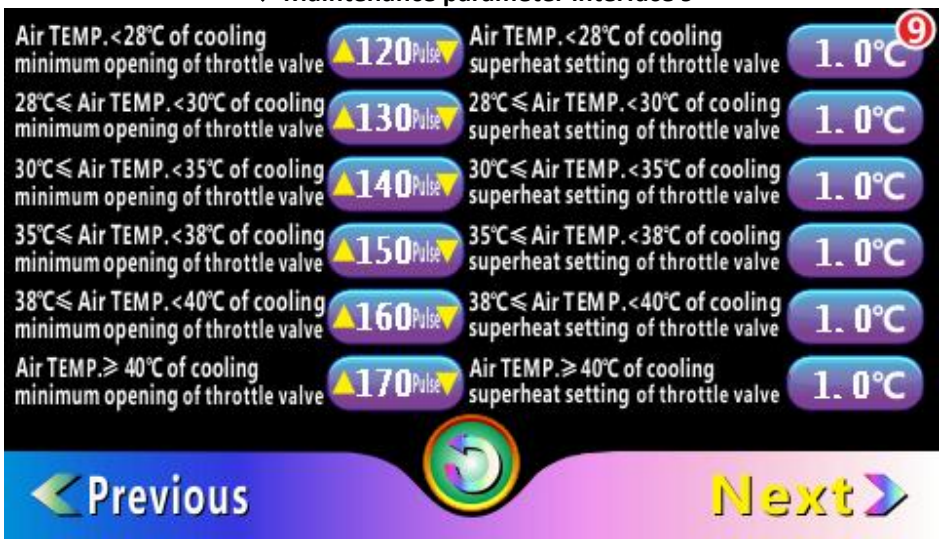
◆ **Maintenance parameter interface 7**

Note : Compressor type selection, variable frequency drive selection, shut down and all compressor frequencies 0 rps can be switched.
Switching starts 10 seconds after the variable frequency drive is selected.

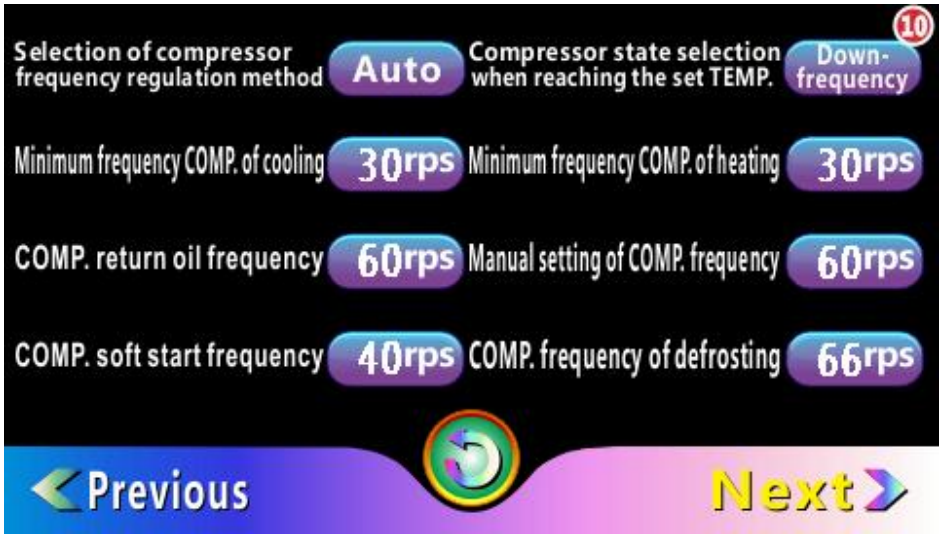
◆ **Maintenance parameter interface 8**



◆ **Maintenance parameter interface 9**

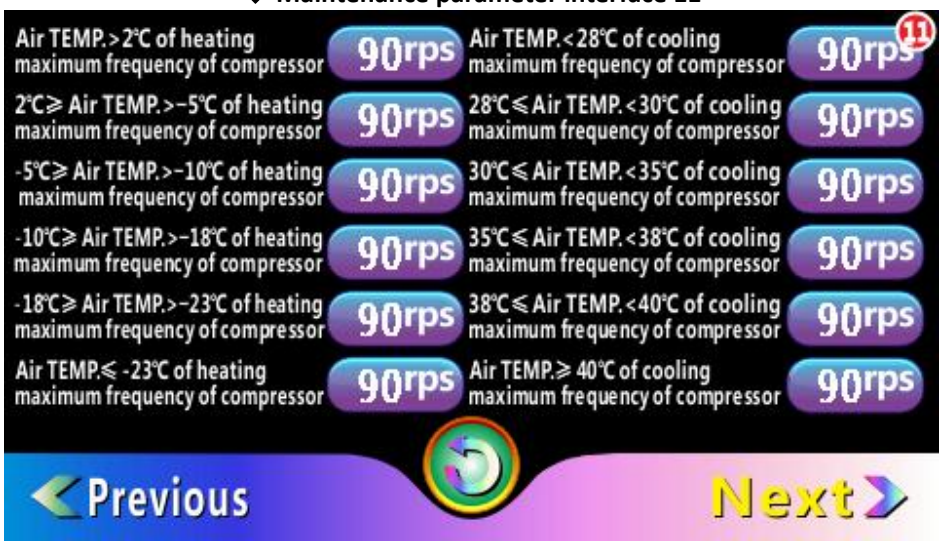


◆ **Maintenance parameter interface 10**

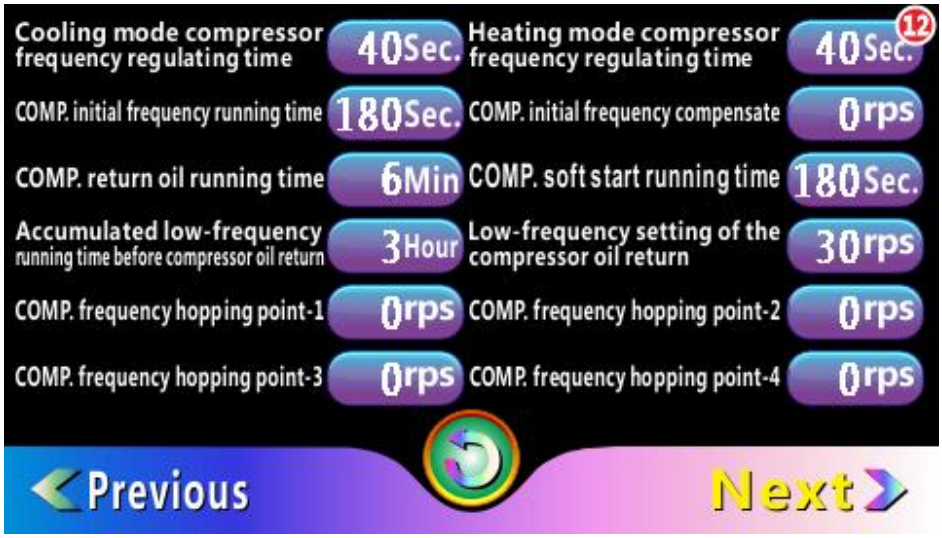


Note: Manual frequency setting is prohibited during the soft start phase and oil return phase.

◆ **Maintenance parameter interface 11**

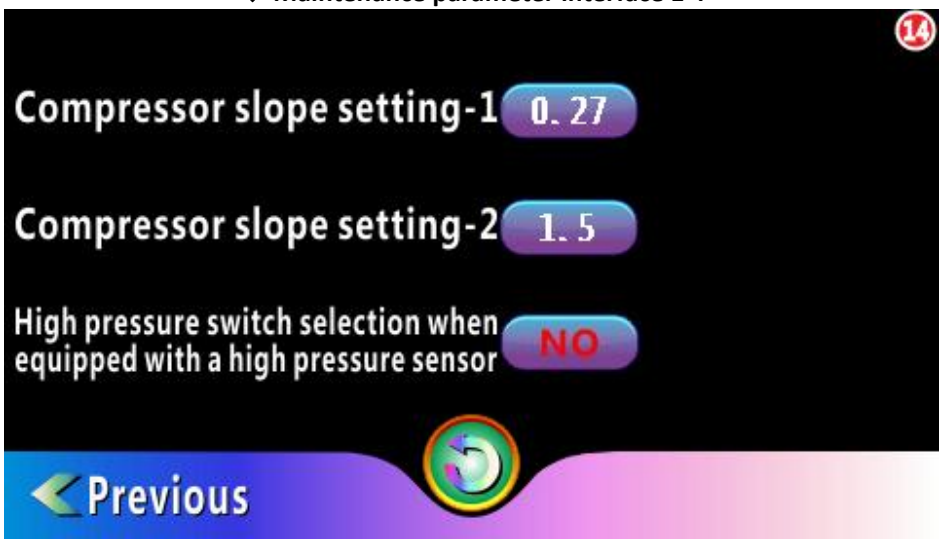


◆ **Maintenance parameter interface 12**



◆ **Maintenance parameter interface 1 3**

◆ **Maintenance parameter interface 1 4**



◆**Maintenance parameters can be set in the parameter table**

Parameter name	Factory settings	Setting range
Unit warm-up time	0 hours	0 ~ 127 hours

Heating cycle outlet water temperature is too high	60℃	40～99 ℃
Cooling cycle outlet water temperature is too low	4 ℃	-48～10℃
Standby antifreeze starter temperature	4℃	0～8℃
Ambient temperature to turn on the electric heating	15℃	-48～60℃
Finned tube heat exchanger temperature is too high when cooling	65 ℃	50 ～ 80℃
Exhaust temperature too high alarm value	120℃	70 ～ 140 ℃
Protection value for excessive temperature difference between inlet and outlet water	12℃	5～90 ℃
Water flow switch continuous detection time	15 seconds	1～60 seconds
Local address code	2	2～125
Detect defrost conditions	Ambient temperature - suction	Ambient temperature-suction/Ambient temperature-fins
Ambient temperature allowed to enter defrost	10℃	0～20 ℃
First defrost interval	30 minutes	20～99 minutes
Enter defrost temperature difference	8℃	0～30 ℃
Exit defrost temperature	20℃	0 ～40 ℃
Defrost time	5 minutes	2 to 15 minutes
Number compressor for forced defrost	1	1～16
Forced defrost option	no	whether
Maximum non-defrost time	2 hours	1～12 hours
Temperature difference to enter defrost immediately	13℃	0～75 ℃
Maximum opening throttle for electronic expansion valve automatically adjustment	500	0～500
Minimum opening for electronic expansion valve automatically adjustment under cooling conditions	70	0～500
Initial opening of the first power-on in cooling mode (automatically determined based on ambient temperature and water temperature by default)	240	0~500 (automatic judgment cannot be adjusted)
Initial opening degree when first starting up in heating mode (automatically determined based on ambient temperature and water temperature by default)	200	0~500 (automatic judgment cannot be adjusted)
Opening degree under defrosting working condition	400	0～500
The exhaust temperature point at which the opening can only increase	95℃	70～125
Electronic expansion valve adjustment cycle under cooling conditions	40 seconds	5～125
Electronic expansion valve adjustment cycle under heating conditions	50 seconds	5～125
Throttle electronic expansion valve adjustment method	Automatic overheating	Superheat automatic/manual valve adjustment
Throttle valve adjustment delay time after starting the compressor	3 minutes	0～10
Throttle electronic expansion valve manual valve opening adjustment	250	0～500
Throttle valve initial opening selection	refrigeration manual Heating automatic	Automatic judgment/manual setting/cooling manual heating automatic judgment
Maintenance password change	111	0～ 255

Compressor shutdown protection time	3 minutes	1～10
Return water/outlet water temperature correction value	0.0 ℃	0～10
Heating temperature set value upper limit	5 5℃	0～90
Cooling temperature set value lower limit	7℃	-48～90
Automatic fault reset time (if set to 99 minutes, it will not reset automatically)	99 points	10~99
Auxiliary circuit electronic expansion valve adjustment method	Automatic enthalpy increase	Automatic enthalpy increase/manual valve adjustment/automatic liquid spray
Auxiliary circuit electronic expansion valve adjustment cycle	35 seconds	1～125
Maximum opening of auxiliary circuit electronic expansion valve	500	0～500
Manual opening of auxiliary circuit electronic expansion valve	250	0～500
Exhaust injection valve opening temperature	100℃	0～127
Condensing temperature to open the enthalpy valve	25℃	0～99
Condensing temperature to close the enthalpy valve	20℃	0～99
Allowable ambient temperature for heating enthalpy increase (less than)	15℃	-5～70
Allowable ambient temperature for cooling enthalpy increase (greater than)	42℃	-48～70
Exhaust injection valve closing temperature	85 ℃	0～127
Heating enthalpy increase superheat setting value	36℃	0～60
Initial opening of heating enthalpy increasing valve	80	0～500
Minimum opening of heating enthalpy increasing valve	70	0～500
Chassis electric heating opening temperature	15 ℃	-48～30
Compressor operating current	32A	0～80
Cooling enthalpy increase superheat setting value	42℃	0～60
Cooling enthalpy increasing valve initial opening setting	180	0～500
Minimum opening of cooling enthalpy increasing valve	80	0～500
Low suction temperature protection under cooling conditions	-2℃	-48～10
Low voltage detection delay time	1 point	0～3
Compressor type selection	frequency conversion	Variable frequency/fixed frequency
DC fan drive selection	onboard	Onboard /external/onboard manual/external manual
DC fan drive quantity	1	1 ～ 2
Power-off memory function selection	yes	no Yes
Reset	no	no Yes
Number of combined modules	1	1～8
Variable frequency drive selection	YM-JUZE	H ITACHA/ SANHUA /CATV/ ZHOUJU / YM-JUZE / YM-AIRCO
Max. Speed of outdoor fan (set to 0 for AC fan)	0rpm	0~1260
Compressor state to enter defrost + four-way valve power selection	Defrost + cooling without shutting	Defrost without stopping + power for heating / defrost with power off + power for heating / defrost without stopping + power for

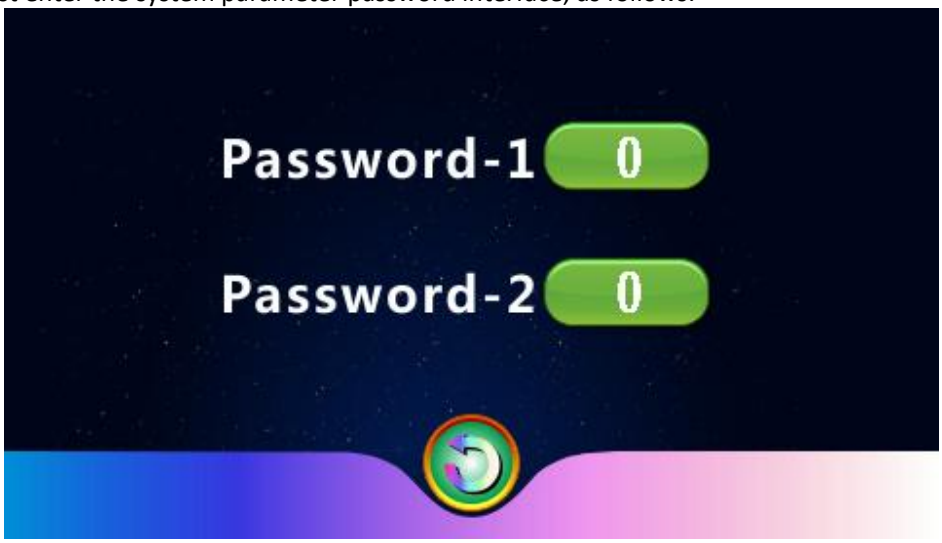
	down	cooling / defrost with power off + power for cooling
Control temperature selection	Backwater	Return water/outlet water/refrigeration return water, heating outlet water
Phase sequence protection function selection	Cancel	Cancellation /absence of inverse phase
Heating 9 ℃ ≥ ambient temperature > 2 ℃ minimum opening of throttle valve	85 steps	0～500
Heating 2 ℃ ≥Ambient temperature ＞ -5 ℃ Minimum opening of throttle valve	80 steps	0～500
Heating - 5 ℃ ≥ ambient temperature > - 10 ℃ minimum opening of throttle valve	75 steps	0～500
Heating - 10 ℃ ≥ ambient temperature > - 18 ℃ minimum opening of throttle valve	70 steps	0～500
Heating - 1 8 ℃ ≥ ambient temperature > -25 ℃ minimum opening of throttle valve	65 steps	0～500
Heating ambient temperature ≤ -25 ℃ minimum opening of throttle valve	63 steps	0～500
Heating 9 ℃ ≥ ambient temperature > 2 ℃ superheat	1℃	-48～60℃
Heating 2 ℃ ≥ ambient temperature > - 5 ℃ superheat	1℃	-48～60℃
Heating - 5 ℃ ≥ ambient temperature > - 10 ℃ superheat	1℃	-48～60℃
Heating - 10 ℃ ≥ ambient temperature > - 18 ℃ superheat	1℃	-48～60℃
Heating - 18 ℃ ≥ ambient temperature > -23 ℃ superheat	1℃	-48～60℃
Heating ambient temperature ≤ -23 ℃ superheat	1℃	-48～60℃
Cooling ambient temperature <28 ℃ minimum opening, unit 10 steps	200 steps	0～255
Cooling 28 ℃ ≤ ambient temperature < 30 ℃ minimum opening, unit 10 steps	220 steps	0～255
Cooling 30 ℃ ≤ ambient temperature <35 ℃ minimum opening, unit 10 steps	240 steps	0～255
Cooling 35 ℃ ≤ ambient temperature <38 ℃ minimum opening, unit 10 steps	260 steps	0～255
Cooling 38 ℃ ≤ ambient temperature < 40 ℃ minimum opening, unit 10 steps	280 steps	0～255
Cooling ambient temperature ≥40 ℃ minimum opening, unit 10 steps	300 steps	0～255
Cooling ambient temperature <28 ℃ superheat degrees	1℃	-48～60
Cooling 28 ℃ ≤ ambient temperature < 30 ℃ superheat degrees	1℃	-48～60
Cooling 30 ℃ ≤ ambient temperature <35 ℃ superheat degrees	1℃	-48～60
Cooling 35 ℃ ≤ ambient temperature <38 ℃ superheat degrees	1℃	-48～60
Cooling 38 ℃ ≤ ambient temperature < 40 ℃ superheat degrees	1℃	-48～60
Cooling ambient temperature ≥ 40 ℃ superheat	1℃	-48～60

degrees		
Frequency adjustment method selection	Automatic	Automatic ~ manual
Minimum frequency of refrigeration conditions	30 rps	0～255
Oil return operating frequency	70 rps	0～255
Soft start operating frequency	40 rps	0～255
Control selection when reached set temperature	Reduce frequency	Shutdown/Reduce frequency
Minimum frequency of heating operation	30 rps	0～255
Manually set the running frequency	60 rps	0～255
Defrost operation frequency	70 rps	0～255
Heating 9 ℃ ≥ ambient temperature > 2 ℃ maximum frequency	90 rps	0～511
Heating 2 ℃ ≥ ambient temperature > - 5 ℃ maximum frequency	90 rps	0～511
Heating - 5 ℃ ≥ ambient temperature > - 10 ℃ maximum frequency	90 rps	0～511
Heating - 10 ℃ ≥ ambient temperature > - 18 ℃ maximum frequency	90 rps	0～511
Heating - 1 8 ℃ ≥ ambient temperature > -23 ℃ maximum frequency	90 rps	0～511
Heating ambient temperature ≤ -23 ℃ maximum frequency	90 rps	0～511
Cooling ambient temperature <28 ℃ maximum frequency	90 rps	0～511
Cooling 28 ℃ ≤ ambient temperature < 30 ℃ maximum frequency	90 rps	0～511
Cooling 30 ℃ ≤ ambient temperature <35 ℃ maximum frequency	90 rps	0～511
Cooling 35 ℃ ≤ ambient temperature < 38 ℃ maximum frequency	90 rps	0～511
Cooling 38 ℃ ≤ ambient temperature < 40 ℃ maximum frequency	90 rps	0～511
Cooling ambient temperature ≥40 ℃ maximum frequency	90 rps	0～511
Cooling condition frequency modulation cycle	30 seconds	0～255
Initial frequency running time	180 seconds	0～240
Oil return running time	6 minutes	0～15
Accumulated low-frequency running time of the press before oil return (0 cancels oil return)	3 hours	0～15
Heating mode frequency modulation cycle	30 seconds	0～255
Initial operating frequency compensation	0 rps	-15～15
Soft start run time	180 seconds	0～240
Low frequency of compressor operation when oil return is required	30 rps	0～255
Frequency hopping point 1 setting	0 rps	0～63
Frequency hopping point 2 settings	0 rps	0～63
Frequency hopping point 3 settings	0 rps	0～63
Frequency hopping point 4 setting	0 rps	0～63
Start and stop outdoor fan control options	temperature	pressure/temperature
Pressure sensor selection, 0=4-20mA, 1=0.5 - 4.5V , 2 without pressure sensor	Need not	4-20mA/0.5-4.5VDC/not used
High pressure pressure range setting	50bar	0～63

High pressure correction	0.0bar	-2.0～2.0
High voltage alarm value	38bar	0～63
Compressor power supply selection	Three phases	single phase/three phase
Refrigerant type selection	R410	R134a/R22/R407c/R410a/R404a
Low pressure range setting	20bar	0～63
Low pressure correction	0.0bar	-2.0～2.0
Low pressure alarm value	1.5 bar	0～6.3
High pressure to turn on outdoor fan	23bar	0～63
High pressure to turn off outdoor fan	18 bar	0～63
Compressor MAP slope 1 setting	0.27	0 ～ 0.63
Compressor MAP slope 2 setting	1.5	0 ～ 6.3
Is there a high-pressure pressure sensor and a high-pressure switch?	Yes	No / Yes

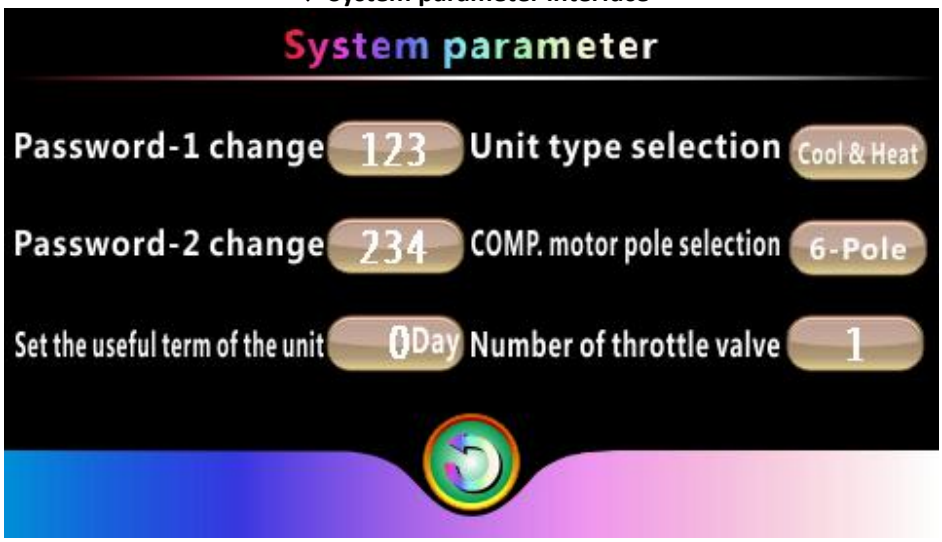
8. System parameter operation interface

Click the System Parameter [] button on the parameter modification selection interface to first enter the system parameter password interface, as follows:



As shown in the figure above, enter the correct first-level password (default is 123) and second-level password (default is 234) and automatically enter the system parameter interface. Click the [] button to return to the function selection interface. The specific interface is as follows:

◆ **System parameter interface**



As shown in the figure above, manufacturers can set relevant parameters according to actual conditions, as follows:

Level 1 password: Default is 123, adjustable range: 10~255;

Secondary password: Default is 234, adjustable range: 10~255;

The unit's limited operating time (Dunning function) can be set: the default is no time limit, and the adjustable range is: 1~254 days;

The unit type can be set: the default is cooling and heating type, cooling and heating, single cooling, and single heating are optional;

Different pole numbers can be used for different compressors: default four-pole, optional four-pole, six-pole, and eight-pole motors;

The number of main valves of the single compressor can be modified. The default is 1, and 1 to 2 are adjustable (2 are used for self-cascading units)

After modification is completed, press the [] key to return to the function selection interface.

9. Current fault interface

Click the Current Fault [] button on the function selection interface to enter the current fault query selection interface, as follows:

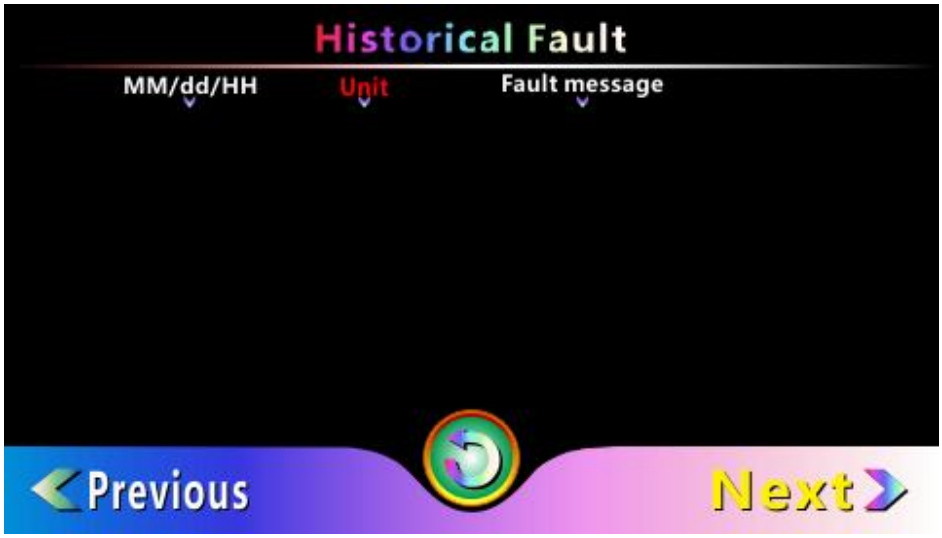
◆ **Current fault interface**

10. Historical fault interface

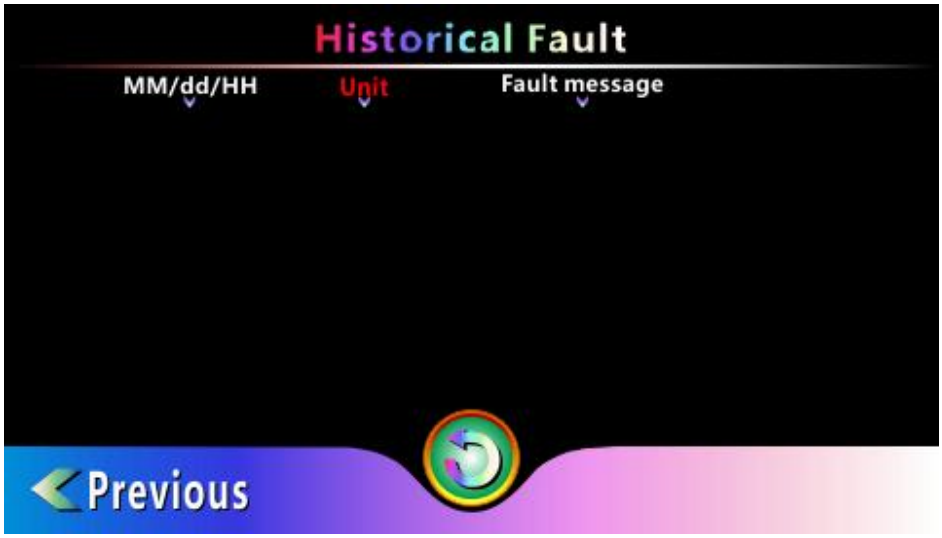
Click the Historical Fault [ ] button on the function selection interface to enter the historical fault query selection interface, as follows:

◆ **Historical fault interface 1**

◆ **Historical fault interface 2**



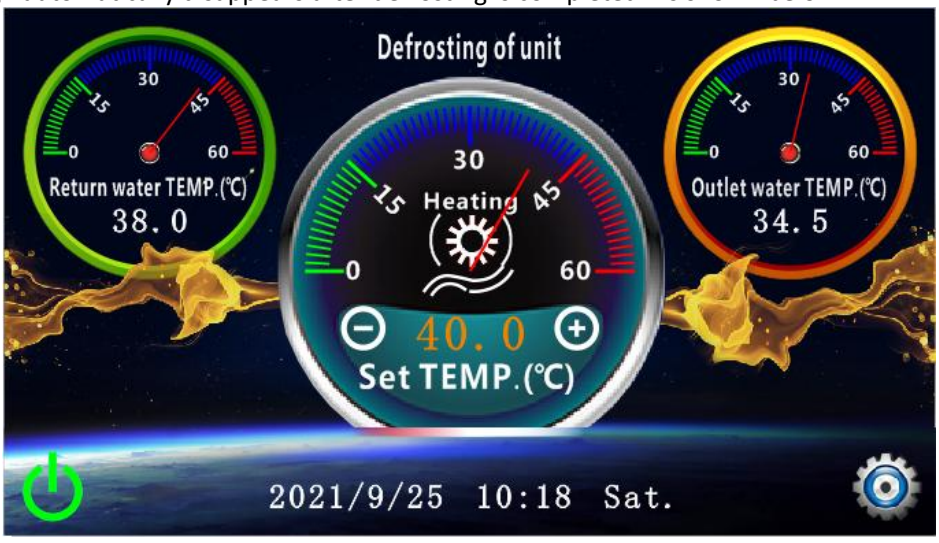
◆ **Historical fault interface 3**



As shown in the figure above, historical faults can be cleared in this interface, and press the [ ] key to return to the function selection interface.

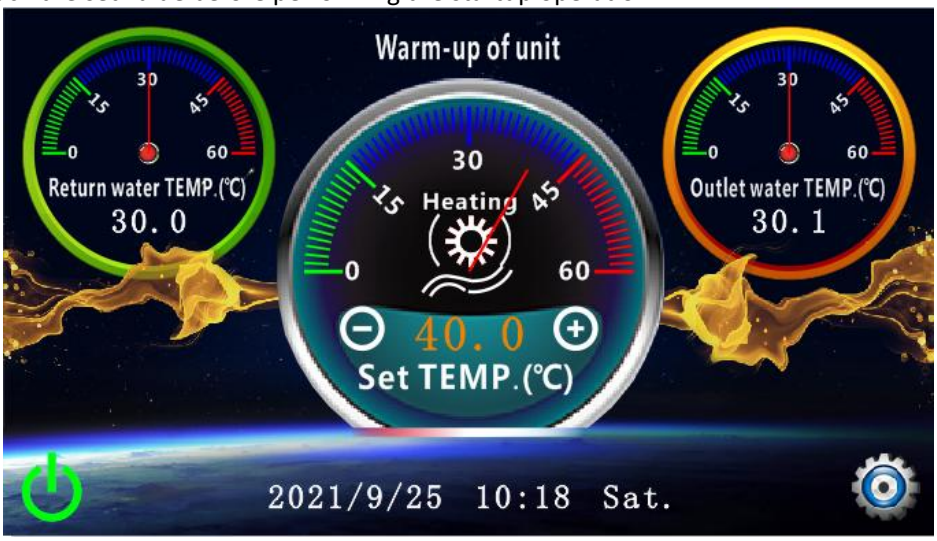
11. Defrost interface

When the unit is defrosting, the main interface displays the [Defrosting of unit] sign, and the sign automatically disappears after defrosting is completed. As shown below:



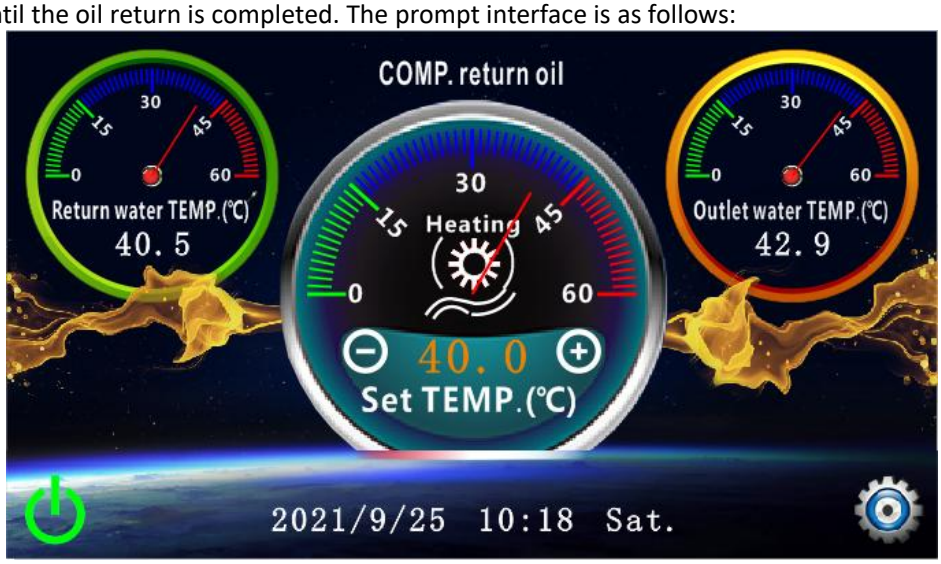
12. Unit preheating prompt interface

When the unit preheating time is set in the unit maintenance parameters, the unit will enter the unit preheating mode when it is powered on for the first time. At this time, the unit will not respond during the startup operation. You must wait for the unit preheating time to reach the set value before performing the startup operation.

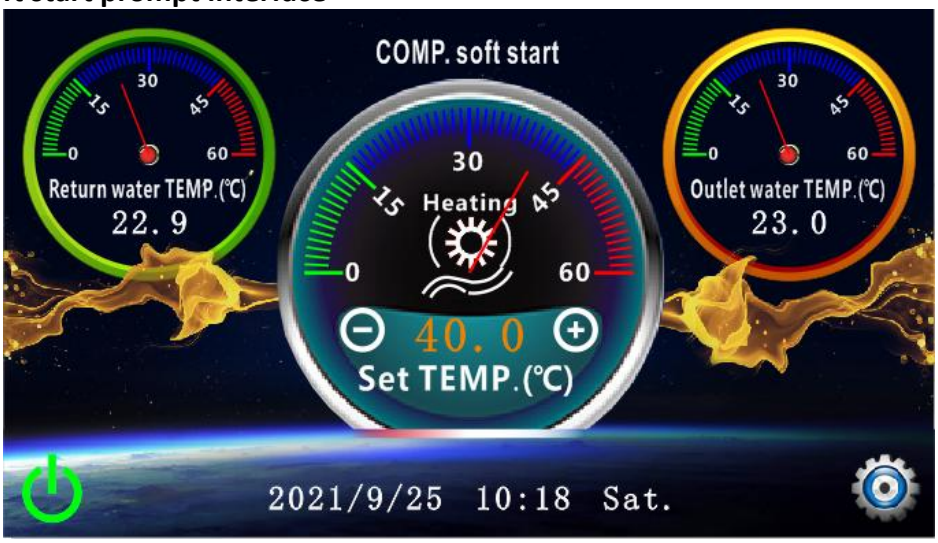


13. Unit oil return prompt interface

When the unit runs the oil return function, the prompt mark on the main interface lights up to prompt oil return. At this time, shutdown and other operations will not be performed until the oil return is completed. The prompt interface is as follows:

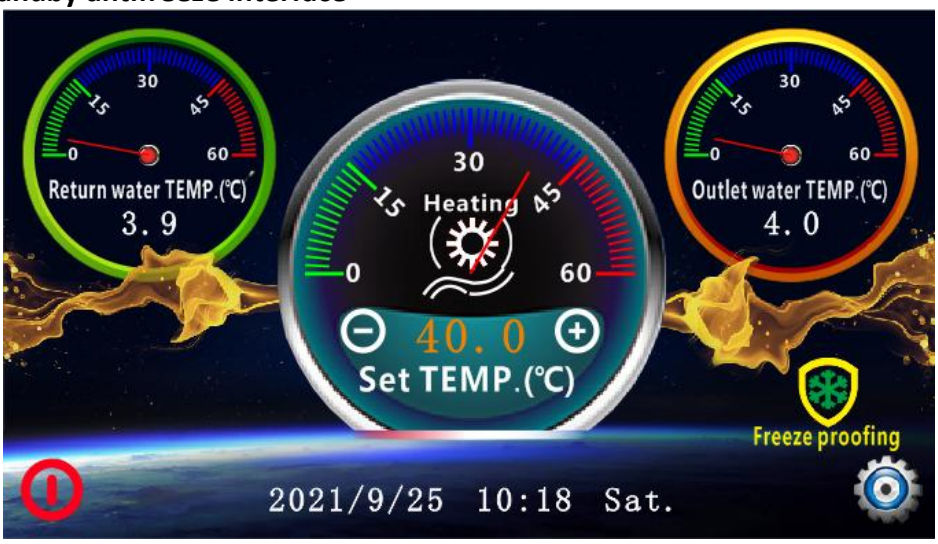


1 4. Soft start prompt interface



When the unit is in the soft start stage, the prompt sign on the main interface lights up to indicate that operations such as shutdown will not be executed until the soft start is completed. The prompt interface is as shown above.

1 5. Standby antifreeze interface



The working power of the unit is not cut off, the unit is in the heating mode and is in the shutdown state. When the unit meets the standby anti-freeze condition, the [Anti-freeze] sign is displayed in the upper left corner of the main interface. The sign is automatically hidden after exiting the anti-freeze function.

⚠ **Note: Since the water pump needs to be started during antifreeze, the water pump must be controlled by the computer board. Do not cut off the power to the unit during winter conditions, otherwise the unit will not be able to automatically operate the standby antifreeze function.**

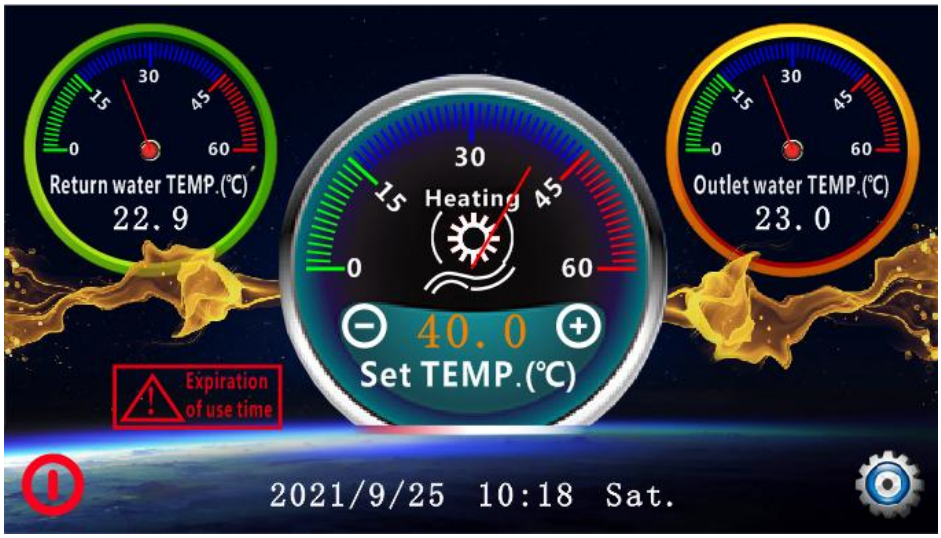
1 6. Limited time operation (dunning) interface

The operation restriction function is the unit overtime usage restriction function (dunning function).

If the unit is set with a time limit function, the controller will automatically accumulate and record the power-on usage time of the unit. When the unit is powered on,

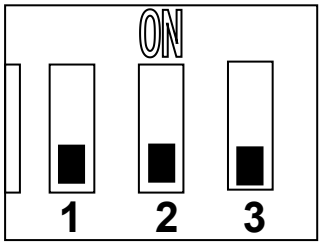
When the usage time reaches the set time, the limit on the use time of the air conditioner is automatically completed, that is, when the unit usage time reaches the set time,

When on duty, the unit will be automatically shut down, and the unit will be locked at this time, as shown in the figure below:


0
15
30
45
60
Return water TEMP.(℃)
22.9
Heating
40.0
Set TEMP.(℃)
Outlet water TEMP.(℃)
23.0
Expiration of use time
2021/9/25 10:18 Sat.

Appendix 1. Main control board address setting table

Outdoor control panel address code switch (Figure 1)



Outdoor control panel address code comparison table

1	2	3	module address
0	0	0	1
0	0	1	2
0	1	0	3
0	1	1	4
1	0	0	5
1	0	1	6
1	1	0	7
1	1	1	8

The address code switch shown in Figure 1 is " 1 " when it is turned upward to ON , and " 0 " when it is turned downward.

Module addresses should be encoded sequentially without interruption

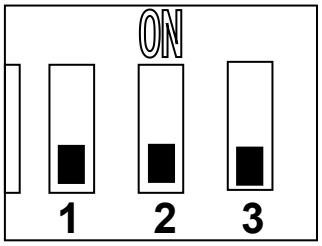


Figure 2: 1#module address

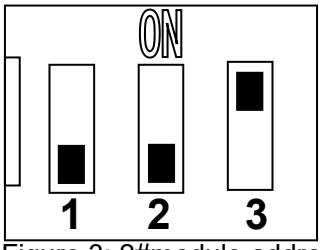


Figure 3: 2#module address

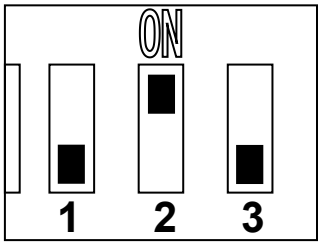


Figure 4: 3#module address

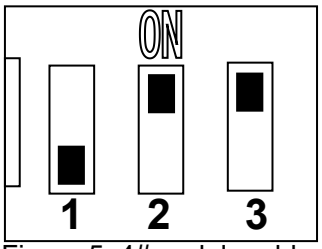


Figure 5: 4#module address

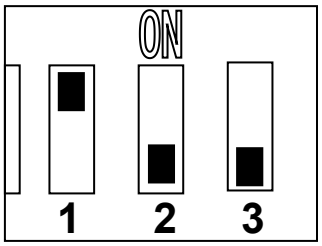


Figure 6: 5#module address

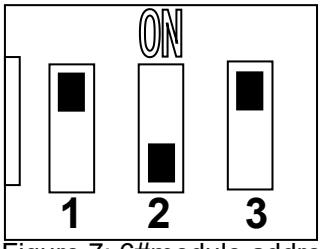


Figure 7: 6#module address

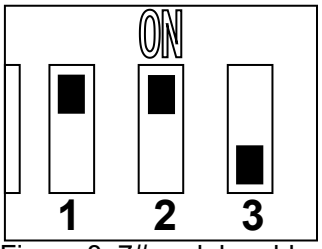


Figure 8: 7#module address

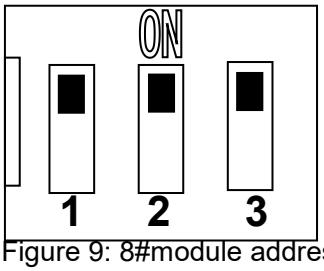


Figure 9: 8#module address

V. Debugging and Running

5.1 The preparation work before the test running

(1) Heat pump units inspection:

◇Check whether the appearance of unit and the inside pipe system is damaged during transportation.

◇Check whether there is air inside the heat pump water pipe, if any, should empty it by the needle valve on heat pump water pipe, or the air vent valve on the water pump.

◇Check whether the fan blades interfere to or touch its fixed plate and shielding cover, make sure no things on or fall into the shielding cover.

(2) Checking Distribution System

◇Check whether the power supply complies with the manual and the unit nameplate.

◇Check whether all the power and control circuits connect absolutely; the wires connects correctly according to the diagram; reliable grounding, all terminals wiring solid.

(3) Check piping system

◇Check whether the piping system, filling pipes, backwater pipes, pressure meter, thermometer, valves, water level switches and other equipment are installed correctly.

◇Check whether the valves needed opening are open and those needed closing are well closed.

◇Check whether the insulation work of piping system is good.

5.2 Testing running

Units test must be operated by professional person.

◇Conduct the overall testing running, until a comprehensive inspection in entire system meets all the requirements.

◇Connect to power supply and start the heat pump, the heat pump starts with 3 minutes delay. For the three-phase power supply units, firstly check whether the fan and the water pump rotate direction is correct. If incorrect, please cut off power supply and adjust the phase sequence.Measure the compressor running current, check if the compressor has abnormal sound.

◇Check whether the unit meets the requirements, run whole system for some time (normally 3 days), if all are fine, then can be put into normal operation.

VI.Troubleshooting

When heat pump unit appears problem, please contact professional maintenance personnel. When maintenance personnel deal with the problems, please refer to below table 7 to exclude error.

Table 7

Fault condition	The possible cause of the malfunction	Treatment measures
Unit no operating	✧ Power supply fault ✧ Unit power cable loose ✧ Control power fuse fusing	✧ Cut off power supply and check the power supply ✧ Pinpoint the cause and fix ✧ Replace the fuse
Water pump operation but water not circulating or water pump noise too large	✧ Shortage of water in water systems ✧ Water systems with air ✧ Water system valve is not completely open ✧ Water filter dirty and blacking	✧ Check the system water refilling device, and refill water to system. ✧ Exclude the air in water systems ✧ Open the valves completely in water system ✧ Clean water filters
Low heating capacity of the unit	✧ Insufficient of refrigerant ✧ Insulation of water system is not good ✧ Dry filter plugging ✧ Air heat exchanger poor heat dissipation ✧ Lack of water flow	✧ System leakage checking and refrigerant charging ✧ Strengthen the water system insulation ✧ Replace the filter ✧ Clean air heat exchanger ✧ Cleaning water filters
Compressor no operation	✧ Power failure ✧ Compressor contactor damage ✧ Loose wiring ✧ Compressor over heat protection ✧ Outlet water temperature is too high ✧ Lack of water flow	✧ Pinpoint the causes of power failure ✧ Replace the contactor ✧ Loose points to identify and fix ✧ Find out the reason of over heat problem, before restart ✧ Reset outlet water temperature ✧ Clean water filters and empty the air inside system
Compressor operating with large noise	✧ Liquid preparation goes into the compressor ✧ Damage of compressor internal parts ✧ Wrong phase sequence ✧ Insufficient lubricating oil	✧ Check whether the throttling device and fan are good ✧ Replace the compressor ✧ Adjust to the correct phase sequence ✧ Add lubricating oil

No operation of fan	✧ Fan fixing screws loose ✧ Fan motor burning ✧ Capacitance of fan is damage	✧ Fastening the fixing screws ✧ Replace the motor or fan ✧ Replace the capacitance
Compressor operation, but the unit no heating	✧ Refrigerant leaks completely ✧ Compressor failure	✧ System leakage checking and refrigerant charging ✧ Replace the compressor
Protection of unit water flow is too low	✧ System is lack of water flow ✧ Target water flow switch not reset	✧ Clean water filter and empty the air in system ✧ Adjust or replace the target flow switch
System high pressure is too large	✧ Water flow is not enough ✧ The heat exchanger of heat source side scaling ✧ Refrigerant too much ✧ Refrigerant way system has non-condensable gas	✧ Check water systems, increase water flow ✧ Clean the heat exchanger ✧ Remove extra refrigerant ✧ Remove non-condensable gas
System low pressure is too low	✧ Filter plugging ✧ Pressure drop that goes by the heat exchanger is too big ✧ Insufficient wind capacity	✧ Replace the filter ✧ Check if the throttle device is normal ✧ Check if fan is normal

VII.Maintenance

The heat pump is a more automatic equipment needing inspection regularly. If the maintenance is long-term and effective, the operation reliability and the service life will have a great increase. Maintenance must be operated by qualified persons.

1.Clean the water filter regularly to ensure the clean water in system and avoid the damage caused by its blocking.

2. When use and maintain the heat pump unit, please noted that all safety protection and parameters are set by factory already, do not change at random.

3. Always check whether the power unit and electrical system cable is solid, and there are abnormal movements between electrical components. If does, carry out timely maintenance and replacement.

4.Check if the filling water valve of water system, safety valve of water tank, liquid level controller and exhaust equipment works normal, in order to avoid air into the system led to the water quantity decrease, then affecting the heating capacity and the reliability of unit.

5.Check whether the water pump and water valve are working properly, check whether the water pipeline or pipe fittings have the problem of leakage.

6.Keep units in the clean, dry and well-ventilated environment, also regularly

clean (1-2 months) the fin evaporator with clean water, to keep good heat absorption, turn the power off when cleaning.

7.Checking whether the components of units working properly, check whether the unit pipe connectors and air valves are with oil, make sure no leakage.

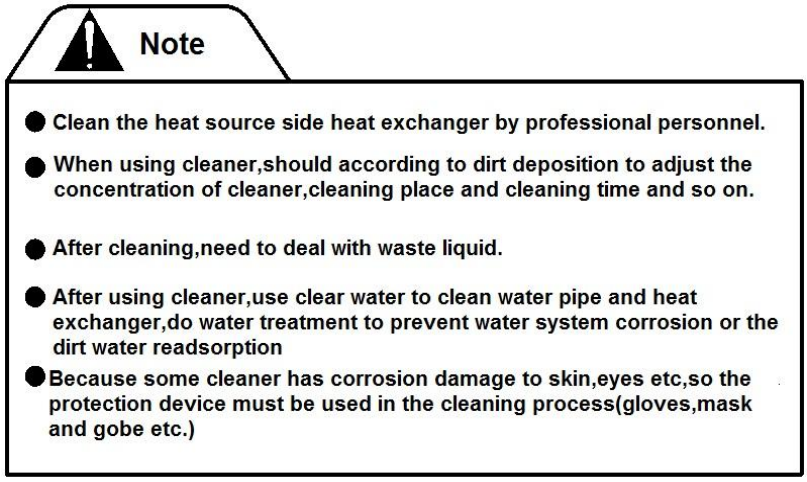
8.Around unit must not pile up sundries, to avoid blocking of the fan outlet, around the unit should be kept clean and dry, well ventilated.

9.Drain the water, cut off the power and put a protective cover,if the downtime is long. A comprehensive checking is necessary before using the unit again.

10.Please contact with the local special maintenance department of our company for the repairs in time if you can not solve failures.

11.About the condenser cleaning, our company recommend adopt 50℃~60℃,the concentration of 15% thermal phosphoric acid solution to clean the condenser, start the unit with circulation pump to clean 3 hours, finally rinse with water for 3 times.(when installation the pipe, please reserved tee interface, using a plug seal interface),in case the pipe connection. Ban with corrosive cleaning to clean the condenser.

12.The tank needs to be in use after a period of time (generally for two months, depending on the local water quality).



VIII.Warranty services

1、The free warranty of our air source heat pump is 24 months, starts from the date of shipment. The after-sale service department of our company will provide consumers free services due to the failure of the product quality under warranty.

2. Warranty certificate:

The heat pump units are free to repair during the warranty period, if the users have the purchase invoice and products warranty card, and need to the product number is same as the warranty card number.

If not, the units are regarded as products surpassing the warranty period.

These products are not enjoy free warranty service, but the company can provide

paid services for users.

3、 The damages caused below are not in the free warranty coverage, but our company could provide paid service.

a. Damage due to the consumer installing, dismantling and repairing.

b. Damage due to transportation and maintenance by consumer themselves, or not Using referring to the manual.

c. Failure due to power supply not meet requirements, or due to natural disasters.

d. Failure duo to the dirty of the outdoor exchanger and the water system, also the irregular clearing the exchanger and filter.

e. Not properly equipping filter for the refilling cold water pipe and water inlet pipe.

f. Equipment failure caused by forced running for large water production seriously Exceeds the heat pump capacity.

g. The warranty card number of the product maintained does not match the product number.

h. Warranty card with an eraser or revise.

i. No warranty card and purchase invoices.

j. Over warranty period products.