DC INVERTER Heat Pump
User Manual
(Carel controller)

Attention

Thank you for choosing our product, we shall be more than glad to service you. For you to better operate this product and to prevent accidents due to misoperation, please read carefully this user manual before carrying out any installation or operation, also please pay special attention to the warning, prohibition and attention instructions. We are continuously supplementing and upgrading this user manual to better service for you!

Contents

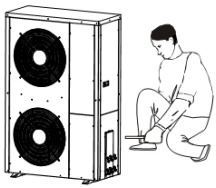
Part 1. Before Use

1. Attentions

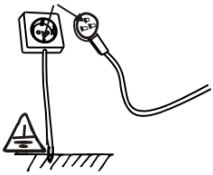
Warning Caution Prohibition

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 have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be super vised to ensure that they do not play with the appliance.

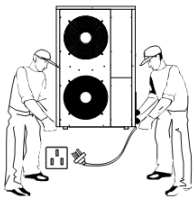
Be sure to read this manual before use.



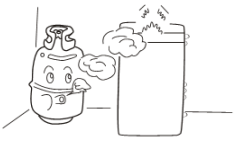
Be sure to read this manual before use. The installation, dismantle mentand maintenance of the unit must be performed by qualified personnel. It is forbidden to do any changes to the structure of the unit. Otherwise injury of personor unit damage might happen.



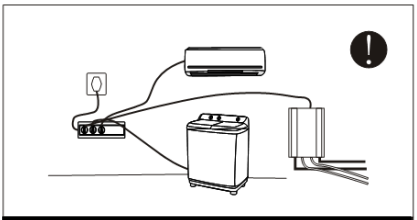
The power supply to the unit must be grounded.



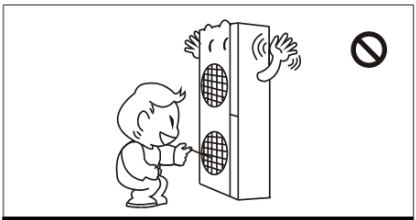
Make sure the power supply to the heat pump unit is off Before any operations are done on the unit.
When the power cord gets looser or is damaged, always get a qualified person to fix it.



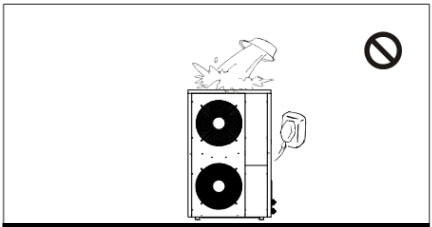
Keep the unit away from the combustible or corrosive environment.



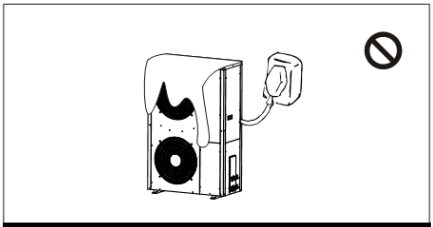
Use a dedicated socket for this unit, otherwise malfunction may occur.



Do not touch the air outlet grill when fan motor is running.

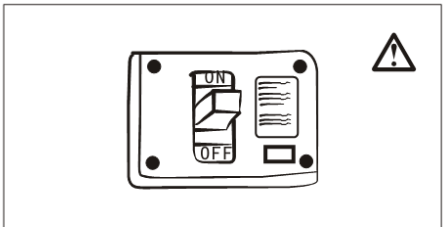


Water or any kind of liquid is strictly forbidden to be poured into the product, or may case creepage or breakdown of the product.



When running the unit, never cover clothes, plastic cloth or any other material that block ventilation on the product which will lead to low efficiency or even non-operation of this unit.

When the power cord gets loose or is damaged, always get a qualified person to fix it.

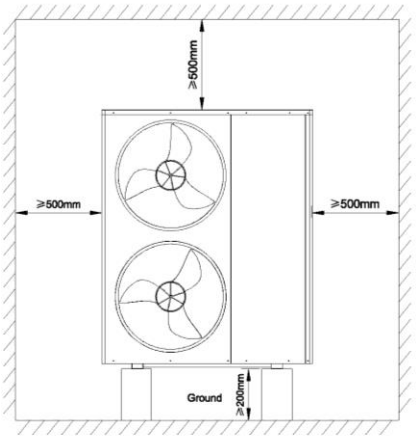


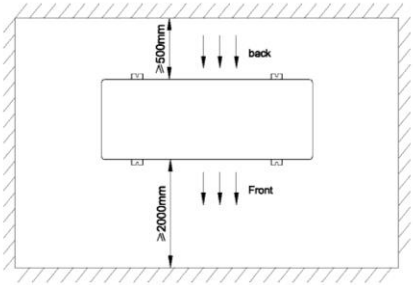
It is mandatory to use a suitable circuit breaker for the heat pump and make sure the power supply to the heater corresponds to the specifications. Otherwise the unit might be damaged.

2. Installation

(1) Heat pump installation location and attentions

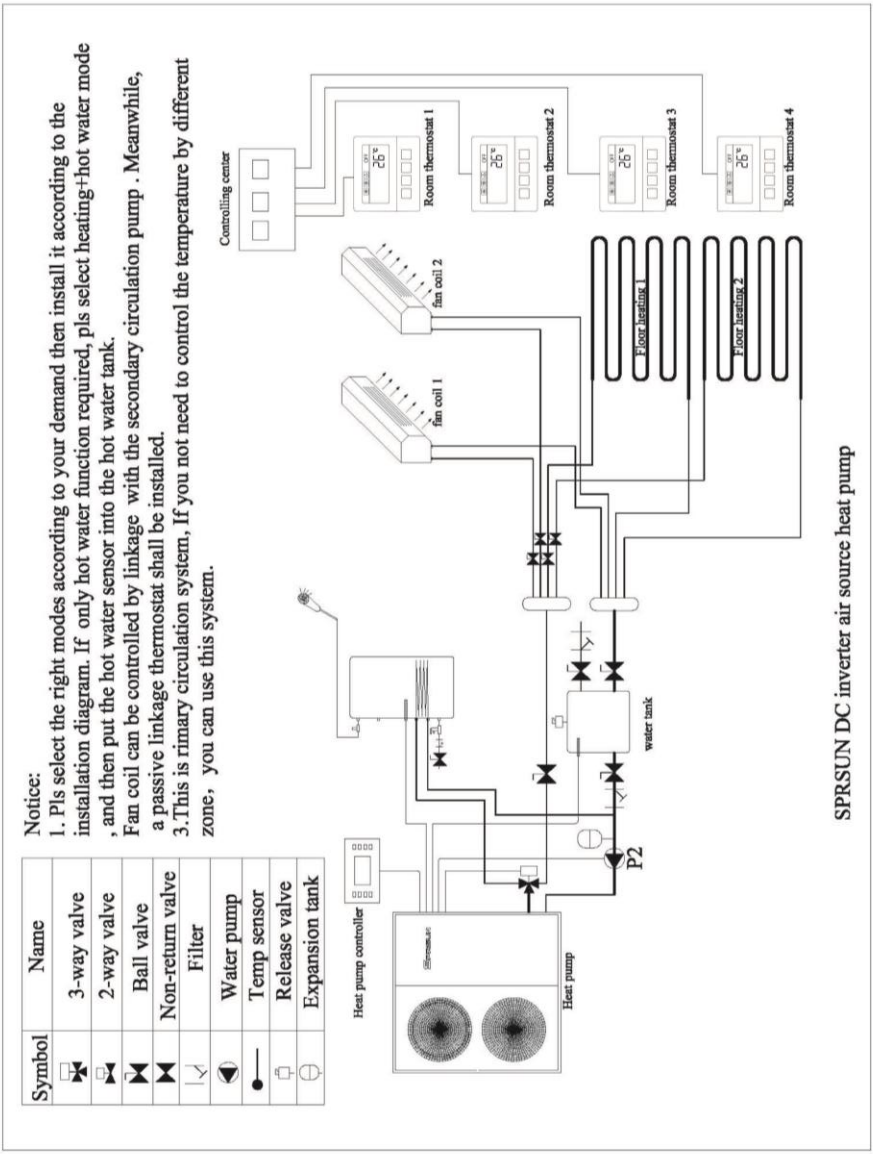
* Heat pump is not allowed to be installed in the place where combustible gas may leaks.
* Heat pump is not allowed to be installed in the place where there is oil or corrosion gas released.
* Heat pump should be installed in a open space, and good ventilating.
* Heat pump each side to wall or barrel should be keep certain distance, air outlet to barrel distance should ≥2m, air inlet distance to wall or barrel≥0.5m, bottom distance to ground ≥0.5m, other side distance should be enough for installation or repairing.
* Heat pump should be installed on concrete basic or steel bracket, and anti-shock pad should be put between heat pump and basic or bracket. Then use expansion bolt to fix heat pump on bracket.
* Water drainage pipe and ditch should be set around heat pump and water pipes and water tank. When testing or repairing, maybe need drain plenty of water, and when heat pump is working, there are some condensed water flow down.



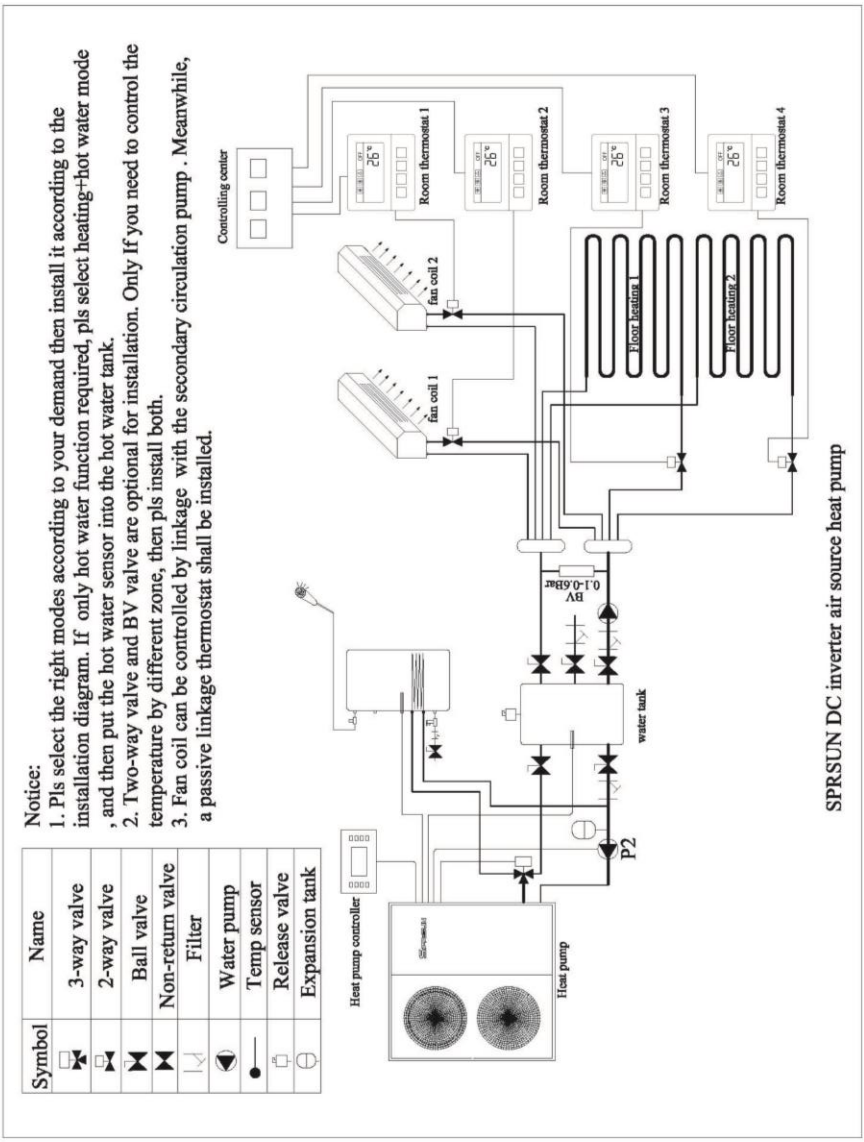


(2) Installation diagram and tips (for reference only, installation shall be based on actual project demand)

Primary circulation system



Secondary circulation system



Tips for installation related to the water pipe part:

- Install a valve at the highest point of each water circulations for releasing air from water system.
- A Y-shape filter is very important in front of circulating water pump of heat pump.
- If more pieces heat pump installed in one water pipe system, the connection of these heat pumps can't be in series, only can be in parallel or independent.

(3) Pre-start up

① Checking before pre-start up

- Check if the water pipe are connected well and if there is any leakage. The water supply valve are open.
- Make sure the water flow is enough and meet the demand of the heat pump selected and water flow smoothly without air . In cold area, pls make sure that the water flow is without freezing
- Check if the power cable is connected well and properly grounded.
- Check if fan blade is blocked by the fixing plate of fan blade and fan blade protecting grill.
- Check if the tank has been filled with water or enough water volume that can meet the demand of heat pump running

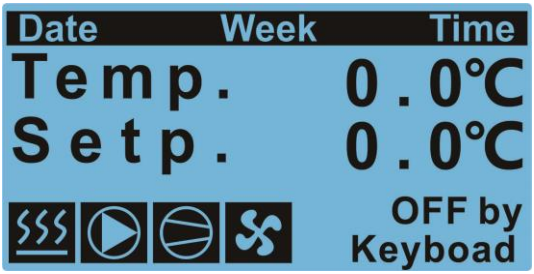
⚠ If everything above is OK, the unit can start up. If any of them fails, please improve it.

② Pre-start up

- After check completely and confirm no problem for installation, the unit can be power to start up .
- After connect power supply, heat pump delay 3mins to start. Check carefully is there is some abnormal noise or vibration or if the working current is normal or if water temp increasing is normal.
- After the unit is working properly for 10 minutes without any problem, then the pre-start up is usefully completed. If not, pls refer to Service and Maintenance Chapter to solve the problem.

Part 2. Use

Main interface



The icon：

1， Heating mode

2， Pump

3， Compressor

4， Fan

5， Defrost

6， Cooling mode

7， Alarm

8， Exit Esc

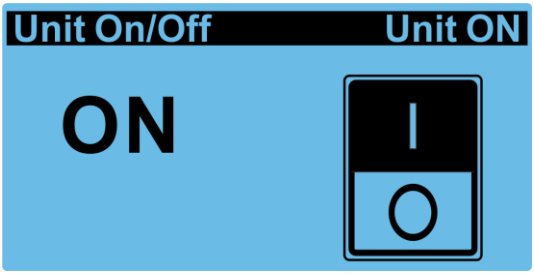
9， Menu & Confirm

10， Select

11， Factory parameters Prg

1、 Turn on/off

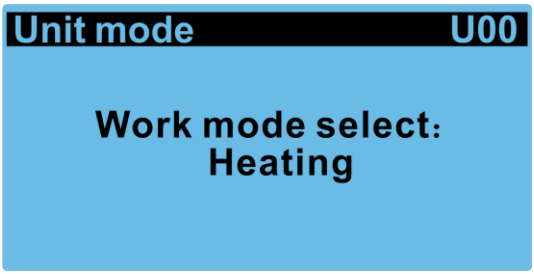
Press ↵ to access menu，press↑↓botton to select Unit On/Off, then press ↵ to confirm. Press↑↓Botton to turn on/off，and press ↵ to confirm：



2、 Mode switching（Heating， Cooling,Hot water,Hot water+cooling, Hot water+heat）

Press ↵ to access menu，press↑↓botton to select User Mask，then press ↵ to confirm. Press↑↓Botton to switch mode，and press ↵ to confirm, Egc. Mode switching&Temperature setting.

Attention：Only switch mode when the unit is turn off

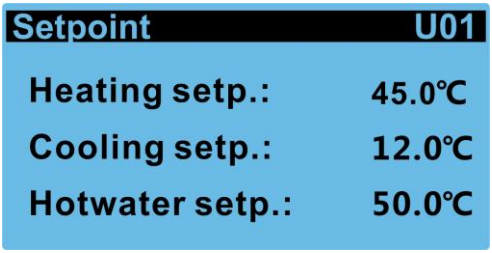


The setting temperature interface is as follows:

Heating setp: heating setting temperature

Cooling setp: cooling setting temperature

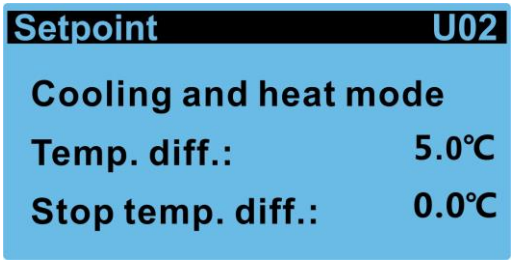
Hotwater setp: hot water setting temperature



Set Temp.diff and Stop temp. diff. of hot water

Temp.diff: The difference between the unit restart temperature and the set temperature after standby.

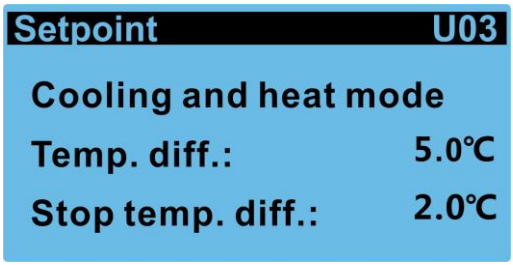
Stop temp.diff: The difference between the unit's shutdown temperature and the set temperature after reaching the setting temperature.



Set Temp.diff and Stop temp. diff. of heating and cooling

Temp.diff: The difference between the unit restart temperature and the set temperature after standby.

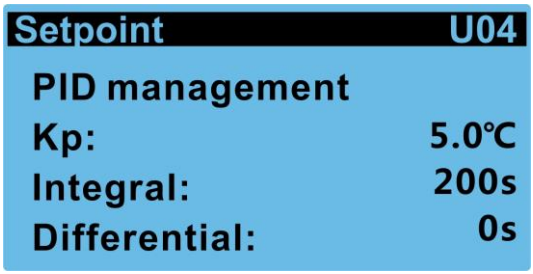
Stop temp.diff: The difference between the unit's shutdown temperature and the set temperature after reaching the setting temperature.



Set PID

Kp: The larger the value, the faster the heat pump adjustment speed (not recommended to adjust this parameter).

Integral and Differential: (not recommended to adjust this parameter).



Pump work:

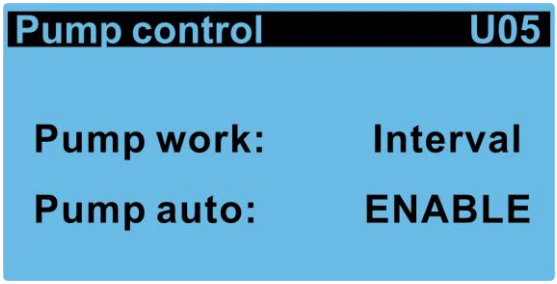
Normal - the water pump is always on during standby; Interval, the water pump is on every 3 minutes during standby;

Demand - the water pump stops during standby.

Pump auto:

ENABLE - the water pump is automatically turned on according to the temperature difference adjustment;

DISABLE - the water pump is automatically turned off according to the temperature difference adjustment.



Fan mode:

Low speed - economic mode, the heat pump can automatically output capacity as required according to the ambient temperature;

Nigt - night mode, the heat pump has low output capacity from 8 pm to 8 am, and high output at other times; Daytime, day mode, the compressor outputs according to the maximum capacity; Pressure, test mode, the heat pumpoutputs according to the test capacity.

Enable heater:

ALL-both floor heating and hot water mode enable electric heating; This mode electric heater must be installed on the main pipe.

Heating-only start electric heating in heating mode; This mode electric heater must be installed in the expansion water tank.

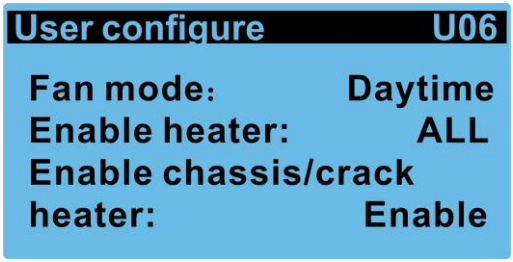
Hot water-only enable electric heating in hot water mode; This mode electric heater must be installed in the hot water tank.

Disable - disable electric heating.

Enable chassis/crack:

Enable - enable chassis electric heating/crankshaft electric heating;

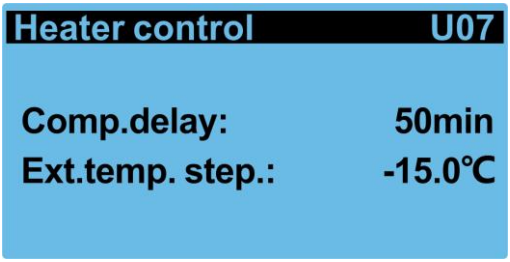
Disable - disable chassis electric heating/crankshaft electric heating.



Heater control:

Comp.delay: The delay time to start the electric heating after the compressor starts, the default is 50 minutes.

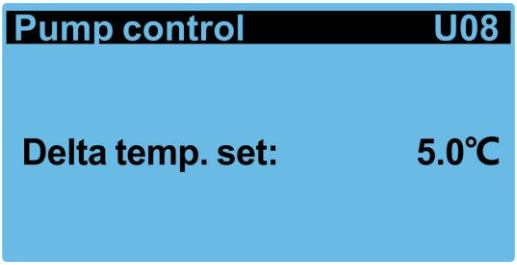
Ext.temp.setp: The maximum allowable ambient temperature for starting electric heating, the default is -15 degrees.



Delta temp.set:

Variable frequency water pump speed adjustment target value of temperature difference between inlet and outlet water: the default is 5 degrees;

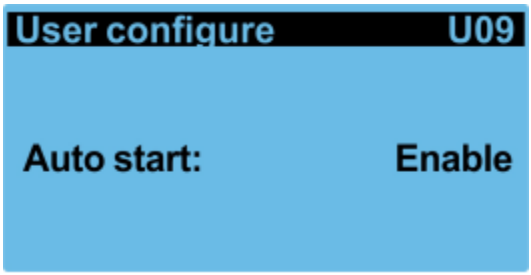
The output of the variable frequency water pump increases when the temperature difference between the inlet and outlet water is greater than 5 degrees, and the output of the variable frequency pump decreases when the temperature difference between the inlet and outlet water is less than 5 degrees.



Auto start:

Disable - after the heat pump is powered off, the heat pump will not automatically start;

Enable - the heat pump will automatically start after the heat pump is powered off



Enable Switch:

Disable - turn off the function of automatically switching the cooling/heating mode based on the ambient temperature;

Enable - turn on the automatic switching of the cooling/heating mode based on the ambient temperature.

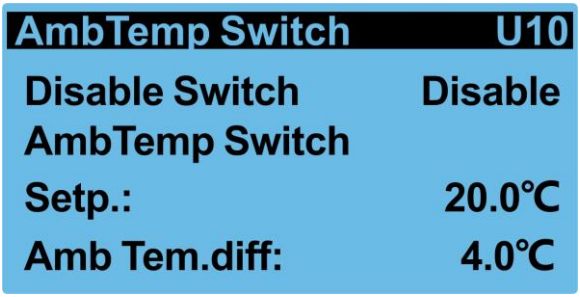
AmbTemp Switch setp: Switch the ambient temperature setting point of the cooling/heating mode;

when the ambient temperature is lower than the set point-hysteresis, the unit will automatically switch to heating or hot water + heating;

when the ambient temperature is higher than the set point +In case of hysteresis, the unit will automatically switch to cooling or hot water+refrigeration;

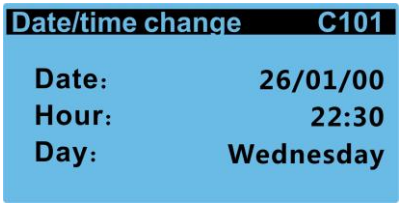
when the ambient temperature is higher than the set point-hysteresis and lower than the set point + hysteresis maintains the current mode

Amb Temp.diff: The difference between the ambient temperature switching mode and the set temperature.



3、TimeZone/CLOCK

Press ↵ to access menu，press↑↓botton to select TimeZone/CLOCK , then press ↵ to confirm，Press↑↓Botton to change the setting, and press ↵ to confirm.



Timezone on off：

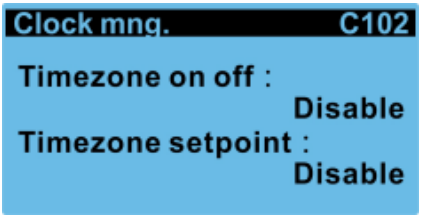
Enabl - Turn on the timer switch function, the unit can be set to switch on and off time for one week after it is switched on;

Disabl - Turn off the timer switch function.

Timezone setpoint：

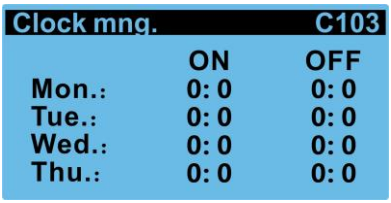
Enabl - Turn on the timer temperature setting function, the unit can set different temperatures in four time periods of a day after it is turned on;

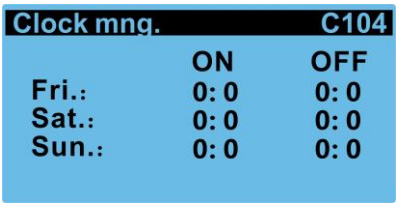
Disabl - Turn off the timer setting temperature function.



Timezone on off

Timing setting interface, under ON is the power-on time, and under OFF is the off-time.

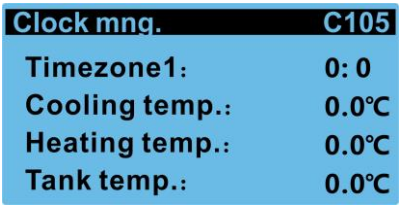


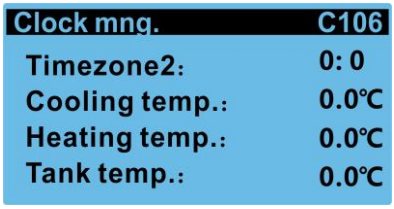


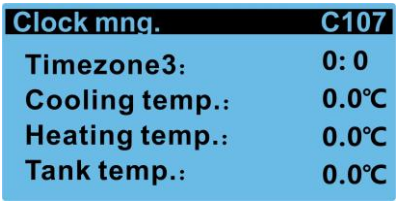
Timezone setpoint Timing setting temperature interface;

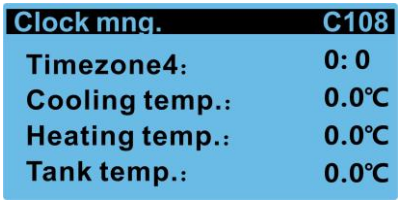
Timezone1 is the start time of the first time period, **Timezong2** is the cut-off time of the first time period and the start time of the second time period, and so on.

Cooling temp、**Heating temp**、**Tank temp** Set the temperature for cooling, heating, and hot water for the corresponding time period



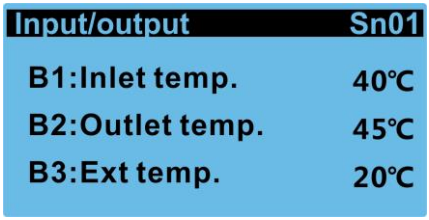


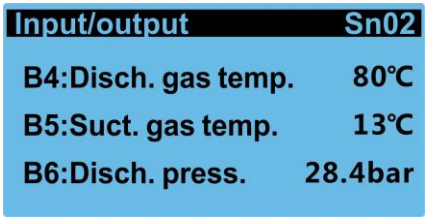


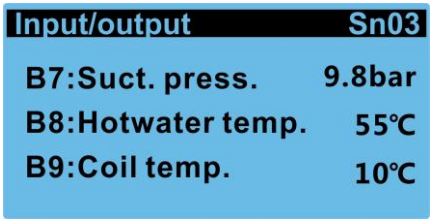


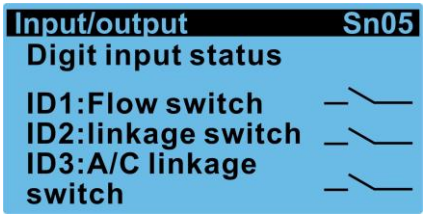
4、Input/Output

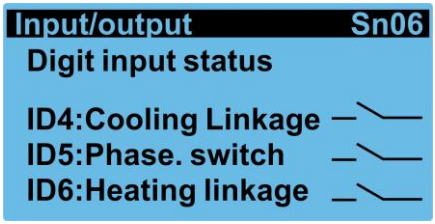
Press ↵ to access menu，press↑↓botton to select I/O mask, then press ↵ to confirm ， Press↑↓Botton to see the I/O ， E.gc Water temperature/ Pressure/Frequency and so on.

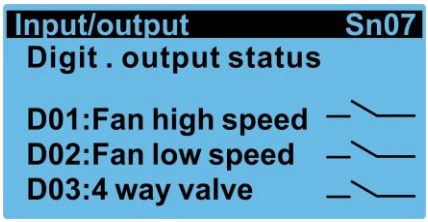


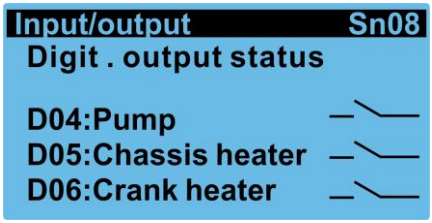


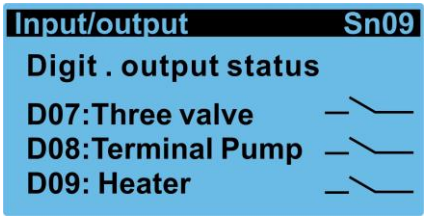


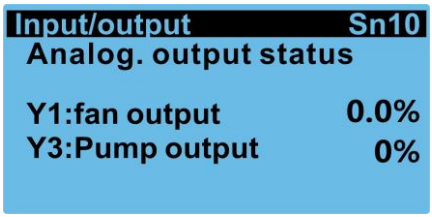






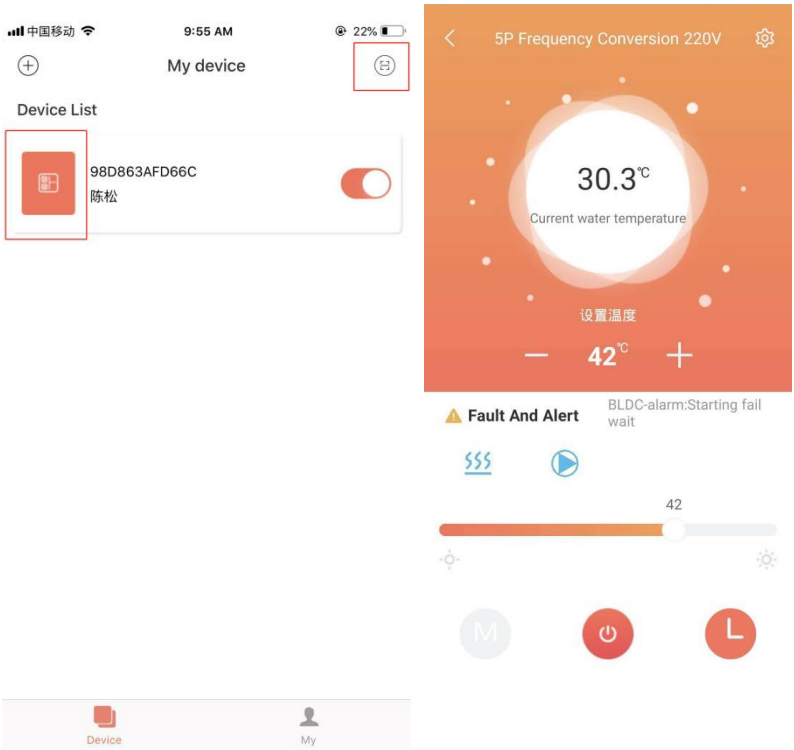






5、APP function

5.1 Device Homepage

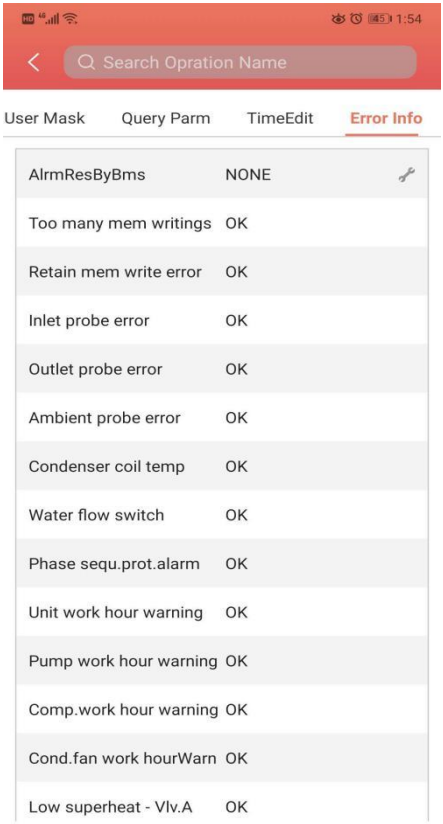


Explanation

1) Click a device in the device list to enter this page.
2) The background color of the bubble indicates the current operating state of the device:
   a. Gray indicates that the device is in the shutdown state, at this time, you can change the working mode, set the mode temperature, set the timing, or you can press the key to switch on and off.
   b. Multicolor indicates that the device is turned on, each working mode corresponds to a different color, orange indicates heating mode, red indicates hot water mode, and blue indicates cooling mode。
   c. When the device is in the power-on state, you can set the mode temperature, set the timer, press the key to switch on and off, but you

can not set the working mode (that is, the working mode can only be set when the device is off)

3) The bubble shows the current temperature of the device.
4) Below the bubble is the set temperature of the device in the current operating mode.
5) Set the temperature is about ＋, — button，Each click adds or subtracts the current setting value to the device.
6) Below the setting temperature is the Fault And Alert. When the device starts to alarm, the specific Alert reason will be displayed next to the yellow warning icon. In case of device Fault And Alert, the Fault And Alert content will be displayed on the right side of this area. Click this area to jump to the detailed Error Information.

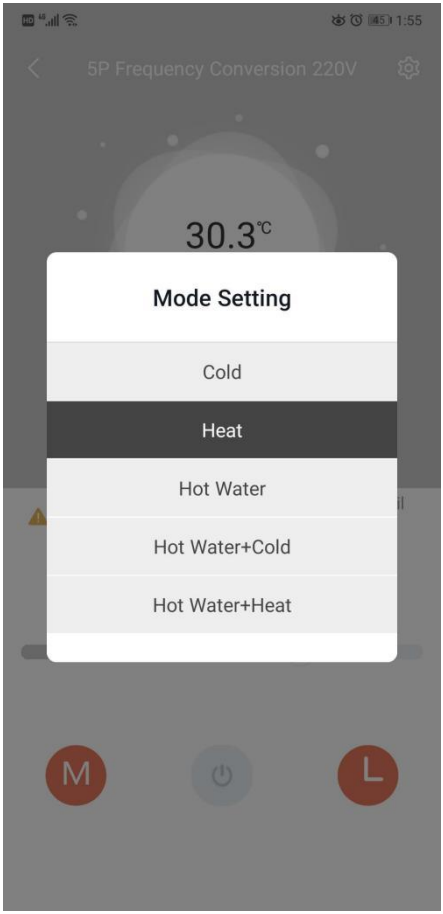


7) Immediately below the fault alarm area, display the current working mode, heat pump, fan and compressor in sequence (corresponding blue icon when it is on, but not displayed when it is off).

8) The slide bar below is used to set the temperature in the current mode. Slide the slider left and right to set the allowable temperature in the current working mode.

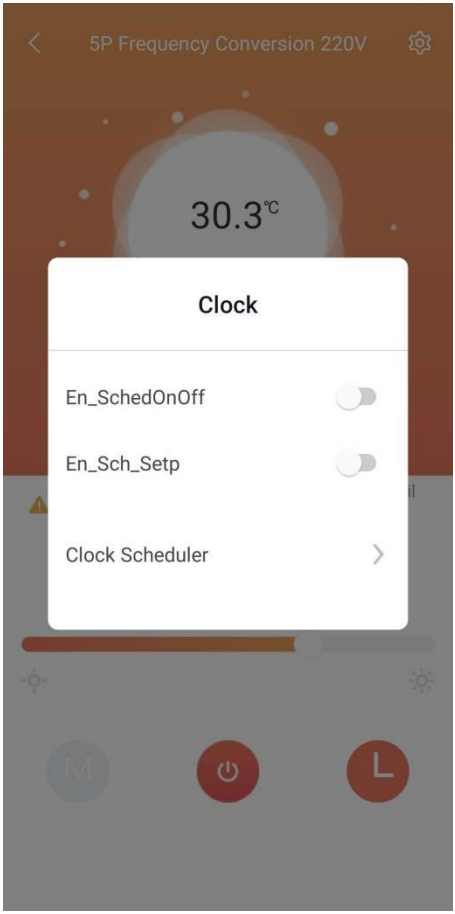
9) The bottom three buttons are in order from left to right: working mode, device switching machine and device timing. When the current background is color, the working mode button cannot be clicked.

   a. Click Work Mode to see the mode selection menu, and you can set the working mode of the device (black is the current setting mode of the device). The diagram as below：



b. Click "on/off" and set "on/off" command to the device.

c. Click the device Timer to see the Timer Settings menu. Click the Clock Schedule to set the device Timer function. The diagram below:



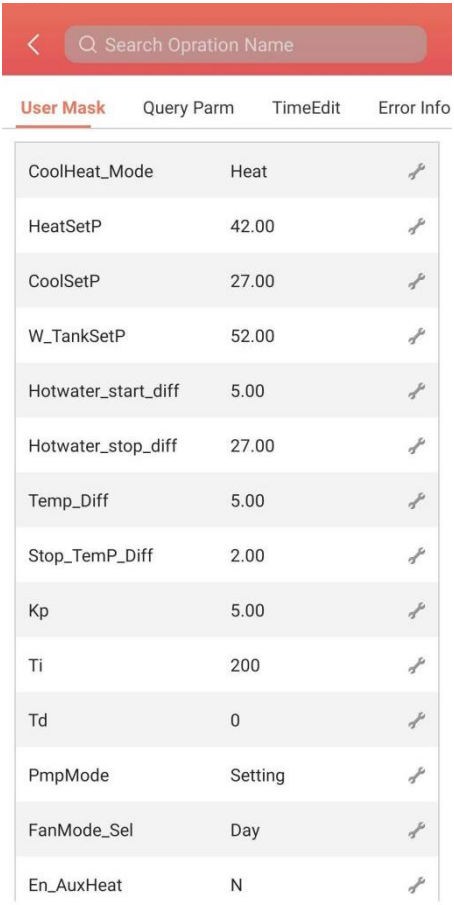
Detailed information of the units

Note :

1) Click this Main Interface menu on the upper right corner to enter this setting page.

2) Users with manufacturer rights can check all the functions , including:

User mask, defrost , other parm, factory settings, manual control , query parm, time edit, error info.



3) User with user rights , only can check part of the functions: User mask, query parm, TimeEdit , alarms.

User setting parameter:

Parameter Name		Initial Value
Unit mode		Heating
Heating setp.		45℃
Cooling setp.		12℃
Hotwater setp.		50℃
Temp. diff.		5℃
Stop temp. diff.		0℃
Cool and heat mode Temp. diff.		5℃
Stop temp. diff.		2℃
Kp		5℃
Integral		200s
Differential		0s
Pump work		Interval
Pump Auto		Enable
Fan model		Daytime
Enable heater		Enable
Enable chassic/crack heater		Enable
Heater control-Comp. delay		50min
Heater control-Ext.temp.setp.		-15℃
Pump control	Delta temp. set.	5℃
Auto start		Enable

Part 3. Maintenance and repairing

1、Maintenance Tips

The heat pump unit is a highly automated equipment. The unit status check is carried out regularly during use. If the unit can be maintained and maintained for a long time and effectively, the unit's operational reliability and service life will be unexpectedly improved.

1、Users should pay attention to the use and maintenance of this unit: all safety protection devices in the unit are set before leaving the factory, do not adjust by yourself;

2、Always check whether the power supply and electrical system wiring of the unit is firm, whether the electrical components are malfunctioning, and if necessary, repair and replace them in time;

3、Always check the water system's hydration, the water tank safety valve, the liquid level controller and the exhaust device to work properly, so as to avoid the air circulation into the system and reduce the water circulation, thus affecting the unit's heating capacity and unit operation reliability;

4、The unit should be kept clean and dry and well ventilated. Regularly clean (1-2 months) air-side heat exchangers to maintain good heat transfer;

5、Always check the operation of each component of the unit, check the oil pipe at the pipe joint and the gas valve, and ensure that the refrigerant of the unit is not leaking;

6、Do not stack any debris around the unit to avoid blocking the air inlet and outlet. The unit should be clean and dry and well ventilated.

7、If the downtime is long, the water in the unit piping should be drained, and the power supply should be cut off and the protective cover should be placed. When running again, check the system thoroughly before starting up;

8、If the unit fails and the user cannot solve the problem, please inform the company's special maintenance department in order to send someone to repair it in time;

9、The main unit condenser cleaning, the company recommends using a 50 ° C concentration of 15% hot oxalic acid to clean the condenser, start the host with a circulating water pump for 20 minutes, and finally rinse with tap water 3 times. (It is recommended to reserve a three-way interface when installing the pipe and seal one interface with a wire plug) in case of cleaning. Do not wash the condenser with a corrosive cleaning solution. The water tank needs to be removed after a period of use (usually two months, depending on local water quality).

2、Error input and protection alarm

AL001	Too many mem writings
AL002	Retain mem write error
AL003	Inlet probe error
AL004	Outlet probe error
AL005	Ambient probe error
AL006	Condenser coil temp
AL007	Water flow switch
AL008	Phase sequ.prot.alarm
AL009	Unit work hour warning
AL010	Pump work hour warning
AL011	Comp.work hour warning
AL012	Cond.fan work hourWarn
AL013	Low superheat - Vlv.A
AL014	Low superheat - Vlv.B
AL015	LOP - Vlv.A
AL016	LOP - Vlv.B
AL017	MOP - Vlv.A
AL018	MOP - Vlv.B
AL019	Motor error - Vlv.A
AL020	Motor error - Vlv.B
AL021	Low suct.temp. - Vlv.A
AL022	Low suct.temp. - Vlv.B
AL023	High condens.temp.EVD
AL024	Probe S1 error EVD
AL025	Probe S2 error EVD
AL026	Probe S3 error EVD
AL027	Probe S4 error EVD
AL028	Battery discharge EVD

AL029	EEPROM alarm EVD
AL030	Incomplete closing EVD
AL031	Emergency closing EVD
AL032	FW not compatible EVD
AL033	Config. error EVD
AL034	EVD Driver offline
AL035	BLDC-alarm:High startup DeltaP
AL036	BLDC-alarm:Compressor shut off
AL037	BLDC-alarm:Out of Envelope
AL038	BLDC-alarm:Starting fail wait
AL039	BLDC-alarm:Starting fail exceeded
AL040	BLDC-alarm:Low delta pressure
AL041	BLDC-alarm:High discarge gas temp
AL042	Envelope-alarm:High compressor ratio
AL043	Envelope-alarm:High discharge press.
AL044	Envelope-alarm:High current
AL045	Envelope-alarm:High suction pressure
AL046	Envelope-alarm:Low compressor ratio
AL047	Envelope-alarm:Low pressure diff.
AL048	Envelope-alarm:Low discharge pressure
AL049	Envelope-alarm:Low suction pressure
AL050	Envelope-alarm:High discharge temp.
AL051	Power+ alarm:01-Overcurrent
AL052	Power+ alarm:02-Motor overload
AL053	Power+ alarm:03-DCbus overvoltage
AL054	Power+ alarm:04-DCbus undervoltage
AL055	Power+ alarm:05-Drive overtemp.
AL056	Power+ alarm:06-Drive undertemp.
AL057	Power+ alarm:07-Overcurrent HW
AL058	Power+ alarm:08-Motor overtemp.
AL059	Power+ alarm:09-IGBT module error
AL060	Power+ alarm:10-CPU error

AL061	Power+ alarm:11-Parameter default
AL062	Power+ alarm:12-DCbus ripple
AL063	Power+ alarm:13-Data comm. Fault
AL064	Power+ alarm:14-Thermistor fault
AL065	Power+ alarm:15-Autotuning fault
AL066	Power+ alarm:16-Drive disabled
AL067	Power+ alarm:17-Motor phase fault
AL068	Power+ alarm:18-Internal fan fault
AL069	Power+ alarm:19-Speed fault
AL070	Power+ alarm:20-PFC module error
AL071	Power+ alarm:21-PFC overvoltage
AL072	Power+ alarm:22-PFC undervoltage
AL073	Power+ alarm:23-STO DetectionError
AL074	Power+ alarm:24-STO DetectionError
AL075	Power+ alarm:25-Ground fault
AL076	Power+ alarm:26-Internal error 1
AL077	Power+ alarm:27-Internal error 2
AL078	Power+ alarm:28-Drive overload
AL079	Power+ alarm:29-uC safety fault
AL080	Power+ alarm:98-Unexpected restart
AL081	Power+ alarm:99-Unexpected stop
AL082	Power+ safety alarm:01-Current meas.fault
AL083	Power+ safety alarm:02-Current unbalanced
AL084	Power+ safety alarm:03-Over current
AL085	Power+ safety alarm:04-STO alarm
AL086	Power+ safety alarm:05-STO hardware alarm
AL087	Power+ safety alarm:06-PowerSupply missing
AL088	Power+ safety alarm:07-HW fault cmd.buffer
AL089	Power+ safety alarm:08-HW fault heater c.
AL090	Power+ safety alarm:09-Data comm. Fault
AL091	Power+ safety alarm:10-Compr. stall detect
AL092	Power+ safety alarm:11-DCbus over current

AL093	Power+ safety alarm:12-HWF DCbus current
AL094	Power+ safety alarm:13-DCbus voltage
AL095	Power+ safety alarm:14-HWF DCbus voltage
AL096	Power+ safety alarm:15-Input voltage
AL097	Power+ safety alarm:16-HWF input voltage
AL098	Power+ safety alarm:17-DCbus power alarm
AL099	Power+ safety alarm:18-HWF power mismatch
AL100	Power+ safety alarm:19-NTC over temp.
AL101	Power+ safety alarm:20-NTC under temp.
AL102	Power+ safety alarm:21-NTC fault
AL103	Power+ safety alarm:22-HWF sync fault
AL104	Power+ safety alarm:23-Invalid parameter
AL105	Power+ safety alarm:24-FW fault
AL106	Power+ safety alarm:25-HW fault
AL107	Power+ safety alarm:26-reseved
AL108	Power+ safety alarm:27-reseved
AL109	Power+ safety alarm:28-reseved
AL110	Power+ safety alarm:29-reseved
AL111	Power+ safety alarm:30-reseved
AL112	Power+ safety alarm:31-reseved
AL113	Power+ safety alarm:32-reseved
AL114	Power+ alarm:Power+ offline
AL115	EEV alarm:Low superheat
AL116	EEV alarm:LOP
AL117	EEV alarm:MOP
AL118	EEV alarm:High condens.temp.
AL119	EEV alarm:Low suction temp.
AL120	EEV alarm:Motor error
AL121	EEV alarm:Self Tuning
AL122	EEV alarm:Emergency closing
AL123	EEV alarm:Temperature delta
AL124	EEV alarm:Pressure delta

AL125	EEV alarm:Param.range error
AL126	EEV alarm:ServicePosit% err
AL127	EEV alarm:ValveID pin error
AL128	Low press alarm
AL129	High press alarm
AL130	Disc.temp.probe error
AL131	Suct.temp.probe error
AL132	Disc.press.probe error
AL133	Suct.press.probe error
AL134	Tank temp.probe error
AL135	EVI SuctT.probe error
AL136	EVI SuctP.probe error
AL137	Flow switch alarm
AL138	High temp. alarm
AL139	Low temp. alarm
AL140	Temp.delta alarm
AL141	EVI alarm:Param.range error
AL142	EVI alarm:Low superheat
AL143	EVI alarm:LOP
AL144	EVI alarm:MOP
AL145	EVI alarm:High condens.temp.
AL146	EVI alarm:Low suction temp.
AL147	EVI alarm:Motor error
AL148	EVI alarm:Self Tuning
AL149	EVI alarm:Emergency closing
AL150	EVI alarm:ServicePosit% err
AL151	EVI alarm:ValveID pin error
AL152	Supply power error
AL153	Fan1 fault
AL154	Fan2 fault
AL155	Fans Offline
AL165	Slave1 Offline

AL166	Master Offline
AL167	Slave2 Offline
AL168	Slave3 Offline
AL169	Slave4 Offline
AL170	Slave5 Offline
AL171	Slave6 Offline
AL172	Slave7 Offline
AL173	Slave8 Offline
AL174	Slave9 Offline

3、 Other problem and repairing

No	Error	Possible reason	Method

1	Heat pump doesn’t run	1. Power supply cable is loose 2. The fuse of power supply is fused.	1. Cut off the power supply to check and repair. 2. Change the fuse.
2	Heating capacity is too small	1. Refrigerant is not enough 2. Water system insulating is not good 3. Air heat exchanger is dirty 4. Water heat exchanger scaled	1. Check leakage and repair and refill gas 2. Improve the insulation 3. Clean air heat exchanger 4. Clean water heat exchanger
3	Compressor doesn’t run	1. Power supply has error 2. Cable connecting is loose 3. Compressor is overheat	1. Check reason and solve 2. Check loose and repair 3. Check reason and repair
4	Compressor noise is loud	1. Expansion valve damaged lead to liquid entering compressor 2. The internal parts of compressor damaged 3. Compressor lack of oil	1. Change expansion valve 2. Change compressor 3. Compensate oil for compressor
5	Fan motor doesn’t run	1. Fan blade fixing screw is loose 2. Fan motor damaged 3. Fan motor capacitance damaged	1. Tight the screw 2. Change fan motor 3. Change the capacitance
6	Compressor run, but not heat	1. There is not refrigerant at all 2. Compressor damaged	1. Check leakage and repair 2. Change compressor

Warranty card

Product model：　　Bar code：

Buyer		Address	
Invoice No.		Date	

Repair date	Repair record	Repairer

Items of warranty:

1. Warranty terms: _____; Within warranty, any problem because of quality, please contact us for support.

2. When repair needed, please show the warranty card and invoice of order or other proof.

3. We don't afford the problem that is caused by re-fitment or adding other function by user.

4. Warranty card and invoice or other purchasing proof will be invalid if alerted.

5. Please keep the warranty card and invoice or other purchasing proofs well, we will need these for service purpose.

6. We will not provide free warranty for below conditions:

(1) without proof;

(2) errors caused by re-fitment or not correct operating;

(3) damage caused by not professional people operating;

(4) faulty by moving or falling;

(5) faulty caused by natural disaster;

(6) After the power failure, the water in the pipeline of the unit was not discharged, which caused the unit to freeze.

CERTIFICATE

Product Model: _____

_____

Bar code: _____

_____