SWIMMING POOL HEAT PUMP UNIT

Installation & Instruction Manual

CONTENTS

1. PREFACE

- In order to provide our customers with quality, reliability and versatility, this product has been made to strict production standards. This manual includes all the necessary information about installation, debugging, discharging and maintenance. Please read this manual carefully before you open or maintain the unit. The manufacture of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, or unnecessary maintenance. It is vital that the instructions within this manual are adhered to at all times. The unit must be installed by qualified personnel.

- The unit can only be repaired by qualified installer centre , personnel or an authorised dealer.

- Maintenance and operation must be carried out according to the recommended time and frequency, as stated in this manual.

- Use genuine standard spare parts only.
  Failure to comply with these recommendations will invalidate the warranty.

- Swimming Pool Heat Pump Unit heats the swimming pool water and keeps the temperature constant. For split type unit, The indoor unit can be Discretely hidden or semi-hidden to suit a luxury house.

  Our heat pump has following characteristics:

  1 Durable
  The heat exchanger is made of PVC & Copper Nickle tube which can withstand prolonged exposure to swimming pool water.
  2 Installation flexibility
  The unit can be installed outdoors or indoors.
  3 Quiet operation
  The unit comprises an efficient rotary/ scroll compressor and a low-noise fan motor, which guarantees its quiet operation.
  4 Advanced controlling
  The unit includes micro-computer controlling, allowing all operation parameters to be set. Operation status can be displayed on the LED wire controller. Remote controller can be chosen as future option.

2.SPECIFICATION

2.1 Performance data of Swimming Pool Heat Pump Unit

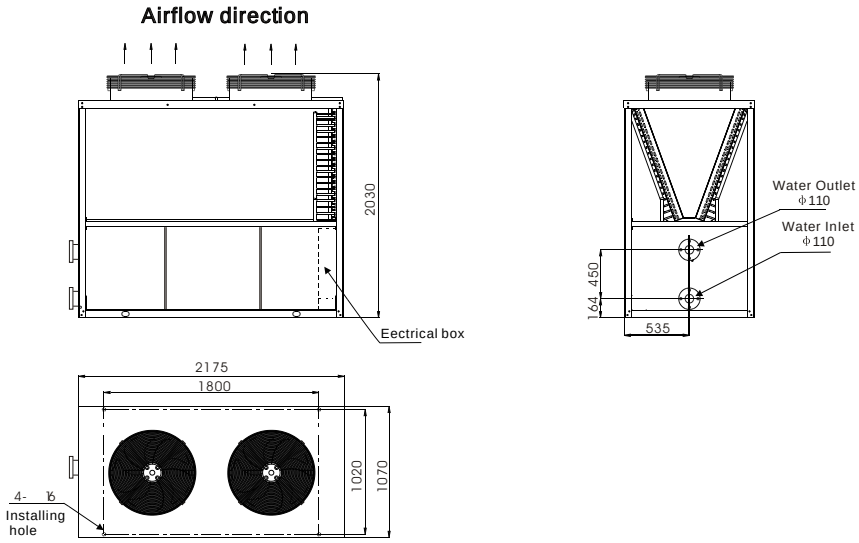
*** REFRIGERANT : R410A

Model		PASRW250S-V
Heating capacity	kW	120
	Btu/h	408000
Heating Power Input	kW	21
Maximun volume	A	38
Power Supply		380V/3N~/50Hz
Compressor Quantity		2
Compressor		scroll
Fan Number		2
Fan Power Input	W	615x2
Fan Rotate Speed	RPM	700
Fan Direction		vertical
Noise	dB(A)	71
Water Connection	mm	110
Water Flow Volume	m^3/ h	35
Water Pressure Drop(max)	kPa	16
Unit Net Dimensions(L/W/H)	mm	See the drawing of the units
Unit Ship Dimensions(L/W/H)	mm	See package lable
Net Weight	kg	see nameplate
Shipping Weight	kg	see package label

Heating: Outdoor air temp:24℃/19℃, Inlet water temp:26℃

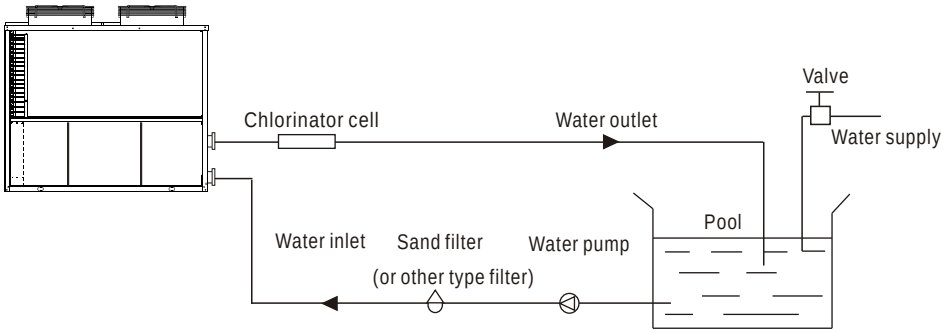
2.2 The dimensions for Swimming Pool Heat Pump Unit

Models :PASRW250S-V Unit:mm



3.INSTALLATION AND CONNECTION

3.1 Installation illustration



Installation items:

The factory only provides the main unit and the water unit; the other items in the illustration are necessary spare parts for the water system ,that provided by users or the installer.

Attention:

Please follow these steps when using for the first time
1.Open valve and charge water.
2.Make sure that the pump and the water-in pipe have been filled with water.
3.Close the valve and start the unit.
ATTN: It is necessary that the water-in pipe is higher than the pool surface.

3.INSTALLATION AND CONNECTION

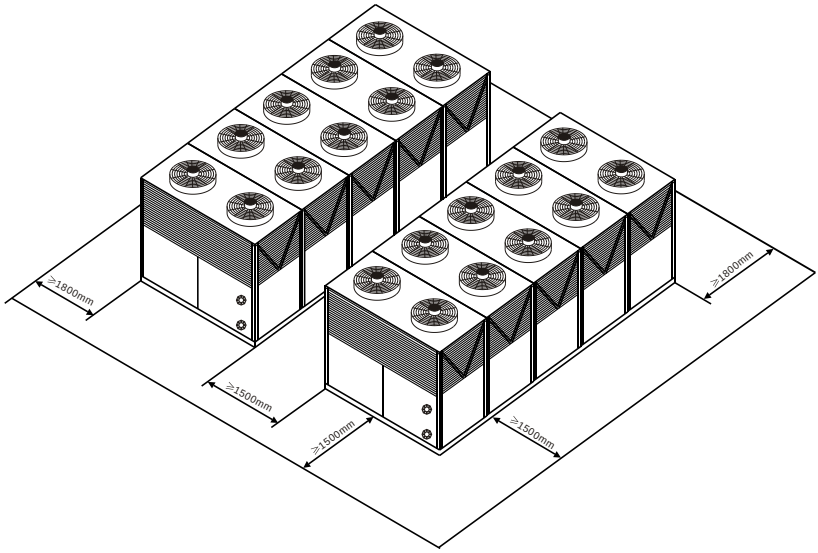
3.2 Swimming Pool Heat Pumps Location

The unit will perform well in any outdoor location provided that the following three factors are presented:

1. Fresh Air - 2. Electricity - 3. Pool filter piping

The unit may be installed virtually anywhere outdoors. For indoor pools please consult the supplier. Unlike a gas heater, it has no draft or pilot light problem in a windy area.

DO NOT place the unit in an enclosed area with a limited air volume, where the units discharge air will be re-circulated.
DO NOT place the unit to shrubs which can block air inlet. These locations deny the unit of a continuous source of fresh air which reduces it efficiency and may prevent adequate heat delivery.



3.3 How Close To Your Pool?

Normally, the pool heat pump is installed within 7.5 metres of the pool. The longer the distance from the pool, the greater the heat loss from the piping. For the most part ,the piping is buried. Therefore, the heat loss is minimal for runs of up to 15 meters(15 meters to and from the pump = 30 meters total), unless the ground is wet or the water table is high. A very rough estimate of heat loss per 30 meters is 0.6 kW-hour,(2000BTU) for every 5 ℃ difference in temperature between the pool water and the ground surrounding the pipe, which translates to about 3% to 5% increase in run time.

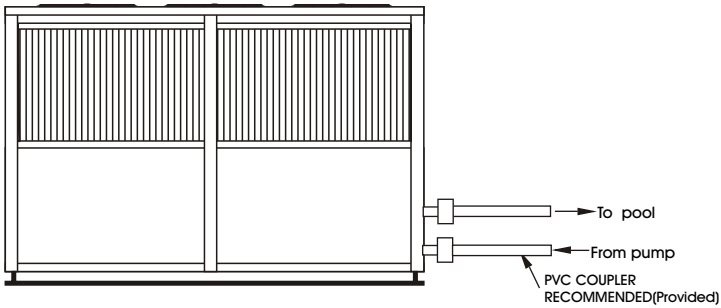
3.4 Swimming Pool Heat Pumps Plumbing

The Swimming Pool Heat Pumps exclusive rated flow titanium heat exchanger requires no special plumbing arrangements except bypass(please set the flow rate according to the nameplate). The water pressure drop is less than 10kPa at max. Flow rate. Since there is no residual heat or flame Temperatures, The unit does not need copper heat sink piping. PVC pipe can be run straight into the unit.

Location: Connect the unit in the pool pump discharge (return) line downstream of all filter and pool pumps, and upstream of any chlorinators, ozonators or chemical pumps.

Standard model have slip glue fittings which accept 40mm NB PVC pipe for connection to the pool or spa filtration piping. By using a 50 NB to 40NB you can plumb 50NB PVC piping straight into the unit.

Give serious consideration to adding a quick coupler fitting at the unit inlet and outlet to allow easy draining of unit for winterizing and to provide easier access should servicing be required.



Condensation: Since the Heat pump cools down the air about 4 -5℃, water may condense on the fins of the horseshoe shaped evaporator. If the relative humidity is very high, this could be as much as several litres an hour. The water will run down the fins into the basepan and drain out through the barbed plastic condensation drain fitting on the side of the basepan. This fitting is designed to accept 3/4" clear vinyl tubing which can be pushed on by hand and run to a suitable drain. It is easy to mistake the condensation for a water leak inside the unit.

NB: A quick way to verify that the water is condensation is to shut off the unit and keep the pool pump running. If the water stops running out of the basepan, it is condensation. AN EVEN QUICKER WAY IS to TEST THE DRAIN WATER FOR CHLORINE - if the is no chlorine present, then it's condensation.

3.5 Swimming Pool Heat Pumps Electrical Wiring

NOTE: Although the unit heat exchanger is electrically isolated from the rest of the unit, it simply prevents the flow of electricity to or from the pool water. Grounding the unit is still required to protect you against short circuits inside the unit. Bonding is also required.

The unit has a separate molded-in junction box with a standard electrical conduit nipple already in place. Just remove the screws and the front panel, feed your supply lines in through the conduit nipple and wire-nut the electric supply wires to the three connections already in the junction box (four connections if three phase). To complete electrical hookup, connect Heat Pump by electrical conduit, UF cable or other suitable means as specified (as permitted by local electrical authorities) to a dedicated AC power supply branch circuit equipped with the proper circuit breaker, disconnect or time delay fuse protection.

Disconnect - A disconnect means (circuit breaker , fused or un-fused switch) should be located within sight of and readily accessible from the unit, This is common practice on commercial and residential air conditioners and heat pumps. It prevents remotely-energizing unattended equipment and permits turning off power at the unit while the unit is being serviced.

3.6 Initial startup of the Unit

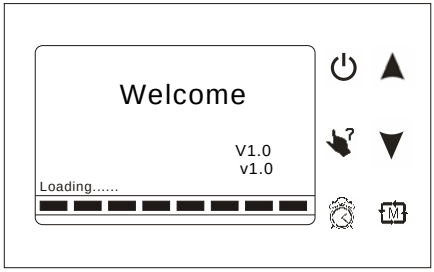
NOTE- In order for the unit to heat the pool or spa, the filter pump must be running to circulate water through the heat exchanger.

Start up Procedure - After installation is completed, you should follow these steps:
1. Turn on your filter pump. Check for water leaks and verify flow to and from the pool.
2. Turn on the electrical power supply to the unit, then press the key ON/OFF of wire controller, It should start in several seconds.
3. After running a few minutes make sure the air leaving the top(side) of the unit is cooler(Between 5-10 ℃)
4. With the unit operating turn the filter pump off. The unit should also turn off automatically,
5. Allow the unit and pool pump to run 24 hours per day until desired pool water emperature is reached. When the water-in temperature reach setting, The unit just shuts off. The unit will now automatically restart (as long as your pool pump is running)when the pool temperature drops more than 2℃ below set temperature.

Time Delay- The unit is equipped with a 3 minute built-in solid state restart delay included to protect control circuit components and to eliminate restart cycling and contactor chatter. This time delay will automatically restart the unit approximately 3 minutes after each control circuit interruption. Even a brief power interruption will activate the solid state 3 minute restart delay and prevent the unit from starting until the 5 minute countdown is completed. Power interruptions during the delay period will have no effect on the 3 minute countdown.

4. USAGE AND OPERATION

4.1Function of wire controller



Button	Name	Function
⏻	ON/OFF	Press this button to start up/shut off the unit, cancel current operation or back to upper interface.
	HELP	Press this button to check button function or system state.
M	MODE	Press this button to change the current mode, page up or confirm current operation.
	CLOCK	Press the button to set the clock, the timer on or timer off
▲	Up	Press this key to select the upward option or increase the parameter value.
▼	Down	Press this key to select the downward option or decrease the parameter value.

4.2Usage of wire controller

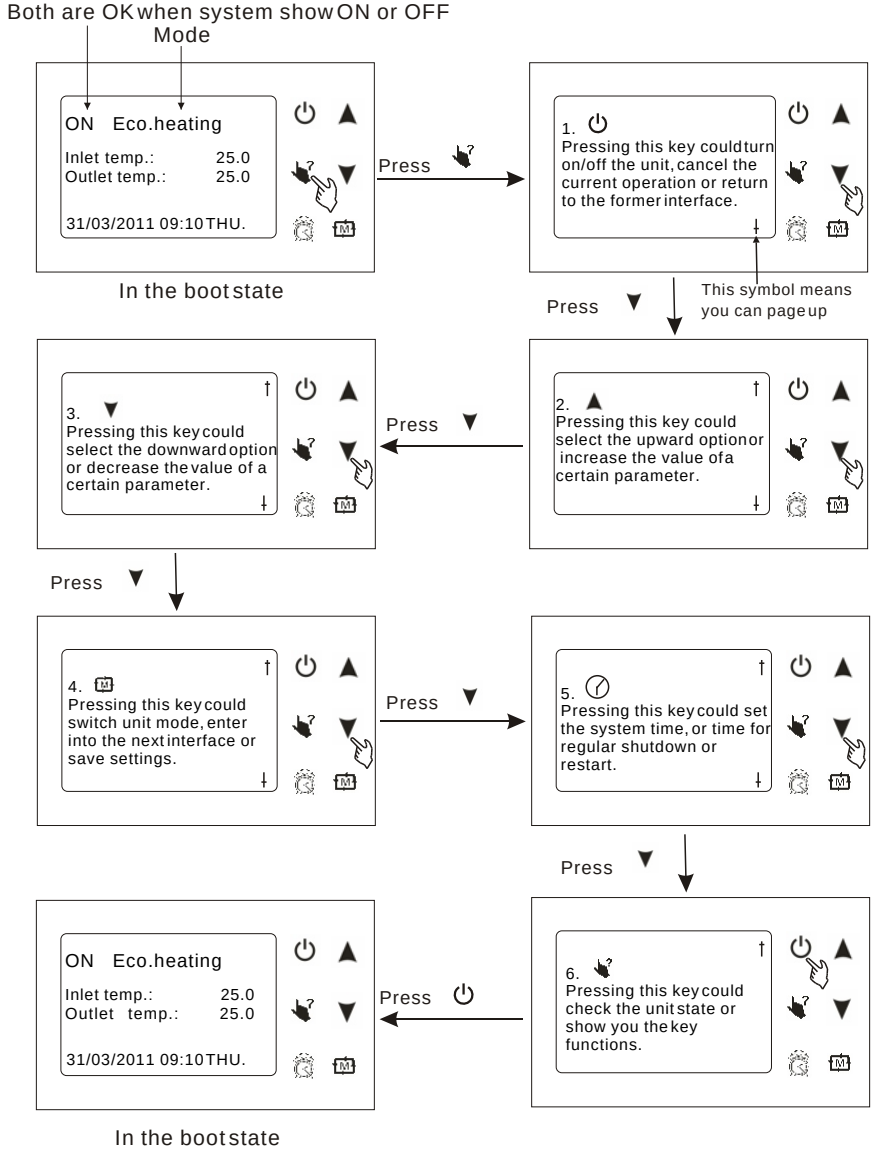
4.2.1 The way to use

You can use at any interface, it will show relevant button function of current interface.

You can press to exit the "help" interface.

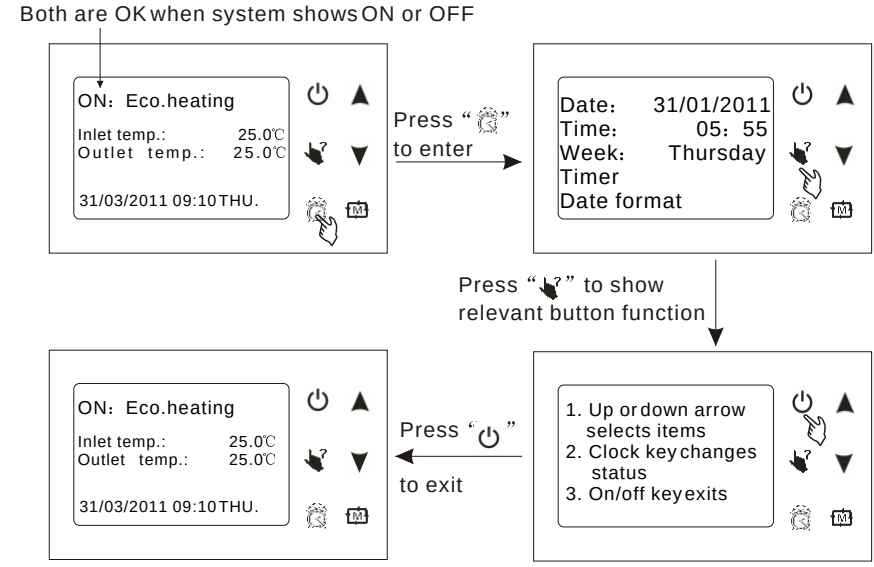
For example

Press at main interface, system will show all button function; Press at clock interface, system will show ▲ ▼ and button function.



4. USAGE AND OPERATION

Press " " at clock interface, the screen shows as follow:

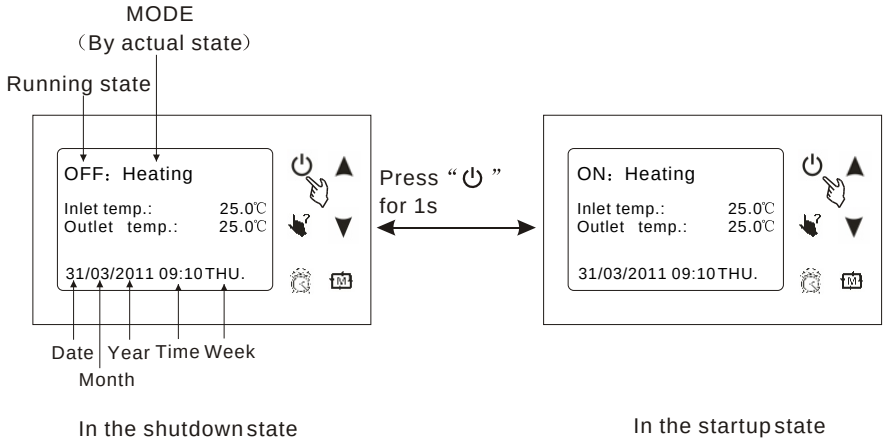


4.2.2 Starting up and shutting down

Press " " in the shutdown state for 1s to start up the system;

Press " " in the startup state for 1s to shut down the system.

For example:



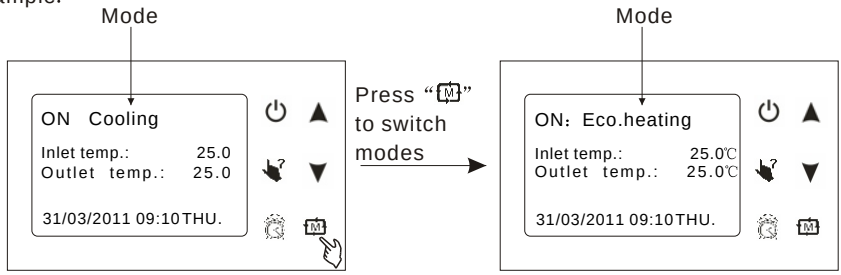
4. USAGE AND OPERATION

4.3 The operation of mode switching

At main interface, you can switch modes of cooling, economic heating, heating, rapid heating by pressing " M " . Or switch modes of cooling, economic heating and automatic. The different unit gets different mode types.

Attention：the operation of mode is invalid when the unit you buy is cooling only or heating only.

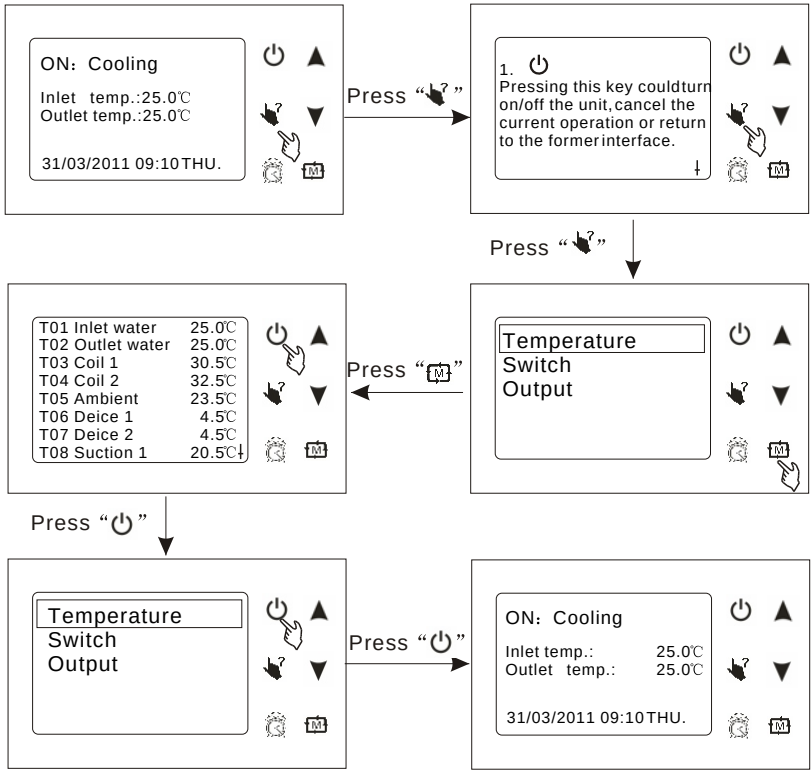
For example:



4.4 The operation of system state checking

At any interface, you can enter system working state by pressing " ? " twice, press " ▲ " （pageup）or " ▼ " （pagedown）to select the needing parameter, press " M " to enter, and press " ⏻ " to exit.

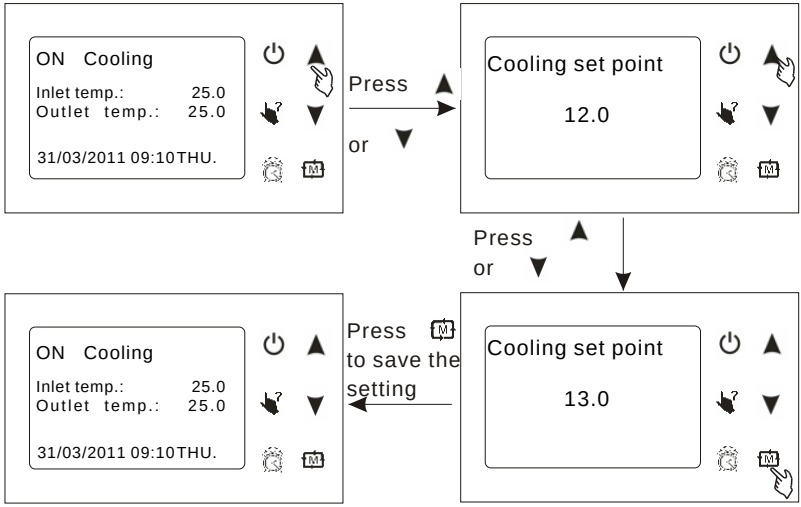
For example:



4. USAGE AND OPERATION

4.5 The operation of parameter setting

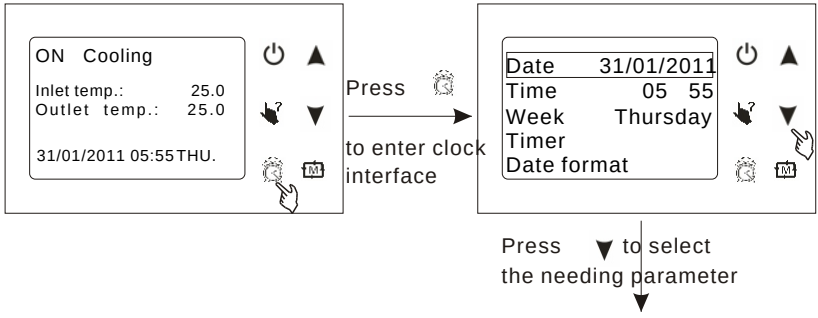
At main interface, press ▲ or ▼ enter parameter setting interface, press ▲ increasing or ▼ decreasing can change parameter value, press M to save the setting and exit. Press ⏻ can not save the setting but exit. You can refer to parameter table to set relevant temperature.

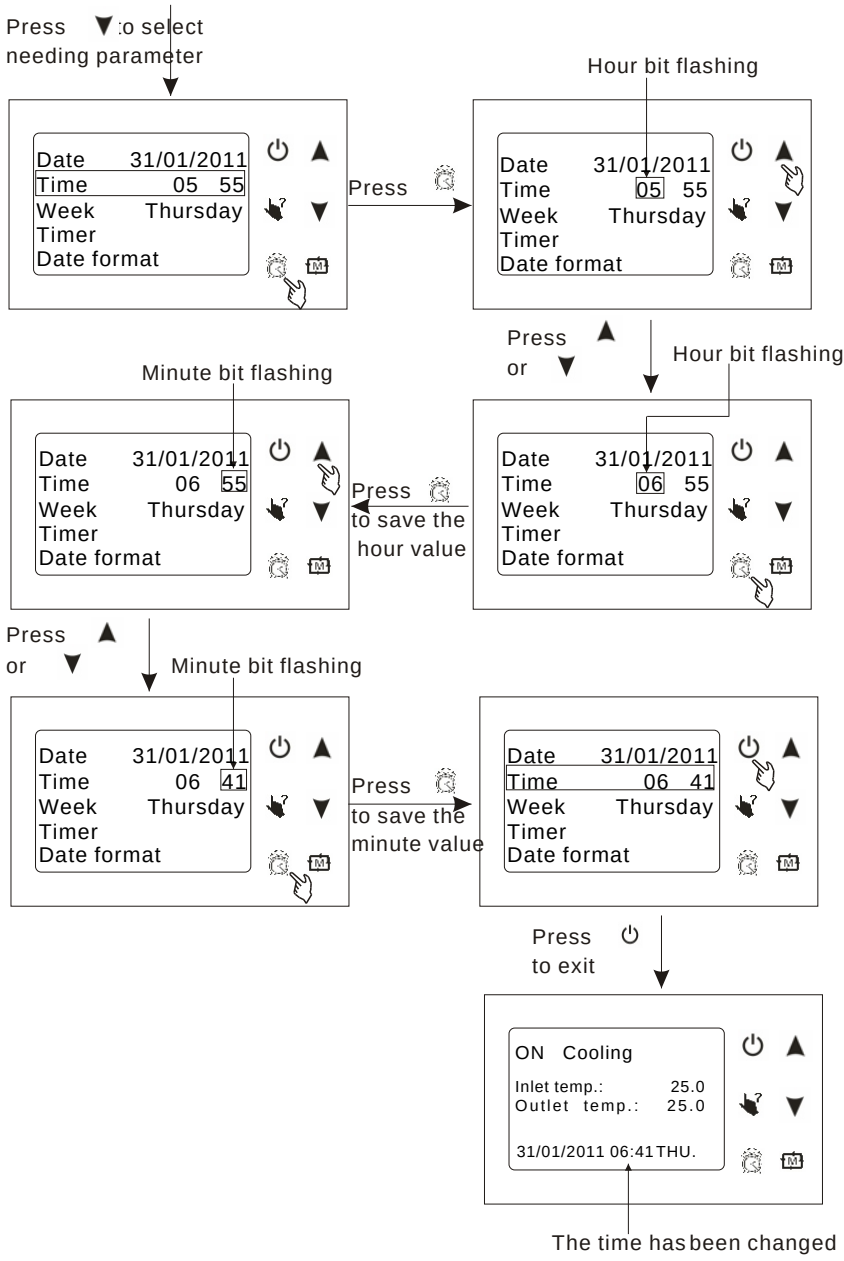


4.6 The operation of clock setting

At main interface, press ⏱ to enter clock setting interface, select the needing parameter and press ⏱ at this time, parameter value flashing, press ▲ (Increasing) or ▼ (Decreasing) can change parameter value, then press ⏱ to save, press ⏻ to cancel the setting or back to the main interface. timer setting refer to timer operation

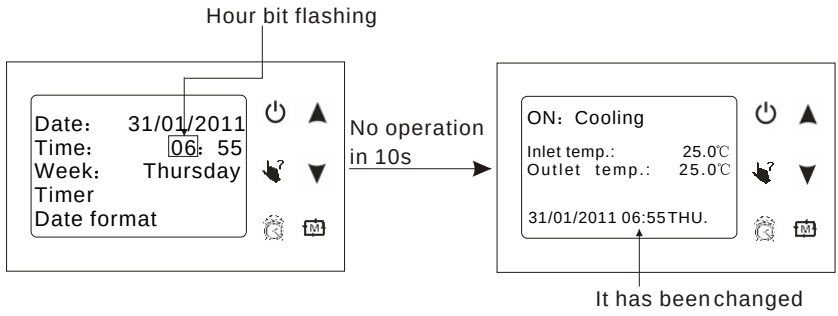
For example





Tips The setting of date and week is the same with clock;
If there is no operation in 10s, system will remember parameter setting automatic and back to the main interface.,

As follow



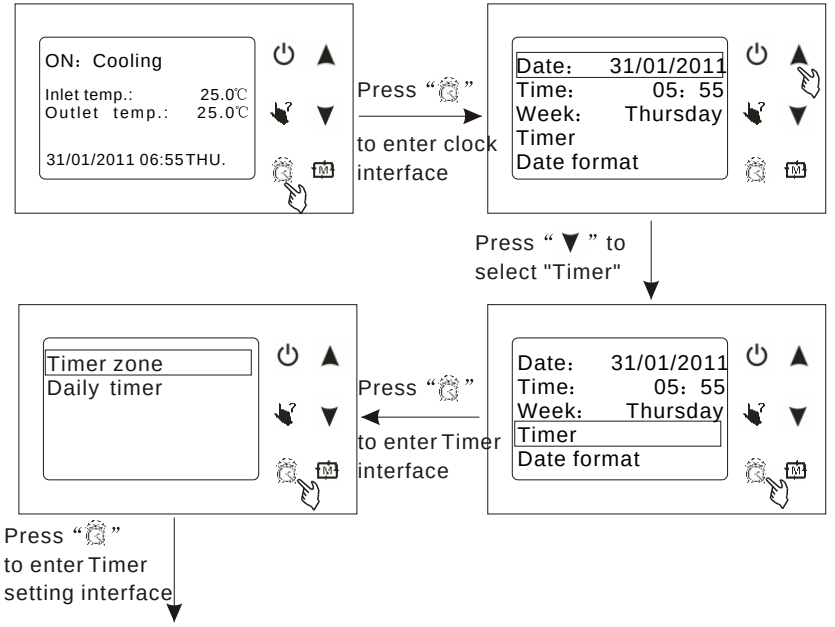
4.7 The operation of timer setting

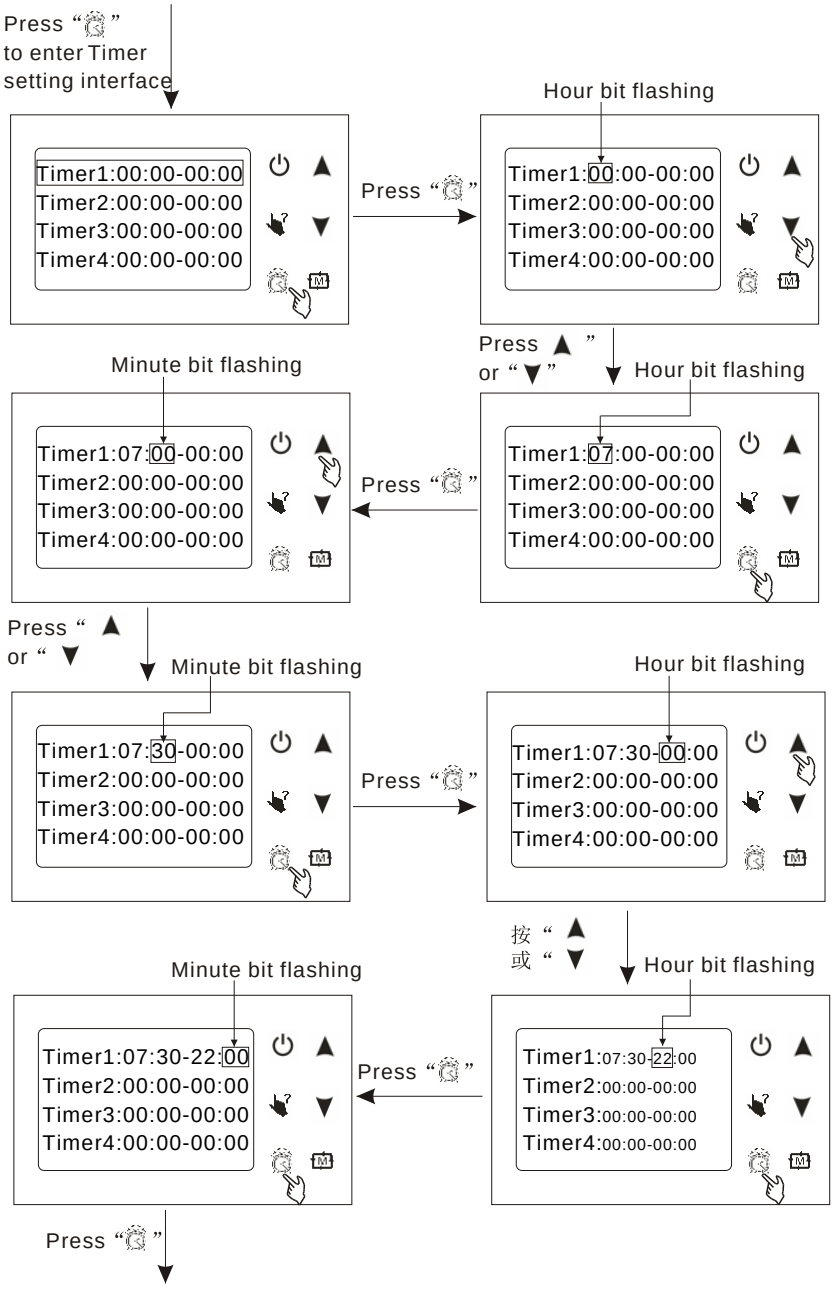
You can set four timer on and timer off according to you needing.

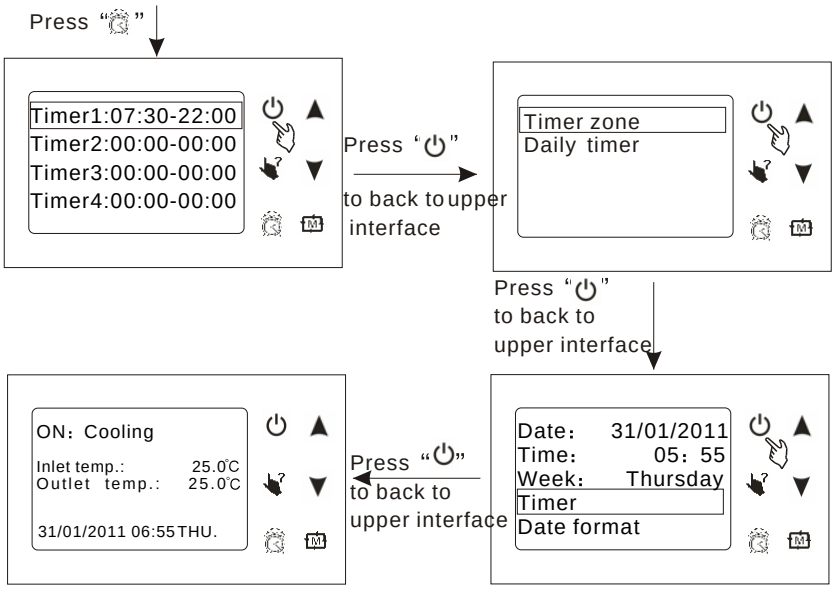
At main interface, press " " to enter timer setting, press " ▼ " to select "Timer", then press " " to enter timer setting interface, (timer setting: you can set four timer on and timer off, and the time you set can from Monday to Sunday.), the operation is the same with clock setting.

For example:

A. Timer setting

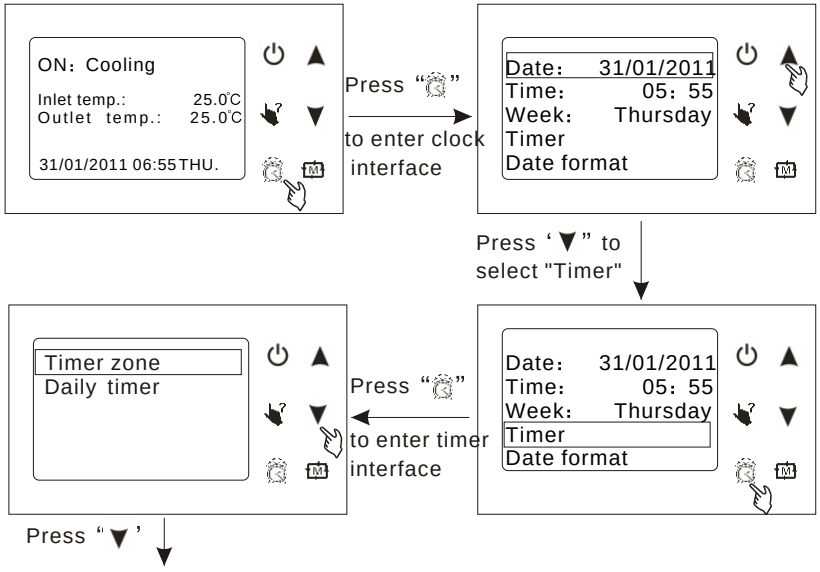


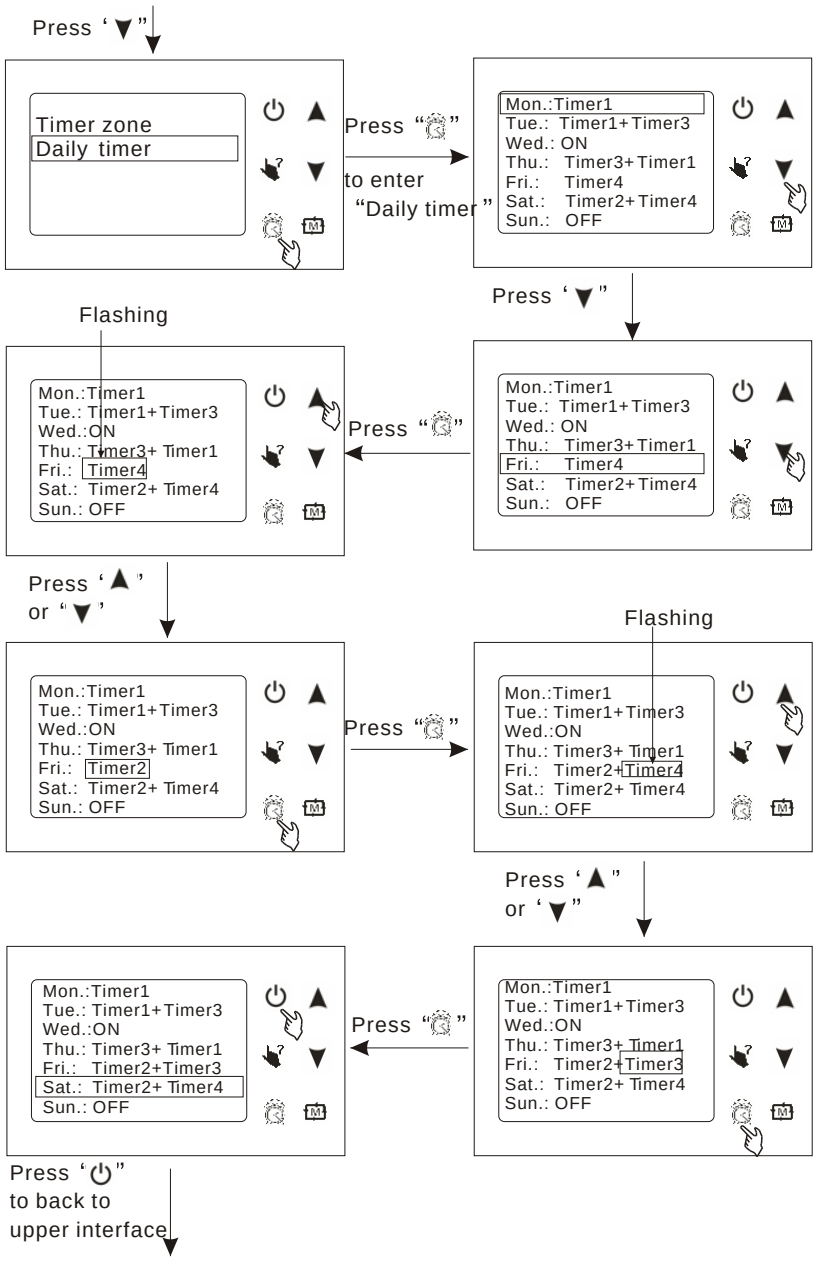

Press "⏱" to enter Timer setting interface
Timer1:00:00-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏱"
Hour bit flashing
Timer1:00:00-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press ▲ " or "▼"
Hour bit flashing
Timer1:07:00-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏱"
Minute bit flashing
Timer1:07:00-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press " ▲ or " ▼
Minute bit flashing
Timer1:07:30-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏱"
Hour bit flashing
Timer1:07:30-00:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
按 " ▲ 或 " ▼
Hour bit flashing
Timer1:07:30-22:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏱"
Minute bit flashing
Timer1:07:30-22:00
Timer2:00:00-00:00
Timer3:00:00-00:00
Timer4:00:00-00:00
Press "⏱"

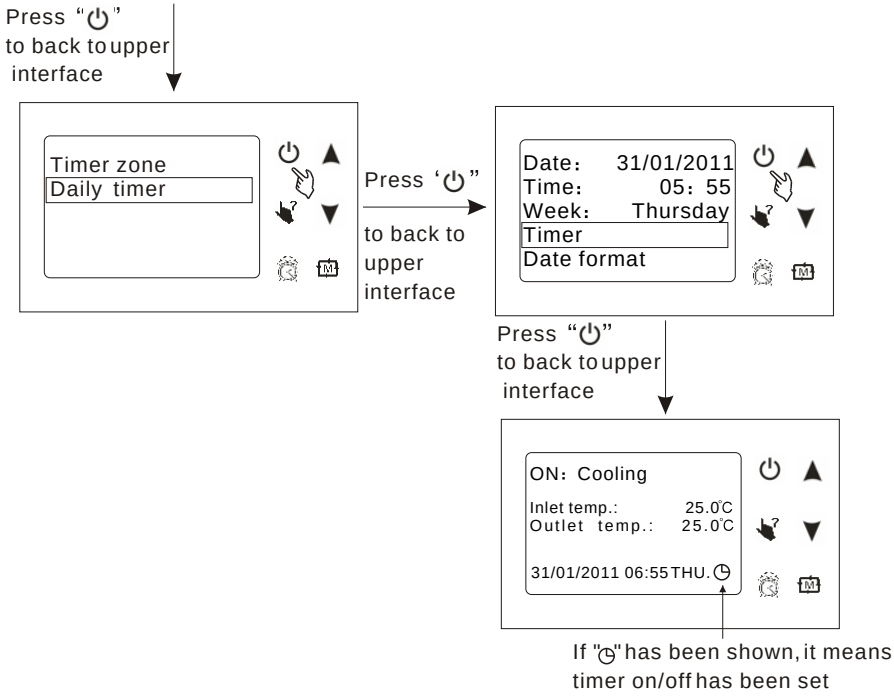


Tips：1) The operation of Timer2, Timer3, Timer4 is the same with Timer1;
2) Timer1:07:30-22:00 means system starts up at 7:30, and shut down at 22:00 automaticly;
3) If there is no operation in 10s, system will memory parameter setting automaticly.

B. The operation of daily timer




Press ‘▼”
Timer zone
Daily timer
Press “⏰”
to enter
“Daily timer”
Mon.:Timer1
Tue.: Timer1+Timer3
Wed.: ON
Thu.: Timer3+Timer1
Fri.: Timer4
Sat.: Timer2+Timer4
Sun.: OFF
Press ‘▼”
Flashing
Press “⏰”
Press ‘▲’
or ‘▼’
Flashing
Press “⏰”
Press ‘▲”
or ‘▼”
Press “⏰”
Press ‘⏻”
to back to
upper interface



Tips: The Timer operations of Monday, Tuesday, Wednesday, Thursday, Saturday, Sunday is the same with Friday.

Monday: OFF : means Monday Timer hasn't been set, and the running state is the same with Sunday at 24:00, for example, if system is running at 24:00 on Sunday, then it will be running the whole day on Monday, and vice versa;

Wednesday: ON : means system will be running the whole day on Wednesday

Thursday: OFF : means system will be off the whole day on Thursday;

Saturday: Timer1+Timer2 : means the time to start up and to shut down is according to Timer1 and Timer2.

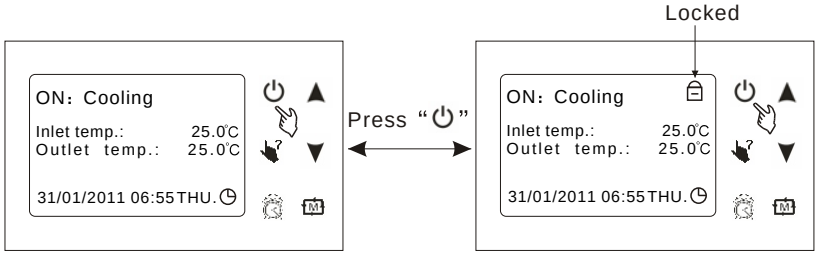
If there is no operation in 10s, system will memory the parameter setting automaticly and back to main interface.

4.8 Keyboard lock

To avoid mis-operations, please lock the controller after parameter setting.

At the main interface, pressing "⏻" for 5 seconds, the keyboard will be locked.

When the keyboard is locked, pressing "⏻" for 5 seconds, the keyboard will be unlocked.



NOTES:

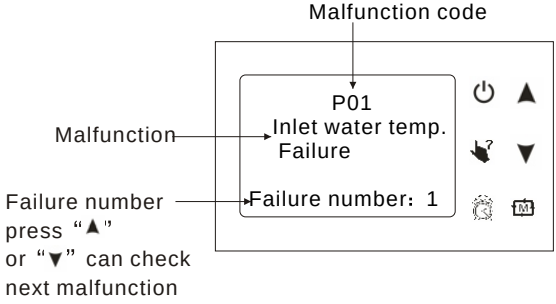
When the unit is in alarming state, the key lock can be removed automaticly.

4.9 Malfunction display

There will be malfunction code showing on the controller screen when relative malfunction occurs.

You can refer to the malfunction table to find out the failure cause and solution.

For example：



4.10 Parameter table

Meaning	Default	Remarks
Set-point of cooling target temp.	27℃	Ajustable
Set-point of heating target temp.	27℃	Ajustable
Set-point of auto mode target temp.	27℃	Ajustable

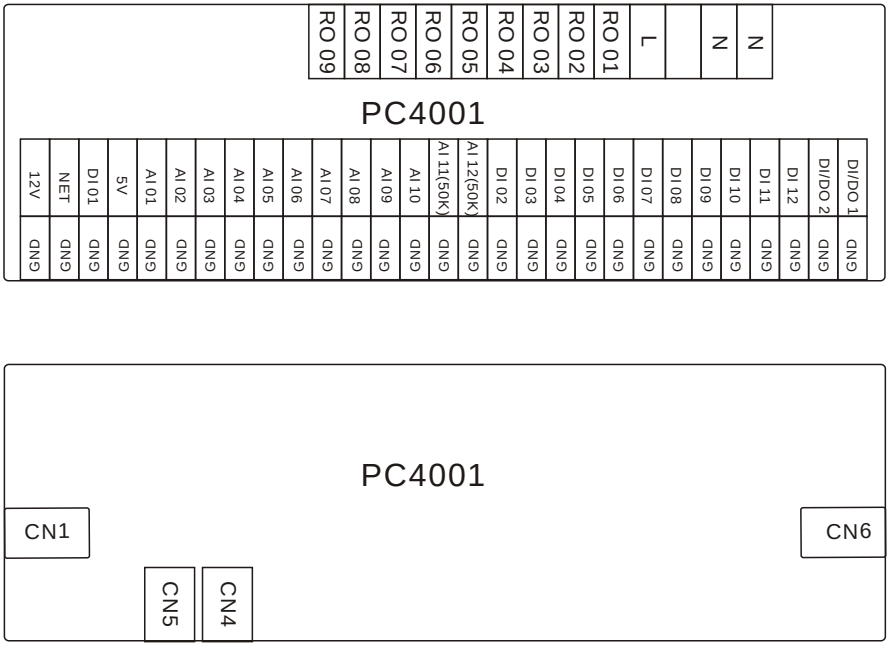
5. MAINTENANCE AND INSPECTION

5.1 Malfunction table

You can refer to the malfunction table to find out the failure cause and solution.

malfunction	display	Indicator	Reason	resolution
Power on		Off		
Normal working		On		
Inlet temp. Sensor failure	P01	1 On 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Outlet temp. Sensor failure	P02	2 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Recovery temp. Sensor failure	P033	3 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Ambient temp. Sensor failure	P04	4 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Coil 1 temp. Sensor failure	P15	5 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Coil 2 temp. Sensor failure	P25	5 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Suction 1 temp. Sensor failure	P17	7 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Suction 1 temp. Sensor failure	P27	7 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Discharge 1 temp. Sensor failure	P181	8 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Discharge 2 temp. Sensor failure	P281	8 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Antifreezing 1 temp. Sensor failure	P19	9 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
Antifreezing 2 temp. Sensor failure	P29	9 on 1 off	The temp. Sensor is broken or short circuit	Check or change the temp. Sensor
High pressure1 protection	E11	11 on 1 off	The high-preesure switch is broken	Check the pressure switch and cold circuit
High pressure2 protection	E21	11 on 1 off	The high-preesure switch is broken	Check the pressure switch and cold circuit
Low pressure1 protection	E12	12 on 1 off	The low-preesure switch is broken	Check the pressure switch and cold circuit
Low pressure2 protection	E22	12 on 1 off	The low-preesure switch is broken	Check the pressure switch and cold circuit
Heat source side water flow failure	E031	13 on 1 off	No water/little water in water system	Check the pipe water flow and water pump
The use side water flow failure	E032	13 on 1 off	No water/little water in water system	Check the pipe water flow and water pump
water flow over-low failure	E035	13 on 1 off	No water/little water in water system	Check the pipe water flow and water pump
Elctrical-heat over heat failure	E04	14 on 1 off	Electrical-heat is over heat	Check or change electrical-heat
Compressor 1 overload failure	E101	21 on 1 off	Compressor is overload	Check the compressor functionality
Compressor 2 overload failure	E201	21 on 1 off	Compressor is overload	Check the compressor functionality
Water-inlet and outlet temp. difference	E06	16 on 1 off	Water flow is not enough and low differential pressure	Check the pipe water flow and whether water system is jammed or not
The system 1use side antifreezing protection	E171	17 on 1 off	Water flow is not enough	Check the pipe water flow and whether water system is jammed or not
The system 2 use side antifreezing protection	E271	17 on 1 off	Water flow is not enough	Check the pipe water flow and whether water system is jammed or not
The system 1heat source side antifreezing protection	E172	17 on 1 off	Water flow is not enough	Check the pipe water flow and whether water system is jammed or not
The system 2 heat source side antifreezing protection	E272	17 on 1 off	Water flow is not enough	Check the pipe water flow and whether water system is jammed or not
The primary anti-freezing protection	E19	19 on 1 off	The ambient temp. Is low	/
The secondary anti-freezing protection	E29	19 on 1 off	The ambient temp. Is low	/
Discharge Temp. Of system 1 is too high	P182	8 on 1 off	The compressor is overload	Check the compressor functionality
Discharge Temp. Of system 2 is too high	P282	8 on 1 off	The compressor is overload	Check the compressor functionality
System protection	E05	8 on 1 off	The protection system is failure	Check each protection point of the system
Defrosting		Flashing	/	/
Communication failure	E08	/	Communication failure between wire controller and mainboard	Check the wire connection between remote wire controller and main board

6.1 Connection of PCB illustration



Connections explanation:

NO.	Symbol	Meaning	NO.	Symbol	Meaning
1	AC-L	Live line	21	DI 07	Water flow switch protection input
2	AC-N	Null line	22	DI 08	Electric heater overload protection input
3	RO 01	Compressor 1 output(220VAC)	23	DI 09	Compressor 1 overload protection input
4	RO 02	Compressor 2 output(220VAC)	24	DI 10	Compressor 2 overload protection input
5	RO 03	High speed of fan output(220VAC)	25	DI 11	System protection input
6	RO 04	Low speed of fan output(220VAC)	26	DI 12	Emergency switch input
7	RO 05	Water pump output(220VAC)	27	AI 01	Water input temperature input
8	RO 06	4-way valve output(220VAC)	28	AI 02	Water output temperature output
9	RO 07	Electric heater output(250VAC)	29	AI 03	System 1 fan coil temperature input
10	RO 08	Spray valve output(220VAC)	30	AI 04	System 2 fan coil temperature input
11	RO 09	Alarm system output(220VAC)	31	AI 05	Ambient temperature input
12	DI/DO 1	Mode indicator output	32	AI 06	System 1 antifreeze temperature input
13	DI/DO 2	Emergency switch output	33	AI 07	System 1 antifreeze temperature input
14	DI 01	Flow rate input	34	AI 08	System 1 suction temperature input
15	DI 02	System 1 high pressure protection input	35	AI 09	System 2 suction temperature input
16	DI 03	System 1 low pressure protection input	36	AI 10	No use
17	DI 04	System 2 high pressure protection input	37	AI 11(50K)	System 1 discharging temperature input
18	DI 05	System 2 low pressure protection input	38	AI 12(50K)	System 2 discharging temperature input
19	NET GND 12V	Connecting to the remote controller	39	CN1	System 2 electric expansion valve output
20	DI 06	Phase sequence protection	40	CN6	System 1 electric expansion valve output
			41	CN4	Burning program interface
			42	CN5	RS485 interface

6.2 Caution & Warning

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

6.3 Cable specification

1. Single phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	2 1.5mm^2	1.5mm^2	20A	30mA less than 0.1 sec	n 0.5mm^2
10~16A	2 2.5mm^2	2.5mm^2	32A	30mA less than 0.1 sec	
16~25A	2 4mm^2	4mm^2	40A	30mA less than 0.1 sec	
25~32A	2 6mm^2	6mm^2	40A	30mA less than 0.1 sec	
32~40A	2 10mm^2	10mm^2	63A	30mA less than 0.1 sec	
40~63A	2 16mm^2	16mm^2	80A	30mA less than 0.1 sec	
63~75A	2 25mm^2	25mm^2	100A	30mA less than 0.1 sec	
75~101A	2 25mm^2	25mm^2	125A	30mA less than 0.1 sec	
101~123A	2 35mm^2	35mm^2	160A	30mA less than 0.1 sec	
123~148A	2 50mm^2	50mm^2	225A	30mA less than 0.1 sec	
148~186A	2 70mm^2	70mm^2	250A	30mA less than 0.1 sec	
186~224A	2 95mm^2	95mm^2	280A	30mA less than 0.1 sec	

2. Three phase unit

Nameplate maximum current	Phase line	Earth line	MCB	Creepage protector	Signal line
No more than 10A	3 1.5mm^2	1.5mm^2	20A	30mA less than 0.1 sec	n 0.5mm^2
10~16A	3 2.5mm^2	2.5mm^2	32A	30mA less than 0.1 sec	
16~25A	3 4mm^2	4mm^2	40A	30mA less than 0.1 sec	
25~32A	3 6mm^2	6mm^2	40A	30mA less than 0.1 sec	
32~40A	3 10mm^2	10mm^2	63A	30mA less than 0.1 sec	
40~63A	3 16mm^2	16mm^2	80A	30mA less than 0.1 sec	
63~75A	3 25mm^2	25mm^2	100A	30mA less than 0.1 sec	
75~101A	3 25mm^2	25mm^2	125A	30mA less than 0.1 sec	
101~123A	3 35mm^2	35mm^2	160A	30mA less than 0.1 sec	
123~148A	3 50mm^2	50mm^2	225A	30mA less than 0.1 sec	
148~186A	3 70mm^2	70mm^2	250A	30mA less than 0.1 sec	
186~224A	3 95mm^2	95mm^2	280A	30mA less than 0.1 sec	

When the unit will be installed at outdoor, please use the cable which can against UV.

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