

SWIMMING POOL HEAT PUMP UNIT

Installation & Instruction Manual

CONTENTS

| | |
|--|----|
| 1. Preface | 1 |
| 2. Specifications | 2 |
| 2.1 Performance Data of Swimming Pool Heat Pump Unit | 2 |
| 2.2 Dimensions for Swimming Pool Heat Pump Unit | 3 |
| 3. Installation and Connection | 4 |
| 3.1 Installation of System | 4 |
| 3.2 Swimming Pool Heat Pumps Location | 5 |
| 3.3 How Close to Your Pool? | 5 |
| 3.4 Swimming Pool Heat Pumps Plumbing | 6 |
| 3.5 Swimming Pool Heat Pumps Electrical Wiring | 7 |
| 3.6 Initial Start-up of the Unit | 7 |
| 4. Usage and Operation | 8 |
| 4.1 Function of the controller | 8 |
| 4.2 Usage of the controller | 10 |
| 4.3 The operation of mode switching | 11 |
| 4.4 The operation of system state checking | 11 |
| 4.5 The operation of parameter setting | 12 |
| 4.6 The operation of clock setting | 12 |
| 4.7 The operation of timer setting | 14 |
| 4.8 Keyboard lock | 19 |
| 4.9 Malfunction display | 19 |
| 4.10 Parameter table | 19 |
| 5. Maintenance and Inspection | 20 |
| 5.1 Malfunction table | 20 |
| 5.2 SYSB malfunction Table | 21 |
| 6. Appendix | 22 |

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

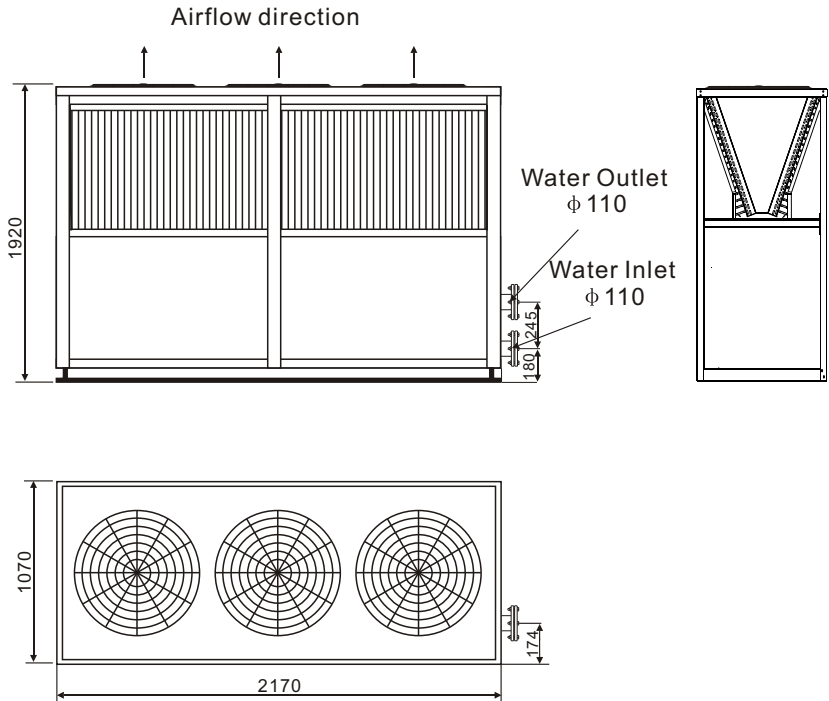
| Unit | Model | PASRW200S-V-P |
|---------------------------------|-------------------|------------------------------|
| Heating Capacity | kW | 95 |
| | BTU/h | 324000 |
| Heating Power Input | kW | 16.1 |
| Running Current | A | 28.8 |
| Power Supply | | 380-415V/3N~/50Hz |
| Compressor Quantity | | 4 |
| Compressor | | scroll |
| Fan Quantity | | 3 |
| Fan PowerInput | W | 200×3 |
| Fan Rotate Speed | RPM | 830 |
| Fan Direction | | vertical |
| Noise | dB(A) | 61 |
| Water Connection | mm | 110 |
| Water Flow Volume | m ³ /h | 28 |
| Water Pressure Drop(MAX) | kPa | 16 |
| Unit Net Dimensions(L/W/H) | mm | see the drawing of the units |
| Unit Shipping Dimensions(L/W/H) | mm | see package label |
| Net Weight | kg | see nameplate |
| Shipping Weight | kg | see package label |

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

2.SPECIFICATION

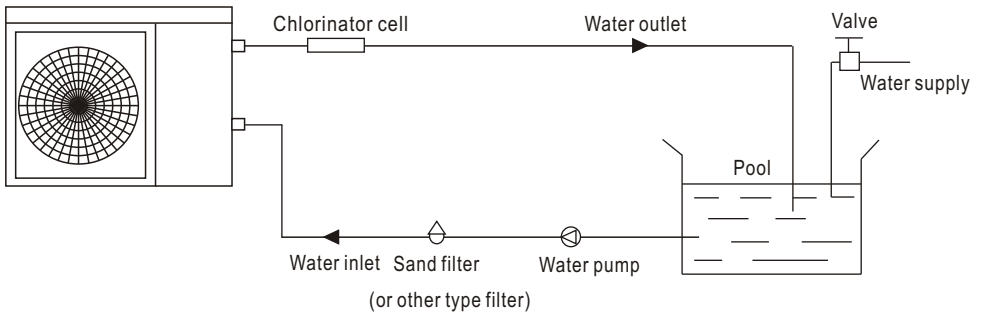
2.2 The dimensions for Swimming Pool Heat Pump Unit

Models :PASRW200S-V-P



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.

3.INSTALLATION AND CONNECTION

3.2 Swimming Pool Heat Pumps Location

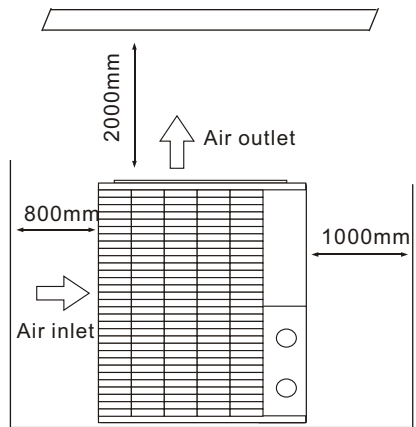
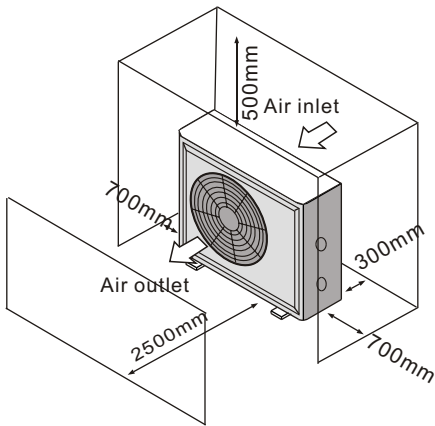
The unit will perform well in any outdoor location provided that the following three factors are present.

- 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 its 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, (2000 BTU) for every 5 °C 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.INSTALLATION AND CONNECTION

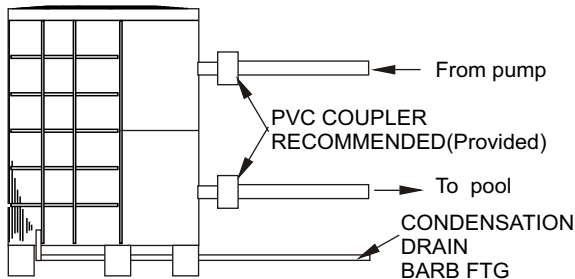
3.4 Swimming Pool Heat Pumps Plumbing

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 heatsink 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 Swimming Pool 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°C, 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 base pan and drain out through the barbed plastic condensation drain fitting on the side of the base pan. 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 base pan, it is condensation. AN EVEN QUICKER WAY IS to TEST THE DRAIN WATER FOR CHLORINE - if there is no chlorine present, then it's condensation.

3. INSTALLATION AND CONNECTION

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.

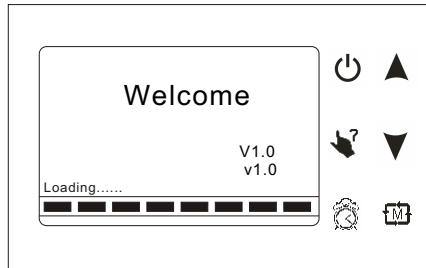
Start up Procedure- After installation is completed, you should follow these steps:







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 °C)
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 temperature 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°C 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

4.1 Function 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. |
|  | 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. USAGE AND OPERATION

4. Usage of wire controller

4.1 The way to use

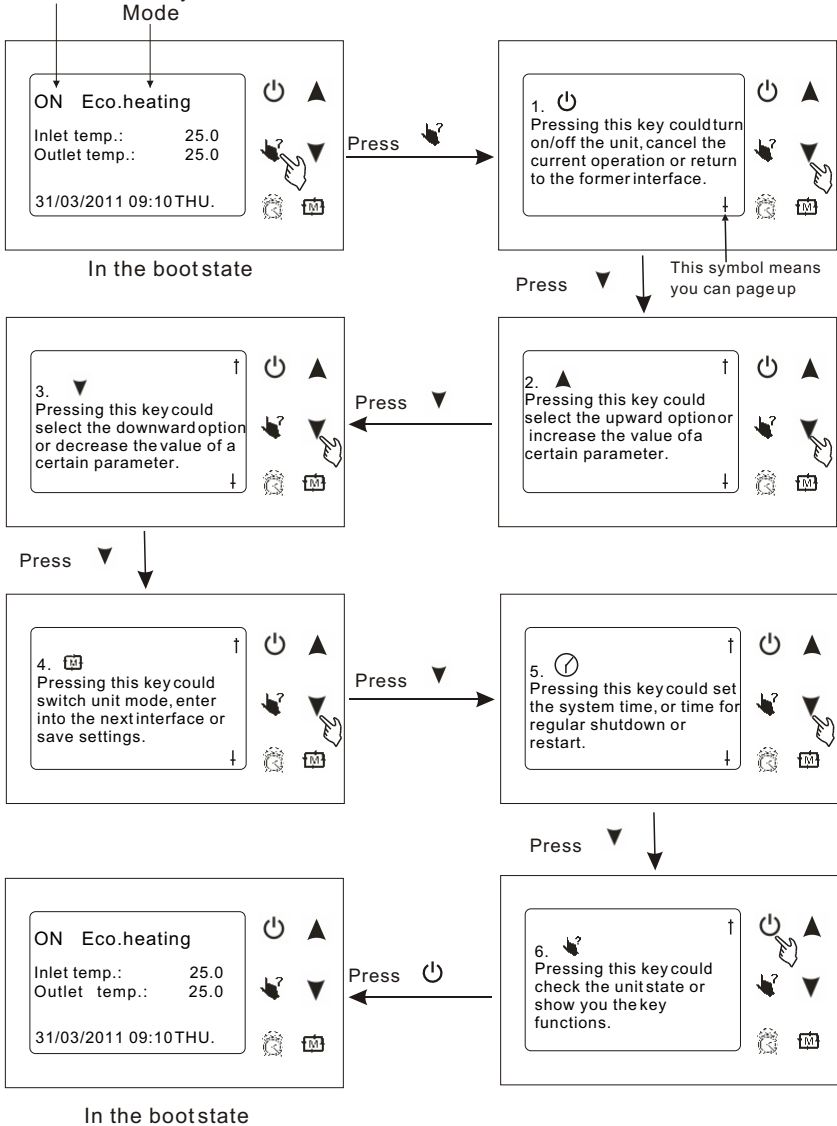
You can use at any interface, it will show relevant button function of current interface.

You can press to exit the "help" interface.

For example

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

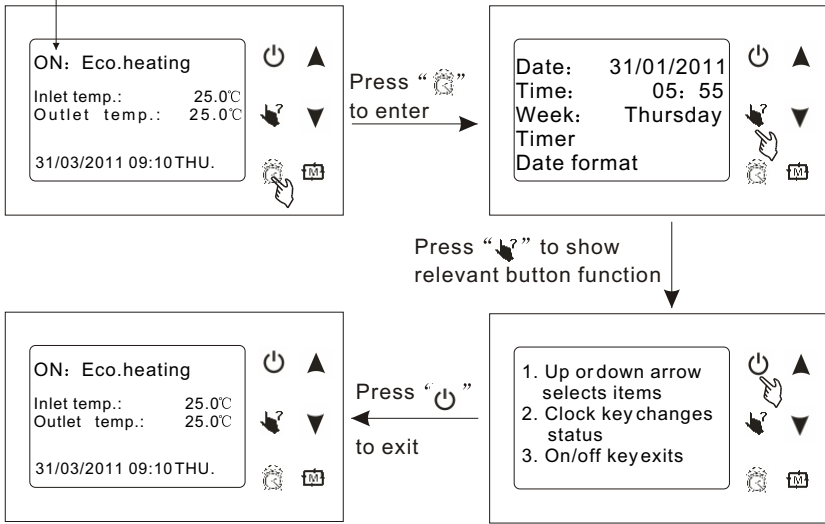
Both are OK when system show ON or OFF



4. USAGE AND OPERATION

Press “?” at clock interface, the screen shows as follow:

Both are OK when system shows ON or OFF

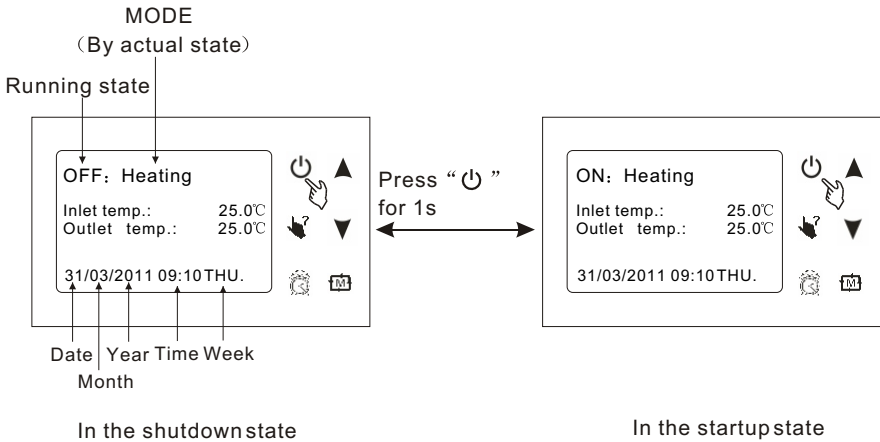


4.2.2 Starting up and shutting down

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:

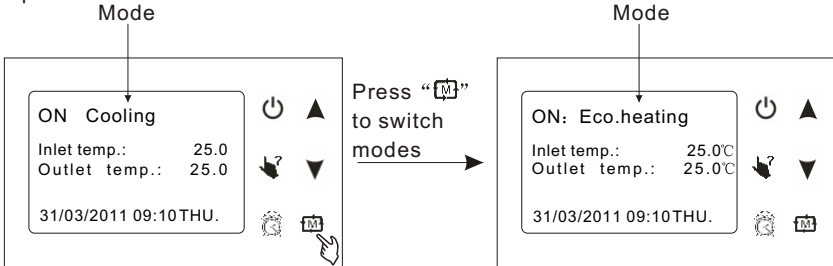


4. USAGE AND OPERATION

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.

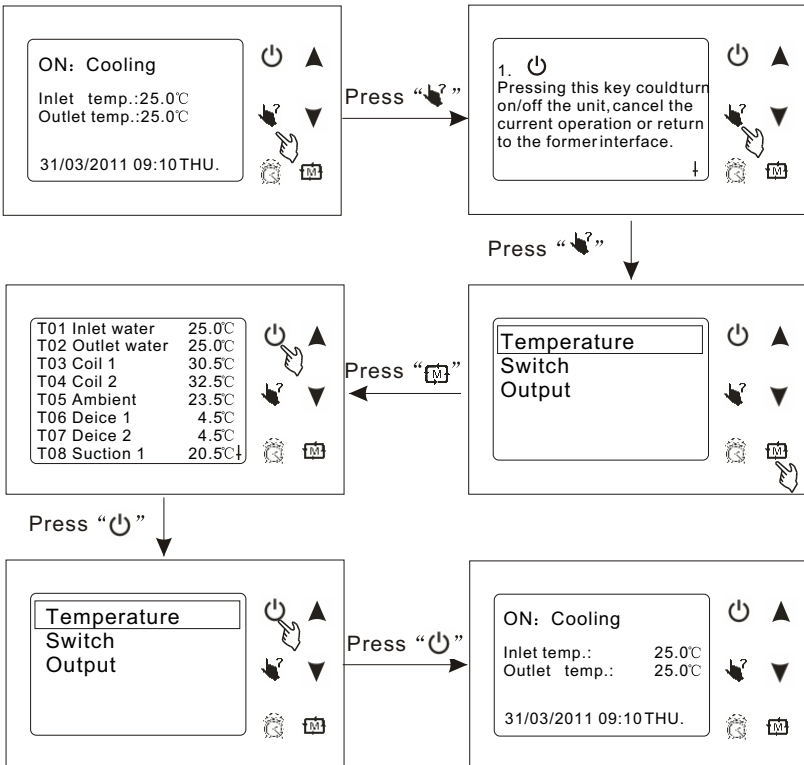
Attention: the operation of mode is invalid when the unit you buy is cooling only or heating only. For example:



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.

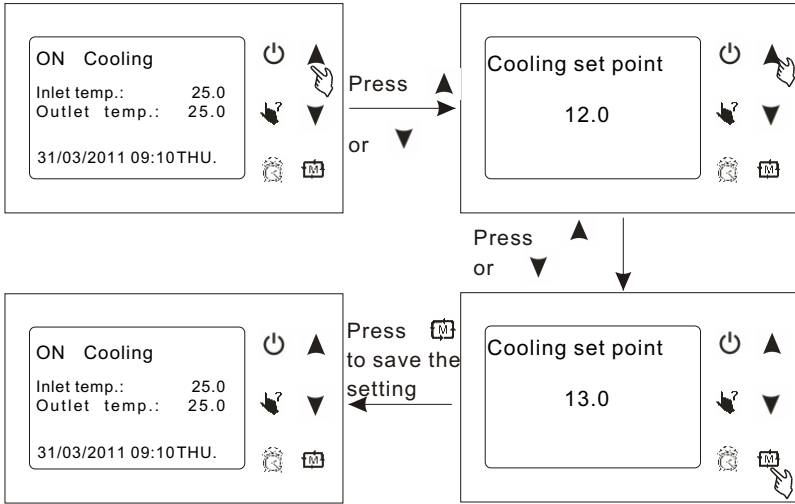
For example:







4. USAGE AND OPERATION

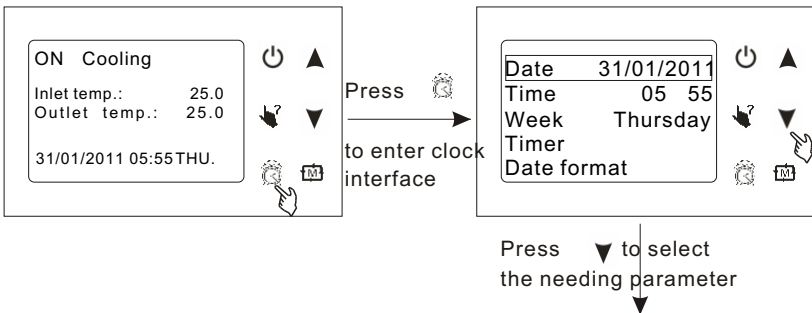
4.5 The operation of parameter setting

At main interface, press ▲ or ▼ enter parameter setting interface, press ▲ increasing or ▼ decreasing can change parameter value, press  to save the setting and exit. Press  can no save the setting but exit. You can refer to parameter table to set relevant temperature.

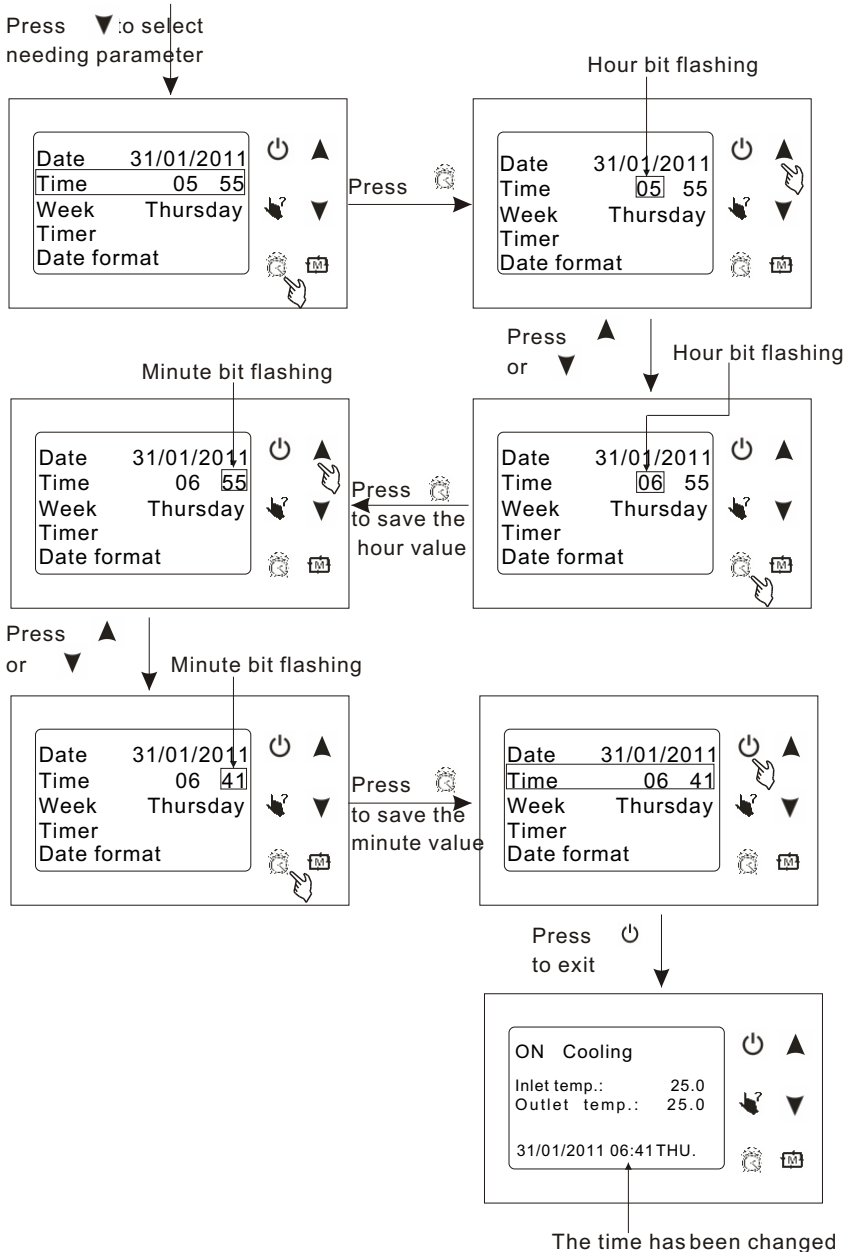


4.6 The operation of clock setting

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  cancel the setting or back to the main interface. timer setting refer to timer operation
For example



4. USAGE AND OPERATION

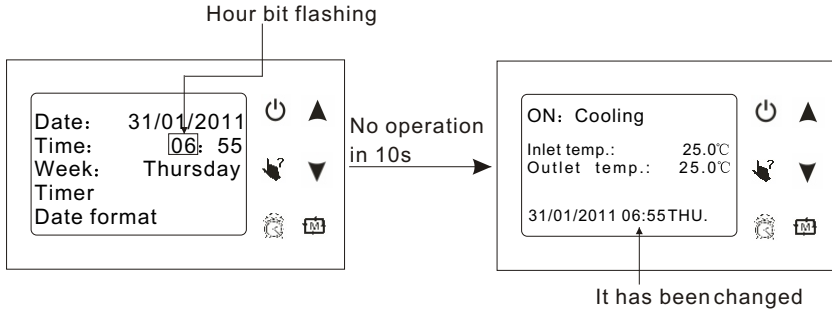


Tips The setting of date and week is the same with clock;

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

As follow

4. USAGE AND OPERATION



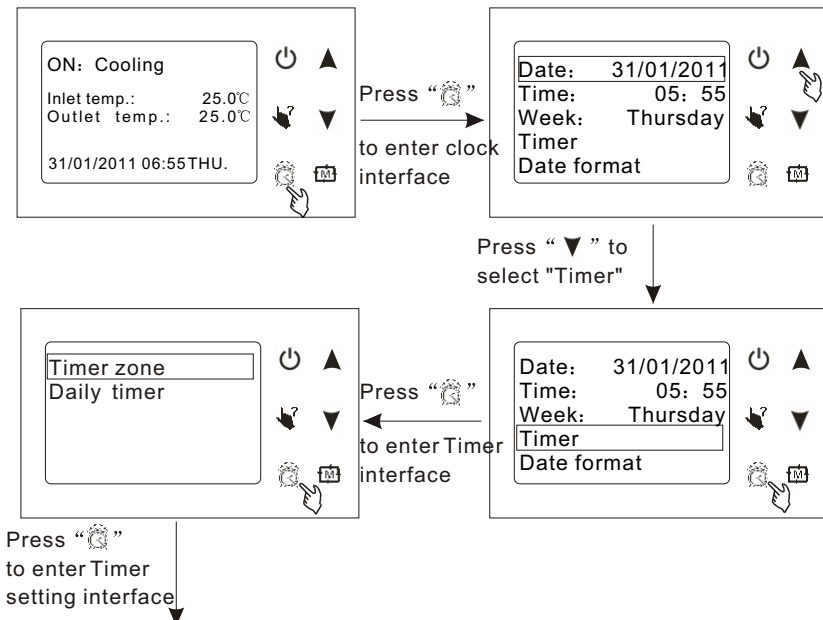
4.7 The operation of timer setting

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.

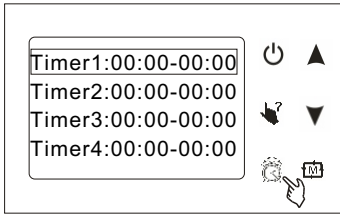
For example:

A. Timersetting

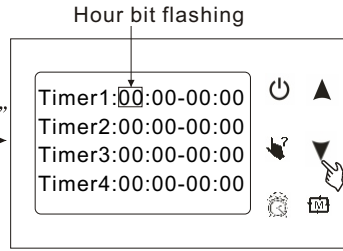


4. USAGE AND OPERATION

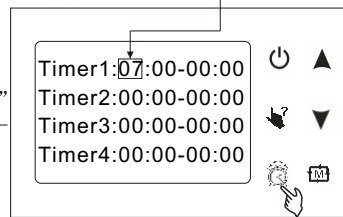
Press “”
to enter Timer
setting interface



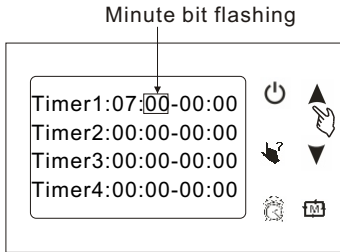
Press “”



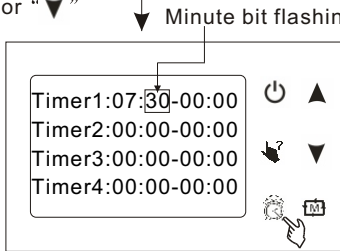
Press “”
or “”



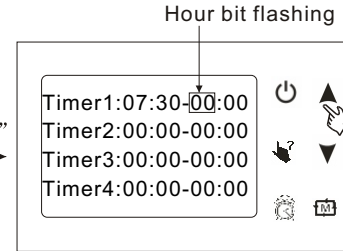
Press “”



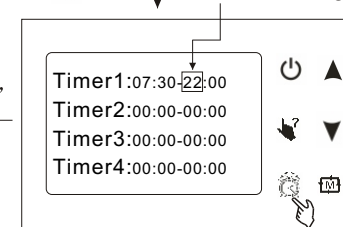
Press “”
or “”




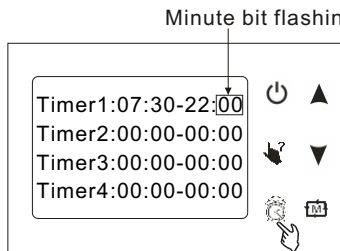
Press “”



Press “”
or “”

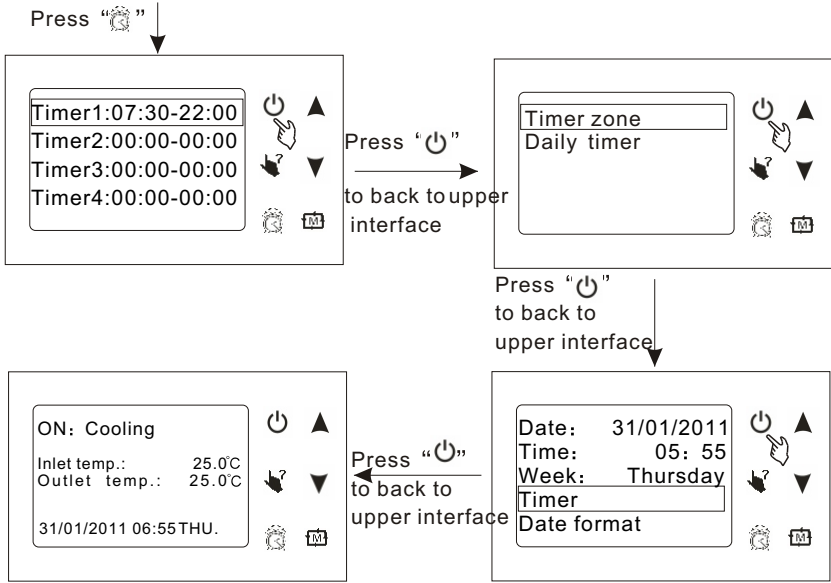


Press “”



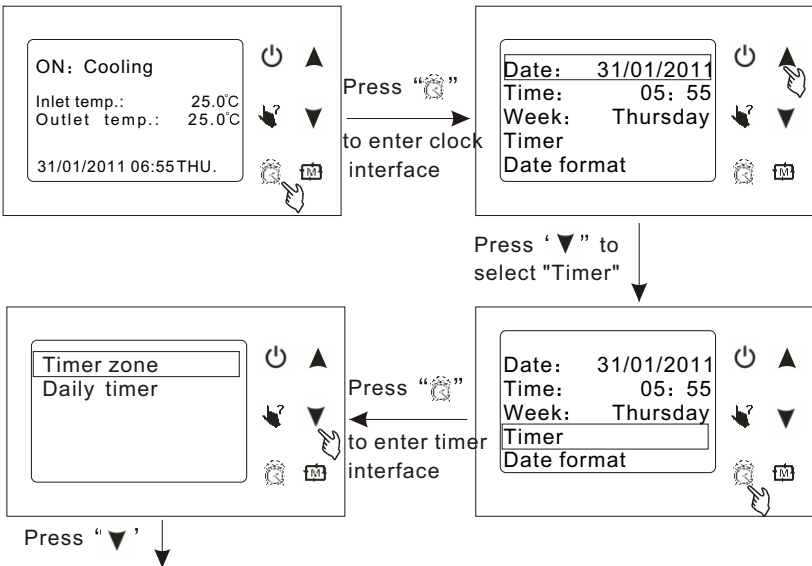
Press “”

4. USAGE AND OPERATION

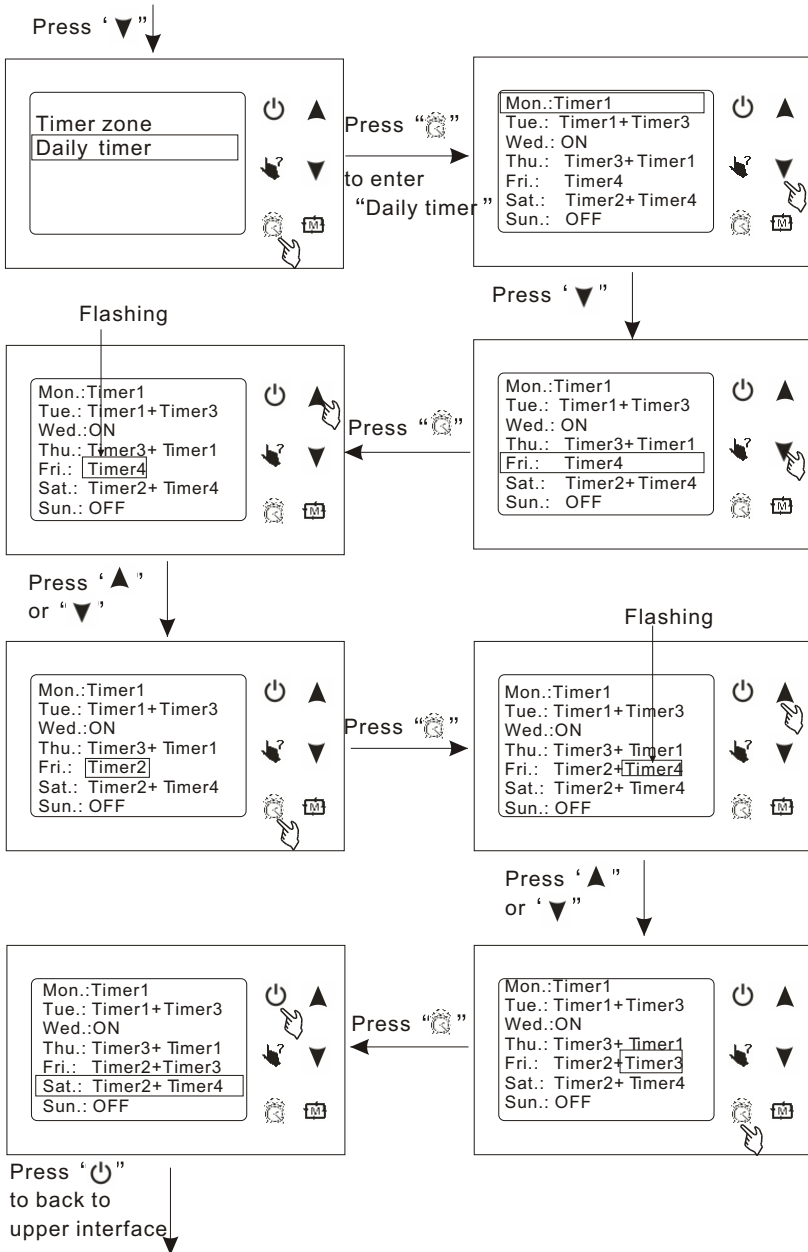


- Tips: 1) The operation of Timer2, Timer3, Timer4 is the same with Timer1;
 2) Timer1:07:30-22:00 means system starts up at 7:30, and shutdown at 22:00 automatically;
 3) If there is no operation in 10s, system will memory parameter setting automatically.

B. The operation of daily timer

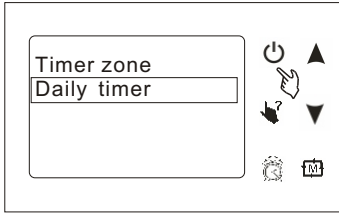


4. USAGE AND OPERATION

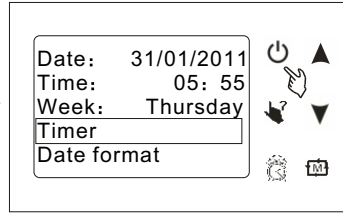


4. USAGE AND OPERATION

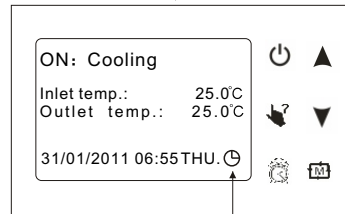
Press "⏻"
to back to upper
interface



Press '⏻'
to back to
upper
interface



Press "⏻"
to back to upper
interface



If "⏻" has been shown, it means
timer on/off has been set

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;

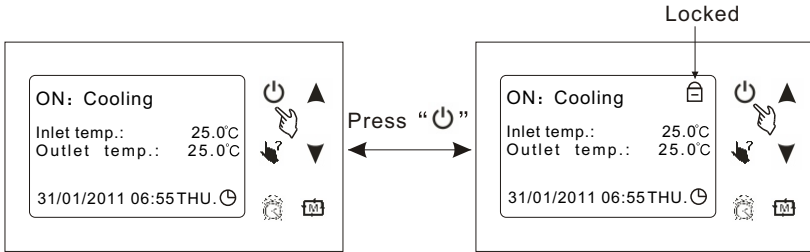
Saturday: Timer1+Timer2 : means the time to startup and to shut down is according to Timer1 and Timer2.

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

4. USAGE AND OPERATION

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.



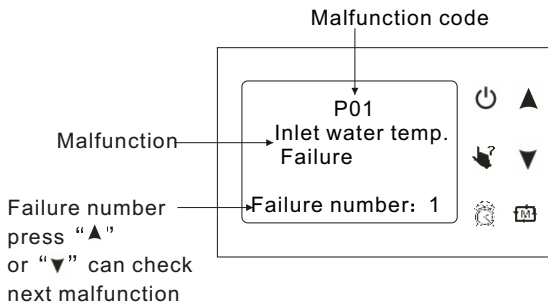
NOTES:

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

4.9 Malfunction display

There will be a malfunction code showing on the controller screen when a 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°C | Ajustable |
| Set-point of heating target temp. | 27°C | Ajustable |
| Set-point of auto mode target temp. | 27°C | 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 | Reason | Resolution |
|--|--|--|---|
| Power on | | | |
| Normal working | | | |
| Inlet temp. Sensor failure | P01 | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| Outlet temp. Sensor failure | P02 | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| Ambient temp. Failure | P04 | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| System 1/2/3/4 Coil temp. Failure | P15(system1),P25(system2) P35(system3),P45(system4) | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| System 1/2/3/4 absorb Temp. Failure | P17(system1),P27(system2) P37(system3),P47(system4) | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| System 1/2/3/4 anti-freeze Temp. Failure | P19(system1),P29(system2) P39(system3),P49(system4) | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| Using side system 1/2/3/4 Anti-freeze temp. Failure | P191(system1),P291(system2) P391(system3),P491(system4) | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| System 1/2/3/4 coil inlet Temp. Failure | P151(system1),P251(system2) P351(system3),P451(system4) | The temp. Sensor is broken or short circuit | Check or change the temp. Sensor |
| System 1/2/3/4 high Pressure protection | E11(system1),E21(system2) E31(system3),E41(system4) | The high-pressure switch is broken | Check the pressure switch and cold circuit |
| System 1/2/3/4 low Pressure protection | E12(system1),E22(system2) E32(system3),E42(system4) | The low-pressure switch is broken | Check the pressure switch and cold circuit |
| Water flow failure | E03 | No water/little water in water system | Check the pipe water flow and water pump |
| Electric-heater Overheat protection | E04 | Electrical-heat is over heat | Check or change electrical-heat |
| Water inlet and outlet Temp. Too big | E06 | Water flow is not enough and low differential pressure | Check the pipe water flow and whether water system is jammed or not |
| System 1/2/3/4 anti-freeze Protection | E06 | Water flow is not enough and low differential pressure | Check the pipe water flow and whether water system is jammed or not |
| System 1/2/3/4 source side Anti-freeze protection | E17(system1),E27(system2) E37(system3),E47(system4) | Water flow is not enough | Check the pipe water flow and whether water system is jammed or not |
| System 1/2/3/4 using side Anti-freeze protection | E171(system1),E271(system2) E371(system3),E471(system4) | Water flow is not enough | Check the pipe water flow and whether water system is jammed or not |
| Anti-freeze protect level 1 | E19 | The ambient temp. is low | / |
| Anti-freeze protect level 2 | E29 | The ambient temp. is low | / |
| System protection | E05 | The protection system is failure | Check each protection point of the system |
| Communication failure | E08 | Communication failure between wire controller and main board | Check the wire connection between remote wire controller and main board |

5. MAINTENANCE AND INSPECTION

5.2 BHB10 malfunction Table

5.2.1 The common failure cause and solution.

| Malfunction | Digital display | Detector display | Canse | Solution |
|---|-----------------|------------------|---|---|
| System 1 exhaust temp.failure | 81 | P181 | The sensor is open or short circuit | Check or change the sensor |
| System 2 exhaust temp.failure | 81 | P281 | The sensor is open or short circuit | Check or change the sensor |
| Ambient temp.sensor failure | 4 | P04 | The sensor is open or short circuit | Check or change the sensor |
| System 1 anti-freeze temp.failure | 9 | E171 | The sensor is open or short circuit | Check or change the sensor |
| System 2 anti-freeze temp.failure | 9 | E271 | The sensor is open or short circuit | Check or change the sensor |
| System 1 economizer inlet temp.failure | 01 | P101 | The sensor is open or short circuit | Check or change the sensor |
| System 2 economizer inlet temp.failure | 01 | P201 | The sensor is open or short circuit | Check or change the sensor |
| System 1 economizer outlet temp.failure | 02 | P102 | The sensor is open or short circuit | Check or change the sensor |
| System 2 economizer outlet temp.failure | 02 | P202 | The sensor is open or short circuit | Check or change the sensor |
| System 1 anti-freeze protection | 71 | P19 | Water flow volume not enough | Check the flow volume,water system is jammed or not |
| System 2 anti-freeze protection | 71 | P29 | Water flow volume not enough | Check the flow volume,water system is jammed or not |
| Communication failure | \ | E08 | Communication failure between remote wire controller and main board | Check the wire connection between remote wire controller and main board |
| System 1 current protection | 51 | E151 | Current through compressor too heavy | Check through the power supply for compressor or short circuit |
| System 2 current protection | 51 | E251 | Current through compressor too heavy | Check through the power supply for compressor or short circuit |
| System 1 exhaust high temp.protection | 82 | P182 | Compressor exhaust temp.too high | Check through the refrigerant system |
| System 2 exhaust high temp.protection | 82 | P282 | Compressor exhaust temp.too high | Check through the refrigerant system |

5.2.2 The indicator light display of failure cause.

| Malfunction | Indicator light |
|------------------|-----------------|
| System 1 failure | 1 on 1 off |
| System 1 failure | 2 on 1 off |
| Ambient failure | 3 on 1 off |

6.APPENDIX

APPENDIX1. Connection of PCB illustration

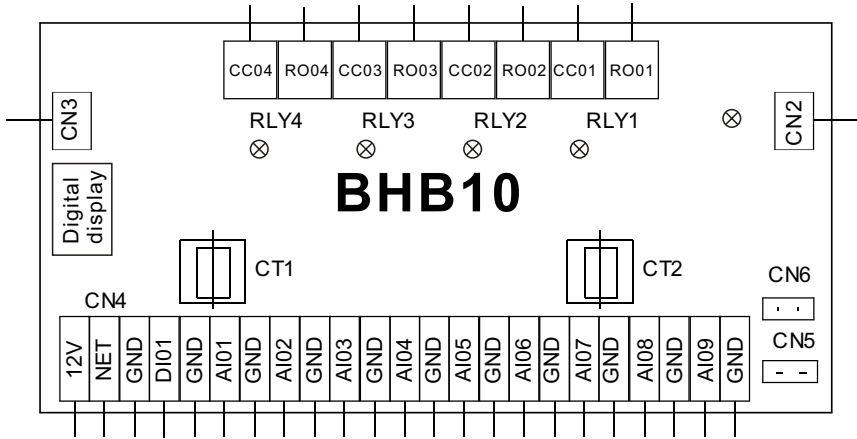
| | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
|--|--|--|--|--|--|--|--|--|--|--|---------------|--------|-------|-------|-------|-------|-------|--------|-------|---------|---------|---------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-----|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|-------|--|--|--|--|--|--|--|--|--|--|--|
| | | | | | | | | | | | RO 11 | RO 10 | RO 09 | RO 08 | RO 07 | RO 06 | RO 05 | RO 04 | RO 03 | RO 02 | RO 01 | L | L | L | | N | N | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | PC8001 | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | | |
| | | | | | | | | | | | RS485B | RS485A | GND | NET | 12V | 5V | DI 11 | DI 10V | GND | DI/DO03 | DI/DO02 | DI/DO01 | DI 10 | DI 09 | DI 08 | DI 07 | DI 06 | DI 05 | DI 04 | DI 03 | DI 02 | DI 01 | GND | AI 16 | AI 15 | AI 14 | AI 13 | AI 12 | AI 11 | AI 10 | AI 09 | AI 08 | AI 07 | AI 06 | AI 05 | AI 04 | AI 03 | AI 02 | AI 01 | AC12V | AC12V | | | | | | | | | | | |

Connections explanation:

| NO. | Symbol | Meaning | NO. | Symbol | Meaning |
|-----|---------|---|-----|--------|---|
| 1 | L | Live line | 27 | DI11 | System protection signal |
| 2 | N | Null line | 28 | AI 01 | Water input temperatureinput |
| 3 | RO 01 | Compressor 1 output(220VAC) | 29 | AI 02 | Water output temperatureoutput |
| 4 | RO 02 | Compressor 2 output(220VAC) | 30 | AI 03 | System 1 fancoil temperature input |
| 5 | RO 03 | Compressor 3 output(220VAC) | 31 | AI 04 | System 2 fancoil temperature input |
| 6 | RO 04 | Compressor 4 output(220VAC) | 32 | AI 05 | System 3 fancoil temperature input |
| 7 | RO 05 | High speed /soucepump output(220VAC) | 33 | AI 06 | System 4 fancoil temperature input |
| 8 | RO 06 | Low speed output (220VAC) | 34 | AI 07 | Ambient temperature input |
| 9 | RO 07 | Water pump output(220VAC) | 35 | AI 08 | System 1 antifreeze temperature input |
| 10 | RO 08 | 4-way valve output(220VAC) | 36 | AI 09 | System 2 antifreeze temperature input |
| 11 | RO 09 | Electric heater output(250VAC) | 37 | AI 10 | System 3 antifreeze temperature input |
| 12 | RO 10 | Spray valve output(220VAC) | 38 | AI 11 | System 4 antifreeze temperature input |
| 13 | RO 11 | Alarm system output(220VAC) | 39 | AI 12 | System 1 suction temperature input |
| 14 | DI/DO 1 | Emergency switch output | 40 | AI 13 | System 2 suction temperature input |
| 15 | DI/DO 2 | Mode indicator output | 41 | AI 14 | System 3 suction temperature input |
| 16 | DI/DO 3 | Emergency switch input | 42 | AI 15 | System 4 suction temperature input |
| 17 | DI 01 | System 1 high pressure protection input | 43 | AI 16 | No use |
| 18 | DI 02 | System 2 high pressure protection input | 44 | GND | Connecting to the remote controller |
| 19 | DI 03 | System 3 high pressure protection input | 45 | NET | |
| 20 | DI 04 | System 4 high pressure protection input | 46 | 12V | |
| 21 | DI 05 | System 1 low pressure protection input | 47 | RS485A | 485 connection |
| 22 | DI 06 | System 2 low pressure protection input | 48 | RS485B | |
| 23 | DI 07 | System 3 low pressure protection input | 49 | AC12V | 12V power input |
| 24 | DI 08 | System 4 low pressure protection input | 50 | AC12V | |
| 25 | DI 09 | Water flow switchprotection input | 51 | CN2 | System 1 electricexpansion valve output |
| 26 | DI 10 | Electric heater overload protection input | 52 | CN3 | System 2 electricexpansion valve output |

6.APPENDIX

APPENDIX2. Connection of PCB illustration



Connections explanation:

| No. | Symbol | Meaning |
|-----|-------------|--|
| 1 | RO01 | System1 mangtic valve outlet (220-230VAC) |
| 2 | RO02 | System2 mangtic valve outlet (220-230VAC) |
| 3 | RO03 | System1 alert outlet (220-230VAC) |
| 4 | RO04 | System2 alert outlet (220-230VAC) |
| 5 | CC01 | System1 mangtic valve inlet (220-230VAC) |
| 6 | CC02 | System2 mangtic valve inlet (220-230VAC) |
| 7 | CC03 | System1 alert inlet (220-230VAC) |
| 8 | CC04 | System2 alert inlet (220-230VAC) |
| 9 | NET GND 12V | Wire controller |
| 10 | DI01 GND | Mode/communication |
| 11 | AI01 GND | System 1 anti-freeze temp.(input) |
| 12 | AI02 GND | System 2 anti-freeze temp.(input) |
| 13 | AI03 GND | System 1 economizer inlet temp.failure(input) |
| 14 | AI04 GND | System 1 economizer outlet temp.failure(input) |
| 15 | AI05 GND | System 2 economizer inlet temp.failure(input) |
| 16 | AI06 GND | System 2 economizer outlet temp.failure(input) |
| 17 | AI07 GND | System 1 exhaust temp.(input) |
| 18 | AI08 GND | System 2 exhaust temp.(input) |
| 19 | AI09 GND | Ambient temp.(input) |

6.APPENDIX

APPENDIX3. 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 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°C.
13. Caution: Single wall heat exchanger, not suitable for potable water connection.

6.APPENDIX

APPENDIX4. 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.

