

# **MACON**

## **Installation & Instruction Manual**

### **MULTI-FUNCTION WATER TO WATER HEAT PUMP UNIT**

Macon Cooling and Heating Energy-efficient Equipment Co., Ltd

# Contents

<b>I. Introduction</b>	1
1. Notice	1
2. Warning	1
3. Product features	1
4. Product work principle	2
<b>II. Specification</b>	2
1. Model Nomenclature	2
2. Product parameter	3
3. Product appearance and installation dimension	5
<b>III. Installation</b>	6
1. Unit installation position	6
2. Water tank install location select	6
3. The unit and water tank installation	6
4. Installation of terminal equipment	7
5. The unit and hot water tank, buffer tank and terminal equipments pipe connection (Refer to installation diagram)	7
6. Installation of the temp detector	8
7. Electrical wiring	8
8. Electrical Wire Selection	9
9. Trial run	11
10. Installation schemes	12
<b>IV. Function diagram of the remote controller</b>	14
1. Display status	14
2. Controller parameter Table	19
<b>V. Maintenance and repair</b>	22
1. Malfunction Indicating Table	22
2. Determine and solve malfunction by below table	23
<b>VI. Wiring diagram</b>	24
1. Mk3051 PCB input and output port definition	24
2. wiring diagram	25

## I. Introduction

### 1. Notice

- 1.1 This manual includes all necessary information of proper installation, debugging, operation and maintenance.
- 1.2 In order to use this product better and safer, please read this instruction carefully before install and operate it. Please pay attention to all the notice in operation and maintenance. Save all manuals and documentation for future reference.
- 1.3 Water to water heat pump is a special appliance. Improper installation will cause damage and danger. It should be installed and maintained by the professionals. Please contact our authorized local service site for installation and maintenance. Please read and follow this instruction carefully before and during installation.  
Remarks: We will not bear the responsibility for any personal injury or unit damage caused by non-compliance of the regulations and instruction in this manual.

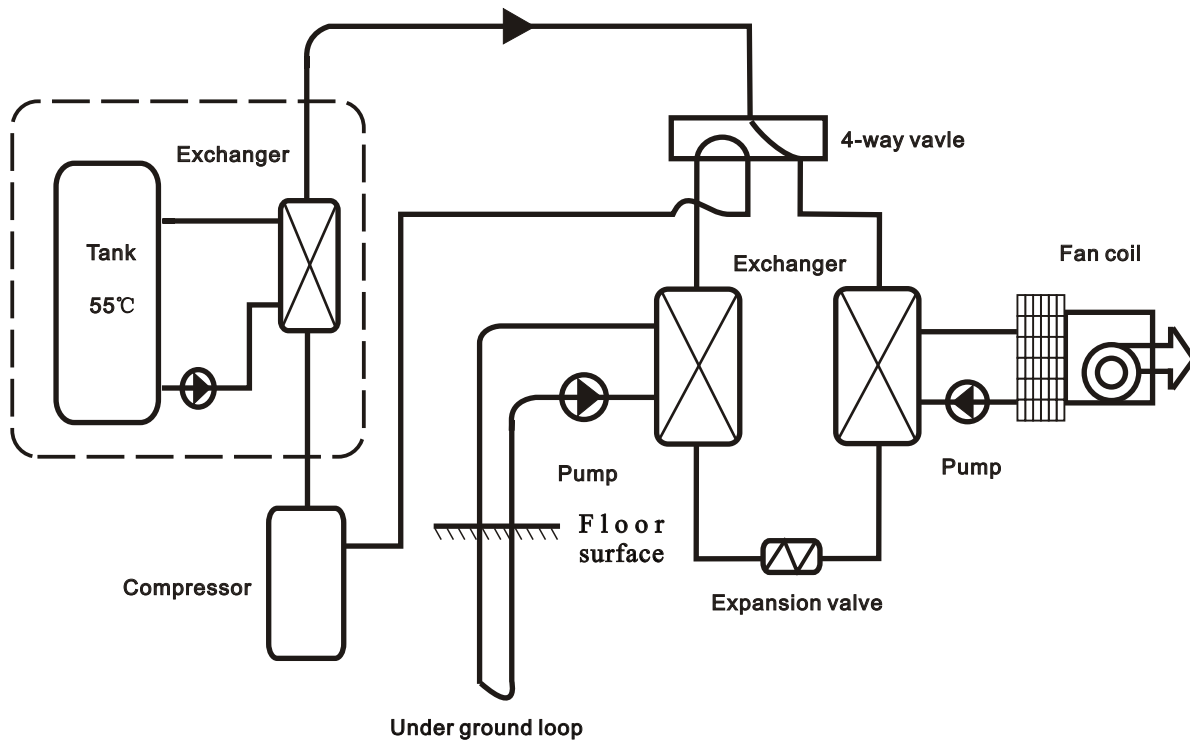
### 2. Warning

- 2.1 Please check whether the distribution power capacity, switch and socket are compliance with the requirements of our unit power. Details please refer to the rating label or parameter table in this manual.
- 2.2 The power should be equipped with leakage protection separately. Power cable should be chosen in accordance with the operation requirements of the unit.
- 2.3 The unit must be grounded safely. Do not use the unit if grounded unsafely. Do not connect the ground line to the neutral and or tap water pipe.
- 2.4 The wire must be joined in compliance with the requirements of the wiring chart. Do not alternate and or repair the unit personally.
- 2.5 The water temperature will reach above 52°C, which will cause burning if the unit with heat recovery. The water can be used only after mix of the hot water and cold water in the tank.
- 2.6 Do not install the unit closed to inflammable, explosive and naked light spot.
- 2.7 To ensure the unit operate properly, please equipped with a filter in the water input when installation.
- 2.8 Please contact us or our authorized service site if the unit failures. The unit can't be used again without technicians' checking.
- 2.9 The unit parameter has been set before leave of the factory. The parameter can't be adjusted by the unprofessional.

### 3 Product features

- 3.1 Environment friendly. No pollution to the environment and energy save. It is environment friendly product and compliance with our energy and environment requirements.
- 3.2 Multifunction. Air cooled water chiller has "cooling", "heating", "cooling + hot water", "heating + hot water" and "heating" function.
- 3.3 Endurance. The unit equipped with famous brand compressor, water pump, plate and high efficient hexagon coaxial screw tube exchanger. The unit can operate stable and efficiently under different condition with advanced control system.
- 3.4 Advanced control means: All performance data can be set and read on the remote controller by the microcomputer.
- 3.5 Wide use range. The unit can supply cooling even it is 43°C and supply heating even it is 7°C.

## 4. Product work principle(The dotted line in the box only heat recovery models.)



## II. Specification

### 1. Model nomenclature

	MW	CHR	W	- *** -	Z	A	/	P	S	(**)
Source medium										
MA: Airsource										
MW: Ground source										
Function of the unit										
C: Aircooling										
R: Airheating										
CH: Air cooling and hot water										
CR: Air cooling and heating										
CHR: Air (heating+cooling) and hot water										
Energy exchange medium										
A: Refrigerant										
W: Water										
The figure represents the horse power of unit										
eg:010 means 1 horse power										
Z: Integrated type										
W: Split type(indoor unit)										
A: Horizontal fan direction										
B: Upward fan direction										
P: With built in pump, (without built in pump omitted)										
S: 3phase(single phase omitted)										
Design alternative serial number										

## 2、Product Parameter

### 2.1. Product parameter

Model	MWC(H)RW	045Z	050Z	040Z/S	045Z/S	050Z/S	060Z/S
Rated Cooling Capacity	kW	13.5	14.7	11.6	13.4	14.5	17.6
	BTU/h	46100	50200	39600	45700	49500	60100
Rated Heating Capacity	kW	17.6	19.1	15.1	17.4	18.9	22.9
	BTU/h	59900	65200	51500	59400	64300	78100
*Heat Recovery Output Water	L/h	338	375	300	338	375	450
Rated Input Power(Cooling)	kW	4.75	5.00	3.80	4.60	4.95	5.80
Rated Input Power(Heating)	kW	4.51	4.75	3.61	4.37	4.70	5.51
Rated Input Current(Cooling)	A	21.6	22.7	6.7	8.1	8.7	10.2
Rated Input Current(Heating)	A	20.5	21.6	6.3	7.7	8.3	9.7
Power Supply	V/PH/Hz	220/1/50	220/1/50	380/3/50	380/3/50	380/3/50	380/3/50
Exhausting Side Max. Working Pressure	Mpa	3.0	3.0	3.0	3.0	3.0	3.0
Absorbing Side Min. Working pressure	Mpa	0.05	0.05	0.05	0.05	0.05	0.05
Compressor		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Compressor Qty		1	1	1	1	1	1
Noise	dB(A)	50	50	50	50	50	50
<b>*Hot water side</b>							
*Water Flow Volume	m <sup>3</sup> /h	2-3	3-4	2-3	2-3	3-4	3-4
*Water Pressure Drop	kpa	20	30	20	20	30	30
*Water Connection	inch	1 "	1 "	1 "	1 "	1 "	1 "
<b>Application side</b>							
Water Flow Volume	m <sup>3</sup> /h	2-3	3-4	2-3	2-3	3-4	3-4
Water Pressure Drop	kpa	20	30	20	20	30	30
Water Connection	inch	1 "	1 "	1 "	1 "	1 "	1 "
<b>Hot source side</b>							
Water Flow Volume	m <sup>3</sup> /h	2-3	3-4	2-3	2-3	3-4	3-4
Water Pressure Drop	kpa	20	30	20	20	30	30
Water Connection	inch	1 "	1 "	1 "	1 "	1 "	1 "
Refrigerant Gas Type		<b>R407C/410A/R22</b>					
Main Unit Net Dimensions(L/M/H)	mm	600/630/785	600/630/785	600/630/785	600/630/785	600/630/785	600/630/785
Main Unit Shipping Dimensions (L/M/H)	mm	710/720/915	710/720/915	710/720/915	710/720/915	710/720/915	710/720/915
Net weight(Horizontal/upwards fan direction)	kg	170/182	176/188	165/178	170/182	176/188	183/195
Shipping weight(Horizontal/upwards fan direction)	kg	190/202	196/208	185/198	190/202	196/208	203/215

Note table 2.1 and table 2.2:

1. Cooling: air condition side input / output water temperature 12/7℃, water source input/output water temperature 25/30℃.
2. Heating: air condition side input/output water temperature 40/45℃, water source input/output water temperature 0/-℃.

## 2.2 Product parameter

Model	MWC(H)RW	080Z/S	100Z/S	120Z/S	200Z/S	250Z/S	300Z/S	450Z/S
Rated Cooling Capacity	kW	23.2	29.0	35.2	52.8	70.4	78.0	119.6
	BTU/h	79200	98900	120100	180200	240200	266100	408100
Rated Heating Capacity	kW	30.2	37.7	45.8	68.6	91.5	101.4	155.5
	BTU/h	102900	128600	156100	234200	312300	346000	530500
*Heat Recovery Output Water	L/h	600	750	900	1500	1875	2250	3375
Rated Input Power(Cooling)	kW	7.60	9.90	11.60	17.40	23.20	25.20	37.50
Rated Input Power(Heating)	kW	7.22	9.41	11.02	16.53	22.04	23.94	35.63
Rated Input Current(Cooling)	A	13.3	17.4	20.4	30.5	40.7	44.2	65.8
Rated Input Current(Heating)	A	12.7	16.5	19.3	29.0	38.7	42.0	62.5
Power Supply	V/PH/Hz	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50	380/3/50
Exhausting Side Max. Working Pressure	Mpa	3.0	3.0	3.0	3.0	3.0	3.0	3.0
Absorbing Side Min. Working pressure	Mpa	0.05	0.05	0.05	0.05	0.05	0.05	0.05
Compressor		Scroll	Scroll	Scroll	Scroll	Scroll	Scroll	Scroll
Compressor Qty		2	2	2	3	4	4	4
Noise	dB(A)	53	53	53	56	56	56	56
<b>*Hot water side</b>								
*Water Flow Volume	m <sup>3</sup> /h	5-6	5-6	5-6	10-12	10-12	15-20	15-20
*Water Pressure Drop	kpa	35	35	35	40	40	45	45
*Water Connection	inch	1-1/4 "	1-1/4 "	1-1/4 "	2 "	2 "	3 "	3 "
<b>Application side</b>								
Water Flow Volume	m <sup>3</sup> /h	5-6	5-6	5-6	10-12	10-12	15-20	15-20
Water Pressure Drop	kpa	35	35	35	40	40	45	45
Water Connection	inch	1-1/4 "	1-1/4 "	1-1/4 "	2 "	2 "	3 "	3 "
<b>Hot source side</b>								
Water Flow Volume	m <sup>3</sup> /h	5-6	5-6	5-6	10-12	10-12	15-20	15-20
Water Pressure Drop	kpa	35	35	35	40	40	45	45
Water Connection	inch	1-1/4 "	1-1/4 "	1-1/4 "	2 "	2 "	3 "	3 "
Refrigerant Gas Type		<b>R407C/410A/R22</b>						
Main Unit Net Dimensions(L/M/H)	mm	800/660/1010	800/660/1010	800/660/1010	1500/980/1080	1500/980/1080	2000/980/1080	2000/980/1080
Main Unit Shipping Dimensions (L/M/H)	mm	880/740/1150	880/740/1150	880/740/1150	1600/1060/1220	1600/1060/1220	2100/1060/1220	2100/1060/1220
Net weight(Horizontal/upwards fan direction)	kg	250/270	260/280	280/300	400/450	450/500	600/670	700/780
Shipping weight(Horizontal/upwards fan direction)	kg	280/300	290/310	310/330	450/500	500/550	700/770	800/880

## 2.3. Pressure-bearing tank performance parameters

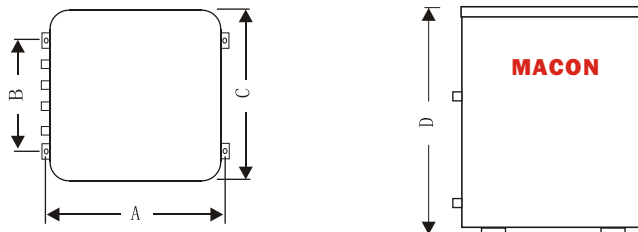
Model	MX	100	150	200	250	300	400	500
Water volume	L	100	150	200	250	300	400	500
WaterOutlet/Water Inlet	inch	G1 "	G1 "	G1 "	G1 "	G1-1/4 "	G1-1/4 "	G1-1/4 "
Max.Working Pressure Tank	Mpa	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Net Dimensions(φxH)	mm	Φ470×1060	Φ470×1500	Φ520×1500	Φ600×1320	Φ600×1540	Φ700×1500	Φ700×1800
Shipping Dimensions (L/M/H)	mm	550/550/1150	550/550/1600	590/590/1600	635/635/1420	635/635/1660	775/775/1620	775/775/1920
Net/Shipping Weight	kg	25/30	30/35	35/40	45/50	53/60	65/75	73/83

## 2.4. Buffer tank performance parameters

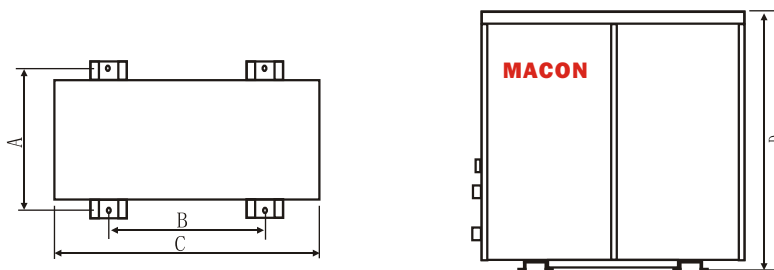
Model	MH	20	30	50	80	100	120	150
Water volume	L	20	30	50	80	100	120	150
WaterOutlet/Water Inlet	inch	G1 "	G1 "	G1 "	G1-1/4 "	G1-1/4 "	G1-1/2 "	G1-1/2 "
Max.Working Pressure Tank	Mpa	0.7	0.7	0.7	0.7	0.7	0.7	0.7
Net Dimensions(φxH)	mm	Φ470×250	Φ470×380	Φ470×510	Φ470×850	Φ470×1060	Φ470×1300	Φ470×1500
Shipping Dimensions (L/M/H)	mm	550/550/350	550/550/480	550/550/610	550/550/950	550/550/1150	550/550/1450	550/550/1600
Net/Shipping Weight	kg	10/15	12/17	15/22	20/27	25/30	28/33	30/35

## 3. Product appearance and installation dimension

### 1. Installation dimensions of integrated type unit



MWCR (H) W Dimensions	040Z/(P)S	050Z/(P)S	070Z/(P)S	080Z/(P)S	100Z/(P)S
A	665	665	665	700	790
B	390	390	390	600	900
C	600	600	600	800	1152
D	820	820	820	1010	1140

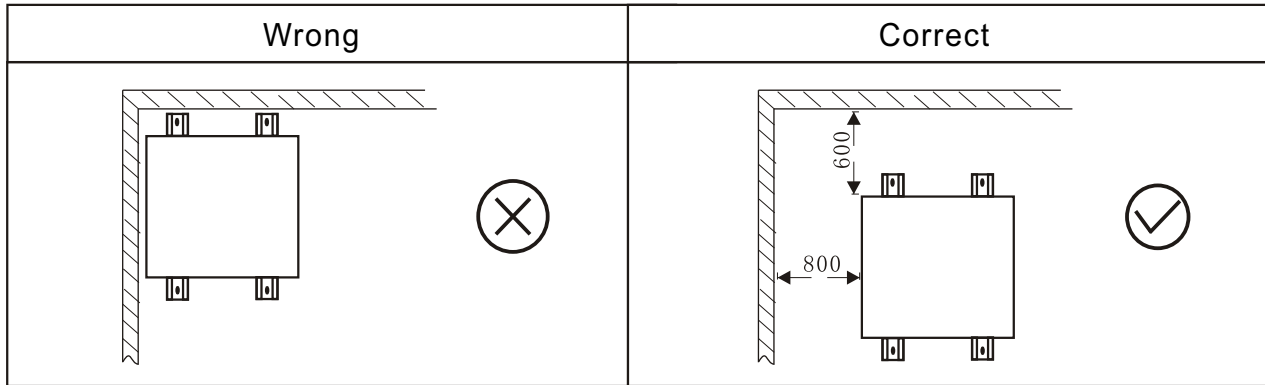


MWCR (H) W Dimensions	130Z/(P)S	200Z/(P)S	250Z/(P)S	300Z/(P)S	450Z/(P)S
A	790	1030	960	960	1190
B	900	1500	1450	1450	1600
C	1152	2000	1760	1760	1910
D	1140	1080	1360	1360	1360

### III. Installation

#### 1. Unit installation position

1.1 Please keep enough space around the unit for repair. Correct and wrong means as below:



- 1.2 The unit can be installed inside floor or any other inside convenient place and reliable load-bearing.
- 1.3 The installation position can hold the unit without noise and shake.
- 1.4 No sunlight to the unit.
- 1.5 The installation position will not be affected by garbage, oil and mist.
- 1.6 The unit will be damaged under the condition with oil(engine oil), salt(sea area) and sulfide air(near thermal spring and refining factory).

#### 2. water tank(hot water tank and buffer water tank) install location select

- 2.1 The water tank can be installed in the outdoor with heat pump outdoor unit, such as balconies, roofs, floors, also can be installed in the room.
- 2.2 Water tank must be standing install, the installation place is a solid foundation, must be bear the weight of the tank when full of water.
- 2.3 Around the water tank, as well as water pipes and hot water pipes should install a valve.
- 2.4 Do not install the water tank, where exist pollute and corrosive gases.

#### 3. The unit and water tank installation

- 3.1 Unit install base is concrete structures, also can be made of steel angle brackets, plus vibration rubber pad placed on the ground or roof, to ensure the unit horizontally.
- 3.2 Installed base design should in accordance with units and water tanks installed size And operational quality.
- 3.3 Directly use expansion bolts to fix unit and water tank to the concrete base.
- 3.4 Around the unit and tank should be drain or outlet.



## 4. Installation of terminal equipment

- 4.1. Indoor terminal equipment installation (such as: fan coil, radiator heater or floor heating), the equipment should be installed in accordance with relevant regulatory requirements.
- 4.2. In accordance with the requirements of engineering design drawings, installation and construction.
- 4.3. Use a soft connector to connect the unit and fan coil inlet and outlet pipes; install fan coil condensate drain pipe, connect the condensate drain interface, and to ensure smooth drainage of condensate water.

## 5. The unit and hot water tank, buffer tank and terminal equipments pipe connection (Refer to installation diagram)

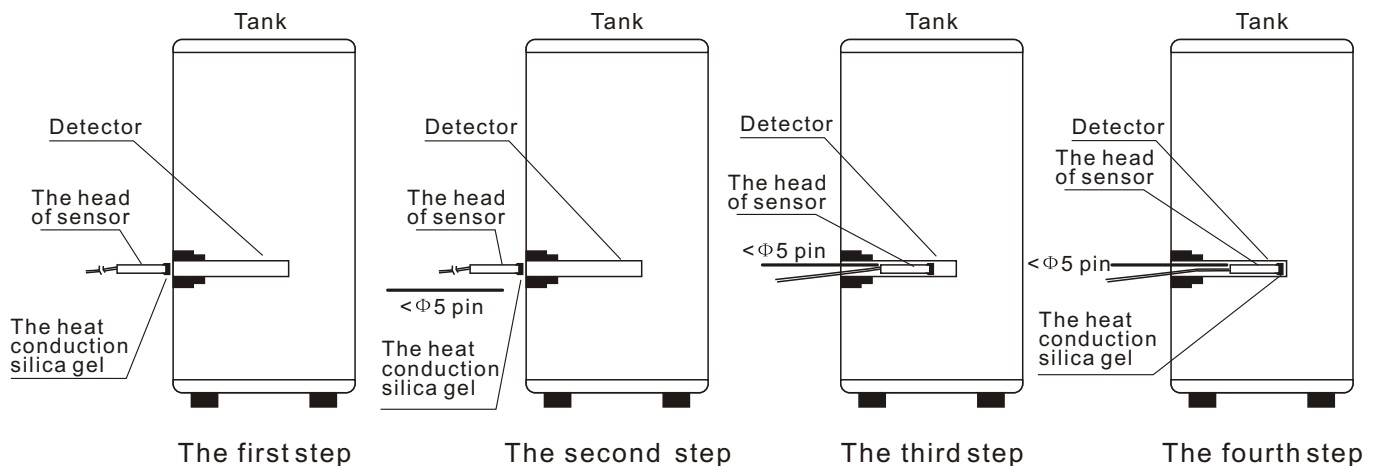
- 5.1. Pipe material selection, can be stainless steel pipe, copper pipe, aluminum water pipe, hot water PPR pipes and so on, according with national health and safety standards, heat-resistant, rust-proof, no scaling pipe.
- 5.2. The choice of pipe sizes can be used the one which matches the heat pump inlet and outlet main pipe, and, respectively connect to heat pump inlet and outlet, and follow the proper construction of plumbing standards.
- 5.3. Water tank outlet pipe and overflow pipe installed in the gutter or outlet position as far as possible, where convenient to drainage.
- 5.4. The unit and the junction to the tank must be installed valve or demolition loose joint, for maintenance use.
- 5.5. Water pipes are arranged reasonably to minimize bending and reduce the pressure loss of water system
- 5.6. The unit air-conditioning side and the hot water side circle inlet must be installed a above 50 mesh water filter to reduce the water system resistance loss.
- 5.7. The unit air-conditioning side and the hot water side which connect to running water must be installed a one-way valve, filter and pressure relief devices (pressure relief devices used on the closed water tank, water tank accessories in general, the parameter value  $\leq 0.7\text{MPa}$ ), in accordance with the flow and valve arrow direction, to avoid flow be obstructed.
- 5.8. The unit hot water side circle outlet connect to tank circle inlet, and the host hot water side circle inlet connect to tank circle outlet, tank hot water supply connect to hot water pipe.
- 5.9. Air-conditioning side buffer tank in series installed on the outlet of the main pipe.
- 5.10. After hot water side and air-conditioning side water system pipes, circulated pipes, hot water supply pipes connected, it must be pipe connection rigorous testing , plus 0.7Mpa pressure testing 24 hours, system pipes connector no leakage and clean and sewage pipes, to ensure that the system clean, no debris. No leakage after the test, then pack the pipe and valve with insulation (including the replenishment pipes and valves).
- 5.11. In order to discharge the water system air clean, avoid air trapping in the pipeline, the water supply return pipe highest point should be set up a automatically exhaust valve.
- 5.12. The water system expansion tank, automatic water valve and stop valve should be installed indoors, to prevent water pipes and valves crack when not use in the winter.
- 5.13. The metal pipe must be used above 50mm thickness of glass fiber or high-density fire retardant PE for thermal insulation and moisture, PPR water pipe can be used 30mm thickness of glass fiber or high-density fire retardant PE for thermal insulation and moisture to prevent cold, heat loss and condensation.

5.14. The unit water inlet and outlet must install a thermometer, water pressure gage, to facilitate inspection when operate.

**Note:**

- 1) Tubing pipeline should be separate test pressure, must not test with hot water unit or tanks.
- 2) The water system working pressure: 0.2-0.7 Mpa.
- 3) The water system operating temperature: 5-75°C.
- 4) Water can drain from the pressure relief device drainage pipe, and the pipe keep open to atmosphere.
- 5) The pressure relief device regularly move to remove the calcium carbonate, and prove that the device is not plugged.
- 6) Installation of one-way valves, filters and pressure relief device, valve body arrow as same as flow direction.
- 7) The pressure relief device discharge pipe should be installed in the frost-free environment in a continuous down way.

## 6. Installation of the temp detector



- 6.1. The first step: Daub the heat conduction silica gel spreads in the front of sensor, and insert into the detector.
- 6.2. The second step: use  $< \Phi 5$  pin to push the detector into the end of the detector against the end of the sensor, and marks on level of the pin and the detector.
- 6.3. The third step: put out the pin, the position of mark to be at the same level with the inlet of detector, check whether the sensor is inserted to the pipe terminal.
- 6.4. The fourth step: the inlet of the detector is sealed with the glass silica gel, and keep the inlet of the detector upwards and upright about an hour.

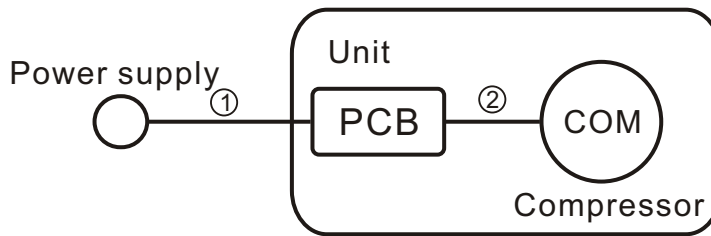
## 7. Electrical wiring

- 7.1. The unit should use dedicated power supply, power supply voltage line corresponding with rated voltage.
- 7.2. The unit power cable must use copper cable, the cable diameter must ensure that the unit's maximum starting current requirements.
- 7.3. The unit power supply circuit must have a grounding wire, which should connect with a reliable external ground wire, and the external ground wire is effective.

- 7.4 Wiring construction must be installed by professional technicians refer to circuit diagram.
- 7.5 Power lines and signal line layout should be neat, rational, strong and weak lines separate and can not interfere with each other, while not contacted with the connecting pipe and the valve body.
- 7.6 When power lines and control lines parallel, the wires were placed in each tube, also leave appropriate distance between the lines.
- 7.7 Unit electric wire connection: take the unit power line, remote control three core lines, electric heater power line, solar circulated water pump control power line, water tank temperature sensing line, solar collector temperature sensor line, terminal equipments connect to unit lines, through the unit wiring hole set into the electrical box, connect to the appropriate terminals according to wiring diagram, and fix it by the pressure line of board in the electrical box.
- 7.8. Unit control panel Code MK3051, Fuse specifications: 5A/250V

## 8. Electrical Wire Selection

8.1 Voltage drop occur may due to the large current draw during compressor starting, and may be result in the compressor is difficult to stat. So we recommend selecting the wire specification from the table below.



### 8.2. Size Table of Electrical Wire

Starting current (A)	The wiring specifications (mm <sup>2</sup> )						
	Markor Mark①(Heat resistance temperature above 60℃)						Mark②(Heat resistance temperature above 120℃)
	within 5m	Within 10m	Within 15m	Within 20m	Within 30m	Within 50m	Within 1m
Below 20	2.0	2.0	2.0	3.5	5.5	8.0	2.0
Below 30	↑	↑	3.5	5.5	↑	14.0	↑
Below 40	↑	3.5	5.5	↑	8.0	↑	↑
Below 50	↑	↑	↑	8.0	14.0	22.0	↑
Below 60	↑	5.5	↑	↑	↑	↑	↑
Below 70	3.5	↑	8.0	14.0	↑	↑	3.5
Below 80	↑	↑	↑	↑	22.0	30.0	↑
Below 90	↑	↑	14.0	↑	↑	↑	↑
Below 100	↑	8.0	↑	↑	↑	38.0	↑
Below 110	↑	↑	↑	↑	↑	↑	↑
Below 120	5.5	↑	↑	22.0	30.0	↑	↑
Below 140	↑	14.0	↑	↑	↑	50.0	5.5
Below 160	↑	↑	22.0	↑	↑	↑	↑
Below 180	↑	↑	↑	↑	38.0	60.0	8.0
Below 200	8.0	↑	↑	30.0	↑	↑	↑
Below 220	↑	↑	↑	↑	50.0	80.0	↑
Below 240	↑	↑	↑	↑	↑	↑	14.0

Power supply installation condition: The touching space of breaker should be more than 3mm, use copper wire only.

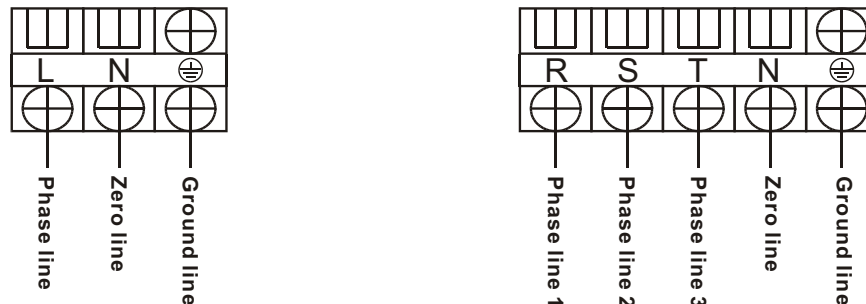
### 8.3 Caution of Ground

The internal motor protector does not protect the compressor against all possible conditions. Please be sure that the system utilizes the ground connection when installed in the field.

### 8.4 Warning: To avoid fire, electric shock and other accidents, keep in mind about these tips:

- 8.4.1 Only use power supply voltage indicated on the label, if you do not know the family of voltage, contact the dealer or local power company.
- 8.4.2 When you use the unit by the maximum current please view the specifications, so make sure your home's power supply (current, voltage and cable) to meet the machine's normal load requirements.
- 8.4.3 To protect the power lines. Power lines should be fixed, so that people will not be trip over or the lines damaged by other things. Paying particular attention to plugs, which should be easily plug into the socket, careful the plug position.
- 8.4.4 Do not overload wall plugs or extension the cable. Line overload can cause fire or electric shock.
- 8.4.5 To ensure your safety, you must plug the power lines into the socket with a grounded three-phase, and check to ensure your socket is accurate and reliable grounding.

### 8.5. Power wiring as follows (single unit):



Mode	Host Power	Phase line	Zero line	Ground line	Max.line length (m)	Signal line	Tem. sensor assistance line	Max.line length (m)
045Z	220V/1PH/50Hz	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
050Z		2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
040Z/S	380V/3PH/50Hz	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
045Z/S		2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
050/S		2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
060/S		2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	2.5mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
080Z/S		4.0mm <sup>2</sup>	4.0mm <sup>2</sup>	4.0mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
100Z/S		6.0mm <sup>2</sup>	6.0mm <sup>2</sup>	6.0mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
120Z/S		6.0mm <sup>2</sup>	6.0mm <sup>2</sup>	6.0mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
200Z/S		10.0mm <sup>2</sup>	10.0mm <sup>2</sup>	10.0mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
200Z/S		16.0mm <sup>2</sup>	16.0mm <sup>2</sup>	16.0mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
300Z/S		16.0mm <sup>2</sup>	16.0mm <sup>2</sup>	16.0mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50
450Z/S	16.0mm <sup>2</sup>	16.0mm <sup>2</sup>	16.0mm <sup>2</sup>	15	0.5mm <sup>2</sup>	0.5mm <sup>2</sup>	50	

### Note:

1. used PVC insulated copper wire for above wiring
2. for installation requires, the line is longer than the maximum line length, please contact the company

## 9. Trial run

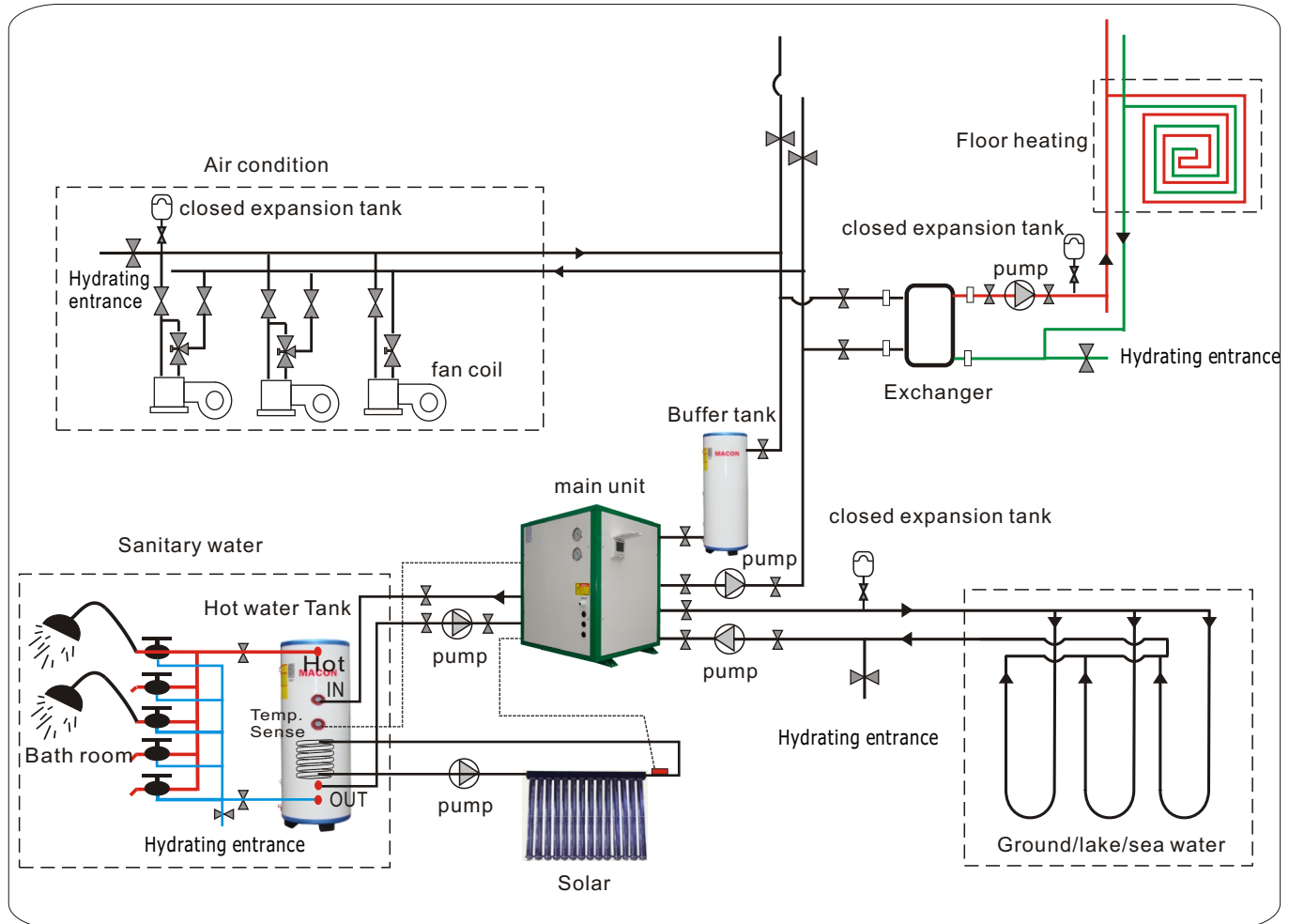
- 9.1. Check the hot water side, air-conditioning side and solar side of the water system piping and all accessories are installed correctly, heat pumps, water tanks, terminal equipment piping connections are correct. The fill water supply of hot water side, air-conditioning side and solar side are normal, the replenishment port whether installed pressure relief valve, one-way valve, filter and other accessories.
- 9.2. Open the unit hot water side, air-conditioning and solar side hydrating valve, circular inlet and outlet water valve, main pipe backwater valve, floor branch pipe valve, terminal equipment inlet and outlet valve, fill the hot water side water tank, air-conditioning side water tank and solar collector system with water. Check the valves should be open if all open, the valves should be closed if all closed, pipe insulation if complete.
- 9.3. Open the exhaust valve, hot water valve, drain the pipe air, confirm pipe clean, close the exhaust valve, hot water valve.
- 9.4. Check the power supply if required with the unit power supply on the nameplate, power supply voltage if normal.
- 9.5. Check all power supply and control wires are all connected in place, whether connect correctly according to the cable wiring diagram, all the terminals are tightened and check the reliability of ground connection.
- 9.6. Test Hot water side, air-conditioning side, solar side water system to test, first of all, heat pump units connected to power supply, operating the remote controller (refer to the remote controller operation), start the hot water side, air-conditioning side, solar side circulating pump, opened the exhaust valve again to drain the pipe air, observe and listen water pump operation, the circulating water flow whether normal. Until the hot water side, air-conditioning side, and solar side circulating water system work completely normal, close the hot water side, air conditioning and solar side circulating pump.
- 9.7. When a full inspection of the entire system to install correctly and meet the requirements, may carry out the whole test run.
- 9.8. Operate the unit controller, select the heat pump working mode and setting temperature, back to controller main interface, press “ ⏻ ” to start the heat pump.
- 9.9. First water pump operate 30s, the compressor starts. To determine unit operation if have different sound through hearing, if is, shunt down power immediately and check, only continue running if there is no different sound, at the same time pay attention to system high and low pressure if normal.
- 9.10. Check again whether the unit input power and current normal, if not, then shut down to check.
- 9.11 View the unit control operation status display, check and record the unit's output and input status, the value of each point temperature indicated if normal.
- 9.12. Operate the unit controller, change the heat pump working mode, check and record the unit's output and input status, the value of each point temperature indicated if normal. Unit put into normal run only after checking all the working modes are normal.

### Note:

- 1 unit the first time power on without three minutes delay protection, other times there is three minutes delay protection.
- 2 must clean the pipe air when first the unit boot.

## 10. Installation schemes

### 1. Installation sketch for the unit with heat recovery.

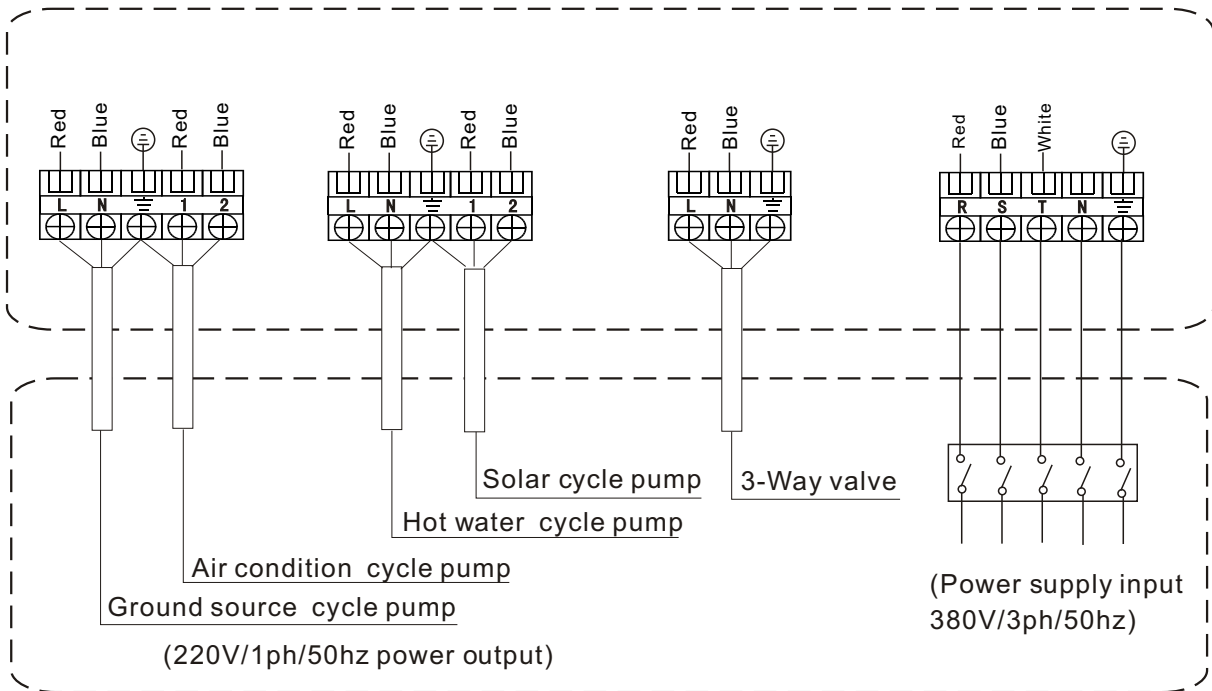


#### Notice to installation

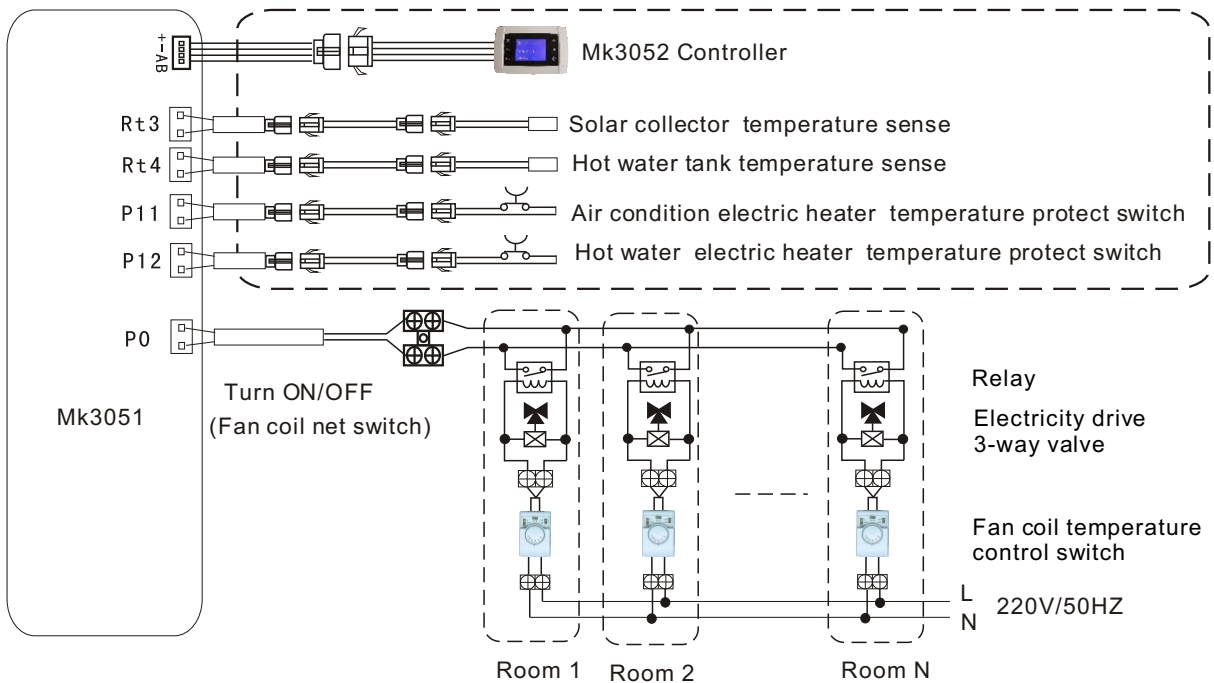
1. The factory only supply the main unit . Other accessories as water system necessary parts should be offered by user or installation company.
2. The water system should be equipped with automatic exhausted valve which is in stalled at the highest of the water system(refer to the pipe connection explanation)

## 2. Electrical connection diagram

### 2.1. Strong current connection diagram

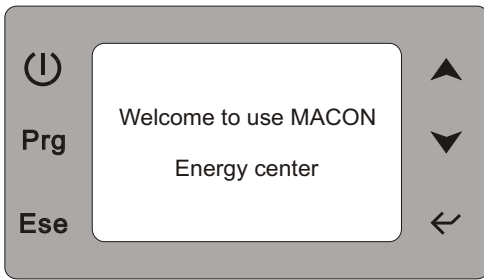


### 2.2. control signal connection diagram



## IV、 Function diagram of the remote controller.

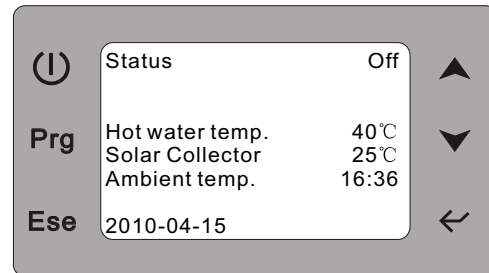
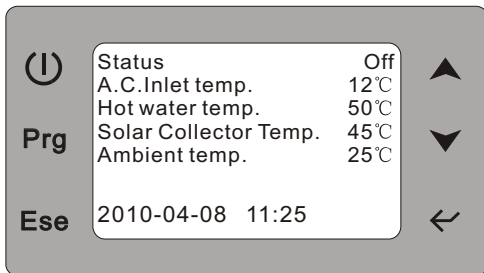
Remote controller interface displays as below



	UNIT ON/OFF	Press this button to control the unit's ON or OFF
<b>Prg</b>	SET	Press this button to enter the main menu interface
<b>Ese</b>	BACK	Press this button to return to the previous screen
	UP	Modify the parameter values or turn to next page
	DOWN	Modification parameter values or turn to next page
	ENTER	Press this button and enter the next parameters interface or enter parameters modification state, and confirm the modification

### 1. Display status

#### 1.1. Standby display status

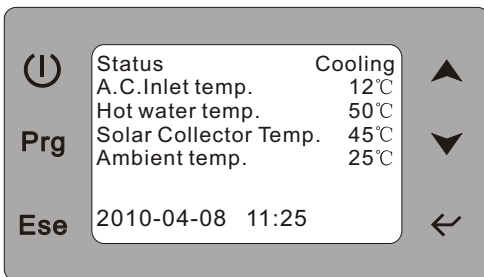


#### 1.2 .Power on(off)/mode display status

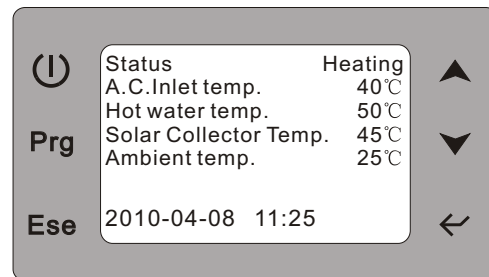
Power on: Under the standby status, press "⏻" for 3 second, after hear "beep" means power on, operation pannel display the corresponding mode.

Power off: Under the standby status, press "⏻" for 3 second, after hear "beep" means power off, operation pannel display the corresponding "off" mode.

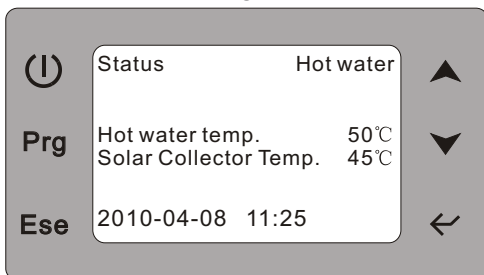
The following is the corresponding mode of power on:



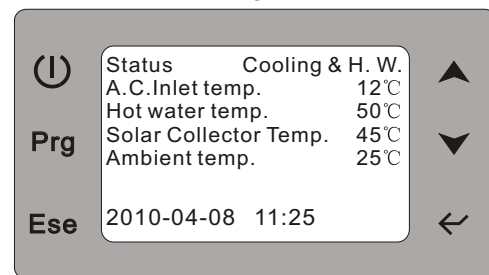
cooling mode



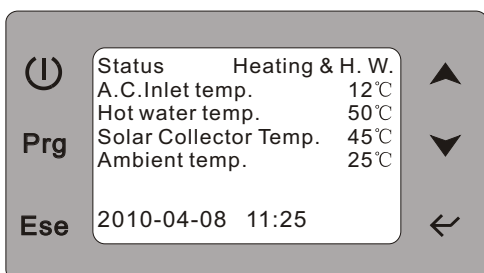
heating mode



hot water mode



cooling+hot water mode

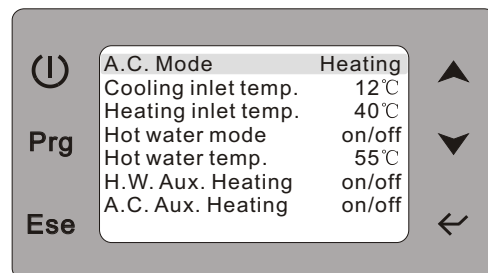
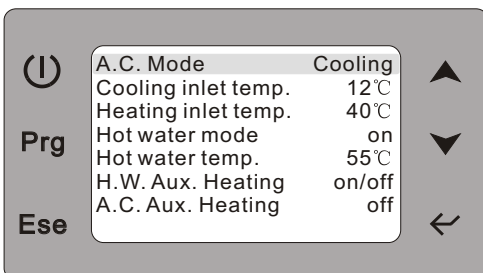
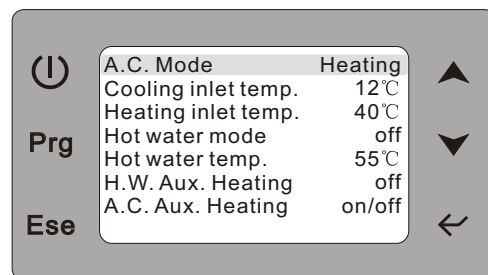
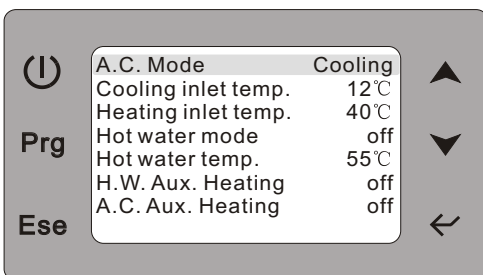
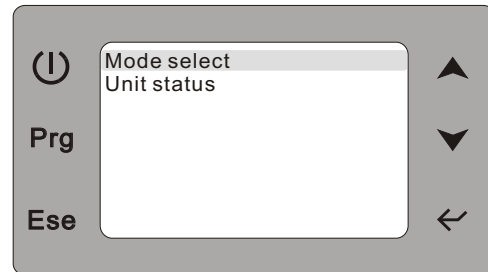
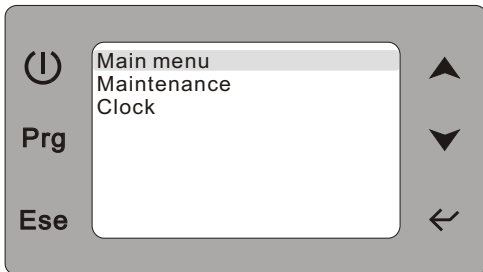


heating+hot water mode



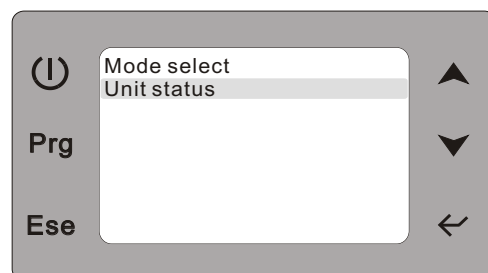
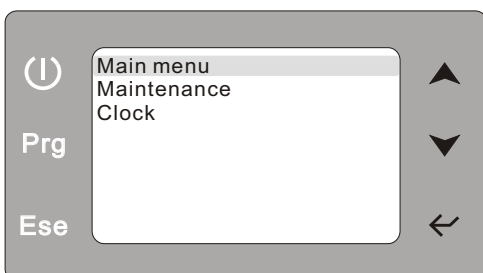
### 1.3. Corresponds to enter the parameters setting mode

Under the main interface, press: “ Prg ” enter into parameter setting interface, choose "Main menu ", press “ ← ” button, choose "Mode select", press “ ← ” into the mode setting, press “ ▲ ▼ ” to view and choose, press “ ← ” again to go into the modify parameter interface, the corresponding parameter value is flashing, press “ ▲ ▼ ” to modify the value, press “ Ese ” return to the previous menu.



### 1.4. System parameter checking:

On the main interface, press “ Prg ” enter into parameter setting interface, choose "Main menu ", press “ ← ” button, choose "Unit status", press “ ← ” into the mode setting, press “ ▲ ▼ ” to view the paramter, press “ Ese ” return to the previous menu.



## 1.4.1. Host type: air to water

(I) Prg Ese	A.C. Inlet temp.	40°C	▲ ▼ ←
	A.C. Outlet temp.	45°C	
	Hot water temp.	55°C	
	Rec. Inlet temp.	65°C	
	Sys1. Evap. Temp.	13°C	
	Sys2. Evap. Temp.	13°C	
	Solar temp.	50°C	
	Ambient temp.	13°C	

(I) Prg Ese	Compressor 1	on/off	▲ ▼ ←
	Compressor 2	on/off	
	4way-valve	on/off	
	Fan motor	on/off	
	A.C. Water pump	on/off	
	Hot water pump	on/off	
	Solar pump	on/off	
	A.C.aus. Heater	on/off	

(I) Prg Ese	H.W.aus. Heater	on/off	▲ ▼ ←
	Comp. Oil Heater	on/off	
	3 way-valve	on/off	

(I) Prg Ese	A.C. flow sw	close/open	▲ ▼ ←
	G.S. flow sw	close/open	
	H.W. flow sw	close/open	
	Sys1 HP sw	close/open	
	Sys1 LP sw	close/open	
	Sys2 HP sw	close/open	
	Sys2 LP sw	close/open	
	A.C. aux.TH sw	close/open	

(I) Prg Ese	H.W. aus. TH sw	close/open	▲ ▼ ←
	Emergency Sw	close/open	
	Phase sw	close/open	

## 1.4.2. Host type: water to water

(I) Prg Ese	A.C. Inlet temp.	40°C	▲ ▼ ←
	A.C. Outlet temp.	45°C	
	Hot water temp.	55°C	
	Rec. Inlet temp.	65°C	
	G.S.water inlet	13°C	
	G.S. water outlet	13°C	
	Solar temp.	50°C	
	Ambient temp.	13°C	

(I) Prg Ese	Compressor 1	on/off	▲ ▼ ←
	Compressor 2	on/off	
	4way-valve	on/off	
	G.S. water pump	on/off	
	A.C. Water pump	on/off	
	Hot water pump	on/off	
	Solar pump	on/off	
	A.C.aus. Heater	on/off	

(I) Prg Ese	H.W.aus. Heater	on/off	▲ ▼ ←
	Comp. Oil Heater	on/off	
	3 way-valve	on/off	

(I) Prg Ese	A.C. flow sw	close/open	▲ ▼ ←
	G.S. flow sw	close/open	
	H.W. flow sw	close/open	
	Sys1 HP sw	close/open	
	Sys1 LP sw	close/open	
	Sys2 HP sw	close/open	
	Sys2 LP sw	close/open	
	A.C. aux.TH sw	close/open	

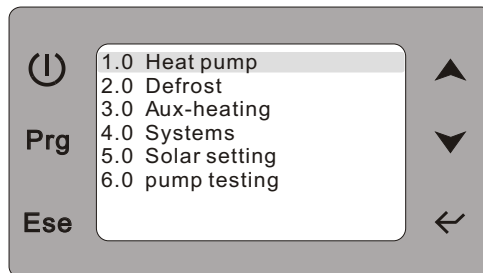
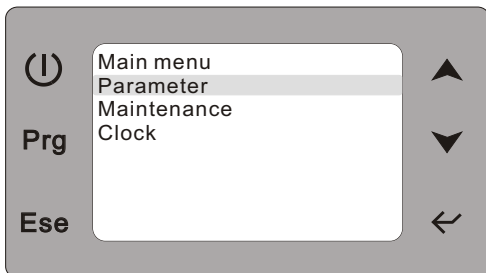
(I) Prg Ese	H.W. aus. TH sw	close/open	▲ ▼ ←
	Emergency Sw	close/open	
	Phase sw	close/open	

## 1.5. System parameter setting:

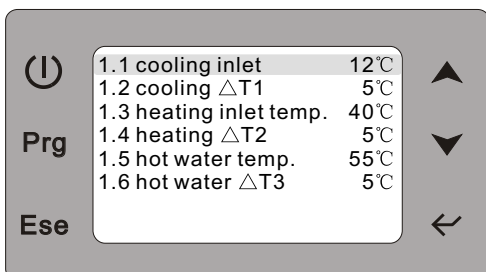
On the main interface, press the button “Prg” enter into page2 (picture1), press “Prg” for 5 second until hear the “beep”, one more parameter (parameter) appear, press “▲▼” to view the parameter, choose “Parameter” and press “←” to enter the parameters setting interface, press “▲▼” to view the parameter, press “←” to enter the parameters setting interface, press “▲▼” to view the parameter, press “←” to enter the system parameters setting interface, corresponding parameter flashing, press “▲▼” to modify, press “Ese” to return previous menu.

Note: If exit interface of figure1, the “Parameter” disappears.

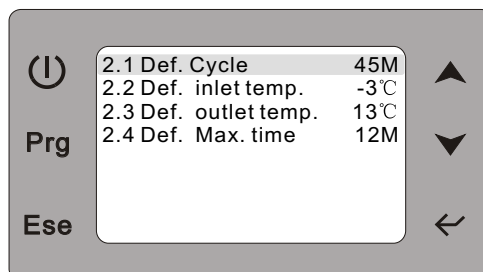
Picture 1



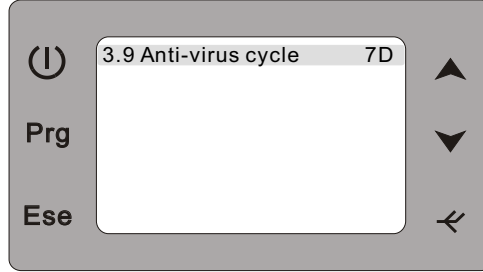
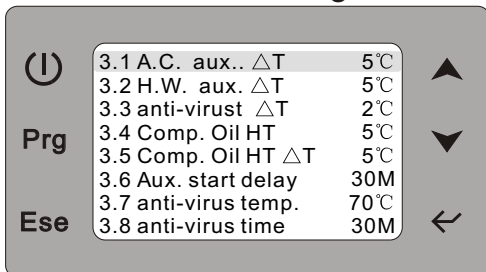
Select “Heat pump”



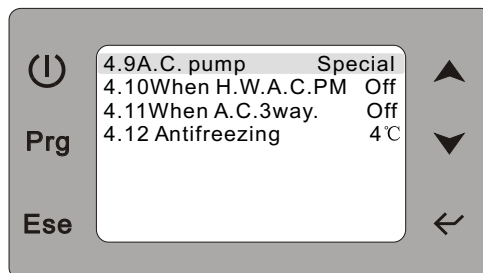
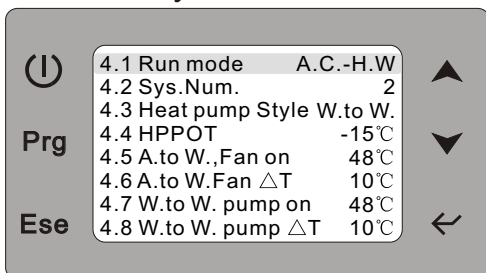
Select “Defrost”



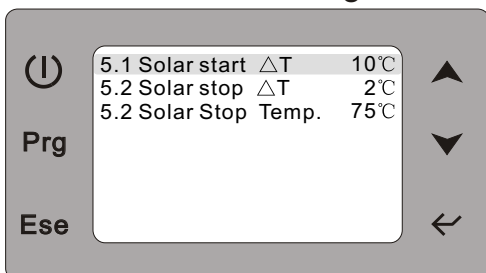
Select “Aux-heating”



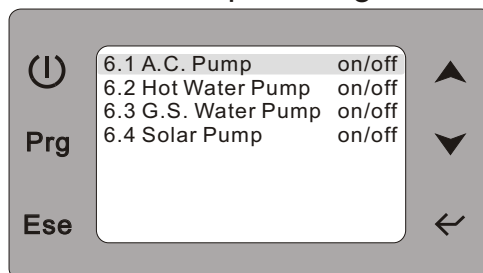
Select “Systems”



Select “Solar setting”

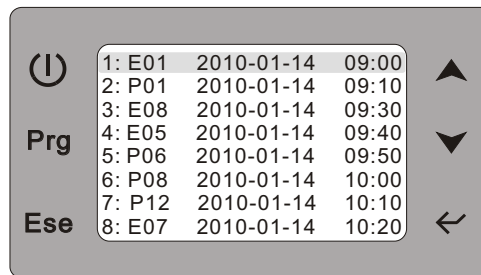
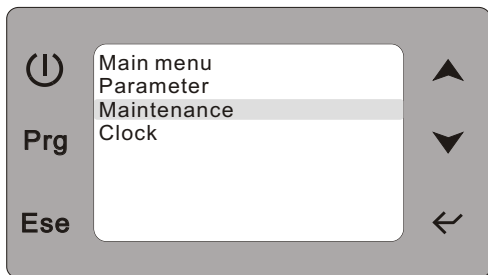


Select “Pump testing”



## 1.6.The maintenance time inquires ;

In the interface ,press “ Prg ” to enter parameter setting interface,choose "Maintenance" and press “ ← ” to enter Maintenance time inquires, press “ ▲ ▼ ” to turn a choice, and press “ Ese ” key returns the last menu.



## 1.7.Date/ time/ timing on and off settings:

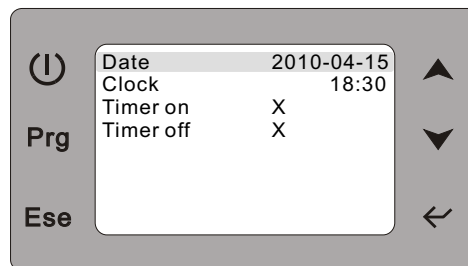
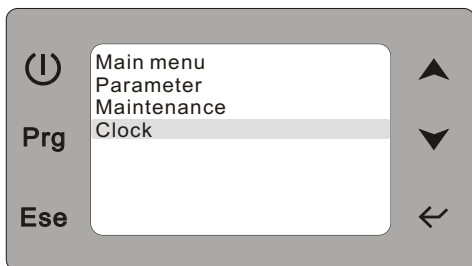
In the main interface, press “ Prg ” key to enter the parameter setting interface, select Clock, press “ ← ” key to enter the time setting / timing on or off interface, press the “ ▲ ▼ ” key to turn options:

1, when you select "Date", press “ ← ” key, the date of the year setting flash, press the “ ▲ ▼ ” key to modify Year, then press “ ← ” key again, the month setting flash, press the “ ▲ ▼ ” key to modify the month, click the “ ← ” key again, Day flash, press the “ ▲ ▼ ” key to modify the day, then press “ ← ” key to confirm and exit, press the “ Ese ” button to return the layer menu.

2. When you select "Clock", press the “ ← ” key, the time hourly position flash, press the “ ▲ ▼ ” key to modify hour value, then press “ ← ” key, minutes flash, press the “ ▲ ▼ ” key to modify the minute value, press the “ ← ” key again confirm and exit, press the “ Ese ” to return the layer menu.

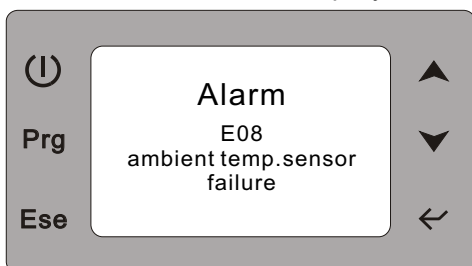
3. When you select "Timer on", press the “ ← ” key, regular on or off setting flash, press “ ▲ ▼ ” key to modify the boot time whether on / off, appear "√" symbol when choose on, and show regular boot time settings, click the “ ← ” key, regular on or off hour value setting flash, press the “ ▲ ▼ ” key to modify the value, then press “ ← ” key, regular on or off minute value setting flash, press “ ▲ ▼ ” key to modify the value, press “ ← ” key to confirm and exit, press the “ Ese ” "Ese" to return the layer menu.

4. When you select "Timer off", press the “ ← ” key, time off setting flash, press the “ ▲ ▼ ” key to choose the sleep timer whether on / off, it will appear "√" symbol when choose, and shows the value of time off setting, press “ ← ” key, timer off hour value setting flash, press the “ ▲ ▼ ” key to modify the value, then press “ ← ” key, time off minute value setting flash , press “ ▲ ▼ ” key to modify the value, press “ ← ” key to confirm and exit, press the “ Ese ” to return the layer menu.




## 1.8.Fault code display:

When a fault, unit controller display automatically corresponding fault code and the fault reasons. When fault resolution, fault display automatically eliminate or after re-power to eliminate



## 1.9.Lock button/ “Fahrenheit” and “Celsius” change:

Display Lock: Under the power on or standby status:Press “ ← ” for 10s, all buttons on the display are locked, but it can be unlocked after pressing “ ← ” for 10s again.Shows: “  ”

“Fahrenheit” and “Celsius” change: Under the Celsius status, press “ Ese ” for 10 s can change to “ Fahrenheit ” ,it will change to Celsius again when press “ Ese ” for 10s.

## 2. Controller parameter Table

Display code1	Display code2	Setting data explanation or working state	Parameter setting range	Default	Remarks
Main menu					
Mode select	A.C. mode Cooling /Heating /Off	Cooling/heating/off	Cooling/heating/off	Heating	Adjustable
	Cooling inlet temp. 12 °C	Cooling inlet temperature setting	8°C ~18°C	12°C	Adjustable
	Heating inlet temp. 40 °C	Heating inlet temperature setting	18°C ~60°C	40°C	Adjustable
	Hot water mode on/off	hot water mode selection, on /off	On/off	On	Adjustable
	Hot water temp. 55 °C	Hot water temperature setting	30°C ~60°C	55°C	Adjustable
	H.W. Aux. Heating on/off	hot water auxiliary elecetric heater on / off settings	On/off	Off	Adjustable
	A.C. Aux. heating on/off	air condition auxiliary elecetric heater on / off settings	On/off	Off	Adjustable
	Priority hot water /A. C. Heating/ATST	Heating and hot water mode, the priority selection.	Hot water/A. C. Heating/ATST	ATST	Adjustable
		Priority hot water:hot water priority Priority A.C. Heating: air condiction priority Priority ATST:air condiction and hot water at the same time working			
Unit status					
Air to water	A.C. Inlet temp. 45°C	air condition water inlet tempture	measured value		
	A.C. Outlet temp. 45°C	air condition water outlet tempture	measured value		
	Hot water temp. 40°C	tank hot water tempture	measured value		
	Rec. inlet temp. 65°C	Heat recovery water inlet temperature	measured value		
	Sys1.Evap. temp. 13°C	1 system evaporator coil temperature (ground source water inlet temperature)	measured value		
	Sys2.Evap. temp. 13°C	2 system evaporator coil temperature (ground source water outlet temperature)	measured value		
	Solar temp. 50°C	Solar collector water temperature	measured value		
	Ambient temp. 13°C	Ambient temperature	measured value		
	Compressor 1 on/off	1 system compressor on/off	Actual state		
	Compressor 2 on/off	2 system compressor on/off	Actual state		
	4way-valve on/off	4 way-valve on/off	Actual state		
	Fan motor on/off	Fan motor on/off	Actual state		
	A.C. water pump on/off	air condition cycle water pump on/off	Actual state		
	Hot water pump on/off	Hot water cycle pump on/off	Actual state		
	Solar pump on/off	Solar cycle pump on/off	Actual state		
	A.C.aus. heater on/off	air condition auxiliary electric heater on / off			
	H.W. aus. Heater on/off	hot water tempture auxiliary electric heater on / off			
	Comp. Oil Heater on/off	compressor oil tempture auxiliary electric heater on / off			
	3 way-valve on/off	3 way-valve on / off			
	A.C. flow sw close/open	air condition side water flow switch close or open	Actual state		
	G.S. flow sw close/open	ground source side water flow switch close or open	Actual state		
	H.W. flow sw close/open	hot water side water flow switch close or open	Actual state		
	Sys1 HP sw close/open	1 system high pressure switch close or open	Actual state		
	Sys1 LP sw close/open	1 system low pressure switch close or open	Actual state		
	Sys2 HP sw close/open	2 system high pressure switch close or open	Actual state		
	Sys2 LP sw close/open	2 system low pressure switch close or open	Actual state		
	A.C. aux.TH sw close/open	Air-conditioning auxiliary electric heater, thermal protection switch close or open	Actual state		
	H.W. Aus.TH sw close/open	hot water auxiliary electric heater, thermal protection switch close or open	Actual state		
	Emergency Sw close/open	Emergency Switch close:working ;open:stop working	Actual state		
	Phase sw close/open	close:Normal; open:Phase, phase sequence wrong.	Actual state		

Display code1	Display code2	Setting data explanation or working state	Parameter setting range	Default	Remarks	
<b>Unit status</b>						
Water to water	A.C. Inlet temp.	45℃	air condition water inlet tempture	measured value		
	A.C. Outlet temp.	45℃	air condition water outlet tempture	measured value		
	Hot water temp.	40℃	tank hot water tempture	measured value		
	Rec. inlet temp.	65℃	Heat recovery water inlet temperature	measured value		
	G.S.water inlet	13℃	1 system evaporator coil temperature (ground source water inlet temperature)	measured value		
	G.S.water outlet	13℃	2 system evaporator coil temperature (ground source water outlet temperature)	measured value		
	Solar temp.	50℃	Solar collector water temperature	measured value		
	Ambient temp.	13℃	Ambient temperature	measured value		
	Compressor 1	on/off	1 system compressor on/off	Actual state		
	Compressor 2	on/off	2 system compressor on/off	Actual state		
	4way-valve	on/off	4way-valve on/off	Actual state		
	G.S.water pump	on/off	ground source water pump on/off	Actual state		
	A.C. water pump	on/off	air condition cycle water pump on/off	Actual state		
	Hot water pump	on/off	Hot water cycle pump on/off	Actual state		
	Solar pump	on/off	Solar cycle pump on/off	Actual state		
	A.C.aus. heater	on/off	air condition auxiliary electric heater on / off			
	H.W. aus. Heater	on/off	hot water tempture auxiliary electric heater on / off			
	Comp. Oil Heater	on/off	compressor oil tempture auxiliary electric heater on / off			
	3 way-valve	on/off	Water 3 way-valve on / off			
	A.C. flow sw	close/open	air condition side water flow switch close or open	Actual state		
	G.S. flow sw	close/open	ground source side water flow switch close or open	Actual state		
	H.W. flow sw	close/open	hot water side water flow switch close or open	Actual state		
	Sys1 HP sw	close/open	1 system high pressure switch close or open	Actual state		
	Sys1 LP sw	close/open	1 system low pressure switch close or open	Actual state		
	Sys2 HP sw	close/open	2 system high pressure switch close or open	Actual state		
	Sys2 LP sw	close/open	2 system low pressure switch close or open	Actual state		
	A.C. aux.TH sw	close/open	Air-conditioning auxiliary heater, thermal protection switch close or open	Actual state		
	H.W. Aus.TH sw	close/open	hot water auxiliary heater, thermal protection switch close or open	Actual state		
Emergency Sw	close/open	Emergency Switch (close:working ;open:stop working)	Actual state			
Phase sw	close/open	close:Normal; open:Phase, phase sequence wrong.	Actual state			
<b>Parameter</b>						
1.0 Heat pump	1.1 cooling inlet	12℃	cooling inlet tempture setting	8℃ ~18℃	12℃	Adjustable
	1.2 cooling ΔT1	4℃	cooling start temperature difference setting	1℃ ~20℃	5℃	Adjustable
	1.3 heating inlet temp.	40℃	heating inlet tempture setting	18℃ ~60℃	40℃	Adjustable
	1.4 heating ΔT2	5℃	heating start temperature difference setting	1℃ ~60℃	5℃	Adjustable
	1.5 hot water temp.	55℃	Tank hot water tempture setting	30℃ ~60℃	55℃	Adjustable
	1.6 hot water ΔT3	5℃	Tank hot water heating start temperature difference setting	1℃ ~20℃	5℃	Adjustable
2.0 Defrost	2.1 Def. Cycle	40M	defrosting cycle setting	1min~90min	45min	Adjustable
	2.2 Def. inlet temp.	-3℃	Start defrosting coil temperature setting	-20℃-10℃	-3℃	Adjustable
	2.3 Def. outlet temp.	13℃	Exit defrost temperature setting	1℃ ~30℃	13℃	Adjustable
	2.4 Def. Max. time	12M	Defrost time setting	1min~12min	12min	Adjustable
3.0 Aux-heating	3.1 A.C. Aux. ΔT	5℃	air condition auxiliary heating start temperature difference setting	1℃ ~20℃	5℃	Adjustable
	3.2 H.W. aux. ΔT	5℃	Hot water auxiliary heating start temperature difference setting	1℃ ~20℃	5℃	Adjustable

Display code1	Display code2	Setting data explanation or working state	Parameter setting range	Default	Remarks
<b>Parameter</b>					
3.0 Aux-heating	3.3 anti-virust $\Delta T$ 2 $^{\circ}C$	High-temperature sterilization auxiliary heating start temperature difference setting	1 $^{\circ}C \sim 20^{\circ}C$	2 $^{\circ}C$	Adjustable
	3.4 Comp. Oil HT 5 $^{\circ}C$	Start heating the compressor oil temperature settings	0 $^{\circ}C \sim 20^{\circ}C$	5 $^{\circ}C$	Adjustable
	3.5 Comp. Oil HT $\Delta T$ 5 $^{\circ}C$	shut off heating the compressor oil temperature settings	1 $^{\circ}C \sim 20^{\circ}C$	5 $^{\circ}C$	Adjustable
	3.6 Aux. start delay 30M	Accumulated heat pump run time is attained, the electric auxiliary allow start	2min $\sim$ 90min	30min	Adjustable
	3.7 anti-virus temp. 70 $^{\circ}C$	High-temperature sterilization temperature setting	60 $^{\circ}C \sim 90^{\circ}C$	70 $^{\circ}C$	Adjustable
	3.8 anti-virus time 30M	High-temperature sterilization hold time setting	0min $\sim$ 240min	30min	Adjustable
	3.9 Anti-virus cycle time period 7D	High-temperature sterilization cycle starts	0days $\sim$ 14days	7days	Adjustable
4.0 Systems	*4.1 Run mode A.C.-H.W./H.W./A.C.	Heat pump model settings	A.C.-H.W./H.W./A.C.	A.C.-H.W.	Factory setting
	4.2 Sys.Num. 1/2	Single, double system options	1:single system 2:double system	1	Factory setting
	*4.3 Heat pump Style A.to W./W.to W.	Air source or water source options	A.to W./W. to W.	W.to W.	Factory setting
	4.4 HPPOT -15 $^{\circ}C$	Heat pump stoped working outside temperature setting	-50 $^{\circ}C \sim 50^{\circ}C$	-15 $^{\circ}C$	Adjustable
	4.5 A.to W., Fan on 50 $^{\circ}C$	Cooling and hot water mode, fan start coil temperature	30 $^{\circ}C \sim 125^{\circ}C$	48 $^{\circ}C$	Adjustable
	4.6 A.to W.Fan $\Delta T$ 10 $^{\circ}C$	Cooling and hot water mode, stoped fan coil temperature difference setting	1 $^{\circ}C \sim 50^{\circ}C$	10 $^{\circ}C$	Adjustable
	4.7 W.to W. pump on 50 $^{\circ}C$	Cooling and hot water mode, ground source pump start inlet temperature setting	2 $^{\circ}C \sim 99^{\circ}C$	48 $^{\circ}C$	Adjustable
	4.8 W.to W. Pump $\Delta T$ 10 $^{\circ}C$	Cooling and hot water mode, ground source pump stop inlet temperature difference setting	10 $^{\circ}C \sim 30^{\circ}C$	10 $^{\circ}C$	Adjustable
	4.9 A.C. pump Normal/Special	When hot water reaches the set temperature, set the pump mode. Normal is stop;Special is working.	Normal/Special	Special	Adjustable
	4.10 When H.W.A.C.PM on	Hot water mode, the aircondition water pump operating mode selection. On/off	On/off	Off	Adjustable
	4.11 When A.C.3way. Off	Air conditioning heating mode, the three-way valve mode selection.	On/off	Off	Adjustable
	4.12 Antifreezing 4 $^{\circ}C$	Ground source side antifreezing protection temp. Setting	-20 $^{\circ}C \sim 10^{\circ}C$	4 $^{\circ}C$	Adjustable
5.0 Solar setting	5.1 Solar start $\Delta T$ 10 $^{\circ}C$	Solar water pump start temperature difference setting	1 $^{\circ}C \sim 20^{\circ}C$	10 $^{\circ}C$	Adjustable
	5.2 Solar stop $\Delta T$ 2 $^{\circ}C$	Solar water pump stop temperature difference setting	1 $^{\circ}C \sim 20^{\circ}C$	2 $^{\circ}C$	Adjustable
	5.2 Solar heating Stop hot water Temp. 75 $^{\circ}C$	Solar water pump stopped working tank temperature setting	60 $^{\circ}C \sim 90^{\circ}C$	75 $^{\circ}C$	Adjustable
6.0 pump testing	6.1 A.C. Pump on/off	air condition pump on or off option	On:running,off:stop		Testing
	6.2 Hot Water Pump on/off	hot water pump on or off option	On:running,off:stop		Testing
	6.3 G.S. Water Pump on/off	ground source pump on or off option	On:running,off:stop		Testing
	6.4 Solar Pump on/off	solar pump on or off option	On:running,off:stop		Testing
<b>Maintenance</b>					
<b>Maintenance</b>	1: E01 2010-01-14 09:00				
	2: P01 2010-01-14 09:10				
	3: E08 2010-01-14 09:30				
	4: E05 2010-01-14 09:40				
	5: P06 2010-01-14 09:50				
	6: P08 2010-01-14 10:00				
<b>CLOCK</b>					
<b>CLOCK</b>	Date 2010-04-15	day setting			Adjustable
	Clock 18:30	time setting			Adjustable
	Timer on X	timer on setting			Adjustable
	Timer off X	timer off setting			Adjustable

\*4.1.Heat pump model settings:A.C.-H.W.:air condition and hot water;H.W.:hot water;A.C.:air condition.

\*4.3.A.to W.:air to water heat pump;W.to W.:water to water heat pump

## V. Maintenance and repair

### 1. Malfunction Indicating Table. Determine and solve the malfunction by malfunction code as below:

Display Mode	Motherboard travel light	Malfunction and Protection Name	Reason	Solution
	Off	Standby		
	on	normal start		
E 01	1 flashes 1 off	cooling/heating inlet water temp. Sensor failure	The sensor is open or short circuit	1.Check whether the connection of sensor is poor. 2.Check or change the water tank sensor.
E 02	2 flashes 1 off	cooling/heating outlet water temp. Sensor failure	The sensor is open or short circuit	1.Check whether the connection of sensor is poor. 2.Check or change the water tank sensor.
E 03	3 flashes 1 off	System 1 coil temp sensor failure (heat source side inlet temp sensor failure)	The sensor is open or short circuit	1.Check whether the connection of coil sensor is poor. 2.Check or change the water tank sensor.
E 04	4 flashes 1 off	System 2 coil temp sensor failure (heat source side outlet temp sensor failure)	The sensor is open or short circuit	1.Check whether the connection of coil sensor is poor. 2.Check or change the water tank sensor.
E 05	5 flashes 1 off	hot water inlet water temp. Sensor failure	The sensor is open or short circuit	1.Check whether the connection of sensor is poor. 2.Check or change the water tank sensor.
E 06	6 flashes 1 off	tank bottom temp. Sensor failure	The sensor is open or short circuit	1.Check whether the connection of water tank sensor is poor. 2.Check or change the water tank sensor.
E 07	7 flashes 1 off	tank top temp. sensor failure	The sensor is open or short circuit	1.Check whether the connection of water tank sensor is poor. 2.Check or change the water tank sensor.
E 08	8 flashes 1 off	ambient temp. sensor failure	The sensor is open or short circuit	1.Check whether the connection of ambient temperature contact is poor. 2.Check or change the ambient temperature sensor.
E 09	9 flashes 1 off	solar tank temp. sensor failure	The sensor is open or short circuit	1.Check whether the connection of solar tank temperature contact is poor. 2.Check or change the solar tank temperature sensor.
	off	communication failure		
E 23	10 flashes 1 off	Outdoor temperature is low, heat pump stopped working.	Outdoor air temperature is lower than the heat pump operating temperature settings, heat pump stopped working. Outdoor air temperature is higher than the heat pump operating temperature settings, heat pump allowed to work.	
P 01	11 flashes 1 off	Phase failure protection	Power supply phase failure /lacking	check the whether it 's power supply phase failure /lacking or not, if phase failure ,please the exchange the position of
P 02	12 flashes 1 off	Use side water flow switch failure	No water/little water in water system.	1.Check whether the use side flow switch is normal. 2.Check whether the use side water system is normal/jam.
P 03	13 flashes 1 off	Heat source side water flow switch failure	No water/little water in water system.	1.Check whether the heat source side flow switch is normal. 2.Check whether the heat source side water system is normal/jam.
P 04	14 flashes 1 off	Hot water side water flow switch failure	No water/little water in water system.	1.Check whether the hot water side flow switch is normal. 2.Check whether the hot water side water system is normal/jam.
P 05	15 flashes 1 off	System 1 high pressure protection	High pressure 1 switch protection	1.Check whether the high pressure switch is normal. 2. Check whether the water tank temperature setting is too high. 3.Check whether the refrigerant is over capacity.
P 06	16 flashes 1 off	System 1 low pressure protection	Low pressure 1 switch protection	1.check whether the low pressure switch is normal. 3.check whether refrigerant leak.
P 07	17 flashes 1 off	System 2 high pressure protection	High pressure 2 switch protection	1.Check whether the high pressure switch is normal. 2. Check whether the water tank temperature setting is too high. 3.Check whether the refrigerant is over capacity.
P 08	18 flashes 1 off	System 2 low pressure protection	Low pressure 2 switch protection	1.check whether the low pressure switch is normal. 3.check whether refrigerant leak.
P 09	19 flashes 1 off	Use side Frost-protection	The unit operation process piping temperature too low	1. Automatic defrost, after finishing the work restored to the original state of antifreeze.
P 10	20 flashes 1 off	Heat source Frost-protection	The unit operation process piping temperature too low	1. Automatic defrost, after finishing the work restored to the original state of antifreeze.
P 11	21 flashes 1 off	Hot water Frost-protection in winter	Standby unit under low temperature of pipeline	1. Automatic defrost, after finishing the work restored to the original state of antifreeze.
P 12	22 flashes 1 off	Use side Frost-protection in winter	Standby unit under low temperature of pipeline	1. Automatic defrost, after finishing the work restored to the original state of antifreeze.
P 13	23 flashes 1 off	Heat source side Frost-protection in winter	Standby unit under low temperature of pipeline	1. Automatic defrost, after finishing the work restored to the original state of antifreeze.
	keep flashing	Defrost		