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# 1 Product introduction

## 1.1 Features

- **Convenient operation**

Microelectronics control, all temperature settings are set by manufacturer. System tests water temperature and adjust water temperature automatically, all user needs to do is just to press ON/OFF button. System finishes the other operation automatically.

- **Excellent performance**

Adopt world famous components, and the best match of system design. Scroll compressor with high EER and low noise. High efficient heat exchanger insures the utmost using of system capacity. Professional air conditioner water pump insures smooth quiet operation.

Models adopting two compressors system may operate with one compressor on condition of partial load, energy saving design.

- **Easy to install**

The system is designed with full consideration of insuring installation as easy as possible. Refrigerant circle is a sealed complete system finished by manufacturer. No needs for users to connect copper pipes or refrigerant charging. Hydraulic circle of system can be connected to hydraulic terminals by two tubes.

- **Operating protection**

System is designed with over voltage, under voltage, over load protection to insure safe operation. The microelectronics controller can start or switch off the machine by judging the water temperature. If the water temperature is lower than designed water temperature, the machine will be switch off to avoid freezing. The microelectronics controller can also supervise the status of components. Malfunction occurred would be transmitted to the controller and displayed through malfunction code.

- **Flexible applicability**

Compact design. System can run at conditions high ambient temperature or low ambient temperature with high EER.

- **Convenient for maintenance.**



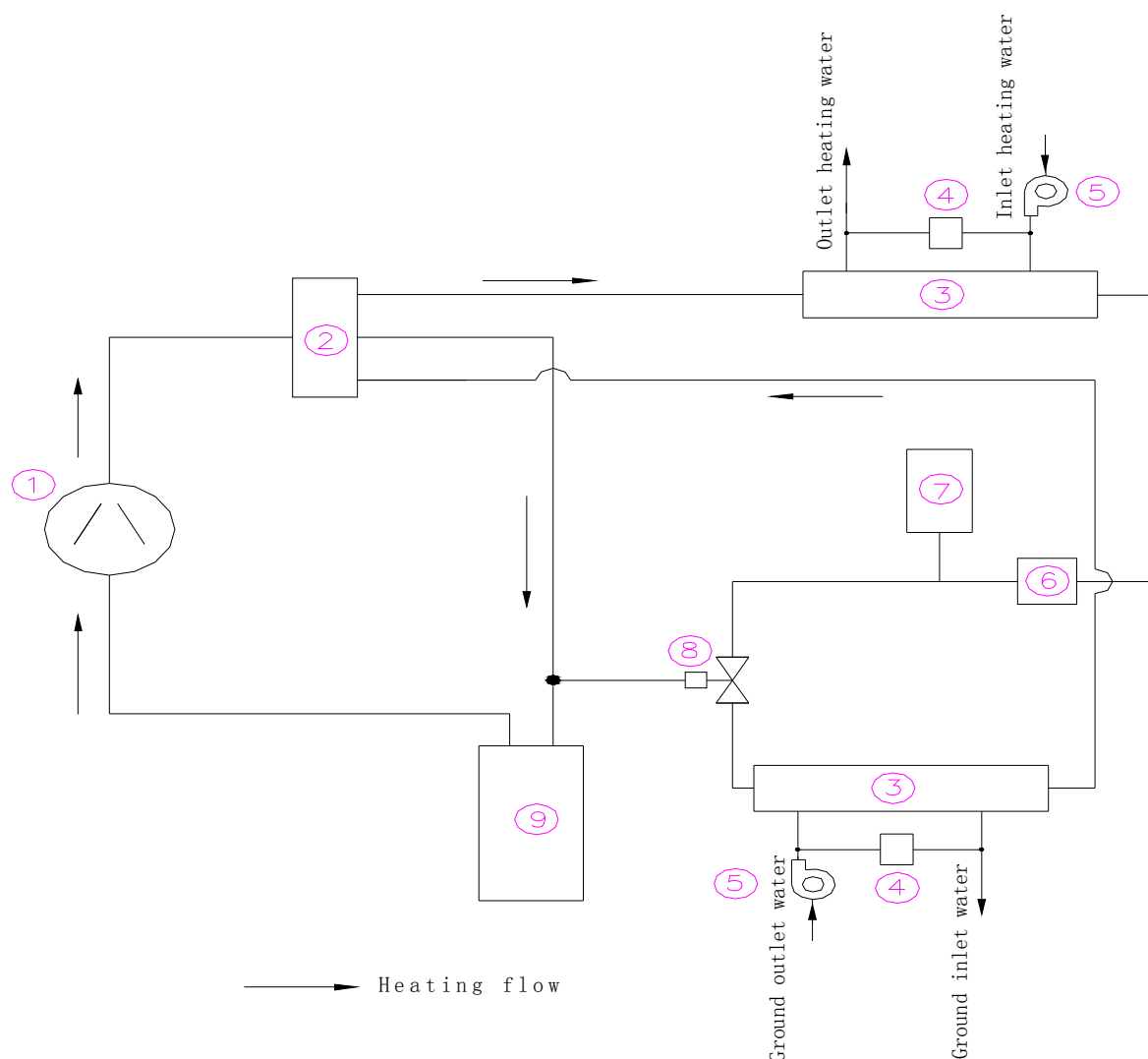
<b>Model No</b>		<b>CWR-12</b>
Noise level	dB(A)	45
Dimension(mainframe)(L*W*H)	mm	620×725×575
Working Temp	°C	-15~45
Net weight	kg	125
Enclosure Class	IPX4	
Date,S/N:	See circuit diagram	

**Note:** 1. Standard heating conditions: Rated water source temp.15/10 Deg.C, indoor water temp.45/50 Deg.C

2. Manufacturer tests the noise level showed above in lab. The noise level of installed unit could be different with above data due to the surrounding condition.

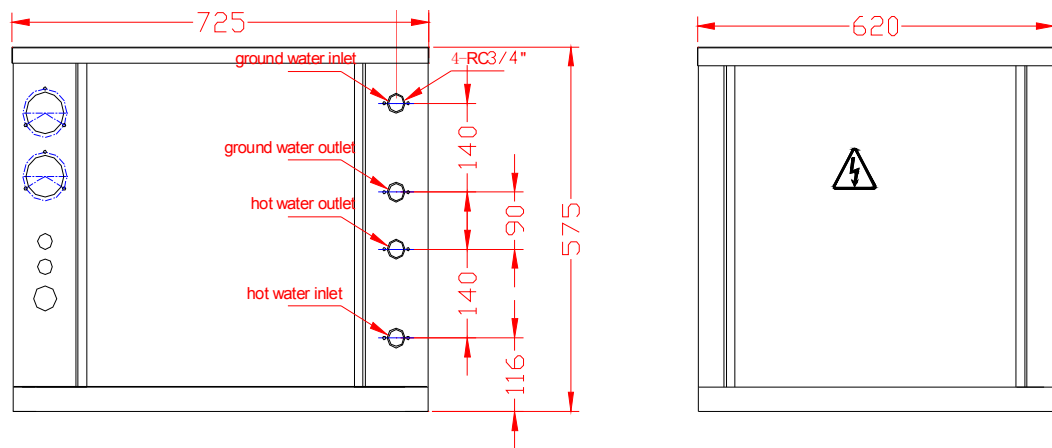
3. Manufacturer keeps the right to change technical data due to technical improvement.

## 2.2 The figure of working principle



① compressor	② Four-way valve	③ tube in tube heat exchanger
④ pressure drop switch	⑤ Pump	⑥ Filter
⑦ liquid tank	⑧ Thermal Expansion Valve	⑨ gas-liquid segregator

## 2.3 Figure dimension



Picture 1 CWR-12

## 3 Installation Instruction

### 3.1 Installation

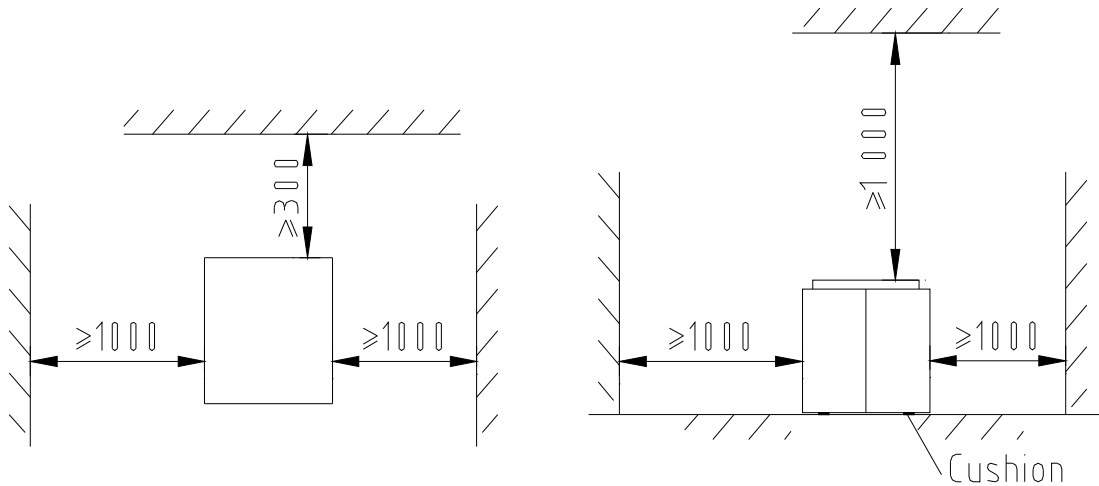
The installation must be done by qualified professionals. Make sure the installation matching the following conditions.

#### ① The selection of installation location

The installation location must match the following conditions:

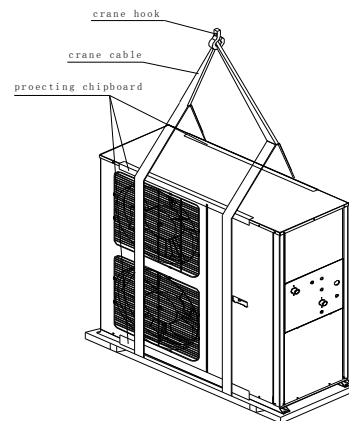
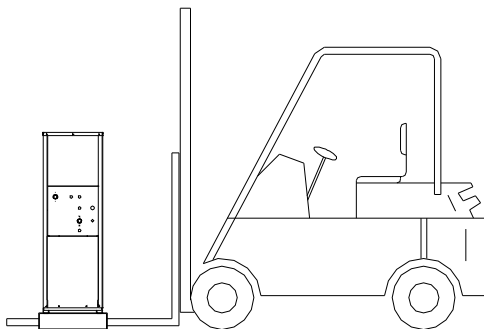
- Make sure the installation environment is open surrounding and good ventilation.
- This unit cannot be installed at hot and humid place like laundry.
- The machine may be installed above the ground, keeping enough space between the bottom plate and ground. In order to assure draining water effectively. And the bracket must has enough carrying capacity;
- Hydraulic circle charged with clean water, no dust or oil. Soft water is recommended;
- Make sure that the unit operating noise will not impact the living of neighbor.

- The unit must be installed firmly, and the bottom of unit must be horizontal (the gradient must be less 5 degree)
- Keep enough space between the machine and wall. It is convenient for unit's repairment and maintenances; and also you shouldn't lay the pipelines and top-ray tubes on the unit. The suggested installation location as below. (Unit: mm)



## ② Attention of moving machine

- Fork lift stacker or crane is suggested to move the machine;
- The surrounding ambient temperature of unit during transportation must be among  $-25$  to  $55^{\circ}\text{C}$



- While suspending the machine, crane cable must be tie to machine tightly, keeping the machine horizontal.
- disassemble the ground bolt in the pallet after the machine is well located, and take the pallet aside.

## ③ Fixation

- 
- Rubber gasket is recommended to reduce vibration and noise while rivet the bottom plate.

#### ④ Water pipe connection

- Heated water pipe must be packed with thermal isolation material to avoid thermal capacity loss or dew dropping.
- Inlet connection pipe must be equipped with a water filter.
- The connection water pipes must be well matched (refer to specification parameters sheet).
- PVC or PP-R pipe is recommended to use as water pipe.
- Hot water pipe must be equipped with water pump 、 Soft tie-in、 a water filter、 One way valve、 Flow meter、 exhaust valve、 Drain valve、 Shutoff valve and so on。
- Cooling pipe must be equipped with Soft tie-in、 a water filter、 One way valve、 Flow meter、 Drain valve、 Shutoff valve ,And then connected to underground inlet/outlet water pipe.
- Drain cock should be installed at the highest point of hydraulic circle. After the hydraulic circle is connected completely, exhaust air inside hydraulic circle.
- Drain valve should be installed at the lowest point of water pipe.

#### ⑤ Please note:

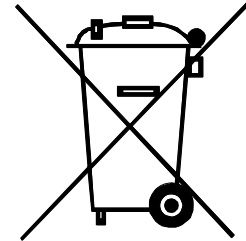
- The appliance shall be installed in accordance with national wiring regulations.
- Please make sure the following working conditions. the voltage can not be more or less than 10% of rated voltage and the frequency can not be more or less than 1% of rated frequency. The height above sea level should be less than 1,000 meters.
- Working water temperature available from 8~50℃, maximum water pressure 10 bar.
- Wires must be connected according to the instruction of electrical connection diagram.
- Also an all-pole air-break switch is needed and the pole clearance should be more than 3mm.
- The ground wire must be well connected. Ground wire can't be connected to coal gas pipe, water pipe or telephone wire.
- Drain electricity protection switch is needed for the system. No drain electricity protection switch may cause electrical shock.
- The operation handle of power switch is suggested to be black or gray, and it can be fixed at OFF status. The installation location of power switch is suggested among 0.6 to 1.7 m. electrical short circuit protection is needed.

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- If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person in order to avoid a hazard.

## ⑥ dispose

- Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary.

• Meaning of crossed-out wheeled dustbin: Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities.



- Contact you local government for information regarding the collection systems available.

• If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.

- When replacing old appliances with new ones ,the retailer is legally obligated to take back your old appliance for disposal at least free of charge.

• It is prohibited to dispose of this appliance in domestic household waste. for disposal there are several possibilities:

- a) The municipality has established collection systems, where electronic waste can be disposed of at least free of charge to the user.
- b) When buying a new product , the retailer will take back the old product at least free of charge.
- c) The manufacturer will take back the old appliance for disposal at least free of charge to the user.
- d) As old products contain valuable resources, they can be sold to scrap metal dealers.

Wild disposal of waste in forests and landscapes endangers your health when hazardous substances leak into the ground-water and find their way into the food chain.

## ⑦ Warning



### Warning

Any abnormal accident, such as burning smell, switch off the machine immediately. Contact the supplier for help.

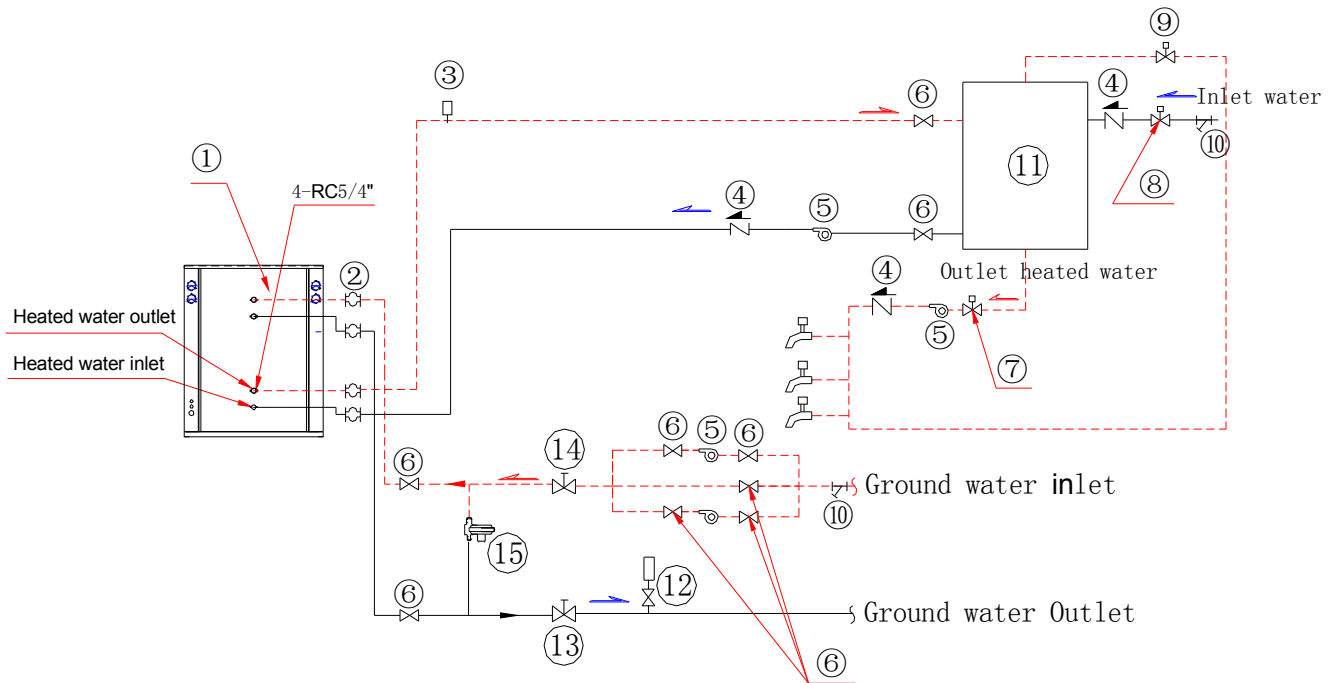


## ⚠ Warning

It is forbidden to clean the hydraulic circle by water pump inside system.

## ⚠ Warning

Make sure the machine has been power connected over 12 hours before starting the system. Otherwise, machine could be damaged.



1 Water Source Heat Pump Water Heater	2 Soft tie-in	3 Pressure drop switch	4 One way valve
5 Pump	6 Shutoff valve	7 Water supply valve	8 Water valve
9 Back valve	10 Y type filter	11 Water tanks	12 Thermometer
13 Flow Control Valve	14 Safety valve	15 Pressure switch	

Hydraulic circle is recommended while installing Water Source Heat Pump Water Heater .  
The installation of hydraulic circle can be finished according to above chart.

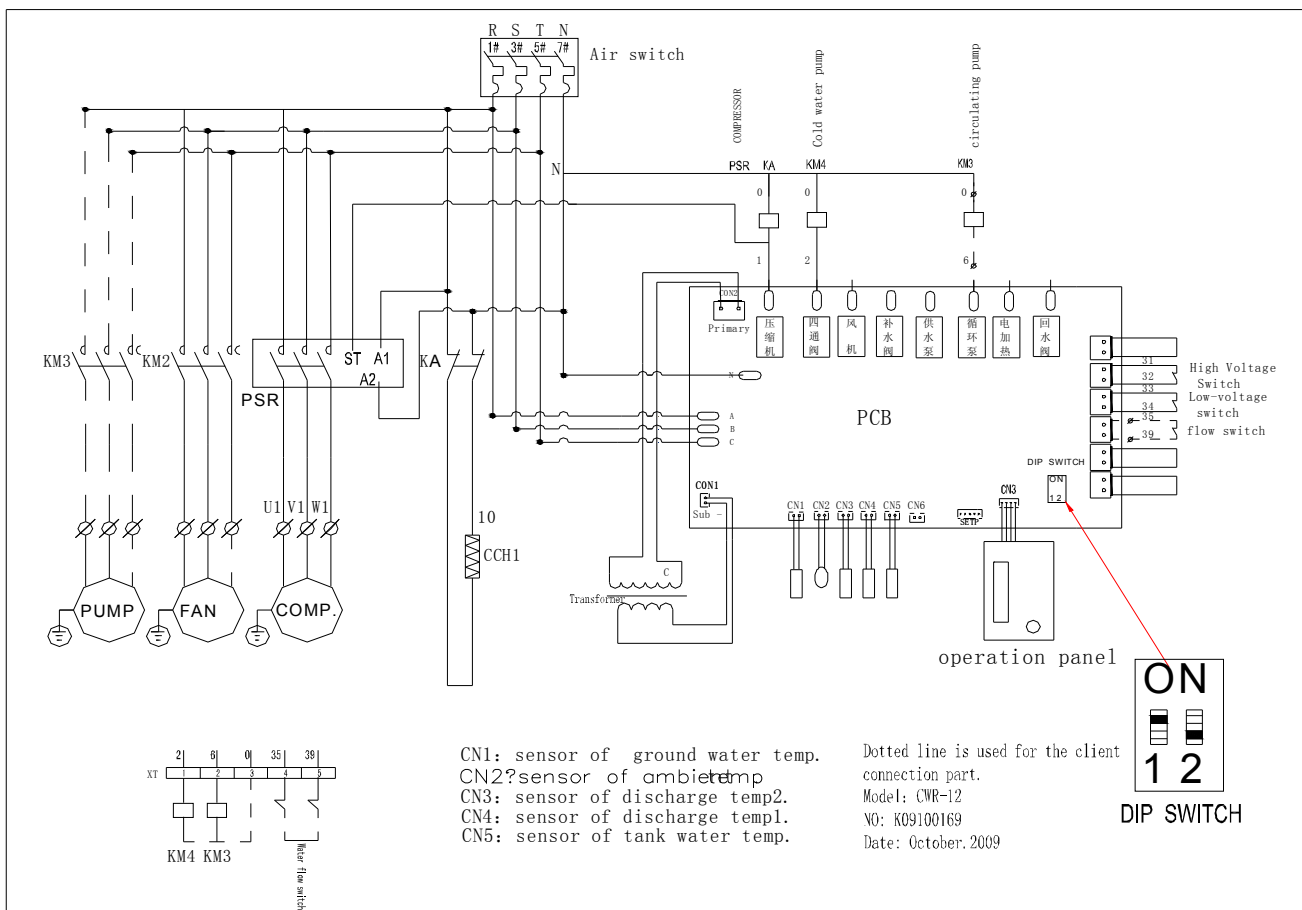
**NOTES:**    **A**、Please do exhaust the air in water system before running the machine, if you completely finished the circulating water system piping.

**B**、 The water flow switch must be installed at the straight pipeline section of the same level, from the elbow, valves and other pieces of partial resistance to more than 5 times the diameter.

C、The pipe must be insulated closely in order to improve cooling (heating) effect and energy conservation.

D、The take-over of this unit must be installed with drainpipe to make it converts to drain water inside the unit and prevent it from freezing.

### 3.3 Electrical diagram.



#### ① unit wiring

Model	Power	Voltage (V)	Power wire (mm <sup>2</sup> )	Allowed max current (A)	Allowed leakage current
CWR-12	380V/~/3N/50HZ	342-418	≥4.0	20A	3mA

#### ② attentions of wire connecting

- All wires must be well connected.
- All wire should avoid touching refrigerant tube. If it is not avoidable, vibration protection and

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isolation must be well done.

- All wire no touch to compressor or any other kinetic components.
- When the heated water flow switch and ground water flow switch is unused, the 10 and 11 terminal on the bank terminal should be short-joined, or the unit can't start.
- When the high water level switch、in water level switch and low water level switch is unused, the 12、13、14 and 15 terminals on the bank terminal should be short-joined, or the unit can't start.

### **3.4 System test**

#### **① Checking items before test run of system**

- 1)、Seal test to make sure system is well sealed.
- 2)、Power source checking to make sure required voltage and current are available.
- 3)、Pressure inside hydraulic circle reaches to operating pressure (1-3) kgf/cm<sup>2</sup>.
- 4)、Make sure hydraulic system inside is clean and no jam.
- 5)、make sure hydraulic circle is fully filled with water and no air inside.
- 6)、Check to make sure all valves are switched on, well thermal isolated.
- 7)、Make sure all electrical wires are connected correctly according to wiring instruction, and wiring screws are driven properly.
- 8)、Exhaust the air inside hydraulic circle by manual drain cock in hydraulic tube and drain cock on the water pump.
- 9)、Check if there is visual damage caused during transportation.
- 10)、make sure all wiring correct.

#### **② Commissioning**

- 1)、Make sure all above checking items are passed.
- 2)、Open controller cover, then connect the power source wires. If the power source is three phases, check the phase order immediately. Red lamp on controller board will light while phase order is correct. Check if water pump works smoothly. If there is scream from water pump, it means there is air inside the water circle. In this case, stop the machine and exhaust air inside water circle. Then start machine again. The compressor will start to run 3 minutes after the system is switched on. Check if compressor

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run at right direction.

3)、 Check if there is unusual noise from system by listening. If there is, switch off the machine and check system. If no unusual noise, let system running.

4)、 If all checking items passed, keep system running.

5)、 At heating mode , if water tanks temperature  $\leq 45^{\circ}\text{C}$  , compressor starts to work. The compressor stop working until the water tanks temperature increase to  $50^{\circ}\text{C}$  .

6)、 Check the temperature difference between return water temperature and outlet water temperature of outdoor unit. Normally, the temperature difference should be less than  $6^{\circ}\text{C}$  . If the temperature difference is over  $6^{\circ}\text{C}$  , check if water flow match designed standard.

7)、 All hydraulic circle filters must be cleaned after finishing test run.

### ③ Normal operation:

Heating running process: Start the unit---pump running--- Detection of flow switch---Compressor running (When disconnected from the low water level, the solenoid valve will open to compensate water)

Water level control: in cycle mode, when disconnected from the low water level, the unit Stop running, the compressor is permitted running the circle when the switch of low water level is pull in, when the low water level switch is disconnected, then the power begins to compensate Water. At the same time stop provide water for the pump.. When tank temperature is lower  $3^{\circ}\text{C}$  , the tanks begin to detect the temperature, if the tank temperature is higher than the setting temperature, the compensate water valve would work for water-filled, If the tank temperature is  $3^{\circ}\text{C}$  lower than the setting temperature, it would stop compensate water and power off, At the high-water absorption time, it stops water supply. When the high-level is broken up but the mid-water level is running it won't supply water, on order to avoid frequent moving of compensating valve.

In Direct thermal mode, when the mid-water level is disconnected, the host will Open the water valve, heat pump thermostat begins to work. If the thermostat switches pull in, the host would press and the fan would work and the circulating water pump would shut down. The same for the high-water absorption mode, thermostat stops working. At high water absorption time, when water temperature is  $5^{\circ}\text{C}$  lower than the setting temperature, it will enter the heating circulation and pumps circulation, compressors and fans will run, the compensating water valve will shut down, and the thermostat won't work; when the low water level is disconnected, the pumps won't supply water and

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electric heating begins. At the low-water level absorption time, when the water temperature is lower than the setting temperature limitation, it will take the priority for circle heating.

When the supply water valve is turned on, if the high-water level is disconnected and the tank water temperature is lower than  $-3^{\circ}\text{C}$  (initial setting) then the tank would not compensate water. If the tank water temperature is higher than setting value then it would compensate water and the high-water level would last pull-in water 2 minutes before shut down the compensating water valve (when there is a temperature control the supply of water).

If power up for the first time, it is necessary to circulate pumps after lower-water level absorbs, then the compressor would run.

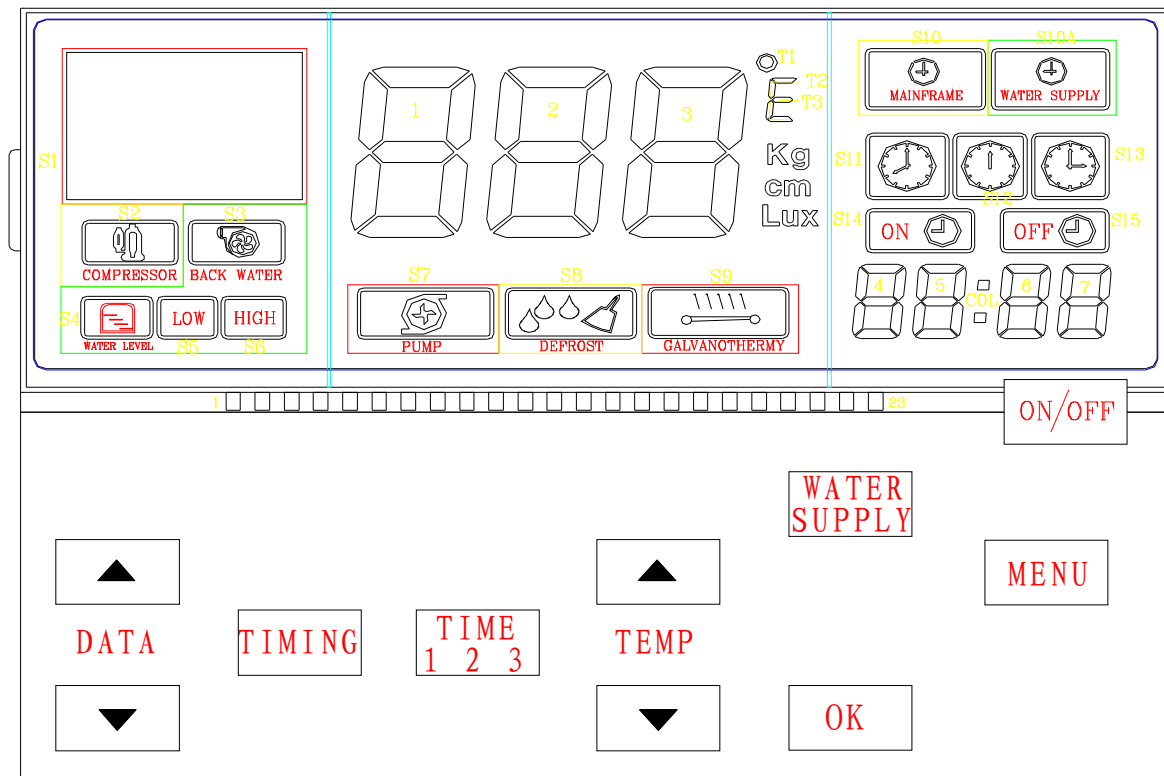
When the unit is running, the circulating water pump opens. When the unit stops, the circulating pump will stop operation 30 seconds later.

Backwater Solenoid valve runs according to water temperature detection. When the return water temperature is higher than the setting temperature, the solenoid valve will stop return water. When the return water temperature is lower than setting temperature, then the valve will open to keep the water supply pipe preserving hot water for a long time.

You can choose water moods of compulsory and time, when the water temperature is over  $40^{\circ}\text{C}$ , press the "**WATER SUPPLY**" key, or it meets the time requirement and it will supply the water. When it is supplying the water, pressing "**WATER SUPPLY**" key, or it meets the stop water supply requirement, water supply will stop. When the water temperature is below  $40^{\circ}\text{C}$ , it won't supply water.

## 4 Parameter settings

### 4.1 Operation Panel Description



- ① **On / Off button:** The on/off function of the main unit.
- ② **Water supply button:** Unused.
- ③ **Water temp “▲/▼” button:** available setting range: 28℃~60℃ (Tank temp).
- ④ **Data “▲/▼” button:** Various parameters can be set up and down
- ⑤ **Menu button:** Choose the menu setting functions.
- ⑥ **Affirm button:** Enter into a certain function when set the functions.
- ⑦ **Time button:** Choose the three different time settings in 24 hours of main unit or water supply.
- ⑧ **Timing button:** Choices of duly timed on, off, and cancellation.

## 4.2 Instruction of controller operation

### ◆ Temperature cut in value, On/Off function:

In **Off** mode, press "**Data**" "**▲**" button one time, select 01 item( Timing), display cut in value (default temp. cut in vavle:5 Deg. C), press "**OK**" button to set temp cut in value, press "**Data**" "**▲/▼**" button set temp cut in value.

### ◆ Water temperature correction:

In **OFF** mode, press "**DATA**" "**▲**" button one time, select 02 item ( Time123 ), display temp. correction value(default value:2Deg.C) , press "**OK**" button to set temp correction , press "**▲/▼**" button set temp correction value.

### ◆ ON and OFF

When supply power to unit, press "**ON/OFF**" button, In the case of shutdown, the unit will start, If not, shutdown. We can set on / off, regular water supply, backwater, Antifreeze, electric heating function in the case of unit running.

### ◆Water tank temp. setting:

in the case of unit running, the tank water temperature can be adjusted to regulate the temperature of the water temperature will only need to press "**▲ / ▼**" button to adjust to the required temperature, water temperature in the range of 28-60 °C adjustable.

### ◆Data of the inquiry:

Boot in the normal state, press the **Data** "**▲ / ▼**" button to the operation of mainframe data queries (20 seconds after the cessation of operations automatically from the parameters of the inquiry), the temperature display shows "**Data name**" data, the clock area "**show label**", A total of 11 data. The table below:

Table 1 Single compressor-panel parameters of the system look-up table

Data name	Show label	Remark
Recoverable fault code	01	Under normal work shows "28", a show can get back to the failure of the code, see table 1
Motherboard "mode select" switch, code-named	02	Unused
Motherboard "Model select" switch, code-named	03	Unused
Ground water temperature	05	Ground water temperature detection point, Anti-frozen temperature point.

Back water temperature	06	Detection of backwater temperature, Control back valve .
Return water pipe temperature	07	In case of backwater temperature lower than the set value, backwater solenoid valve to open
Compressor Exhaust temperature value	10	Detection of compressor discharge temperature
Tank temperature	09	Shows the temperature of water tanks

Table 2 Recoverable fault code

Fault name	Remark
“01” Water flow switch disconnected	When the circulating water pump is running, if the water flow switch disconnected more than 10s, it would indicate of water flow switch error. If it is less than three times per hour won't alarm.
“03” High-voltage switch disconnected	High-voltage switches disconnected, if it is less than three times per hour won't alarm.
“04” Low-voltage switch disconnected	Low-voltage switches disconnected, if it is less than three times per hour won't alarm.
“05” Exhaust temperature is too high	Exhaust temperature is too high, if it is less than three times per hour won't alarm.
“11” Exhaust temperature is too high	Ground water temperature is too low.

◆Menu features choice:

Press "MENU" button, can be the clock, time on / off the unit, time on / off the pump ,determine the backwater (supply water) temperature, brightness requirements, Antifreeze parameters ,electric heating temperature requirements of the seven menu options. To carry out functions of choice, must be turned on ,press "MENU" button long by 5 seconds to enter the function of choice, confirmed the selection function is completed, no longer operating the control panel, 15 seconds after an automatic logoff feature selection.

**A、Clock function setting:**

(1) long press "MENU" button, access to feature selection, and then click "MENU" button, enter the time setting function, when the display shows flashing clock can adjust the parameters of the hour, press and hold the "Data" "▲ / ▼" button, the number of hour may be adjusted upwards or downwards.

(2) After the completion of hour setting, and click the "ok" button, enter the number of minutes set up, press and hold the parameters "▲ / ▼" button, the number of minutes can be adjusted upwards or downwards. And then "OK" button, the clock is set up.



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## B、Timing setting:

(1), Enter the Menu selection, click the **"MENU"** button two times, display "host" menu flashing and click **"OK"** button to enter the host timing.

(2)、Time slot or Regular open, shutdown

You can choose three time slots, enter the host regular feature, press **"Time 123"** button may choose different time slots. At that time, after the completion of above, may press **"Time 123"** button to query the time of regular open, shutdown unit. At this time, screen display regular open, shutdown.

(3), Regular open setting

Click the **"Timing"** button, flashing regularly open, at the same time clock zone flashing, press the **"Data" "▲ / ▼"** button, adjust the timing of time (set accuracy of 30 minutes), and click the **"OK"** button, timing open setting completed.

(4) Regular shutdown setting

Press **"Timing"** button two times, Regular shutdown flashing, the same method as setting regular open unit.

(5) Press **"Timing"** button three times to remove timing setting.

When the function does not withdraw, continuously press **"Timing"** button, one time to set regular open , two times to set regular shutdown, three times to cancel timing setting.

## C 、Time supply water setting:

When enter the function, press **"MENU"** button three times, then screen displays **"water supply "** menu, just press **"OK"** button to confirm this time.

This time program is the same with operation on host machine.

## D、Return water temperature setting:

When enter the function, press **"MENU"** button four times, then screen displays **"Backwater"** menu, just click **"OK"** button to confirm entering of this function. (this function of small single-phase home unit is not available)

Press **"DATA" "▲ / ▼"** button you can set the return water temperature. When water pumps are working, at the same time, the return water sensor temperature is lower than backwater temperature, the return water valve works. When the return water temperature gets the setting value, the return valve does not work.

## E、Water tank temperature setting

Into the functions of selection, by five times of "Menu" button, it will display "water Level" menu, then click "OK" button to enter the compensating water temperature setting.

Set Range 10-60℃ setting, when the tank temperature reaches desired compensate Water temperature and water tanks temperature gets this value, the compensating Water Valve works. When the tank temperature is lower than the set value exceeding 3℃, the compensating water valve will turn off its valve to stop compensate water.

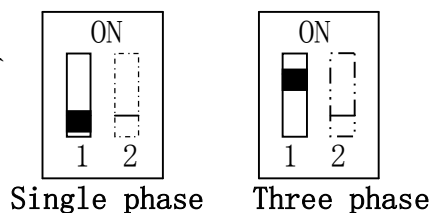
F、Enter function menu, press "Menu" button for 6 times, the screen 'Defrost' menu will flash, then press "Data" ▲/▼ button you will enter the Ground water temperature protection function setting. press "Data" ▲/▼ button you can choose the items of 01-04. C Corresponds to 02 (clock area) and then the press "OK" button, press "DATA" ▲ / ▼ key to adjust the Ground water temperature .

Data name	display tab	default setting	Remark
	01		Unused
Water temperature of the Ground water is too low to protect	02	5~25℃	To prevent freezing because the ground water temperature is too low
	03		Unused
	04		Unused

## G、Instruction of dip switch of commercial single-system motherboard

1、Power source selection

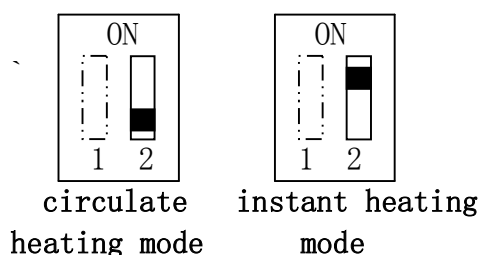
00	01
Single phase	Three phase



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## 2、Heating mode selection

00	01
Circulate heating mode	Instant heating mode



## 3, To remind and Description:

1)Time settings: regular open and shutdown setting and regular water supply setting may be invalid in the case of long-term machines do not use(due to work on the battery).

2) For the protection of the operation panel, long time no operation of the panel, LCD backlight will turn off and so on, when this happens, the unit is still the situation of the original operation mode settings. Button will cause the liquid crystal display backlight light. If you want to cancel this feature, a long time by five seconds on the button to cancel this feature, and then a long time by five seconds on the keys can be re-set this feature.

## 5 Maintenance

### 5.1 maintaining

- Only qualified professional is allowed to do system installation and maintenance. Check protection device and controlling components carefully, in order to assure normal performance.
- Once system works normally, no need to change refrigerating system.
- System designed with full consideration of maintenance. Most of maintenance can be handled through maintenance door.
- Usually, user just needs to check if there is dust or sundries on fin/tube heat exchanger, condensing air status. Timely cleaning for heat exchanger is recommended, especially for environment with oil and dust.

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## 5.2 malfunction analyses

### 1. The protection function of Controller and error code

- 1) Three minutes delay start to protect the compressor, the compressor start and stop time for 3 minutes, the shortest running time not less than five minutes
- 2) when press “ON” button only after 1 minute to detect the flow of water, when the water flow switch off , protection of 10 seconds delay action; then controller will be locked, and regardless of whether it reset, and show code
- 3) Automatic antifreeze: winter to prevent water pipes, pumps Frost Crack, when the following conditions are met unit automatically antifreeze into the work, when the ambient temperature is lower than 2 °C, the outlet water temperature is less than 10 °C ,and the circulating water pump power outages for more than 30 minutes ,the circulating water pump run 60seconds and then power off, cycle operation.
- 4) High pressure protection: Pressure Switch off in an hour less than 3 times ,the display does not show pressure protection, when the pressure is restored , compressor will restart (meet three minutes delay). In more than (three times per hour) of fault the controller is locked, the compressor is no longer restart regardless of whether the reset switch reset, and display the fault code.
- 5) Low pressure protection: during the period of defrost, does not detect low pressure switch, delay detection of 3 minutes in heating start. Pressure Switch off in an hour less than 3 times ,the display does not show pressure protection, when the pressure is restored , compressor will restart (meet three minutes delay). In more than (three times / h) when the controller of the fault is locked, the compressor is no longer restart regardless of whether the reset switch reset, and display the fault code.
- 6) Sensor fault: Sensors have problems, unit shutdown, and display the appropriate error code.
- 7) Discharge temperature switch protection: Discharge temperature switch off in an hour less than 3 times , the display does not show the discharge temp. protection, discharge temperature switch restoration ,the compressor restart after three minutes . In more than three times per hour, the controller be locked, the compressor is no longer appropriate to restart, showing fault code (code is same with the high-pressure protection)

8) Reverse Phase Protection: all the components stop and display fault code.

9) Protection of low Ground water temperature: when the Ground water temperature is lower than the setting value, the compressor stop, indicating 11E, pumps continue to operate. when the water temperature rise , the compressor to resume operation.

2. Suppose malfunction occur, switch off power source immediately. The following analyses is only for reference:

Item No	Malfunction description	Malfunction code	Reason	Malfunction dispose
1	Phase sequence malfunction detection	00E	Power supply phase missing	Check power supply
			External power supply phase sequence error	External power supply to replace any of the three-phase two-phase power supply wiring
2	Flow switch malfunction	01E	Water flow switch is not properly access electronic control box	Check and join
			Regulation of water flow switch spring preload adjustment is incorrect, resulting in insufficient water flow, but flow switch does not close	To re-install the flow switch
			Water flow switch is not installed correctly (the wrong direction, flow switches, valve selection error)	To re-install the flow switch
			Water flow is too small	Check water-way valve is fully open, or change the water pump to increase flow
3	Over current protection	02E	The pressure may be lower.	Check the pressure.
			The load is too large	Check the unit load.
			The compressor locked rotor	Check the electric circuit and the compressor.
4	3 times high-pressure failures	03E	Expansion valve opening is too small	Adjust thermal expansion valve opening larger
			Water flow is too small	Check the water-way valve is fully open, or change the

				water pump to increase flow
			Dust accumulation fin heat exchanger	Unit operation will have a period of time scaling phenomenon, cleaning
5	3 times low-pressure failures	04E	Expansion valve opening is too small	Adjust thermal expansion valve opening larger
			System has a leak	Refrigerant leak detection and re-filling
			Dust accumulation fin heat exchanger	Unit run period of time will produce dust phenomenon, cleaning
6	3 times Discharge failures	05E	Expansion valve opening is too small	Adjust thermal expansion valve opening larger
			System has a leak	Refrigerant leak detection and re-filling
			Temperature probe is damaged(Resistance produce changes)	Replacement of the corresponding temperature probe
7	Water Level Switch Error	06E	The wiring troubles	Check the line
			Water gauge does not contact well.	Check the water gauge
8	Communication failure	09E	The wiring troubles	Check the line
			The controller is wrong	Change the controller
9	The defrosting temp sensor circuit short or open	11E	Circuit board temperature probe is not inserted well or loose	Re-insert temperature probe
			Temperature probe is damaged	Replacement of the corresponding temperature probe
10	Ambient temp sensor circuit short or open	12E	Circuit board temperature probe is not inserted well or loose	Re-insert temperature probe
			Temperature probe is damaged	Replacement of the corresponding temperature probe
11	Outlet water temp sensor circuit short or open	13E	Circuit board temperature probe is not inserted well or loose	Re-insert temperature probe
			Temperature probe is damaged	Replacement of the corresponding temperature probe
12	Back water temp sensor circuit short or open	14E	Circuit board temperature probe is not inserted well or loose	Re-insert temperature probe

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			Temperature probe is damaged	Replacement of the corresponding temperature probe
13	Water temperature sensor of water tank circuit short or open	15E	Circuit board temperature probe is not inserted well or loose	Re-insert temperature probe
			Temperature probe is damaged	Replacement of the corresponding temperature probe

Note: other malfunction indication occurs, please contact the manufacturer or it's authorized dealer.

### 5.3 maintenances

To assure system performance, proper maintenance is recommended.

Suppose system no use for long in winter, drain off water inside hydraulic circle.