WATER SOURCE/GEOTHERMAL HEATING&COOLING HEAT PUMP

High COP, Free Cooling

Installation and Operation Manual

GH –Close Loop Series
OH –Open Loop Series

Content

1. Safety Precautions

Note!

It is required to read the Safety precautions in detail before operation. The precautions listed below are all-important for safety, please obey without fail.

1. 1 General

- Make sure that the fixed ground wire in the building is securely connected to earth.
- Wiring tasks should be carried out by qualified electricians only, in addition, they should check the safety conditions of power utilization, for example, check if the line capacity is adequate, and check if the power cable is damaged.
- Users must not install, repair or relocate the unit.

  Improper treatment might lead to the accidents e.g. personal injury caused by fire, electrical shock or unit's falling-off, and water leakage in the machine. Please contact professional repair and service department of local dealer.
- The unit shall not be installed at a spot with potential hazard of leakage of inflammable gas.

  In case the leaked gas is congregated around the machine, there might be the risk of explosion.
- Make sure that the foundation of installation is stable.

  If the foundation is unstable, the outdoor unit may drop and cause a casualty accident. so this must be validated carefully.
- Make sure that the electric leakage protection switch is fixed.

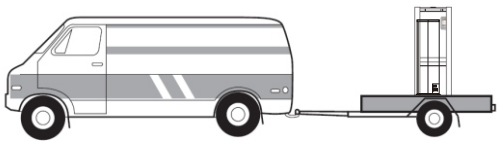
  If no electric leakage protection switch is fitted at the beginning of the electric supply, it maybe cause electric shocks or fires.
- If any abnormity occurs in the unit (such as burned taste inside the unit), cut off the power supply immediately, and contact professional repair and service department of local dealer.
- Please observe the follow items when cleaning the unit..

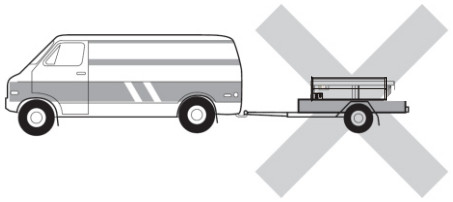
  Before cleaning, shut off the electric supply of the unit firstly to avoid injuries caused by fan in operation.

  Do not rinse the unit by water because the rinsed unit may cause electric shock.
- Make sure to shut off the electric supply before maintain the unit.
- Please do not insert fingers or sticks into air outlet or air inlet.

1. 2 Transport and storage

The machine must be transported and stored vertically.

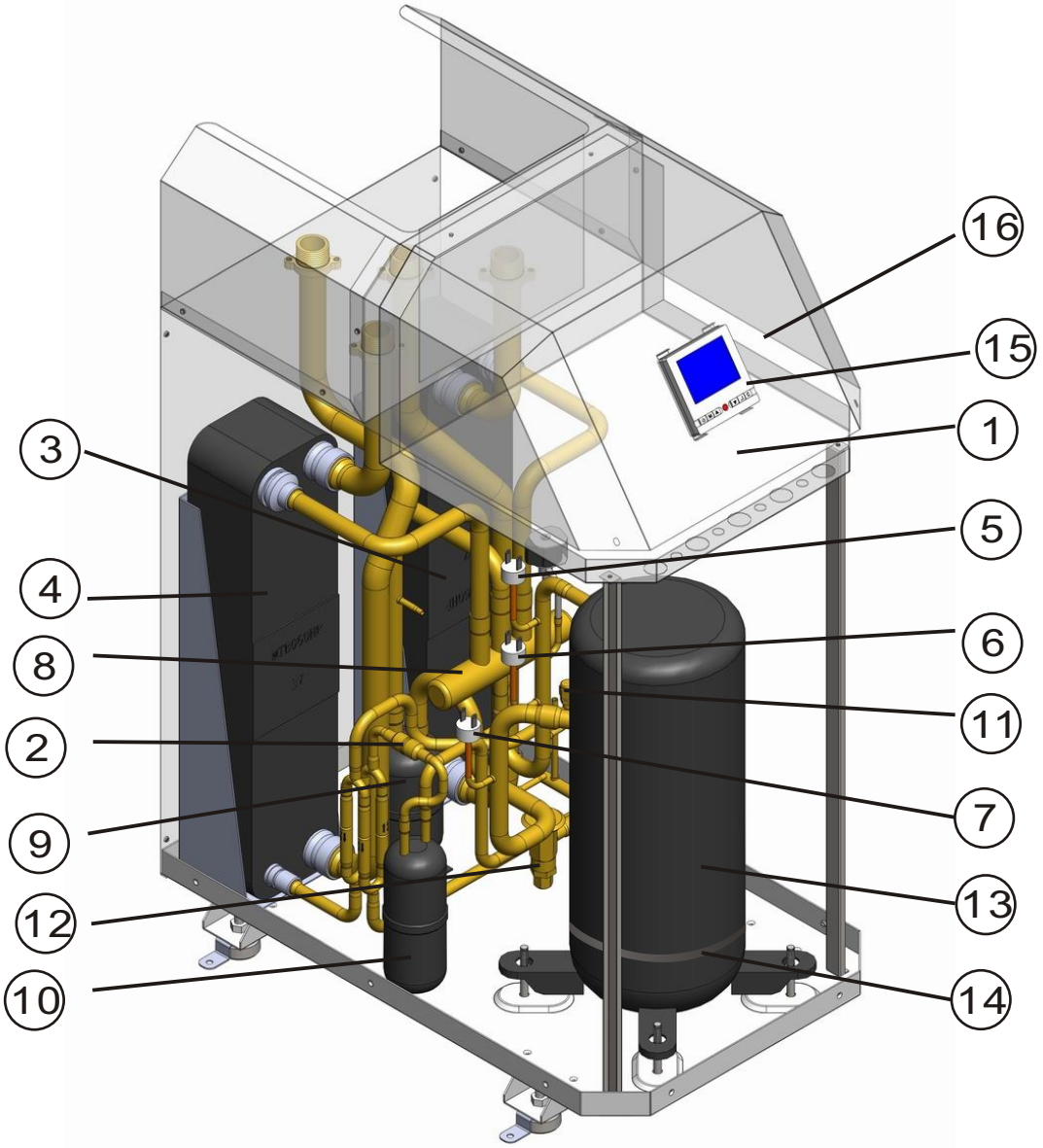




1.3 Important Notice for Antifreeze to Avoid heat pump broken

1. **Water flow switches MUST be installed** during installation for heat pump geo(water) source side and usage side to ensure proper water flow to protect the plate heat exchanger and compressor.
2. **Water filter MUST be installed** before water go into PLATE HEAT EXCHANGER. The water filter need to be cleaned at least half an year.
3. **Must use enough brine(glycol) in the water system in cold area**. if the air temp is lower than -0 ℃, for the safety, you must use brine(glycol) as the fluid in the heat pump water system instead of pure water.
4. **MUST keep the electricity power supply always connected even when you don't use the heat pumps**. Our heat pump has antifreeze function if with electricity connected. So If without enough glycol (antifreeze liquid) and if the electricity is cut off by accident for more than 30 minutes in winter, you need to drain out all the inside water to protect the heat pump to be frozen.

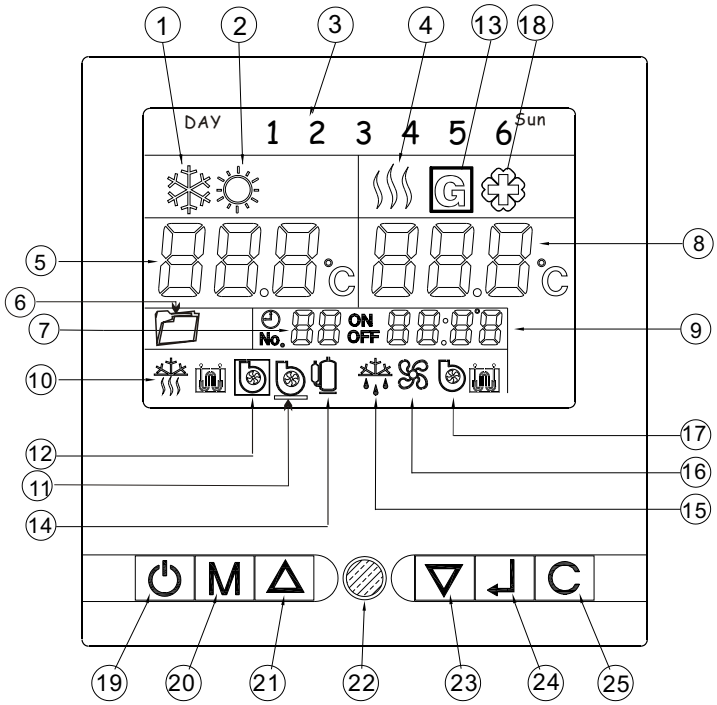
2 Components



1	WEO17ZJ005	Electric box	9	X13T001	Liquid gas isolator
2	WEO17ZX018	Filter	10	X13T000	Liquid accumulator
3	WEO17ZX019	Heat Exchanger	11	X16T000	needle valve
4	AQD20IX002A	Heat Exchanger	12	X03T000	Heat expansion valve
5	X09T0002	High pressure switch 1	13	D01T001	Compressor
6	X09T0003	High pressure switch 2	14	D08T000	Crancase Heater
7	X09T0004	Low pressure switch	15		Control board
8	X06T0003	4 way valve	16		LCD Controller

3 Wired controller

3. 1 Display and Button



Display

1.Cooling operation mode
2.Heating operation mode
3.Day display
4.DHW operation mode
5.A/C temperature (Heating or Cooling)
6.Menu
7.Timer
8.DHW temperature
9.Clock
10.Anti-freezing running
11.AC assistant water pump(C6)
12.Main water pump(C4)
13.Geothermal icon
14.Compressor
15.Defrost running
16.Water source water pump(C2)
17.DHW assistant water pump(C5)

Button

18.Antibacterial function
19.ON/OFF button
20.Mode selector key
21.Up key
22.LED Indicator(Reserved)
23.Down key
24.Confirm (enter) key
25.Clear(Cancel) key

Notes:1.When the unit is freeze-proofing mode or defrost mode, and will appear or flicker.
2. If are solit,it means that the conponent is working,if they are hollow ,it means that the conpenont is un-working.
3. DHW:Domestic hot water;A/C:Air conditioning.

4. To check 4 sensors temp

During On mode, Icon 6 shows Room Heating/cooling returned water temp to heat pump. Actual outlet water temp is 5 °C higher than the figure. Icon 8 is DHW tank temp sensor, you need to put this sensor to the water tank temp port.
Outside air temp sensor(code 10), Air Conditioning outlet water temp sensor(code 49) can be checked according to parameter table in installer manual.

3 Wired controller

3. 2 Operating the unit

3.2-1 OPERATION MODE SHIFT (OPERATING STEPS):

A, in the On / Standby cases, press the M key, cooling icon appears and flashes; press M key again to change into air-conditioning heating , and flashes; press M key again icon to change domestic hot water and flashes; press M key again to return to cooling. When select a certain mode, press 』 key to confirm, the icon still. Unit will perform the selected.

B, the selected air-conditioning refrigeration, heating mode also includes a domestic hot water, running hot water first.

C, selection of hot water that is only hot water, no air conditioning running.

D, Health and sterilization is an independent automatic operation mode, if necessary, modify the parameters individually.

3.2-2 modify the setting parameters (steps):

A, when the selected mode is running, the unit will run in accordance with the factory set default values, or the last modification of the temperature.

B, the modification method of set the temperature value

In the On / Standby cases, press M and C keys at the same time 3 seconds, the current operation mode flashes; by pressing the M key, you can switch the sequence in the following order: Cooling / heating / hot water; by pressing the ▲ or ▼ key to change set up fixed value, press 』 button to confirm and exit or exit amendment automatically after 15 seconds or press the C key to exit the amendment.

C, the detailed settings in the table below:

No	Mode	Setting range	Default	The buttons operation of modify the setting parameters
1	A/C cooling	10℃～25℃	12℃	M+C→M→』 →▲ or ▼→』
2	A/C Heating	10℃～60℃（AU）	40℃	
3	D.H.W.	10℃～60℃（AU）	45℃	
4	Virus Killing function of D.H.W.	60℃～70℃	65℃	

The above A/C temp is returned water temp, the actual outlet hot water temp is 5° C higher. "AU" means automatic temp operation according to following page.

3.3 Health and antibacteria time setting (steps): In the On / Standby condition, press M and C keys together for 3 seconds, press M button until Antibacteria icon (No. 18) appear press 』 then press ▲or ▼key to set antibacteria target temp value, press 』 button to confirm, the number of interval days appears and flashes, showing the original default settings 7 (means 7 days), press ▲or ▼key to increase or decrease interval days, maximum 99 days, then press 』 button to confirm the selection. " ON "characters appear," hours " icon appears and flashes, showing the original settings value (default 01: means start at 1:00 a.m) . Pressing ▲or ▼key to change (0-23) and press』 button to confirm the new start time. Then "ON" characters disappear, "OFF" characters appear, "minutes" appears and flashes , showing the original set value (default 10, means antibacterial duration time is 10 minutes). Pressing ▲or ▼key to change (minimum 10, maximum 99 minutes), and then press 』 button to confirm and finish setting and quit; or not confirm and automatically exit after 15 seconds.

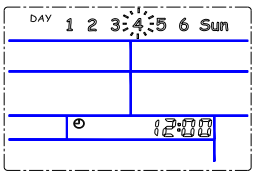
3.4 』 key function description

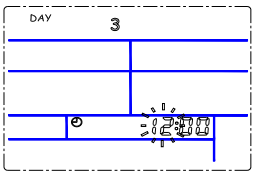
A, to set any parameters that must press 』 button to confirm to be valid, otherwise invalid.

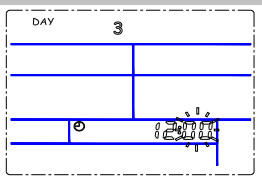
B, in the parameter setting process, if more than 15 seconds there is no button operation, exit parameter settings automatically, we have pressed 』 button to confirm the setting effective and not pressed 』 button to confirm the setting is invalid.

3.5 C key function description

Click the C key to cancel current setting not confirmed by pressing 』 button and exit setting.







3.6 the current time adjustments (steps)

A, press M key 6 seconds, then release, week icon (for example, "4"), flashes. Press ▲ or ▼ selecting between the 1-SUN and then 〗 key to confirm. As shown below:

B, the clock icon appears, number of hours flashing, press ▲ or ▼ key to select number between 0 ~ 23, and then 〗 key to confirm.

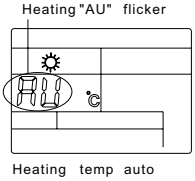
C, at this time the number of minutes flashing, press ▲ or ▼ key to select number between 0 ~ 59, and then press〗 button to confirm and exit setting automatically after 15 seconds, or press C key to exit setting.

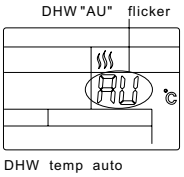
Automatic Heating Temp Curve (Weather Compensation Heating) Function.

In air Conditioning heating mode and DHW mode, we provide two special temperature settings.that is Automatic heating temperature

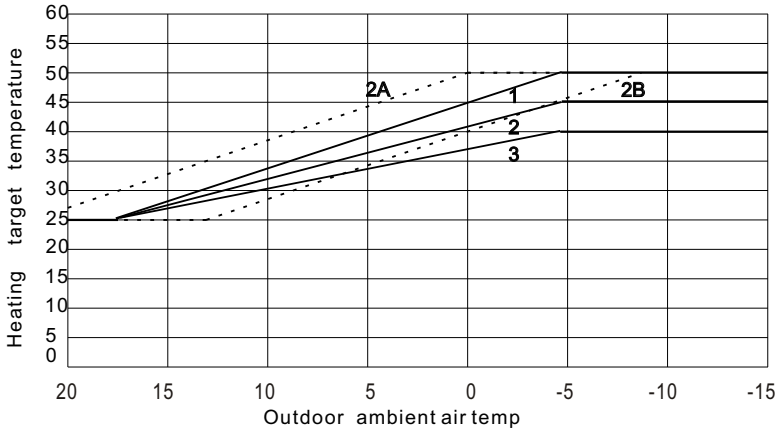
DHW Auto temp: When modify DHW temp to 50ºC, Press the △ key again,on the temp area "AU"symbol appears and flickers,press the ↵ key to confirm,the DHW temp will be automatic setting by outdoor ambient temperature.

Heating auto temp: when modify heating temp to 50ºC, press the △ key again,on the temp area "AU" Symbol appears and flickers,press the ↵ key to confirm,the heating temp will be automatic setting by outdoor ambient temperature.





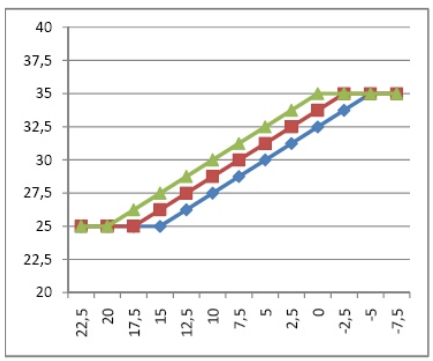
If the default heating auto-temp curve is not ideal for users. The professional installer can adjust the curve by change the parameters. As shown table below:



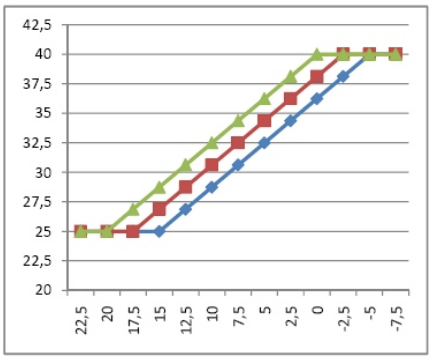
Factory default setting is curve 2.

Parameter 25 is to offset the air temp up or down.
Parameter 27 is to set the max target returned water temp.
Curve 1 : parameter 27 = 50
Curve 2: parameter 27 = 45

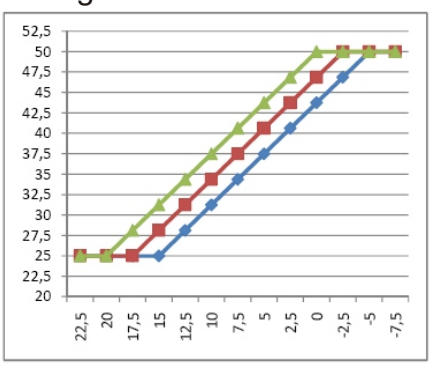
Well insulated home



Medium insulated home



Not good insulated home



3 Wired controller

3. 3 Week and Clock Setting

Press and hold [M] key for 3 seconds until the week digits on the screen start flashing.

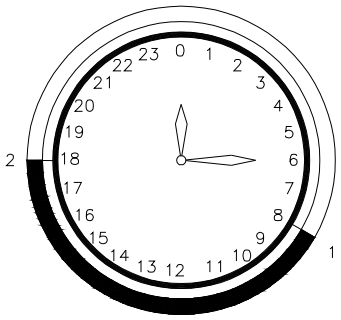
Press [△] or [▽] key to select the day, press [↵] key to confirm, the number of hour appears and flickers.

press [△] or [▽] key to adjust hour, press [↵] key to confirm, then the number of minute appears and flickers.

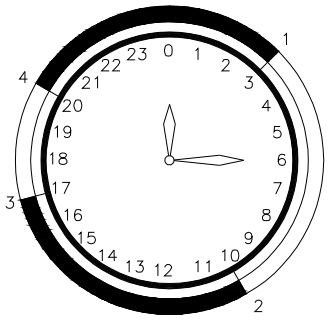
press [△] and [▽] key to adjust minute , press [↵] to confirm and exit setup interface.

Weekly timer function

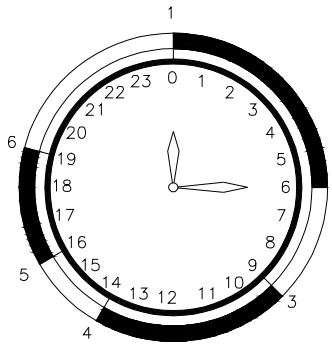
There are timers on the control system that can be used to program the time when the unit switches on and off.
Timer can be set to a cycle every week, since Mon to Sun. each day can be set three different timers to turn on, and three different timers to turn off. There is an option to select the timer set for just one week or weekly repeated.



Timing 1set on/off each day
Need to set 2 time points



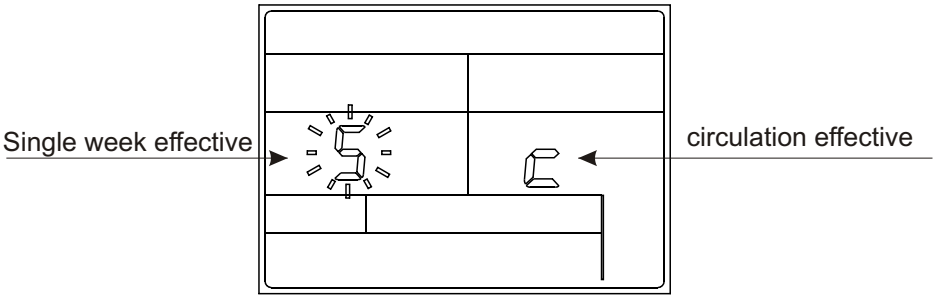
Timing 2sets on/off each day
Need to set 4 time points



Timing 3sets on/off each day
Need to set 6 time points

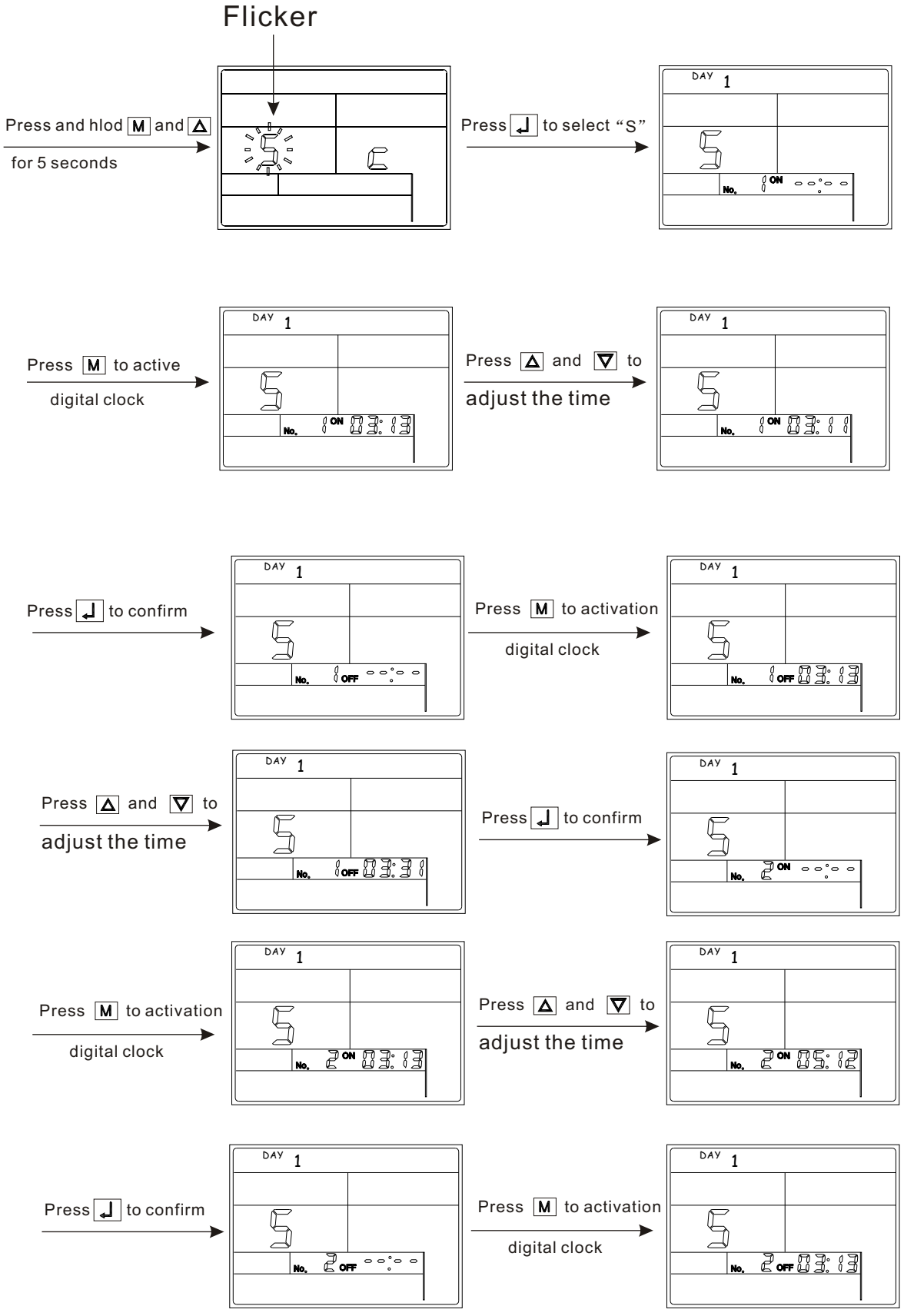
Single week effective and circulation effective

Press and hold [M] and [△] simultaneously for 3 seconds ,the screen appears and flashes “S” or “C”, press [▽] key to select “S” or “C”, press [↵] key to confirm. Select “S” is single week effective,choice “C” is circulation effective, single week effective and circulation effective timing set in the same way.

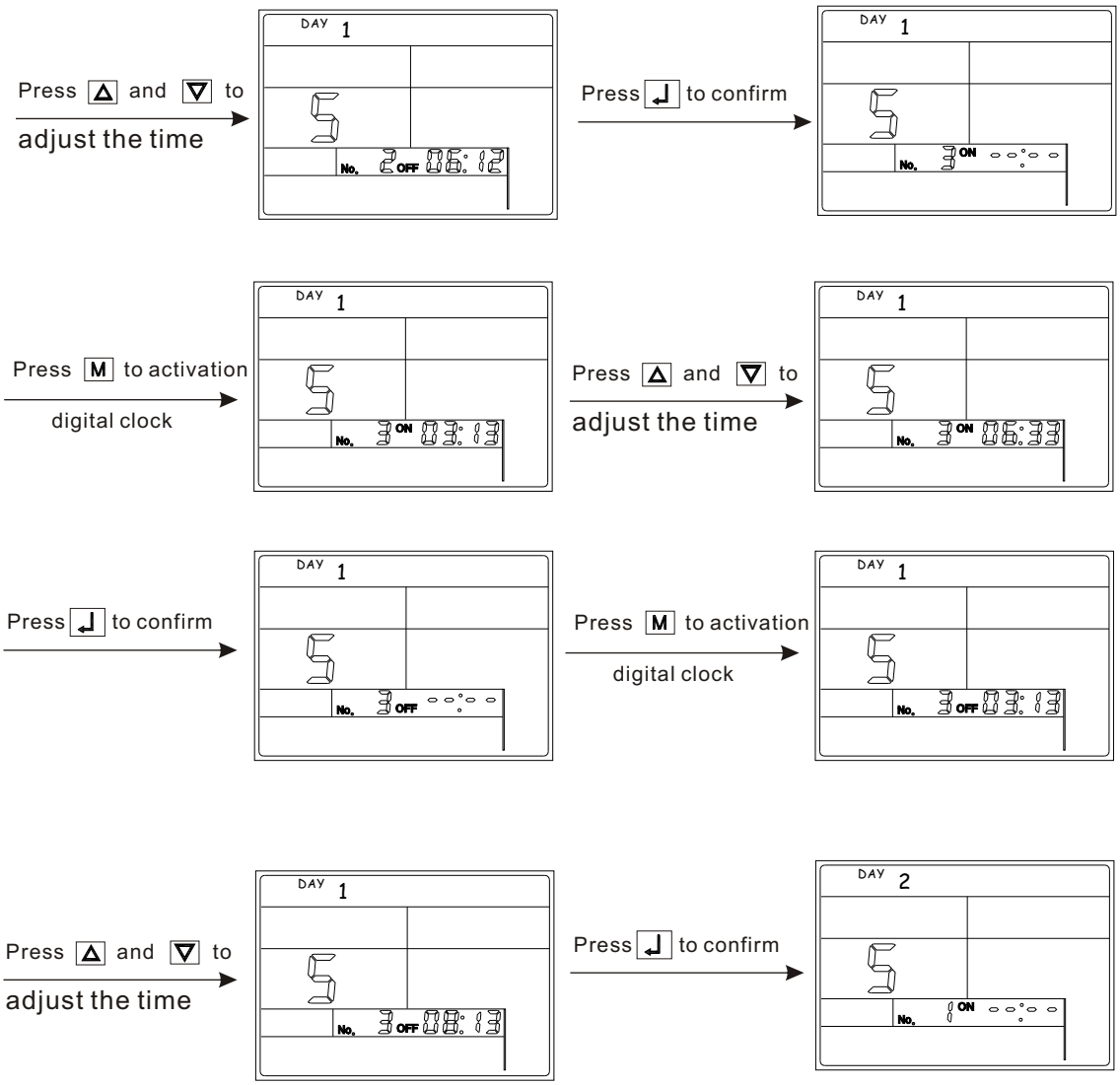


3 Wired controller

3. 4 Timer setting



3 Wired controller



After monday's timer setting is finished, it will be automatically switched to Tuesday's timer setting .until sunday's timer setting is finished,then return to normal display interface.

In the process of setting the timer,if one of the timing time does not need to set,press M key,the digits of clock change to "--:--",press the ↵ key to confirm.

If a day does not need to change the timing settings, press the C key to skip to the next day timer settings.

Clear timer settings

At the same time press M and △ for 3 seconds enter into the timer setting interface, and then press the △ and C simultaneously for 3 seconds, all the timer settings to be canceled.

4 Error Code

Shortly press ⌟, you can enter into the error code checking state. Then press ⌟, key again, you can check each error code. The error code meaning was given on the function book.

Display ″Err Ex″ or ″Err Px″. For example : Err E2, Err P5.

Item	Error Meaning	Error Code
1	Compressor air discharge temp sensor error	P2
2	Outdoor coil temp sensor error	P1
3	Outdoor ambient temp sensor error	P7
4	Air-conditioning returned water sensor failure	P3
5	Air-conditioning outletwater sensor fault	E1
6	Hot water tank sensor fault	E9
7	Solar temp sensor error	Pb
8	high pressure protection, or water source side water flow volume too small	E7
9	Low pressure protection	P9
10	Outdoor Water flow error	P8
11	Indoor Water flow error, AC freezing protection	Pd
12	Missing phase / Wrong phase	PA
13	Indoor freezing protection	Pb
14	Water source inlet water temp error	EF
15	Water source outlet water temp error	EA
16	Water source heat exchange noefficient error	E8
17	Air discharge temp too high protection	E3
18	high pressure protection	E4

5 Installation

5.1 Installation information

DHW tank

DHW tank is too small then it may lead to rapid decline in water temperature during use, DHW tanks to use recommended configuration as following Recommended water tank volume and minimum water flow volume::

Model	GH-8	GH-11	GH-15	GH-17	GH-30
DHW tank	≥100L	≥100L	≥150L	≥200L	≥300L
Water flow volume (Liter/Hour)	1200L/h	1800L/h	2400L/h	3000L/h	3500L/h

Note!

To keep the heat pump from freezing, please do not shut off the power supply of the heat pump in winter. If the electricity is out of supply in winter, please drain out the water in the heat pump **or you can use brine(20%-40% glycol) to replace pure water in case of electric cut off accident during winter .**

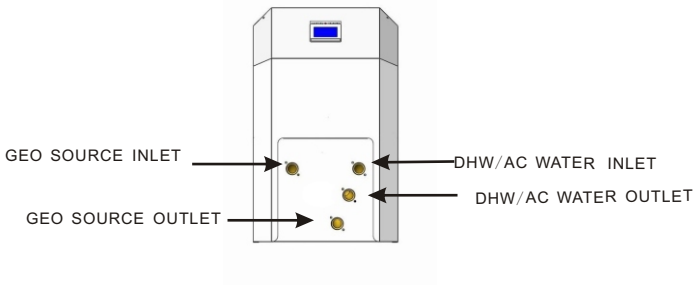
5 Installation

Pipe connection

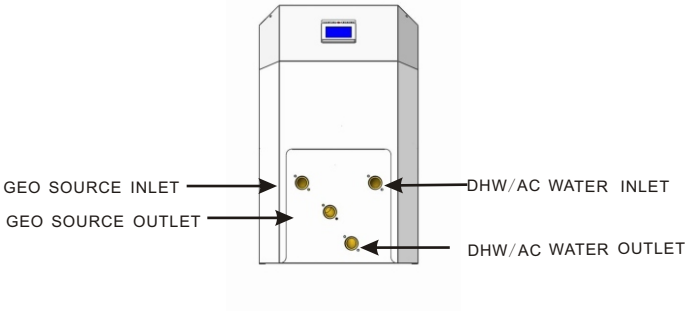
Pipe installation must be carried out in accordance with current standard and directives.
All outdoor pipes must be thermally insulated with at least 19 mm thick pipe insulation.
The pipe must be clean and has no dust and fragments inside.
During Piping connections, filters of domestic hot water and air-conditioning must be install.
Piping connections must ensure that it is no leakage.

Close Loop AC Series: Standard Geo/ Water source heat pump inlets and outlets

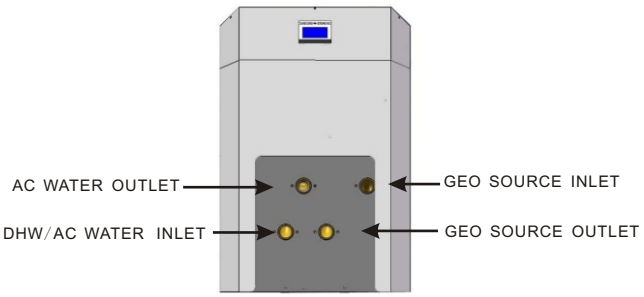
8KW and below model



11KW and above model

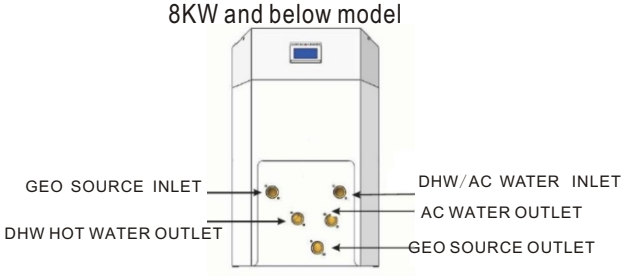


25KW/30KW

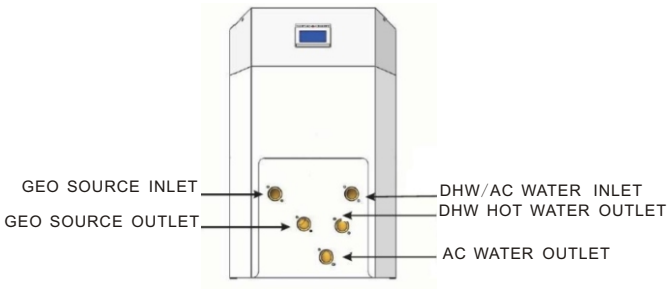


Close Loop HC Series: Multifunctional Geo/ Water source heat pump inlets and outlets

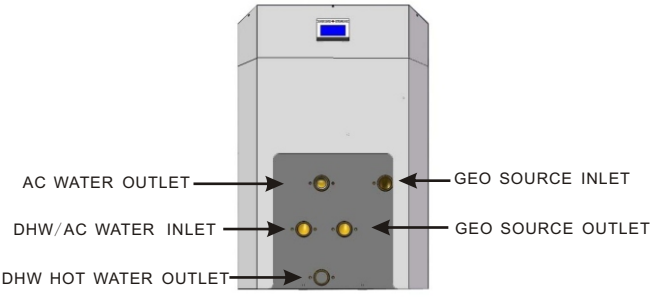
8KW and below model



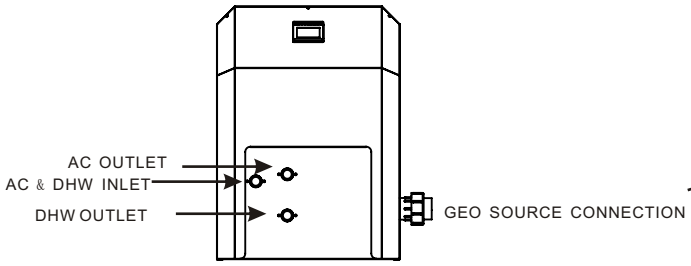
11KW and above model

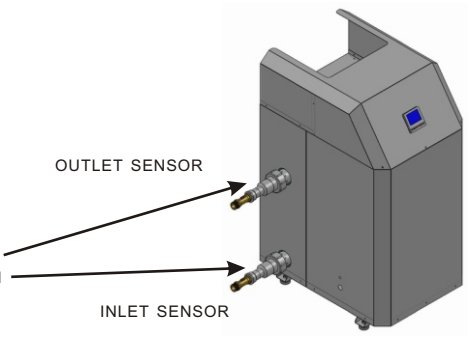


25KW/30KW



Open Loop: Standard Geo/ Water source heat pump inlets and outlets

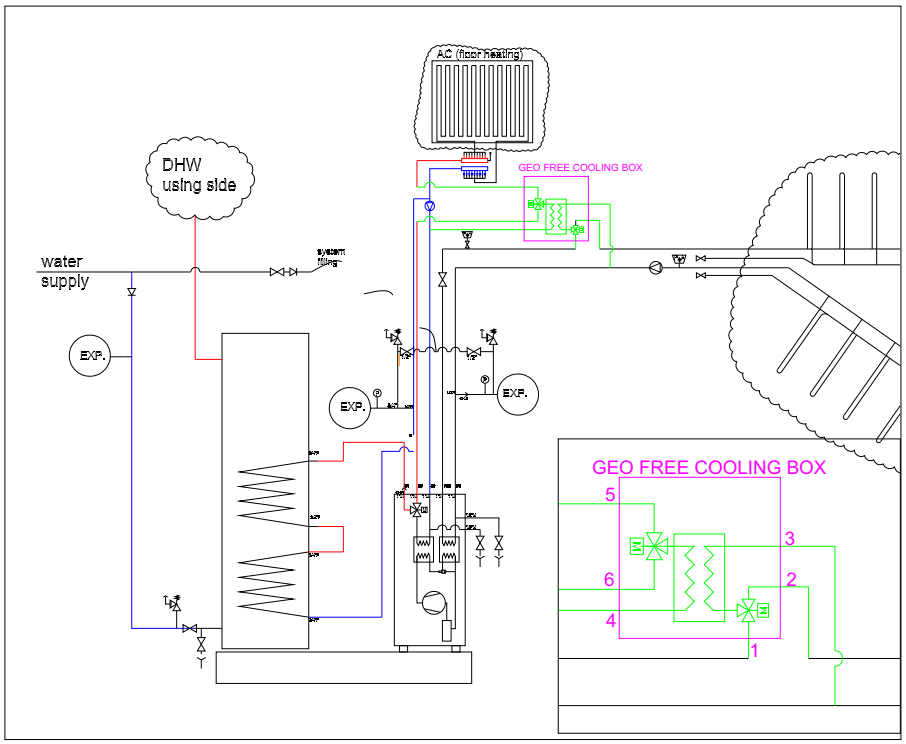




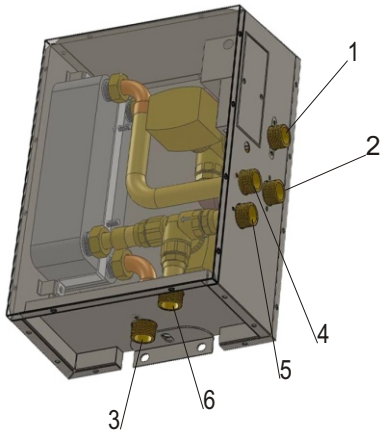
Note:The above inlets and outlets may be changed without notice. Please check the sticker on the unit as final. DHW:Domestic hot water; AC:Air conditioning

5. 2 Free cooling (Passive cooling) Module Connection

1. Water system diagram



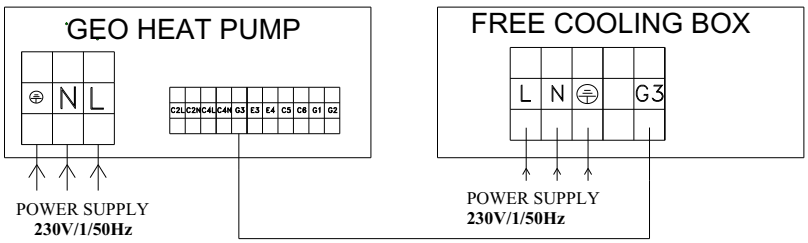
GEO Free Cooling Box



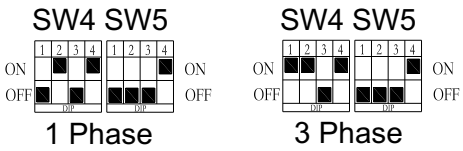
A: Geo source side B: Usage side

1. Active Inlet A
2. Outlet A
3. Passive Inlet A
4. Passive Inlet B
5. Outlet B
6. Active inlet B

2.Wire Connection diagram



3.Dipswitch setting



3. FREE COOLING(Passive cooling) FUNCTION Working Theory

(1) When SW5-4:ON, FREE COOLING function is valid.
When cooling start, Compressor(OUT1)OFF,G3(OUT3)ON. When AC returned water temp- target temp > differential value, Geo water source water pump (OUT2)ON. In this way, the geo water will cool the usage side. When AC returned water temp ≤ target temp, Geo water source water pump OFF, G3(OUT3) OFF. So you can set the cooling target temp to prevent the condensation water.

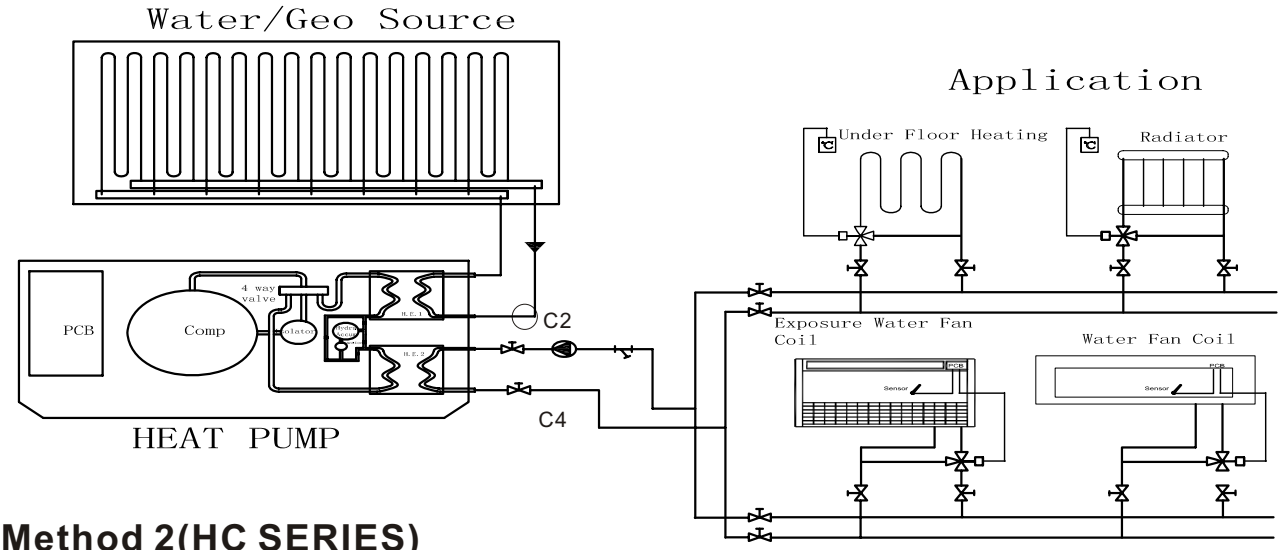
(2) When SW5-4:OFF, FREE COOLING is invalid, Compressor cooling is valid.

5 Installation

5. 3 Installation method

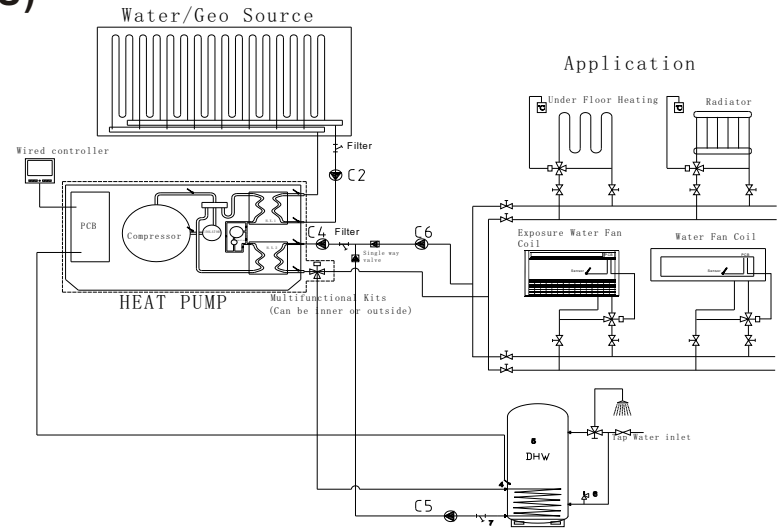
C2 Water source side water pump
C4 Water pump for DHW and AC
C5 DHW assistant water pump
C6 AC assistant water pump

Method 1

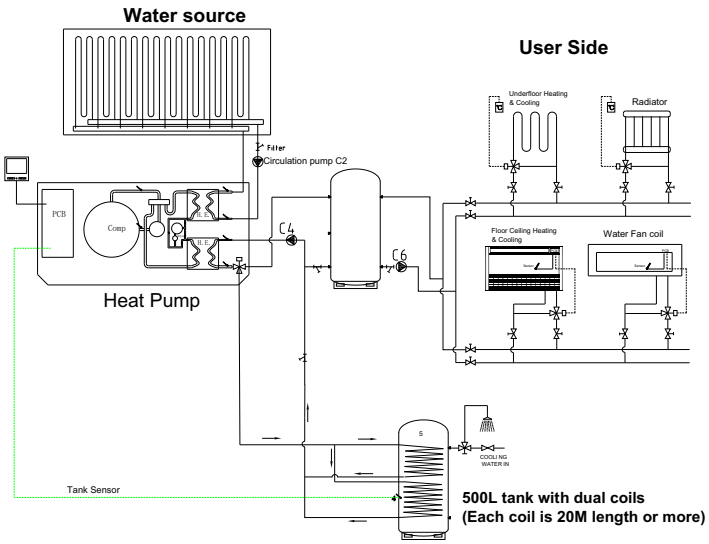


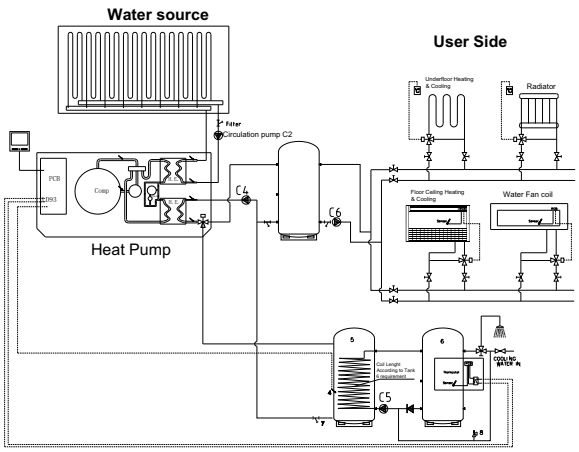
Method 2(HC SERIES)

Recommand for 20KW and below



Recommand for 25KW and above





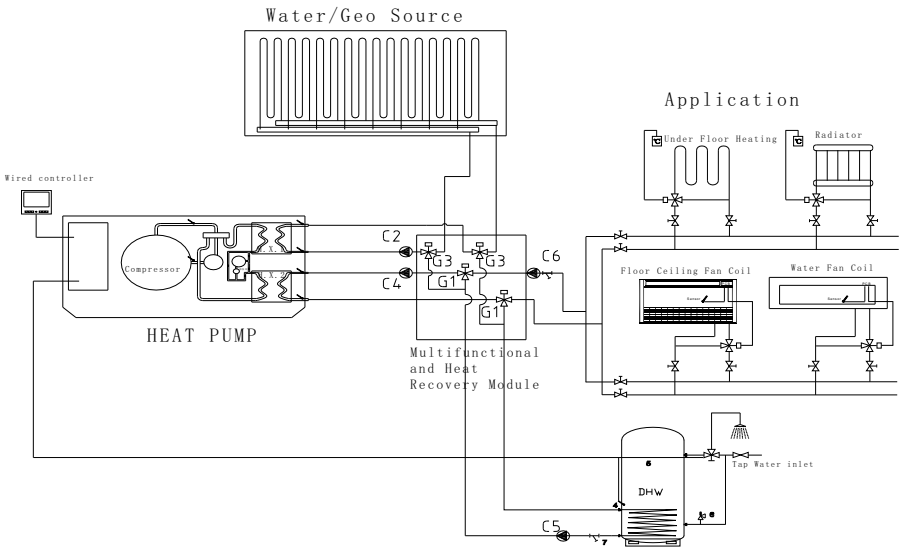
Method 3

Close loop Heat Recovery

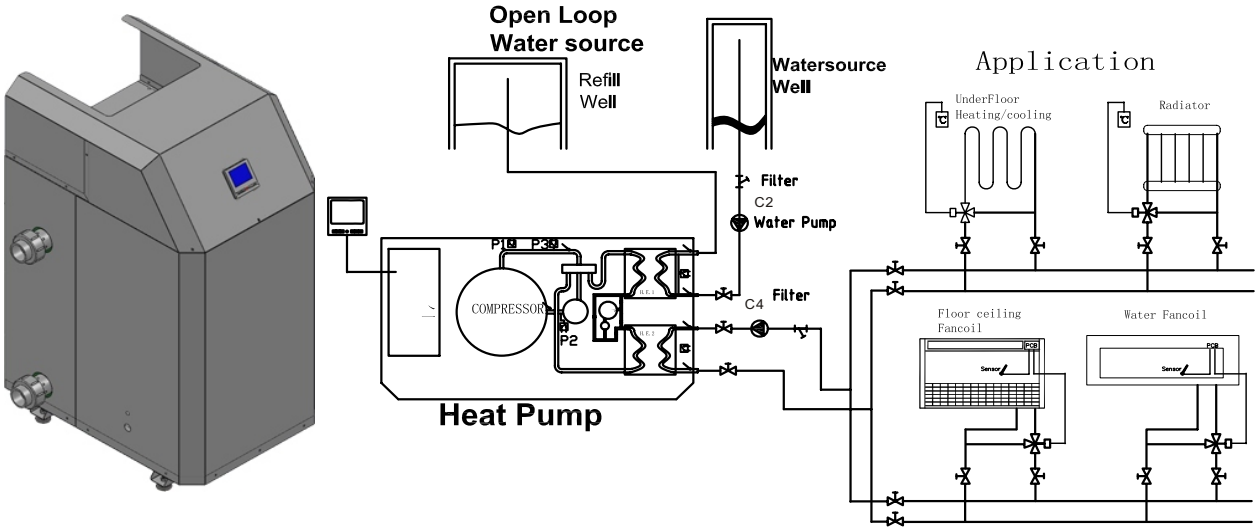
To fill the glycol to the heat recovery module, do as the following step

1.Unplug the OUT1 of compressor connection of PCB board to disable the compressor start.
2.Running it in cooling mode to fill the glycol.
3.Running it in DHW mode again to fill the glycol at DHW side.
4.After finish filling, connect the OUT1 again to enable compressor working.

Water Pump Working
C2 and C4 is always working.
C5 is working when DHW required.
C6 is working when AC side required.

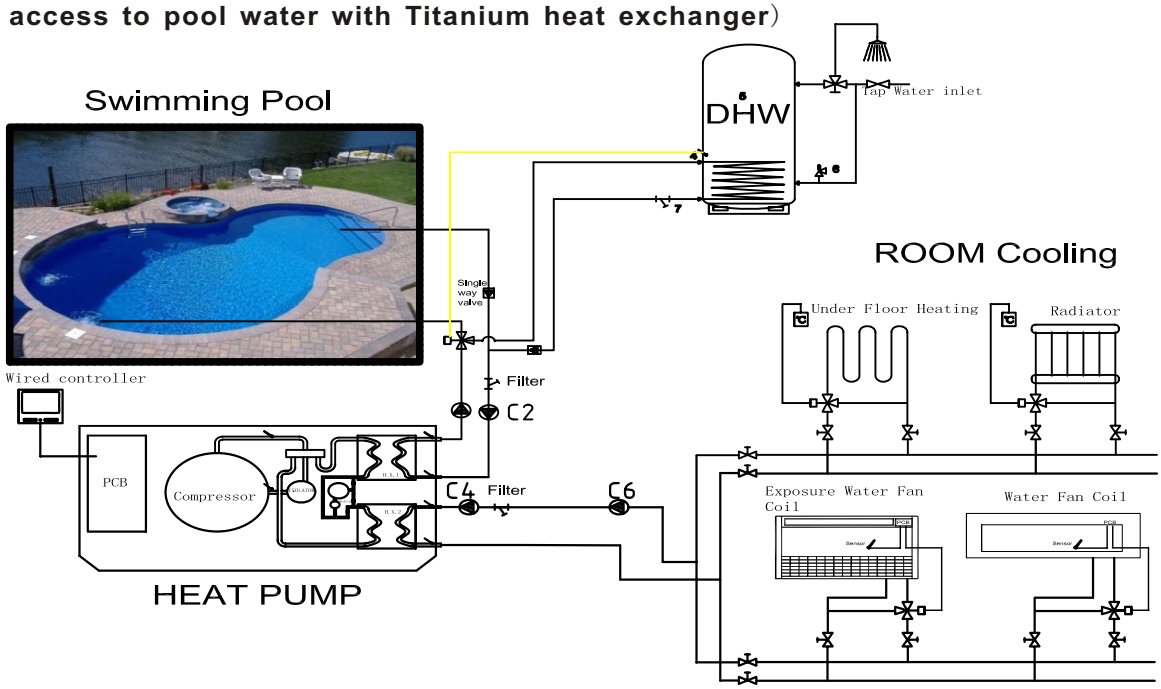


Method 4 (Only for open loop model e. g. OH-15AC-410)



Method 5 (For Open loop model)

(Directly recover room heat for DHW and Swimming pool water Directly access to pool water with Titanium heat exchanger)



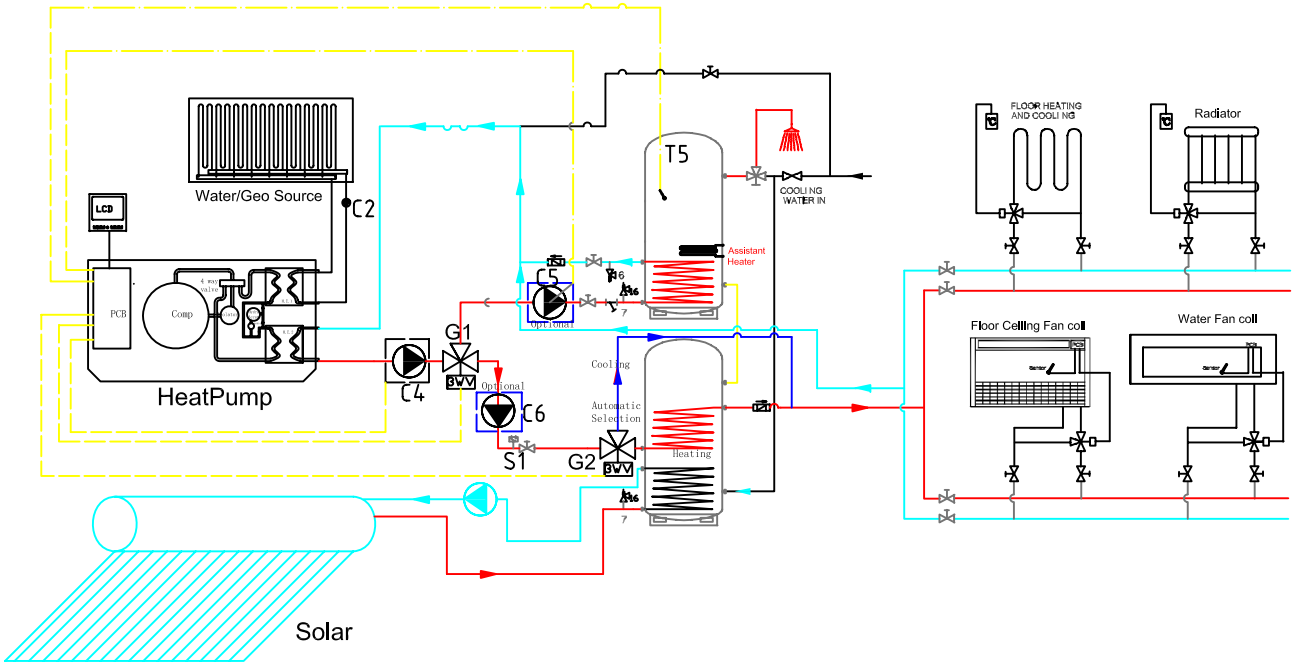
5 Installation

Solar Application

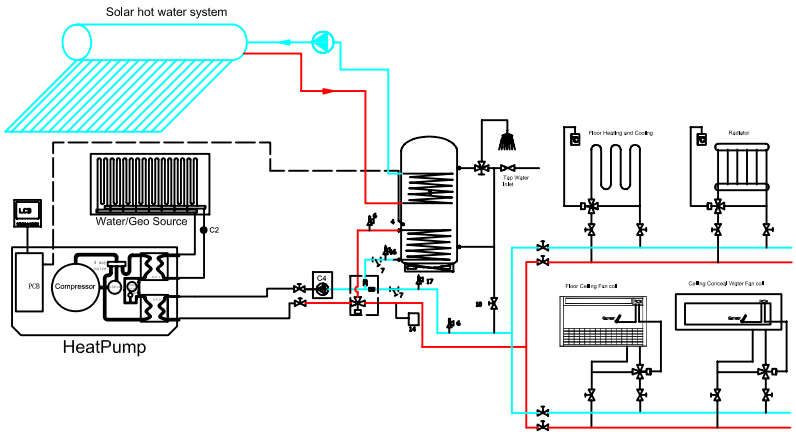
1.Multifunctional heat pump application for solar assist for room heating and DHW

Enhanced programs to work integratedly with solar system

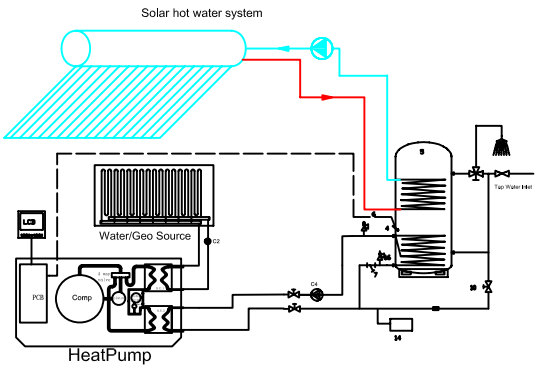
Heat pump automatically select to go or not go through solar water tank to save energy the most.



2.Multifunctional heat pump with solar assistant DHW



3. Only DHW with Solar

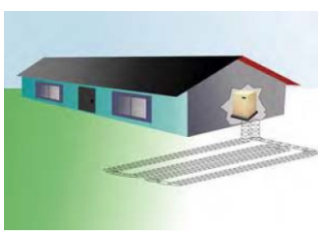


*Note: 1. Multifunctional kits are optional for all models

2.Close loop models need seperate Heat Recovery Kits, open loop models can directly be used as heat recovery model, which can make free water by collect back heat from room.

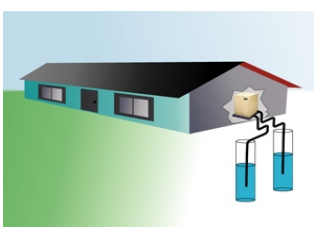
5. 3 Typical Water/Geo Source Connection

Pool/Lake/River Loop



Horizontal Ground Loop

Vertical Ground Loop

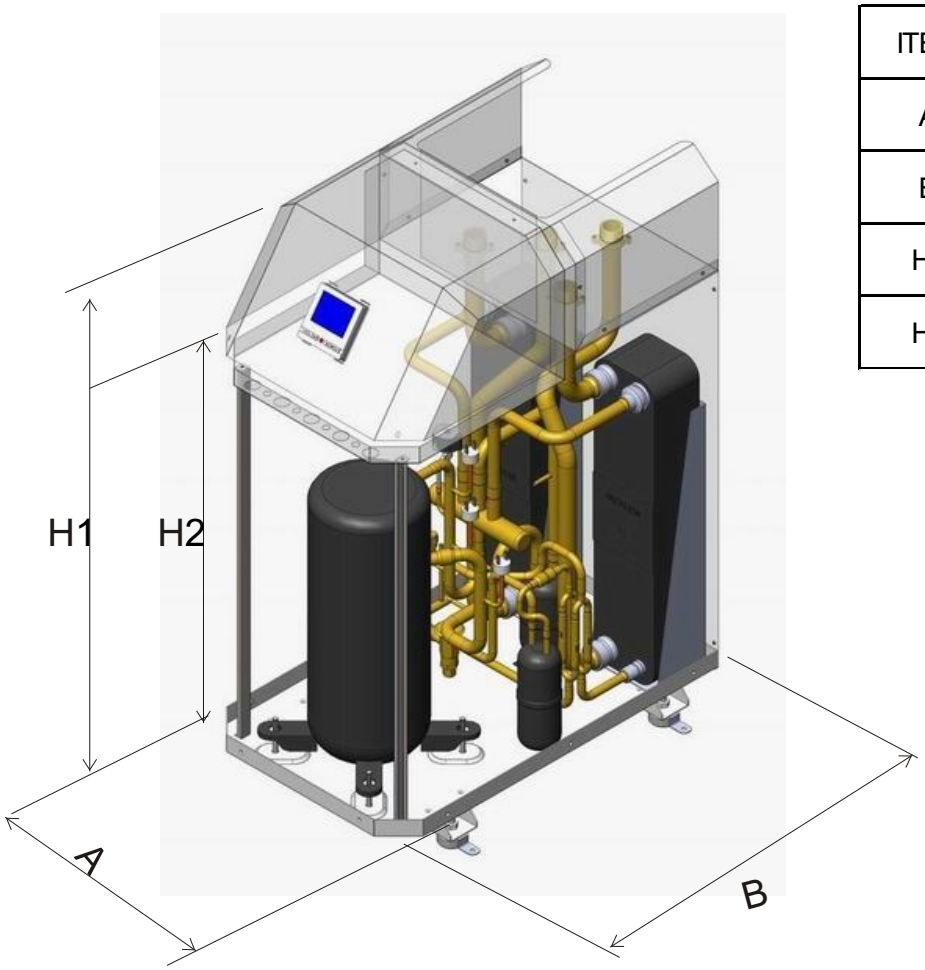


Open Loop Well system

5 Installation

5. 4 Dimensions

GH-11 GH-15 GH-17 GH-30



ITEM	GH-11~17	GH-30
A	400	505
B	650	755
H1	960	965
H2	760	715

5. 4 Installation position

Note!

Installation must be carried out by professional personnel.

1 The unit is recommended to be installed in basement, kitchen or other place indoor.

2 Drain ditch or other facilities should be arranged under the unit, to avoid the environment influence because of water discharge.

3 To install the unit at balcony or top of building, the installation site must meet the allowable bearing capacity of building structure, without affecting the structural safety.

4 The unit should not be installed at places accompanied with oil, inflammable gases, corrosive components e.g. sulfur compound, or high-frequency equipment.

5 The unit must be installed upon reliable machine base or framework. Weight capacity of framework should be 3 times of the body weight, and safeguard measures should be taken to avoid malfunction of fastenings.

6 The unit should not be installed at sites with typhoon/ earthquake hazards. Midair installation should be avoided as much as possible, for machine falling may result in severe accident.

6 Electric connection

6. 1 General

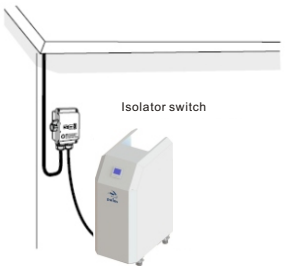
Note!

Electrical installation and service must be carried out under the supervision of a qualified electrician. Electrical installation and wiring must be carried out in accordance with the stipulations in force.

The heat pump must not be connected without the permission of the electricity supplier and must be connected under the supervision of a qualified electrician.

Wires, spare parts and materials etc. must satisfy the relevant standards issued by the host country or region.

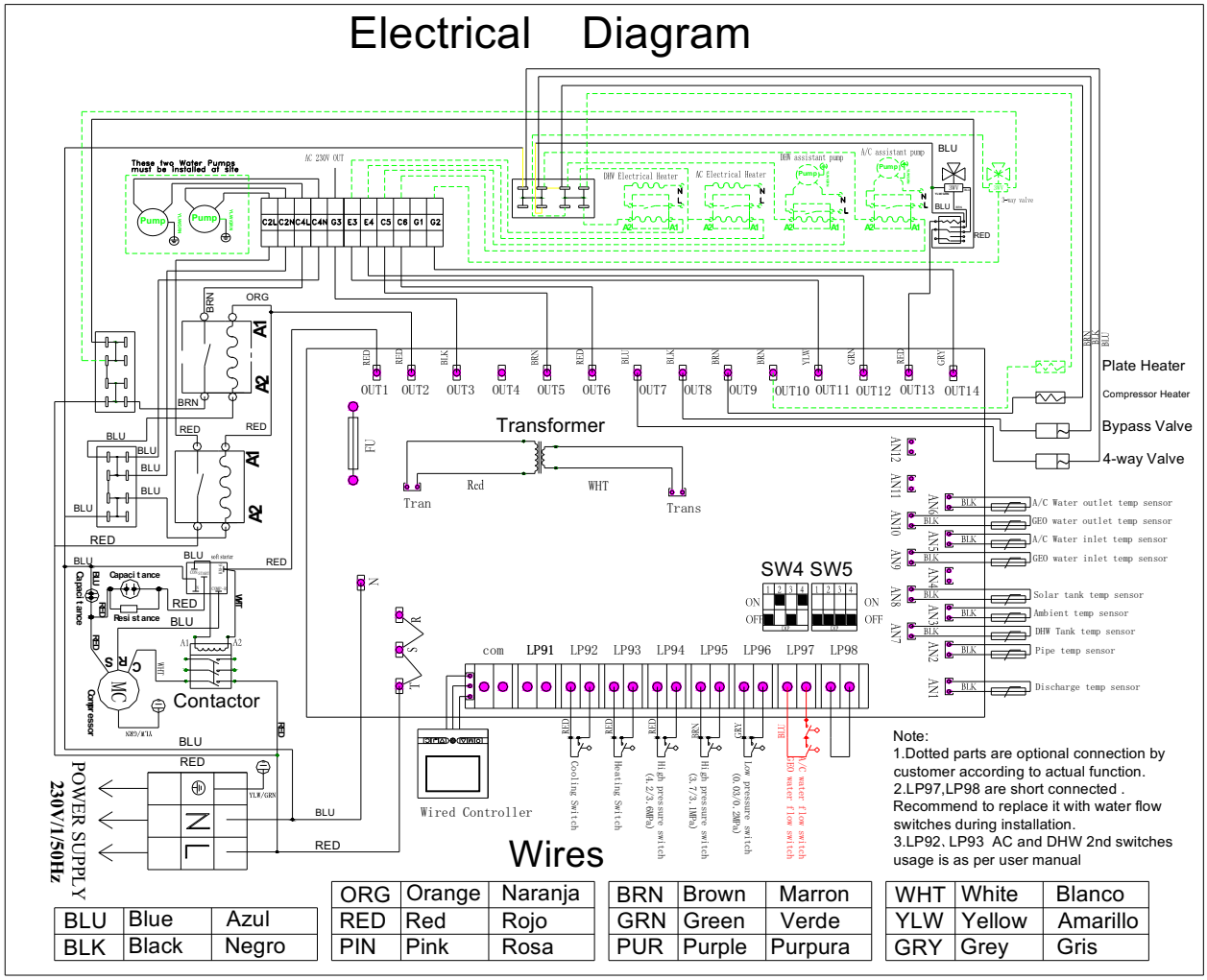
The heat pump does not include an isolator switch on the incoming electrical supply. The power supply cable must be connected to a circuit-breaker with at least a 3 mm breaking gap. Incoming supply must comply with the technical requirements, with ground wire, via a distribution board with fuses.



If an insulation test is to be carried out in the building, please make sure to disconnect the heat pump.

To avoid the possibility of false action caused by electromagnetic coupling, the communication wire must be STP(Shielded Twisted Pair). The size of communication wire should not less than 0.5mm^2.

6.2 Wiring Diagram



BLU	Blue	Azul
BLK	Black	Negro

ORG	Orange	Naranja
RED	Red	Rojo
PIN	Pink	Rosa

BRN	Brown	Marron
GRN	Green	Verde
PUR	Purple	Purpura

WHT	White	Blanco
YLW	Yellow	Amarillo
GRY	Grey	Gris

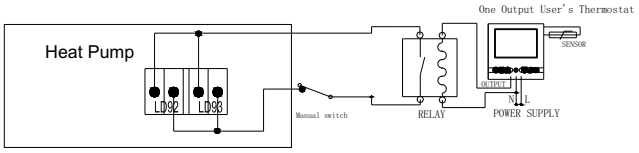
6 Electric connection

Heating Switch/Cooling Switch Usage Illustration

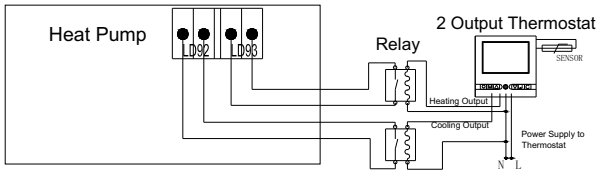
The Heating/Cooling switch function enable our heat pump to be controlled and switch between heating and cooling by any additional user's manual switches or thermostat for convenient control.

1. LD92:Heating switch.
Function: When LD92 switch is on, LD93 is off, the heat pump will run AC cooling mode, no matter the LCD controller setting mode.
2. LD93:Cooling switch.
Function: When LD93 switch is on, LD92 is off, the heat pump will run AC heating mode. no matter the LCD controller setting mode.
When LD92 and LD93 are all on, the heat pump will run same mode as last time. When LD92 and Ld93

Connection 1 - Room thermostat switch Heat pump On/Off



Connection 2- Room Thermostat switch heat pump heating/cooling



7. 1 Preparation

After finish the installation tasks, please check the items:

1 Check the SW4-1 dip switch setting to ensure the correct voltage.

SW4-1: Single phase: Three phase: 

2 cable

Check if the power cable is connected correctly, and check if the screws have been screwed down.
Please use specified communcation *cables.*

3 Water circuit

Check if the water pipes are correctly connected, and the pipe dimensions are correct.
Heatproof measures must be taken for water outlet pipes and water inlet.
Check if all the shut off valve and manual valve is opened, check if all the joint is fastened.

Before connecting the heating water system to the heat pump, the heating system must be flushed to remove any impurities, residue from sealants, etc. Any accumulation of deposits in the liquifier could cause the heat pump to completely break down.
Once the heating system has been installed, it must be filled, deaerated and pressure tested.
Consideration must be given to the following when filling the system:

Untreated filling water and make-up water must be of drinking water quality (colourless, clear, free from sediments)
Filling water and make-up water must be pre-filtered (poresize max. 5µm).

4. Water Quality Requirements

The water should not contain any substances that could form deposits. The limit values for iron (<0.2mg/l) and manganese (<0.1mg/l) must be adhered to prevent iron ochre sedimentation in the heat pump system.The use of surface water or water containing salt is not permissible. Your local water utility can provide you with general information regarding the possible use of ground water. Water analyses are carried out by specially-equipped laboratories. It is not necessary to carry out a water analysis with regard to evaporator corrosion if the annual mean temperature of the ground water does not exceed 13°C). In this case, the limit values for iron and manganese must be adhered to (iron ochre sedimentation).

7 Test Run

7. 2 Water filling

Before fill the water to heat pump water system, please make sure the whole water system is connected correctly, all the piping joints are fasten good.

Two method of water filling
please open the tap water valve, open ball valve
10, air discharge valve 15 and water tank air discharge valve, until the water is full. Then close air discharge valve15 , ball valve 10 and water tank air discharge valve.

7. 3 Running

Turn on the heat pump ,

select cooling, heating, domestic hot water mode , check whether the unit is running properly or not,the compressor will be started in 3~5 minute after powered on.

Note: Please assure water pumps（C2 and C4） for water source side and usage side are both working properly before turn on the heat pump to avoid freezing the plate heat exchangers.

7.4 Routine Maintenance

To prevent faults due to sediment in the heat exchangers, must take care to ensure that no impurities can enter either the heat source system or the heating system. In the event that operating malfunctions due to contamination occur nevertheless, the system should be checked.

1. Check and clean all the water filters every months
2. Check all the water pipe connection for any leakage every half year.
3. Check the refrigerant pressure through the needle valve every year . If the pressure is too low, it need to add more refrigerant. You need to check the leakage also.

IMPORTANT!

1. Make sure water pumps（C2 and C4） for water source side and usage side are both working properly and water circuit is recycling smoothly before turn on the heat pump to avoid freezing the plate heat exchangers.

2. SAdd water flow switches at both geo(water) source side and usage side to protect plate heat exchanger in case water pumps are blocked.
3. S elect big enough water pumps for both sides.

4. Always keep the electricity connection with heat pump to enable the antifreeze function.