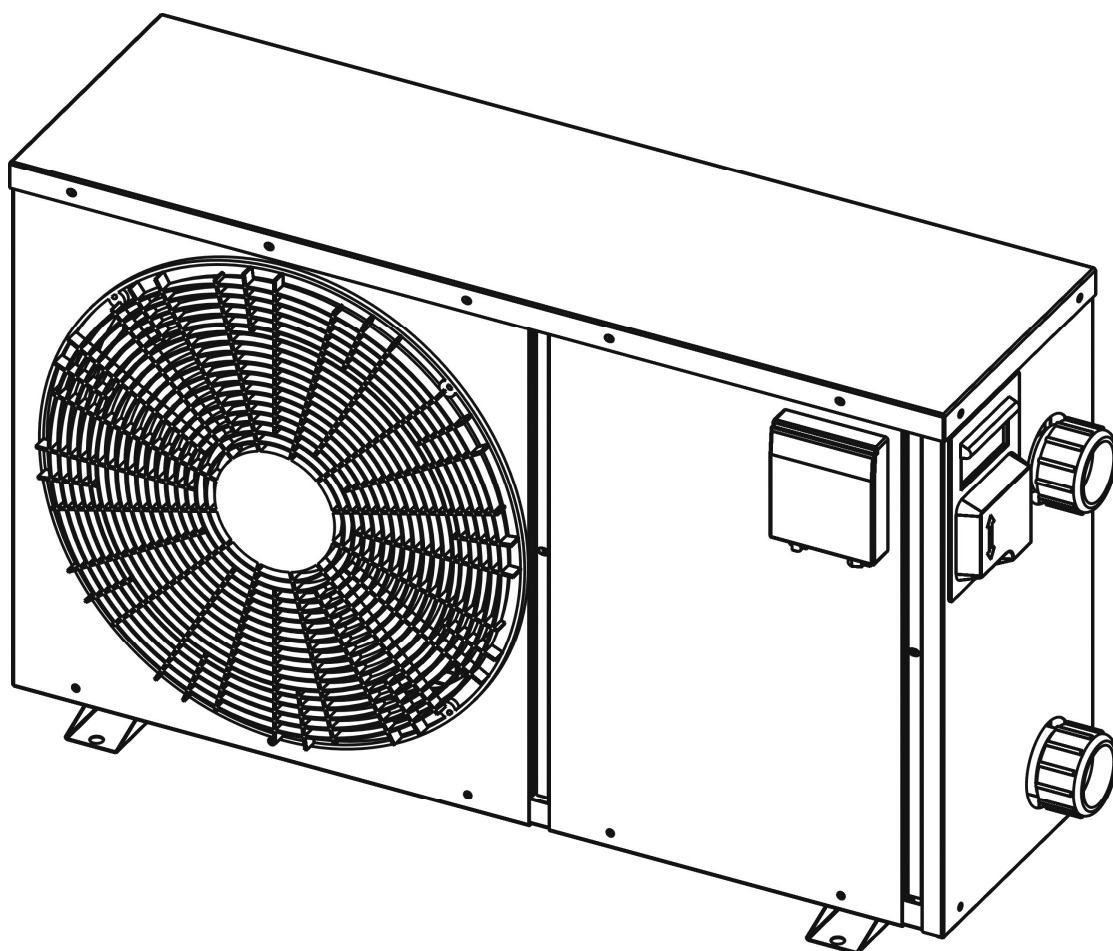


# Heat Pump Pool Heater

## User Manual

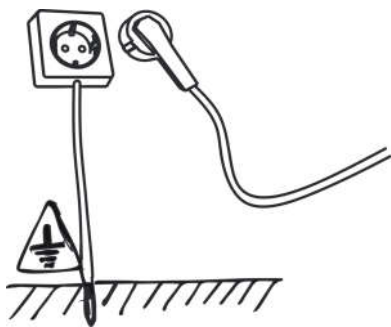


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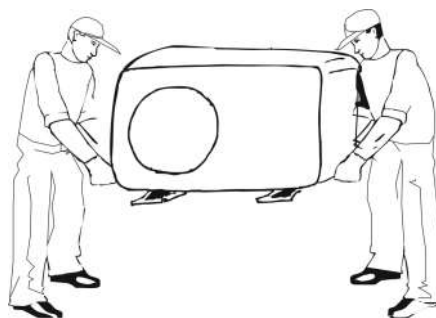
*Before operating this product, please read the instructions carefully and save this manual for future use.*

# 1. Safety precautions

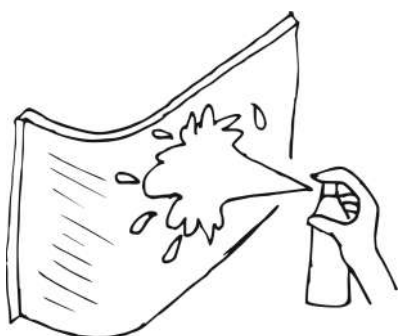
**⚠ VITAL** Electrical power must be switched off before starting any work on heat pump.



The unit must be earthed to avoid any risks caused by insulation defects.



The installation, commissioning and maintenance of these machines should be performed by qualified personnel having a good knowledge of standards and local regulations, as well as experience of this type of equipment.



Clean the machine by washing with detergent and water at low pressure, and then rinsing with clean water.



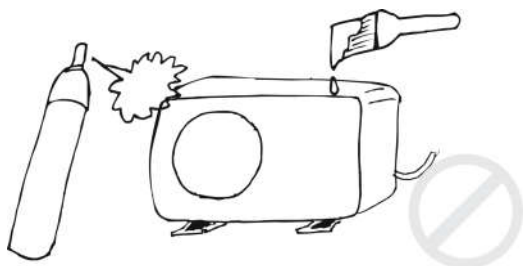
Steel Wire



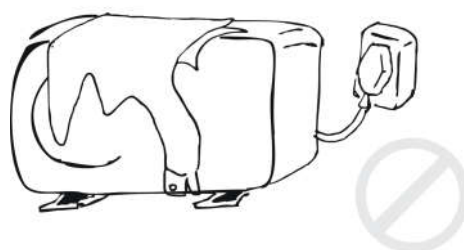
Copper Wire



It is the responsibility of the installer to provide circuit breaker protection, corresponding to the machine's capacity (refer to the unit electrical characteristics table), near to the machine.



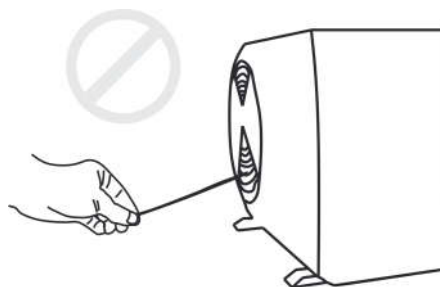
Do not spread over any paint or insecticidal material on the surface of the unit.



Do not block the evaporator by paper or any other foreign bodies, to keep the unit well ventilated.



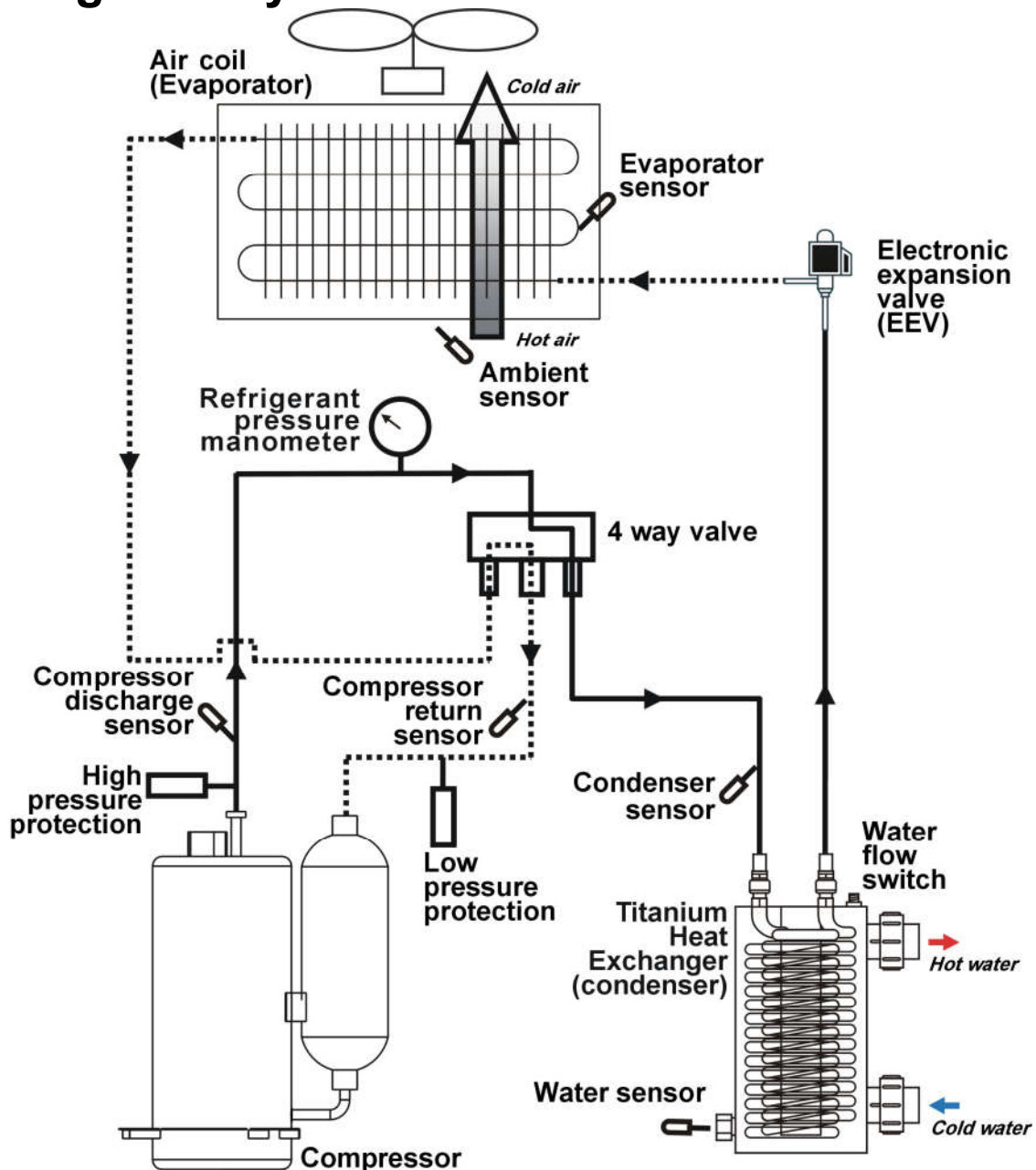
Do not pour any water on the unit.



Do not touch the air outlet grill when fan motor is running.

# 2. System and Main Components

## 2.1 refrigerant system



## 2.2 Working principle of a Heat Pump :

The refrigerant system consists of 5 main components:

compressor, 4-way-valve, titanium heat exchanger (condenser, refrigerant to water), electronic expansion valve/capillary, evaporator (air to refrigerant).

Heat pump can absorb the heating from air source. This makes the heat pump a very environmentally friendly and economically sound alternative for space heating.

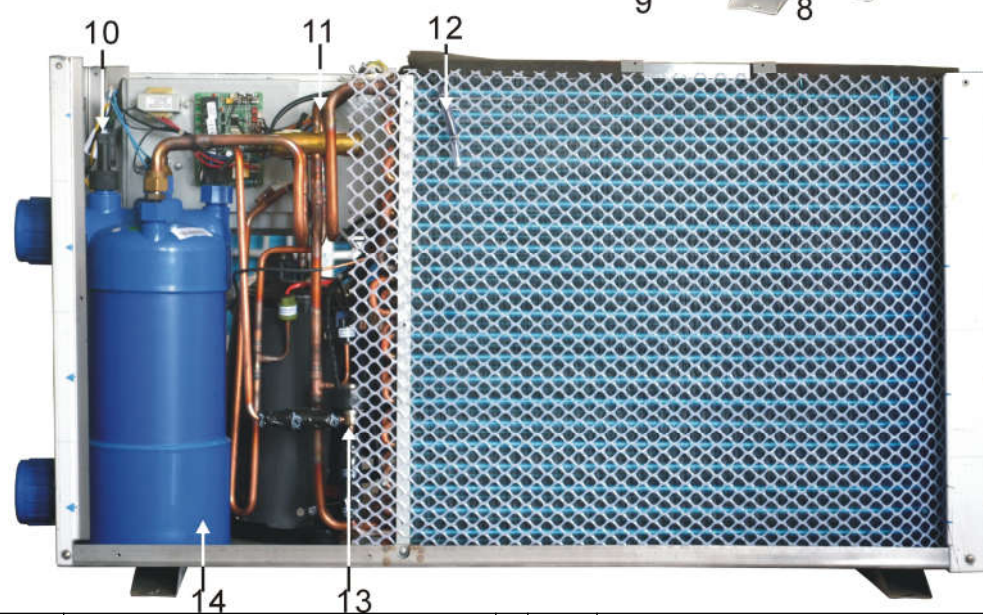
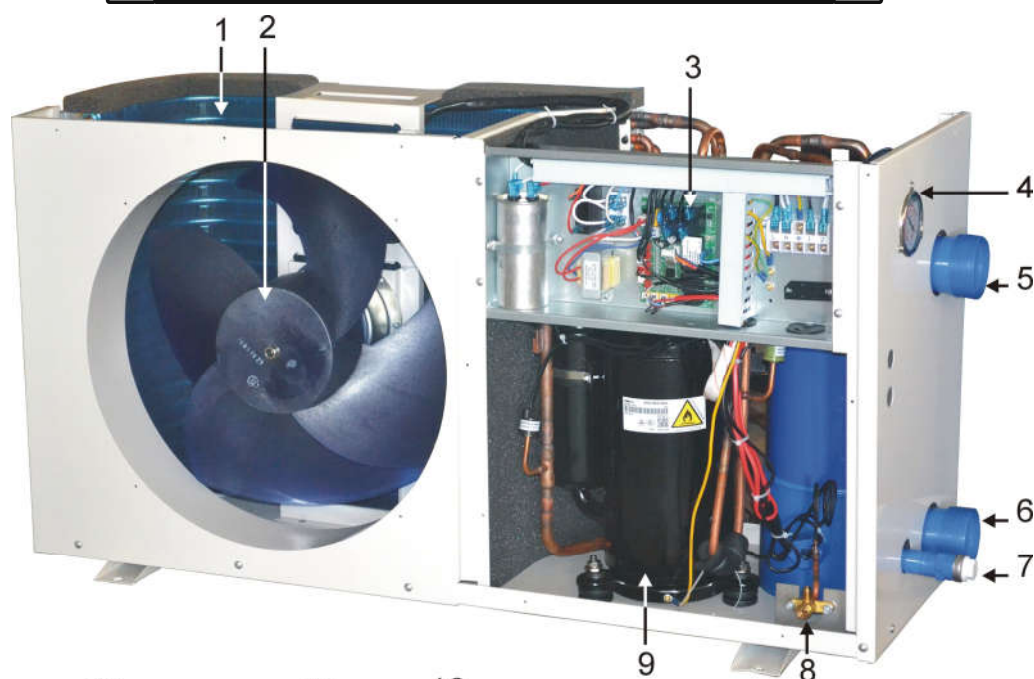
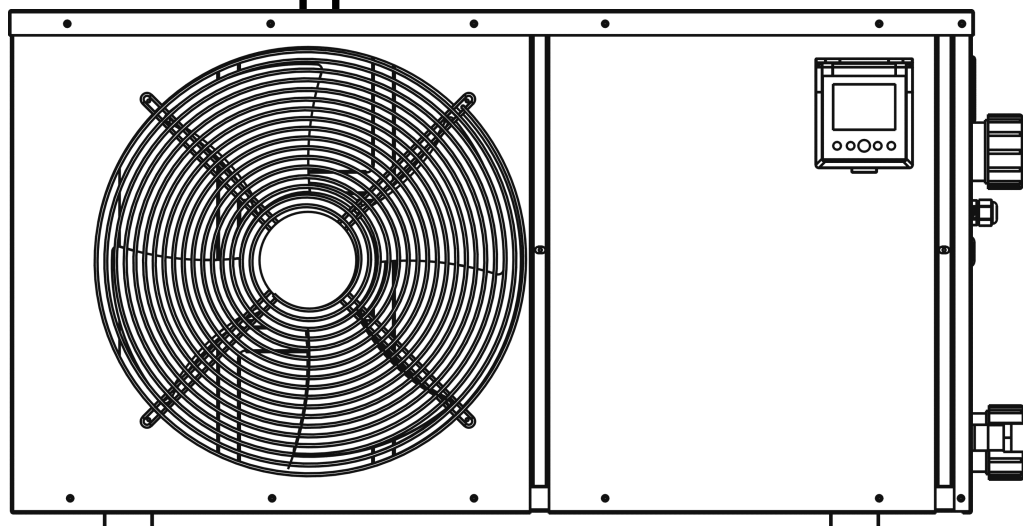
\* Evaporator: low temperature, low pressure refrigerant go through evaporator, to boil and turn from liquid to gas. Refrigerant absorb heating from air source.

\* Compressor: compressor absorb refrigerant, and compress to high temperature, high pressure status.

\* Condenser: refrigerant release heat energy to water. Refrigerant temperature reduces, and it returns from gas status to liquid status.

The heat energy is absorbed by water, circulated by a circulation pump to pool.

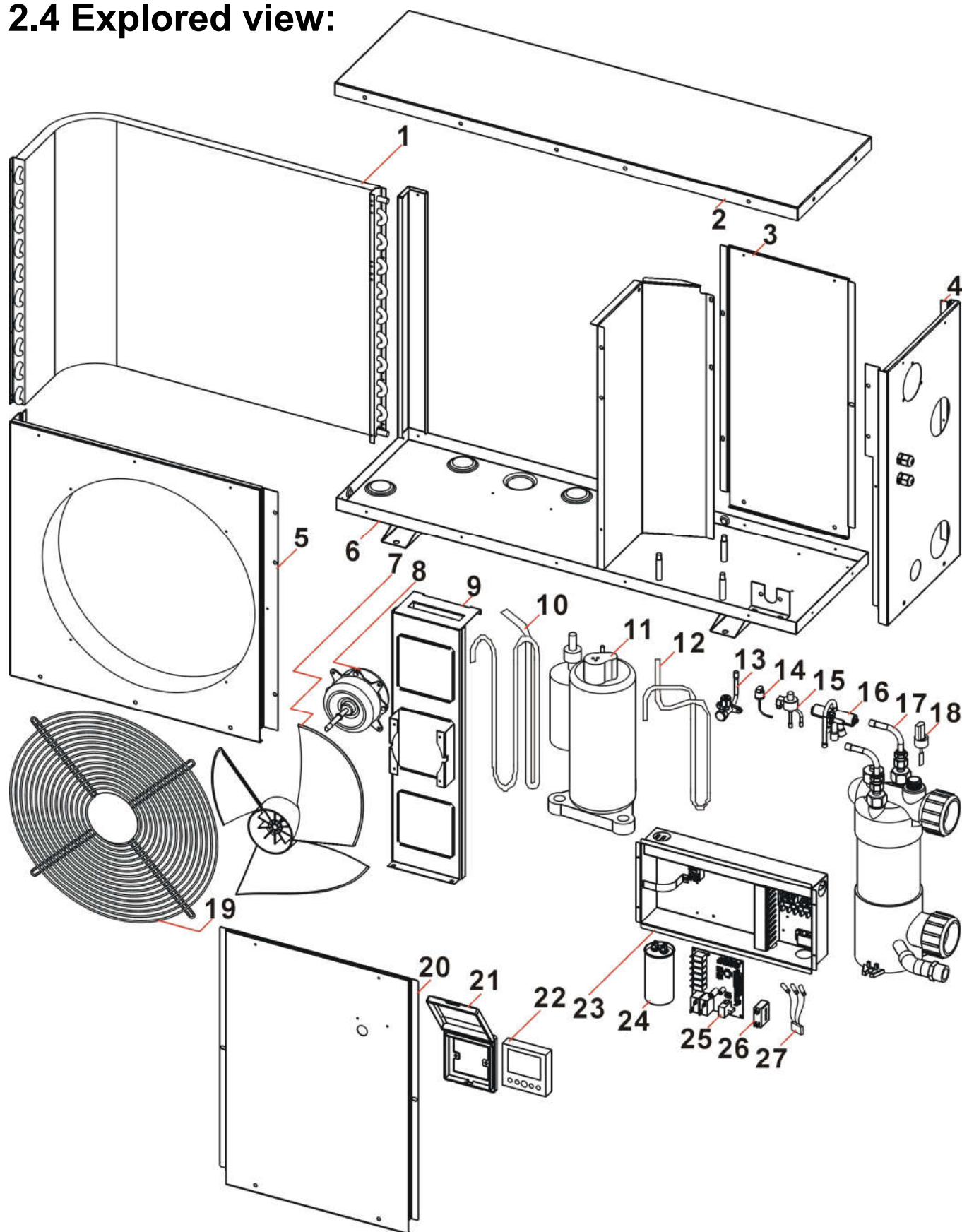
## 2.3 Inside appearance:



1	Evaporator	8	Service valve for vacuum, refrigerant filling
2	Fan blade	9	compressor
3	PCB	10	Water-flow-switch
4	Pressure manometer	11	4-way-valve
5	Water outlet	12	Ambient air sensor
6	Water inlet	13	Electronic expansion valve ( EEV )
7	drain	14	Titanium in PVC heat exchanger



## 2.4 Explored view:



1	Evaporator	10	Copper return pipe	19	Front net
2	Top board	11	Compressor	20	Service board
3	Back board	12	Copper discharge pipe	21	Water-proof cover
4	Right board	13	Service valve	22	Wire controller
5	Front board	14	High/low pressure switch	23	Electrical control box
6	Bottom board	15	Electronic expansion valve (EEV)	24	Compressor capacitor
7	Fan blade	16	4-way-valve	25	PCB
8	Motor	17	Titanium heat exchanger	26	Motor capacitor
9	Motor support	18	Water flow switch	27	sensor

## 2.5 Main Components



compressor



Titanium / PVC heat  
exchanger



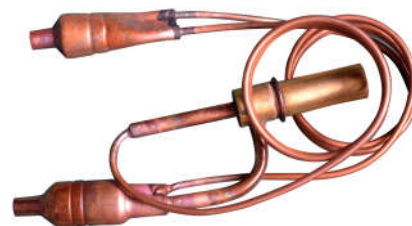
evaporator



Pressure switch



Water flow switch



capillary



Electronic expansion valve  
(EEV)



4-way-valve



Pressure meter



PCB



Wire controller



Sensor



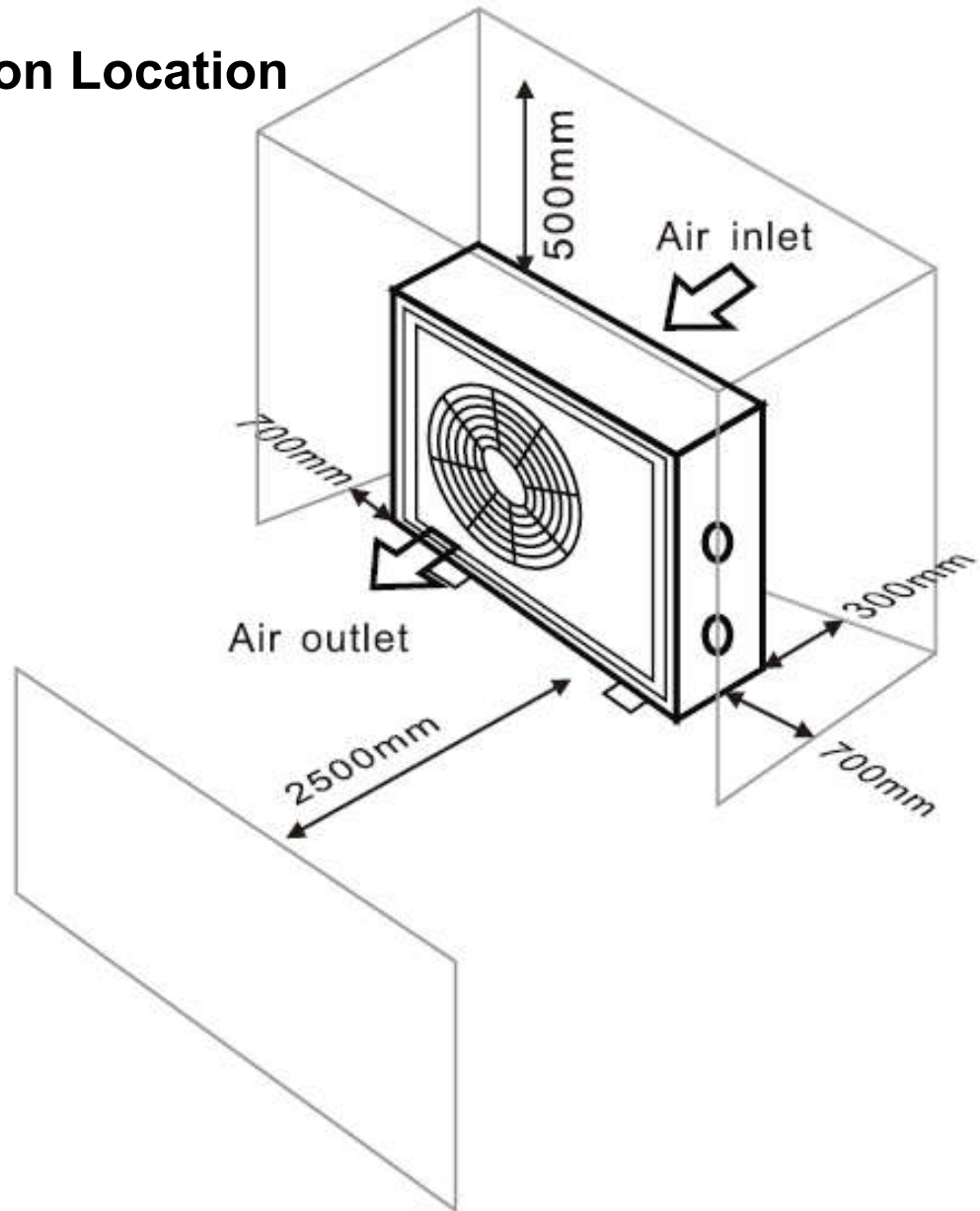
Fan blade



Motor

# 3. Installation

## 3.1 Installation Location



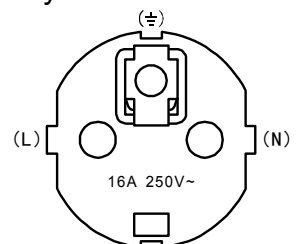
## 3.2 Electrical Connection

NOTE: although the unit heat exchanger is electrically insulated from the rest of the unit, this simply prevents the flow of electricity to or from the pool water. Grounding the unit is still required to protect you against short circuits inside the unit.

NOTE: ensure that the available electrical Power supply and the network frequency are matched to the required operating current, taking account of the appliance's specific location and the current required to supply any other appliances connected to the same circuit.

- 1) See the wiring diagram;
- 2) Ensure that the unit is supplied with the specified voltage. The terminal block is located on the right side of the unit. There are three connections for the Power supply and two connections for the filtering pump control (Enslavement). The Power supply line must be properly matched with a motor supply type fuse or a main circuit breaker to protect the circuit against voltage surges (refer to the nameplate for the voltage);
- 3) Always shut down the main Power supply before opening the electrical control box.

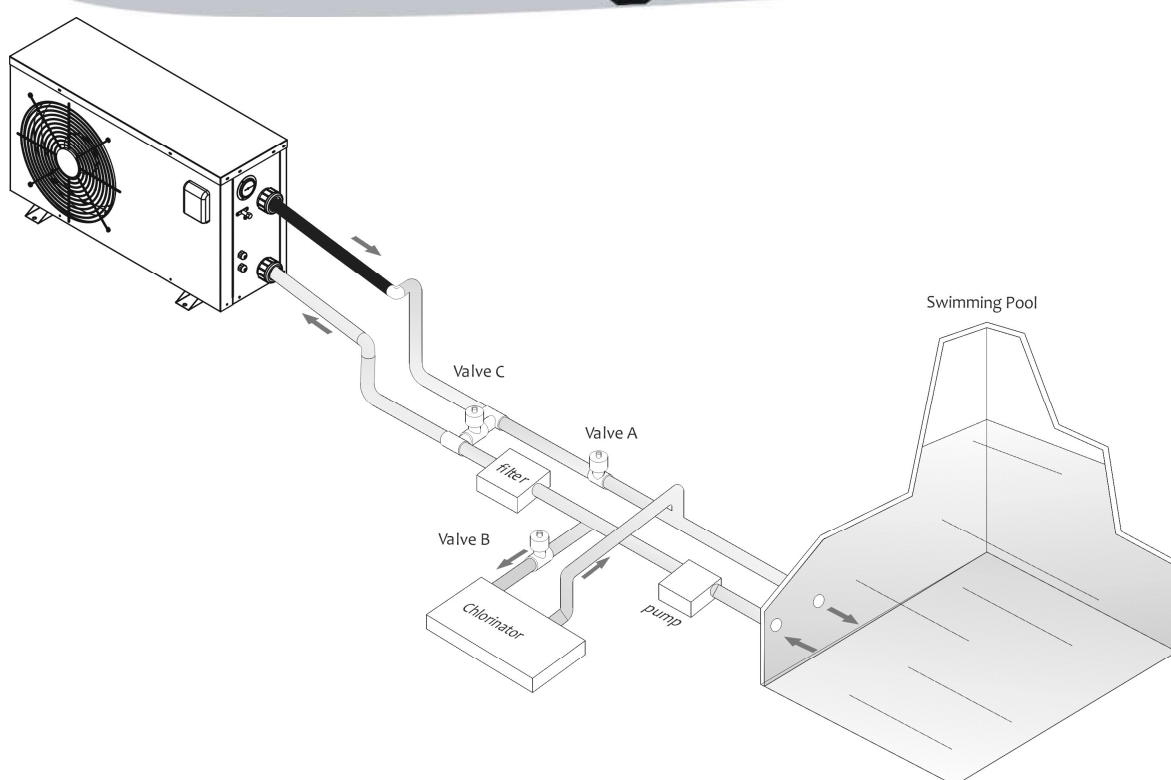
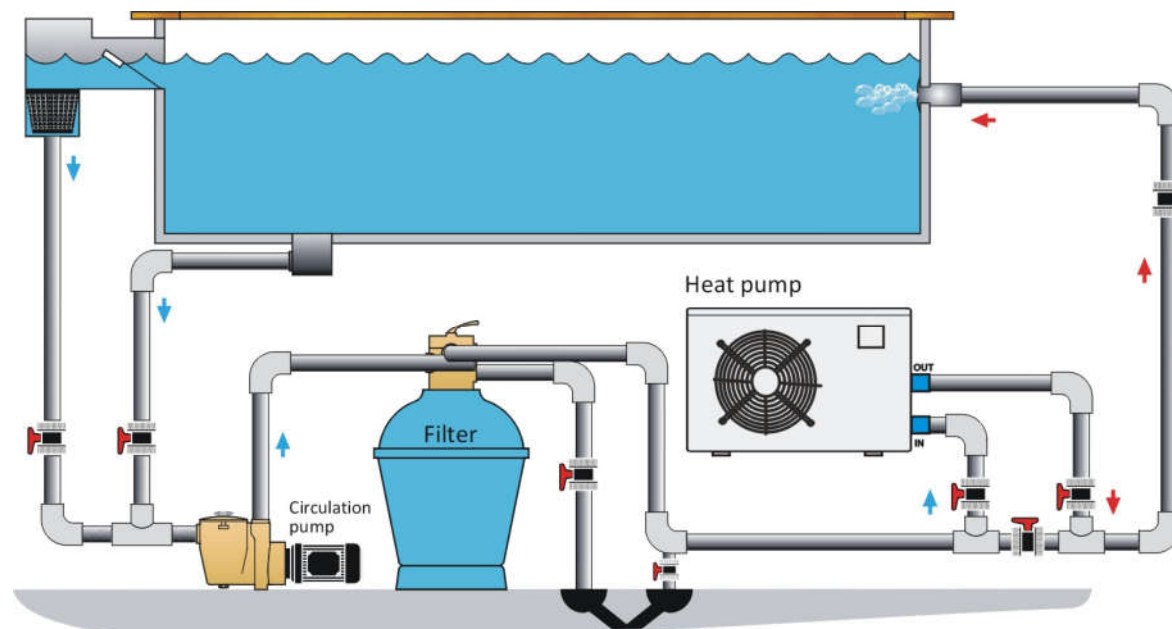
The assembly, the electric connection and the start up must be carried out by specialized and professional person.



When connect plug to socket (power supply), please make sure that live wire, neutral wire, earth wire to plug should be connected as right drawing.



### 3.3 Plumbing System Figure



When heating is needed:

Make valve A open, and then keep the water inlet and outlet Temp difference at  $2^{\circ}\text{C}$  by adjusting the open of valve C.

When heating is not needed :

Make valve A and valve C fully open, so the water can be circulated through the filter only .

When disinfection is needed:

Make valve A closed and valve B open, to guide the water go through the chlorine .

### 3.4 Terminal insulation

In order to proper keep power consumption low and to comply with standards in force, all hot water pipes must be insulated .



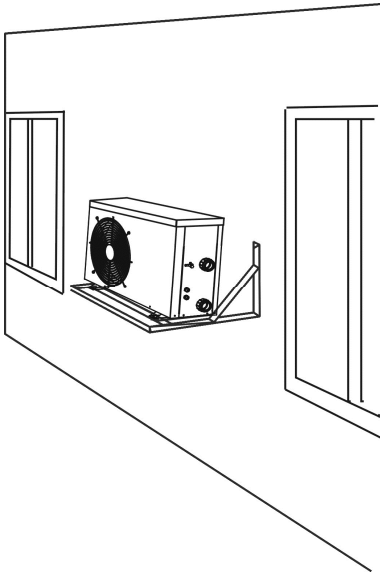
**WARNING**

Please ensure the water flow inside the unit.

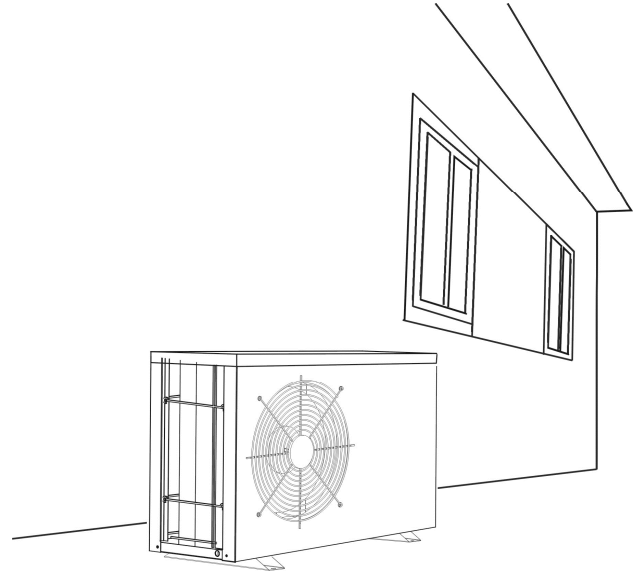
No smaller than 80% of the rated water flow.



### 3.5 Location the unit

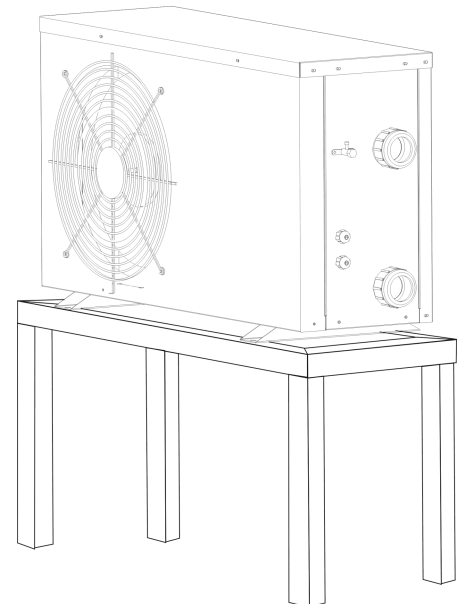


Install on wall



Install on floor

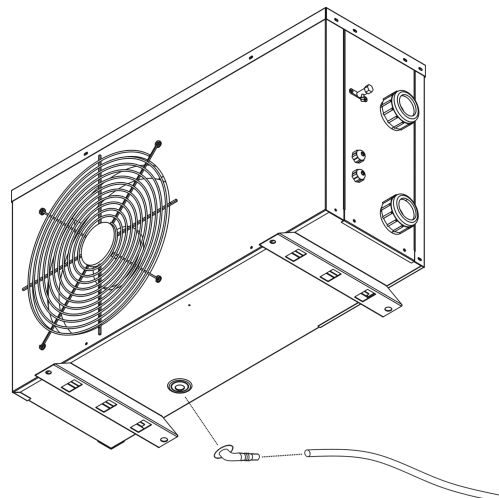
1. heat pump must install on a flat, solid, preferably cemented surface.
2. when install the heat pump in harsh climatic area, sub-zero temperatures, snow, humidity..., it is recommended to raise the unit over the ground 50cm.
3. rubber vibration absorbing mountings are recommended.
4. during installation, make sure sufficient free space around the heat pump for future maintenance.
5. the unit is air cooled. It must be installed outdoor in an area with sufficient clearance to provide enough air circulation through evaporator.
6. shield the unit from direct sunshine or rain, but never block the air ventilation.
7. the unit should be free from explosive and corrosive gas, and grease.



Install on bracket

### 3.6 Installation of drain

Please install the drain connector as shown in the picture when necessary. In some cold areas ( ambient temperature below 0°C ), please do not use the drain connector, otherwise it may clogged by ice.



## 3.7 Installation of water pipe

### 3.7.1 connector 1

1. Put glue to plastic tube, and insert into connector.



Put glue to plastic tube,  
and insert into connector

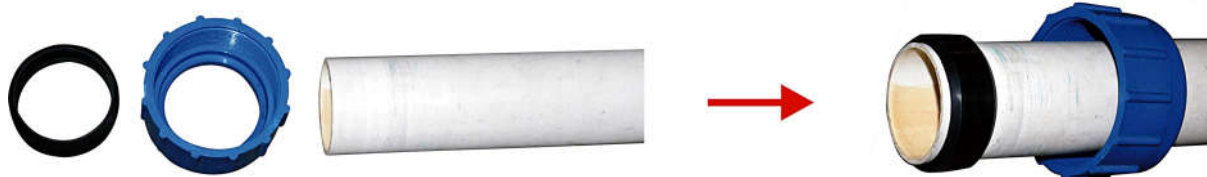
2. install the connector to heat pump



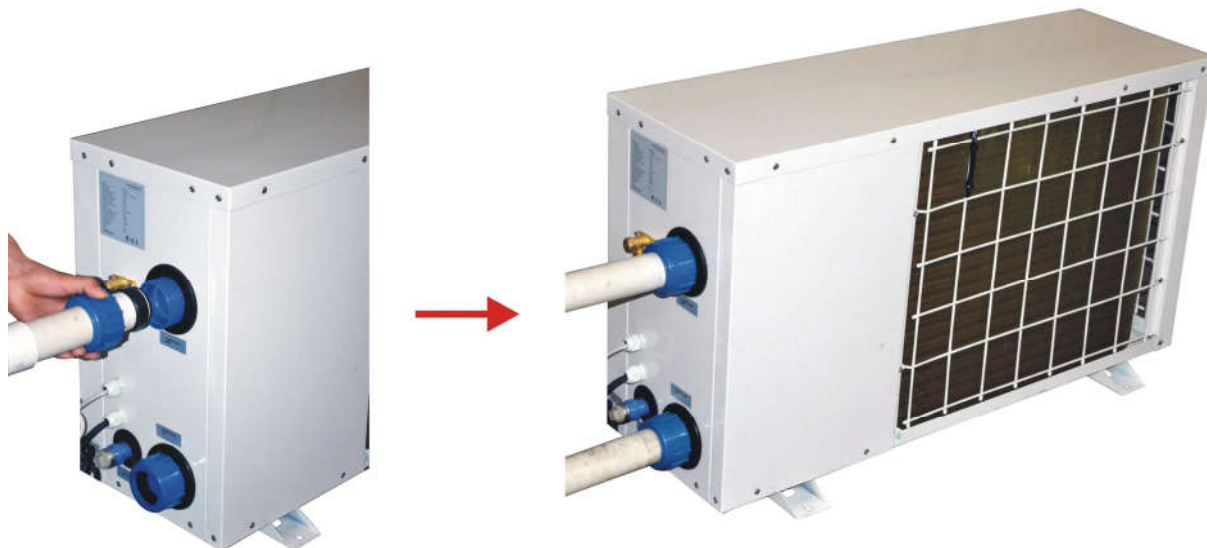
Seal ring

### 3.7.2 connector 2

1. install the rubber ring and nut to water pipe



2. install the water pipe to heat pump



#### **⚠ WARNING**











the water from swimming pool heat pump should already pass by a filter before entering the unit. Some dirt perhaps damage or choke the Titanium / PVC heat exchanger and cause some failure.

# 4. Operation Instructions






## 4.1 Introduction of Wire Controller



### 4.1.1 symbol

 AUTO	 HEATING	 COOLING	 wifi
 current water temperature, Value of parameter			 key lock
 clock	 TIMER ON,OFF	 3 TIMER	 ambient sensor

### 4.1.2 button

 button to clock/TIMER
 button: 1) press to ON/OFF heat pump 2) hold 6S to keylock
 or  button: adjust temperature, parameter, clock, TIMER
 button: 1) press to AUTO, HEATING, COOLING mode 2) hold 6S to parameter setting

## 4.2 Start / Stop unit



When heat pump is OFF



is WIFI symbol



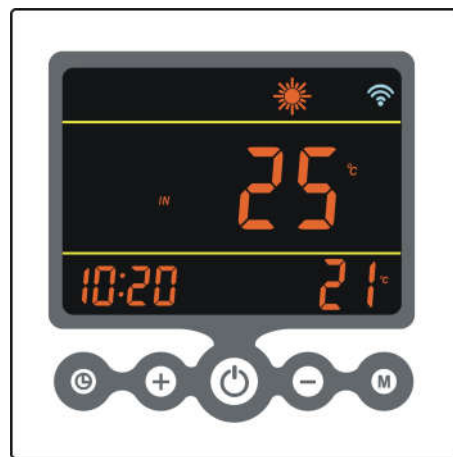
is current clock



is ambient air temperature



Press to start heat pump



HEATING mode



is current water temperature


Press  or  to change set temp.

Press  to other mode

## 4.3 Key Lock



When  ON,

hold  6S to release key lock.



## 4.4 Mode select



HEATING mode

Press  button to other mode.



COOLING mode



AUTO mode

## 4.5 clock & 3 TIMER Setting



to switch setting of CLOCK, TIMER1, TIMER2, TIMER3



to edit



or to change value

### Clock setting



Press ,  display



Press ,  flash



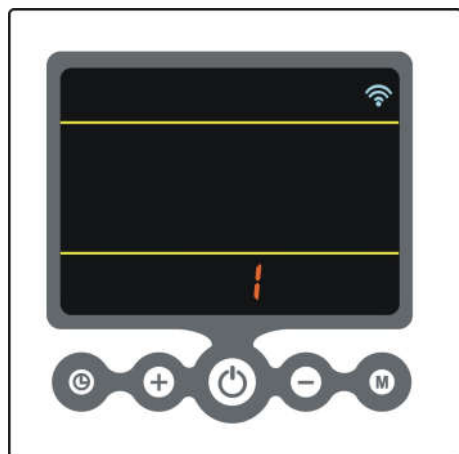
Press  or  to change minute



Press ,  flash



Press  or  to change hour





## TIMER 1 setting

Press , 1 TIMER display





## TIMER 1 ON setting

Press ,   flash

Press  or  to change 1 TIMER ON hour



Press ,   flash

Press  or  to change 1 TIMER ON minute





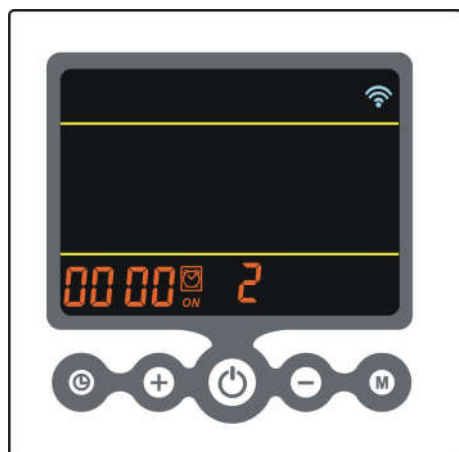
## TIMER 1 OFF setting

Press ,   flash

Press  or  to change 1 TIMER OFF hour

Press ,   flash

Press  or  to change 1 TIMER OFF minute




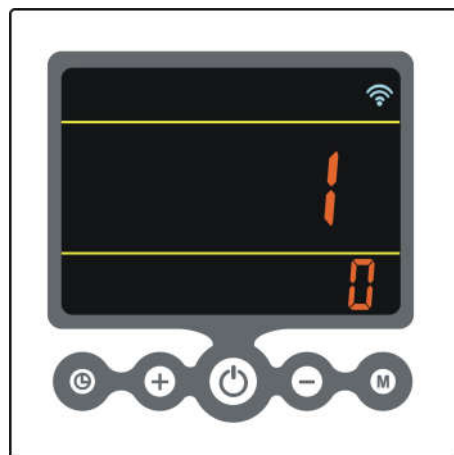
## Next TIMER setting






Press , 2 TIMER display


## 4.6 Parameter setting



Hold  6S to parameter setting.



- Press  to next parameter.
- Press  to edit value ( 1 flash ).
- Press  or  to change value.
- Press  to exit parameter setting.

P	Description	Range	remarks	Factory setting
0	Memory ( 0 without / 1 with )			1 with memory
1	Daily cycle sign ( 0 without / 1 with )			
2	Temperature different X	2°C ~10°C	Adjustable	3°C
3	Temperature different Y	0°C ~3°C	Adjustable	0°C
4	Defrost period	30 ~ 90 min	Adjustable	30 min
5	Defrost start temperature	-30 ~ 0°C	Adjustable	-4°C
6	Defrost exit temperature	2 ~ 30°C	Adjustable	12°C
7	Max defrost running time	1 ~ 12 min	Adjustable	5 min
8	Compressor over-heat protection temp.	95 ~ 120°C	Adjustable	105°C
9	Max set temperature for HEATING mode	40 ~ 65°C	Adjustable	
10	water pump mode : * 0 continue running when compressor stop Stop when press  * 1 stop 10 minutes, run 2 minutes			1
11	Water pump stop time when reach to set temeraturpe	3~20 minute		
12	Reserve 2 <sup>nd</sup> antifreeze method ( 0 HP / 1 heater )			0 HP
13	Mode ( 0 cool / 1 cool & heat / 2 heat )			1 cool & heat
14	EEV action cycle setting	20s ~ 90s		
15	Super heat for P20 - 1 AUTO	-5 ~ 10°C		
16	Allow compressor discharge temperature when EEV adjust	95 ~ 120°C	Adjustable	105°C
17	EEV step for defrost			
18	Min EEV step			
19	EEV step for P20 - 0 manual			
20	EEV control ( 0 manual / 1 AUTO )	0 / 1	Not change	1 AUTO

21	Water sensor			
22	Reserve			
23	Evaporator sensor			
24	Compressor discharge sensor			
25	Ambient sensor			
26	Compressor return sensor			
27	EEV step			
28	Condenser sensor			

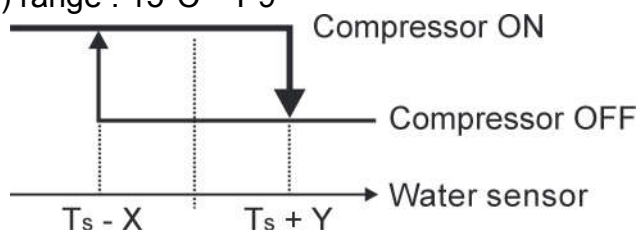
## 4.7 Mode

### 4.7.1 HEATING mode: display ( 4-way-valve switch OFF )

parameter setting:

- P2 Temperature different X
- P3 Temperature different Y
- P9 Max set temperature for HEATING mode

Ts ( Set temperature ) range : 15°C ~ P9

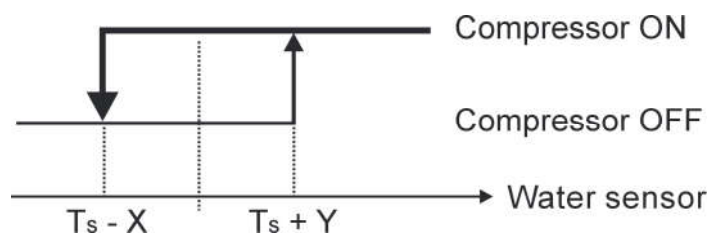


### 4.7.2 COOLING mode: display ( 4-way-valve switch ON )

parameter setting:

- P2 Temperature different X
- P3 Temperature different Y

Ts ( Set temperature ) range : 8°C ~ 28°C

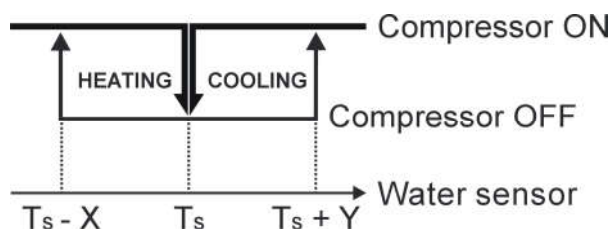


### 4.7.3 AUTO mode: display ( 4-way-valve switch ON )

parameter setting:

- P2 Temperature different X
- P3 Temperature different Y
- P9 Max set temperature for HEATING mode

Ts ( Set temperature ) range : 15°C ~ P9





## 4.8 Sub-Menu WiFi configure

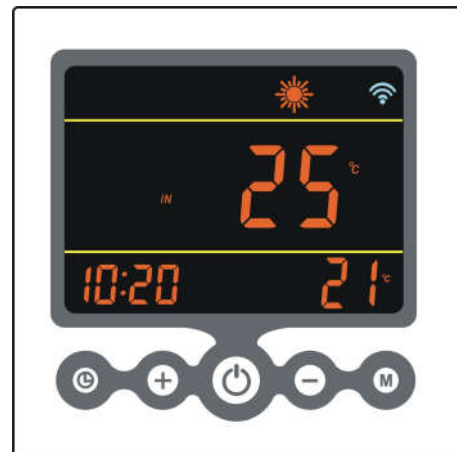
the internet access module install at controller.  
Controller connect to server by your current WIFI.  
Install controller where can access your current WIFI.  
You have to put your Mobile and controller at same place during installation.

### 4.8.1 App installation

Smart Life will request GPS location at your mobile.

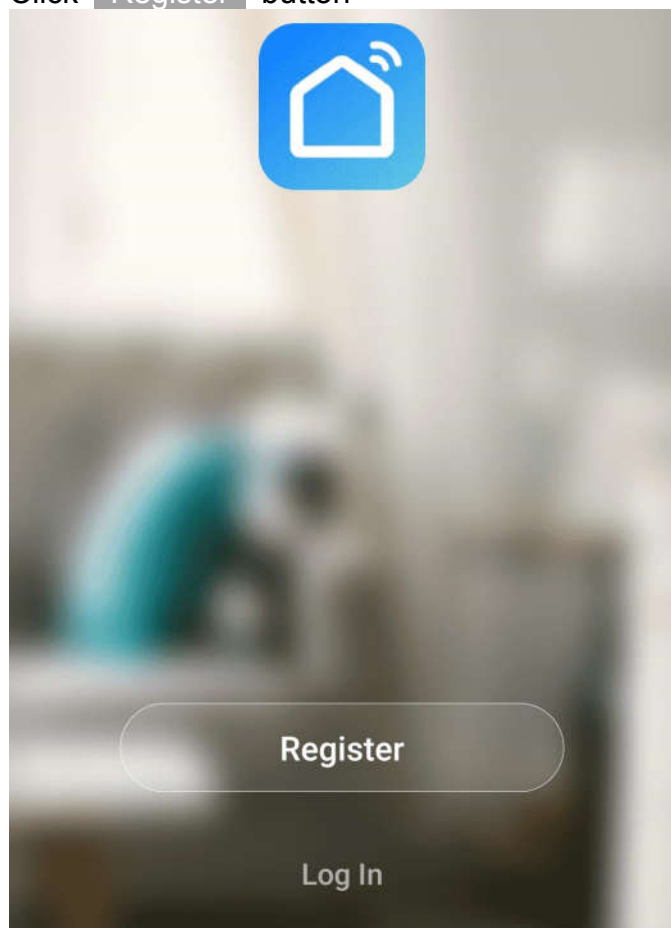


If  do not blinking rapidly,  
then hold  +  6S.



### 4.8.2 register

Click **Register** button



Input your Mobile Number

### Register

China

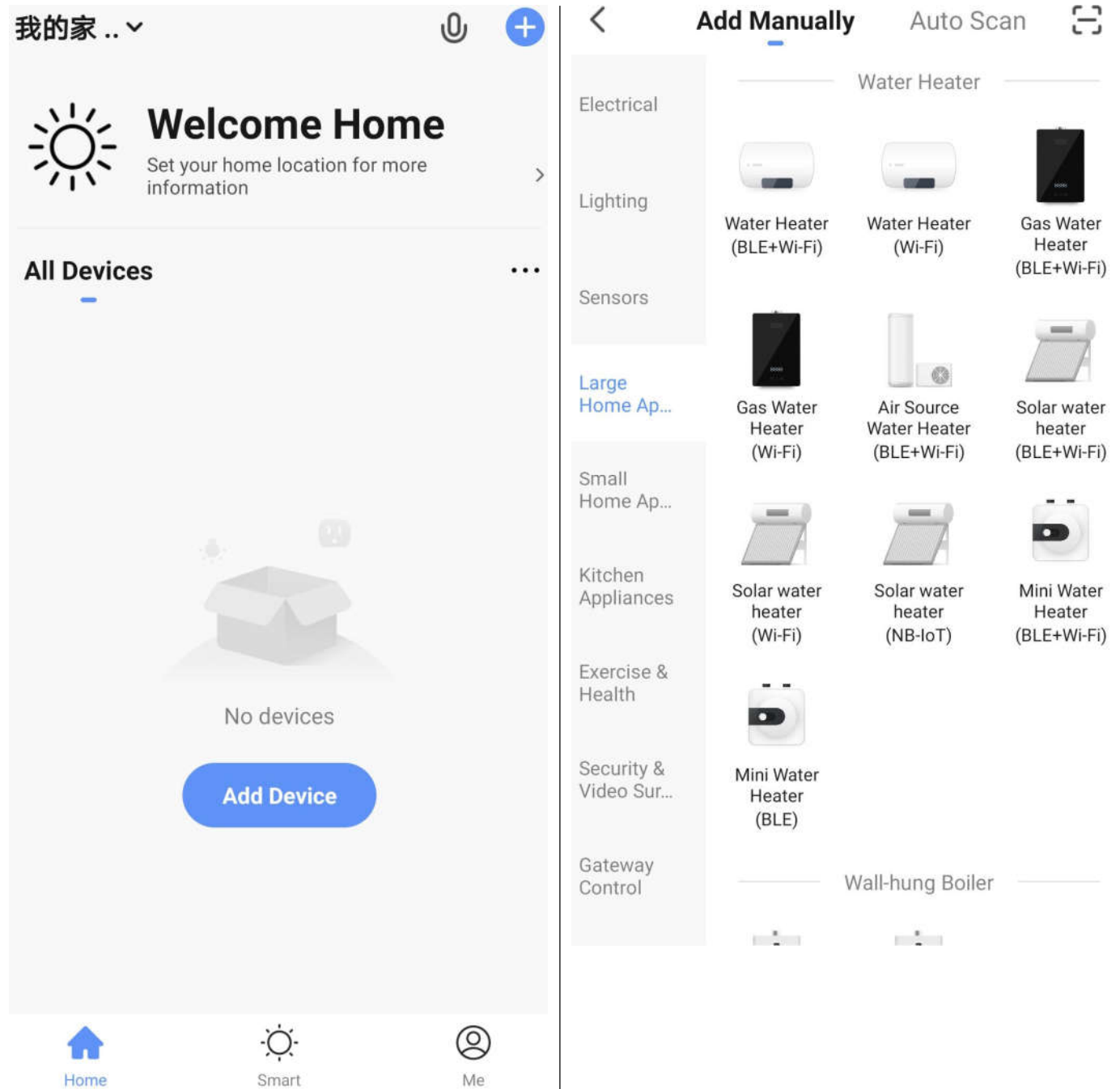


Mobile Number/Email

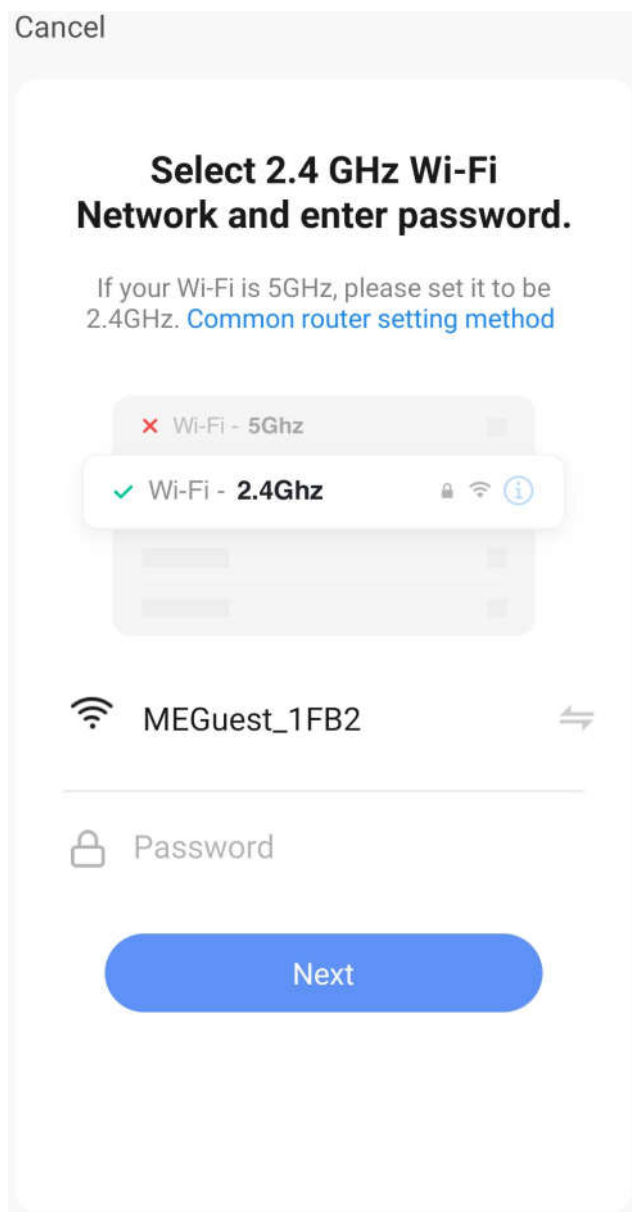
Get Verification Code

☒ I Agree [User Agreement](#) and [Privacy Policy](#)

## 4.8.3 Add Device

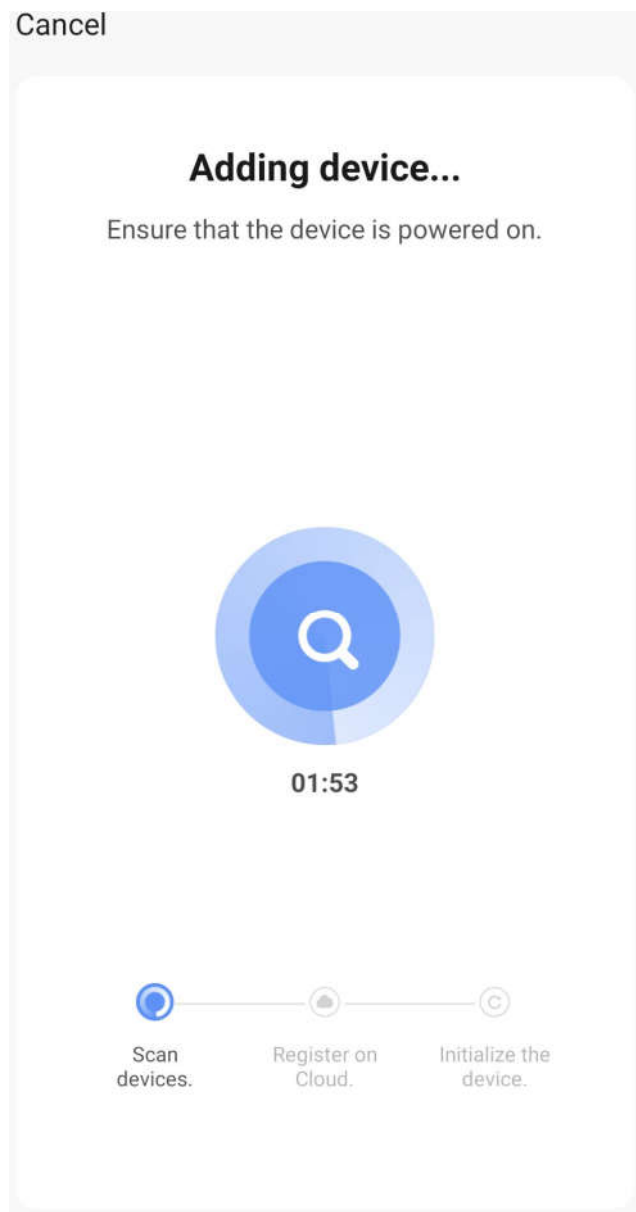
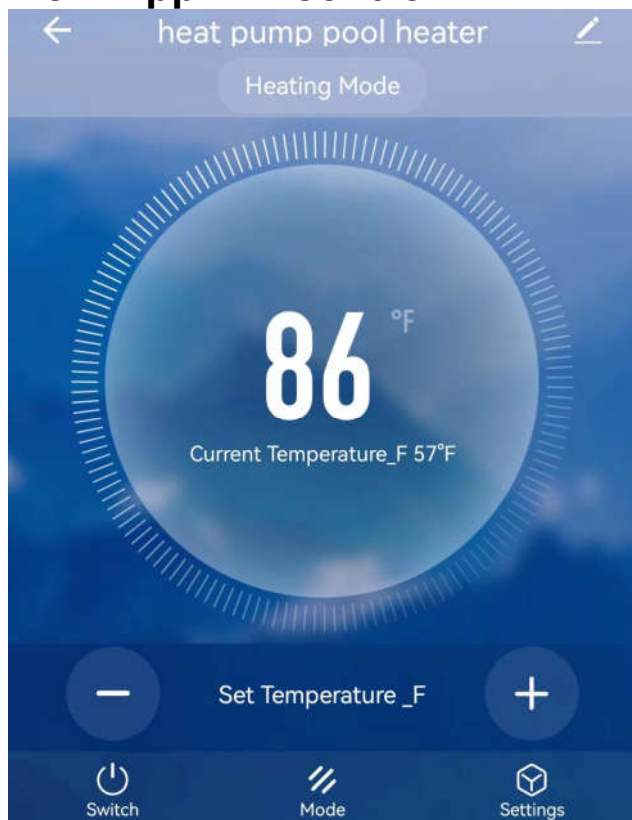


Choose  
**Large Home Appliances**  
**> Water Heater ( Wi-Fi )**



Choose available WIFI,password

#### 4.8.4 App wifi control



# 5. Maintenance

## 5.1 defrost ( defrost only run in HEATING mode )

### parameter setting:

P4 Defrost period

P5 Defrost start temperature

P6 Defrost exit temperature

P7 Max defrost running time

#### • Start of defrost :

The defrost will start when all following conditions are fulfilled at the same time:

- evaporator sensor rature  $\leq -4^{\circ}\text{C}$  (parameter P5)

If evaporator sensor malfunction ( error P3 ), defrost change to TIMER defrosting, defrost running time 8 minutes.

- compressor continue to runs 40 minutes (parameter P4)

#### • Action of defrost :

- compressor and the fan stop
- 25 seconds, 4 way valve switch ON.
- 30 seconds, compressor starts, and hot refrigerant will enter into evaporator, the ice on evaporator will be melt, that is generally with a steam.
- water pump continue to run when defrost

#### • Stop of defrost:

defrost stop when one of the following conditions is fulfilled:

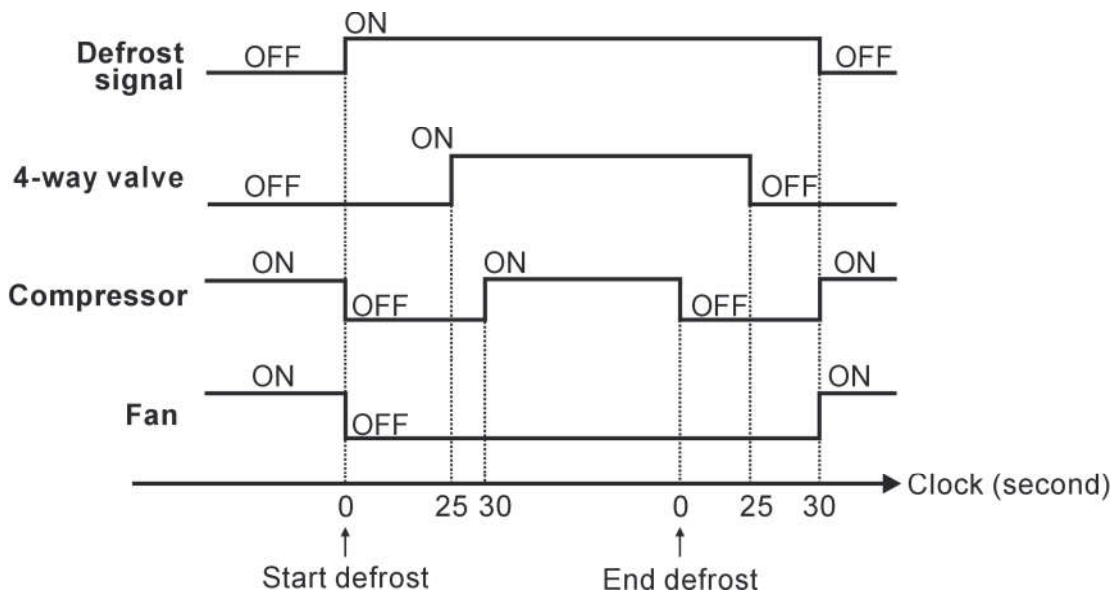
- evaporator sensor  $\geq 12^{\circ}\text{C}$  (parameter P6)
- compressor run totally 8 minutes (parameter P7)

#### • Action of exist defrosting :

- compressor stop, fan run
- 25 seconds, 4 way valve switch OFF
- 30 seconds, compressor run



**WARNING** if not necessary, please do not change defrosting parameter setting.





## 5.2 water pump

1. When unit start, water pump run 90 seconds before compressor run.
2. When unit stop, water pump stop 30 seconds after compressor stop.
3. Water pump continue to run during defrost.
4. Parameter 10 = 0: water pump continue to run when reach to set temperature  
Parameter 10 = 1: water pump stop 30 seconds after compressor stop,  
and stop 10 minutes ( parameter P11 = 10 minutes ), run 2 minutes.
5. When unit OFF, water pump stop 12 hours, run 2 minutes.

## 5.3 electronic expansion valve ( EEV )

Initial step: 350

step range : (parameter P18) ~ 500

After unit start, EEV first reset, opens 520P, then adjusts to initial opening of 350P;

Compressor exdischarge temperature:	Te
Compressor return air temperature:	Tr
Evaporator :	Te
Condenser temperature:	Tc

When  $T_e \geq 95^\circ\text{C}$  (parameter P16), EEV increase 20 step each time.

When  $T_e < 95^\circ\text{C}$  (parameter 16), EEV step calculate by below:

### EEV step action:

After compressor start, EEV step action calculate by below  
(max step per action cycle limit within  $\pm 20\text{P}$ ):

EEV step opening change  $\nabla P = KP * (\text{actual average superheat SH} - \text{target superheat TSH})$

$P = P(\text{initial opening}) + \nabla P$ ;

When SH average  $\leq -1$ ,  $KP=3$ ;

When  $-1 < \text{SH average} \leq 0$ ,  $KP=2$ ;

When SH average  $> 0$ ,  $KP=1$ ;

SH: Calculated value of superheat,

$SH = TS - TC/TE$ ;

(SH=return sensor - evaporator sensor in HEATING,

SH=return sensor - condenser sensor in COOLING )

SH average: average value of actual superheat within 45S, record every 5S

TSH: Target superheat

P: The actual opening of EEV

**Determination of target superheat TSH :**  $0^\circ\text{C}$  (parameter P15);

**EEV step action period :** change every 45S (parameter P14)

**When defrost, EEV step:** 400 (parameter P17).

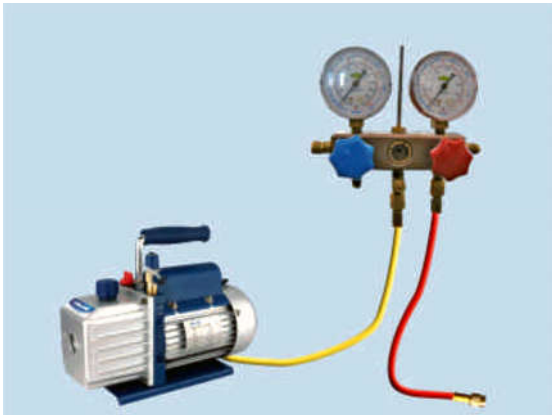
## 5.4 evaporator cleaning

The evaporator do not require any special maintenance, except when it is clogged by paper or any other obstacle. Cleaning is by washing with detergent and water at low pressure, and the rinsing with clean water.

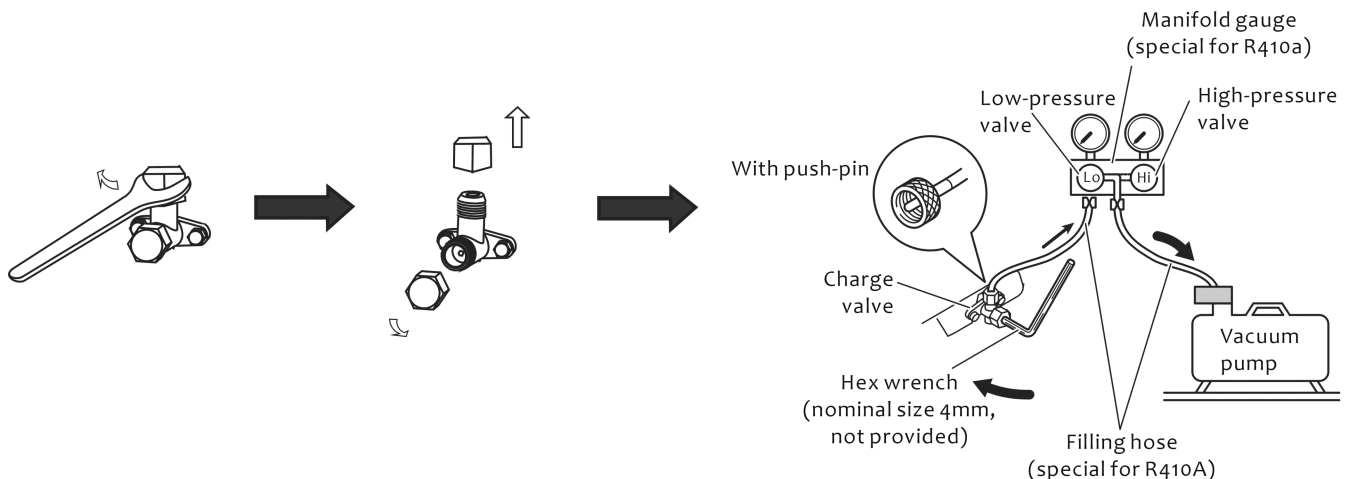
### **⚠ WARNING**

1. before cleaning, make sure that heat pump is power OFF.
2. inside of heat pump must be cleaned by qualified person.
3. do not use gasoline, benzene, detergent etc. to clean the heat pump. And do not spray with insecticide, the unit may be damaged. The cleanser special made for air conditioner cleaning is recommended.
4. spray air conditioner cleanser into the evaporator, let the cleanser sit for 5~8 minutes.
5. then, spray the evaporator by clean water.
6. an old hairbrush works well for brushing surface dirt and lint off the fins. Brush in the same direction as the slots between the fins so the bristles go between the fins.
7. after cleaning, use a soft and dry cloth to clean the unit.

## 5.5 Vacuum



A vacuum pump and manifold gauge are needed.

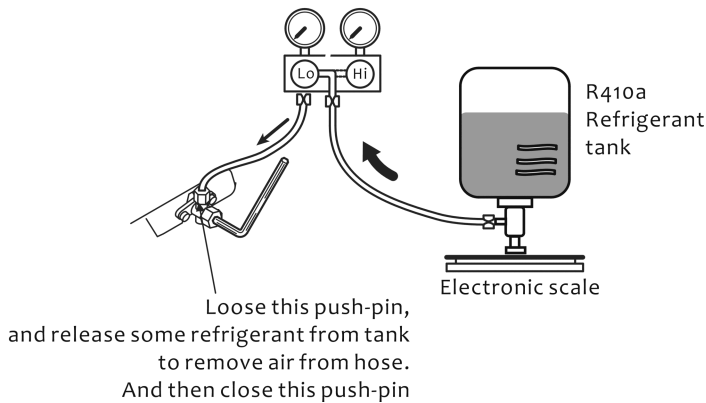


Remove the copper nut. Connect the pressure gauge to the vacuum pump. Vacuum heat pump at least 15 minutes till negative value shown on the pressure gauge, and close the charge valve.

## 5.6 Filling refrigerant

Refrigerant is very stable and should not degrade or break down even under severe operating conditions. If the unit has a leak in the sealed refrigeration system, please locate the leakage and repaired before charge refrigerant.

**⚠ WARNING** refrigerant charging must be performed by qualified person.



Loose the push-pin, and release some refrigerant from tank to remove air from hose. And then close push-pin.

Open the charge valve by hex wrench, fill refrigerant into heat pump. And close the charge valve when fill enough refrigerant into heat pump.

## 5.7 use in Winter

In cold winter ( below  $0^{\circ}\text{C}$  ), when the unit is no longer needed, please drain out all the water inside the heat pump.



Screw the water inlet connector away to drain water away from heat pump.

## 5.8 Water Flow Failure

One water flow switch install on water outlet to ensure adequate water flow on heat exchanger before compressor start.

It acts if partial block, or less water flow.

After water pump run 30s, water-flow-switch continue 5s OPEN signal, then unit stop.

Controller displa PL error code.

This error is recoverable.

## 5.9 anti-freeze function in winter

When unit STANDBY, PCB check water sensor Ti, ambient air sensor Ta:

\* When  $2^{\circ}\text{C} < \text{Ti} \leq 4^{\circ}\text{C}$ ,  $\text{Ta} \leq 2^{\circ}\text{C}$ , then enter 1<sup>st</sup> antifreeze method, water pump switch ON.

\* When  $\text{Ti} < 2^{\circ}\text{C}$ ,  $\text{Ta} \leq 2^{\circ}\text{C}$ , then enter 2<sup>nd</sup> antifreeze method, unit run at HEATING mode.

If  $\text{Ti} \geq 5^{\circ}\text{C}$  or  $\text{Ta} \geq 3^{\circ}\text{C} > 4^{\circ}\text{C}$ , then protection cancel.

Controller display PC during anti-freeze protection.

## 5.10 error message:

	Controller	App	
Water sensor	P3	EE20	Unit stop
Evaporator sensor	P1	EE09	Defrost change to TIMER defrosting
Ambient sensor	P7	EE04	Unit continue running, anti-freeze cancel
Compressor return sensor	P5	EE12	Unit continue running
Compressor discharge sensor	P2	EE10	Unit stop
Condenser sensor	Pb	EE25	Unit continue running
Winter anti-free	PC	EE14	
High pressure protection	E4	EE05	Unit stop, unrecoverable
Low pressure protection	P9	EE06	Unit stop, unrecoverable
Water flow switch	PL	EE03	Recoverable
Defrost			
Compressor over-heat	E3	EE07	Unit stop, unrecoverable
Communication fail	E8		

### Compressor over-heat protection:

Compressor discharge sensor : Tc

$\text{Tc} \geq 105^{\circ}\text{C}$  ( parameter P8 ), then unit stop. When  $\text{Tc} < 90^{\circ}\text{C}$ , unit continue running.

If 3 times error within 30 minutes, unit stop, then enter protection.

This error unrecoverable, cancel by power OFF.

### Communication:

PCB connect to controller, but controller can not receive signal from PCB 2 minutes consecutively, then enter protection.

### High pressure protection:

After compressor run 15s, high-pressure-switch give OPEN signal 5s, unit stop.

If 3 times error within 30 minutes, unit stop, then enter protection.

This error unrecoverable, cancel by power OFF.

### Low pressure protection:

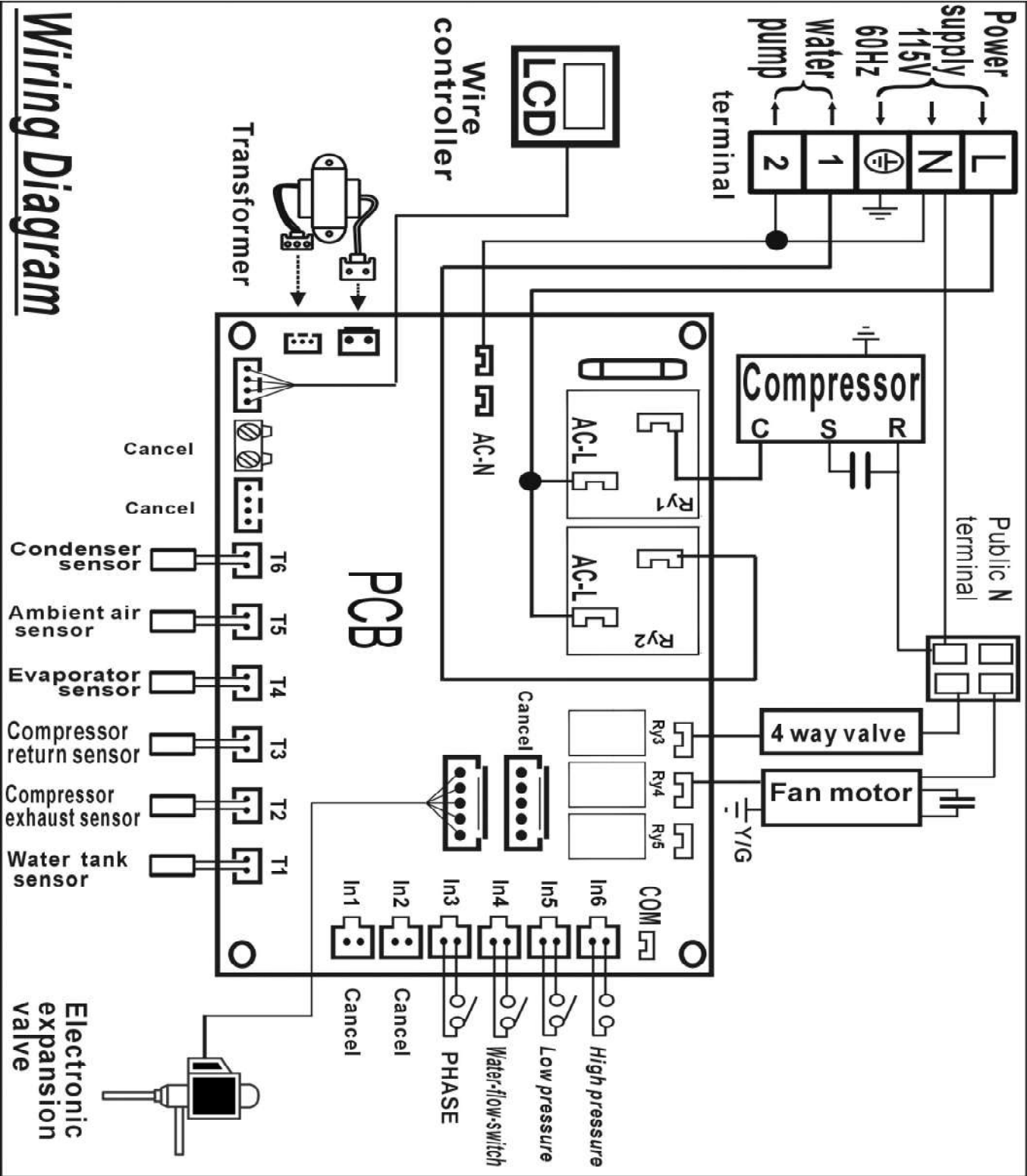
After compressor run 5 minutes, low-pressure-switch give OPEN signal 10s, unit stop.

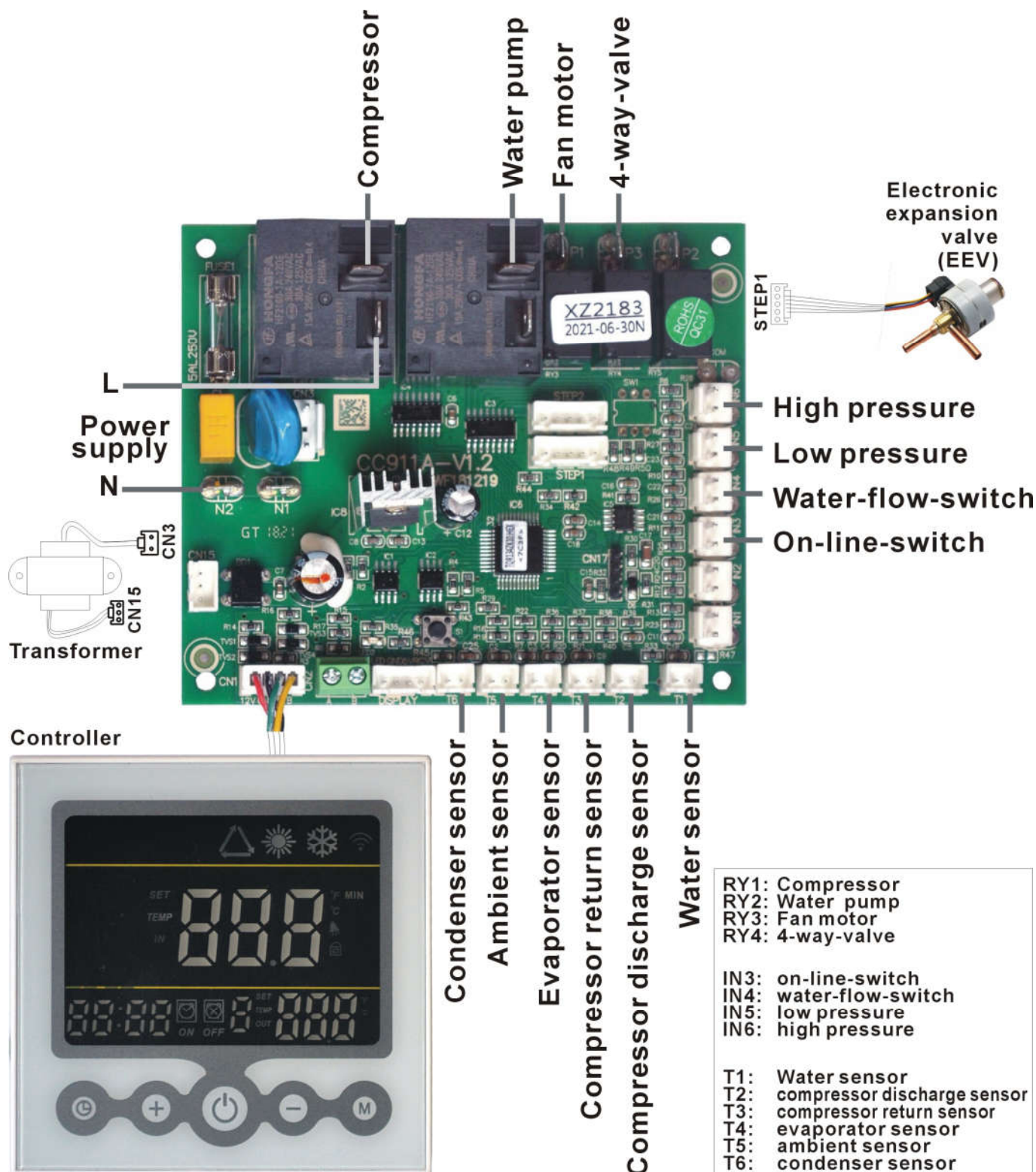
If 3 times error within 30 minutes, unit stop, then enter protection.

This error unrecoverable, cancel by power OFF.



# 6 Wiring Diagram





# WARNING

This diagram is correct at the time of publication, manufacturing changes could lead to modifications. Always refer to the diagram supplied with the heat pump.

1.Changes or modifications not expressly approved by the party responsible for compliance could void your authority to operate the equipment.

2.The distance between user and products should be no less than 20cm.

This equipment has been tested and found to comply with the limits for a Class B digital device, pursuant to part 15 of the FCC Rules. These limits are designed to provide reasonable protection against harmful interference in a residential installation. This equipment generates, uses and can radiate radio frequency energy and, if not installed and used in accordance with the instructions, may cause harmful interference to radio communications. However, there is no guarantee that interference will not occur in a particular installation. If this equipment does cause harmful interference to radio or television reception, which can be determined by turning the equipment off and on, the user is encouraged to try to correct the interference by one or more of the following measures:- Reorient or relocate the receiving antenna.

- Increase the separation between the equipment and receiver.
- Connect the equipment into an outlet on a circuit different from that to which the receiver is connected.
- Consult the dealer or an experienced radio/TV technician for help.