

Haier

Heat Pump Water Heater

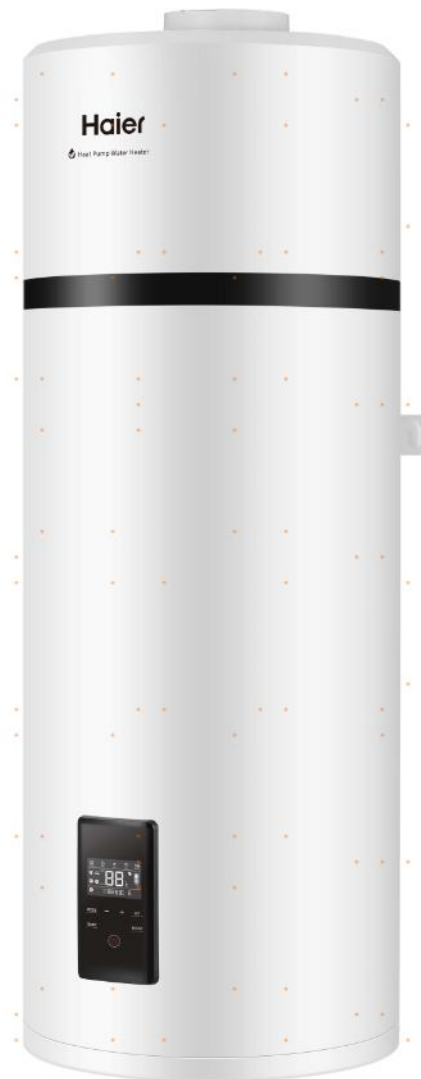
Installation and Service Manual

Model

HP80M5

HP110M5

HP150M5



Please read this manual carefully prior to your use of this water heater.

The appearance of the water heater given in this manual is for reference only.

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1. Product safety statement

1. This appliance can be used by children aged from 8 years and above and persons with reduced physical, sensory or mental capabilities or lack of experience and knowledge if they have been given supervision or instruction concerning use of the appliance in a safe way and understand the hazards involved. Children shall not play with the appliance. Cleaning and user maintenance shall not be made by children without supervision.
2. Children shall be closely supervised to make sure they stay away from this product.
3. The method of installing safety valve please refer to Page 16.
4. The water may drip from the discharge pipe of the pressure relief device and this pipe must be left open to the atmosphere.
5. The water heater is to be drained according to the instructions specified on page 27.

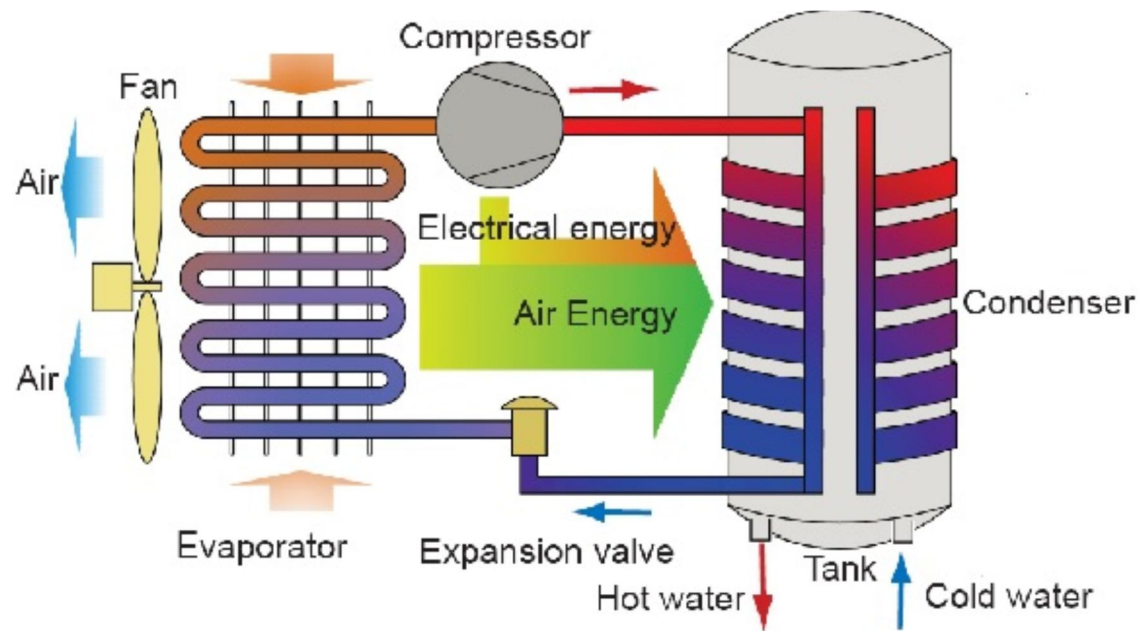
Safety instructions (to be followed at any time)

Refrigerant: R134a; When handling product, you should

- No smoking
- Prevent the accumulation of electrostatic charges
- Work in a well ventilated place.
- Avoid contact with the skin and eyes.
- Do not inhale the vapours.
- Evacuate the hazardous area.
- Stop the leakage.

2. Functionings & principles

A low-pressure liquid refrigerant is vaporized in the heat pump's evaporator and passed into the compressor. As the pressure of the refrigerant increases, so does its temperature. The heated refrigerant runs through a condenser coil within the storage tank, transferring heat to the water stored there. As the refrigerant delivers its heat to the water, it cools and condenses, and then passes through an expansion valve where the pressure is reduced and the cycle starts over.



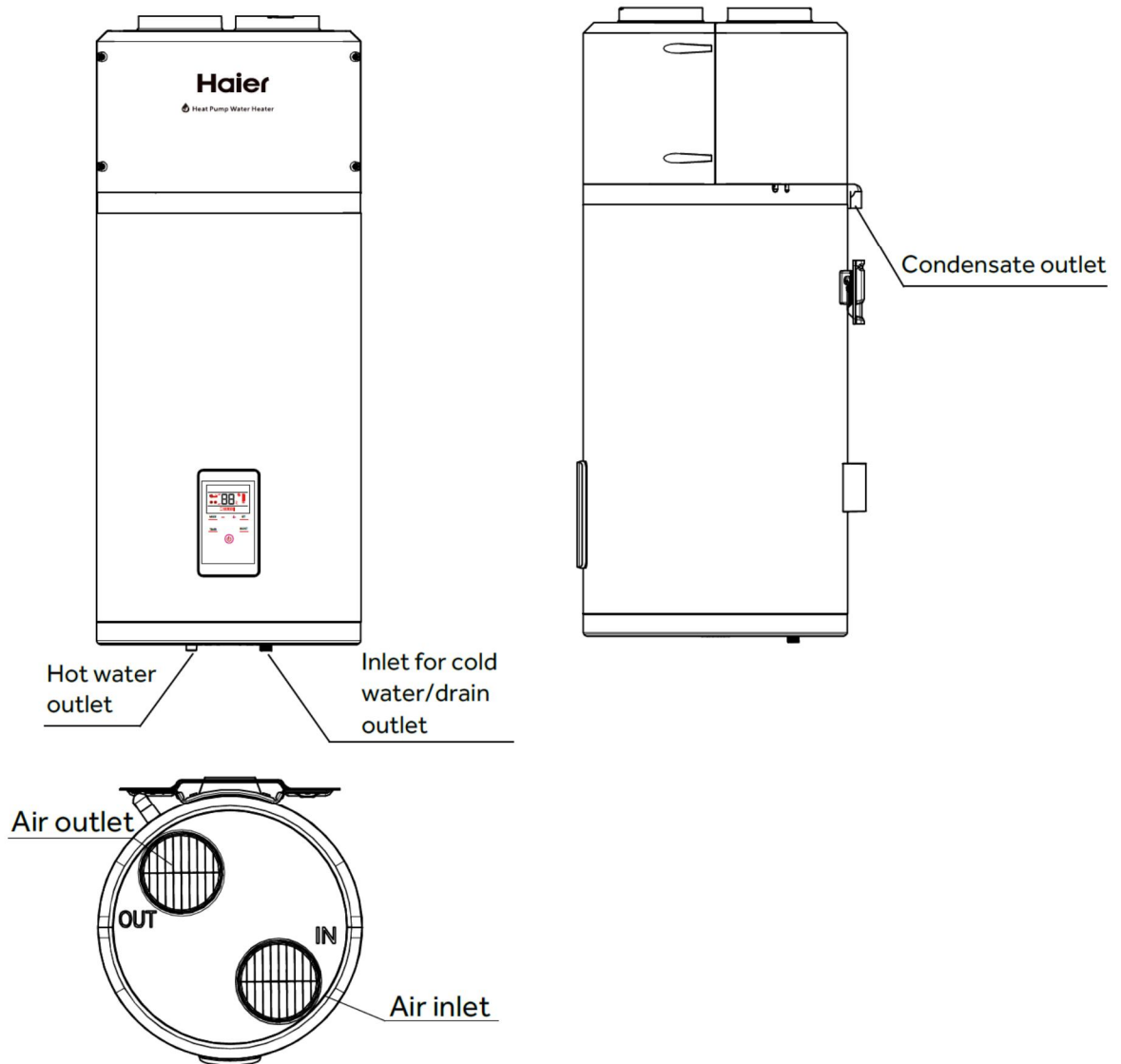
3. Technical parameters

Model	HP80M5	HP110M5
Tank		
Tank volume	80L	110L
Rated voltage/ frequency	220V~240V/50Hz	220V~240V/50Hz
Tank rated pressure	0.8MPa	0.8MPa
Corrosion protection	Magnesium rod	Magnesium rod
Water proof grade	IPX4	IPX4
Performances		
Type of extraction	Ambient / Exterior	Ambient / Exterior
COP@7 °C / EN16147	2.715	2.644
COP@14 °C / EN16147	3.172	3.203
Tapping cycle	M	M
Power input by electric backup	1200W	1200W
Rated power input by heat pump	240W	240W
Maximum power input by heat pump	350W	350W
Maximum power input	1550W	1550W
Standby power input/ Pes	20W	20W
Max volume of usable hot water at 40°C setting at 55°C	102.5L	132.6L
Heating up time (7°C)	4h58	6h35
Heating up time (14°C)	4h09	5h23
Default temperature setting	55°C	55°C
Temperature setting range- with heater	35°C-75°C	35°C-75°C
Maximum length of air duct	5m	5m
Diameter of air duct connection	160mm	160mm
Max working pressure of refrigerant	0.8/2.8MPa	0.8/2.8MPa
Refrigerant type / weight	R134a/0.45kg	R134a/0.45kg
Sound power level	50dB	50dB
Ambient temperature for use of product	-7~45°C	-7~45°C
Operating temperature of heat pump	-7~45°C	-7~45°C
Dimension and connections		
Water inlet and outlet connection	G1/2"M	G1/2"M
Safety valve connection	G1/2"M	G1/2"M
Drain & Water inlet connection	G1/2"M	G1/2"M
Product Dimensions	492*537*1170mm	492*537*1320 mm
Packing dimension without pallet	587*587*1247mm	587*587*1397 mm
Net/Gross weight	51/59kg	55/63kg
* The COP and noise level data was tested in Haier lab.		

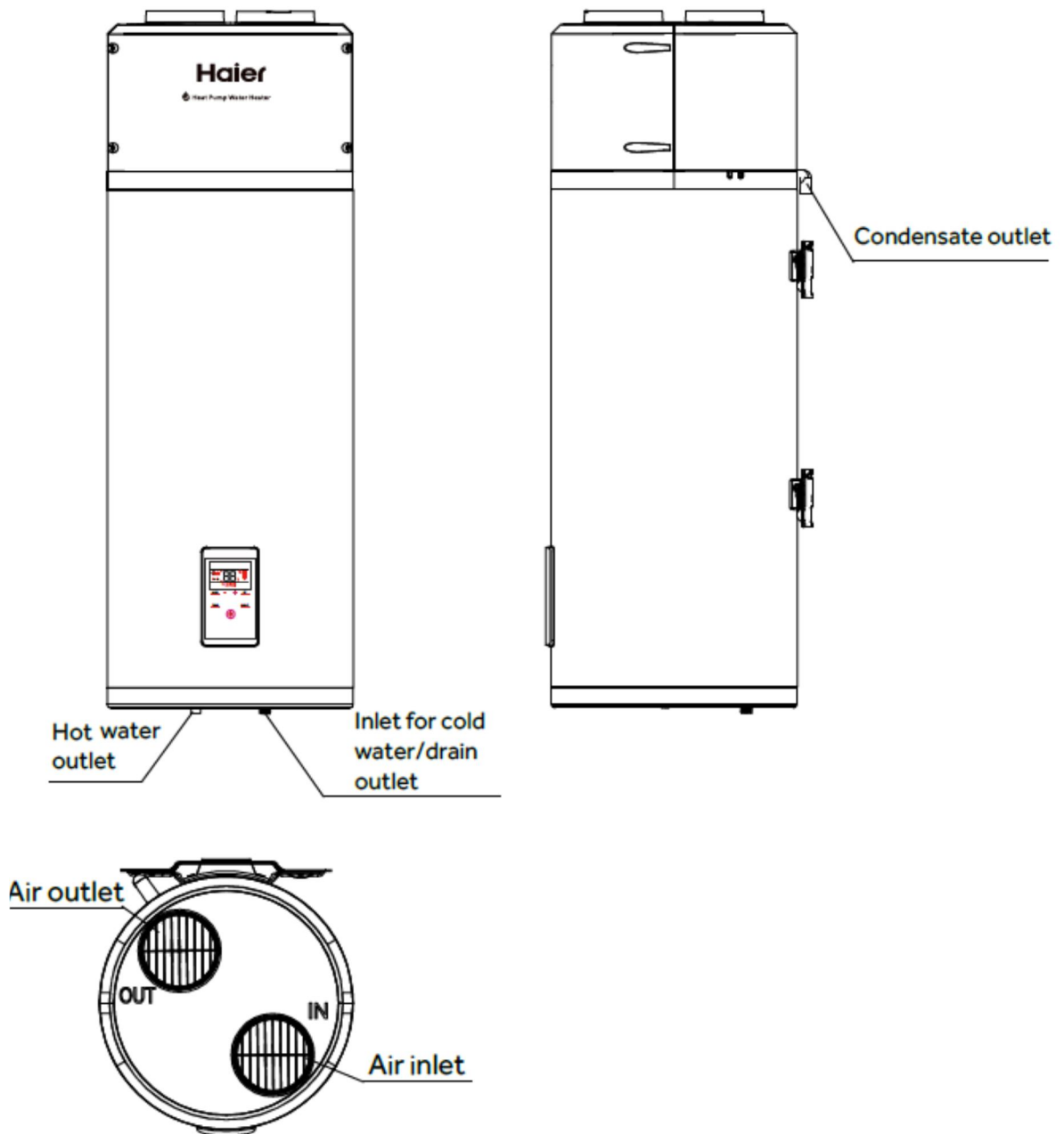
Model	HP150M5
Tank	
Tank volume	150L
Rated voltage/ frequency	220V~240V/50Hz
Tank rated pressure	0.8MPa
Corrosion protection	Magnesium rod
Water proof grade	IPX4
Performances	
Type of extraction	Ambient / Exterior
COP@7 °C / EN16147	2.99
COP@14 °C / EN16147	3.58
Tapping cycle	L
Power input by electric backup	1200W
Rated power input by heat pump	240W
Maximum power input by heat pump	350W
Maximum power input	1550W
Standby power input/ Pes	20W
Max volume of usable hot water at 40°C setting at 55°C	195.9L
Heating up time (7°C)	10h29
Heating up time (14°C)	8h28
Default temperature setting	55°C
Temperature setting range- with heater	35°C-75°C
Maximum length of air duct	5m
Diameter of air duct connection	160mm
Max working pressure of refrigerant	0.8/2.8MPa
Refrigerant type / weight	R134a/0.46kg
Sound power level	50dB
Ambient temperature for use of product	-7~45°C
Operating temperature of heat pump	-7~45°C
Dimension and connections	
Water inlet and outlet connection	G1/2"M
Safety valve connection	G1/2"M
Drain & Water inlet connection	G1/2"M
Product Dimensions	492*537*1680mm
Packing dimension without pallet	587*587*1764mm
Packing dimension without pallet	587*587*1894mm
Net/Gross weight	67/89kg
* The COP and noise level data was tested in Haier lab. The COP values obtained with external air temperature of 7°C and 14°C, inlet water temperature of 10°C and set temperature of 54°C (according to EN 16147).	

4. Description of parts and components

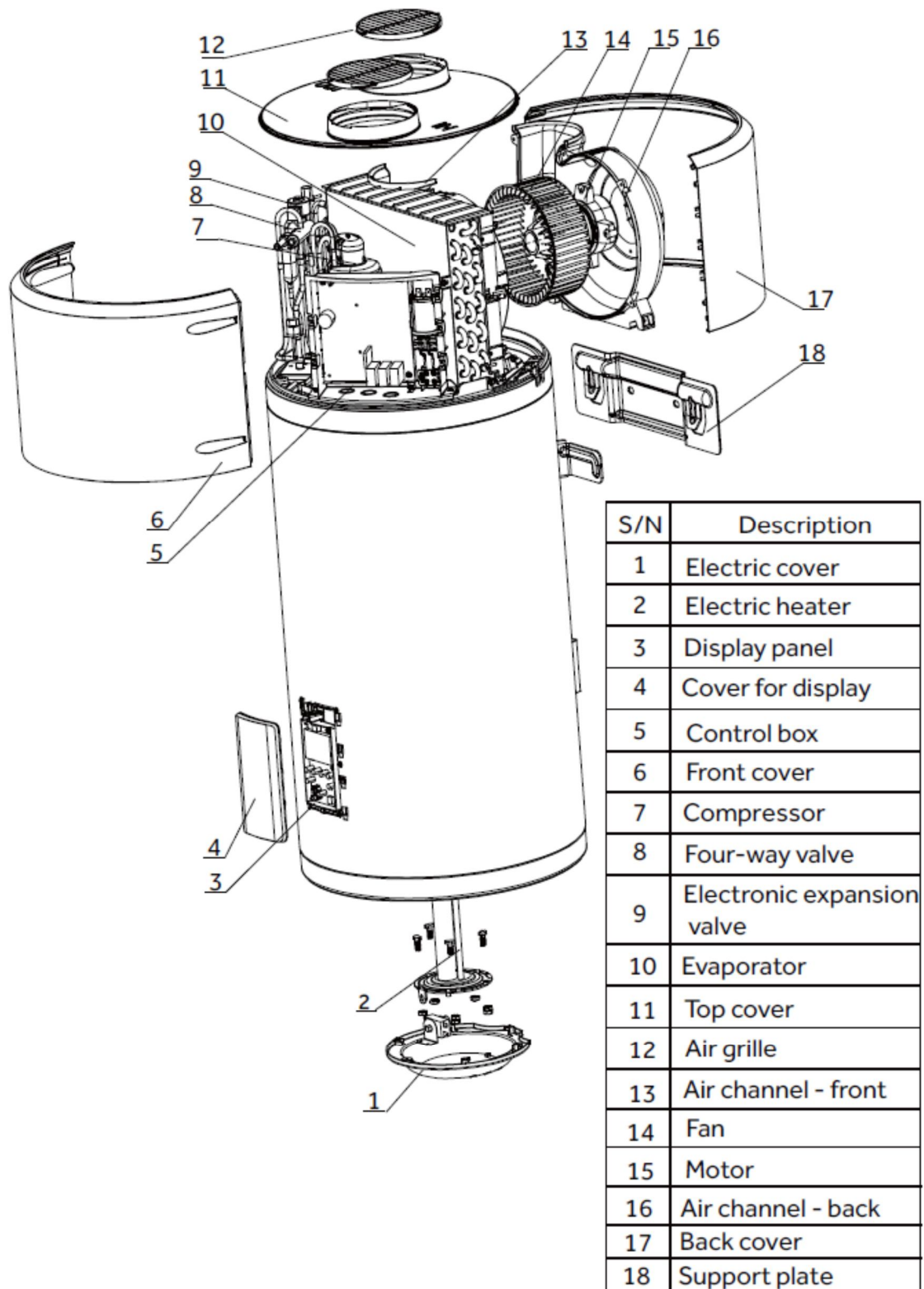
Heat pump structure (HP80M5 HP110M5)



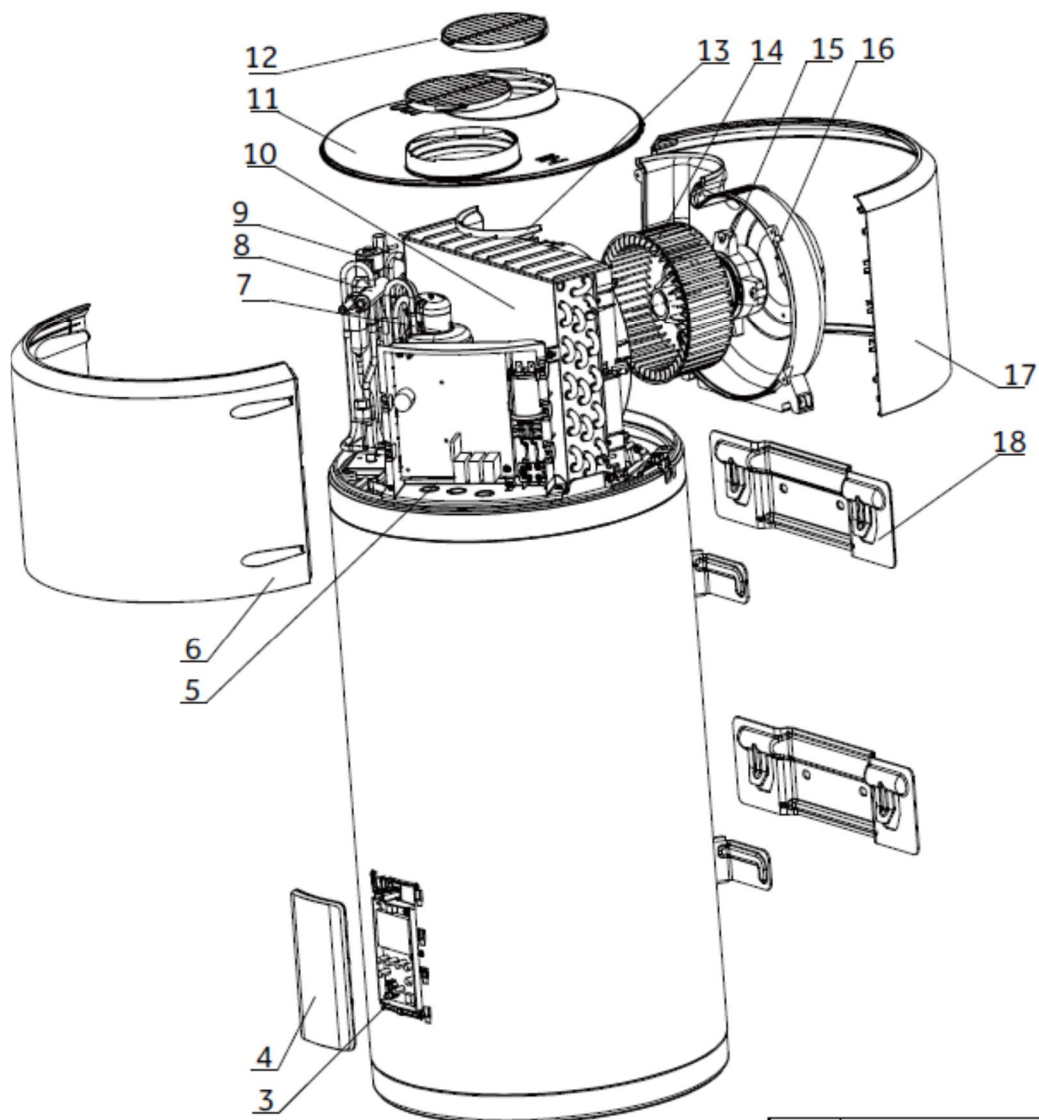
Heat pump structure (HP150M5)



Exploded view (HP80M5 HP110M5)



Exploded view (HP150M5)



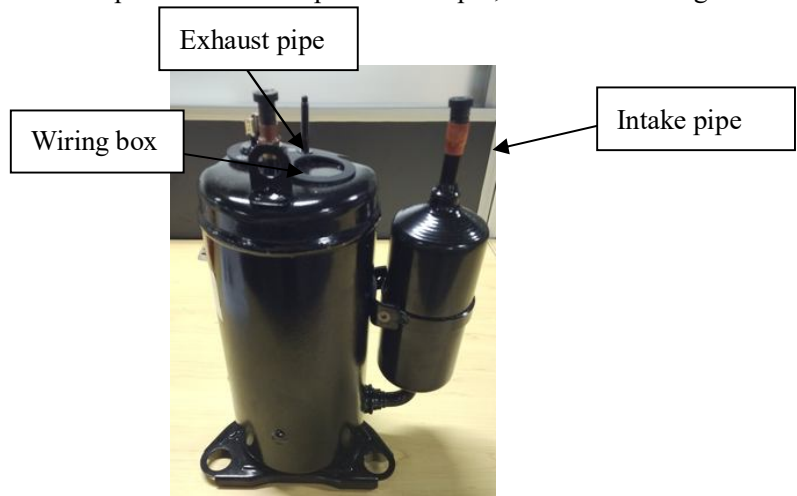
S/N	Description
1	Electric cover
2	Electric heater
3	Display panel
4	Cover for display
5	Control box
6	Front cover
7	Compressor
8	Four-way valve
9	Electronic expansion valve

S/N	Description
10	Evaporator
11	Top cover
12	Air grille
13	Air channel - front
14	Fan
15	Motor
16	Air channel - back
17	Back cover
18	Support plate

Heat pump system components

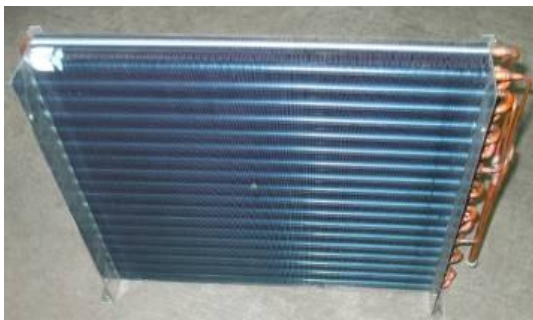
1. Compressor

The compressor is to effect a low-temperature low-pressure evaporator refrigerant vapor sucked and compressed into high temperature and pressure of the superheated vapor, and then discharged to the condenser heat exchanger.



2. Evaporator

Evaporator effects: it makes the liquid refrigerant absorb heat and is evaporated into steam.



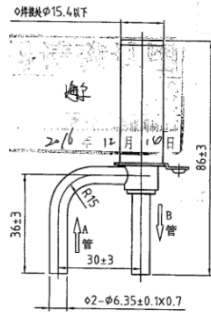
3. Condenser

A condenser: high-temperature high-pressure refrigerant vapor is condensed into liquid, during condensation, the refrigerant vapor discharge heat, the heat is absorbed by the heating medium.



4. Electronic expansion valve:

The refrigerant passes through the electric expansion valve, the pressure from the condensing pressure is reduced to the evaporation pressure, part of the refrigerant will evaporate into gas in the throttling process.



5. Filter

It's interior has a filter and desiccant, the desiccant absorbs moisture from the refrigerant, the filter can filter out impurities in the refrigerant.



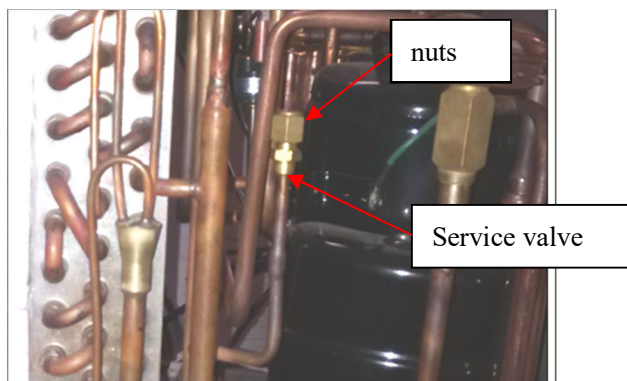
6. High Voltage Switchgear

High-voltage switch is to prevent excessive pressure in the system, thus affecting the life of the system components, high-pressure of the high-voltage switch is 2.8MPa.



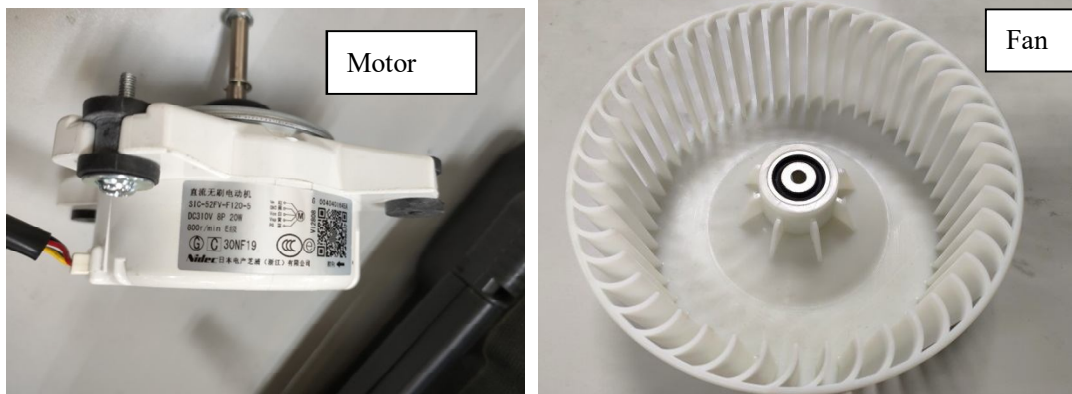
7. Service valve

Service valve is mainly used for filling refrigerant, after removing the nuts, it contains a valve needle, sales staff can vacuum infusion refrigerant from here.



8. Fan

It forced air through the duct, and then flows through a heat exchanger to improve heat transfer efficiency of the heat exchanger.



9. Refrigerant

Heat pump refrigerant is R134a, ODP value is 0, no damage to the ozone layer. R134a refrigerant cans appearance is as follows:



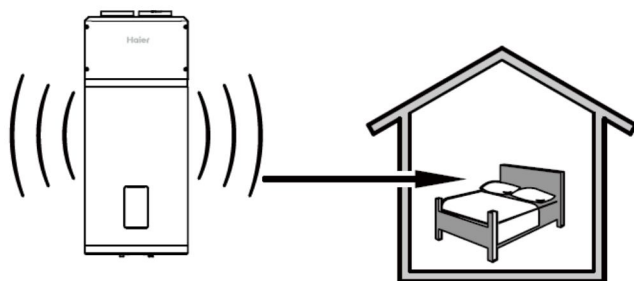
5. Installation introduction

a. Installation precaution

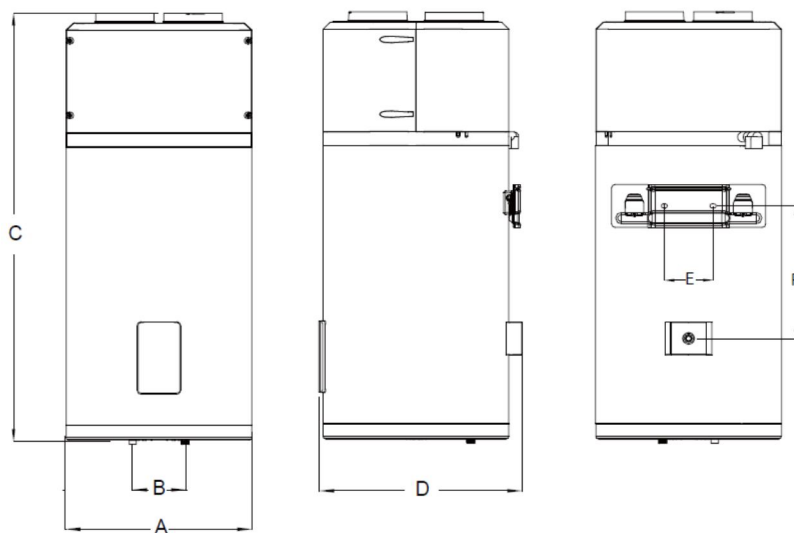
- Do not install the water heater in the position where exposed to gas, vapours or dust.
- Install the appliance on a flat, solid surface. The surface can support the machine weight and the condensate water can be drained freely.
- Noise due to operating and air flow do not bother neighbors.
- Make sure there is sufficient space left for installation and maintenance.
- There is no strong electromagnetic interference around that may affect control functions.
- There is no sulfur gas or mineral oil existing at the installation place, which may cause corrosion of the machine and the fittings.

- The water pipe for the water heater used at temperatures below 0°C shall not freeze.
- It shall not be set in rooms where a heating system is used so that heating supply to the room will not be affected.
- It shall not be set inside a totally-enclosed space.
- The air taken in must in no event be dusty.
- Install the appliance in a dry, frost-free room.
- Temperature of the ambient air or of the air taken in by the heat pump for optimum running: from 10 to 35°C.

Keep an adequate distance between the working heat-pump and the resting places.



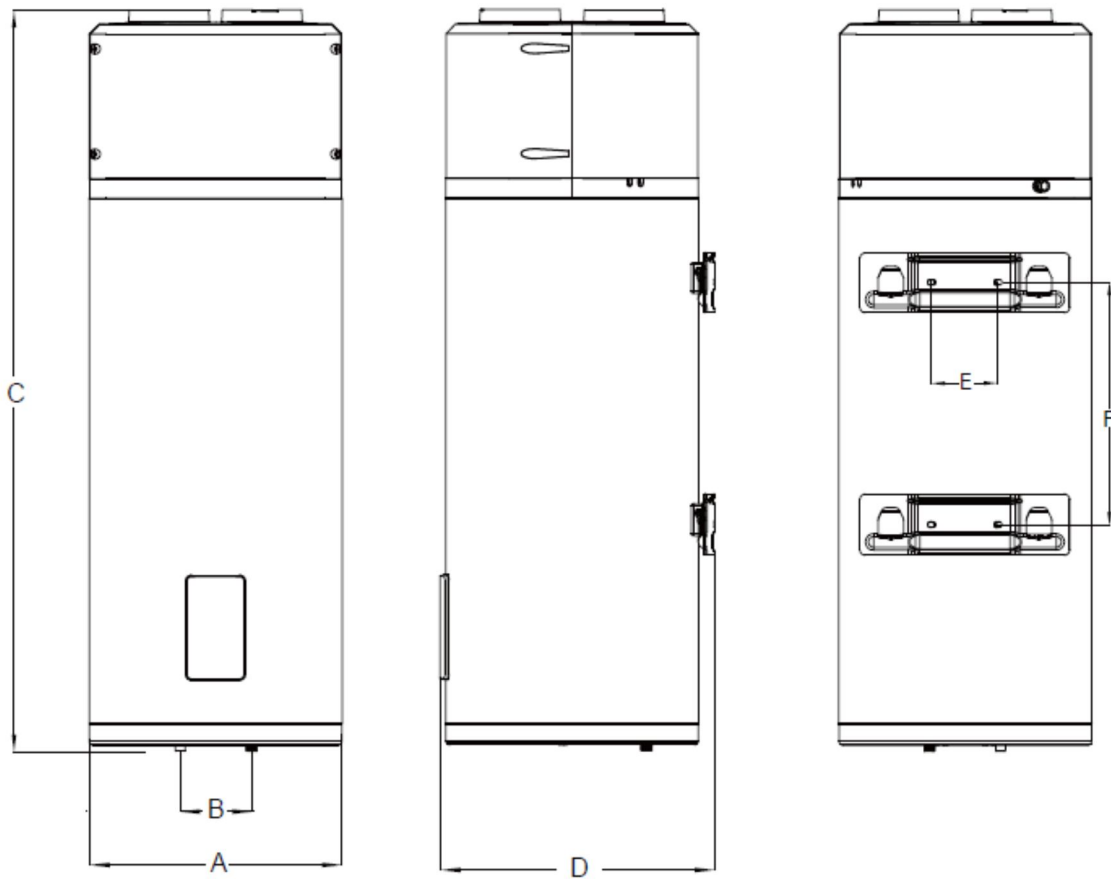
b. Installation dimensions (mm) (HP80M5 HP110M5)



Unit:mm

Model	A	B	C	D	E	F
HP80M5	492	140	1170	538	159	362
HP110M5	492	140	1320	538	159	362

Installation dimensions (mm) (HP150M5)

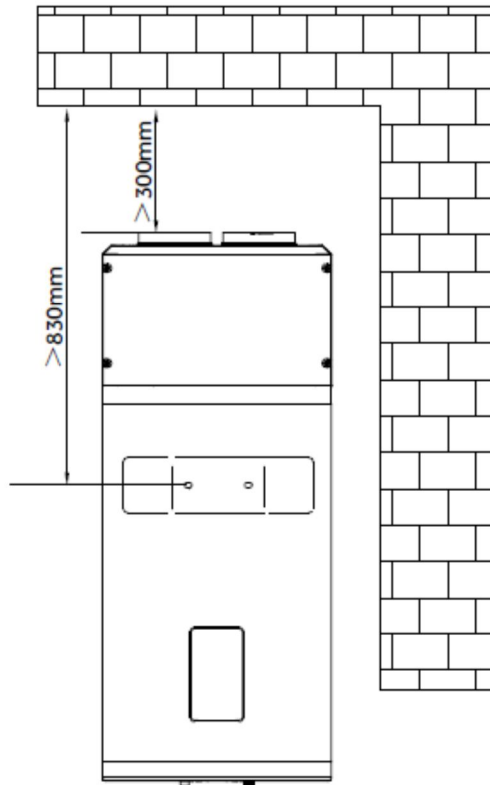


Unit:mm

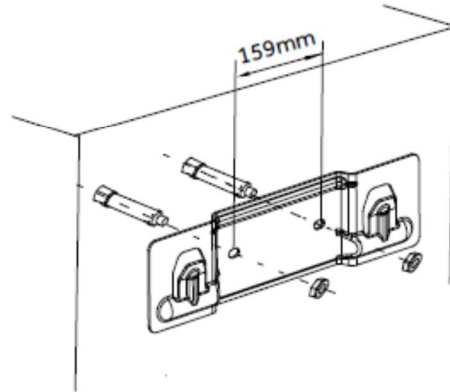
Model	A	B	C	D	E	F
HP150M5	492	140	1680	534	159	470

c. Installation angle refer to the following diagrams

HP80M5 HP110M5:

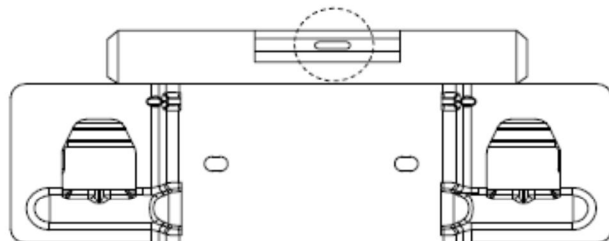
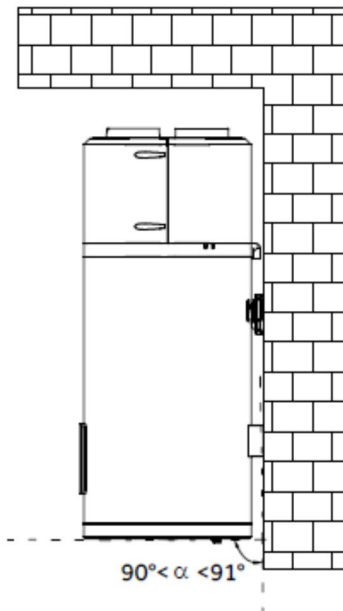


Note: These two expansion bolts can support 200kg weight at least . Please use the expansion bolts adapted to your wall material.

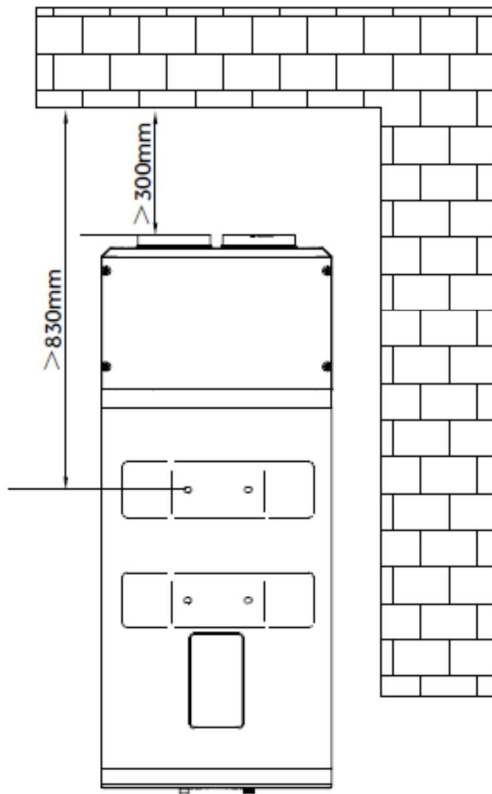


Installation angle refer to the following diagrams :

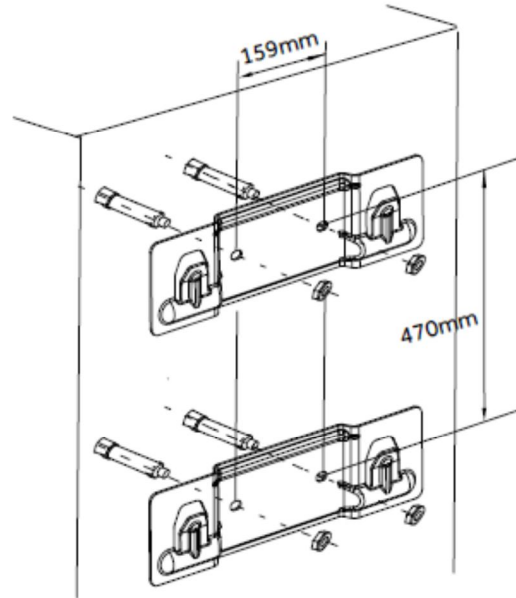
After the installation is completed, it is necessary to use a level ruler to check whether the support is maintained in a horizontal state.



HP150M5:

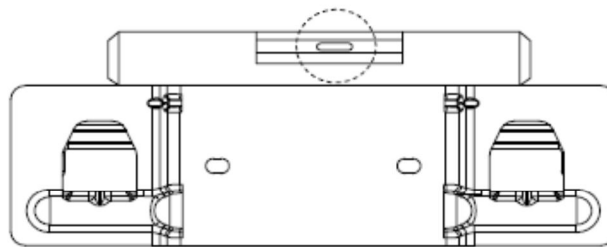
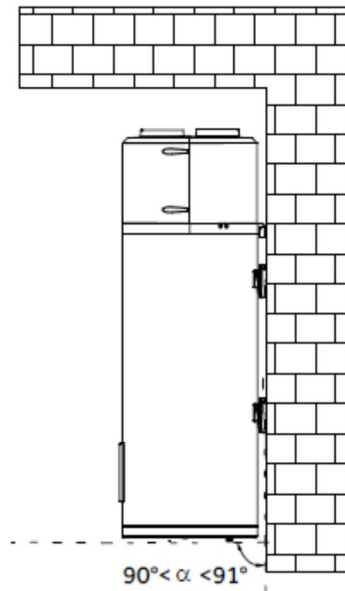


Note: These two expansion bolts can support 250kg weight at least . Please use the expansion bolts adapted to your wall material.

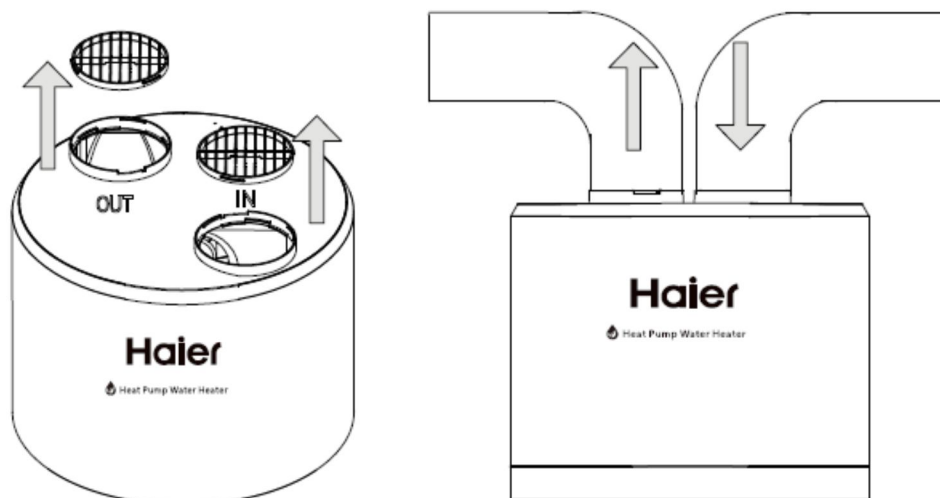


Installation angle refer to the following diagrams :

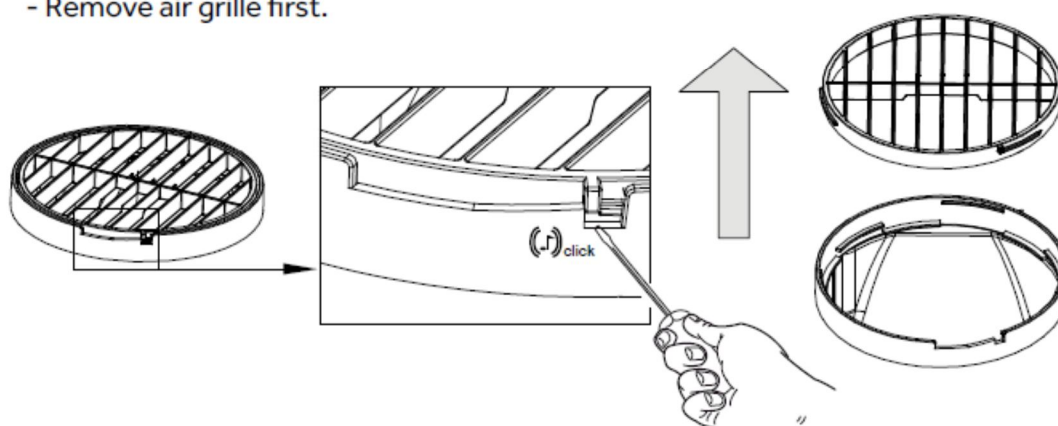
After the installation is completed, it is necessary to use a level ruler to check whether the support is maintained in a horizontal state.



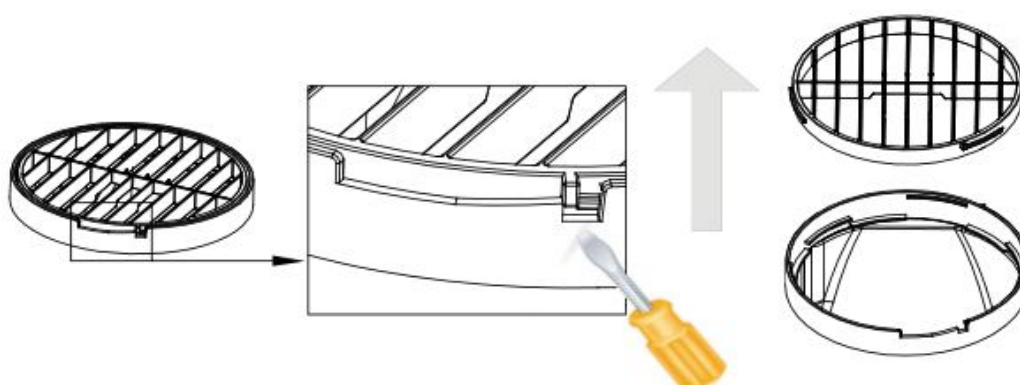
Pipe connection



- Remove air grille first.



- Remove vent grid first.



- Install diameter **160mm** duct.

- Pressure drops from duct must be lower than or equal to the static pressure of the fan.





- If the pressure drops out of range, the performance of the appliance will be impaired.

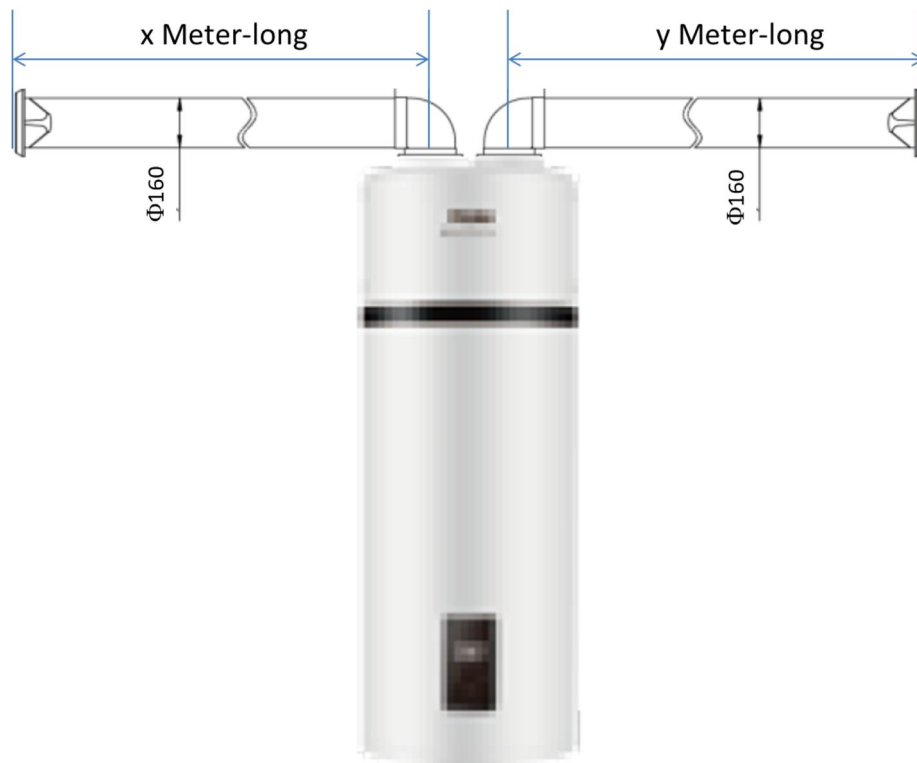
Maximum length of the air connection (Diameter of air connection 160 mm):

Installation suggestions:

$x + y < 24$ m (Smooth tube)

$x + y < 15$ m (Bellows tube)

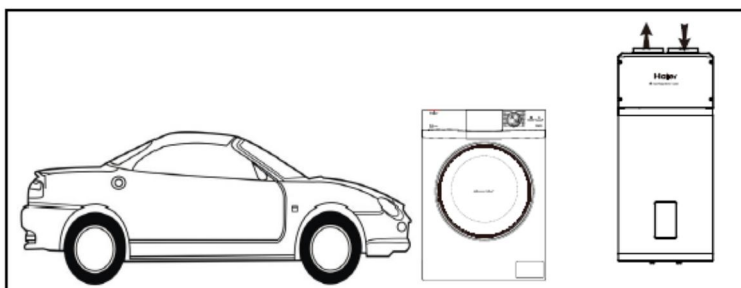
Available pressure 59 - 68 Pa		Drop Pressure (Pa)	Φ 160mm(equivalent meter-long)
	Smooth tube	1.0/1 meter	1
	Bellows	2.0/1 meter	2
	elbow 90°	4.0/unit	4
	air grid	5.0/unit	5



d. Advised positions

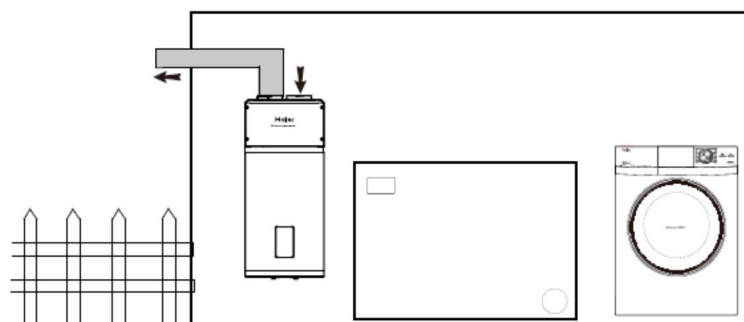
Garage or laundry room (without ducts):

- Unheated room.
- Enables recovery of the free energy released by your vehicle's engine when switched off after use or by household appliances in operation.



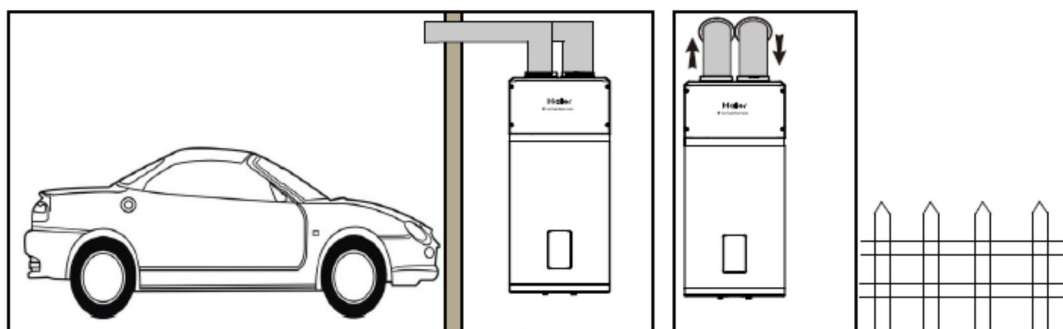
Laundry room (with one duct):

- Unheated room.
- Enables recovery of the free energy released by your vehicle's engine when switched off after use or by household appliances in operation.
- Referring installer menu, adjust the fan speed.



Habitable room or outside air (with two ducts):

- Can obtain free heat from the garage.
- If the outside air temperature is low, connection to the outside air may lead to overconsumption of electricity.
- Referring installer menu, adjust the fan speed



e. Installation caution

When making the connections, you should respect the standards and local directives.

- Before making the connection, rinse the drinking water inlet pipes, in order not to introduce metal or other particles into the tank.

Select copper pipes for pipeline connection.

- The inlet water pressure is between 0.1~0.5MPa. If lower than 0.1 MPa, a booster pump shall be added at the water inlet; if higher than 0.5 MPa, a pressure relief valve shall be added at the water inlet.

- The inlet water temperature is suggested between 10-30° C.

- Outdoor water pipeline and valves should be properly insulated.

- In accordance with safety rules, a safety valve (7bar, G1/2F) must be installed on the tank. For France, we recommend hydraulic safety units fitted with a membrane with the NF marking.

Integrate the safety valve in the cold water circuit. Install the safety valve close to the tank in a place which is easy to access.

No isolating devices should be located between the safety valve or unit and the tank

The rated pressure of the safety valve shall not exceed 0.8MPa.

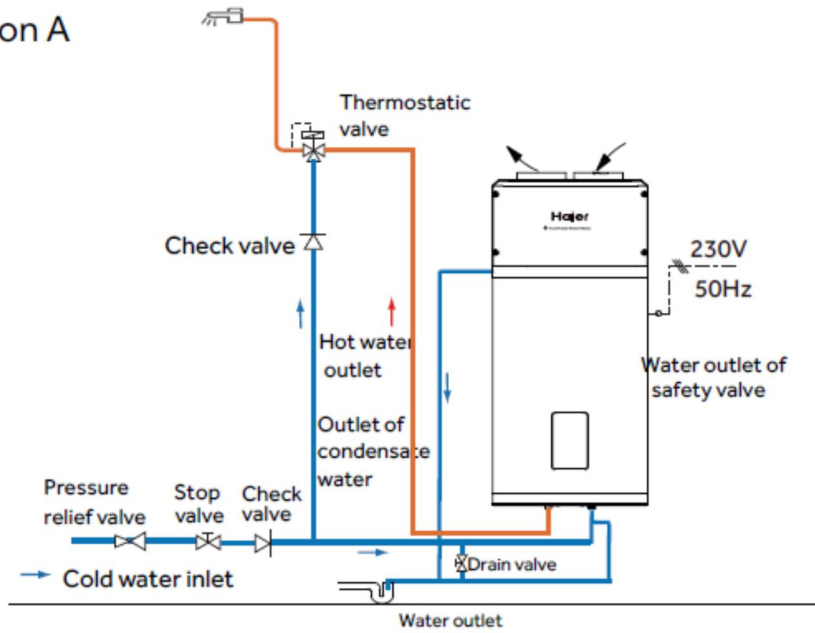
- The outlet pipe in the valve or safety assembly must not be blocked.

- The diameter of the safety unit and its connection to the calorifier must be at least equal to the diameter of the domestic cold water inlet on the calorifier.

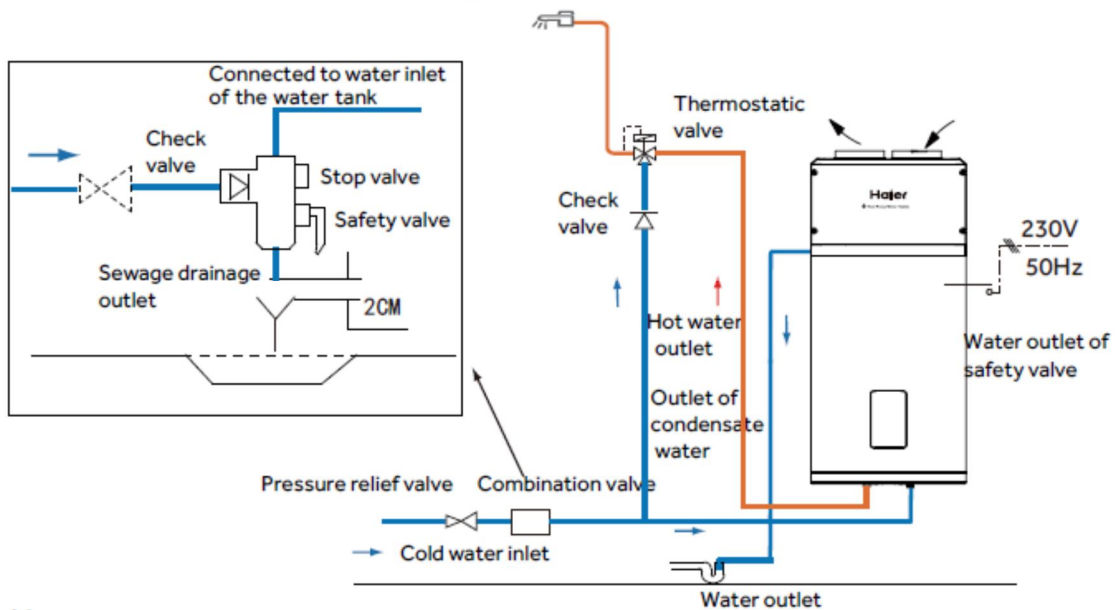
- If the mains pressure exceeds 80% of safety valve, a pressure reducer must be installed upstream of the appliance.

Do not connect the domestic hot water connection directly to copper pipes in order to prevent galvanic couples in iron/copper (risk of corrosion). It is compulsory to fit the domestic hot water connection with a dielectric connection (not supplied).

Installation A



Installation B (for France only)



- Pressure relief valve, thermostatic valve, stop valve, check valve, T&P valve and French combination valve are not included in the accessories, please select proper fittings in local market;
- Valves with NF/CE certification are recommended

WARNING: Plumber -Be Aware

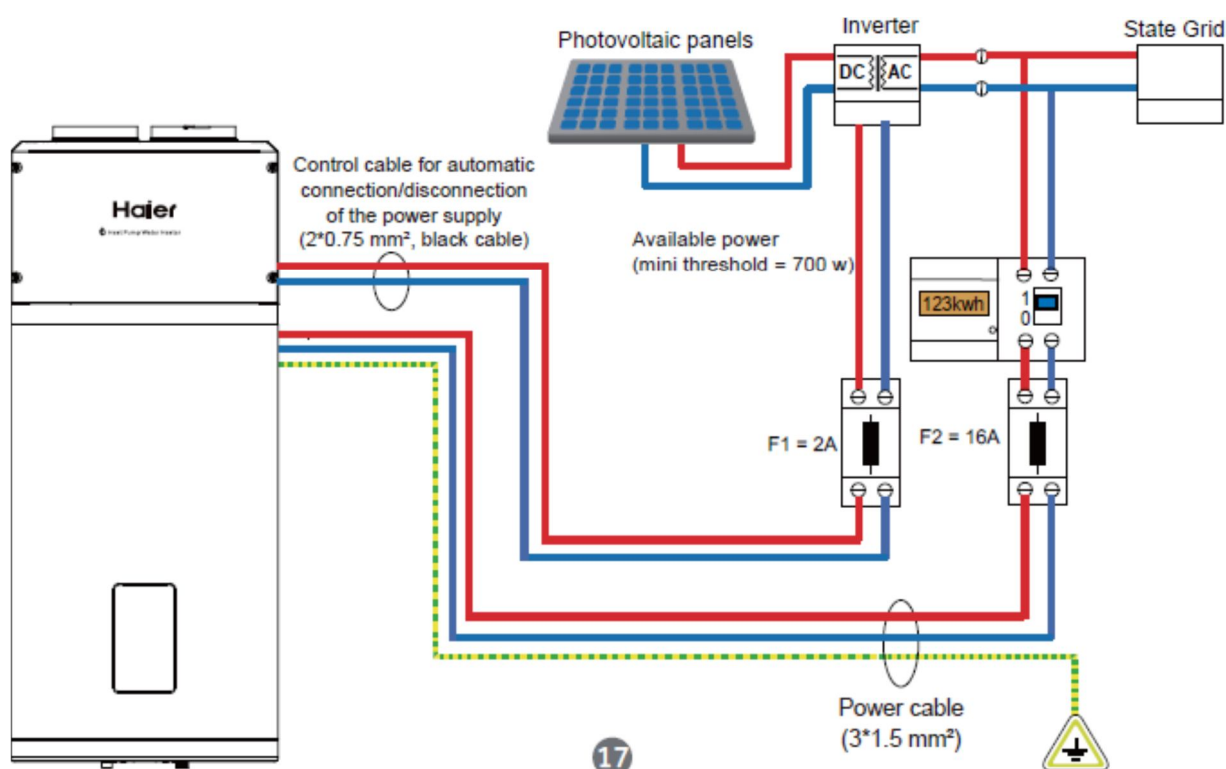
Using boiler auxiliary heating, please make sure that the heat pump water tank temperature not more than 85 °C.

f. Electrical connections precautions

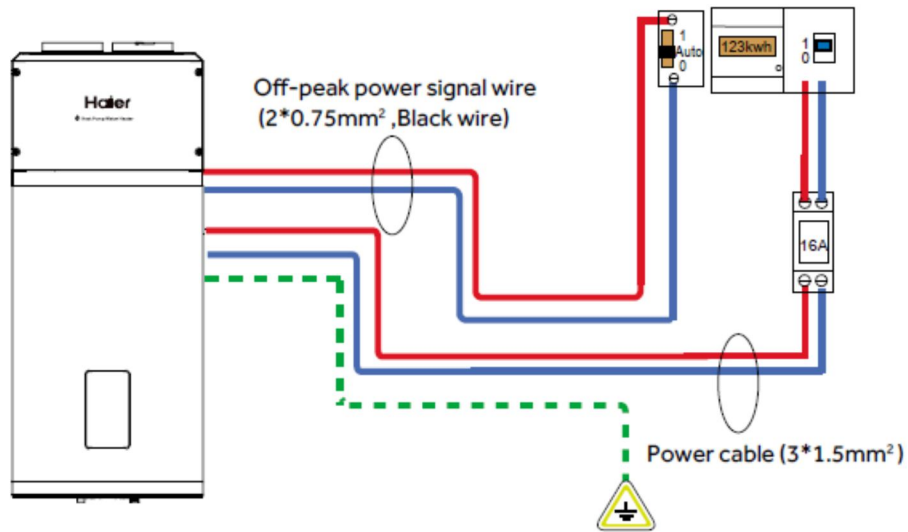
WARNING

- Only qualified professionals may carry out electrical connections, always with the power off.
- The earthing shall comply with local standards.
- Water heaters shall be equipped with a dedicated power line and residual current circuit breakers. The action current shall not exceed 30 mA;
- The ground line and the zero line of the power supply shall be separated entirely. Connecting the zero line to the ground line is not allowed.
- Parameter of the power line: $3 \times 1.5 \text{ mm}^2$ or more.
- If a power cable is damaged, it shall be replaced by qualified professionals to avoid risks.
- In the case of places and walls where water may be splashed to, installation height of a power socket shall not be less than 1.8 m, and it shall be ensured that water would not be splashed on these places. The socket shall be installed out of children's reach.
- The phase line, zero line and ground line inside a power socket used in your home shall be wired correctly without any wrong positioning or false connection, and internal short circuit shall be avoided. Wrong wiring may cause fire accidents.

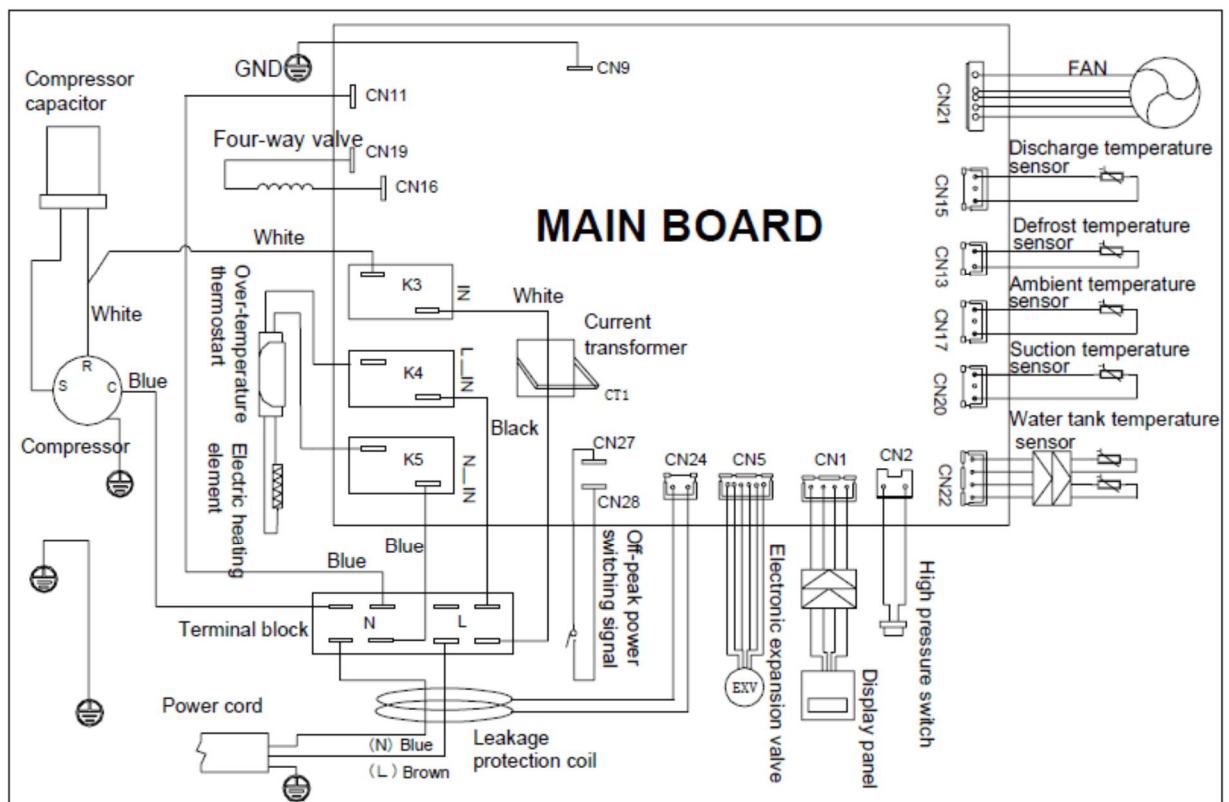
g. Connection to a PV system



Off-peak power signal wire connection



h. Wiring diagram



6. Operation and functions

Display



Functions:

Electrical leakage protection

The control system of this machine features an electricity leakage protection function.

3-minutes protection

When starting the machine immediately after electricity input, the fan and the compressor will start at the same time. When starting the machine immediately after shutdown, the system goes into the protection mode and starts after 3 minutes, which is considered to be normal.

Automatic defrosting function

The defrosting mode is automatically activated if the ambient temperature is too low and after the compressor already runs continuously for a certain period.

Overload protection











The working load of the compressor will be heavy if temperature is high in summer. In order to meet hot water requirements of users and to lengthen service life of the compressor, this product automatically adjusts the fan speed to ensure reliable operation of the compressor.









Anti-freezing function

The heat-pump starts heating to avoid freezing of the water tank if the temperature in the water tank is too low.








The default temperature setting is 55°C.

Description of the pictograms

Symbol	Description
	Power ON/OFF switch
	Working mode selection
	Confirm button
	Timer adjust
	Boost mode. Heat pump and auxiliary power are activated at the same time.
	<p><u>Auto mode</u></p> <ul style="list-style-type: none"> - Optimised management of the heat pump and the electrics for guaranteed comfort; - Prior using heat pump; - If compressor works more than the default 8 hours , start the auxiliary power ; - The compressor maximum continuous working time () can be adjust in the installer settings.
	<p><u>ECO (off-peak) mode</u></p> <ul style="list-style-type: none"> - In this mode ,priority using heat pump; - In two ways using heat pump,should set in the installer settings; 1- timer refer to LP parameter; 2-switch signals by power companies.
	<p><u>Electric heating mode</u></p> <ul style="list-style-type: none"> - In this mode, the electric heating function is turned on, and the electric heating function remains effective. - This function ensures hot water supply when the heat pump is not working properly;
	<p><u>Holiday mode</u></p> <ul style="list-style-type: none"> - According to the vacation dates in advance to prepare hot water; - For example, you leave home for vacation on January 1st and return home on January 5th. The date shall be set as (5-1) =4 days, and corresponding temperature shall also be set. The heat pump will start heating on 00:00 o'clock of January 4th automatically.

Symbol	Description
	Boost mode. Heat pump and Auxiliary electrical heater are activated at the same time(only in AUTO mode).
	Heat pump working icon.
	Auxiliary electrical heater working icon.
	When the PV function is turned on, the setting temperature will be automatically adjusted to 65°C,when the PV effective signal is received, the heat pump and electric heating will be turned on at the same time.
	When receiving the SG signal, the setting temperature will be automatically adjusted to 65°C, and the heat pump will be heated according to the logic of setting the temperature to 65°C.
	Time of peak/off-peak hours. In Time of peak/off-peak hours mode, the symbol corresponding to the mode is displayed. When receiving the signal, "HC" lights up.
	<u>Anti-legionella</u> - Anti-legionella function will be activated every 7 days to heat the tank to 65°C automatically .
	Hot water volume display.

Installer settings

- To open the installer settings, press  switch off the system, then press  and  at the same time for 10 seconds.
- When menu is open, press  or  to change the value of the settings.
- Press  to confirm the settings.
- Press  to close the menu.

Parameters	Description	Factory setting	Adjustment range
LL NO, NC	<u>Off-peak signal type</u> When you use off-peak time clock control, first determine the type of signals, Only allow professional installers to operate. - NO corresponds to Normally Open Signal. - NC corresponds to Normally Close Signal.	NO	NO, NC
LP 01, 02 03, 04	<u>Off-peak logic type</u> - In two ways using heat pump, should set in the installer settings -01 manually set off-peak time; -02 switch signals by power companies. -03 PV signal. -04 SG signal.	01	01, 02 03, 04
AL ON, OF	<u>Avoid Legionella</u> - This parameter is used to activate the legionella protection mode. - Once every 7 days, all domestic hot water is heated to 65°C.	ON	ON, OF
AA 5-15	<u>Compressor maximum continuous working time</u> - If the maximum continuous working time of the compressor more than Set Time, start auxiliary power.	15h	5-15h
CL d1-d7	<u>Set the day of the week</u> - Set the day of the week, d1 to d7 for Monday to Sunday, and remember the day of the week.	/	d1-d7
EH ON, OF	<u>Auxiliary Heating in off-peak time</u> - ON corresponds to turned on auxiliary Heating. - OF corresponds to turned off auxiliary Heating.	ON	ON, OF

7. Checking and maintenance

- Installation and maintenance of the appliance must be done by a qualified professional .
- Before working on the appliance, Shut down the machine and cut off the power supply .
- Do not touch with wet hands.
- Maintenance operations are important to guarantee optimum performance and extend the life of the equipment.

Checking the Safety valve

- Operate the safety valve at least one time per month to check if it is running correctly. Otherwise check for blocking and replace the safety valve if necessary.

Checking the hydraulic circuit

- Check the watertightness of the water connections.

Cleaning the fan

- Check the cleanliness of the fan one time per year.

Checking the evaporator

- Clean the evaporator at regular intervals using a soft-haired brush.
- If they are bent. Carefully realign the evaporator using a suitable comb.
- Because the evaporator fins is very sharp. Risk of injury on your finger.
- Do not damage the fins. Avoid affecting the performance.

Checking the condensates discharge pipe

- Check the pipe cleanliness
- An obstruction by dust may cause poor condensates flow or even a risk accumulation of water in the heat pump plastic base.

Checking the Magnesium rod

- The magnesium anode should be replaced in time, avoid tank corrosion.
- Checking magnesium anode once every 2 years .In poor water areas need to shorten the time.

Drain the water tank to empty

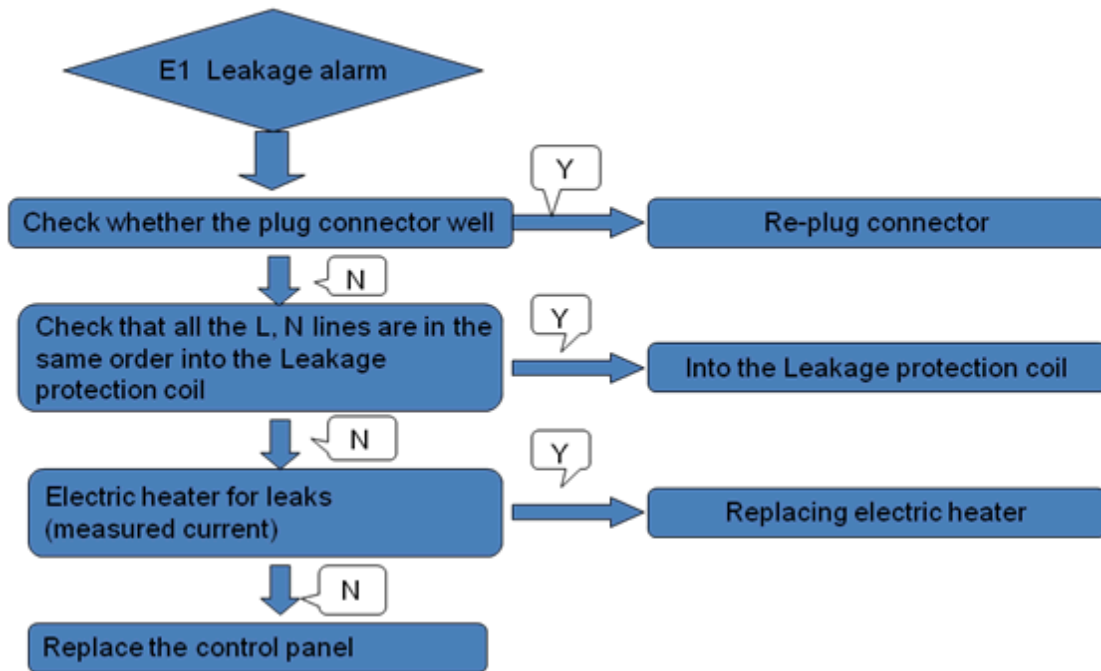
Cut off power supply and shut down water inlet valve, then drain the water tank to empty via the sewage outlet. Please stay away from the sewage outlet if there is hot water inside the water tank to avoid injury.

8. Faults and protection

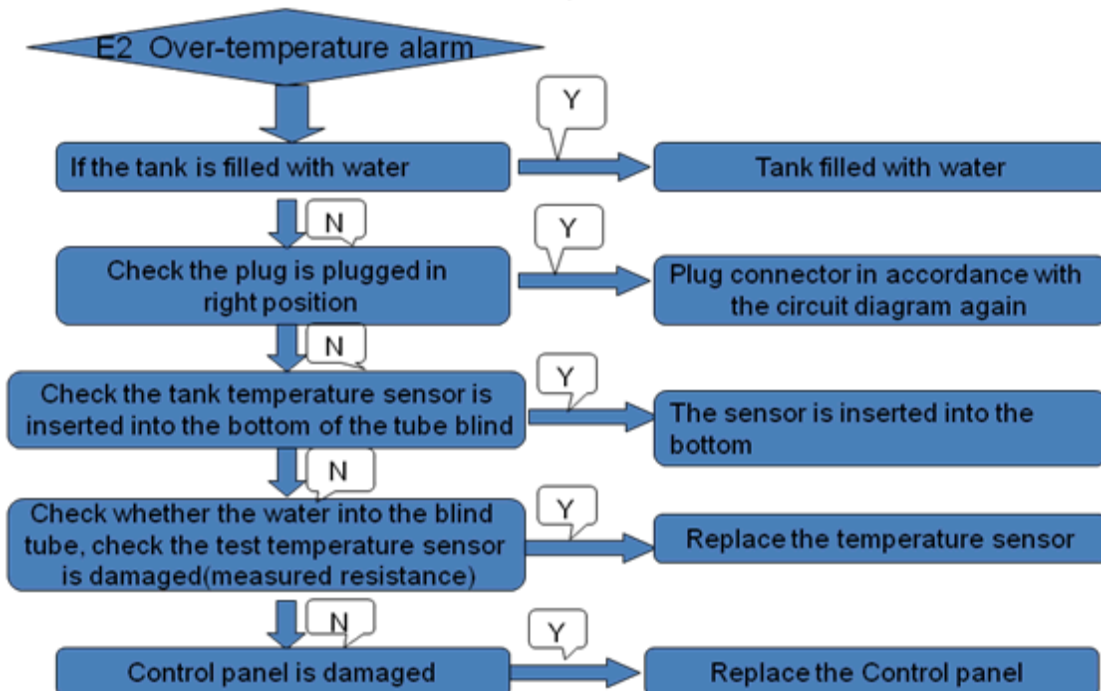
Fault type	Action	Digital indication	Release
Compressor protection	Operating temperature protection	F2	After fault is solved, switch on power supply for release
	Air exhaust temperature protection	F3	
	Evaporation high temperature protection	F5	
Compressor over-current protection	Over-current protection	F6	
Electricity leakage alarming	The system will automatically cut off power supply if any line fault occurs	E1	After fault is solved, switch on power supply for release
Over temperature alarming	The actual water temperature $\geq 85^{\circ}\text{C}$	E2	
Fault of the inner temperature sensor	If short circuit or circuit break occurs to the sensor	E3	
Fault of the ambient temperature sensor	If short circuit or circuit break occurs to the sensor	E4	
Fault of the evaporation temperature sensor	If short circuit or circuit break occurs to the sensor	E5	
Fault of the air exhaust temperature sensor	If short circuit or circuit break occurs to the sensor	E6	
Fault of the air intake temperature sensor	If short circuit or circuit break occurs to the sensor	ED	
Communication fault	Communication of main control panel and display panel is abnormal	E7	
Pressure switch protection	Action of the pressure switch at the exhaust outlet	E8	
Ambient temperature protection	Ambient or outdoor temperature $< -7^{\circ}\text{C}$ or $> 45^{\circ}\text{C}$	E9	
Fault of the Off-peak power switching signal	If not received the Off-peak signal when selecting switch signals by power companies	EF	
Fault of the fan	Fan blade is stuck or fan and control panel communication failure	L7	

9. Fault code identification method

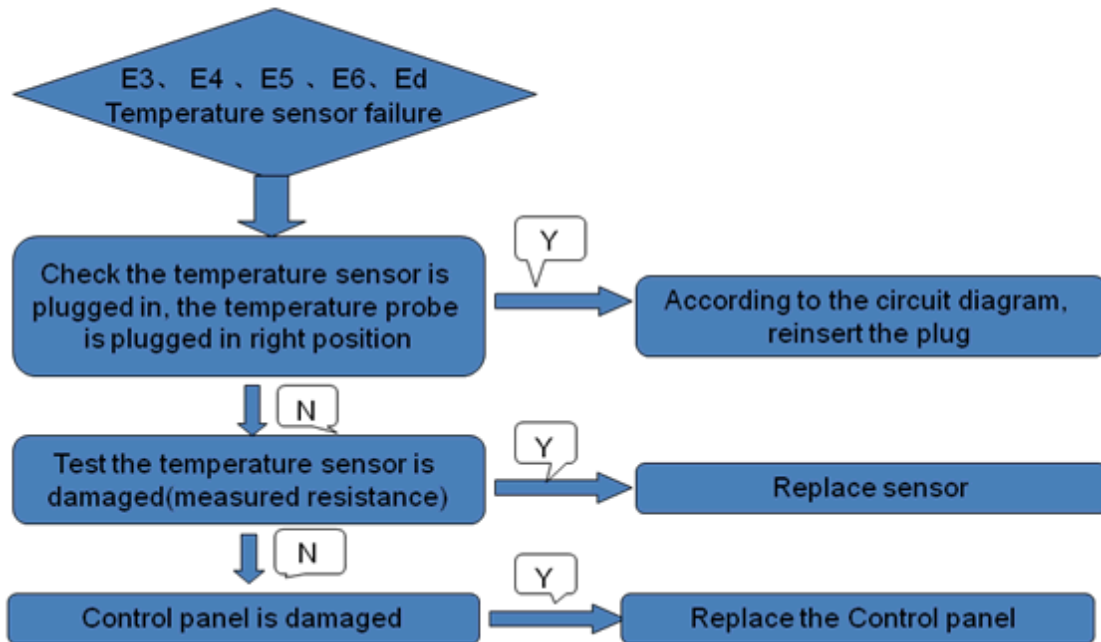
" E1 "error code and identification process



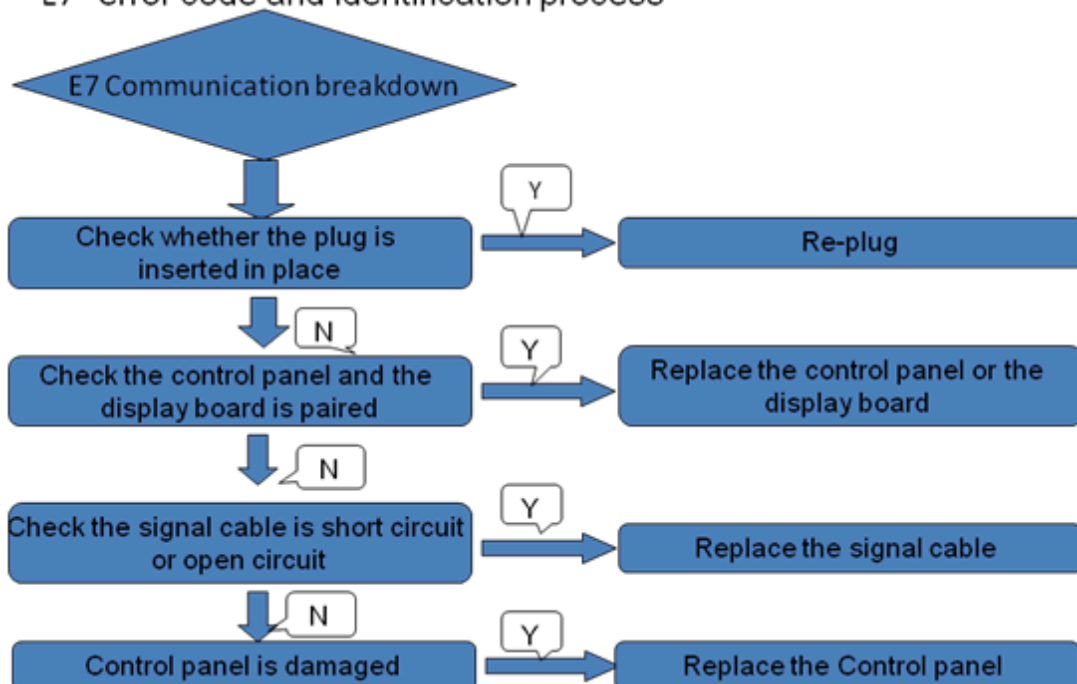
"E2" error code and identification process



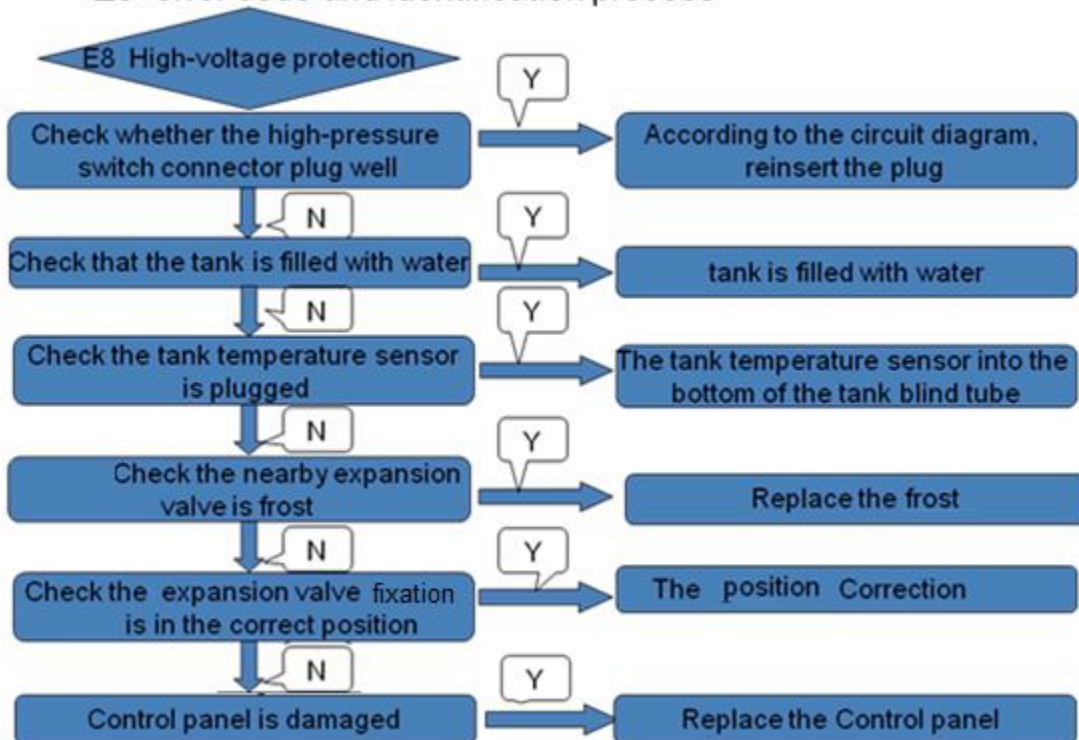
“E3、 E4 、 E5 、 E6、 Ed” error code and identification process



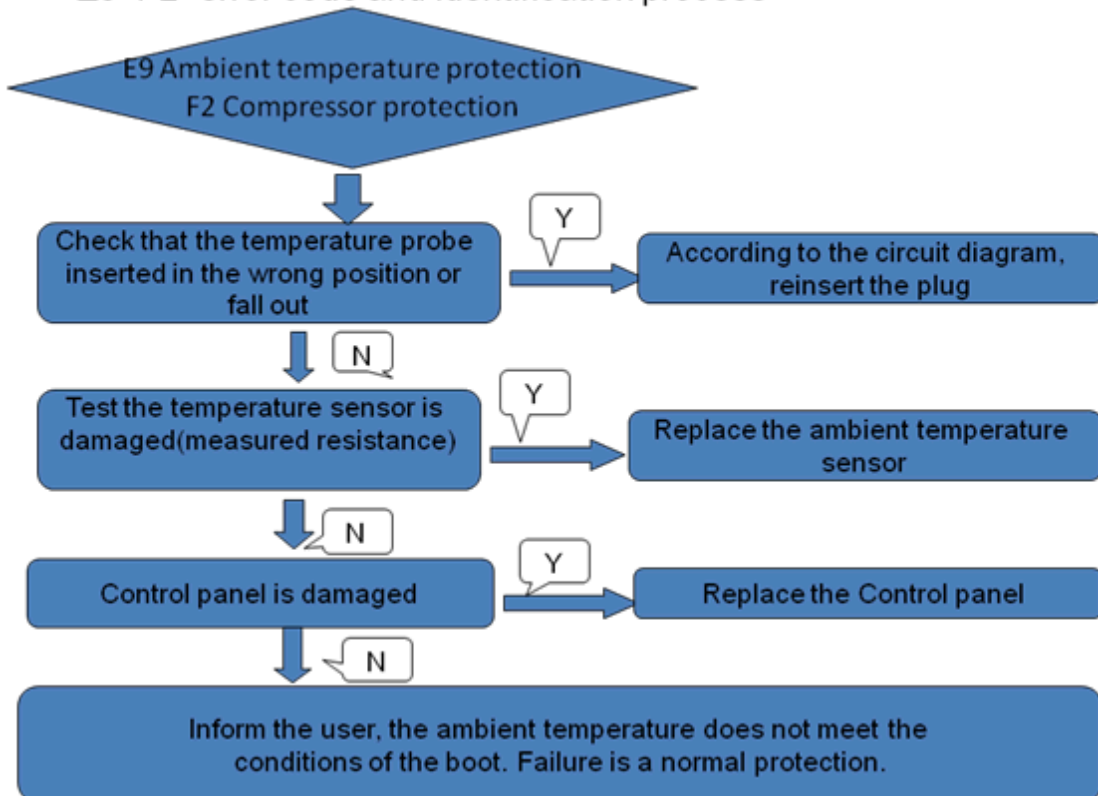
“E7” error code and identification process



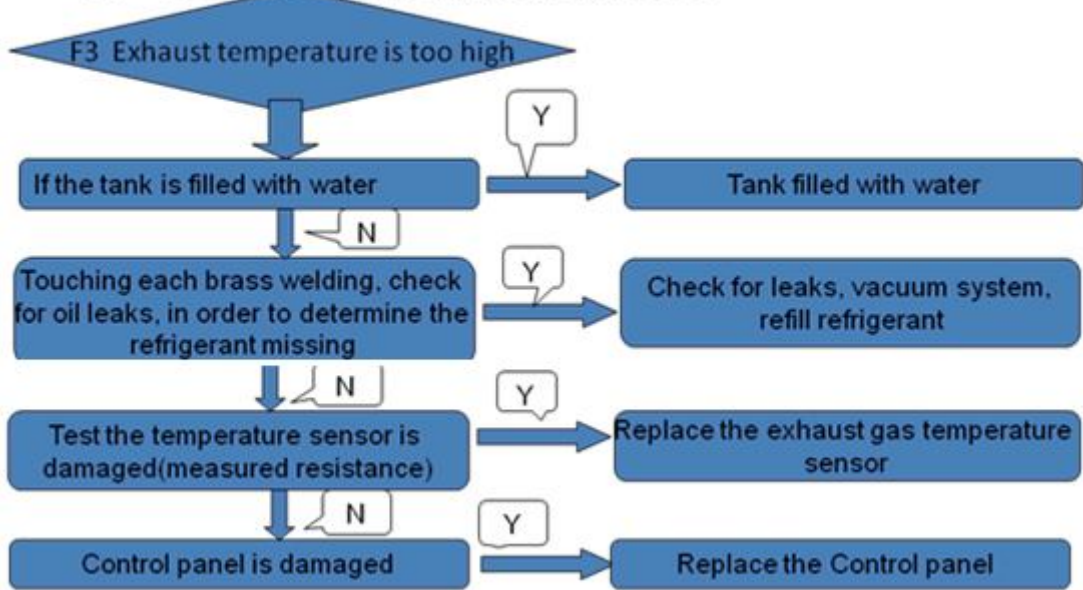
“E8” error code and identification process



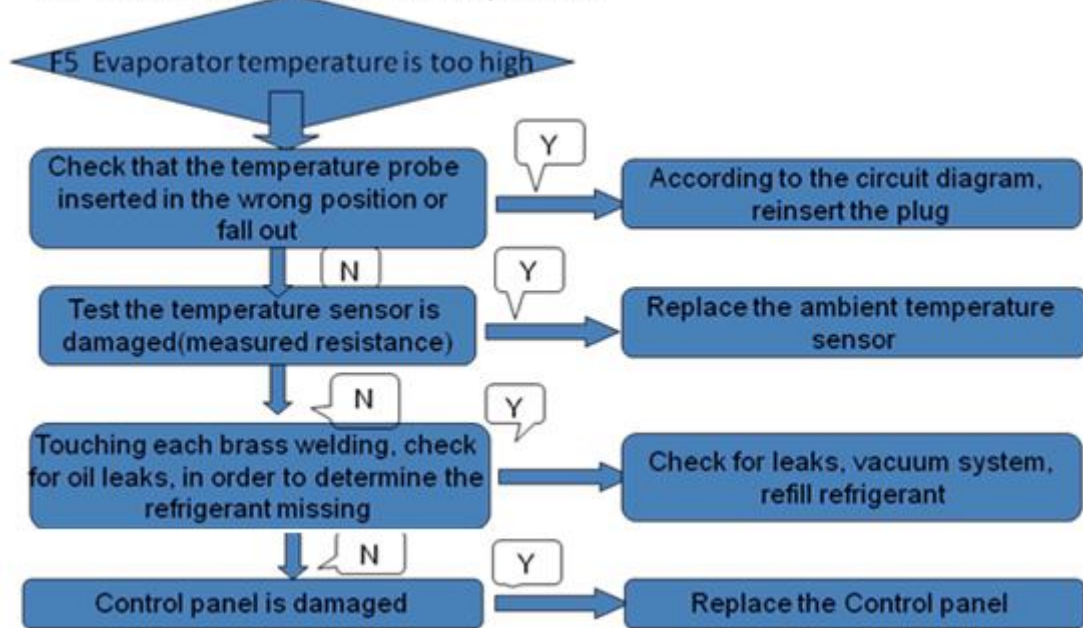
“E9 F2” error code and identification process



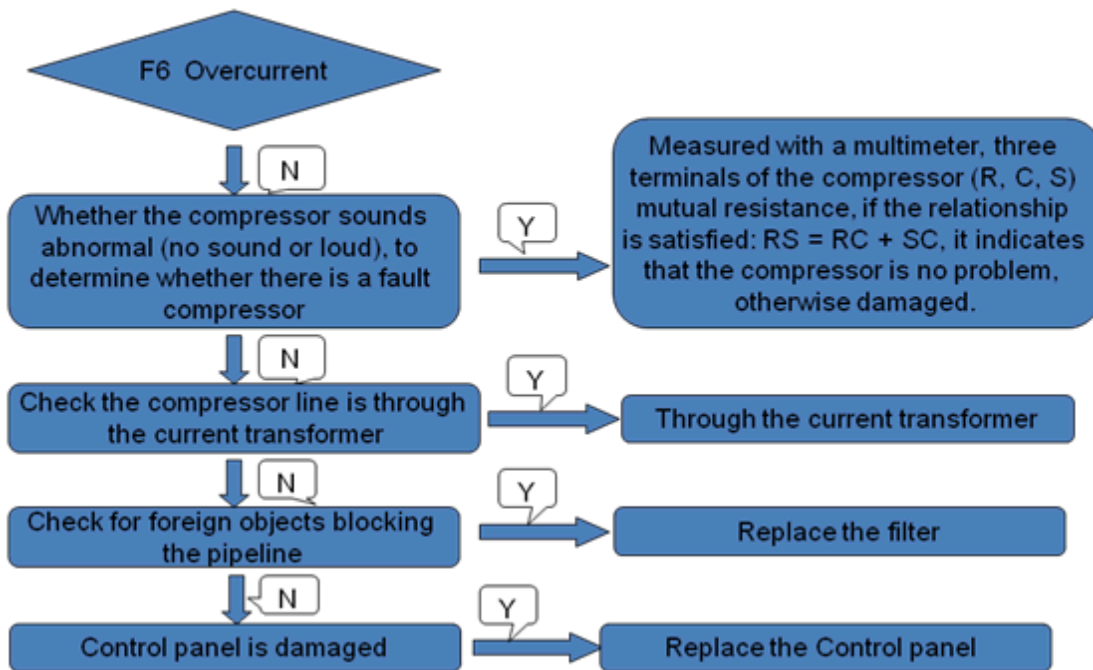
“F3” error code and identification process



“F5” error code and identification process

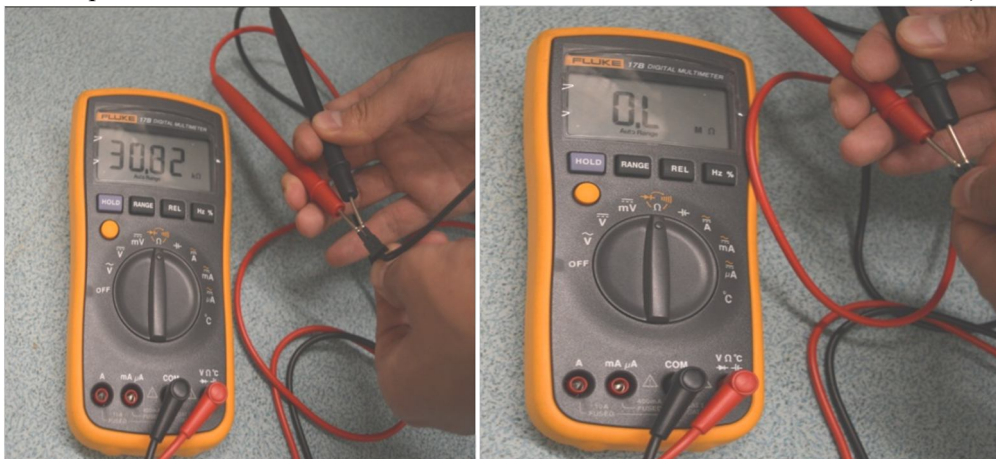


“F6” error code and identification process



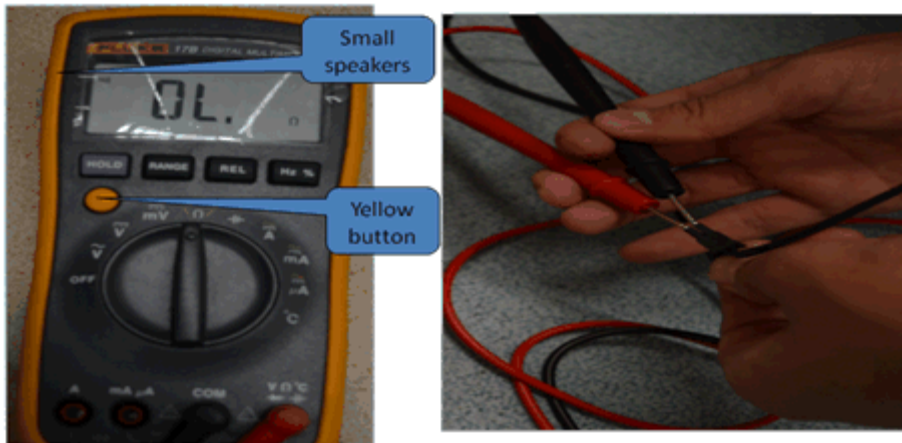
Temperature sensor resistance measurement method

Temperature sensor resistance measurement method (method of measuring the resistance value of the compressor of the same, but is switched to the small resistance of the interface unit).



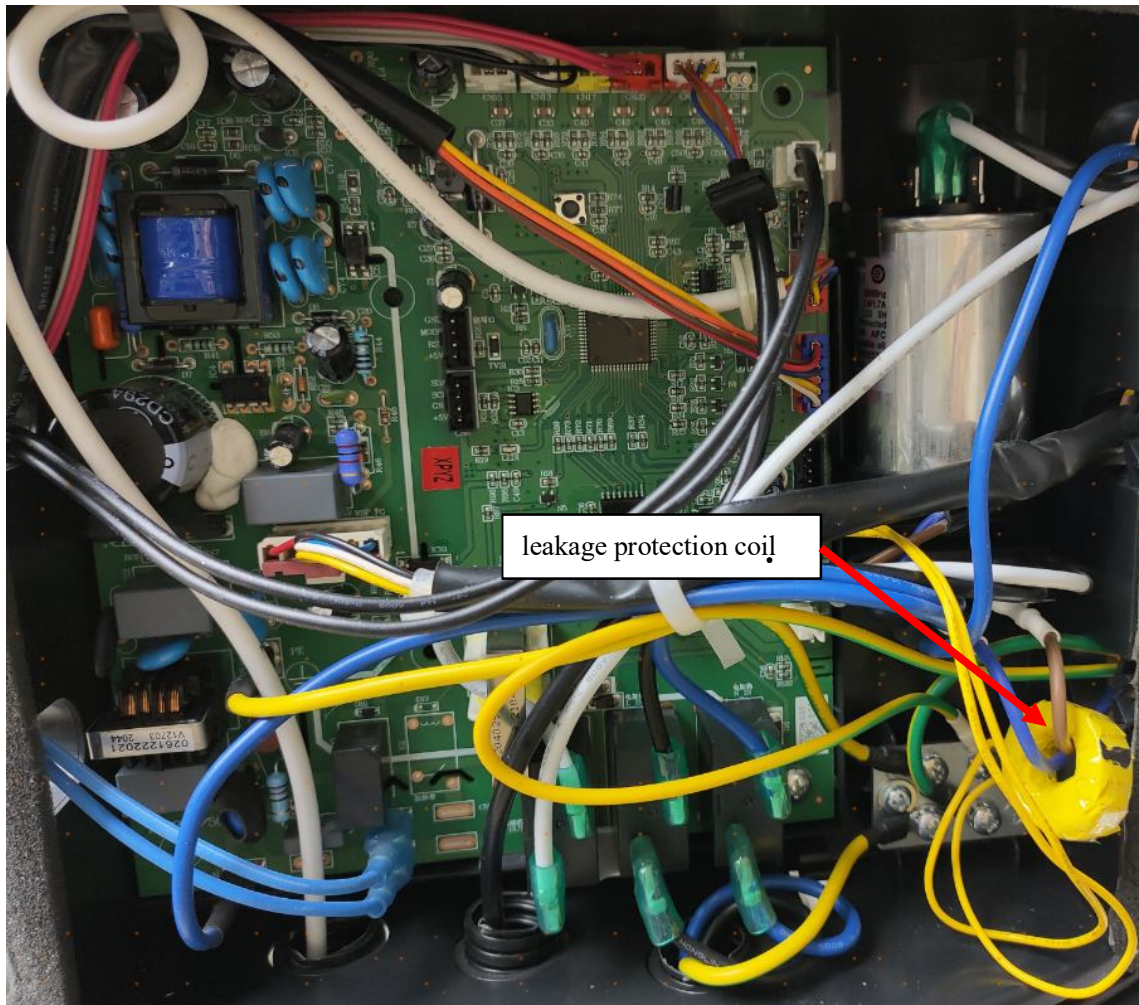
Multimeter set to Ohms, according to the picture of the method of measuring the resistance of the temperature sensor. According to the resistance table, the lower the temperature the smaller the resistance.

Check the signal cable is short-circuited



Press the yellow button to switch to the picture, when a short circuit, there is a beep, the resistance is zero.

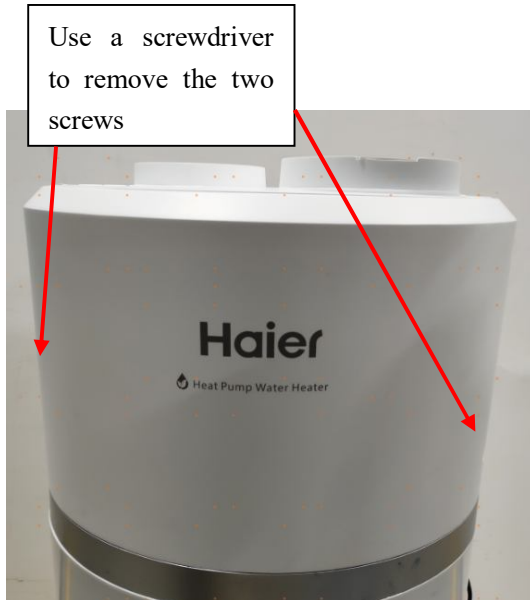
Check that the power cord L, N lines are in the same order into the leakage protection coil



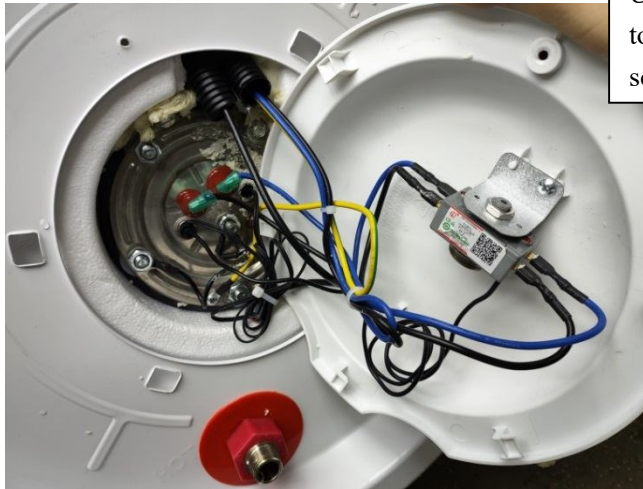
9. The method of dismantling products

Make sure the power cord is disconnected.

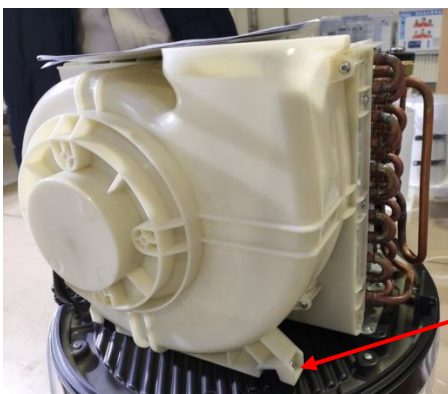
1、 Remove the Top Cover



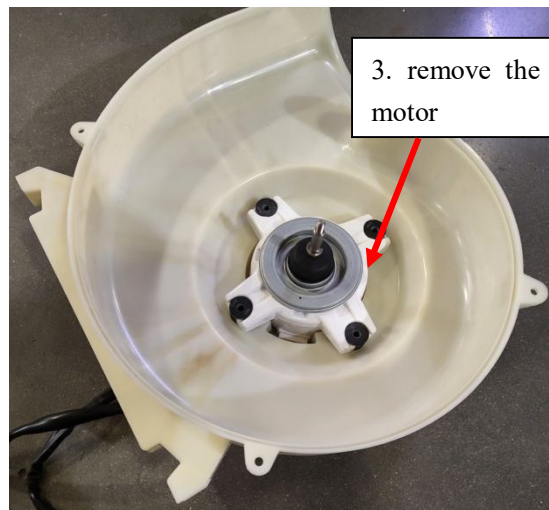
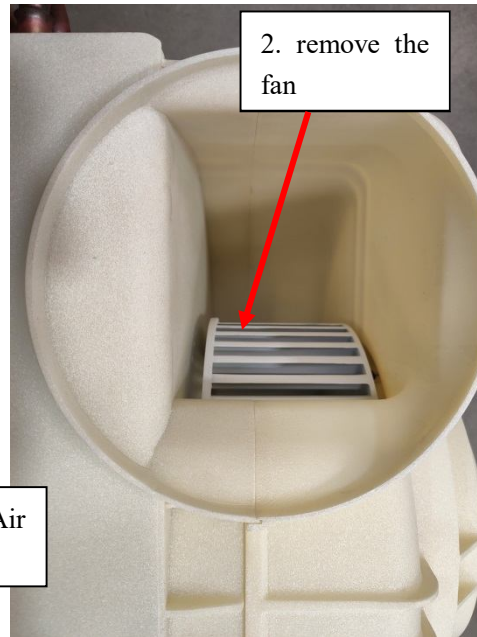
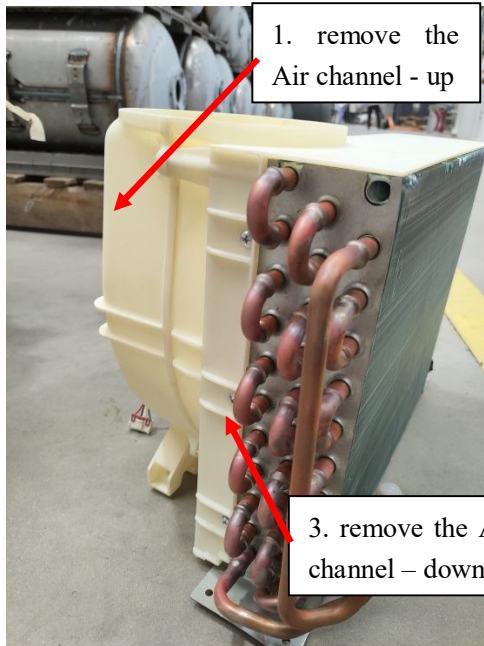
2、 Remove the Bottom Cover



3、 Remove the Air channel and fan



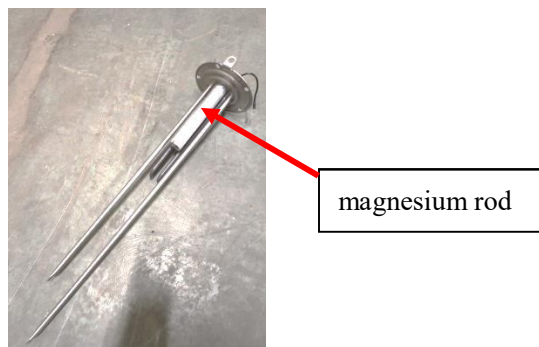
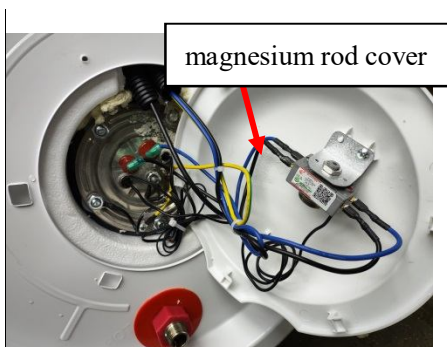
Use a screwdriver to remove the two screws



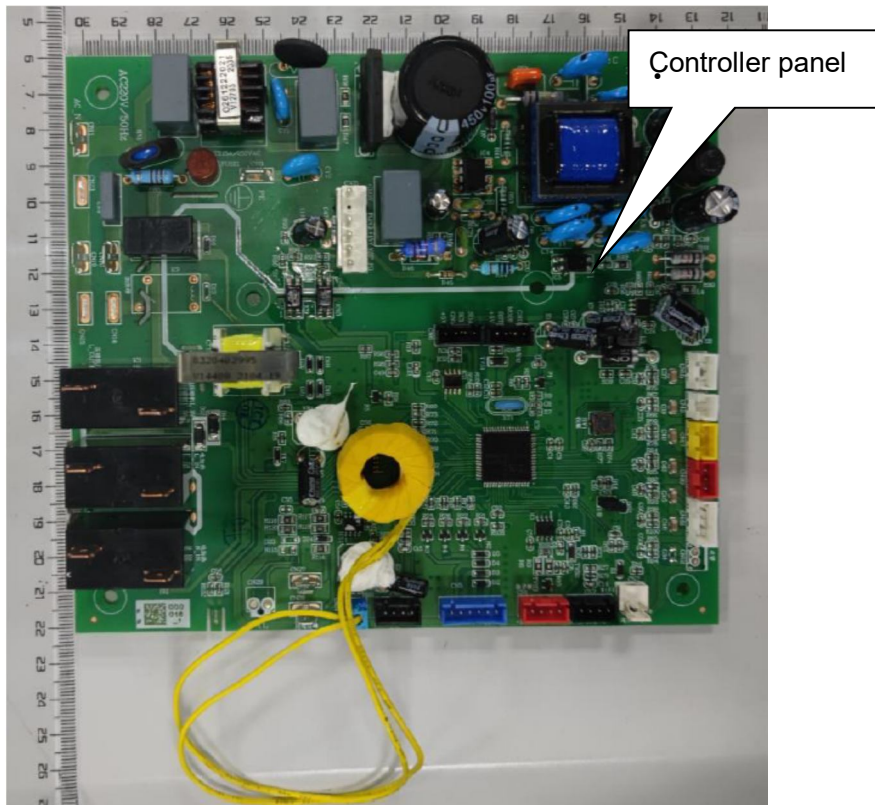
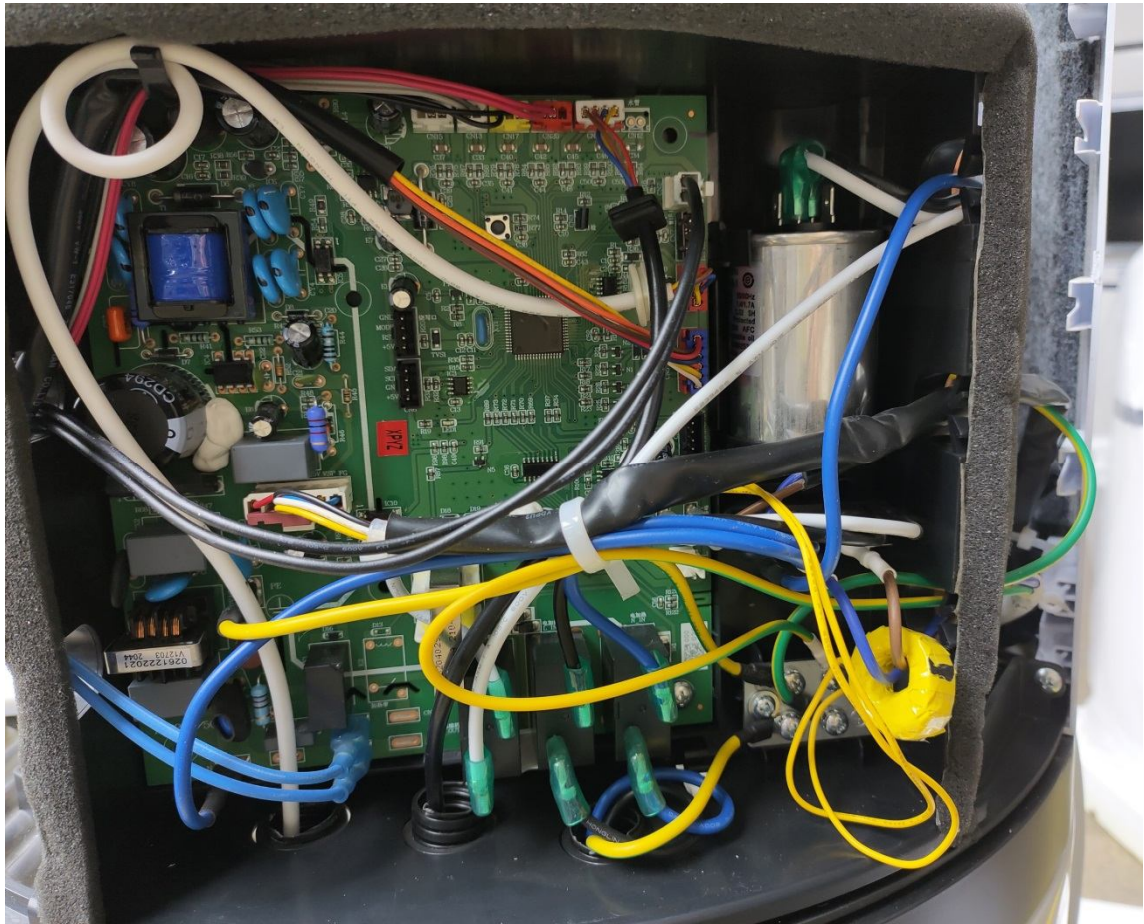
4、 Remove the Magnesium rod

Off the power and close the inlet valve, open any outlet valve, exhaust pressure, when no water flows out of time, turn off all the valves.

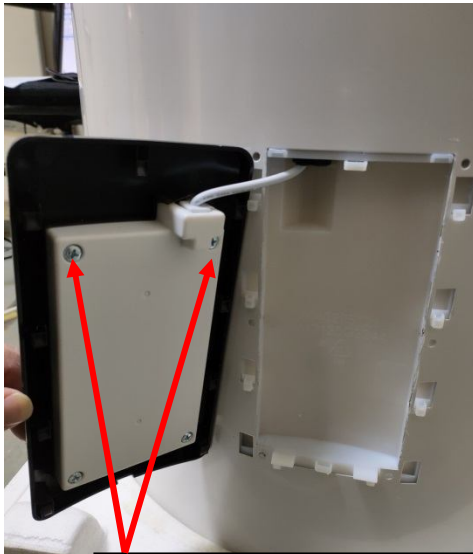
- ① Remove the magnesium rod cover;
- ② After remove the magnesium rod, according to the consumption of magnesium rod, determine whether you need to replace.



5、 Open the control box



6、 Remove the Display board box



Use a screwdriver to remove the screw



10. The method of Charge of the refrigerant gas

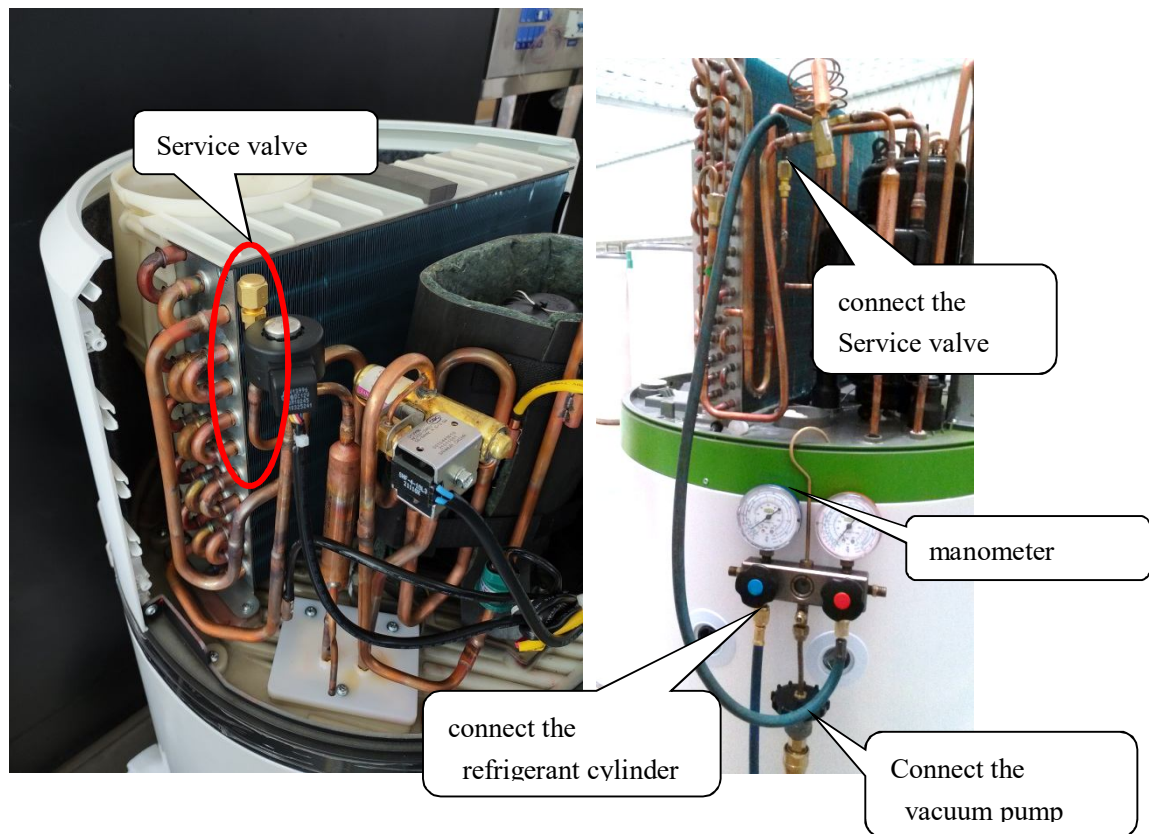
1. Check the heat pump system refrigerant leakage method:

1. In the heating process, heat pump input power has remained unchanged;
2. During heating, the temperature of the water in the tank is constant (ensure that the electric heater is not activated).

2. Leakage check:

If you have confirmed that the system has been leaked, please check it as follows.

1. Unscrew the maintenance valve nut, access to nitrogen, to maintain pressure 1MPa.
2. Apply soap bubbles evenly over the solder joints of the copper tube. Observe the changes in the status of soap bubbles to determine the location of leakage.
3. After the professionals repair the welding leakage point, check the leakage again with the above method until it is confirmed that the system has no leakage point.

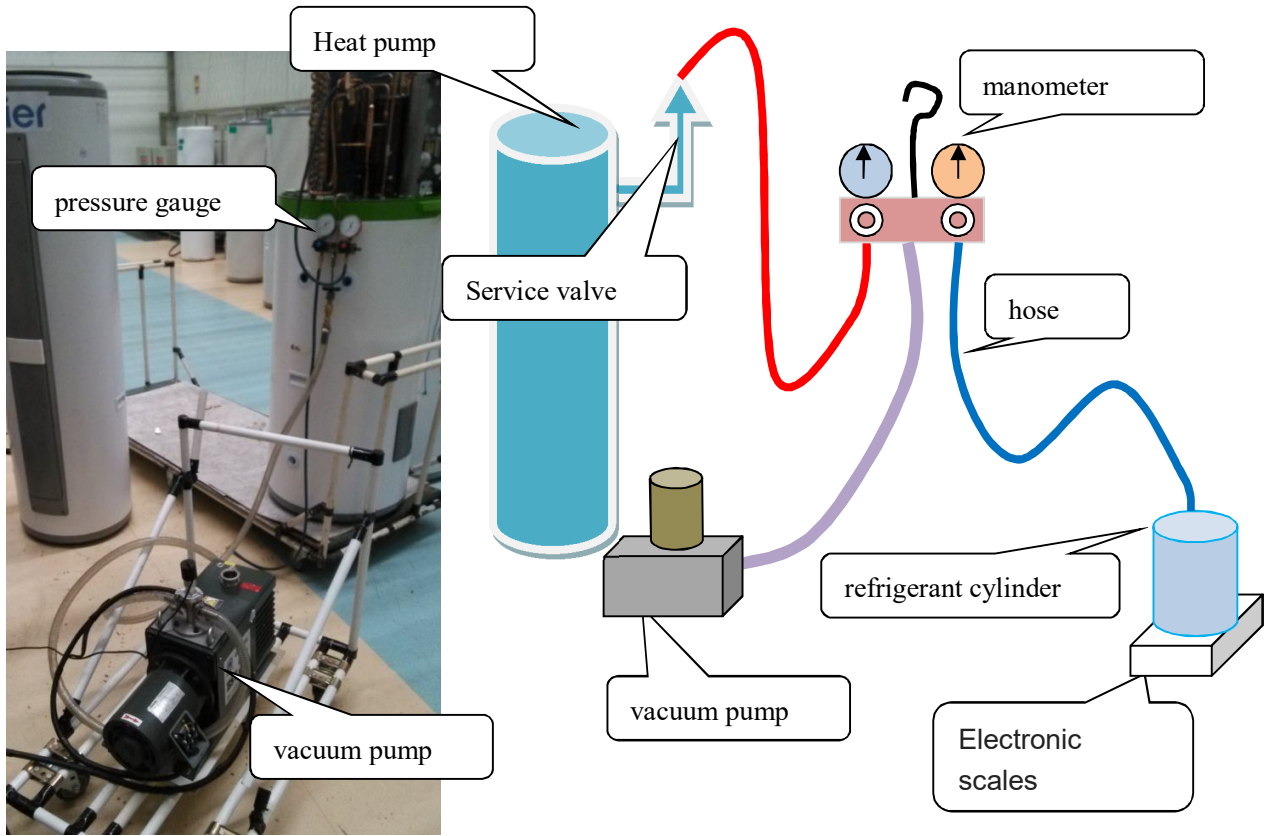


3. Making the vacuum & Gas Charging:










Bleeding from the circuit should take place with a vacuum pump and pressure gauge assembly suitable for R134a.

Make sure the vacuum pump is full of oil up to the level indicated by the oil gauge.

1. Connect the manometer on the low pressure service valve of heat pump, and connect the refrigerant cylinder to the other side the manometer.
2. Connect the vacuum pump to the center tap of the manometer.
3. After opened the valves of the vacuum pump, start it and let it run. Create a vacuum for about 20 / 25 minutes;
4. Close the valves of the pump and shut off. Verify that the gauge needle does not move for about 5 minutes.
5. Disconnect the vacuum pump;
6. Open the container of the refrigerant then open the main valve cap pressure gauge and adjust the needle valve until you hear the coolant leak, and release the pin and close the valve of the pipe;
7. Keep under control the weight of the refrigerant tank through the electronic scale;
8. Open the ball valve and to flow the refrigerant gradually;
9. After reaching the mass of gas to be loaded close the tap(0.9kg);
10. Remove the manometer and charging hose from the valve;
11. turn the product in heat pump mode with the detector and check for leaks of refrigerant;
12. Remove the container from the manifold and replace all the equipment.



10. Repairs common tools

Tools Name	Quantity	Illustration
Spanner	2pc	
Hexagon Spanner	1pc	
Flathead screwdriver	1pc	
Phillips screwdriver	1pc	
Needle-nose pliers	1pc	
Measuring tape	1pc	
Pressure gauge	1pc	
Vacuum pump	1pc	
Electronic scale	1pc	
Bending device	1pc	