User manual

Direct-Current Frequency Conversion Heater

AVH-24V1DE

AVH-30V1DE

★Before operating this product,please read the instruction carefully and keep this manual for future use!

Catalogue

1.Before use

2.Installation

3.Useage

4.Maintenance

5.Appendix

1. BEFORE USE

Attention

Thank you for choosing the product. In order to operate this product well and to prevent accidents due to misoperation, please read carefully this user manual before carrying out any installation or operation. Please pay special attention to the warning, prohibition and attention instructions. We will continuously upgrade this user manual for better service !

1.1 List of accessories

The accessories below are delivered together with the product .
Please check in time. If there is any shortage or damage, please contact local distributor.

Model:AVH-24V1DE	
Name	Quantity
User's manual	1 piece
Air purging valve	1 piece
Location carboard	1 piece
Expansion bolts	2 piece
Screws	10 piece

Model:AVH-30V1DE	
Name	Quantity
User's manual	1 piece
Safety kit	1 piece
Location carboard	1 piece
Expansion bolts	2 piece
Screws	10 piece
Drain pipe	1 piece

1.2 Symbol description

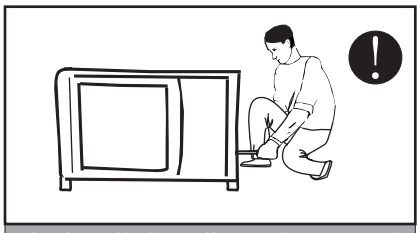
The following symbols are very important. Please be sure to understand their meaning, which concerns the product and your personal safety.

Warning Caution Prohibition

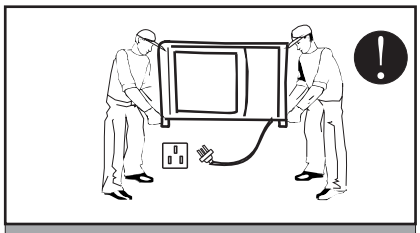
1.3 Safety precautions

This appliance is not intended for use by persons, including children, with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

1. BEFORE USE

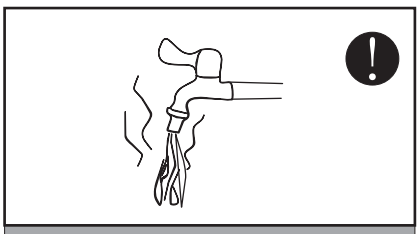


The installation, dismantlement and maintenance of the unit must be performed by qualified personnel. It is forbidden to do any changes to the structure of the unit. Otherwise injury of person or unit damage might happen.

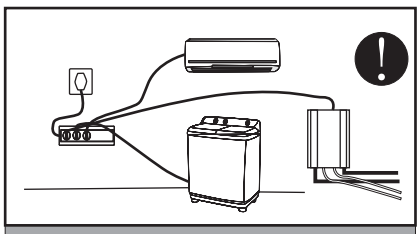


Make sure the power supply to the heat pump unit is off before any operations are done on the unit.

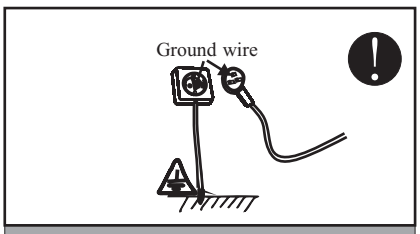
Be sure to read this manual before use.



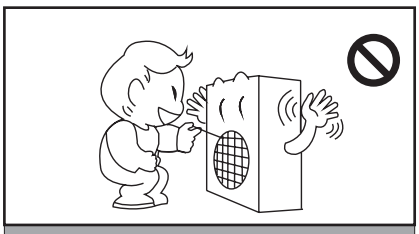
Before taking shower, please always add a mixture valve before water tap and set it to proper temperature.



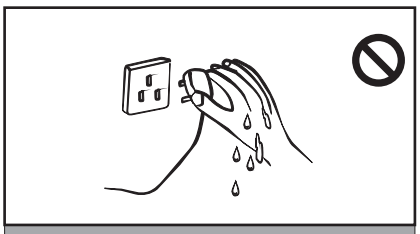
Use a dedicated socket for this unit, otherwise malfunction may occur.



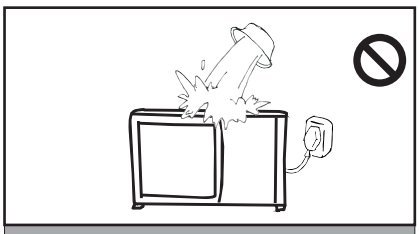
The power supply to the unit must be grounded.



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



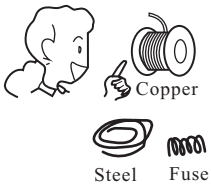
Do not touch the power plug with wet hands.Never pull out the pulg by pulling the power cable.



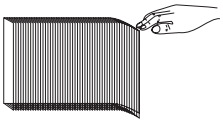
Water or any kind of liquid is strictly forbidden to be poured into the product, or may cause creepage or breakdown of the product.

1. BEFORE USE

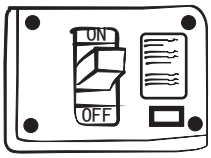
When the power cord gets loose or is damaged, always get a qualified person to fix it.



Please select the correct fuse or breaker as per recommended. Steel wire or copper wire cannot be taken as substitute for fuse or breaker. Otherwise, damaged maybe caused.

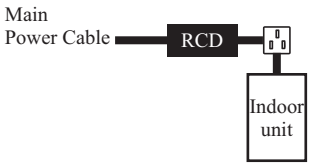


Be aware finger might be hurt by the fin of the coil.

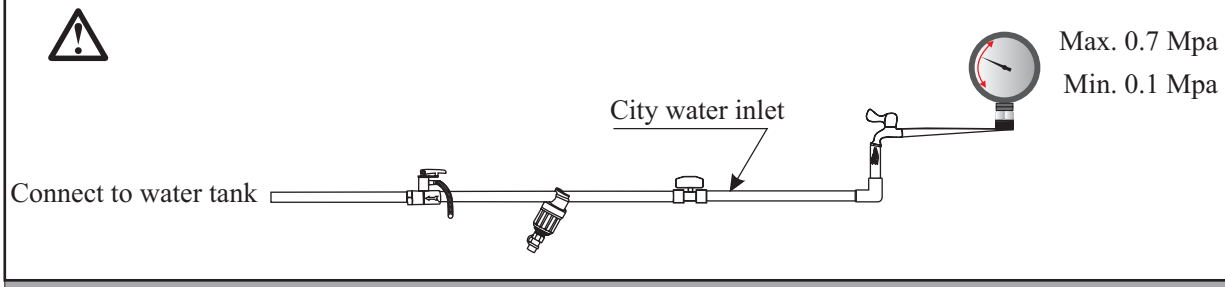


It is mandatory to use a suitable circuit breaker for the heat pump and make sure the power supply to the heater corresponds to the specifications. Otherwise the unit might be damaged.

Disposal of Scrap Batteries --- Please discard the batteries as sorted municipal waste at the accessible collection point.



Installation of a residual current device (RCD) having a rated residual operating current not exceeding 30 mA is advisable.



The maximum inlet water pressure, in pascals: 0.7Mpa.
The minimum inlet water pressure, in pascals, if this is necessary for the correct operation of the appliance: 0.1Mpa.

1. BEFORE USE

1.4 Features and advantaged

★ This unit using the latest DC inverter techology.It can adjust its working frequency,so to give out its output according to the loading.It can work down to -25℃ with good COP.

★ The unit is designed with easy installation that no refrigerant charging or copper pipe brazing is required on site.It can be widely used in house and villa.

★ The unit is with environment-friendly refrigerant R410A,which also provides one of the highest energy effciency ratings in the industry.Output of the compressor and therefore the energy input requirements are constantly monitored and adjusted at the most optimum level for the given indoor and outdoor environmental conditions,and the user's desired demands from the system.

★ Microprocessor control system contains several enhanced software features to make the

operation of the system most advantageous and pleasing,under varying environmental conditionds.

★ Special vibration absorbers on the compressor allow operation of the system with ultra low noise.

★ Microprocessor is programmed to allow operation under wide range of input voltages from 160V-260V and soft starting with lower current draw at each compressor start-up.

★ Auto-restart function keeps all settings in memory and automatically resumes the operation after a power failure.

★ Compressor crankcase heater and bottom plate heater are available as options for extreme cold conditions,enabling the unit to work in very low ambient temperatures with much lessened defrost frequencies,Both these optional heaters are electronically controlled based on the outdoor ambient temperatures and a sophisticated logic.

★ Programmable timer function provides unattended operation of the system.

★ Acrylic coated enhanced aluminum fins on the coil heat exchanger extends the fin life against corrosion and allows easier rainwater wash-down as well as faster defrosts.

★ Copper tubing in all heat exchangers are made by the latest developments in the technology of inner grooved tubing by extending the area of heat exchange in a more compact coil,therefore increasing the operational efficiency.

1. BEFORE USE

1.5 Specifications

Type				AVH-24V1DE	
Power supply				220V~240V/50Hz/1PH	
Function				Cooling	Heating
Capacity	Cooling(heating)capacity		KW	2.34-5.05	4.3-10
			BTU/h	7984-17231	14672-34120
Electrical Specification	Max. allowable current		A	16	
	Running current		A	5.66-13.32	5.09-11.78
	Power input		W	1303-3201	1170-2708
	Power factor		%	99	
	Outdoor fan motor current		A	0.75	
Dimension	Indoor	LXDXH	mm	520X414X220	
	Outdoor	LXDXH	mm	934X354X753	
Weight	Indoor		Kg	27	
	Outdoor		Kg	62.5	
Working Condition	Ambient temp. range in cooling		℃	0～55	
	Ambient temp. range in heating		℃	-25～45	
	Water outlet temp.		℃	7～52	
Others	Noise	Indoor	dB(A)	29	
		Outdoor	dB(A)	54	
	Fan speed	Outdoor	rpm	780	
	Refrigerant		Kg	1.57/R410A	
	Room temp. sensor		KΩ	5K(25℃)	
	Indoor coil temp. senor		KΩ	5K(25℃)	
	Outdoor temp. senor		KΩ	5K(25℃)	
	Outdoor coil temp. senor		KΩ	5K(25℃)	
	Compressor discharge temp. sensor		KΩ	50K(25℃)	
	Indoor water flow		L/S	0.48	
	Indoor piping connection		Inch	G1	

Rated condition of test:

Cooling:water inlet12℃, water outlet7℃, outdoor dry bulb 35℃, wet bulb 24℃;

Cooling:water inlet30℃, water outle35℃, outdoor dry bulb 7℃, wet bulb 6℃;

The specifications air subject to change without prior notice.

For actual specifications of the unit,please refers to the specification stickers on the unit.

1. BEFORE USE

Type				AVH-30V1DE	
Power supply				220V~240V/50Hz/1PH	
Function				Cooling	Heating
Capacity	Cooling(heating)capacity		KW	2.17-6.74	4.56-11.5
			BTU/h	7404-22997	15582-39238
Electrical Specification	Max. allowable current		A	16	
	Running current		A	4.02-13.62	4.0-13.17
	Power input		W	924-3132	915-3028
	Power factor		%	99	
	Outdoor fan motor current		A	0.75	
Dimension	Indoor	LXDXH	mm	720X414X220	
	Outdoor	LXDXH	mm	1044X763X414	
Weight	Indoor		Kg	28	
	Outdoor		Kg	70	
Working Condition	Ambient temp. range in cooling		℃	0～55	
	Ambient temp. range in heating		℃	-25～45	
	Water outlet temp.		℃	7～52	
Others	Noise	Indoor	dB(A)	29	
		Outdoor	dB(A)	55	
	Fan speed	Outdoor	rpm	780	
	Refrigerant		Kg	1.9/R410A	
	Room temp. sensor		KΩ	5K(25℃)	
	Indoor coil temp. senor		KΩ	5K(25℃)	
	Outdoor temp. senor		KΩ	5K(25℃)	
	Outdoor coil temp. senor		KΩ	5K(25℃)	
	Compressor discharge temp. sensor		KΩ	50K(25℃)	
	Indoor water flow		L/S	0.48	
	Indoor piping connection		Inch	G1	

Rated condition of test:

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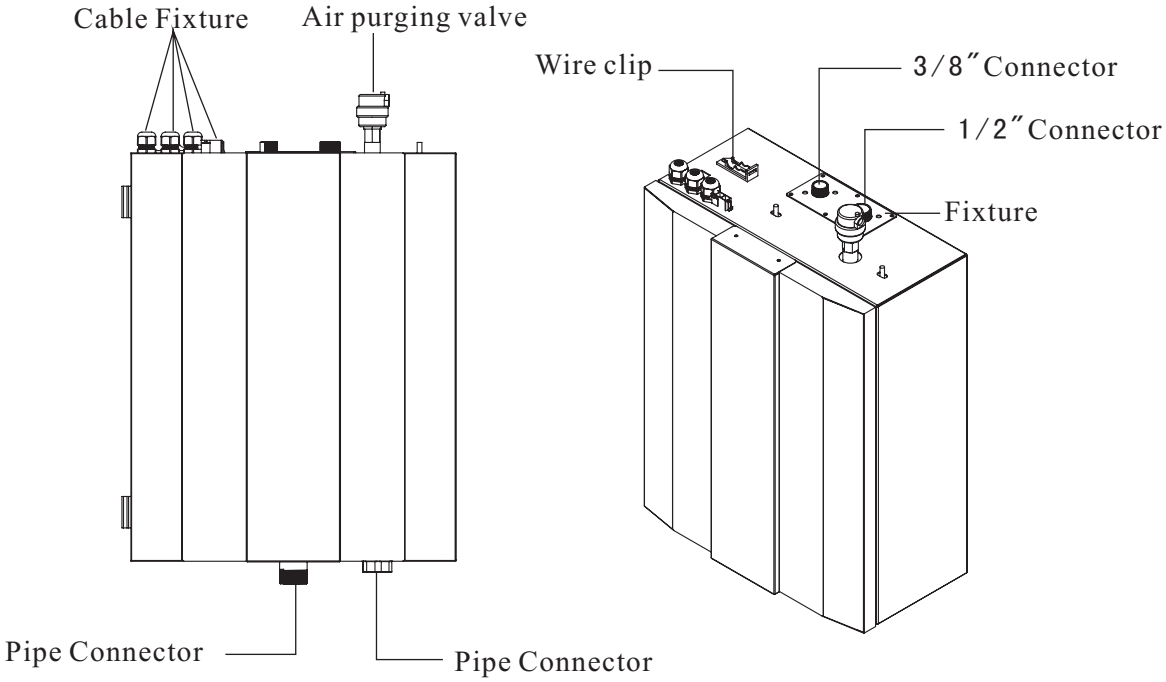
1. BEFORE USE

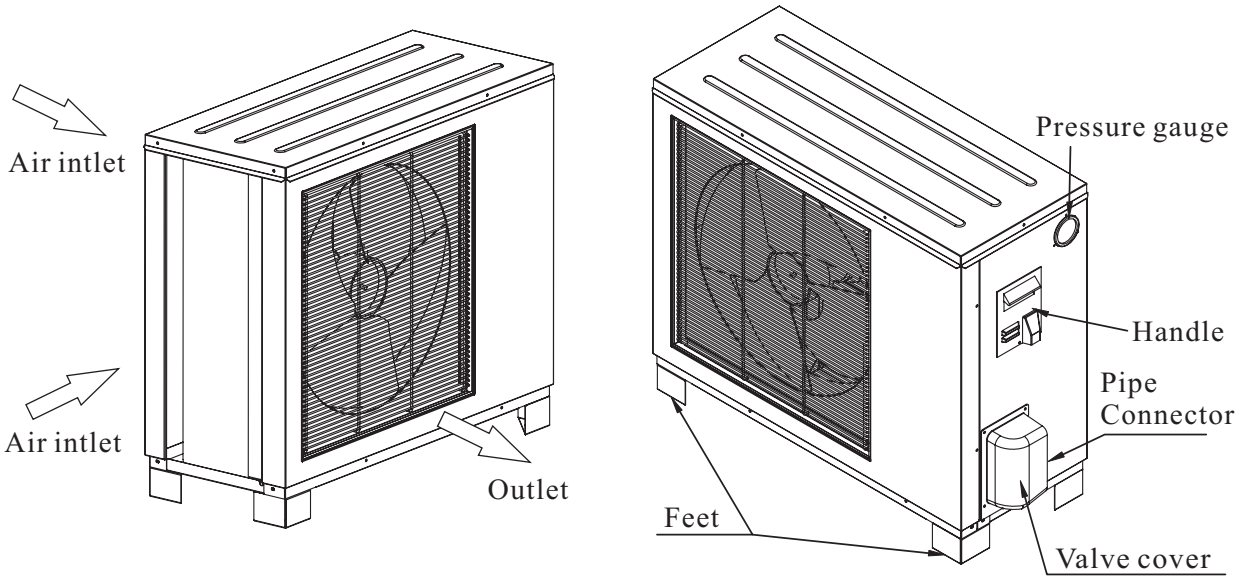
1.6 Part name

AVH-24V1DE

Indoor



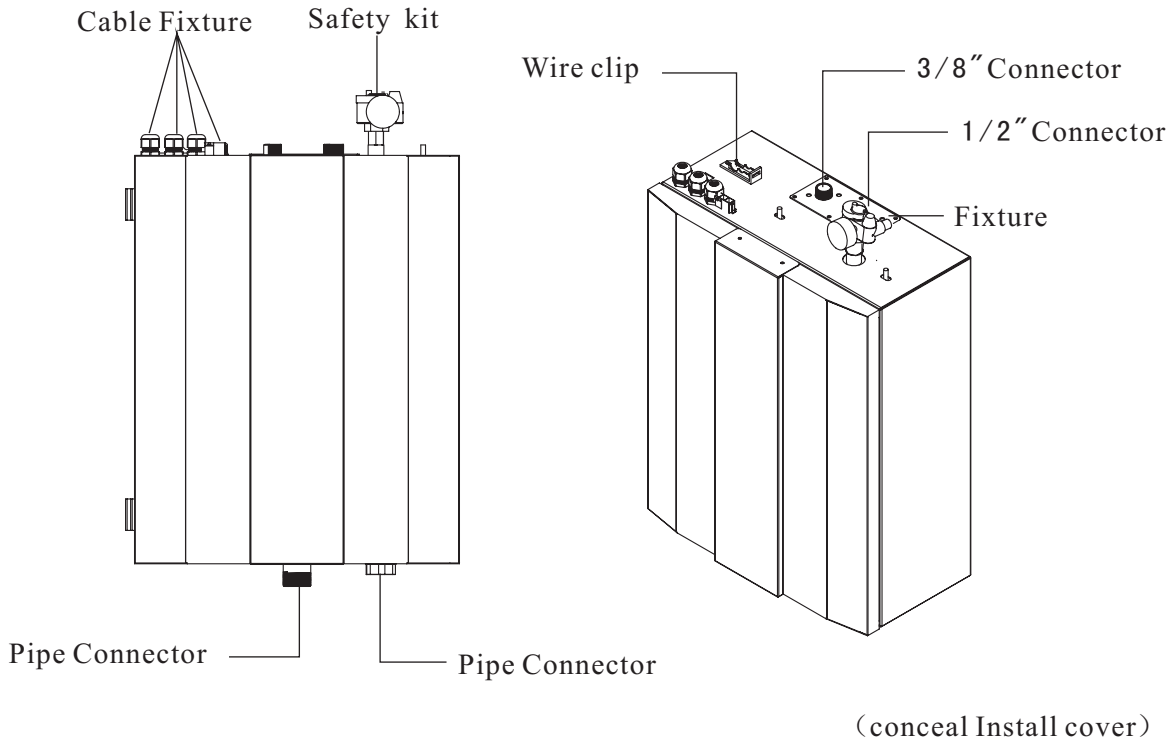
Outdoor



1. BEFORE USE

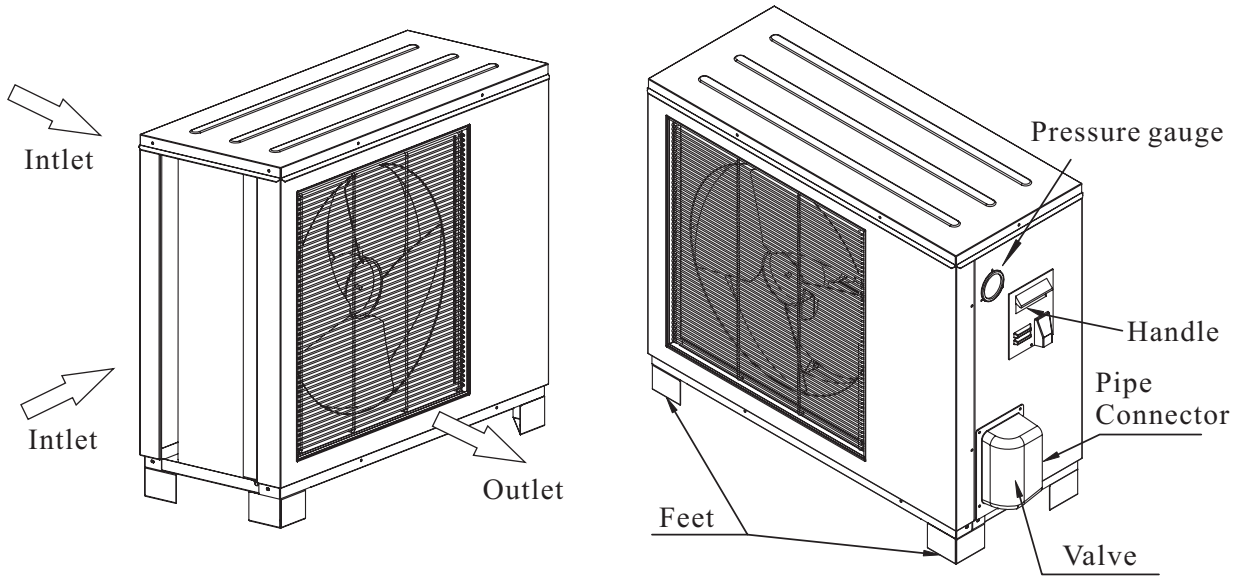
AVH-30V1DE

Indoor



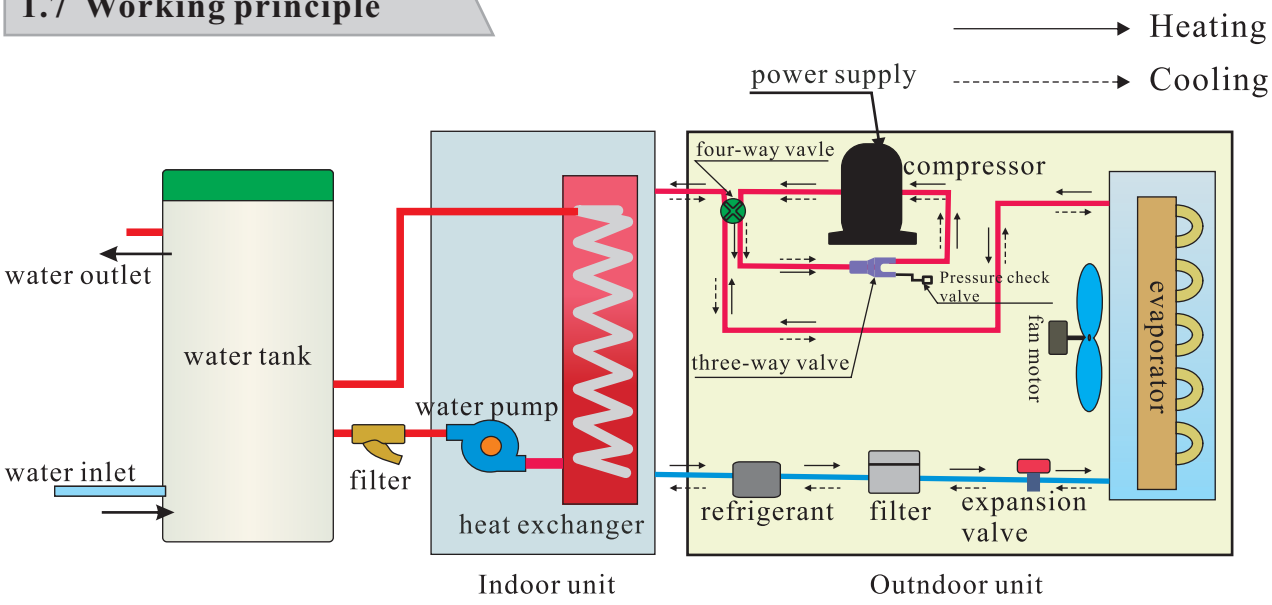
（conceal Install cover）

Outdoor



1. BEFORE USE

1.7 Working principle

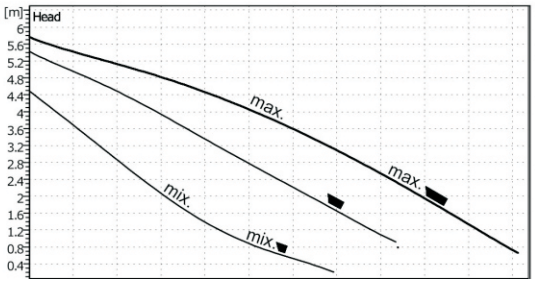


1.8 Setting the pump speed

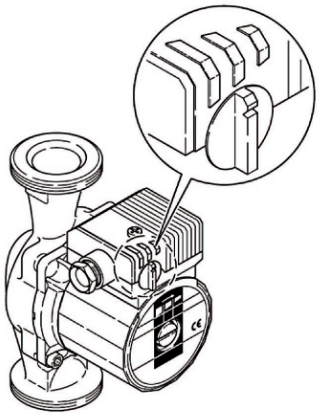
The pump speed can be selected on the pump.The default setting is highest speed.If the water flow in the system is too high(e.g.noise of running water in the installation) the speed can be lowered.

AVH-24V1DE

Performance curve of water pump

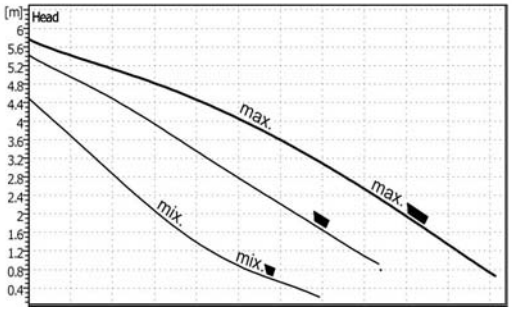


RS25/8



AVH-30V1DE

Performance curve of water pump

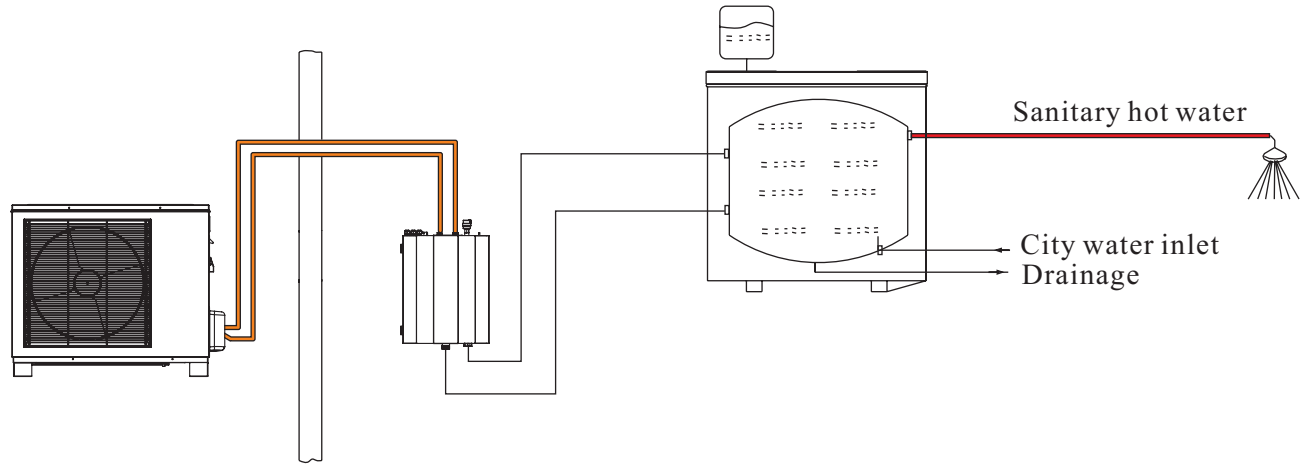


HEP25-6

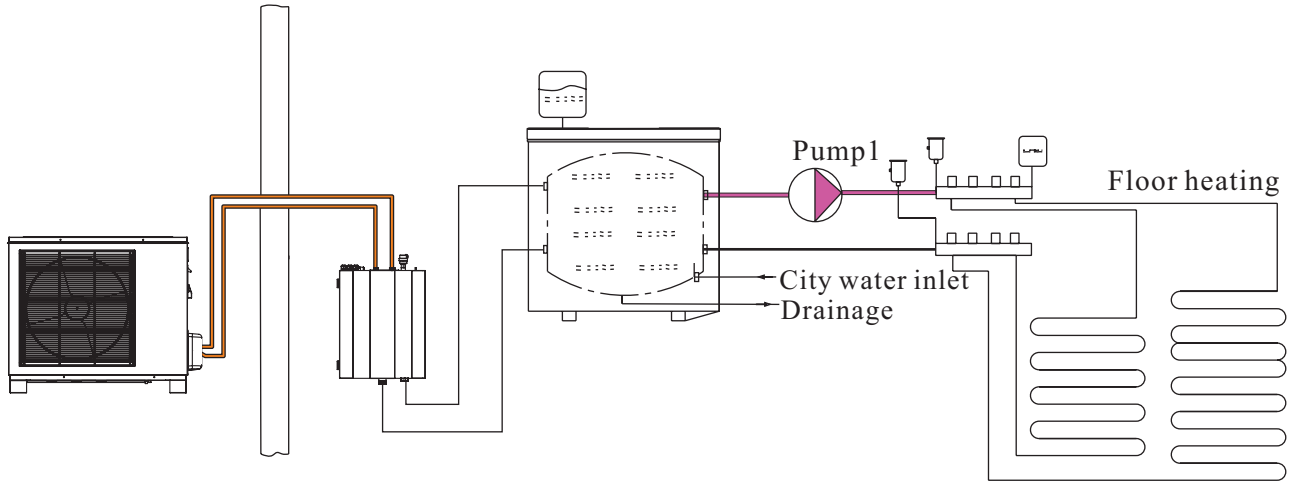
2. INSTALLATION

2.1 Installation methods

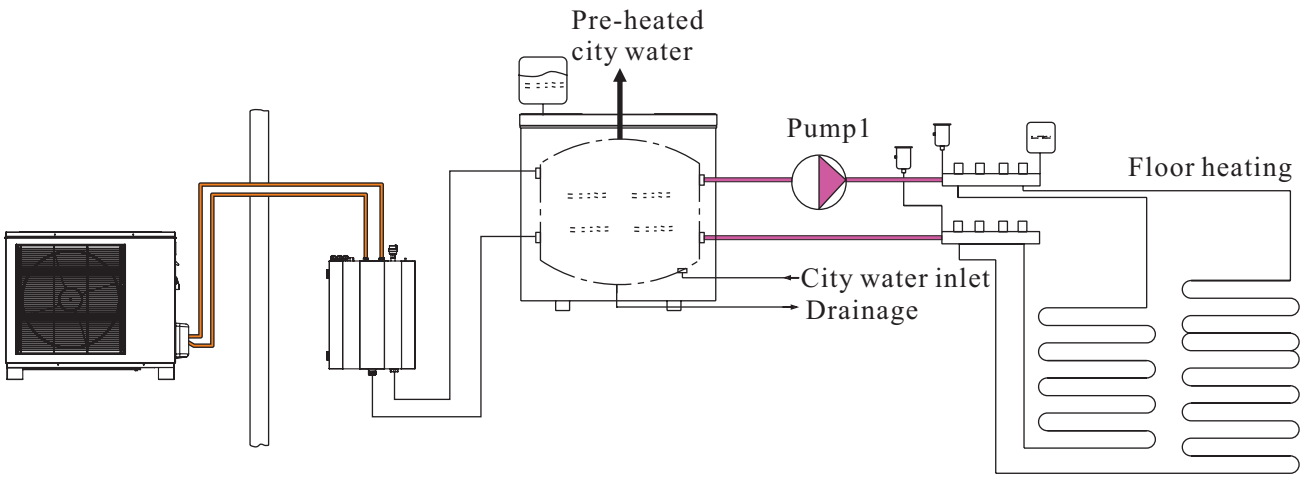
Application1:This installation is for supplying sanitary hot water only.



Application2:This installation is for supplying floor heating hot water only.

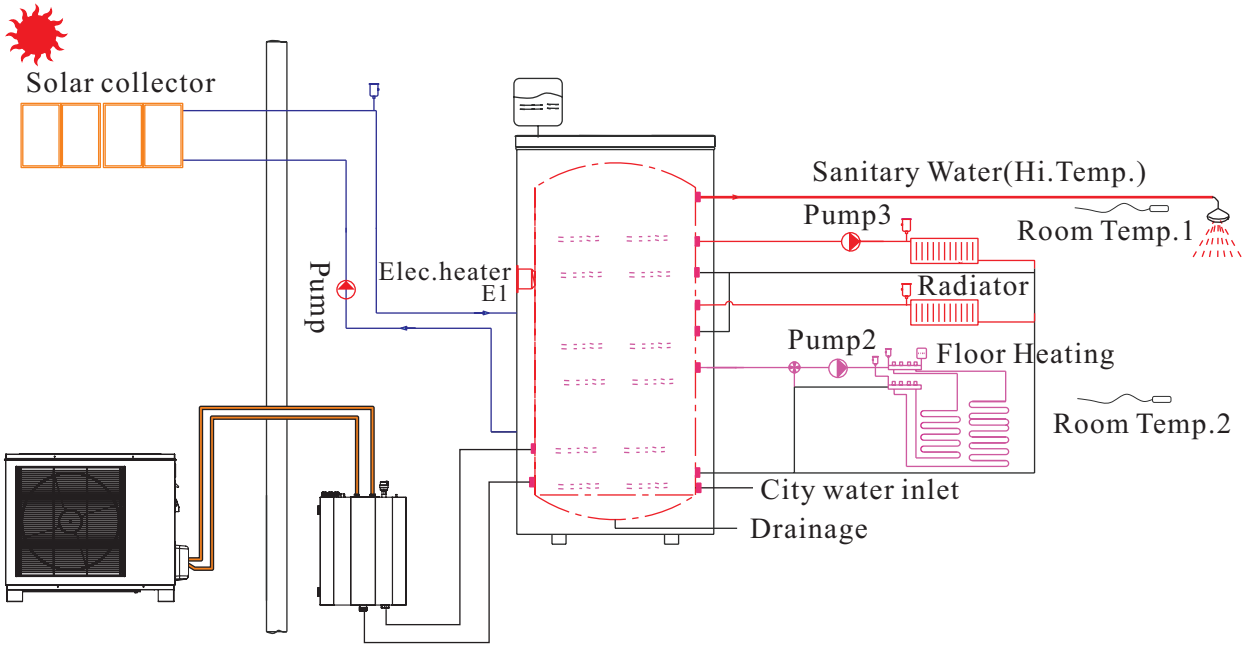


Application 3:It provides both floor heating hot water and pre-heated sanitary water.



2. INSTALLATION

Application4:It provides hot water for central house heating and hot water system.



Heat Pump and Solar System for Heating&Sanitary Water

2.2 Necessary tool for installation

tapeline

screw driver

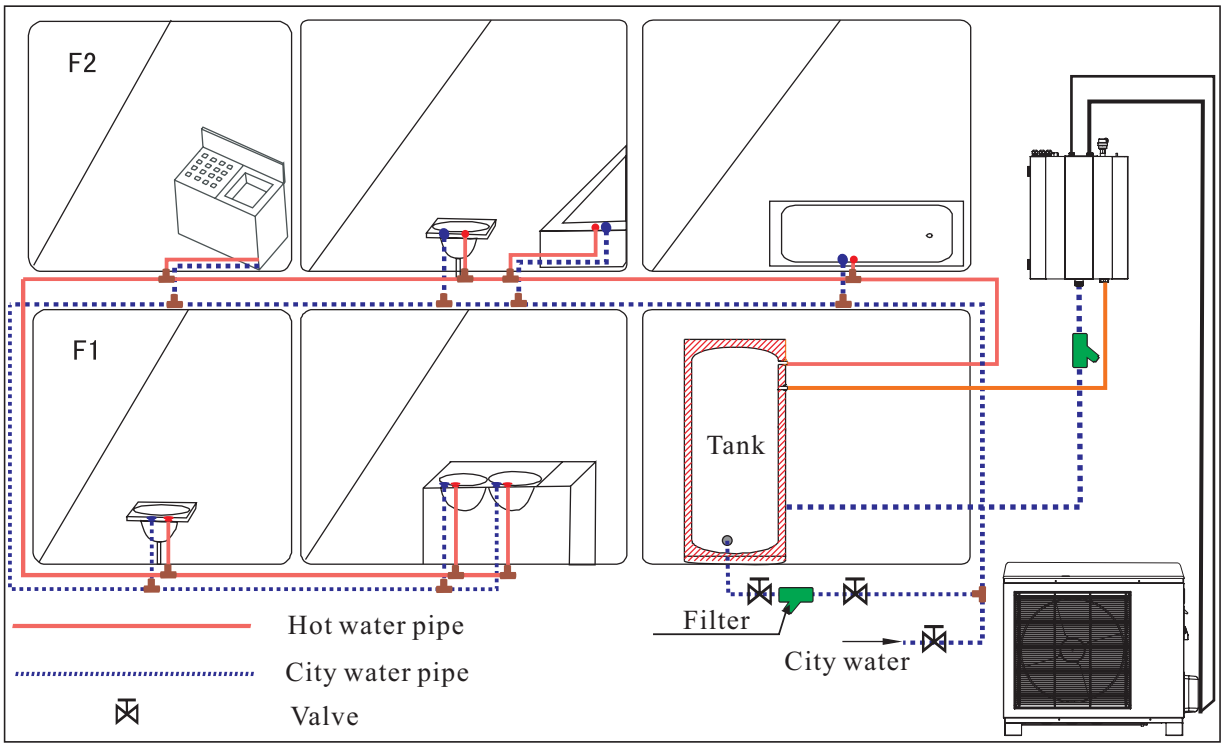
drill

Spanner

Scissors

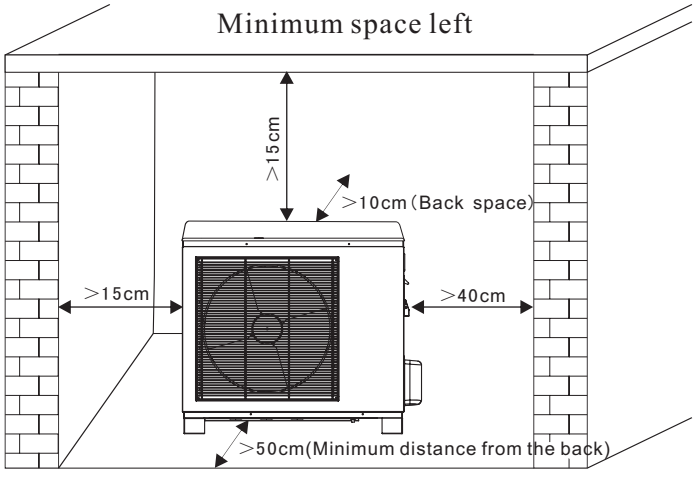
2. INSTALLATION

2.3 Installation precautions

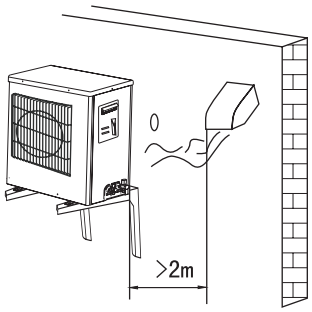


1.The installation,dismantlement and maintenance of the heat pump must be performed by qualified personnel.

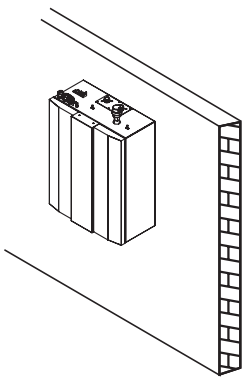
2.The unit must be installed outdoors in an area with sufficient clearance to provide free air citculation through the coil.Please refer to the following figure to choose the right place for the unit.



3.The outdoor unit should be placed at least 2M away from the ventilation outlet of kitchen,to keep the unit clean.



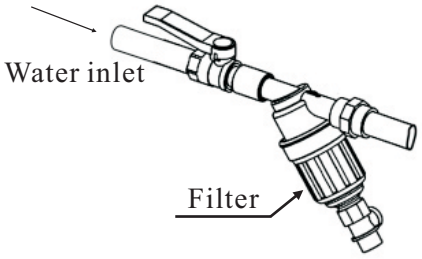
4.The indoor unit should be hung on the wall with the water connectors downwards.



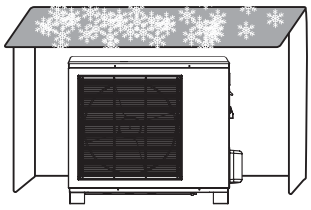
2. INSTALLATION

5.All the hot water pipe and water connections should be insulated,to reduce the energy loss.

6. A mesh filter must be installed in front of the water inlet of the unit and water tank, for keeping the water quality and collecting impurity contained in the water. Take care to keep the water filter mesh towards the bottom. Check valve is recommended to be installed at both sides of the filter, so as to clean or change the filter in a easier way.



7.Shield the unit from direct sunshine,rain or snow, but never cover the unit which will cause the bad ventilation.



8. Install the unit and water tank close to each other as much as possible to reduce the distance between them,so to reduce the energy loss

9.The unit should be free from corrosive and moisture surrounding.Otherwise the lifetime of the unit might be shortened.

2.4 Installation of indoor unit

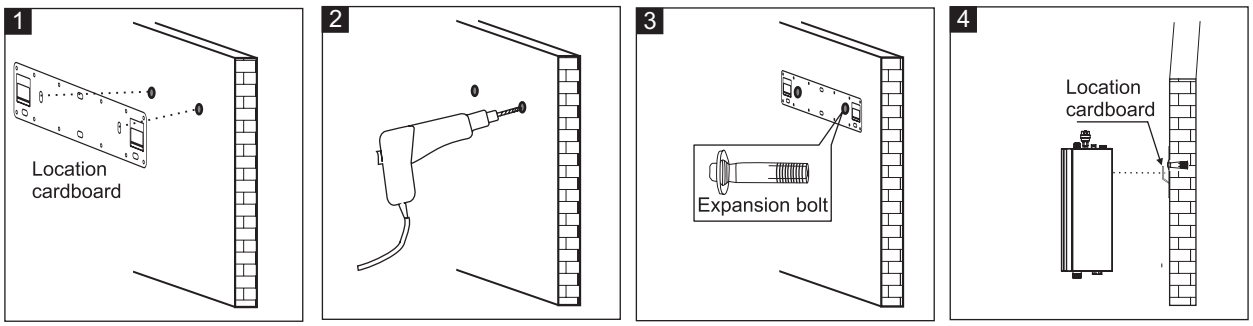
For the installation of the indoor unit, please refers to the followings:

1.Mark out the positions of the unit bracket on the wall.(refer fig.1)

2.Drill the holes on the wall.(refer fig.2)

3.Fix unit bracket with expansion bolts on the wall.(refer fig.3)

4.Then hand the indoor unit on the bracket.(refer fig.4)



Note:You must choose very firm wall for installation otherwise the bolts may get loose and cause unit damage!

2. INSTALLATION

2.5 Outdoor installation

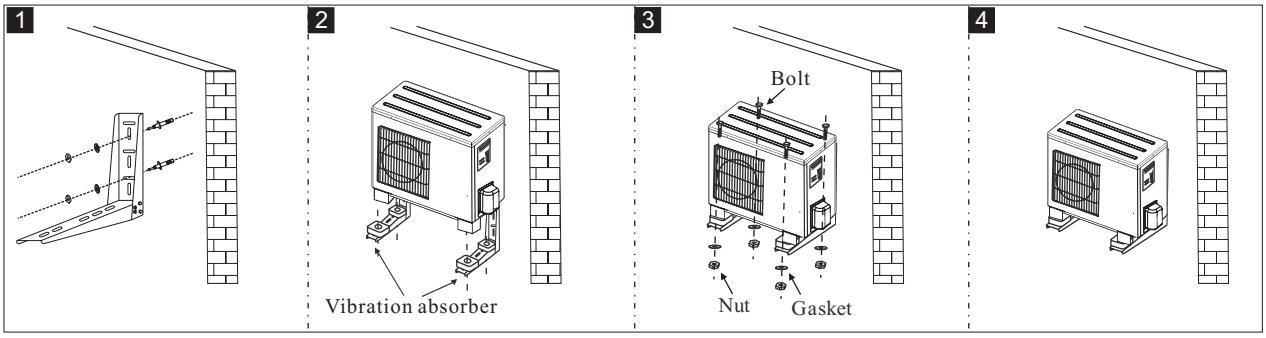
A:If needs to hang the outdoor unit on the wall, please do as followings:

1.Adjust the location of the wall brackets according to the distance between two feet of the unit.

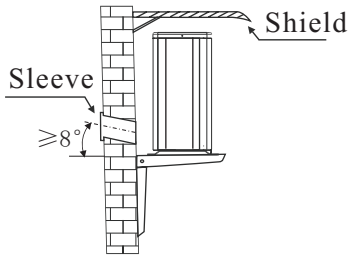
2.Fix the brackets on the wall with expansion bolts.

3.Place the outdoor unit on the brackets.A Vibration absorbers are recommended to reduce vibration and noise.

4.Fix the unit to the bracket.



▲ It is recommended to use a wall sleeve to guide power cable and piping kits go through the wall.



B:On a concrete stand

User can either use the dedicated mounting bracket from the supplier, or prepare a suitable bracket for the unit installation. Make sure the installation meets following requirements:

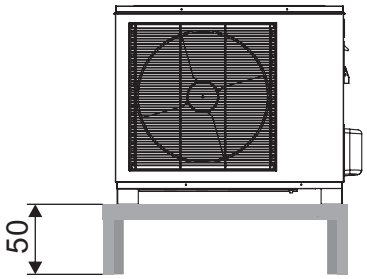
1. The unit must be installed on flat concrete blocks, or a dedicated mounting bracket. The bracket should be able to support at least 5 times of unit's weight.

2. All nuts must be tightened after the bracket is fixed; otherwise, it may cause damage to the equipment;

3.User should double check and make sure the installation of unit is firm enough.

4. The bracket can be of stainless steel, galvanized steel, aluminum and other materials as required by the user.

5. Besides the mounting bracket, the user can also install the outdoor unit on two concrete blocks, or a raised concrete platform. Please make sure that the unit is securely fastened after installation.



6.Please refer the dimension of outdoor unit when choose a suitable wall bracket.

2. INSTALLATION

2.6 Wiring

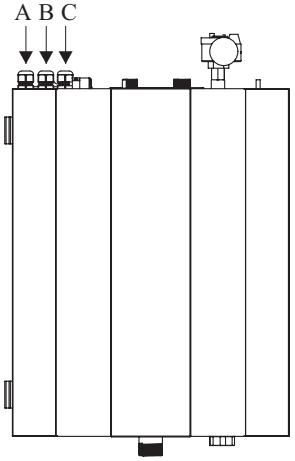
1.It is recommended to use a suitable breaker for the heat pump and make sure the power supply to the heater corresponds to the specifications.Otherwise th unit might be damaged.

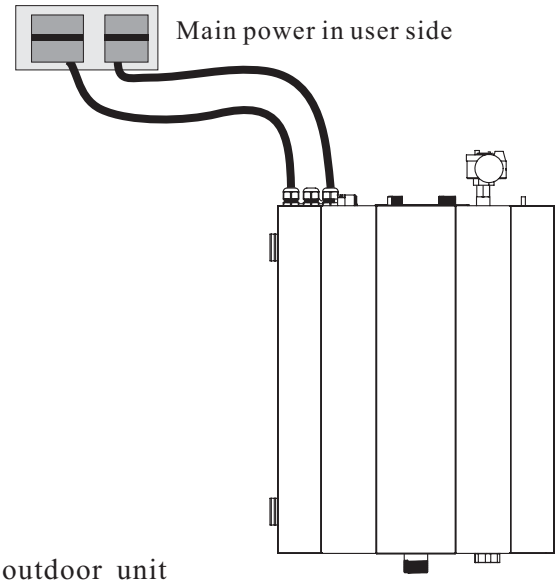
2.The power supply to the heat pump unit must be grounded.

3.Cable should be fixed tightly,to ensure it won't get lossen.

A : Main power cable and electric heater power cable

1.Main power cable and power cable of electric heater has connected into the terminal block of indoor unit. Please find these two cables on top of indoor unit according to the labels, and connect them to main power, as shown in the pictures below.

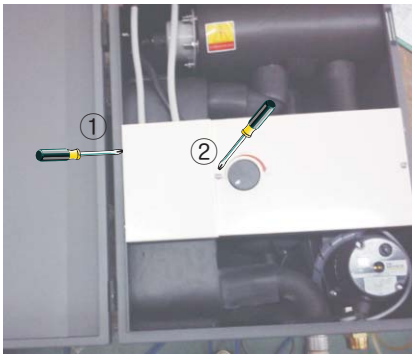


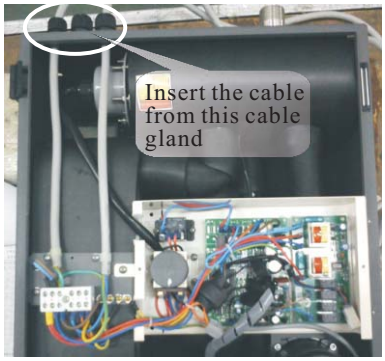


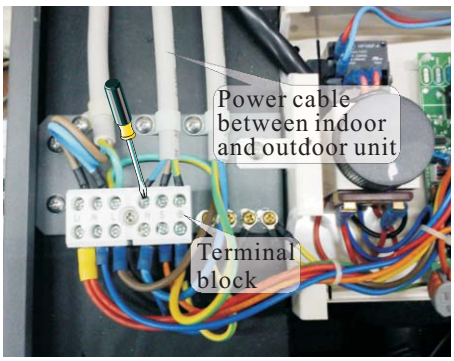
A: Power cable of electric heater
B: Main power cable
C: Power cable between indoor and outdoor unit

B:Power cable between indoor and outdoor unit

1.Open the indoor unit.
2. Prepare a power cable of 2.5mm2 and four cores with suitable length, insert the cable through cable gland on top of the indoor unit.
3. Connect the power cable to the terminal block according to the wiring diagram of indoor unit.
4. Fasten the cable with cable gland, to ensure it won't get loose.

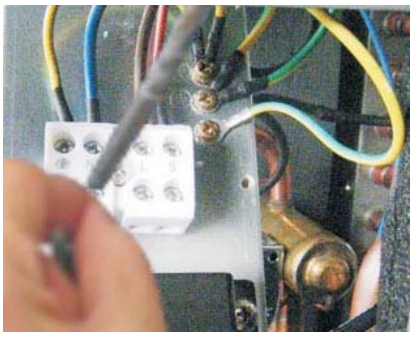
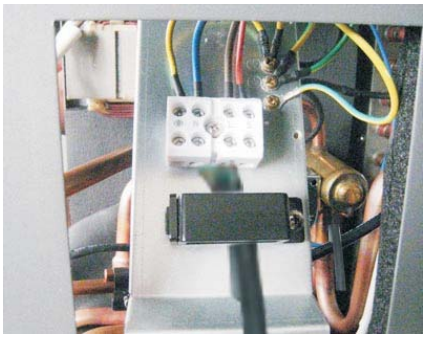






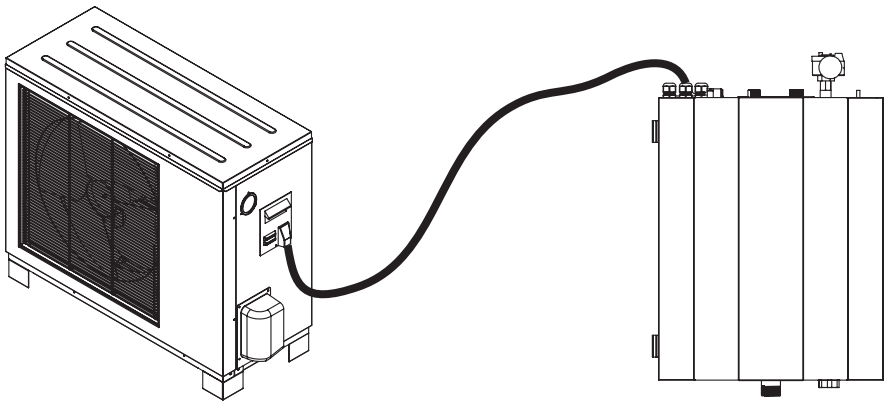
2. INSTALLATION

5.Take off the screw on the handle of the outdoor unit.
6.Connect the other side of the power cable to the outdoor unit,according to the wiring diagram.
7.Fix the cable with cable fixture,to ensure it won't get loose.
8.Wiring done!

When connecting the power cable between the outdoor unit and indoor unit, cables connected to the terminal block in indoor unit must match these in outdoor unit. For example, if the terminals and power cables are connected as ⏚→ yellow cable 、L→ red cable、N→blue cable 、S→black cable in indoor unit, the connections in the outdoor unit should be in the same way.

Installation sketch



2. INSTALLATION

2.7 Connection of refrigerant pipe

A:For the unit with quick connector

Begin routing from the indoor unit and straighten out the pipes as you go.On the pipe ends in the installation kit are cap nuts for connection to the cannot be installed incorrectly.Hold the connection in place with one spanner and tighten the cap nut with the other,as otherwise the connection can be damaged.

Conect the installation kit's pipes to the connections on the indoor unit.First screw together the screw connections by hand and then tighten using the spanners.Tighten the connection fully without stopping.A hissing noise can be heard.Hold the connection in place with one spanner and tighten the cap nut with the other.Tighten to at least 18Nm.Use a torque wrench if you are unsure Never turn the fixed connections.Use the spanner only as a counter hold during connection.If a counter hold is not used,the connections can turn,which can destroy them.Tighten the connections 24 hours after installation has been completed.

IMPORTANT:

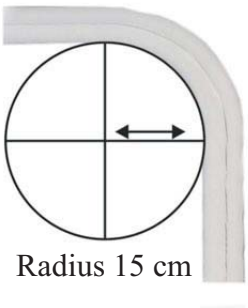
Note that the pipes in the installation kit are filled with gas and must not be cut under any circumstances.

The plastic plugs on the ends of the pipe must not be removed until the pipes are to be connected.

If the pipes are bent and causing leakage, the couplings must be loosened so that the non-return valves close.

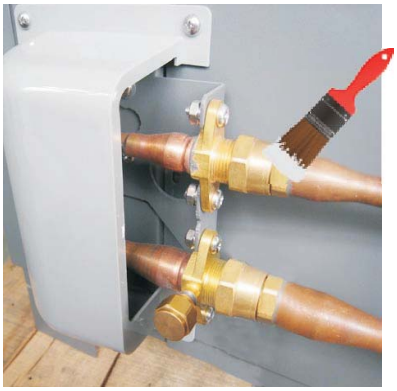
Route the pipes from the indoor unit and connect them in the same way to the outdoor unit.

Refrigerant pipes must not be bent to a radius of less than 15cm(check with a cardboard template).Route the electrical cable along the pipes.Bend the pipes carefully,a little at a time.Do not bend the pipes too sharply.



2. INSTALLATION

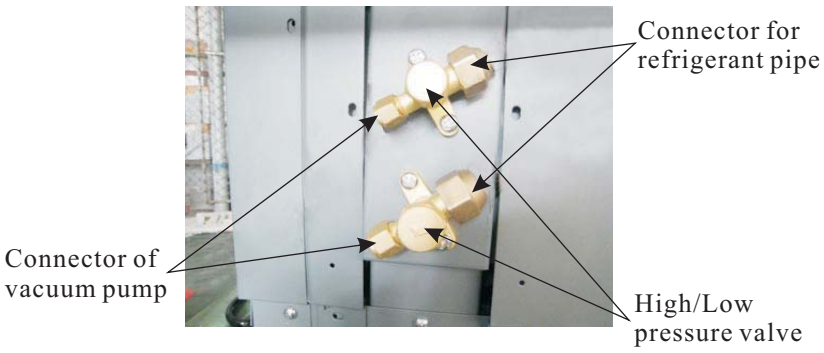
Connect the installation kit's pipes to the connections on the outdoor unit.First screw together the screw connections by hand and then tighten using the spanners.
Tighten the connection fully without stopping.A hissing noise can be heard.Hold the connection in place with one spanner and tighten the cap nut with the other.
Never turn the fixed connections.Use the spanner only as a counter hold is not used,the connections can turn,which can destroy them.Tigthen the connections 24 hours after installation has been completed.



Check the seals and tighten the couplings again 12-24 hours after installation. Check for leaks by wetting with soapy water. Also check the connections at the indoor unit. If no bubbles appear, the couplings are properly connected and tightened!

B : For the unit with flare nut connection

Note: When vacuuming the system,please don't turn on the high/low pressure valve. Otherwise refrigerant leaks.



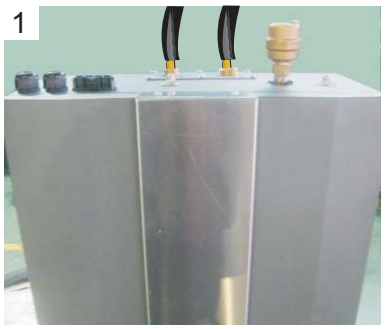
2. INSTALLATION

1.Connect the refrigerant piping to the indoor unit(refer fig.1).

2.Connect the other side of the refrigerant pipe to the the outdoor unit(refer fig.2).

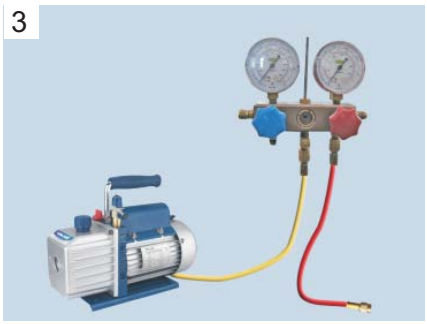
3.Prepare a vacuum pump and a pressure gauge, connect one tube of the pressure gauge to the vacuum pump.(refer fig.3).

1



2

3



4. Connect the other tube of the pressure gauge to the outdoor unit.(refer fig.4).

5. Open pressure gauge, and start the vacuum pump to vacuum the unit for around 10 minutes. When the pressure gauge shows negative pressure, close the pressure gauge and stop vacuuming (refer fig.5).

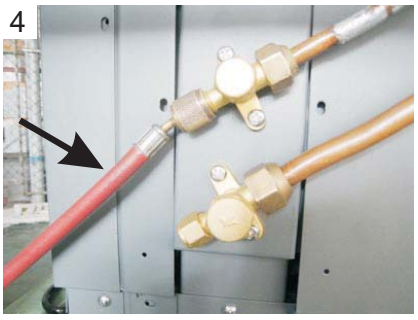
⚠ Attention:The liquid valve can't be opened until the vacuumizing has been totally finished.

6.Ture off the vacuum pump and install the cooper nut back to the high pressure connector (refer fig.6).

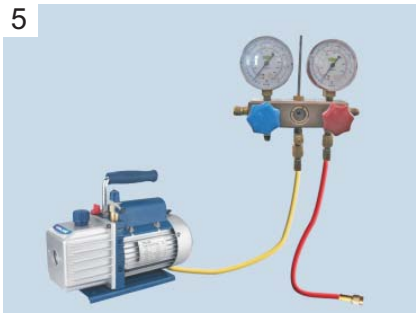
7.Use a 5mm hex wrench to open two valves on the unit as shown in the picture(refer fig.7).

8.Check with leakage detector or soap water if there is any leakage. If not , then put back the copper nuts onto the valves(refer fig.8).

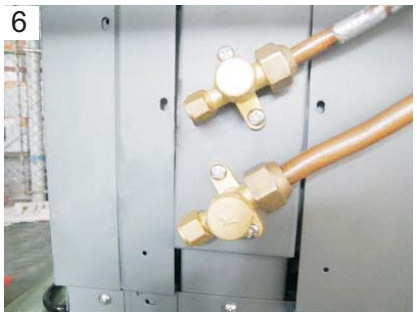
4



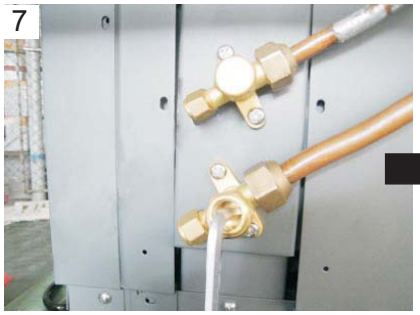
5

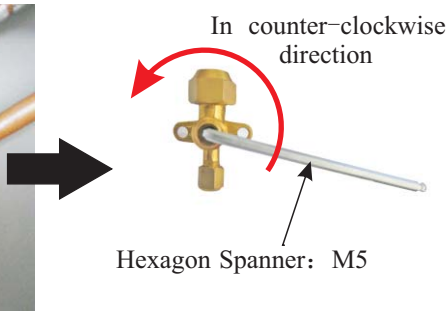


6

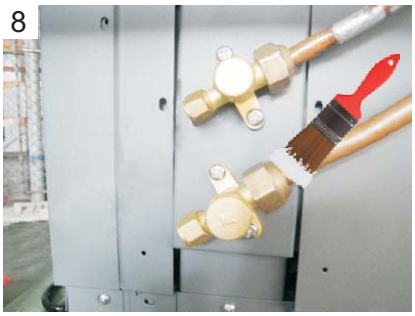


7





8



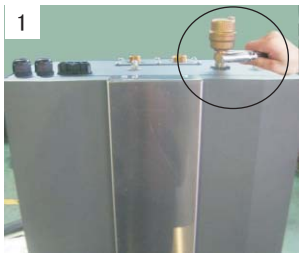
2. INSTALLATION

2.8 Installation of air purging valve

AVH-24V1DE

Screw the air purging valve into the connector, and tighten it with a wrench, as shown in fig.1.

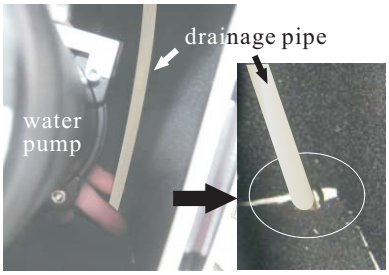
Note: Loosen (not take off) the black cap as shown in fig. 2 for air purging, and screw it back after air purging work finished.



2.9 Installation of safety valve kit

AVH-30V1DE

1.Have the drainage pipe packed with the unit goes through the indoor unit as shown in the pictures.



2.Put the safety valve kit into the connector and tighten it. Be sure that the gauge is facing to the front of the indoor unit. Tighten it with a wrench.

3.Add the cover for the safety valve kit back, and connect the drainage pipe to the valve kit as shown in the below pictures.

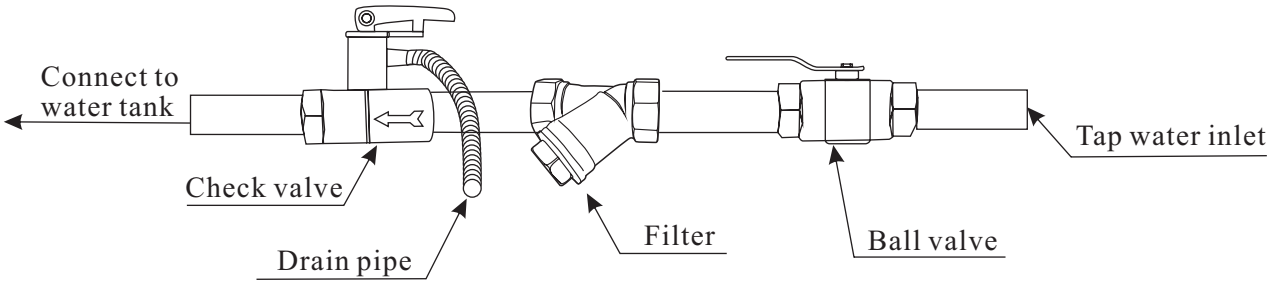
2.Installation

2.10 Water pipe connection

After installing the unit,please connect the water inlet and outlet pipe according to the local regulations.Please carefully select and operate the water pipe.
After connection,the water piping should be pressure tested,cleaned before use.

【Filter】

A mesh filter must be installed in front of the water inlet of the unit and water tank, for keeping the water quality and collecting impurity contained in the water. Take care to keep the water filter mesh towards the bottom. Check valve is recommended to be installed at both sides of the filter, so as to clean or change the filter in a easier way.



【Insulation】

All pipes running hot water should be well insulated. The insulation must be tied up tightly without gap (But please don't wrap up the check valve for future maintenance).

Please ensure enough water pressure to send the water to the required height.
If the water pressure is not enough that cause the system has too small water flow rate, please add water pump to increase the pumping head.

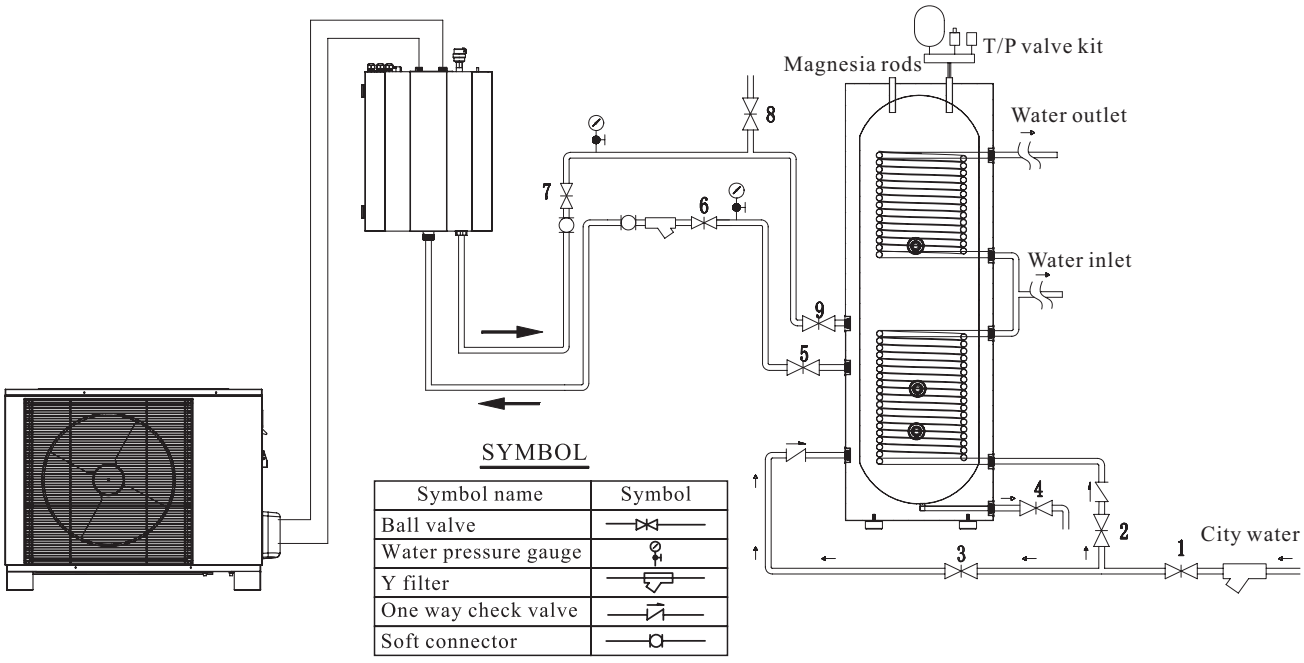
【Requirements of water quality】

1. Chloridion element in the water should be less than 300ppm(temperature is less than 60℃)
2. PH value of water should be from 6 to 8.
3. The water with ammonia can't be used for the unit.

If the water quality is bad, or water flow too little, scale formation or clogging may happen after unit running for a long time, then the efficiency of cooling or heating will be low or the unit will work abnormally.
Please clean water before use or use purified water. Make sure the water quality is good enough to keep the unit long-term running in high efficiency.

2. INSTALLATION

2.11 Air purging



【Air purging of water system】

1.Open ball valve 3,5,6,7 and 8,close ball valve 2,4 and 9.

2.Open ball valve 1,making the tap water come into the water tank unitl water come out from ball valve 8 and T/P valve kit.

3.Close ball valve 8 and open ball valve 9,then air purging finishes.

【Air purging of hot water pipingsystem】

After finish the air purging of water system,open ball valve 2 until water come out from water outlet 1 and 2.

【Note:】

1.The above application illustration just shows hot water piping.

2.The above application illustration is just for reference.Different installation application has different operations for air purging.But the theory is the same.Check the water flow direction,open the valves to fill the water tank and all the pipings with water.Use the air purging valve in the system to discharge the air till water comes out from the air purging valves.Close the air purging valves,then the air purging finish.

2. INSTALLATION

2.12 Test run

【Pre Start-up】

Before starting up the unit,a certain number of verifications must be performed on the installation to ensure that the unit will operate under the best possible conditions.The check list below is not exhaustive and should only be used as a minimum reference basis:

1.Make sure fan rotates freely;
2.Inspect all water piping for flow direction;
3.Verify all system piping is correct for operation as per installation requirements;
4.Check voltage of the unit power supply and make certain voltage is within authorized limitations;
5.Make sure the unit is properly grounded;
6.Check the presence of protective and breaking devices;
7.Check all electric connections for tightness.
8.Check all piping for leaks and air is well ventilated.

If everything above is OK, the unit can start up.
If any of them fails, please fix it.

【Pre-start up】

A. When the installation of unit is completed, water system pipes are well connected and air purging is done, no leakage or other problems, the unit can be powered to start up.

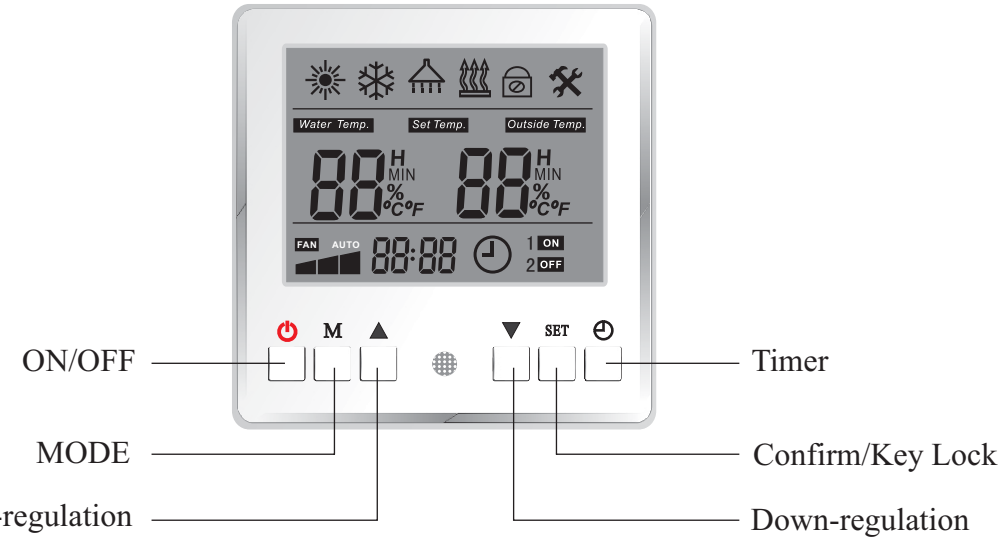
B. Turn on the unit, press the on-off button on the operation panel to start the unit. Please check carefully if there is some abnormal noise or vibration, or the display of wired controller is normal or not.

C. After the unit is working properly for 10 minutes, without any problem, then the pre-start up is completed; If not, please refer to the Service and Maintenance chapter in this manual to solve the problems.

It is suggested not to run "heating" or "hot water" mode, when ambient temperature is over 32 ℃, otherwise unit may go into protection mode easily.

3.USEAGE

3.1 Introduction of operation panel



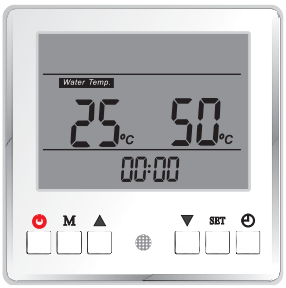
Display	Meaning	Function
	Heating	When the unit works in heating mode, is ON.
	Cooling	When the unit works in cooling mode, is ON.
	Hot water	When the unit works in hot water mode, is ON.
	Defrosting	When the unit works in defrosting, is flickers.
	Key lock	When buttons are locked, is ON.
	Parameter setting	When parameter setting is activated, is ON.
88	Value or code	To display temperature,timer,parameter,error code and so on.
88:88	Time	Timer will be shown here in 24 hours after setting. Set value will be saved and recover automatically after repower.
Water Temp.	Water temperature	When water temperature mode is activated, Water Temp. is ON.
Set Temp.	Set temperature	When changing the set temperature, Set Temp. is ON.
1 ON 2 OFF	Timer function	When timer function is activated, is ON.
%	Too low water temperature protection	If water inlet temperature is too low in heating mode, "%" is ON and unit works with limited compressor speed (for some models only).
H	Fixed defrosting interval time	When unit is set to fixed defrosting interval time model, "H" is ON.
	Compressor speed	: Low speed; : Medium speed; : High Speed

3.USEAGE

3.2 Operation instruction

Standby

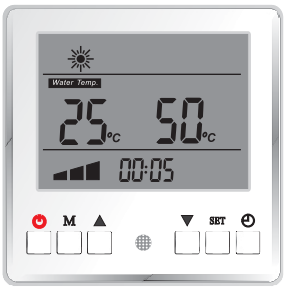
The unit is standby when it is fed with power.



ON/OFF

When the unit is standby,press ⏻ to turn on the unit.
The unit will work in its last working mode.
Press ⏻ again to turn off the unit.

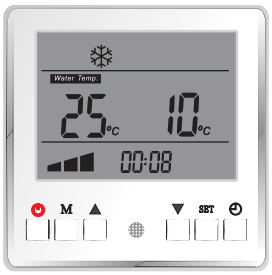
☆After repower the unit, unit will recover to heating mode automatically. Please change the setting to what you need, if needed.



Mode selection

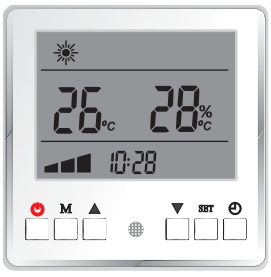
Press M to choose the unit operation mode.It comes in the sequence:

→Heating ☀ →Hot water ❄ →Cooling ⌂ →



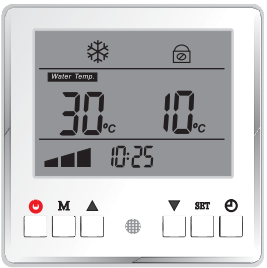
Too low water protection

When the unit work in heating model,if inlet water temperature is too low, in order to protect compressor, compressor will work with limited speed,with "%" shown on the display.



Key lock

When unit is powered,press SET for 5 seconds,to lock all the buttons,with 🔒 shows.Press SET for 5 seconds again, to unlock all the buttons.

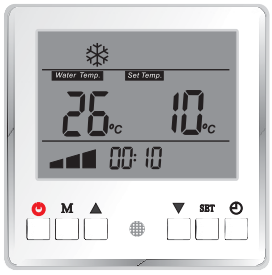


3.USEAGE

Temperature setting

When the unit is ON,press ▲ once,the set temperature incteases by 1℃;press ▼ once, the set temperature decreases by 1℃. Keep on pressing ▲ or ▼ ,the temperature can be increased or decreased by 5℃.

When changing the set temperature, Set Temp. is ON.

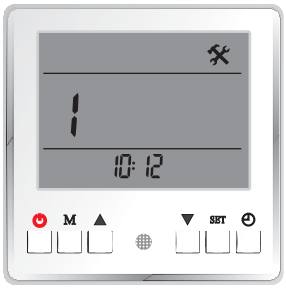


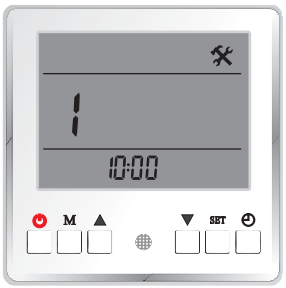
Note:Press ▲ or ▼ at unit standby mode for parameter inquiry.

Parameter setting

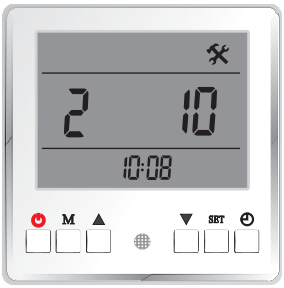
When power is fed and unit in standby mode press ▲ or ▼ to choose target Parameter.

Press SET to activate parameter setting process when parameter flickers.User can set its value with button ▲ or ▼;Press SET again to confirm the setting work:otherwise the setting Value will not be saved,and the system will exit this parameter setting program automatically in 10 seconds,or by pressing 🕘.

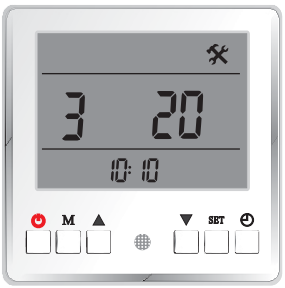




Parameter 1
Parameter 1 indicates the local time.The time is always presented in the 24-hour system.



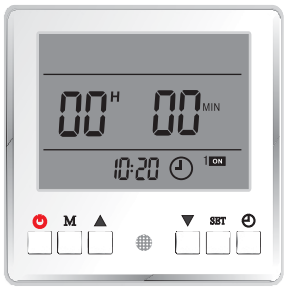
Parameter 2
This parameter has no function in this unit.



Parameter 3
Parameter 3 indicates the duration time for back light.It can be set to 00,10,20,and 30. While 00 means the back ligh is always ON,and 10,20,and 30 means the duration time for back light is 10 seconds,20 seconds and 30 seconds.

3.USEAGE

Timer function



To set the ON timer, press ⏲ button, ⏲1 ON shown on the display. Press ▲ to set the timer in hours, and press ▼ to set the time in minutes. Confirm ON timer setting by pressing SET. Press ⏲ again to activate OFF timer setting and the value can be adjusted in the same way. After done, confirm OFF timer setting by pressing SET .

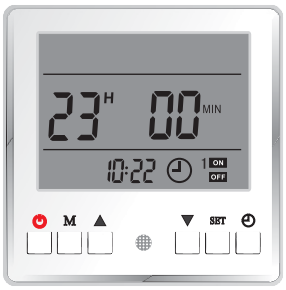
After timer setting done, press ⏲ button again to set the set temperature in timer working period. Set value can be adjusted by pressing ▲ and ▼. Confirm settings by press SET . Press ⏲ again at this moment, system can enter into second ON OFF timer setting, with ⏲1 ON 2 OFF shown on the display.

Confirm the settings by pressing SET otherwise settings will not be saved.

After settings confirmed, press SET again, or no operation for 10 seconds, system will quit timer setting mode.

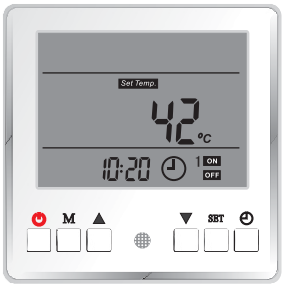
Timer ON

Timer ON setting doesn't function when the unit is working.It will be activated when unit is turned OFF.



Timer OFF

Timer OFF setting only functions when unit is ON. It will be activated when the unit is turned ON.



Temperature setting in timer working period

When unit works in timer working period (time between timer ON and OFF), system will take this set value as the set temperature, instead of the set value of the last working mode.

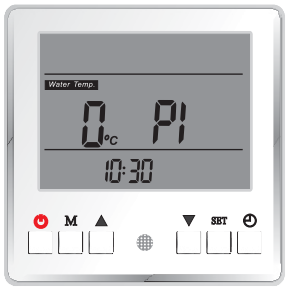
★Timer setting can be cleared by pressing ⏲ button for 5 seconds.

3.USEAGE

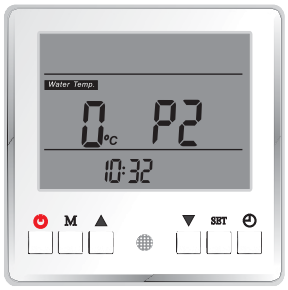
Anti-freezing protection in winter

When unit is in standby mode, if ambient temperature is lower than5℃, then water pump works for 1 minute in every 10 minutes, unit show P1 code.

When unit is in standby mode and water temperature is set as the control target, if ambient temperature is lower than 0℃ and water temperature lower than 3℃, unit show P2 code and start to work in heating mode till water temperature higher than 8℃ or ambient temperature higher than 3℃.



Anti-freezing protection-1

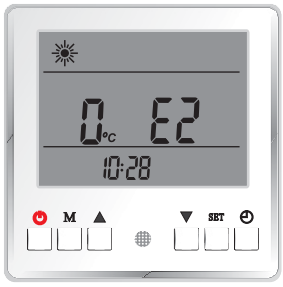


Anti-freezing protection-2

Note:Only when water temperature is set as the control target,the unit will work in heating mode.

Protection and failure code

When system is meeting some protections or failures, correspondent protection or failure codes will be shown on the display, e.g. E2 failure.



E2 failure

3.USEAGE

3.3 Failure codes

Error codes	Causes	Ways to check and remedies
P1	Anti-freezing protection-1	System will turn on the water pump automatically for anti-freezing purpose.
P2	Anti-freezing protection-2	System will work in heating mode to warm up the water automatically for anti-freezing protection.
E0	1.Wire connection between wired controller and PCB open or short-circuited.	1. Cheak whether the wire connection gets loose.Fasten it.
	2.Wired controller failure.	2.Change it.
E1	1.Wire connection between wired controller and PCB open or short-circuited.	1. Cheak whether the wire connection gets loose.Fasten it.
	2.Wired controller failure.	2.Change it.
E2	1.temp.sensor open or short-circuited.	1.Measure with a multimeter at 20K to check whether it is shirt-circuited or open.If yes,change it.
	2.temp.sensor resistance drifting.	2.Measure with a multimeter at 50K to check the sensor resistance. Take ambient temp.into consideration.If it isdrifting,change it.
	3.Temperature sensors not well connected to the wired controller.	3.Check whether the sensor connection gets loose. Fasten it.
F1	Communication failure.	1.Check whether port gets loose.Fasten it. 2.Change the PCB. 3.Change the outdoor PCB.
F2	1.water inlet Temp sensor failure.	1.Check whether the sensor connection gets loose. Fasten it. 2.Wire connection between wired controller and indoor PCB open or short-circuited. 3.Water inlet Temp. sensor resistance drifting.
	2.water outlet Temp sensor failure.	1.Check whether the sensor connection gets loose. Fasten it. 2.Wire connection between wired controller and indoor PCB open or short-circuited. 3.Water outlet Temp. sensor resistance drifting.
	3.Coil Temp sensor failure.	1.Check whether the sensor connection gets loose. Fasten it. 2.Wire connection between wired controller and indoor PCB open or short-circuited. 3. Temp sensor resistance drifting.Temp. sensor resistance drifting.
F3	Current or Voltage detector failure.	1.Change PCB.
F4	Compressor drive failure、IPM failure、IPM protection(overload)、drive protection.	1.Check whether PFC transducer gets loose.Fasten it. 2.Change PFC transducer.

3.USEAGE

Error codes	Causes	Ways to check and remedies
F5	EEPROM failure.	1.Check whether EEPROM gets loose.Fasten it. 2.Change EEPROM
F6	Too high coil.Temp in heating.	1.Cheak the water flow of the unit. 2.Too high ambient and water Temp.Reduce the set water Temp.
	Too high pipe Temp in cooling	1.Check the water flow of the unit 2.Too low ambient and water Temp.Increase the set water Temp.
	Over-current protection	1.Check the water flow of the unit 2.Too high (low)ambient, and too high(low) set water Temp.Decrease or increase the set water Temp.
F7	Too high or too low voltage	1.Check the voltage of the power supply. 2.Change the outdoor PCB.
F8*	Pressure switch failure	1.Check the pressure of the system. 2.Change the pressure switch.
F9	EEPROM failure	1.Check whether EEPROM gets loose.Fasten it. 2.Change outdoor EEPROM.
Fb	Ambient temp.sensor failure	1.Check whether the sensor connection gets loose. Fasten it. 2.Wire connection between wired controller and PCB open or short-circuited. 3.Temp sensor resistance drifting.
	Pipe temp.sensor failure	
	Compressor discharge temp. sensor failure	
Fc*	System protection caused by too high (low) pressure	1.Measure the high(low)pressure switch with a multimeter to check whether it is shirt-circuited or open. If yes,change it. 2.Check the water flow of the unit.
Fd	System protection caused by the ambient Temp.	1.Check the ambient Temp sensor. 2.Check whether the ambient Temp is too high(low)for working(Ambient lower than -1℃ or higher than 65℃ in cooling,lower than -25℃ or higher than 33℃ in heating.
Fe	Indoor coil anti-freezing protection in cooling operation	When water inlet water temperature in cooling mode is too low, unit stops to protect the heat exchanger and show this failure code.

3.USEAGE

***Difference between F8* and Fc*:**

System Pressure Protection

In compressor's operation, when system pressure rise too high and pressure switch turns off, (in system's normal operation, pressure switch keeps on),the controller will lower compressor's running speed by 1Hz/s until pressure switch reconnects. Meanwhile, it records the compressor's current running speed, and takes the value one level lower as the maximum speed. This limit will be released automatically after compressor keeps on running for 2 hours. However, if during this process, similar pressure protection happens again, the controller will records the new running frequency and takes 1 level lower than this new frequency as the maximum speed. And it will release this protection in 2 hours since the time when this new protection happens. If compressor is off, but pressure switch is disconnected for 5 seconds, the controller will judge it as "Pressure Switch Failure" and relevant error code will be shown in wired controller.

For check whether the system have this pressure switch failure or protection is due to hardware failure, we can do like this:

1.Turn the unit off, and cut the power. Leave the unit without power for 10 minutes.

2.Power up the unit.

3.If F8* comes once after power the unit, then it is for sure that it is the pressure switch itself, or the cable loosen that cause F8* failure.

4.If not, then it is for sure that the refrigerant system working abnormal, that caused this high pressure switch failure.

Anti-freezing function for indoor (must work with new version indoor PCB):

When unit is in standby mode, if ambient temperature is lower than 5℃, then water pump works for 1 minute in every 10 minutes, unit show P1 code.

When unit is in standby mode, if ambient temperature is lower than 0℃ and water temperature lower than 3℃, unit show P2 code and start to work in heating mode till water temperature higher than 8℃ or ambient temperature higher than 3℃.

3.USEAGE

3.4 Electric heater

The inbuilt electric heater can be used as a back-up heater or auxiliary heater to our heat pump unit,when ambient temperature is too low,or heat pump fails to work properly,which makes the unit can't produce enough heat.

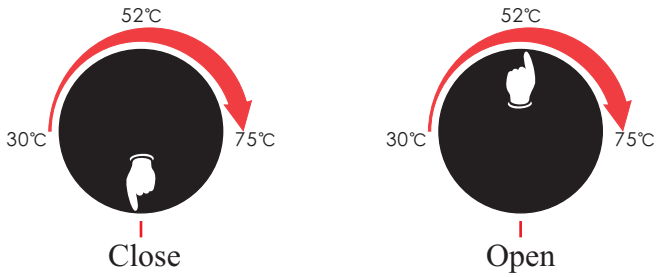
This heater will start to work when any of following two conditions is met:
1.water temperature is lower than what is set via mechanical thermostat for electric heater.
2.Heat pump unit thinks its capacity is not enough,so it turns ON the heater.

For condition1:
This electric heater is set to turn on when water temperature drops to 30℃, in case heat pump capacity is not enough in critical weathers or heat pump fails to work.It can also be set manually to higher temperature when needed.However please always make sure to set it to lower temperature than heat pump set temperature,otherwise the heater will turn on before the heat pump starts to work,and the system will not work efficiently.

For condition2:
Heat pump unit will send signal to turn ON the heater,when all following conditions are met at the same time:
- Ambient Temp lower than 10℃;
- Compressor has been working continuously for 25 minutes;
- Compressor runs in its maximum allowable speed.
- Water temperature is 3℃ lower than the set temperature;
- Water temperature rises less than 1℃ over 15 minutes;
- Temp rise less than 1℃ in over 15 minutes.

This heater can also manually set to high water temperature(60-75℃) for a certain period of time,for bacterial purpose.

Please don't forgot to set the teperature back,after bacterial kill finished!



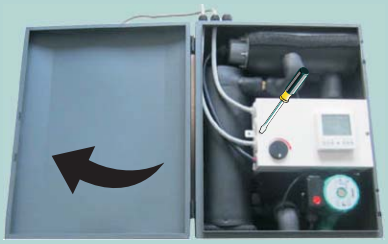
3.USEAGE

3.5 Wiring

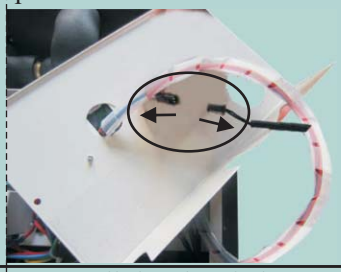
Attention: Below installation figure varies in appearance with different unit models. Please take the real appearance of unit as final. The installaiton and wiring method is the same.

1. Connect of 10M room temperature sensor

A. Cut off the power supply and open the front panel, take off the electronic box cover.

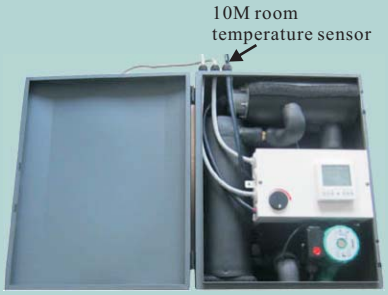


B. Find the short room temperature sensor on the back of the operation panel.

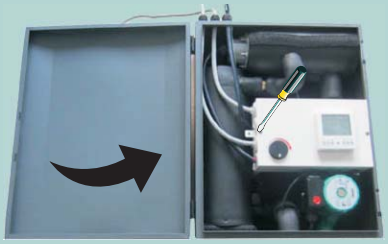


C. Replace it with the 10M long room temperature sensor.

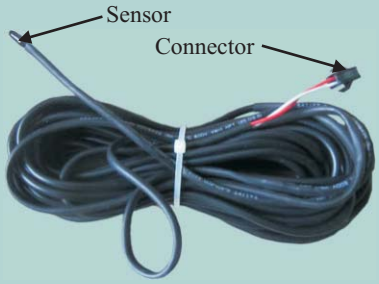
D. Get this sensor out from the unit, place it on the ideal place and fix it.



E. Install the electric box cover ack and close the door of the unit.



10M long room temperature sensor cable



2. Water temperature control/Room temperature control switch

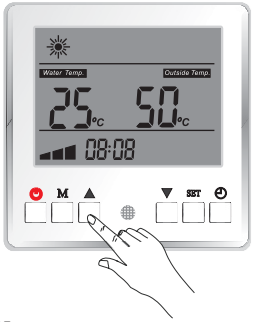
⚠ Please mind that when the unit works in room temperature control mode, it may not supply sanitary hot water with high enough temperature.

When switching between the water and room temperature control mode the heat pump running mode may also changed. So please short push on the M-button to change to the correct running mode. (Heating – Hot water - Cooling)

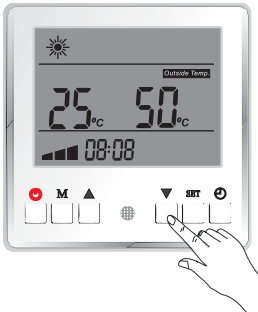
When unit is working, keep on pressing ″M″ button to choose water temperature temperature or room temperature as the control target .

When water temperature is set as the control target, ″Water Temp.″″Set Temp.″ is ON;

When room temperature is set as the control target, ″Water Temp.″ is OFF.



Water temperature control

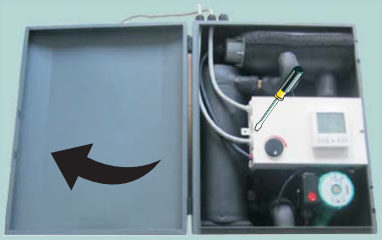
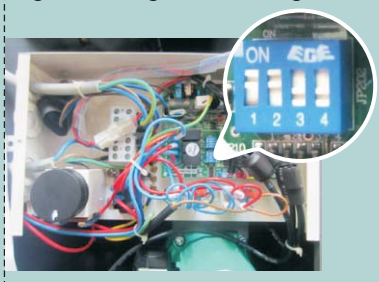
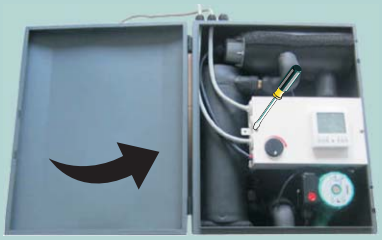


Room temperature control

3.USEAGE

3. Limit maximum water outlet temperature from 52℃ to 38℃.

If unit is connected with floor heating system, in order to ensure it won't be damaged by too high water temperature under room temperature control mode, maximum water outlet temperature can be limited to 38℃ as shown below:

A. Cut off the power supply and open the front panel, take off the electronic box cover.	B. Set switch number 1 of dip-switch Jp202 to ON position.	C. Install the electric box cover back and close the door of the unit.
		

4. Connecting a backup heater under control of the heat pump.

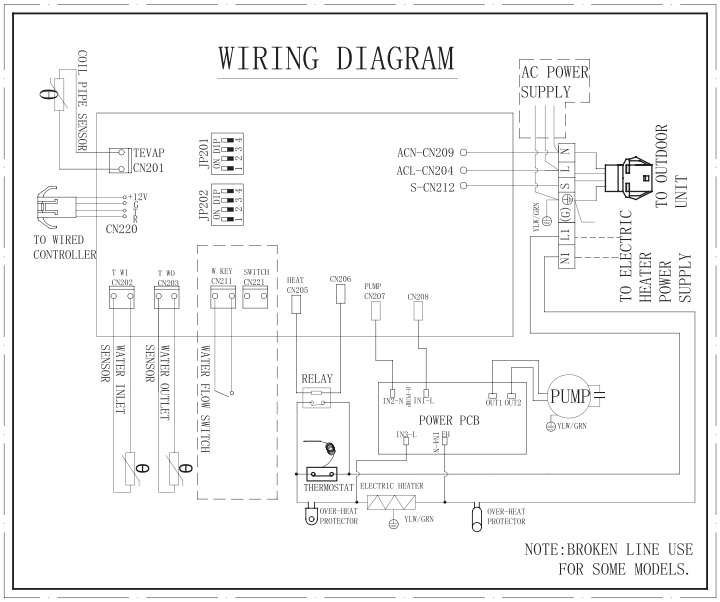
Explanation

A heat pump it selves is seldom dimensioned to cover 100% of a house heat demand. This unit has an inbuilt 3 kW electric back up heater, but often more power is required to meet the maximum heating load in the house.**It's the installer's responsibility to ensure correct sized back up heater in accordance to the house maximum heating demand.**

In some cases it can be feasible to be able to choose other heating sources as back up. This ES heat pump have a 230V control signal that allows you, through a contactor/relay, to control different types of back up heaters like an **oil burner, electric heater, pellets or wood burner.** The 230V signal shall be connected to a separate contactor/relay that again powers the external back up heater. When the heat demand drops, the signal to the contactor/relay closes, which again makes the backup heater to shut off.

The following parameters have to be met for the control signal to open(in both room temperature and water temperature control mode).

1. The ambient temperature needs to be 7 degrees or lower.
2. Real water temperature needs to be 3 degrees lower than set temperature.
3. Compressor has been running with maximum power the last 30 minutes.
4. The temperature raise the last 15 minutes has not exceeded 1 degree.



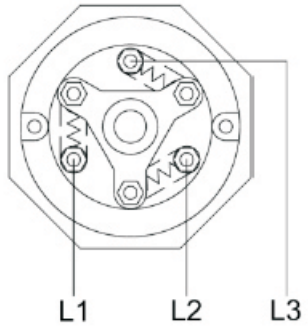
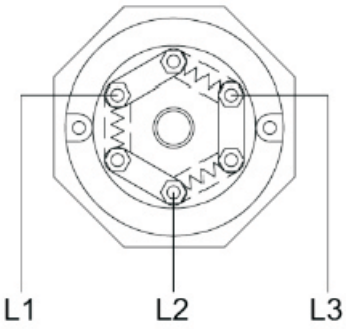
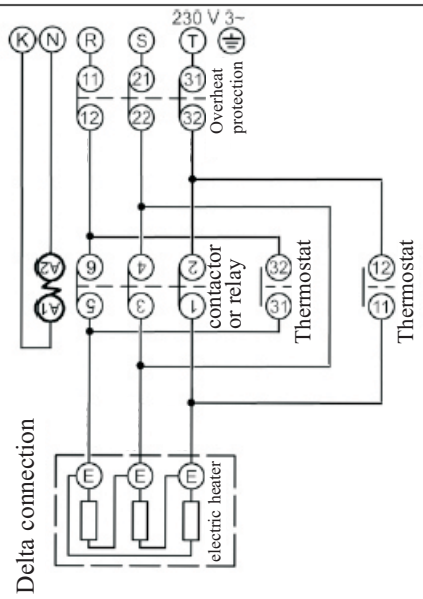
When all these parameters are met, the 230V control signal on the PCB's port CN205 and CN218 opens.

When temperature is raised equal to set temperature, the 230V control signal closes, and only the heat pump will run.

3.USEAGE

NB! In accordance of stop of heat pump operation, either due to outdoor temperature is lower than the heat pumps operation range, power failure, or other internal failures in the heat pump that makes it stop, will the 230V control signal to the backup heater be closed (off).

An eventual back up heater should therefore always have a parallel connected mechanical thermostat as anti-freezing back up in these cases. Please see figure 3.

wiring diagram 1	wiring diagram 2	wiring diagram 3
		
Y-connection for 400V/3-phase	“delta connection” for 230V/3-phase	wiring diagram formechanical thermostat 230V/400V

An ES 4,5 / 6 / 9 kW electric heater can be connected as shown in figure 3 above, where a mechanical thermostat is connected in parallel with the contactor. The thermostat is normally set 5 to 10 degrees lower than the heat pump set temperature. In normal operation the heat pump will control the heater and the heater will not start before there is a heat demand that the heat pump can't replace. If some failure happens, the thermostat will kick in the heater if the temperature drops too much. This also allows the system to be run by backup heater only for heat pump service or maintenance work.

ES article no. 120117, 120118, 120119, 120120, 120121 electric heater have the contactor and thermostat connected in series, which means they needs to be reconnected in accordance to figure 3 above to have the described function.

ES article no. 120178, 120179, 120180 electric heaters are factory connected as figure 3.

NB! Please ensure that electric heater is connected correctly in accordance to the local power supply on the installation site. The ES heaters can be reconnected for both 230V/3-phase and 400V/3-phase. Please refer to figure 1 and 2 above.

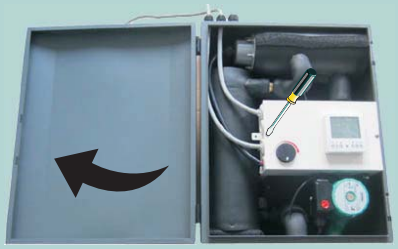
3.USEAGE

How to connect

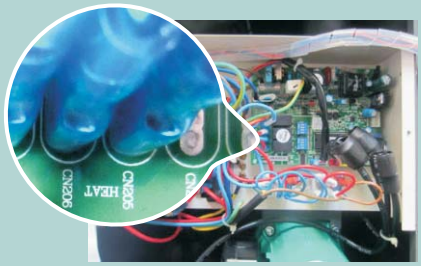
A. Get the following parts ready:
◆1 pieces long enough dual core double insulated cable（PN0.75mm^2, one red and one blue)
◆1 250 type female plug
◆1 250 type male plug

B. Connect the red cable with 250 female plug, and blue cable with 250 male plug.

C. Cut off the power supply and open the front panel, take off the electronic box cover.

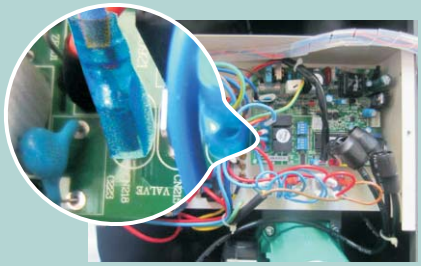


D.Disconnect cables connected to CN205 connectors on the PCB.



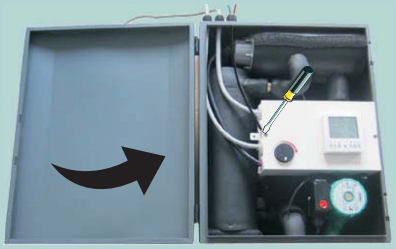
E. Connect 250 female connector on the red wire with the 250 male connector plug out from CN205 port, and plug it back into CN205 port.

F. Plug the blue cable with male plug on Cn218 port on the PCB.

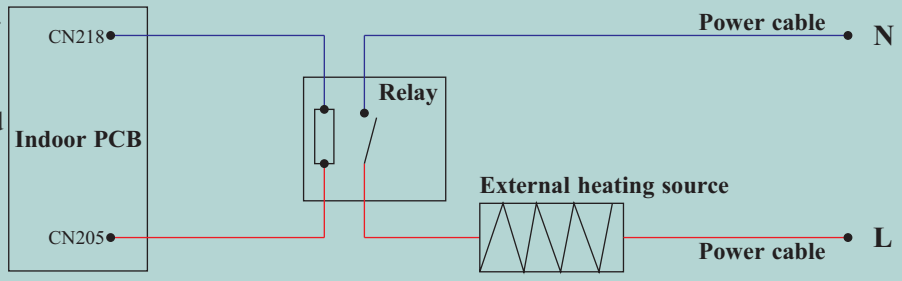


G. Get extra cables out from the cabinet, and connect it with the relay controlling the power supply of the external heating source.

H. Install the electric box cover back and close the door of the unit.



The signal output here is 230V. And this signal is used to control the external heater relay only. It can never be used as the power cable to any heater.

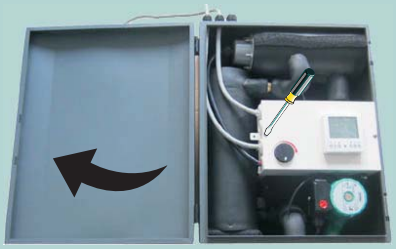


★ **This is for illustration only and may not be in accordance to local regulations in your place. It is** the installers **responsibility to connect in accordance to the local regulations and limitations on the installation place**.

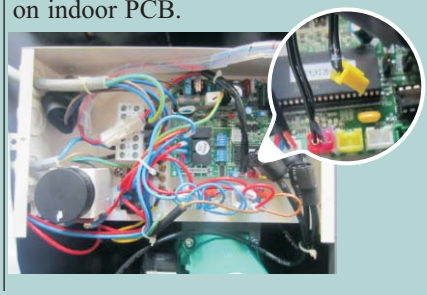
3.USEAGE

5. Connect of extra long water sensor cable

A. Cut off the power supply and open the front panel, take off the electronic box cover.

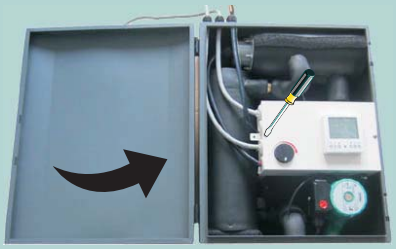


B. Disconnect water outlet temperature sensor from port CN203 on indoor PCB.

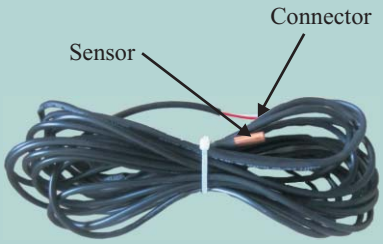


C. Connect extra long water sensor cable to port CN203 on indoor PCB, get it out from the unit and place the sensor head on the ideal position. Please note the detected water temperature should be as close as the real water outlet temperature sensor as possible, and can't be placed in water directly.

D. Install the electric box cover back and close the door of the unit.

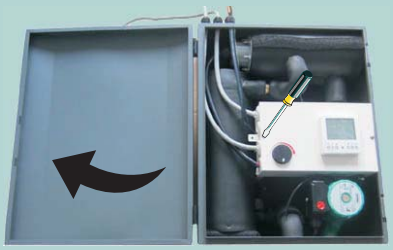


5M long water temperature sensor

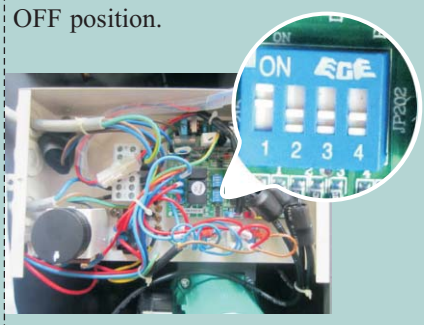


6. If water outlet temperature sensor is placed in the water tank, do as followings to make the water pump works when compressor needs to work only

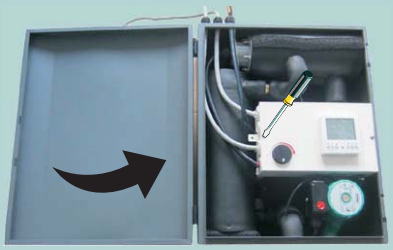
A. Cut off the power supply and open the front panel, take off the electronic box cover.



B. Set switch number 2 of JP202 to OFF position.



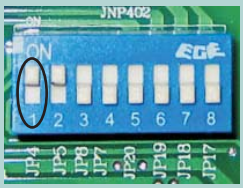
C. Install the electric box cover back and close the door of the unit.



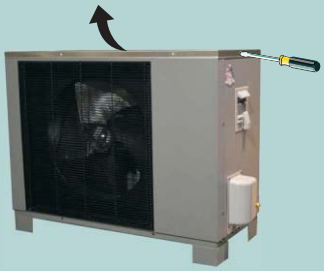
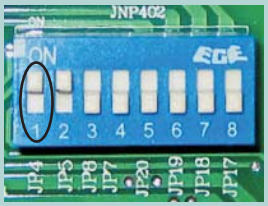
3.USEAGE

7. Change of defrosting interval time

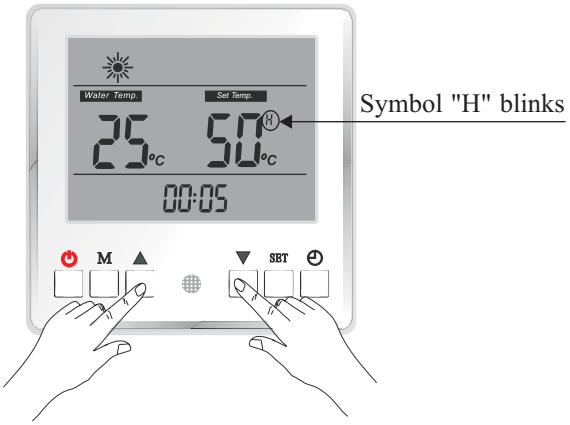
★ For some old version units, change of defrosting interval time can only be done as followings:

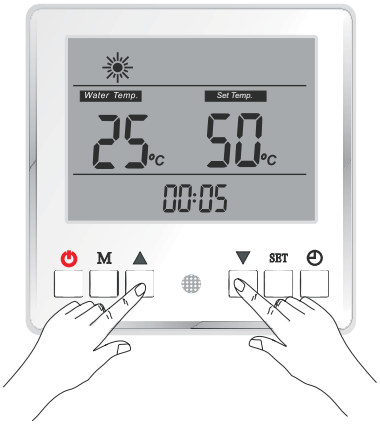
A. Cut off the power supply and open the top panel, take off the electronic box cover.	B. Find JP402 dip-switch on outdoor PCB, and set it to ideal position. When it is set to OFF, defrosting interval time is 45 minutes. When it is set to ON, defrosting interval time will be calculated by the self-learning logic automatically.	C. Install the electric box cover and unit top cove back.
		

★ For new version of the unit, if outdoor dip-switch is set to self-learning defrosting interval time logic, it can be switched between 45minutes defrosting interval time logic and self-learning defrosting interval time logic via operation panel. For some units that are default set to 45 minutes defrosting interval time logic, please do as followings to switch the dip-switch to ON position, which stands for self-learning defrosting interval time logic.

A. Cut off the power supply and open the top panel, take off the electronic box cover.	B. Set switch number 1 of dip-switch JNP402 to ON position.	C. Install the electric box cover and unit top cover back.
		

When unit is working in heating or hot water mode, pressing "▲" and "▼" at the same time for 5 seconds, defrosting interval time logic can be changed. Fixed 45 minutes defrosting interval time will be indicated with a symbol "H" blinks on the display, and when self-learning logic is activated, symbol "H" will disappear.





4.MAINTENANCE

4.1 Attention

★The user mustn't change the structure or wiring inside the unit.
★The service and maintenance should be performed by qualified and well-trained technician. When the unit fails to run,please cut off power supply immediately.
★The smart control system can automatically analyze various protection problems during daily use,and display the failure code on the controller.The unit may recover by itself. Under normal operation,the piping inside the unit don't need any maintenance.
★Under normal running,the user only needs to clean the surface of the outdoor heat exchanger per month or quarter of a year.
★If the unit runs in a dirty or oily environment,please clean the outdoor heat exchanger by professionals,using specified detergent,to ensure the performance and efficiency of the unit.
★Please pay attention to the ambient environmet,to check if the unit is intalled firmly,or whether the air inlet and outlet of the ontdoor unit is blocked.
★Unless the water pump is damaged,no special service or maintence should be taken to the water system inside the unit.It's recommended to clean water filter regularly or change it when it's very dirty or blocked.
★If the unit will not be used in winter for a long time,please drain all the water inside the system,to prevent the water pipes from damage deu to freezing.

4.2 Cleaning of water filter

The water filter should be cleaned according to the manual of water filter, to ensure the water flow of the water system. It is recommended to be cleaned once in the first month, and then, once half a year.

4.3 Cleaning of heat exchanger

Heat exchanger should be cleaned every half year. because after long term running, gap between the fins of heat exchanger may be clogged up by dust, leaves, plastic films or papers, which will affect the efficiency of heat exchange, please clean the heat exchanger as follows:

A. Use a vacuum cleaner to clean the surface of the fins, to get rid of the dust or other rubbish.
B. Use a soft nylon brush to clean the fins, rinse by water at the same time (please don't rinse with high water pressure). If the outdoor unit is located in an oily place and is hard to clean, please ask for professional people to clean it.

Be care about:

①. Avoid splashing water to the electric part when cleaning.
②. Avoid touching the sharp fins when cleaning, or they may cut your skin. It's recommended to wear rubber gloves before cleaning.
③. The fins of heat exchanger are soft, please don't wipe strongly with hard object, or it may damage the fins.
④. If the unit is working in a salty environment, please clean the heat exchanger more often.
⑤. If the fins have corrosion in surface, please move the unit to a better environment.

4.MAINTENANCE

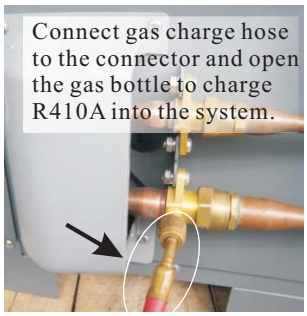
4.4 Cleaning of plate heat exchanger

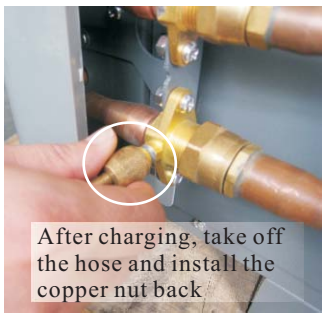
Thanks to the normally very high degree of turbulence in the heat exchanger, there is a self-cleaning effect in the channels. However, in some applications the fouling tendency can be very high, e.g. when using extremely hard water at high temperatures. In such cases it is always possible to clean the exchanger by circulating a cleaning liquid (CIP – Cleaning In Place). Use a tank with weak acid, 5% phosphoric acid or, if the exchanger is frequently cleaned, 5% oxalic acid. Pump the cleaning liquid through the exchanger.This work should be done by qualified person. For further information, please contact your supplier.

4.5 Gas Charging

The refrigerant plays an important role in delivering energy in cooling or heating. Insufficient refrigerant affects directly efficiency of cooling and heating. Please pay attention to the following before adding refrigerant:

A. The work should be done by professionals
B. If the system has not enough refrigerant inside, please check whether the system has leakage inside. If yes, please repair it before gas charging, otherwise unit will lack of refrigerant again after working for a short period.
C. Don't add too much refrigerant than required, or it may cause a lot of failures, such as high pressure and low efficiency.
D. This system uses R410A refrigerant. It is strictly forbidden to charge any refrigerant other than R410A into the system.
E. There must be no air in the refrigerant circulation, because air will cause abnormal high pressure, which will damage the gas piping and lower heating or cooling efficiency.
F. leaks inside the house, please keep windows open for few minutes even R410A refrigerant do no harm to health.
G. The steps are as follows:





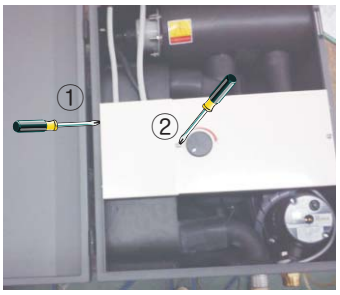
Note: Always use a weight scale to measure the gas amount charged into the unit.
Note: For the unit with flare nut connection, do the gas charge in the same way.

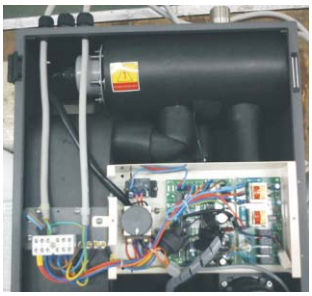
4.MAINTENANCE

4.6 Maintenance of the electric components

Indoor

1.Cut off the power supply.
2.Open the indoor unit and then take off the screws around the electrical box.
3.Do the maintenance of the electrical parts.

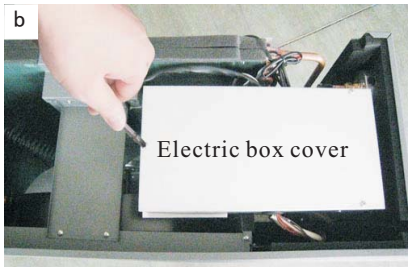


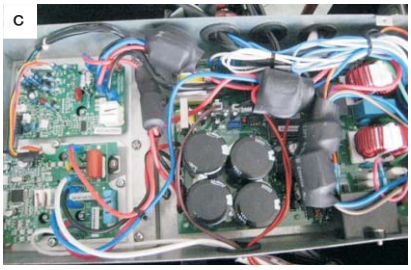


Outdoor

1.Maintenance of controller

a. Take off the top cover of the unit (see picture a)
b. Take off the electric box cover. (see picture b)
c. Do necessary maintenance work to the controller of outdoor unit (see picture c).

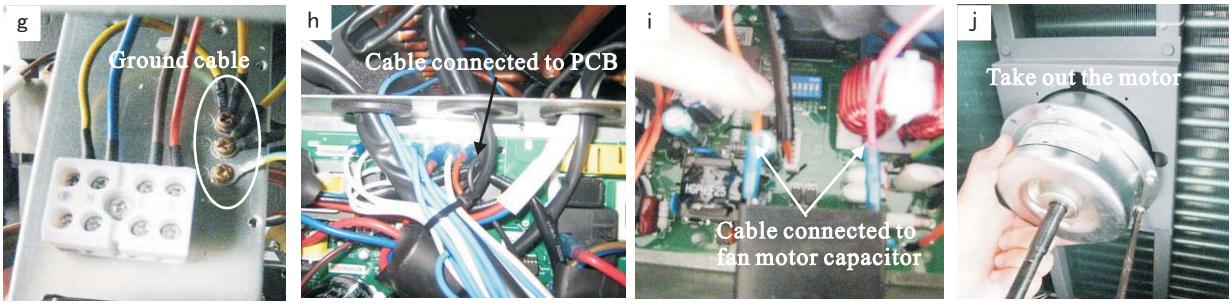




2. Replacement of fan motor

a. Take off screws of the front grill (see picture a and b)
b. Use a wrench to loosen the nut for fan blade and take out the fan blade(see picture c and d)
c. Unscrew the screws of fan motor (see picture e)
d. Then unscrew the small handle (see picture f).

e. Tracking and take out the ground and power cable for fan motor, and take the whole fan motor with cables out. (see picture g, h, i and j).
f. Put the repaired or new fan motor back and connect all cables back.

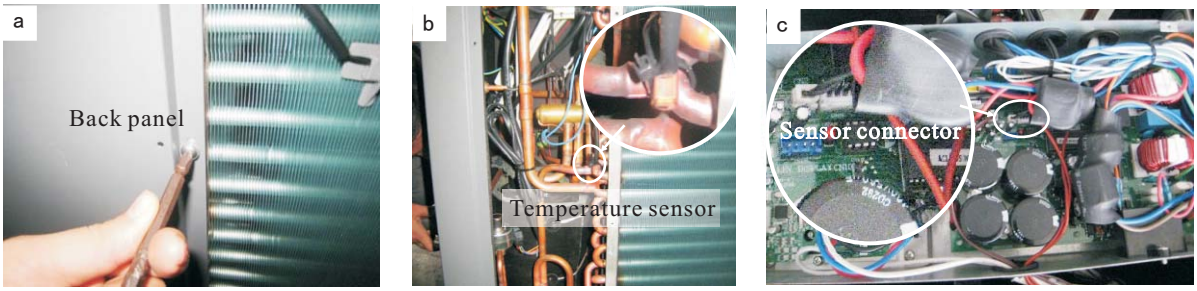


3.Replacement of bottom plate heater

a. Take out the fan blade in same procedure as 4.6.2.
b. Unscrew the fixture of bottom plate heater(see picture a).
c. Disconnect the quick connector for bottom plate heater and take the heater out (see picture b).
d. Put a new bottom plate heater back, and connect it to the quick connector(see picture c).

4.Replacement of temperature sensor

a. Take off the back panel (see picture a).
b. Take out the broken sensor from its fixture, and also pull its connector out from the controller.
c.Put the new sensor back and connect it to the same port on controller.



4.MAINTENANCE

4.7 Trouble shooting

Failure	Cause	Solution
Unit can't start up	1. No power supply	1. Check the power supply
	2. Fuse is broken or circuit breaker is disconnected	2. Check if it's open circuit or if the motor coil is earthed. Then change a fuse and reset the breaker, check if the circuit is stable or the connection is well.
	3. Some kind of protection works	3. Check which protection is working, and clear the protection, then restart the unit.
	4. Wiring is loose	4. Check the wire connection and tighten the screws on the terminal.
	5. compressor fails	5. Change a compressor
Fan fails to run	1. Fan motor wire loose	1. Check the wire connections.
	2. fan motor failure	2. Change fan motor.
Low heating performance	1. The coil fins are very dirty	1. Clean the evaporator coil
	2. Air inlet is blocked	2. Remove any object that blocks the air circulation of the unit.
	3. Insufficient of refrigerant	3. Inspect the unit for leakage and fix it if any. Discharge all refrigerant and charge the unit again with correct amount.
Too high noise from the water pump, or no water flow when the water pump is running	1. Lacking of water in water system	1. Check the water filling device. Fill the system with enough water.
	2. Air exists in water system	2. Purging the air out.
	3. Valves in water system are not completely opened	3. Check all the valves to ensure they are fully opened.
	4. Water filter is dirty or blocked	4. Clean the water filter
Too high compressor discharge pressure	1. Too much refrigerant	1.Discharge all refrigerant and charge the unit again with right amount.
	2. Air exists in refrigerantion system	2. Discharge all refrigerant and charge the unit again with right amount.
	3. Inadequate water flow	3. Check the water flow of the system. Use a bigger pump to increase the water flow if necessary.
	4. Too high water temperature	4. Check the value of the water temperature sensor, to ensure it works properly.
Too low suction pressure	1. Drier filter is blocked	1. Change a new one
	2. Electronic expansion valve is not opened	2. Repair or change a new one
	3. Leakage of refrigerant	3.Inspect the unit for leakage and fix it if any. Discharge all refrigerant and charge the unit again with right amount.
Unit can not defrost properly	1. Coil temperature sensor failure	1. Check the position and value of the coil temperature sensor. Replace it if necessary.
	2. Air inlet/outlet is blocked	2.Remove any object that blocks the air circulation of the unit. Clean the evaporator coil occasionally.

4.MAINTENANCE

The following phenomenon may not be problems of unit itself.
Please contact with a professional maintenance staff for help.

Number	Failure	Solution
1	The unit is not running	When the unit restarts, the compressor will start 3 minutes later (self-protection of compressor), please check if the circuit breaker is disconnected, and if there is normal power supply for the wire controller.
2	Low capacity	Check if the air inlet or outlet is blocked in outdoor unit; check if the setting temperature is too high in cooling mode, or too low in heating mode.

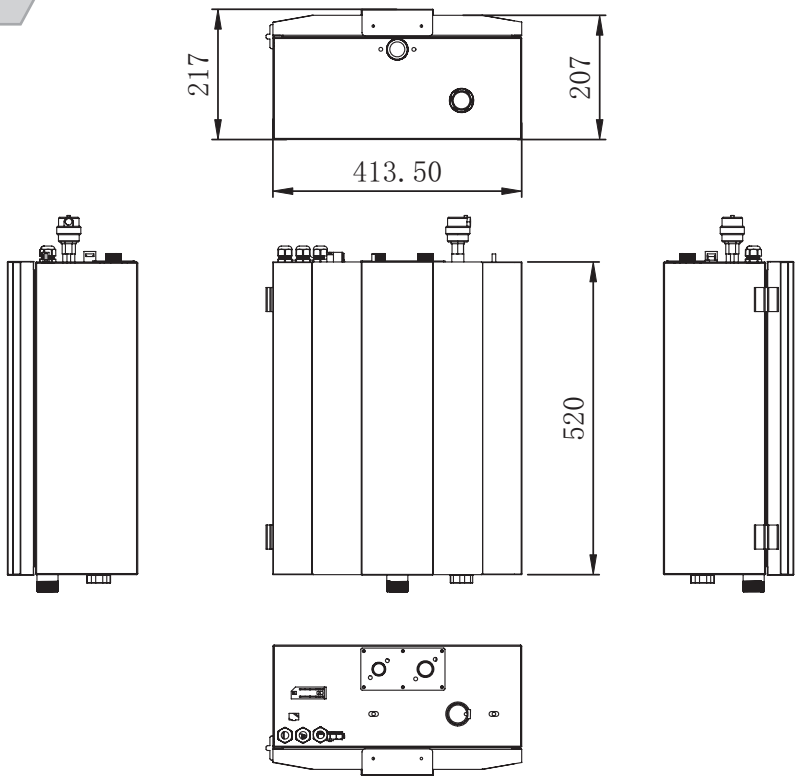
5.ATTACHED DRAWING

5.1 Outlines and dimensions

AVH-24V1DE

Indoor

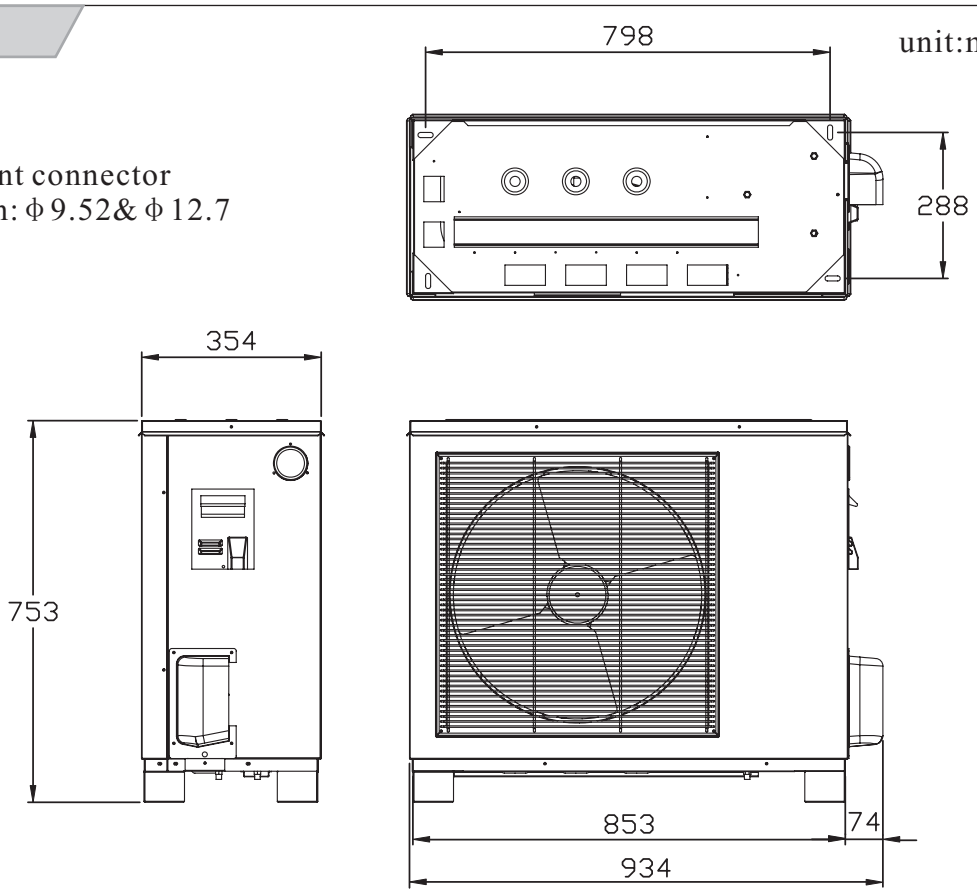
unit:mm



Outdoor

unit:mm

Refrigerant connector
dimension: ϕ 9.52& ϕ 12.7

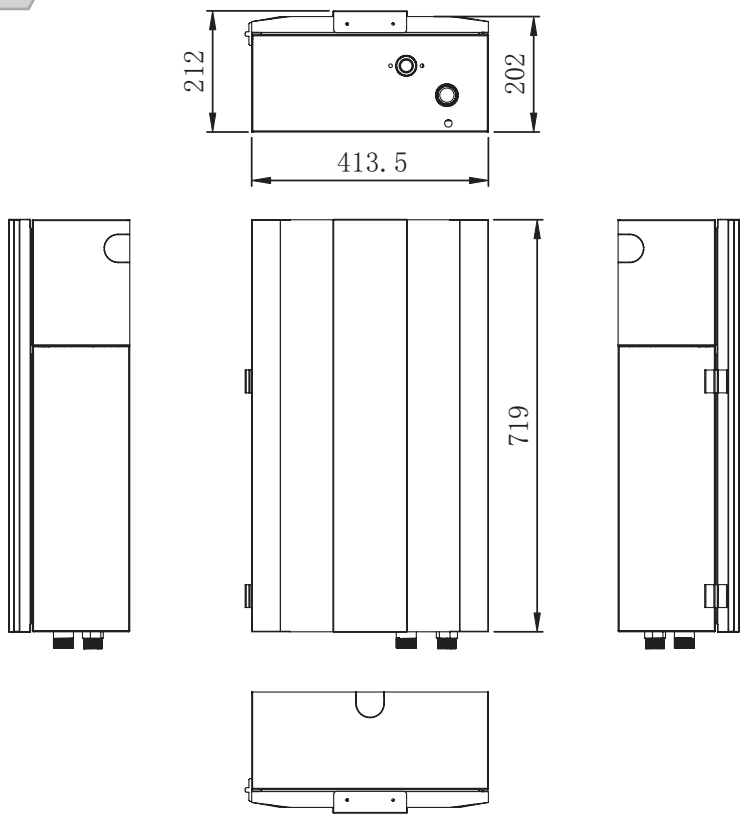


5.ATTACHED DRAWING

AVH-30V1DE

Indoor

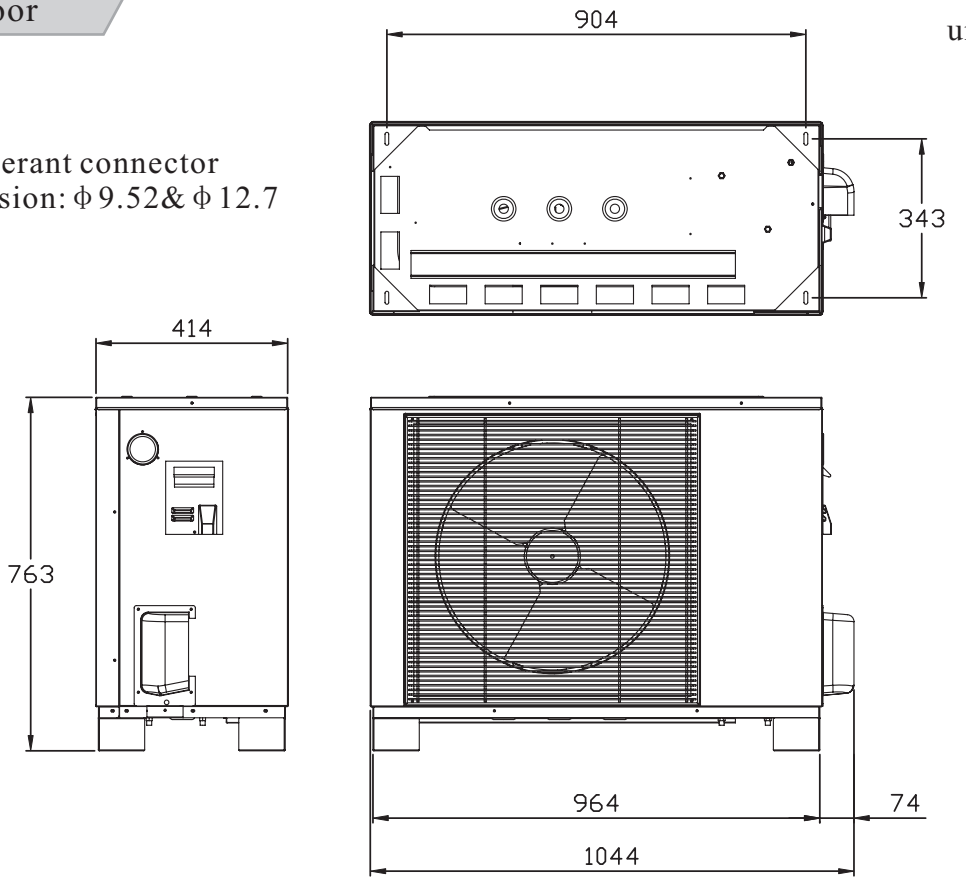
unit:mm



Outdoor

unit:mm

Refrigerant connector
dimension: ϕ9.52& ϕ12.7

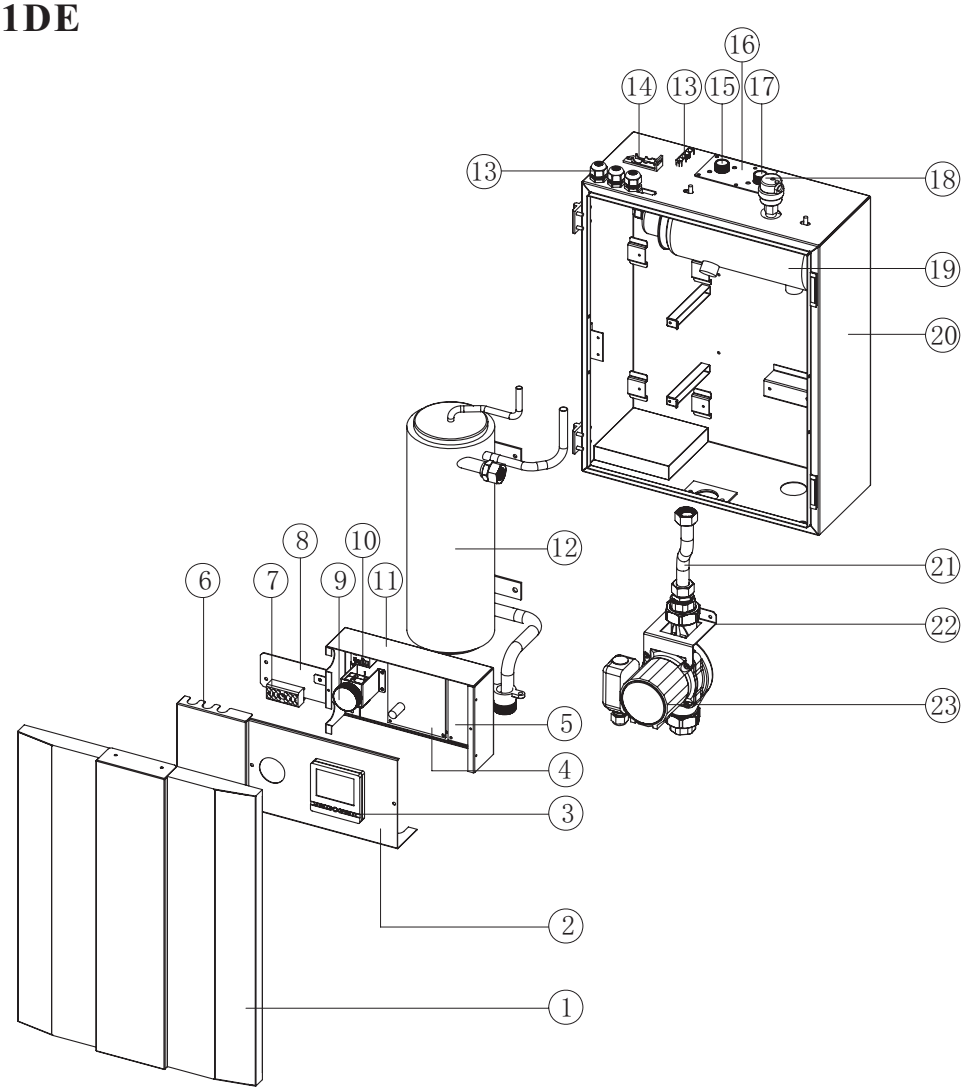


5.ATTACHED DRAWING

5.2 Exploded view

AVH-24V1DE

Indoor

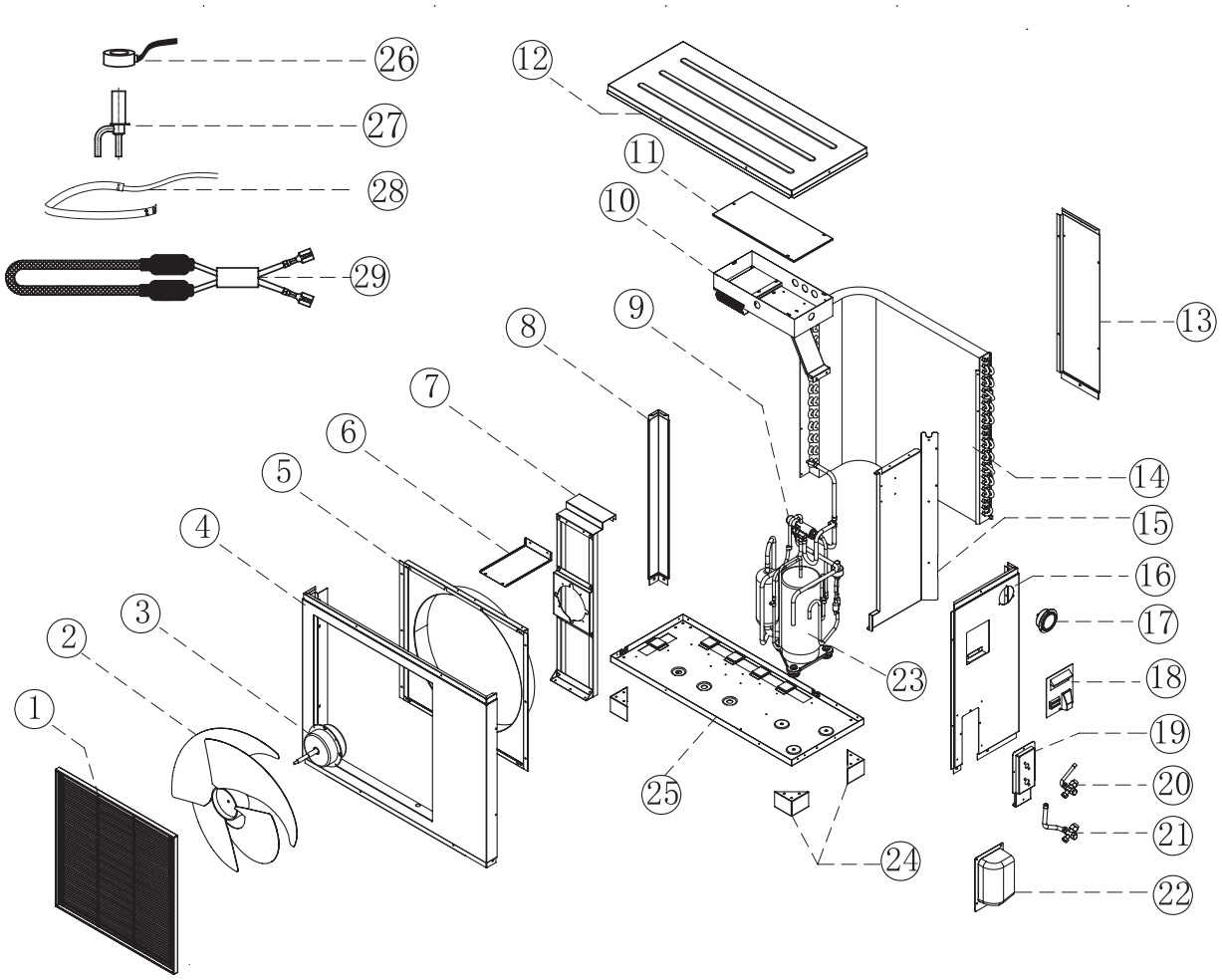


NO	Name	NO	Name
1	Front panel	13	Cable fixture
2	Electric box cover	14	Wire clip
3	Wire controller	15	3/8″Connector
4	Indoor PCB	16	Connector fixture
5	Water pump power board	17	1/2″Connector
6	Cover for terminal block	18	Air purging valve
7	Terminal board	19	Electric heater
8	Fixture	20	Box
9	Thermostat	21	Water outlet pipe
10	Relay	22	Water pump support
11	Electric box	23	Water pump
12	Heat exchanger		

5.ATTACHED DRAWING

AVH-24V1DE

Outdoor

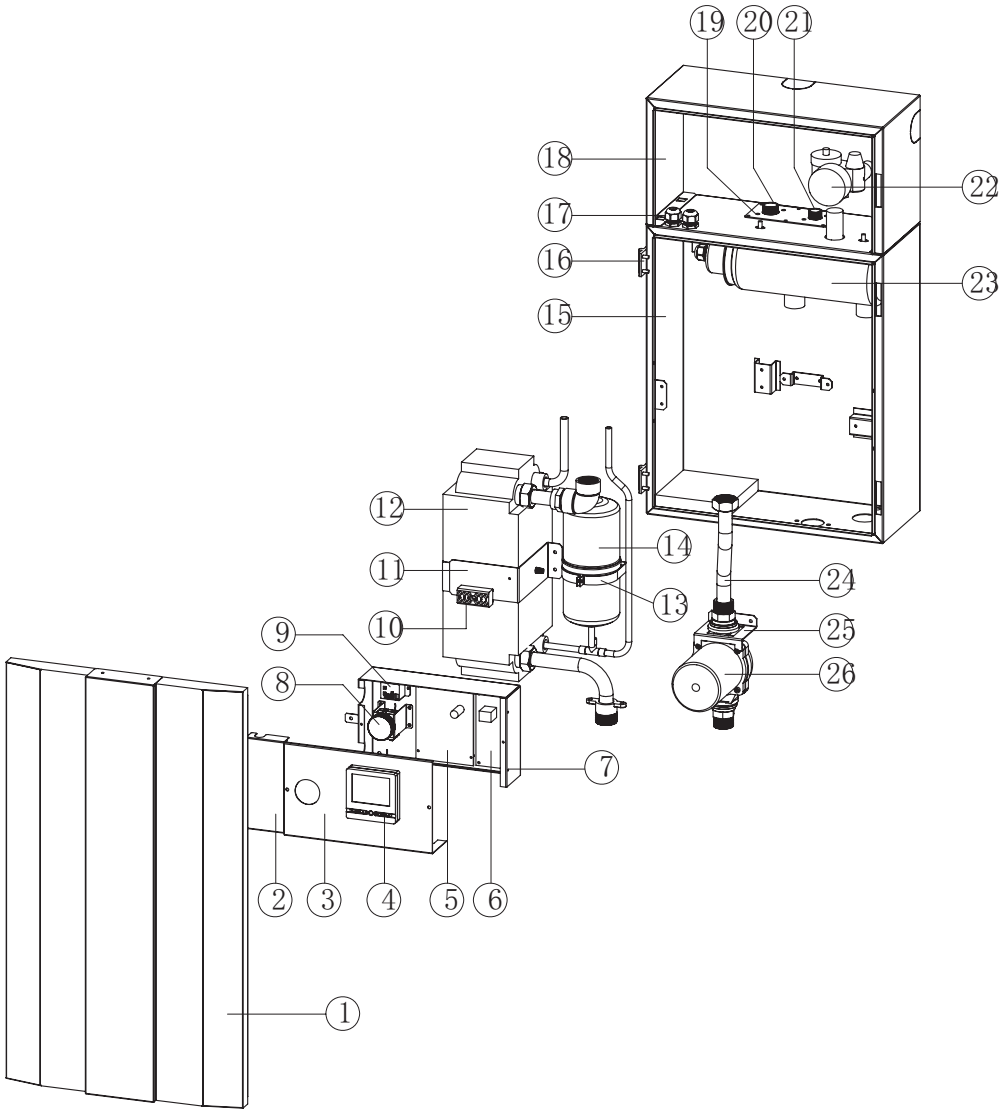


NO	Name	NO	Name
1	Decorative Panel	16	Right Plate
2	Outdoor Fan	17	Pressure
3	Outdoor Motor	18	Big Handle
4	Front Panel	19	Bulkhead
5	Air guide	20	3/8 Valve
6	Fixture	21	1/2 Valve
7	Motor Bracket	22	Valve Cover
8	Column support	23	Compressor
9	Four-Way Valve	24	Feet
10	Electrical Box	25	Bottom Plate
11	Electric Box Cover	26	EEV Coil
12	Top Panel	27	Electrical Expansion Valve
13	Back Panel	28	Compressor Heater
14	Condenser	29	Condebser Heater
15	Bulkhead		

5.ATTACHED DRAWING

AVH-30V1DE

Indoor

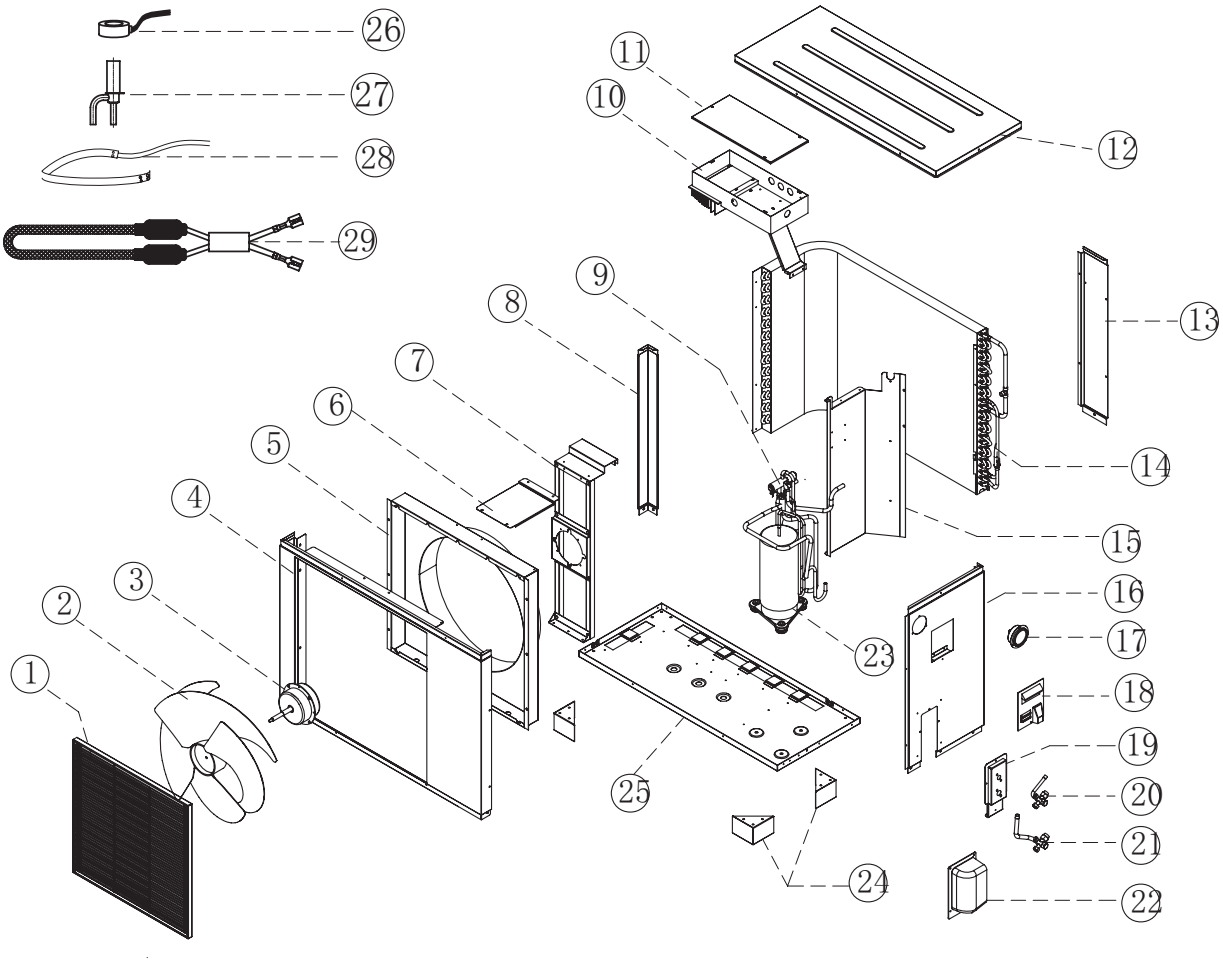


NO	Name	NO	Name
1	Front panel	14	Refrigerant expansion tank
2	Cover for terminal block	15	Box
3	Electric box cover	16	Hinge joint
4	Wire controller	17	Cable fixture
5	Indoor PCB	18	Cover
6	Water pump power board	19	Connector fixture
7	Bracket for electronics	20	3/8″Connector
8	Thermostat	21	1/2″Connector
9	Relay	22	Safety kit
10	Terminal board	23	Electric heater
11	Fixture	24	Water outlet pipe
12	Plate heat exchanger	25	Water pump support
13	Refrigerant expansion tank fixture	26	Water pump

5.ATTACHED DRAWING

AVH-30V1DE

Outdoor

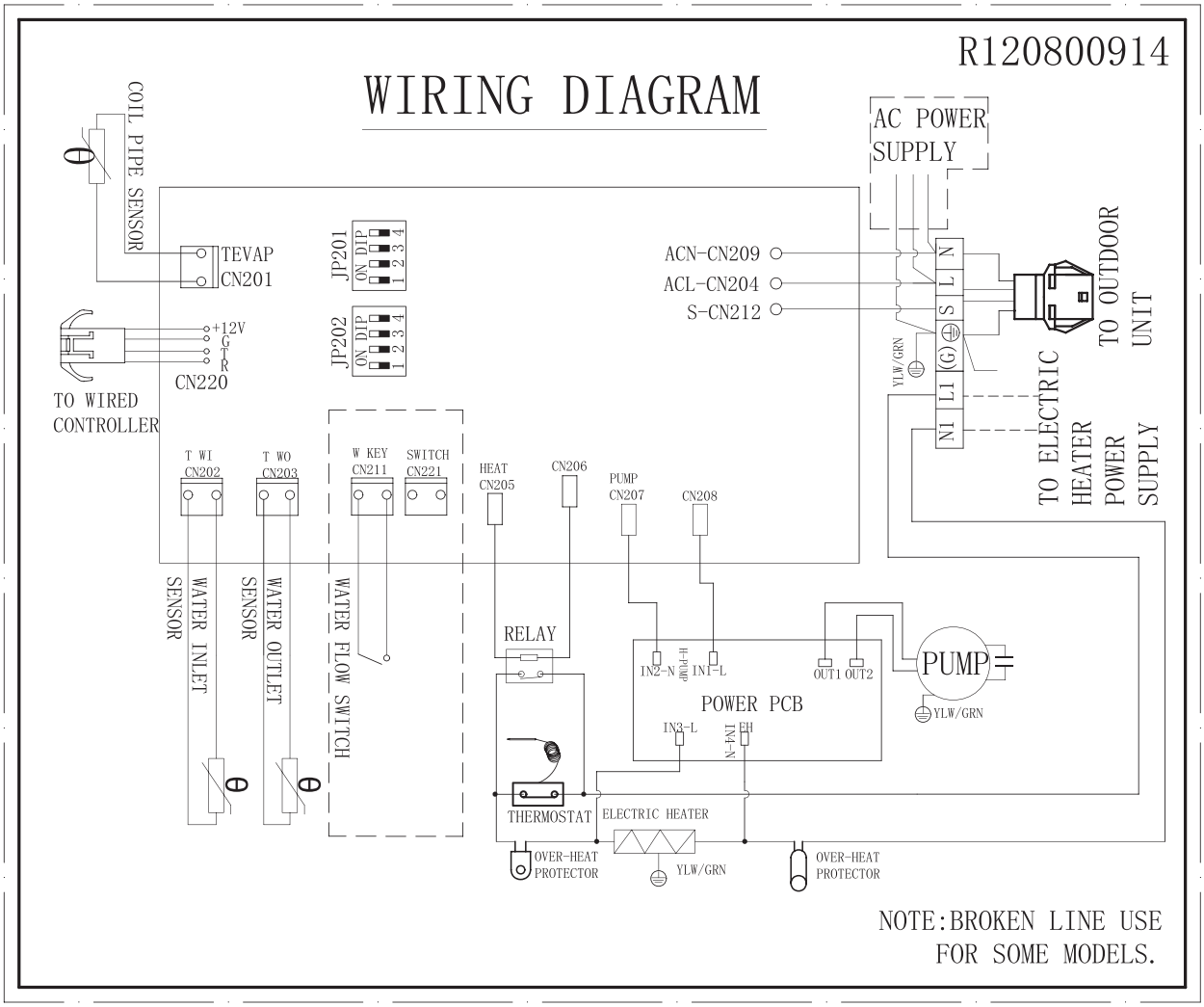


NO	Name	NO	Name
1	Decorative Panel	16	Right Plate
2	Outdoor Fan	17	Pressure
3	Outdoor Motor	18	Big Handle
4	Front Panel	19	Bulkhead
5	Air guide	20	3/8 Valve
6	Fixture	21	1/2 Valve
7	Motor Bracket	22	Valve Cover
8	Column support	23	Compressor
9	Four-Way Valve	24	Feet
10	Electrical Box	25	Bottom Plate
11	Electric Box Cover	26	EEV Coil
12	Top Panel	27	Electrical Expansion Valve
13	Back Panel	28	Compressor Heater
14	Condenser	29	Condebser Heater
15	Bulkhead		

5.ATTACHED DRAWING

5.3 Wiring diagram

Indoor

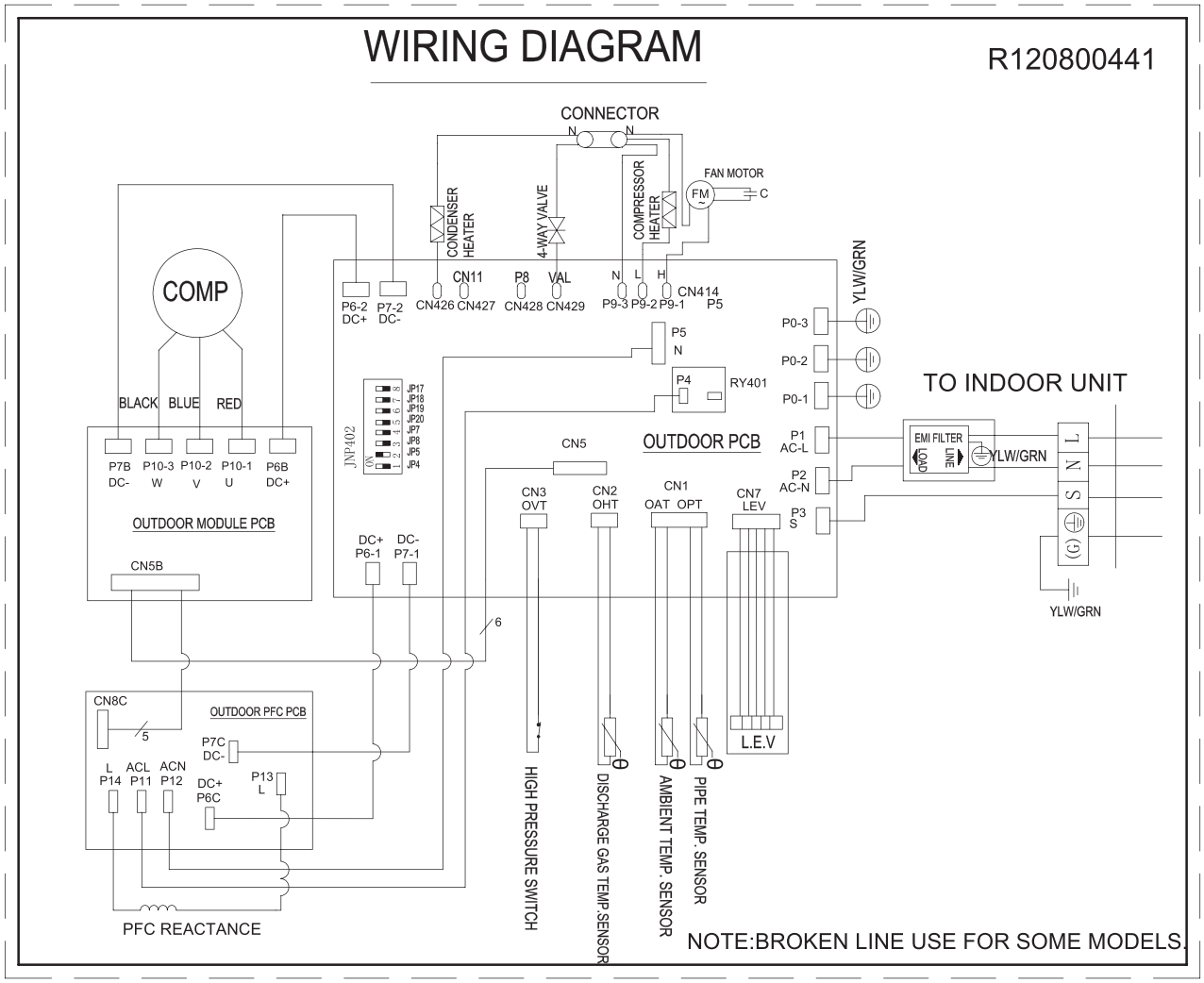


Take Care:

This diagram is subject to change with improvement of the unit.Always refer to the diagram supplied with the product.

5.ATTACHED DRAWING

Outdoor--Flare nut

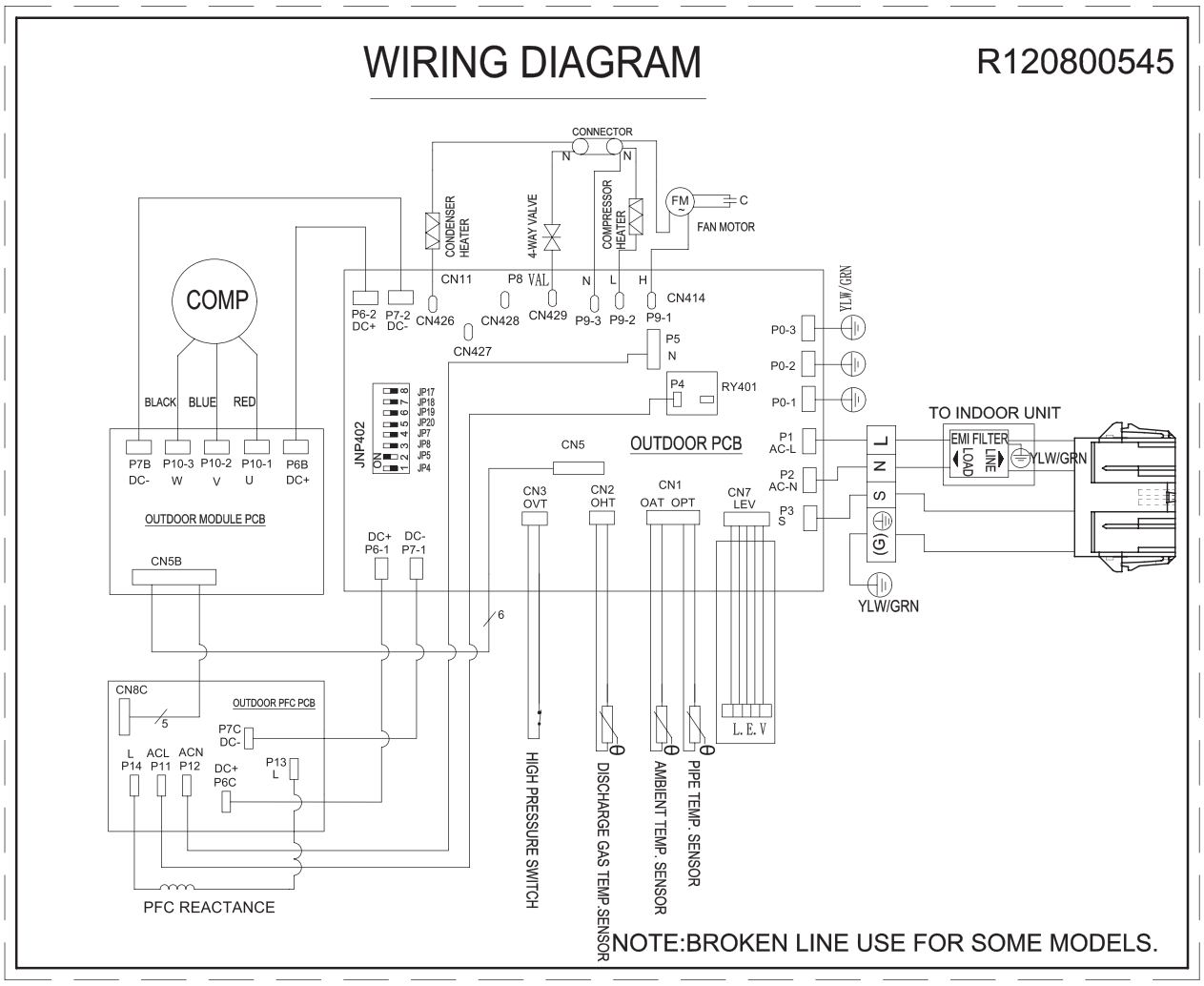


Take Care:

This diagram is subject to change with improvement of the unit.Always refer to the diagram supplied with the product.

5.ATTACHED DRAWING

Outdoor--Quick connector



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