Operation &Installation Manual

Air source hot water heat pump

Model: PASHW010-300LD£HE£

PROJET'AR
ar condicionado

Code:20080819-0004

Preface

- This manual includes all the necessary information about installation, debugging, discharging and maintenance. Please read this manual carefully before you open or maintain the unit.
- When install the unit and connect the pipe, please carry it out strictly according to the manual.
- Once finish the installation and connection, please make everything ok before power on the unit.
- The installer should explain to the user how to operate and maintain the unit according to the manual, when the unit is installed. And ask the user to read the manual carefully, keep the manual and do the operation in strict accordance with the Manual.
- The manufacture of this product will not be held responsible if someone is injured or the unit is damaged, as a result of improper installation, debugging, unnecessary maintenance which is not in line with this manual.
- It is vital that the below instructions are adhered to at all times to keep the warranty.

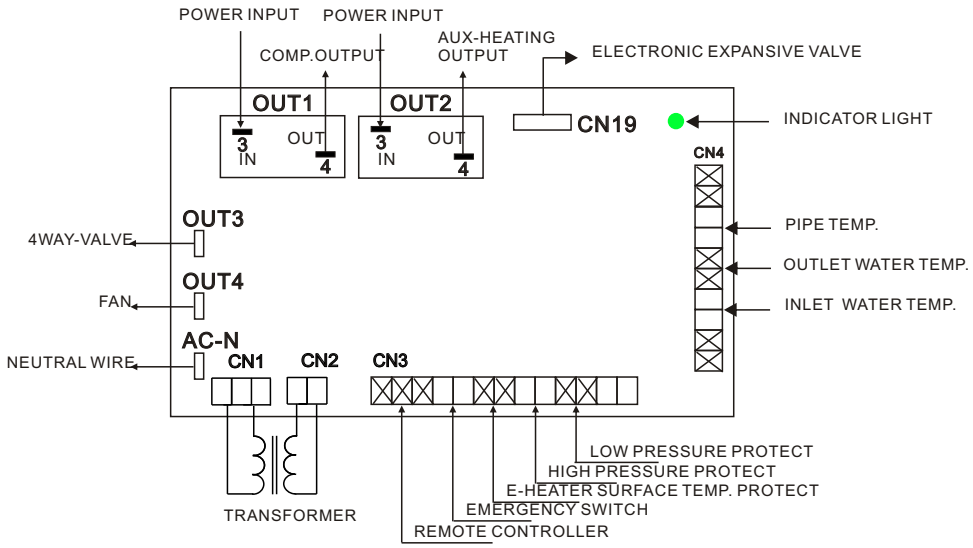
¡Maintenance and operation must be carried out according to the recommended time and frequency, as stated in this manual.

Failure to comply with these recommendations will invalidate the warranty.

- The manual will be changed if there is any improvement on the unit, there will not be advance notice.

7.Appendix

Appendix2. Controlling board access



PICTURE 14

7.1 Appendix 1. Parameters for unit running

Parameter	Meaning	Range	Default	Remarks
0	return water temp. in the tank	0-70¡	55¡	Adjustable
1	heating differential	2-15¡	5¡	Adjustable
2	tank water temp. for starting e-heater	10-90¡	55¡	Adjustable
3	e-heater delay time T	0-90min	40min	Adjustable
4	high water temp. for antisepsis per week	50 -70¡	60¡	Adjustable
5	high water temp. period for week	0-90min	10min	Adjustable
6	defrosting period	30-90min	45min	Adjustable
7	coil temp. for starting defrosting	-30-0¡	-7¡	Adjustable
8	coil temp. for exit defrosting	2-30¡	13¡	Adjustable
9	defrosting cycle period	1-12min	8min	Adjustable
10	To adjust the electrical expansion valve	0/1	1	Adjustable
11	Target over-heat degree £when parameter10=1, it will take effect£	-20¡- 20¡	5¡	Adjustable
12	Step to adjust the electrical expansion valve by hand	10-50	35	Adjustable
A	Inlet water temp.	-30-99¡	True testing figure; show P1 if there is any failure	
B	Outlet water temp.	-30-99¡	True testing figure; show P2 if there is any failure	
C	Evaporator coil temp.	-9-99¡	True testing figure; show P3 if there is any failure	
D	Evaporator temp.	-9-99¡	True testing figure; show P4 if there is any failure	
E	Exhaust temp.	-9-199¡	True testing figure; show P5 if there is any failure	
F	Eletronic expansive valve step	0-50	N*10	

Remarks£Electric-heater starting time after compressor is parameter 03 that is subject to the data of the setting data multiply 5 .(The default is 40 min but the real delay time is 200 min. (40 min X5)

Content

1.Safety Precaution

Safety Precaution

To prevent the users and others from the harm of this unit, and avoid damage on the unit or other property, please use the heat pump properly, please read this manual carefully and understand the following information correctly.

Mark	Meaning
WARNING	A wrong operation may lead to death or heavy injury on people.
ATTENTION	A wrong operation may lead to harm on people or loss of material.

Icon	Meaning
	Prohibition. What is prohibited will be nearby this icon
	Compulsory implement. The listed action need to be taken.
	ATTENTION (include **WARNING**) Please pay attention to what is indicated.

1.The hurt means no need to be in hospital and cure for a long time, it's injury, burn and get an electric shock.

2.The material lost means property and datum lost.

INSTALLATION WARNING

Professional installer is required	The heat pump must be installed by qualified personals, to avoid improper installation which can lead to water leakage, electrical shock or fire.
Earthing is required	Please make sure that the unit and power connection have good earthing, otherwise may cause electrical shock.
Concentration limits	When install the unit in a small room, please take some measures to prevent the asphyxia caused by the leakage of refrigerant. Please consult the dealer for concrete measures.

6.Maintenance and repair

6.1 maintenance

- Check the water supply and air vent frequently, to avoid lack of water or air in the water loop. Clean the water filter in a certain period to keep good water quality. Lack of water and dirty water can damage the unit. The heat pump will start the water pump per 72 hours when it is not running, to avoid freezing.
- Keep the unit in a place which is dry and clean, and has good ventilation. Clean the heat exchanger in 1 or 2 month and keep good heat exchange rate and save energy.
- Check each part of the unit and the pressure of the system. Replace the failure part if there is any, and recharge the refrigerant if it is needed.
- Check the power supply and the electrical system, make sure the electrical components are good, the wiring is well. If there is any part failed with wrong action or smell, please replace in time.
- If the heat pump is not used for a long time, please drain out all the water in the unit and seal the unit to keep it good. Please drain the water from the lowest point of the heat exchanger to avoid freezing in winter. Water recharge and full inspection on the heat pump is needed before it is restarted.
- Don't power off the unit when you use it incontinuity, or the water in the pipe will freeze and split the pipe. We will not answer for this damage.

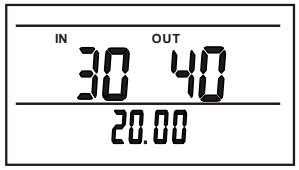
6.2 the normal failure and solutions

Failure	Display	Indicator	Cause	Solutions
Power on		Off		
Unit running		On		
Lower tank water temp. sensor failure	**PP 1**	1 on 1 off	The temp. sensor is open or short circuit	Check and replace the temp. sensor for the lower tank water
Upper tank water temp. sensor failure	**PP 2**	2 on 1 off	The temp. sensor is open or short circuit	Check and replace the temp. sensor for the upper tank water
Evaporator coil temp. sensor failure	**PP 3**	3 on 1 off	The temp. sensor is open or short circuit	Check and replace the temp. sensor for the evaporator inlet
El-heater temp. sensor failure	**PP 4**	4 on 1 off	The temp. sensor is open or short circuit	Check and replace the temp. sensor for the El-heater
High pressure protect	**EE 1**	6 on 1 off	1.too much refrigerant 2.bad air side heat exchange	1. discharge the redundant gas 2. clean the air side heat exchanger
Low pressure protect	**EE 2**	7 on 1 off	1.the refrigerant is not enough 2.block on the filter or capillary 3.water flow is not enough 4.expansion sensor is broken	1.check if there is any leak and refill gas 2.replace the filter or capillary 3.clean the water side exchanger or discharge the air in the water loop 4.use new expansion valve
AUX-heating thermal protect	**EE 3**	8 on 1 off	Water lever in tank too low	Check the water supply or tank whether have enough water
Exhuast temp.protect	**EE 4**	9 on 1 off	1.shortage of refrigerant 2.out water temp. setting too high	1. Check the gas pressure and if have enough refrigerant 2. Check the setting temp.
Communication failure	**EE 8**	On	Communication failure between wire controller and main board	Check the wire connection between the wire controller and the main board
Defrosting	**Defrosting indicate**	flash		

5. Usage

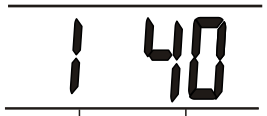
3£Turn-off

Press¡ ¡ to turn off the unit with the screen showing as the following:



4£Check parameters

During running or standby state, press ▲ or ▼ to check the related parameters with the screen showing as the following:



The parameter value

"1" means the parameter code

5£check and change the set parameters (Note: you can check and change the set parameters during standby state but you can only check the set parameters when the unit running)

1. Press ¡ ▲▼ repeatedly to check the related set parameters;
2. Then press¡ELEC. HEATING¡¡ ¡at the same time ,to change the parameters; If without press within 6 seconds, it will exit setting state;

The screen displays as the following :

To show the set parameter

To show parameter No. 0 ¡ 12
(please check the system parameter table for the related meanings)

6£Malfunction Display

During standby or running state , if malfunction happens to the system, the system will stop to show the malfunction code as the following:

To show the malfunction code
(refer to malfunction code table)

1. Safety Precaution

Installation Place	The unit CANNOT be installed near the flammable gas. Once there is any leakage of the gas, fire can be occur.
Fix the unit	Make sure that the basement of the heat pump is strong enough, to avoid any decline or fall down of the unit.
Need circuit breaker	Make sure that there is circuit breaker for the unit, lack of circuit breaker can lead to electrical shock or fire.

OPERATION WARNING

PROHIBITION	DO NOT put fingers or others into the fans and evaporator of the unit, otherwise harm may be occurred.
Shut off the power	When there is something wrong or strange smell, the power supply need to be shut off to stop the unit. Continue to run may cause electrical short or fire.

MOVE AND REPAIR

Entrust	When the heat pump need to be moved or installed again, please entrust dealer or qualified person to carry it out. Improper installation will lead to water leakage, electrical shock, injury or fire.
Prohibit	It is prohibited to repair the unit by the user himself, otherwise electrical shock or fire may be occur.
Entrust	When the heat pump need to be repaired, please entrust dealer or qualified person to carry it out. Improper movement or repair on the unit will lead to water leakage, electrical shock, injury or fire.

OPERATION ATTENTION

Check the install placement	The unit must be installed indoor, and the ambient temperature must be over 0 ¡, If don't use the unit for a long time and the environment temperature is below 0 ¡, please drain the water in the tank to prevent the freezing.
Shut off the power	When do the clean, must stop the unit and shut off the power, if don't stop the unit, it will cause hurt by the high speed running fan.
Prohibit	Please use the suitable fuse. If use copper or iron, it will cause failure, even the fire.
Prohibit	Forbid spraying the flammable aerosols to the unit, otherwise it will cause the fire.

2.Specs

2.1 Appearance

Picture 1

2.2 Characteristic

- good looking and efficient
  attractive design allows the unit to be placed in the open in finished utility spaces and basements, reducing the cost of remodelling; depending on external condition the cost of operation can be 25% of that of an electric water heater, and can be used in locations unsuitable for solar hot water heating.

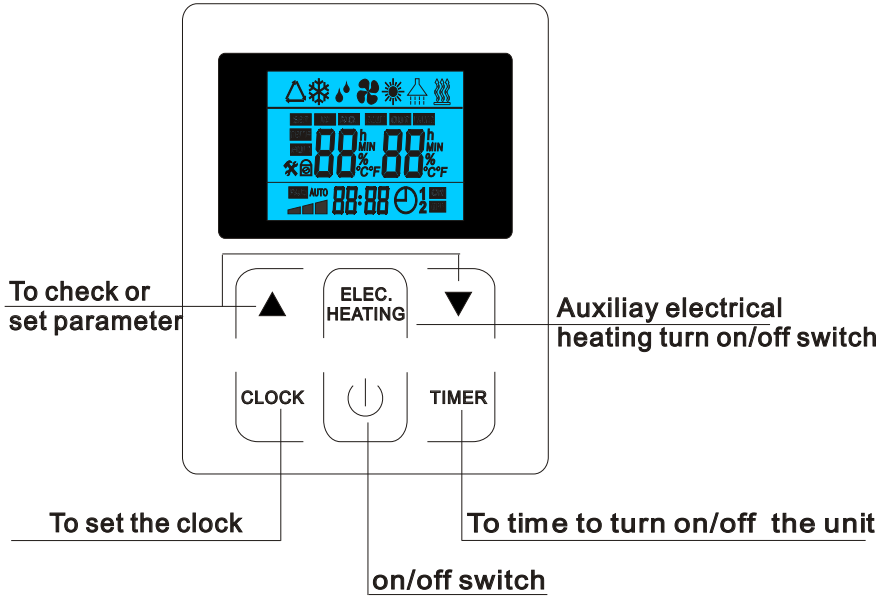
- environmentally friendly and safer
  produces no harmful gas locally from the combustion of oil, coal, or natural gas; free of potential hazards from carbon monoxide, it also can avoids electrical contact with water, and does not provide an open flame, making the device more suitable for installation.

- easy to operate and multiple teat sources
  contains a timer for start and stop, and an adjustment dial for easy setting of the water temperature; depending upon the location of the air exchanger, heat may be taken from the outside environment , from a sun porch or attic space, or from hot areas in light industrial environments.

5. Usage

5.1 function of the controller

User Interface and Usage as the following£



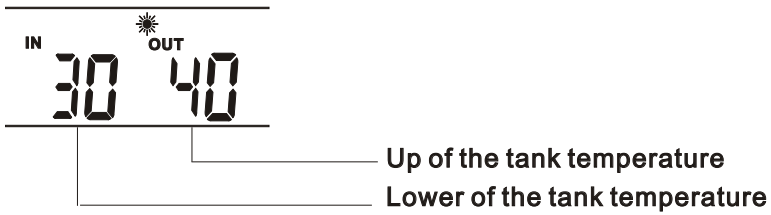
5.2 usage of the controller

1） Electrify

After checking everything is ok, electrify and enter into standby state , with the screen showing as the following:

2)Turn-on。

Press“ to turn on the unit with the screen showing as the following:



4.6 Water loop connection

Pay attention to these points when connect the water loop pipe:

- Try to reduce the water loop resistance£
- Make sure there is nothing in the pipe and the water loop is smooth, check the pipe carefully to see if there is any leak, then pack the pipe with the insulation.
- Install the one way valve and safety valve in the water circulation system.
- The nominal pipe widths of the field-installed sanitary installations must be selected on the basis of the available water pressure and the expected pressure drop within the piping system. The water-side installation has to be executed in compliance with DIN 1988(in case of excessive water pipe pressure, a pressure relief valve is to be provided!)
- The water pipes may be of the rigid of flexible type. To prevent corrosion damage, make sure that the materials used in the piping system are compatible.
- When installing the pipework on the customer's site, any contamination of the piping system must be avoided(pipes may have to be flushed prior to the connection of the unit).

4.7 Wire connection

- There is wire at the bottom of the unit, it's for power supply of the unit. The spec of the wire is 1.5mm^2.
- There must be a switch when connect the unit to power system.

4.8 Trial running

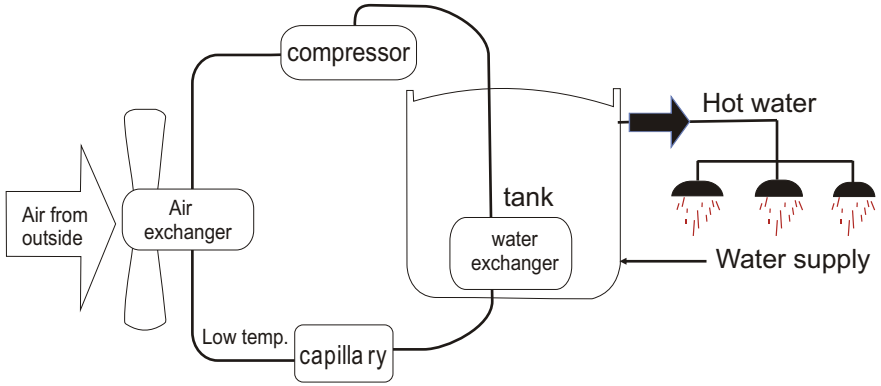
4.8.1 Inspection before trial running

- Check the water in the tank and the water pipe connection.
- Check the power system£make sure the power supply is normal and the wire connection is correct.
- Check the unit: make sure everything is ok before power on the unit, check the light on the wire controller when the unit runs.

4.8.2 Trial running

- Use the wire controller to start the unit£
- Listen to the unit carefully when power on the unit, power off the unit at once when you heard deviant noise;
- Measure the water temp. To check the Undulation of the water Temp.;
- The parameter has been set, the user can't change the parameter optionally, ask for professional peter to change the parameter.

2.3 principium



Picture 2

System theory:

(1) Using a little power input to drive the motor, the using power is Q1.

(2) While the unit is running, the power that comes environment is Q2(from the refrigerant transformation).

(3) The energy that the house using water gets from the unit is Q3.

(4) According to the low of conservation of energy:

¡ sum of input power = sum of output power Q1+Q2 = Q3

¡¡In standard working condition, the power that heat pump gets from the environment is about 3.2 times of the power input, Q2 = 3.2 Q1

so: Q3 = Q1+Q2 = Q1+3.2Q1= 4.2Q1

Which means you can get 4.2Q1 from heat pump if you spend Q1 energy.

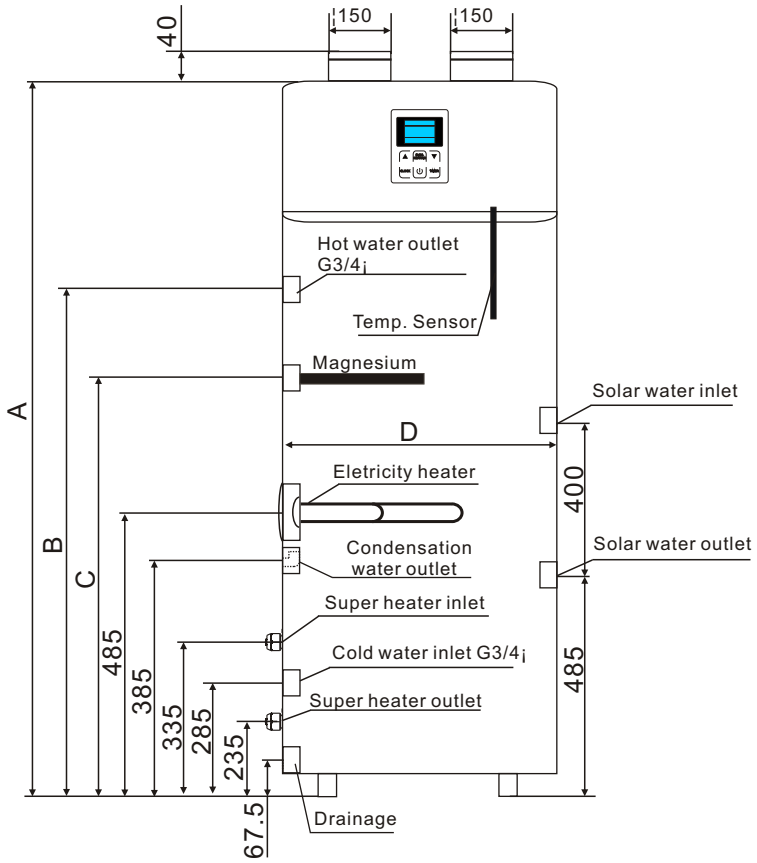
Which also means the energy that you can get from heat pump after using 1 degree electricity equal to the energy that you get from electrical heater after using 4.2 degree electricity. So, the hot water heat pump is one of the most energy saving equipments.

2.4 dimensions

PASHW010-150L/200L/250L/300LD(HE)

unit：mm

model / dimension PASHW	010-150LD(HE)	010-200LD(HE)	010-250LD(HE)	010-300LD(HE)
A	1510	1660	1910	1760
B	875	1060	1310	1120
C	775	960	1210	1020
D	¦560	¦560	¦560	¦640

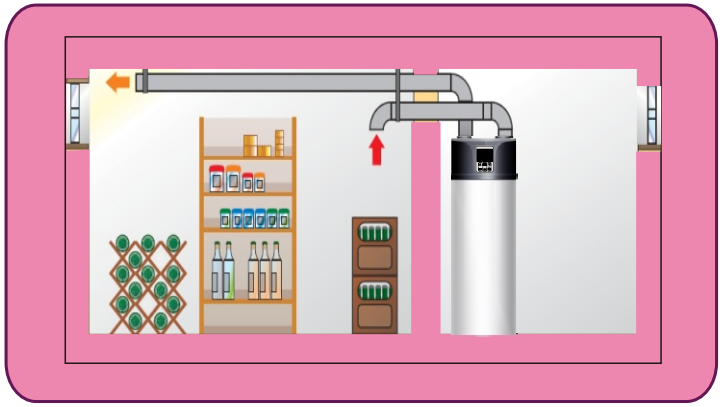


Picture 3

Remark: the solar and super heater is option. The drainage is also the water inlet when with the super heater.

(3) Cooling in the recirculating air mode (picture 12)

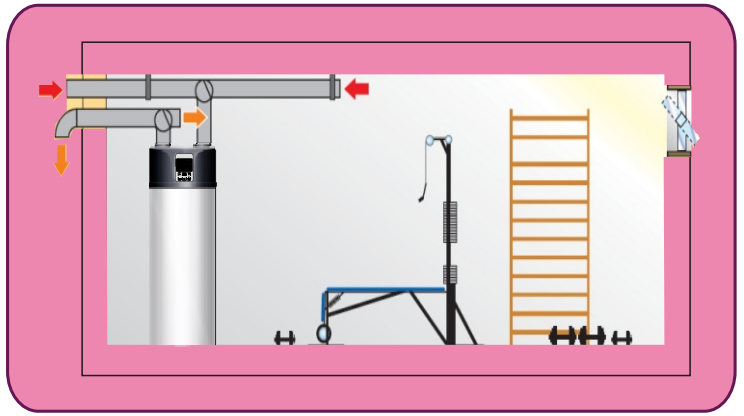
The room air is extracted from the storage room or a wine cellar, subsequently cooled and dehumidified in the heat pump and finally re-introduced into the room. Recreation rooms, boiler rooms or utility rooms are ideal installation sites. The air ducts leading through warm sections must be insulated to prevent the formation of condensation.



Picture 12

(4) variable change over of intake air

A duct system with integrated bypass flaps allows for variable utilization of the heat contained in the outside air or room air for the production of hot water.



Picture 13

Installation attentions

① Choose the right path to move the unit;

② Try to move the unit as original case;

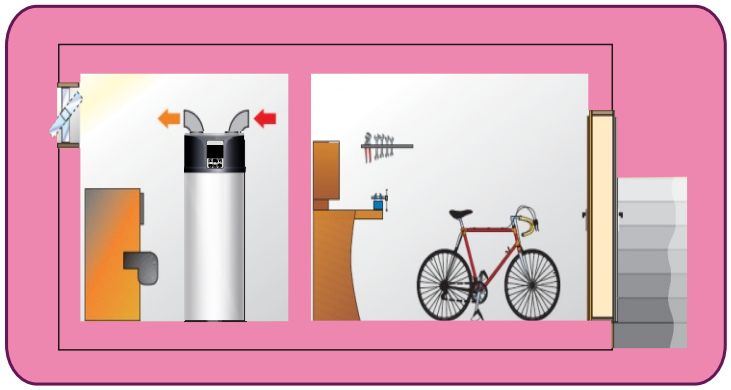
③ If the unit installed in the building of the metal part, it must work for electrical insulation and comply with the relevant technical standards of electrical equipment.

4.Installation

Installation position

(1) Waste heat is useful heat (picture 10)

The standard hear exchanger of the hot-water heat pump enables direct connection to a second heat generator, e.g. a solar heating system or a boiler.



(2) Dehumidification in the recirculating air mode (picture 11)

Dehumidified air in the laundry room supports laundry drying and prevents moisture-induced damage.

Picture 11

2. Specs

2.5 performance parameter

MODE	PASHW	010-150LD(HE)	010-200LD(HE)	010-250LD(HE)	010-300LD(HE)
Heating capacity	kW	2.6	2.6	2.6	2.6
Heat recycle capacity	kW	2.5	2.5	2.5	2.5
Water tank capacity	L	150	200	250	300
Power input	W	810	810	810	810
Running current	A	3.7	3.7	3.7	3.7
Power supply	V/Ph/Hz	220/1/60	220/1/60	220/1/60	220/1/60
Compressor Number		1	1	1	1
Compressor		rotary	rotary	rotary	rotary
Rated outlet water Temp	→	55	55	55	55
Air volume	m^3/h	450	450	450	450
Air pressure	Pa	60	60	60	60
Duct diameter	mm	⊥150	⊥150	¦150	¦150
Noise	dB(A)	49	49	49	49
Water inlet/outlet size	inch	3/4	3/4	3/4	3/4
*Auxiliary E-heater	kW	1.5	1.5	1.5	1.5
Net dimensions	mm	See the drawing of the units			
Shipping dimensions	mm	See package label			
Net weight	kg	See nameplate			
Shipping weight	kg	See package label			

Measurement conditions:
Instant heating: Ambient temperature20¡/19¡,Water outlet.55¡

Work range£
(1).Ambient temperature is 0-40¡
(2). The max temperature of water tank is 60¡

1.Function presentation

Heating capacity

- The unit absorb energy from outside and release the heat according to the heat exchanger, if the environment temperature is low, the heating capacity will be attenuation.

3 minutes protection

- When the unit stop, if you restart the unit or turn on the manual switch, the unit will not run in 3 minutes, it's the protection for the compressor.

Heating mode running

- If the environment temperature is too high, the fan motor will stop running to protect the unit.

Defrosting

- Under the heating mode, the unit will defrost automatic to make sure the heating efficiency (it will last 2-10 minutes).
  The fan motor will stop running when the unit is defrosting.

Working condition

- In order to use the unit correctly, please run the unit at environment temperature 0¡-40¡.
  The unit includes sophisticated electronic devices, prohibited to use water from lake, untreated river water and groundwater!

Power off

- If the power supply is off, the unit will sop running.
  If the running unit is disturbed by lightning, car radio, power grid fluctuations please cut off the manual power switch , and then power on, press the on / off button.

leakage current protection

- There is a leakage current action protection comes with the power supply wire.

4.3 Choose the suitable unit

In order to save the energy, please choose the suitable unit.

Person number	Tank capacity
2-3 people	200L
4-5 people	250L
More than 6 people	300L

Notice: The choice is just for reference, please choose the unit according to native environment and custom.

4.4 Deposited and transportation

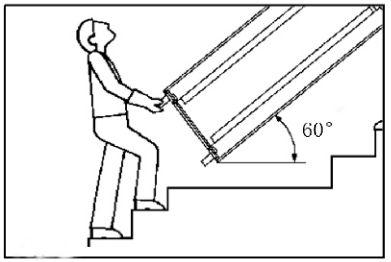
As a rule, the unit is to be stored and/or transported in its shipping container in upright position and without water charge. For a transport over short distance, and provided due care is exercised, an inclination angle of up to 30 degree is permitted. Both during transport and storage, ambient temperatures of - 20 to +70¡ are permissible.

4.4.1 Transport using a forklift

When transported by a fork lift, the unit must remain mounted on the pallet. The lifting rate should be kept to a minimum. Due to its top-heaviness, the unit must be secured against tipping over.
To prevent any damage, the unit must be placed on a level surface!

4.4.2 Manual transport

For the manual transport, the wooden pallet can be used for bottom part. Using ropes or carrying straps, a second or third handling configuration is possible. With this type of handling, care must be taken that the max. Permissible inclination angle of 60 degree is not exceeded. If transport in an inclined position cannot be avoided, the unit should be taken into operation one hour after it has been moved into final position.



Picture 9

CAUTION£High center of gravity, low overturning moment!

● Controller system test

Power on the unit, check the display of the wire controller, it will display the water temperature when the unit stand by. If the wire controller display the error code, please refer to the form 6.2.

● Debug the cooling system

a) When finish the connection, please release a little refrigerant from the high pressure(inlet) side, or use the vacuum pump to vacuumize the system, until the pressure is below 70Pa;

b) Once the unit is vacuumized, please open the High pressure valve£inlet£ and the High pressure valve£outlet£ until the pressure is balanceable, then check the joints by the suds;

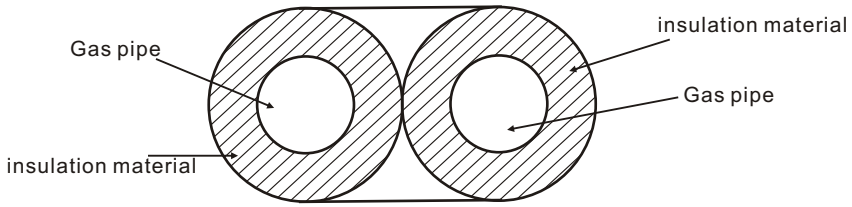
ATTENTION Can't allow any sundries to enter the refrigerant system.

5) Insulation treatment

As the below picture shows, must take the Insulation treatment for the connection pipe, and can use the 15mm-20mm thickness PVC.

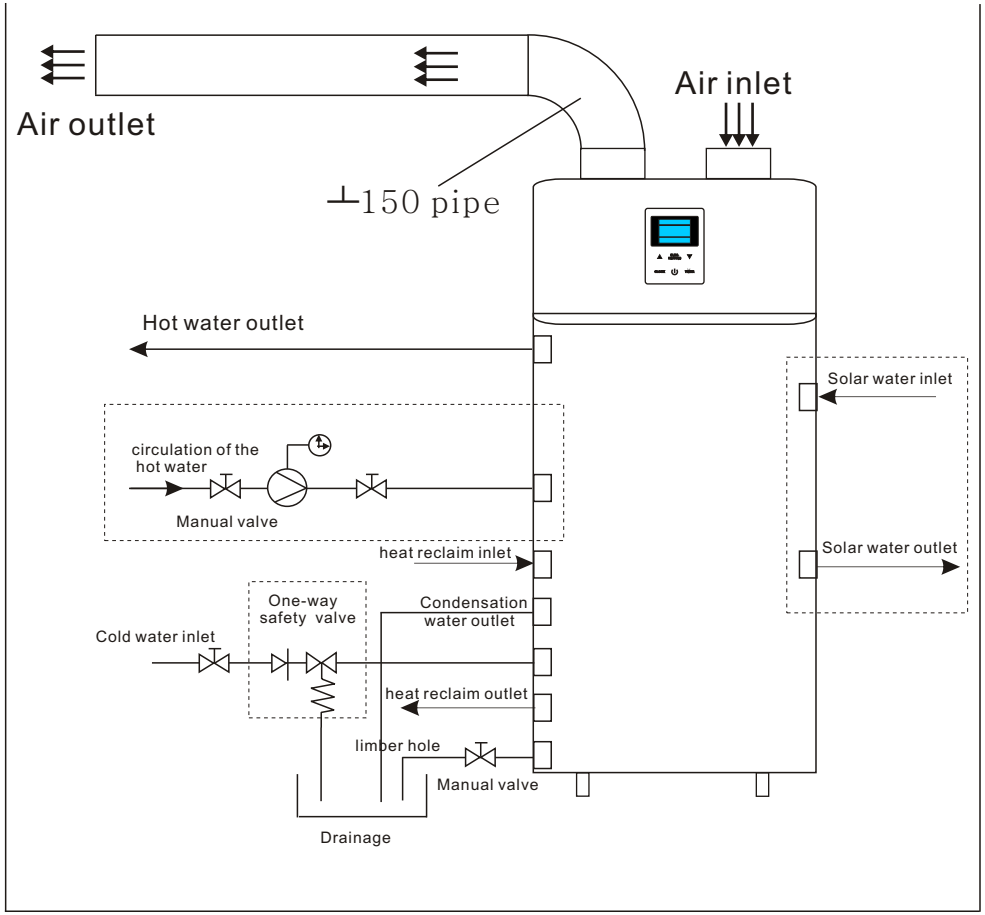
(1) Please pack the two gas pipes by insulation material separately, in order to organize the pipes easily, you can enswathe the packed two gas pipes together, and should not be forced tied too closely to prevent the frost caused by cold air;

(2) The electrical wire can't come into contact with the copper pipe.



Picture 8

4.1 installation sketch map



Picture 4

Illuminate: circulation of the hot water, solar and heat reclaim is for option. When the unit has heat reclaim function, the limber hole is used for water inlet.

ATTENTION The one-way safety valve attached with the unit must be installed, or it will cause damage to the unit, even hurt the people.

4.2 how to connect to the heat pump

(This section is main for the unit with outside supper-hearter)

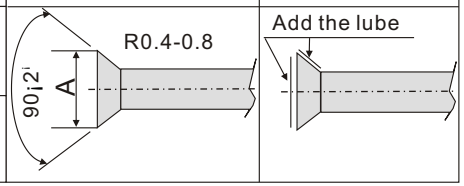
1) connecting requirements:

(1) The size of dilater as the form shows;

(2) Please daub the lube in the dilater when connect the dilater nut. Fastening the nut Screw three to four teeth before the final fastness;

(3) The Torque of pinch please check the form

(4) Make the leakage test when the unit is installed.

Specs	Torque	Size of dilater (A)	Dilater	lube
μg12.7mm	50-60N.M	15.4-15.8mm		
μg9.52mm	35-40N.M	12.0-12.4mm		

2) Pipe connection

The length of pipe between the unit and the heat pump is less than 5m, and the height difference is less than 3m.

3) Connect the pipe to the heat pump:

(1) Take off the nut from the heat pump, expending the pipe and connect it to the heat pump;

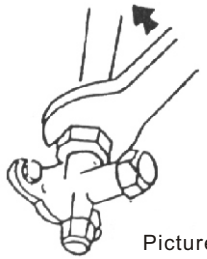
(2) Connect the pipe expending to the joints of heat pump, then screw the nut, the torque please refer to the above form.

4) Connect the pipe to the hot water unit:

(1) Take off the copper nut and put in through the pipe, then expending the pipe as the above form shows;

(2) Connect the pipe expending to the joints on the hot water unit, make sure the axis in the same direction.

(3) Screw on the nut step by step, according to the torque as the form shows.



Picture 5

(4) Leakage test

Please make the leakage test when finish the pipe connection. Infuse the nitrogen from the High pressure valve£inlet£ until the pressure is up to 4MPa, then check the joints by the suds;

(5) Vacuum and filling Refrigerants

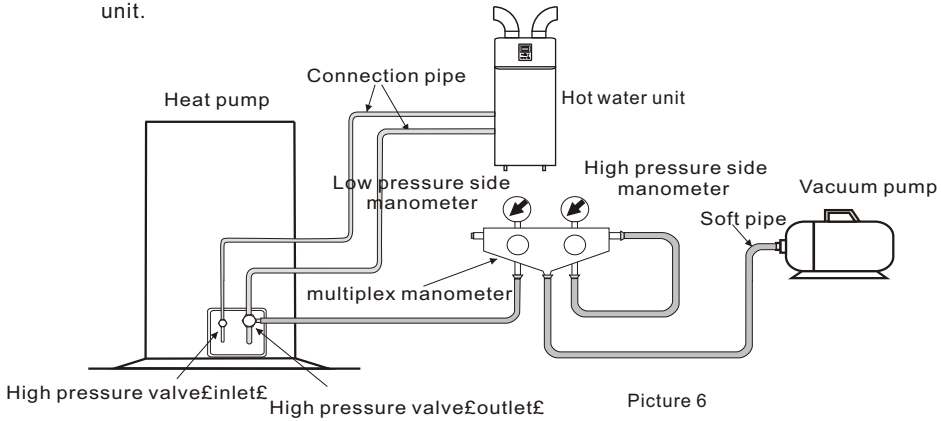
The refrigerant has been filled into the unit in the factory, when finish the connection between the heat pump and the hot water unit, must vacuumize the hot water unit.

As below picture shows:

A¡Unscrew the screw cap of the High pressure valve（outlet） on the heat pump, and connect the multiplex manometer to the check valve;

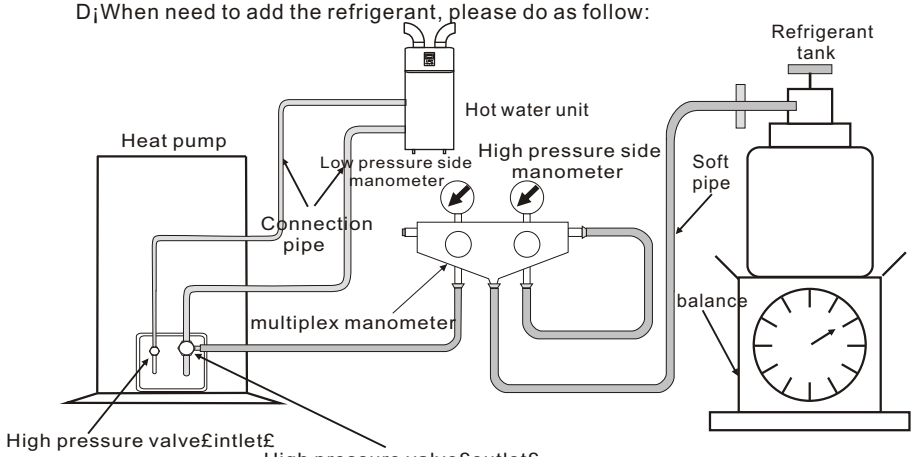
B¡Connect the vacuum pump to the multiplex manometer, then open them to vacuumize the hot water unit, to make sure the absolute pressure is less than 70Pa, and lasts 60 minutes.

C¡When finish the vacuum, open the check valve to let the refrigerant go into the hot water unit.



Picture 6

D¡When need to add the refrigerant, please do as follow:



Picture 7