SOLTARO

INSTALLATION & OPERATION MANUAL

All-In-One Type Air Source Heat Pump Water Heater

Model: HPWSTR002 / HPWSTR003

Soltaro_ASHP_Manual V1.4

NOTES

Dear customers,

Thank you for selecting our products.

The manual aims to provide instructions for the installation, operation and maintenance of heat pump, providing important safety information. Please carefully read the entire contents of this manual before you install and use heat pump. Please keep this installation manual carefully for purpose of future reference.

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SAFETY PRECAUTIONS

- Please make sure you have read at least one chapter of safety precautions shown in the manual. This part provides important safe points for you. Please operate it based on safety precautions.

WARNING

1.Household electrical system must have a reliable ground connection;

2. Household electrical system must have a leakage protection device;

3. Do not dismantle any permanent instruction, label or parameter plate attached to the outside cover or any internal plate of heat pump;

4. Please ensure a dealer or professional person installs the device; Installer must have professional knowledge, any improper operation may cause fire, electric shock, injury or leakage etc.;

5. Purchases from the local market must select specified product by our company;

6. Please obey the local electrical regulations to connect power supply;

7. When you need to remove or re-install heat pump, please ensure this is done by a dealer or professional person;

8. Any self-transformation or repair is forbidden, improper repair may cause fire, electric shock, injury or leakage etc. must entrust dealer or professional person to repair;

9. Earthing pole of power outlet must have a reliable connection, and rated current value should be not less than 20A. Outlet and power plug must be kept dry to prevent leakage, outlet and power plug must be well matched.

10. Due to possibility of water spatter, the installation height of power plug must

be no less than 1.8m. Ensure power plug is installed away from water source. Ensure children cannot touch power plug.

11. One way valve suitable to application must be installed near to cold water outlet;

12. In the state of energization and heating;

13. For continued safety of this appliance, it must be installed, operated and maintained in accordance with the manufacturer's instructions;

14. This appliance may deliver water at high temperature. For Australian installations, refer to the plumbing code of Australia(PCA), local requirements and installation instructions to determine if additional delivery temperature is required;

15. Australian installation shall conform to the Plumbing Code of Australia (PCA);

16. If the fixed appliance is not fitted with a power cord and plug, or is not fitted with other devices to disconnect the power cord (these devices must have contact separation at all poles and can be completely disconnected under overvoltage Class III conditions; All-pole disconnect switch), then the disconnect device must be incorporated into the fixed wiring according to the arrangement of wiring rules;

17. The minimum installation room area for HPWSTR002 is 69 square meters, and the minimum installation room area for HPWSTR003 is 42 square meters, unless the products are used entirely outside;

18. Do not use means to accelerate the defrosting process or to clean, other than those recommended by the manufacturer;

19. The appliance shall be stored in a room without continuously operating ignition sources (for example: open flames, an operating gas appliance or an operating electric heater);

20. Do not pierce or burn;

21. Be aware that refrigerants may be odorless;

22. Ensure no obstructions near any required ventilation;

23. Maintenance should only be carried out as recommended by the supplier;

24. Ducts connected to electrical appliances must not contain ignition sources;

25. Appliances should be stored in a well-ventilated area with the room size corresponding to the designated operating room area;

26. If electrical appliances connected to one or more rooms via an air duct system are installed in a room with an area smaller than the minimum area determined in Article 17 above, the room shall be free of open flames in continuous operation (e.g. gas appliances in operation) or other potential sources of ignition (e.g. electric heaters in operation, hot surfaces). A fire producing device may be installed in the same space if it is provided with an effective flame arrester;

27. For equipment connected to one or more rooms via an air duct system, auxiliary equipment must not be installed in the air duct system, which may be a potential source of ignition;

28. For appliances connected to one or more rooms through an air duct system, only auxiliary devices approved by the appliance manufacturer or declared suitable for refrigerant shall be installed in the connected piping system;

29. The appliance shall be stored so as to prevent mechanical damage from occurring.

30. 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.

31. Children should be supervised to ensure that they do not play with the appliance.

32. If the power cord is damaged; it must be replaced by the manufacturer, its service agent or a similarly qualified person in order to avoid a hazard.

33. If the hot water system is not used for two weeks or more, a quantity of highly flammable hydrogen gas may accumulate in the water heater. To dissipate this gas safely, it is recommended that a hot tap be turned on for several minutes or until discharge of gas ceases. Use a sink, basin, or bath outlet, but not a dishwasher, clothes washer, or other appliance. During this procedure, there must be no smoking, open flame, or any electrical appliance operating nearby. If hydrogen is discharged through the tap, it will probably make an unusual sound as with air escaping.

GENERAL INFORMATION

I. Measurement

Model	Weight(kg)	Dimension(mm, D×H)	Power supply	Water connection size
HPWSTR002	120	φ620mm*1518mm	220V/ 50Hz/ 1 phase	3/4”
HPWSTR003	140	φ620mm*1838mm	220V/ 50Hz/ 1 phase	3/4”

II. External appearance

III. Features

All in one heat pump for sanitary hot water:

1. Has complete isolation between water and electricity, without electric shock possibilities;

2. No fuel tubes and storage, no potential danger from oil leakage, fire, explosion, etc.;

3. No cross-contamination potential, the condenser coil is an external coil wrapped around the stainless tank, it does not come in contact with water directly;

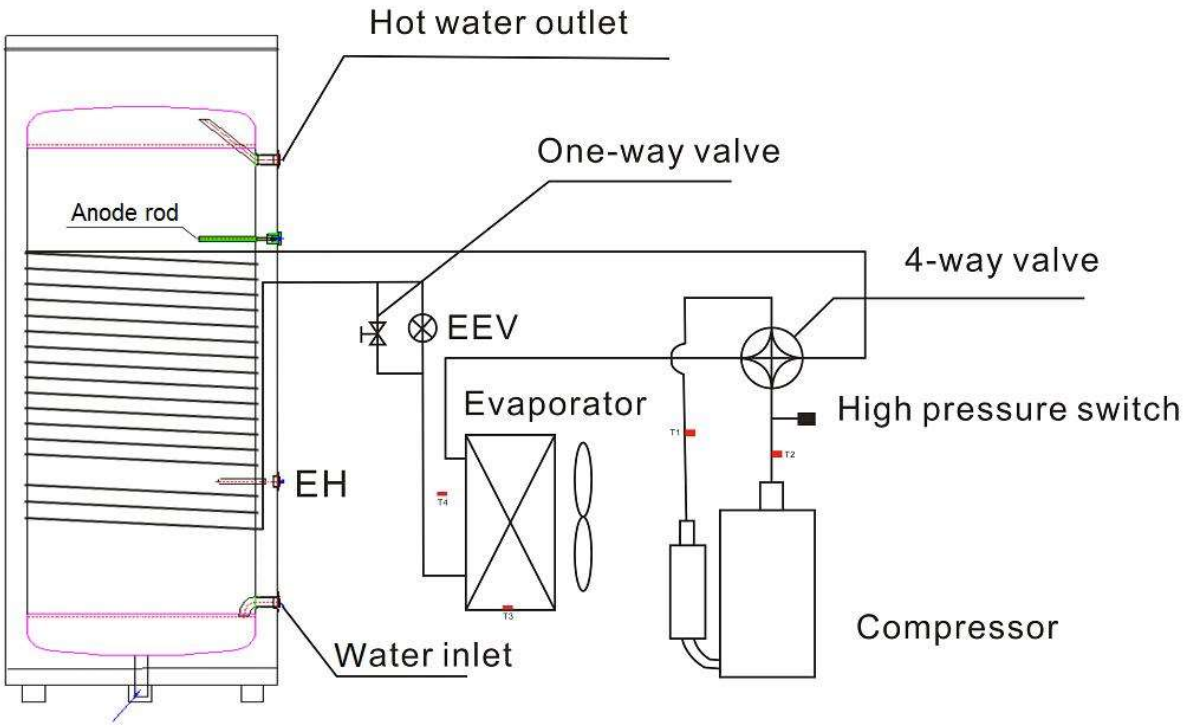
4. The maximum outlet water temperature is 75°C. The system ensures the water is heated stably and quickly with innovative heating methods combining electric heating and heat pump heating;

5. Automatic start-up and shutdown, automatic defrosting by revising refrigerant cycle;

6. According to heat pump principles, the unit absorbs heat from outdoor air and transfers heat to water with a thermal efficiency of approximately 4.17 (Under the condition A20/15°C W15/55 °C);

7. The unit will operate within the temperature range from -7 °C to 43 °C. The unit is not affected by night, cloudy sky, rain or snowy weather;

IV.Refrigerant circuit



Compressor: R290, supplied by GMCC.

Evaporator: Copper tube and aluminum fin type heat ex-changer.

EXV: Electronic expansion valve, the opening is regulated according to the discharge air temperature of compressor.

Fan: Centrifugal fan with three speeds.

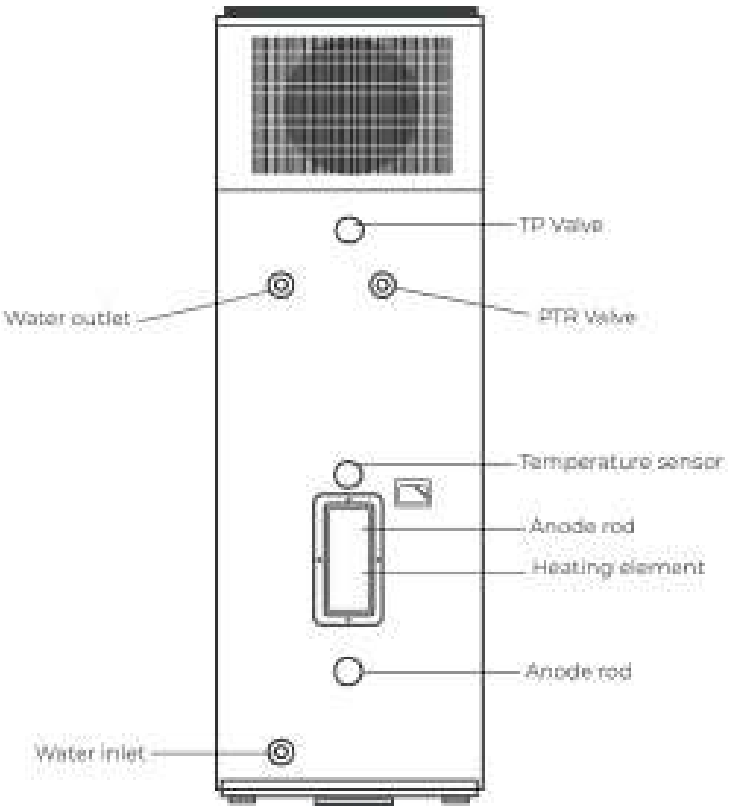
High Pressure Switch: When the discharge pressure of compressor is 2.76Mpa or higher, protection switch will be triggered, then if the discharge pressure is below 2.07MPa, the protection switch will disengage.

V.Specifications

Model	HPWSTR002	HPWSTR003
Power supply	220V～240V/50HZ	220V～240V/50HZ
Rated Input Power(Heat pump)	1.2KW	1.2KW
Rated Input Current(Heat pump)	5.3A	5.3A
Rated Heating Capacity(Heat pump)	2.78KW	2.78KW
Rated Input Power(Resistance)	1.8KW	1.8KW
Rated Input Current(Resistance)	7.5A	7.5A
Max Current(HP&Resistance)	14A	14A
Water tank volume	200L	270L
Recovery Rates (litres per hour)	60	60
COP (A 20/15, W 15-55)	4.15	4.15
STC in zone 4	31 or 32	31 or 32
Refrigerant	R290 (400g)	R290 (400g)
Compressor	GMCC / Rotary	GMCC / Rotary
Expansion valve	EEV	EEV
Fan	Axial	Axial
Ventilation	Horizontal discharge	Horizontal discharge
Heat exchanger	Microchannel / Wrap around tank	Microchannel / Wrap around tank
Inner tank material	Enamel	Enamel
Inner tank thickness	Dome 3.0mm / Wall 2.5mm	Dome 3.0mm / Wall 2.5mm
Inner tank type	Concave	Concave
Insulation / thickness	Polyurethane / 40mm	Polyurethane / 40mm
Outer Casing	Galvanized painted sheet	Galvanized painted sheet
TPR valve	850KPA	850KPA
Rated Outlet Water Temperature	60°C	60°C
Max Outlet Water Temperature	70°C	70°C
Working range with element	-15°C-43°C	-15°C-43°C
Working range without element	-7°C-43°C	-7°C-43°C
Anti Legionella	Water heated up to 60°C	Water heated up to 60°C
IP Class	IPX4	IPX4
Electric Shock Proof	I	I
Unpacked Dimension (outdoor unit)	φ620mm*1518mm	φ620mm*1838mm
Packed Dimension (outdoor unit)	700*700*1565mm	700*700*1880mm
Net Weight	104	118KG
Gross Weight	120	140KG
Noise	49dBA	49dBA

The data above is only a reference, specific data please refer to the nameplate on the units.
Note : We reserve the right to discontinue, or change at any time, specifications or designs without notices and without incurring obligations.

PART NAMES



NOTE

All the pictures in this manual are for explanation purposes only. They may be slightly different from the heat pump water heater you purchased (depending on the model). Please refer to the real sample instead of the pictures of this manual.

INSTALLATION OF HEAT PUMP

I. Choose a suitable location

- Avoid installing this equipment indoors. If installed indoors, may cause overflow, noise or indoor temperature changes which can influence comfort, please ensure preventive measures are taken in advance;
- Ensure sufficient space for installation and maintenance;
- Inlet or outlet air must have no obstacles and be sheltered from strong winds;
- Dry and ventilated place is most suitable;
- Support surface must be flat (horizontal angle must not be more than 2°C), and able to bear heat pump's weight. The surface shall not increase any noise or shock;
- Ensure position where noise and exhaust air aren't immediately adjacent to neighbours' property;
- The place has no leaking combustible air;
- Easy access to install connection pipe and electrical parts;
- If heat pump installed in metal parts of a building, electrical insulation must comply with technical standard on electrical equipment.

NOTE

In the region which the temperature is below 0°C, the heat pump must be installed indoor or other positions where it will not be frozen for purposes of protecting connection pipe;

If used for those regions which the temperature is below 0°C, suitable measures must be taken to protect pipes if the heat pump is installed outdoors;
Installation location that experiences high temperature or long-term exposure is prohibited, as it may decrease lifetime of the product.

Notes: If installed in the following places, machine errors may occur. If unavoidable, please consult your local authorized service point;

a. The location contains mineral oil such as cutting oil;

b. The location contains salt such as coastal areas;

c. The location has corrosive fumes such as spa's, or where there is sulfur gas;

d. The location has frequent changes to voltage and current;

e. The location has strong movement, such as a car or cabin;

f. Location with strong electromagnetic waves;

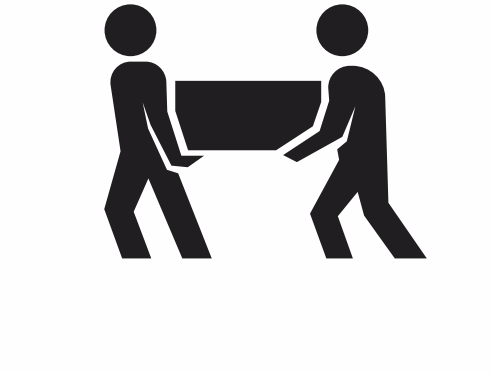
g. Location where there is oil, gas or oil spatter such as kitchen;

h. Location where the evaporation of acid or alkaline gas occurs;

i. Other location where there is special conditions.

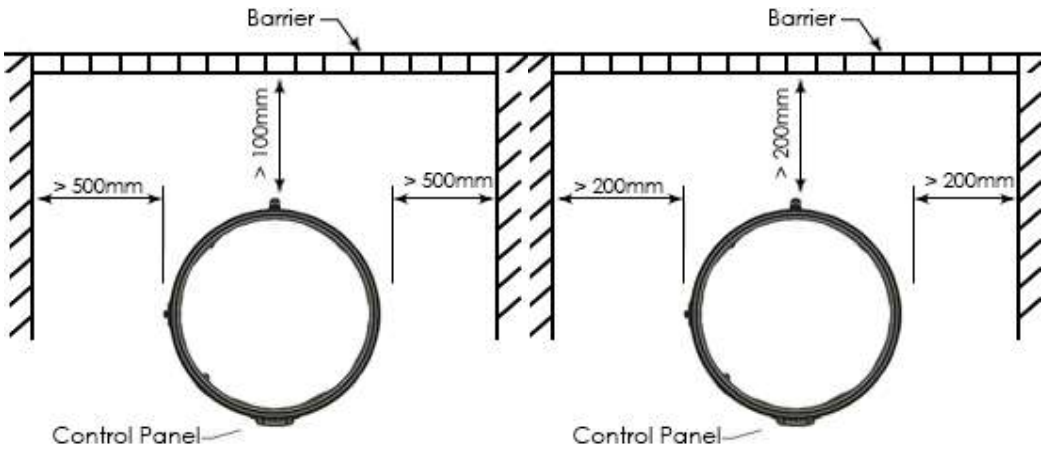
II. MOVEMENT OF HEAT PUMP

- This heat pump is heavy requires at least two people to move and install it;
- Please move the equipment according to the original factory packaging;
- Please use protection during transit to avoid scratches and damage to the unit;
- Do not touch fan with your hands or other objects;
- Do not move the heat pump at an angle of <75°.



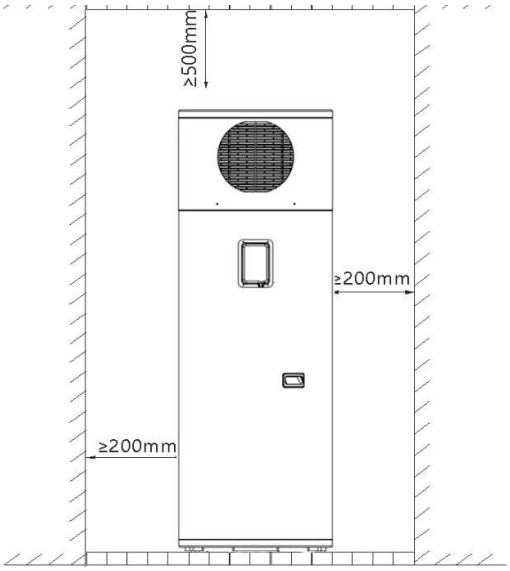
III. INSTALLATION OF HEAT PUMP

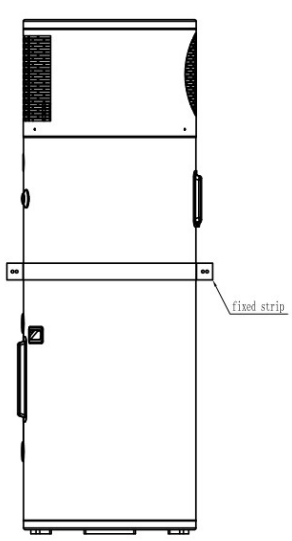
O Please leave enough space for installation and maintenance by following either of the below clearance options.

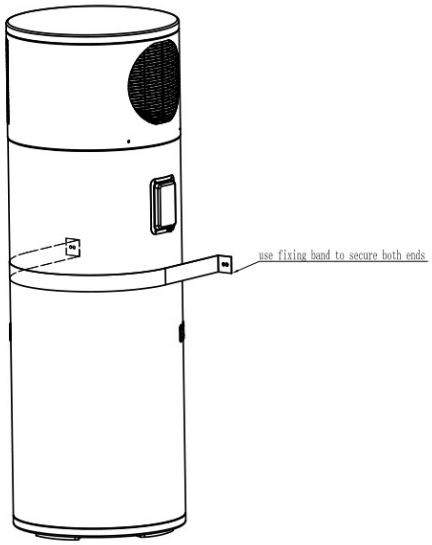


O If heat pump is installed in the basement, indoors or other airtight space, please note exhaust and intake circulation between surrounding air and outdoor air;

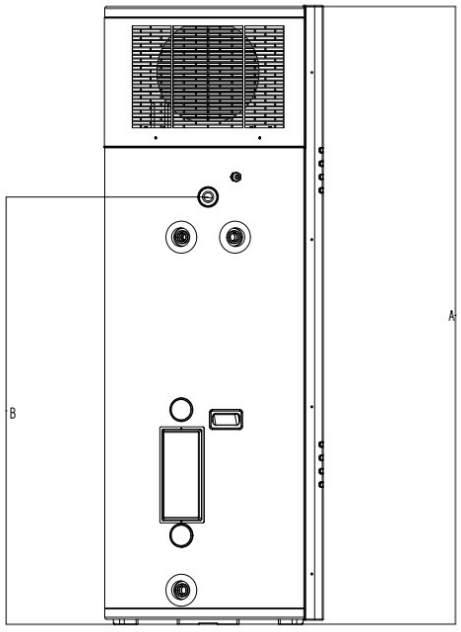
O If ducting is used, the air duct total length should be equal to or less than 6 meters, and the duct diameter should be equal to or more than 150 mm.







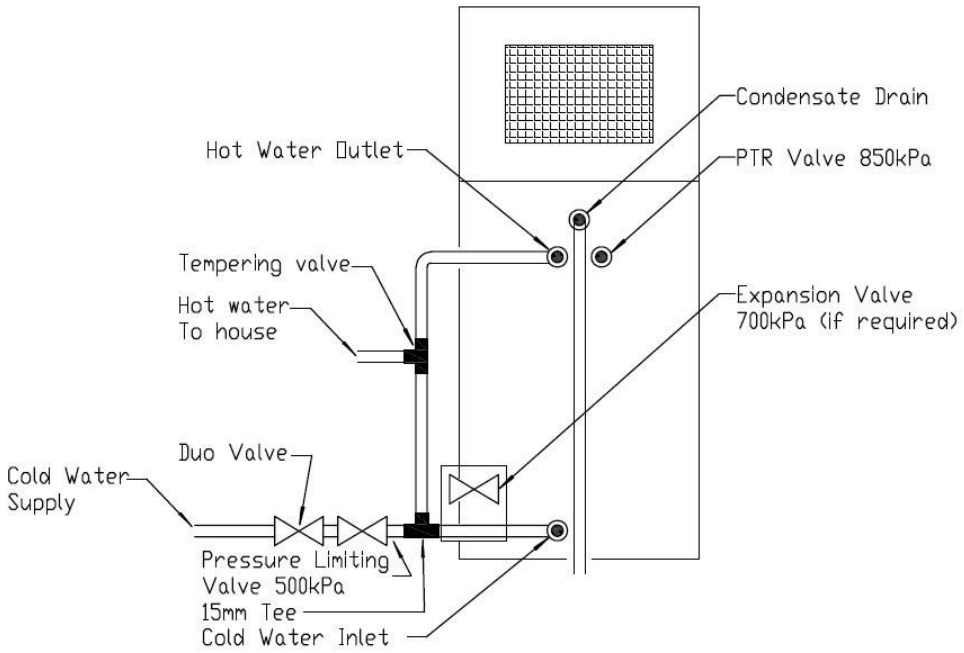
IV. EXTERNAL PRODUCT DIMENSIONS



Size / Model	A	B
HPWSTR002	1518	1010
HPWSTR003	1838	1330

PIPE LINE CONNECTION

I. PIPE CONNECTION DIAGRAM



II. WATER QUALITY REQUIREMENTS

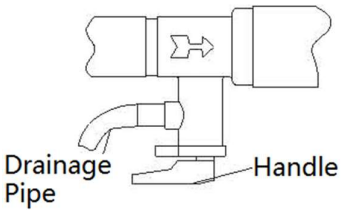
PH value	Total hardness	Conductivity	Sulphate ion	Chlorine ion	Ammonia ion
7~8.5	< 50ppm	<200μV/cm (25℃)	None	< 50ppm	None
Sulfate ion	Silicon	Iron content	Sodium	Ca	
< 50ppm	< 50ppm	< 0.3ppm	No requirement	< 50ppm	

III. WATER PIPE INSTALLATION INSTRUCTIONS

- Do not use iron pipe for heat pump connections. CPVC pipe, PPR pipe or PB pipe or other pipe as per local regulations is recommended;
- Water pipes, connectors etc., must be installed according to the drawing. If the ambient temperature is below 0 ℃, proper insulation must be installed for the water pipes;
- Water inlet/outlet size is G3/4", external thread;
- The water pipe's working life must not be less than the heat pump's working life;
- Relief valve is G1/2", 0.8 MPa. After installation, ensure that the drainage pipe which connects to the relief valve is not blocked;

NOTE

The relief valve needs to be pulled once every six months for purpose of removing calcium carbonate and ensuring no blockages. Outlet temperature of drainage port may be high, please be careful;



Measures must be taken to prevent drainage pipe from freezing

DANGER

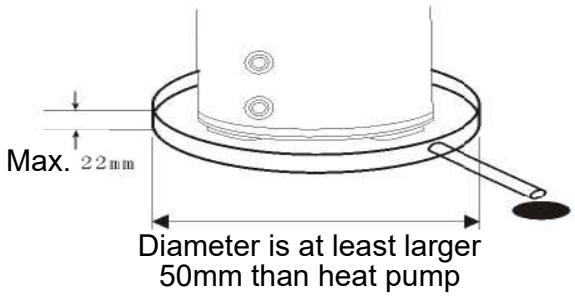
- Do not hold down the handle of safety valve;
- Do not knock down safety valve;
- Do not plug the drainage port;
- Excretion pipe must be connected with a open drainage port.

DANGER OF EXPLOSION

- After pipe installation is complete, open up the valve controlled cold water inlet and the valve controlled hot water outlet to fill water into tank, you can stop when water overflows from water outlet, then inspect all piping and ensure there is no water leakage. If leakage is found, it must be repaired and water tank filled again.;

- When intake pressure is below 0.15MPa, a booster pump needs to be installed to connect with inlet water pipe for purpose of increasing water pressure. Water pressure must be greater than 0.15MPA after booster installation. When intake pressure is greater than 0.65MPa, a relief valve needed to be installed to connect with inlet water pipe for purpose of keeping your water tank in a long-term working state;

- During heat pump operation, condensed water droplets may be formed. Drainage water port may be unexpectedly blocked, which can make surface of equipment drip water. To ensure correct long-term operation, we suggest a water tray. Please refer to the below chart.



NOTE

When used in a location where the temperature is below 0℃，if the heat pump is installed outdoors, please take measures to protect water pipe according to local minimum temperature to prevent frozen or damaged water pipes.

ELECTRICAL CONNECTION

NOTE

The equipment must be connected to the correct power supply, supply voltage must comply with rated voltage;

Power supply circuit must be fitted with a grounding wire, and grounding wire of power supply must be reliably connected with external grounding wire;

The installation must be undertaken by professional personnel based on provided circuit diagrams;

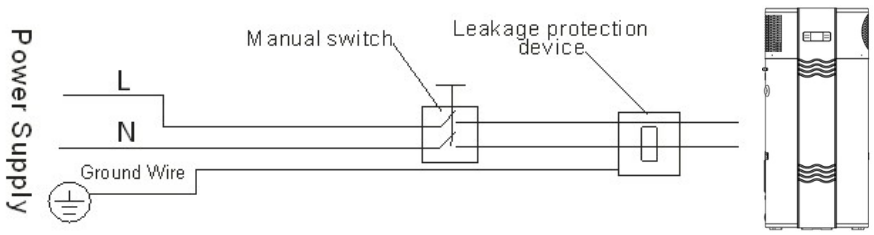
Leakage protection device must be installed correctly according to the National Technical Standard for electrical equipment;

1. POWER SPECIFICATION

Item / Model	Power supply	Minimum wire diameter (mm2)		Manual switch (A)		Leakage protection device	Circuit breaker
		Size (continuous length ≤ 30m)	Ground wire	Capacity	Fuse		Rated current
HPWSTR002 HPWSTR003	220V/50Hz	≥2.5	≥Φ1.0mm	≥20	20	Below 30mA 0.1sec	≥20A

Remark: Please directly connect power supply wire with user's plug when using the heat pump.

2. LEAKAGE PROTECTION

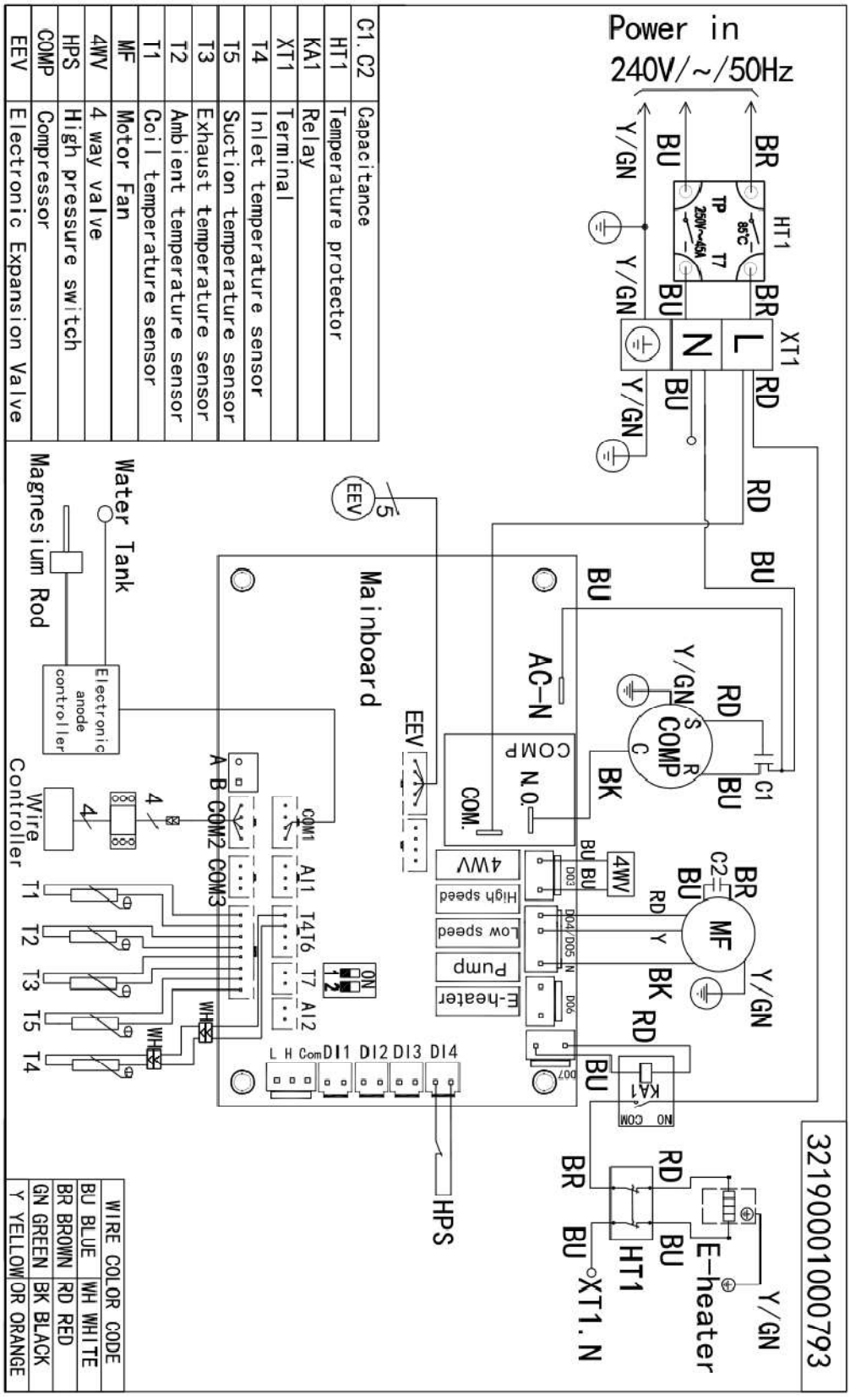


WARNING

The power supply must have a leakage protection device installed according to the diagram above for your safety;

The equipment cannot be used unless you have confirmed grounding wire is reliably connected;

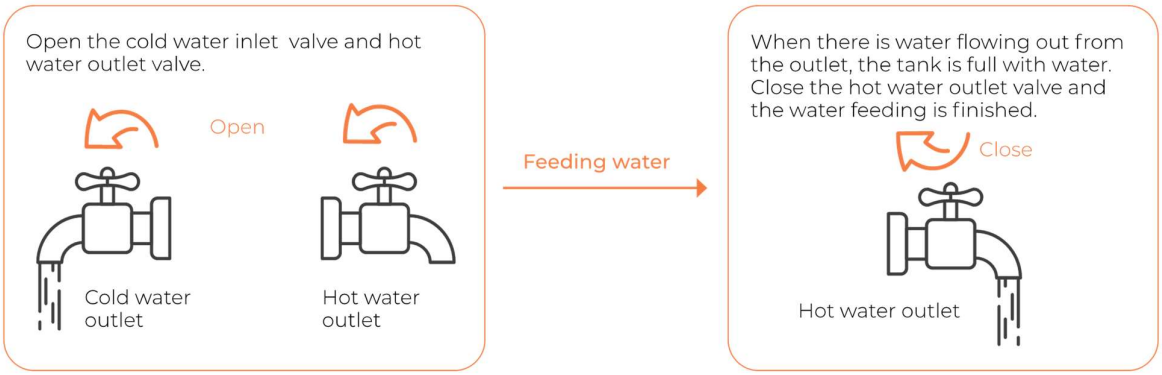
3. INTERNAL WIRING DIAGRAM



METHOD OF APPLICATION

When using the unit, please operate in the following order

O Feeding water: when using the unit for the first time (or reusing it after the tank is emptied), before connecting the unit to power, please make sure the tank is full of water. Water feeding method is as per below picture.



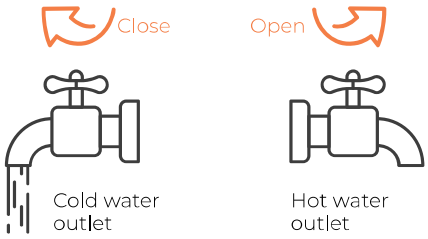
Operation without water in water tank may result in the damage of auxiliary E-heater. Due to such damage, manufacturer will not be liable for any damages caused by this issue.

Connect the unit to power. Then the screen will turn on, which shows that the unit is connected to power. The user can check different parameters by clicking the relative button on the screen (see next pages). Please ensure the unit is in correct heating mode as required via screen (eg. Check for Heating Symbol illumination, set timer setting as required, etc);

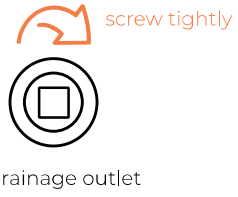
Water temperature over 50°C can cause severe burns instantly or death from scalds. Children, disabled and elderly are at highest risk of being scalded. Feel water before bathing or showering. Water temperature limiting valves are recommended.

Water draining: before cleaning or moving the unit, please drain the water in the water heater. The draining method is as per below picture:

Close the inlet valve. Open the outlet valve. Open the draining valve.



After draining, please screw the nut of the drainage outlet; the water draining is finished.



INSTRUCTION OF OPERATION

1. CONTROL SYSTEM SPECIFICATIONS

(1) Operating condition

- Voltage:220V~±10%,50Hz±1Hz.
- Ambient temperature: -7~+43°C
- Storage temperature: -20~+75°C
- Relative humidity: 0~95%RH
- Temperature accuracy: ±1°C

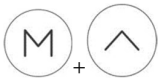
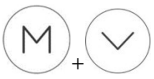
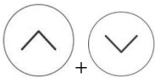
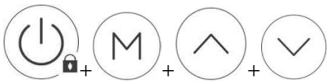
(2) Main Function

- Display the water temperature and setting temperature. Can also query the coil temperature, ambient temperature, exhaust temperature etc.
- Power cut memory function.
- When power lost, clock will still work.
- Timing on/off.
- Automatic defrosting.
- Forced defrost.
- Large LCD display.
- Protection functions.
- The error code display and query
- Key-Lock Function
- Anti-freezing function
- When there is no wired controller or wired controller is broken, the system will recognize it, and control the heat pump to run automatically.

2. WIRED CONTROLLER AND OPERATIONS

1) Controller Instruction

Symbol	Name	Meaning
	On/OFF key	1. On/off key (hold for 1 second) 2. Return key 3. Escape key 4. Unlock key (hold for 3 seconds)
	Clock key	1. Setting the clock, press the key will enter into clock setting interface, and then press one time to switch the hour and minute area 2. Setting the timer (press the key and hold for 3s) 3. During timer setting, press the key and hold for 3s, cancel the current timer setting 4. During clock setting, press the key and fold for 3s, enable or disable the week function
	Mode key	1. Press the key and hold for 5s, enter into parameter setting interface 2. Press the key to change operation mode 3. In parameter query interface, press the key enter into value setting or save the setting

	Up key	1.Press the key to change temperature setting value or parameter value or change hour and minute value 2. Press the key and hold for 3s to query the system status/ parameter 3. Page up
	Down key	1. Press the key to change temperature setting value or parameter value or change hour and minute value 2. Press the key and hold for 3s to query the system status/ parameter 3. Page down
	Combination key	When heat pump running in heating mode, press the two keys and hold for 3s, turn ON/OFF Boost mode (turn ON/OFF heating element)
		When heat pump running, press the two keys and hold for 5s, start/exit defrosting mode
		When power on the heat pump, press the two keys and hold for 5s, enter into Ventilation mode (running high speed). Press the two keys for 3s, running low speed. Press the two keys for 3s again, exit Ventilation mode
		Press the three keys and hold for 5s, turn ON/OFF sterilization mode
		Power on within 5 minutes and don’t turn on the heat pump, press the four keys and hold for 5s, restore the factory setting

2) Instruction of the buttons

Status	Symbol	Meaning
Not bright		Heat pump OFF or not in heating mode
Light up		In heating mode
Light up		Heating element ON
Flash for 1s		Run in Boost mode
Flash for 2s		Run in sterilization mode
Light up		Water temperature
Light up		Setting temperature

Light up		Degree centigrade
Light up		Degree Fahrenheit (reserved)
Light up		Percent(reserved)
Light up		Low/middle/high water level(reserved)
Flash		Heat pump OFF and refrigerant recovery mode
Light up		In defrosting mode
Light up		Maintenance mode
Light up		Error present

Light up		Lock screen
Light up		Compressor running
Light up		High fan speed
Light up		Low fan speed
Flash for 1s		Ventilation mode: high fan speed
Flash for 2s		Ventilation mode: low fan speed
Display		Error code display
Light up		Timer ON

Display		In timing ON period
Flash		Setting timing ON
Display		In timing OFF period
Flash		Setting timing OFF
Light up/Not bright		Timer number 1/2/3
Display		Week

OPERATION PARAMETER QUERY

When power on, press “∧” or “∨” button for 3 seconds, will enter into status query interface, press “∧” or “∨” button to query each status; Press “ ” button will exit status query interface.

name	code	Remark
Fluorine cycle/water cycle heat pump	00	0=water cycle; 1=fluorine cycle
High pressure switch	01	0=disconnect; 1=close
Low pressure switch	02	0=disconnect; 1=close
Water flow switch	03	0=disconnect; 1=close
EEV value	04	Measured value
Evaporator coil sensor	05	Measured value
Ambient temperature sensor	06	Measured value
Suction temp.	07	Measured value
Exhaust temperature sensor	08	Measured value
Water inlet temperature (Water tank)	09	Display value = measured value + compensation value
Water outlet temperature	10	Display value = measured value + compensation value
Compressor	11	0=stop; 1=running
4-way valve	12	0=stop; 1=running
High-speed fan	13	0=stop; 1=running
Low-speed fan	14	0=stop; 1=running
Circulation water pump	15	0=stop; 1=running
Heating element	16	0=stop; 1=running
Compressor working time before defrosting	17	Measured value
Link switch	18	0=Open; 1=Close
Program code	19	Show the code
Dial switch	20	0=Open; 1=Close
Dial switch	21	0=Open; 1=Close
Phase detecting value	22	0=OK; 3=Lack phase; 4=Phase fault; 5=No connection

OPERATION INSTRUCTION

1) Lock and unlock:

When the controller is in the normal display mode and there is no button operation for more than 60 seconds it will get automatically locked. Press the key " " for 3 seconds to unlock, it will beep.

2) Turn ON/OFF the heat pump:

When the controller is in the normal display mode, press " " button for more than 1 second to switch the controller to the power ON or OFF mode

3) Operation mode selection:

When the controller is in normal display mode, press "M" key to show the existing operation mode, it will display constantly for 8 seconds, before it disappears, press "M" again to switch between different operating modes;

The mode name will show at the clock area for 8 seconds each time when you touch "M" key, when unlock, the area will show clock, pressing "M" key one time will query the existing operation mode.

The system default mode is STAN mode; When the unit is switched on for the first time, the system will operate under STAN mode, later on the unit will always start as per previous setting mode. For changing the mode, refer below instructions:

Operation Modes Chart With Symbols

S.No.	Mode	Symbol	Setting Range
01.	Standard Mode	STAN	15°C~60°C
02.	Economic Mode	ECO	15°C~60°C
03	Hybrid Mode	HYB	15°C~65°C
04	Hybrid Mode 1	HYB1	15°C~70°C
05	Electric Mode	ELE	15°C~70°C

STAN mode (Standard mode):

In STAN mode, the controller will display " ", in this mode only heat pump operates and the default water temperature setting is 55°C, setting range is 15°C~60°C, restart temperature difference is 5°C.

ECO mode (Economic mode):

In ECO mode, the controller will display " ", in this mode only heat pump operates and the default water temperature setting is 55°C, setting range is 15°C~60°C, restart temperature difference is 12°C

HYB mode (Hybrid mode):

Under HYB mode, the controller will display " ", in this mode, only heat pump runs until the water temperature reaches 60°C, when water temperature is above 60°C, heat pump will stop running, heating element continues heating until the water temperature reaches the set temperature (if the set value more than 60°C). In this mode, water temperature setting range is 15°C~65°C, restart temperature difference is 5°C

HYB1 mode (Hybrid mode 1):

Under HYB1 mode, the controller will display " ", in this mode, only heat pump runs until the water temperature reaches 60°C, when water temperature is above 60°C, heat pump will stop running, heating element continues heating until the water temperature reaches the set temperature (if the set value more than 60°C). In this mode, water temperature setting range is 15°C~70°C, restart temperature difference is 5°C (default value).

ELE mode (Heating element mode)

Under ELE mode, the controller will display " ", in this mode only the heating element will work to heat the water. Water temperature setting range is 15°C~70°C, restart temperature difference is 10°C.

4) Water temperature set

Unlock the controller, in the main interface, press the "∧" or "∨" button to increase or decrease the water temperature setting value

5) Clock settings:

In the main interface, click the “ ” button to enter the clock setting interface;

During clock setting, when hour part flash, press and hold the “ ” button for 3 seconds, enable / disable the week function. If enable the week function, it will show weekday (Monday: 1, Tuesday: 2...Sunday: 7).

If enabled the week function, then in the real-time clock setting interface, press the “ ” button, the weekday part of the number flashes first, press “∧” or “∨”, you can set the weekday of the clock; if disabled the week function, press the “ ” button, will set the hours first. the hour part of the number flashes, press “∧” or “∨”, you can set the hour of the clock; when the hour part is set, press the “ ” button again, the number of minutes will flash, press “∧” or “∨” to set the minutes of the clock;

After the minutes part is set, press the “ ” button again to confirm the real-time clock setting and return to the main interface;

In the real-time clock setting interface, if there is no button operation for 60 seconds, the current clock setting value will be confirmed and return to the main interface;

In the clock setting interface, press the “ ” button to confirm the clock setting value and return to the main interface.

6) Work time settings

Press and hold the “ ” button for 3 seconds in the main interface to enable or disable the timer working mode. Then press “∧” or “∨” to choose the timer No. 1 or No.2 or No.3 period.

When the timer No. 1 period is selected, the symbol flashes, press and release “ ” to switch the hour of the start time (ON), the hour part of the number flashes, press “∧” or “∨”, you can set the hour. When the hour part is set, press the “ ” button again, the number of minutes will flash, press “∧” or “∨” to set the minutes. After the minutes part is set, press the “ ” button again set the hour of the end time (OFF), the hour part of the number flashes, press “∧” or “∨”, you can set the hour. When the hour part is set, press the “ ” button again, the number of minutes will flash, press “∧” or “∨” to set the minutes.

After the minutes part is set, press the “ ” button again to confirm the setting and then switch to next period (No. 2 or No. 3) timer working set, the setting method is the same as above. If the start time of a certain working period is greater than the end time, the end time is considered to be of the next day.

When all time periods are canceled, it is considered to be in working hours throughout the day.

When the start time and end time of a certain working period are the same, it discards the time period

When enabled the week function, the timing work cycle time is week, if disabled the week function, the cycle time is 24 hours.

7) Forced defrosting:

When the controller is in the normal display mode and the heat pump is ON. Press “M” and “∨” buttons together for more than 5 seconds to activate or deactivate the “Forced Defrost” function.

The symbol “ ” will light up when the “Forced Defrost” is ON.

8) Boost mode:

When the controller is in the normal display and the heat pump in heating mode. Press “M” and “∧” buttons together for more than 3 seconds to enable or disable the boost mode, when enable the boost mode, heating element ON, the symbol “ ” will flash for 1 second then light up, when the temperature reach at the set temperature, heating element off, the symbol “ ” will flash, means it is operating in boost mode.
When turn off the heat pump, will exit boost mode.

9) Sterilization:

Manual Sterilization Mode:

When the controller is in the normal display mode and the heat pump is ON. Press “ ” and “ ” and “∨” buttons together for more than 5 seconds to sterilize the water tank, the symbol “ ” will flash for 2 seconds then light up, and the heat pump will heat up the water to 60°C.

In automatic sterilization, the symbol “ ” will flash for 2 seconds then light up, and the heat pump will heat up the water to 60°C. It will automatic sterilization every 7 days.

TROUBLESHOOTING

Error code	Error Description	Possible Cause	Solution
E05	High pressure protection	High pressure switch is broken/Connection is loose	Customer service to identify the reasons
E09	Communication failure	Signal wire connection loose/There is Strong magnetic field/PCB is broken/ Signal wire is broken	Replace the controller communication line (mainboard COM2 port)
E12	Exhaust temp. too high	Lack of refrigerant/ Fluorine system leak	Check then add refrigerant
E14	Tank temp. sensor failure	Sensor failure/ Connection is loose	Replace the T4temp. sensor
E16	Coil temp. sensor failure	Sensor failure/ Connection is loose	Replace the T1temp. sensor
E18	Exhaust temp. sensor failure	Sensor failure/ Connection is loose	Replace the T3temp. sensor
E21	Ambient temp. sensor failure	Sensor failure/ Connection is loose	Replace the T2temp. sensor
E29	Suction temp. sensor failure	Sensor failure/ Connection is loose	Replace the T5temp. sensor (Remark: refer to the diagram,T1+T2+T3+T5 are in group parts)

PILOT RUN OF HEAT PUMP

Please confirm the followings before pilot run of heat pump

- The heat pump has been installed correctly;
- Assembled pipe and wire are all correct;
- Drain water line is not blocked;
- Insulation materials are intact;
- Ground wire is installed correctly;
- Power voltage is equivalent to rated voltage of heat pump;
- Inlet and outlet air port have no obstacle;
- Air attached to water pipe is drained out, and all valves have been opened;
- Leakage protection device works well;
- Input water pressure is more than 0.15Mpa;

MAINTENANCE AND SOLUTION

1. MAINTENANCE

○ Frequently check power plug and sockets and make sure both of them have been connected well and reliably, and have no over-heating effect;

○ When not used for a long time, especially where temperature is below 0°C, water filled in the water tank must be drained out to prevent from damaging inner tank; (operation shown in the above contents)

○ To make heat pump to keep a long-term and high efficiency working state, we suggest you should clean inner tank up every half a year to remove accumulated sediment, please obey the following rules to clean inner tank:

(1). Turn off power supply of heat pump;

(2). Turn off cold water inlet valve, and open up hot water tap water;

(3) Connect drainage water with drain outlet through a soft pipe;(temperature resistance of drainage pipe must be more than 93°C, if drainage pipe is not suitable, please turn on cold water inlet valve, and turn on hot water tap until water is not hot);

(4). Turn on drainage water port of heat pump, clean water tank attached to inner tank up, if needed, you will wash inner tank for many times to clear sediment;

(5). Turn off drainage water port, re-fill water into inner tank and recover power supply;

○ Each device has been matched with one anode rod, and anode rod will be slowly consumed during the process of protecting inner tank and extending use life. Under some water circumstance, anode rod and water can rise reaction, hot water will be quickly corroded and rise leakage when anode rod has been used up. We suggest check insulation materials every one year, if anode rod is used up, you can inquiry local service center or technical department to acquire a new one;

○ It is recommended that the temperature is not set higher than the temperature required, to reduce heat losses and increase system efficiency;

○ Filter should be cleaned up every one month to make sure heating effect;

○ If used in regions where the temperature is below 0°C, you should take suitable measures to protect pipes in case the heat pump is installed outdoors;

- Checks to the area

Prior to beginning work on systems containing flammable refrigerants, safety checks are necessary to ensure that the risk of ignition is minimised. For repair to the refrigerating system, 2 to 6 shall be completed prior to conducting work on the system.

- Work procedure

Work shall be undertaken under a controlled procedure so as to minimise the risk of a flammable gas or vapour being present while the work is being performed.

- General work area

All maintenance staff and others working in the local area shall be instructed on the nature of work being carried out. Work in confined spaces shall be avoided.

- Checking for presence of refrigerant

The area shall be checked with an appropriate refrigerant detector prior to and during work, to ensure the technician is aware of potentially toxic or flammable atmospheres. Ensure that the leak detection equipment being used is suitable for use with all applicable refrigerants, i.e. non-sparking, adequately sealed or intrinsically safe.

- Presence of fire extinguisher

If any hot work is to be conducted on the refrigerating equipment or any associated parts, appropriate fire extinguishing equipment shall be available to hand. Have a dry powder or CO2 fire extinguisher adjacent to the charging area.

- No ignition sources

No person carrying out work in relation to a refrigerating system which involves exposing any pipe work shall use any sources of ignition in such a manner that it may lead to the risk of fire or explosion. All possible ignition sources, including cigarette smoking, should be kept sufficiently far away from the site of installation, repairing, removing and disposal, during which refrigerant can possibly be released to the surrounding space. Prior to work taking place, the area around the equipment is to be surveyed to make sure that there are no flammable hazards or ignition risks. “No Smoking” signs shall be displayed.

- Ventilated area

Ensure that the area is in the open or that it is adequately ventilated before breaking into the system or conducting any hot work. A degree of ventilation shall continue during the period that the work is carried out. The ventilation should safely disperse any released refrigerant and preferably expel it externally into the atmosphere.

❍ Checks to the refrigerating equipment

Where electrical components are being changed, they shall be fit for the purpose and to the correct specification. At all times the manufacturer's maintenance and service guidelines shall be followed. If in doubt, consult the manufacturer's technical department for assistance.

The following checks shall be applied to installations using flammable refrigerants:

– the actual refrigerant charge is in accordance with the room size within which the refrigerant containing parts are installed;
– the ventilation machinery and outlets are operating adequately and are not obstructed;
– if an indirect refrigerating circuit is being used, the secondary circuit shall be checked for the presence of refrigerant;
– marking to the equipment continues to be visible and legible. Markings and signs that are illegible shall be corrected;
– refrigerating pipe or components are installed in a position where they are unlikely to be exposed to any substance which may corrode refrigerant containing components, unless the components are constructed of materials which are inherently resistant to being corroded or are suitably protected against being so corroded.

❍ Checks to electrical devices

Repair and maintenance to electrical components shall include initial safety checks and component inspection procedures. If a fault exists that could compromise safety, then no electrical supply shall be connected to the circuit until it is satisfactorily dealt with. If the fault cannot be corrected immediately but it is necessary to continue operation, an adequate temporary solution shall be used. This shall be reported to the owner of the equipment so all parties are advised.
Initial safety checks shall include:

· that capacitors are discharged: this shall be done in a safe manner to avoid possibility of sparking;
· that no live electrical components and wiring are exposed while charging, recovering or purging the system;
· that there is continuity of earth bonding.

III. REPAIRS TO SEALED COMPONENTS

❍ During repairs to sealed components, all electrical supplies shall be disconnected from the equipment being worked upon prior to any removal of sealed covers, etc. If it is absolutely necessary to have an electrical supply to equipment during servicing, then a permanently operating form of leak detection shall be located at the most critical point to warn of a potentially hazardous situation.

- Particular attention shall be paid to the following to ensure that by working on electrical components, the casing is not altered in such a way that the level of protection is affected. This shall include damage to cables, excessive number of connections, terminals not made to original specification, damage to seals, incorrect fitting of glands, etc.
Ensure that the apparatus is mounted securely.
Ensure that seals or sealing materials have not degraded to the point that they no longer serve the purpose of preventing the ingress of flammable atmospheres. Replacement parts shall be in accordance with the manufacturer's specifications.

IV. REPAIR TO INTRINSICALLY SAFE COMPONENTS

Do not apply any permanent inductive or capacitive loads to the circuit without ensuring that this will not exceed the permissible voltage and current permitted for the equipment in use. The device must be operated in safe conditions, and the device must be operated in rated conditions. Replace parts only with safety parts specified by the manufacturer, otherwise other parts may cause the leaked refrigerant to catch fire.

V. CABLING

Check that cabling will not be subject to wear, corrosion, excessive pressure, vibration, sharp edges or any other adverse environmental effects. The check shall also take into account the effects of aging or continual vibration from sources such as compressors or fans.

VI. DETECTION OF FLAMMABLE REFRIGERANTS

Under no circumstances shall potential sources of ignition be used in the searching for or detection of refrigerant leaks. A halide torch (or any other detector using a naked flame) shall not be used.

The following leak detection methods are deemed acceptable for all refrigerant systems. Electronic leak detectors may be used to detect refrigerant leaks but, in the case of flammable refrigerants, the sensitivity may not be adequate, or may need re-calibration. (Detection equipment shall be calibrated in a refrigerant-free area.) Ensure that the detector is not a potential source of ignition and is suitable for the refrigerant used. Leak detection equipment shall be set at a percentage of the LFL of the refrigerant and shall be calibrated to the refrigerant employed, and the appropriate percentage of gas (25 % maximum) is confirmed.

Leak detection fluids are also suitable for use with most refrigerants but the use of detergents containing chlorine shall be avoided as the chlorine may react with the refrigerant and corrode the copper pipe-work.

NOTE Examples of leak detection fluids are – bubble method, – fluorescent method agents.

If a leak is suspected, all naked flames shall be removed/extinguished.
If a leakage of refrigerant is found which requires brazing, all of the refrigerants shall be recovered from the system, or isolated (by means of shut off valves) in a part of the system remote from the leak.

VII. REMOVAL AND EVACUATION

When breaking into the refrigerant circuit to make repairs – or for any other purpose – conventional procedures shall be used. However, for flammable refrigerants it is important that best practice is followed since flammability is a consideration. The following procedure shall be adhered to:

- remove refrigerant;
- purge the circuit with inert gas (optional for A2L);
- evacuate (optional for A2L);
- purge with inert gas (optional for A2L);
- open the circuit by cutting or brazing.

The refrigerant charge shall be recovered into the correct recovery cylinders. For appliances containing flammable refrigerants other than A2L refrigerants, the system shall be purged with oxygen-free nitrogen to render the appliance safe for flammable refrigerants. This process may need to be repeated several times. Compressed air or oxygen shall not be used for purging refrigerant systems.

For appliances containing flammable refrigerants, other than A2L refrigerants, refrigerants purging shall be achieved by breaking the vacuum in the system with oxygen-free nitrogen and continuing to fill until the working pressure is achieved, then venting to atmosphere, and finally pulling down to a vacuum. This process shall be repeated until no refrigerant is within the system. When the final oxygen-free nitrogen charge is used, the system shall be vented down to atmospheric pressure to enable work to take place. This operation is absolutely vital if brazing operations on the pipe-work are to take place.
Ensure that the outlet for the vacuum pump is not close to any potential ignition sources and that ventilation is available.

VIII. CHARGING PROCEDURES

In addition to conventional charging procedures, the following requirements shall be followed.

- Ensure that contamination of different refrigerants does not occur when using charging equipment. Hoses or lines shall be as short as possible to minimise the amount of refrigerant contained in them.
- Cylinders shall be kept in an appropriate position according to the instructions.
- Ensure that the refrigerating system is earthed prior to charging the system with refrigerant.
- Label the system when charging is complete (if not already).
- Extreme care shall be taken not to overfill the refrigerating system.

Prior to recharging the system, it shall be pressure-tested with the appropriate purging gas. The system shall be leak-tested on completion of charging but prior to commissioning. A follow up leak test shall be carried out prior to leaving the site.

IX. DECOMMISSIONING

Before carrying out this procedure, it is essential that the technician is completely familiar with the equipment and all its detail. It is recommended good practice that all refrigerants are recovered safely. Prior to the task being carried out, an oil and refrigerant sample shall be taken in case analysis is required prior to re-use of recovered refrigerant. It is essential that electrical power is available before the task is commenced.

a) Become familiar with the equipment and its operation.
b) Isolate system electrically.
c) Before attempting the procedure, ensure that:
- mechanical handling equipment is available, if required, for handling refrigerant cylinders;
- all personal protective equipment is available and being used correctly;
- the recovery process is supervised at all times by a competent person;
- recovery equipment and cylinders conform to the appropriate standards.

d) Pump down refrigerant system, if possible.
e) If a vacuum is not possible, make a manifold so that refrigerant can be removed from various parts of the system.
f) Make sure that cylinder is situated on the scales before recovery takes place.
g) Start the recovery machine and operate in accordance with instructions.
h) Do not overfill cylinders (no more than 80 % volume liquid charge).
i) Do not exceed the maximum working pressure of the cylinder, even temporarily.
j) When the cylinders have been filled correctly and the process completed, make sure that the cylinders and the equipment are removed from site promptly and all isolation valves on the equipment are closed off.
k) Recovered refrigerant shall not be charged into another refrigerating system unless it has been cleaned and checked

X. LABELLING

Equipment shall be labelled stating that it has been de-commissioned and emptied of refrigerant. The label shall be dated and signed. For appliances containing flammable refrigerants, ensure that there are labels on the equipment stating the equipment contains flammable refrigerant.

XI. RECOVERY

When removing refrigerant from a system, either for servicing or decommissioning, it is recommended good practice that all refrigerants are removed safely.

When transferring refrigerant into cylinders, ensure that only appropriate refrigerant recovery cylinders are employed. Ensure that the correct number of cylinders for holding the total system charge is available. All cylinders to be used are designated for the recovered refrigerant and labelled for that refrigerant (i.e. special cylinders for the recovery of refrigerant). Cylinders shall be complete with pressure-relief valve and associated shut-off valves in good working order. Empty recovery cylinders are evacuated and, if possible, cooled before recovery occurs.

The recovery equipment shall be in good working order with a set of instructions concerning the equipment that is at hand and shall be suitable for the recovery of all appropriate refrigerants including, when applicable, flammable refrigerants. In addition, a set of calibrated weighing scales shall be available and in good working order. Hoses shall be complete with leak-free disconnect couplings and in good condition. Before using the recovery machine, check that it is in satisfactory working order, has been properly maintained and that any associated electrical components are sealed to prevent ignition in the event of a refrigerant release. Consult manufacturer if in doubt.

The recovered refrigerant shall be returned to the refrigerant supplier in the correct recovery cylinder, and the relevant waste transfer note arranged. Do not mix refrigerants in recovery units and especially not in cylinders.

If compressors or compressor oils are to be removed, ensure that they have been evacuated to an acceptable level to make certain that flammable refrigerant does not remain within the lubricant. The evacuation process shall be carried out prior to returning the compressor to the suppliers. Only electric heating to the compressor body shall be employed to accelerate this process. When oil is drained from a system, it shall be carried out safely.

Error	Reason	Approach
The outlet water is cold;	The plug is not plugged in correctly.	Plug in correctly.
The screen is dark	The temperature controller is on the lowest temperature control state;	Set the temperature of the. controller in higher state
	The temperature controller is damaged;	
	The circuit board of the indicator lamp is damaged.	Inform service dept.
No water out from the hot water outlet	The tap water is cut off;	Waiting for the return of tap water.
	The water pressure is too low;	
	The tap water inlet valve is closed.	Wait and use when the water pressure is increased.
		Open the tap water inlet valve.
Water leakage	Loose connection points between pipes.	Tighten connecting points

AFTER SALES & SERVICE

If your hot water heater cannot operate normally, please turn off the unit and cut off the power supply at once, then contact our service center or technical department.

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