

INSTALLATION & OWNER'S MANUAL

*All In One Type Air-source Heat Pump Water Heater
EcoSpring ES190*

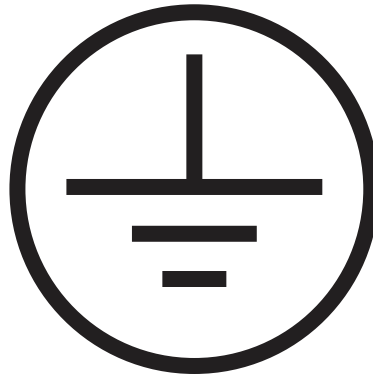
Thank you very much for purchasing our product,
Before using your unit , please read this manual carefully and keep it for future reference.

Verson 1.0 Sep.2011



WARNING

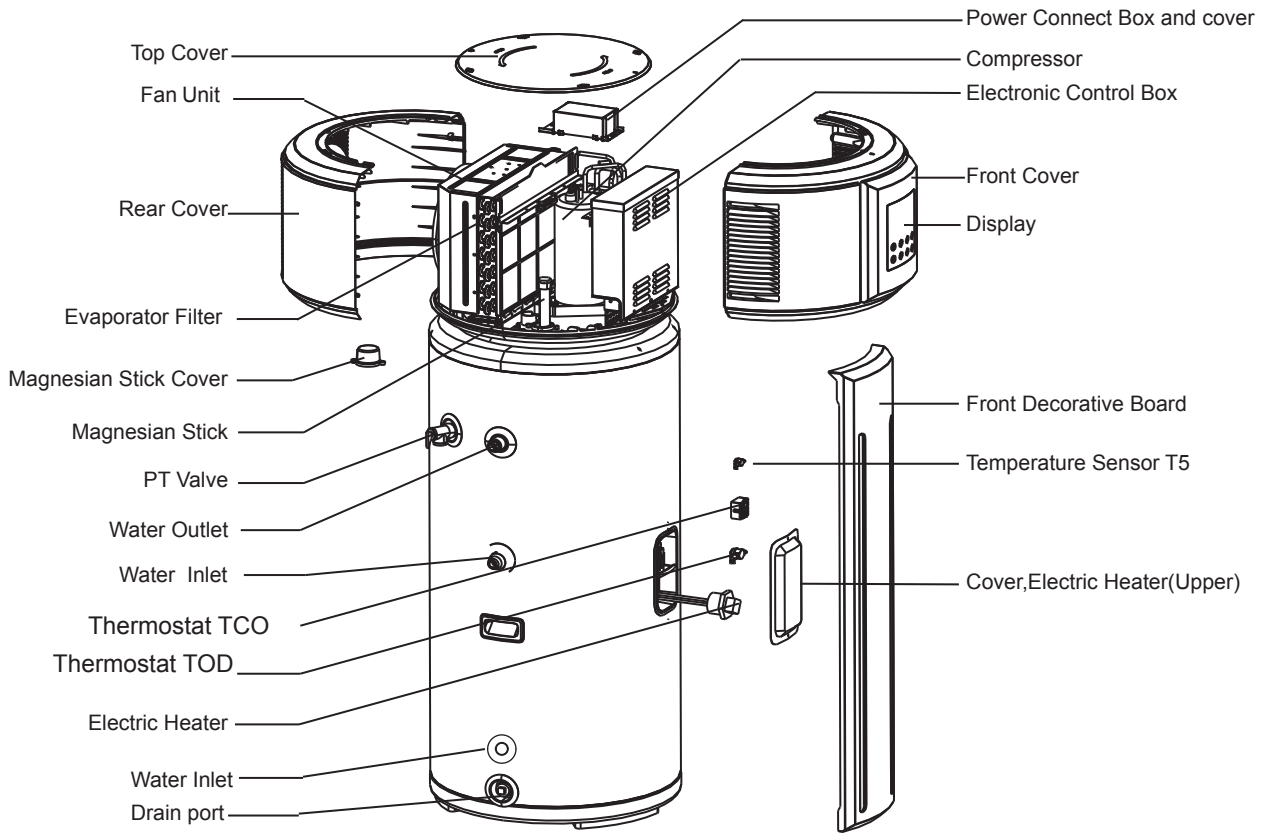
This unit is required reliable earthing before usage, otherwise might cause death or injury



Please ask skilled service persons for reliable earthing connection
(Refer to part 6.1)

Your safety is the most important thing we concern !

PARTS NAMES



NOTE

All the picture in this manual are for explanation purpose only. They may be slightly different from the heat pump water heater you purchased (depend on model).The actual shape shall prevail.

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1. PRECAUTIONS

To prevent injury to the user, other people and/or property damage, the following instructions must be followed. Incorrect operation may cause harm or damage.

The safety precautions listed here are divided into two categories. In either case, important safety instructions are listed to which close attention must be paid.



WARNING

Failure to observe a warning may result in death or serious injury.



CAUTION

Failure to observe a caution may result in injury or equipment damage.



WARNING

- The water heating unit must be earthed effectively.
- A creepage breaker must be installed near the power supply.
- For the purpose of warning and reminding, do not tear off the labels on the unit.



WARNING

- Ask professional installer for installation of the air source heat pump water heating unit. Improper installation may result in water leakage, electric shock, or fire.
- This appliance shall be installed in accordance to AS/NZS standards.
- This appliance should not be used by children without supervision.
- Ask professional service person for repair and maintenance. Improper repair and maintenance may result in water leakage, electric shock or fire.
- In order to avoid electric shock, fire or injury, if any abnormality is detected, such as smell of fire, turn off the power supply and contact your service agent for instructions.
- Never use wire or fuse with incorrect current. Use of wrong wire or fuse may cause the unit to break down or a fire.
- Do not insert fingers, rods or other objects into the air inlet or outlet. When the fan is rotating at high speed, it will cause injury.
- Never use flammable spray such as hair spray or lacquer paint near the unit. It may cause a fire.
- Never touch the air outlet or the horizontal blades while the swing flap is in operation. Fingers may be caught or the unit may break down.
- Never put any objects into the air inlet or outlet. Objects touching the fan at high speed can be dangerous.
- If the supply cord is damaged, it must be replaced by the manufacturer or your installer or a similarly qualified personnel in order to avoid hazard.
- An all-pole disconnection device which has at least 3mm separation distance in all pole and a Residual Current Device (RCD) with a rating of above 10mA shall be incorporated in the fixed wiring according to the AS/NZS standards.
- DISPOSAL: Do not dispose electrical appliances as unsorted municipal waste, use separate collection facilities. Contact you local government for information regarding the collection systems available. If electrical appliances are disposed of in landfills or dumps, hazardous substances can leak into the groundwater and get into the food chain, damaging your health and well-being.



CAUTION

- The earth pole of terminal must be earthed, and the rated current should be more than 20A. Make sure that power supply terminal and power supply plug are dry and have a good connection.
Method: Turn on power supply, run the unit for 30 minutes then turn it off and check whether the power supply plug is hot. If it is hot (more than 50°C), it needs to be replaced to prevent potential electric shock or fire.
- Do not use the air-source water heater for other purposes.
- Before cleaning, be sure to stop machine operation by turning off the breaker or power supply. If not, electric shock or other injury may be caused.
- A tempering valve needs to be installed as per Australian and New Zealand plumbing code.
- In order to avoid injury, do not remove the cover on the unit.
- Do not touch the electric supply with wet hands. Electric shock may be caused.
- The installation height of power supply should be over 1.8m for safety purposes.
- All valves installed must comply with Australian and New Zealand standard.
- It is normal if some water drops from the TPR valve drain pipe during operation. However, if the water is in great amount, contact your installer for instructions.
- After using the unit for a long period (years), check the unit stand and fittings. If damaged, the unit may fall and result in injury.
- Ensure the drain pipe goes into the proper drainline or a safe place outdoor. Improper drain pipe may cause leaking into the building and damage furnitures, etc.
- Do not touch the inner parts of the controller.
Do not remove the front panel. Some parts inside are dangerous to touch. Electric shock and/or machine malfunction may be caused.
- Do not turn off the power supply during operation. System will stop or restart heating automatically depending on water temperature. A continuous power supply for water heating is necessary, except for service and maintenance.

2. ACCESSORIES

Table. 2-1

Accessory Name	Qty.	Shape	Purpose
Installation & Owner's Manual	1		For installation and instruction
Drainage Adaptor	1		Drain condensed water

Australian and New Zealand standard plumbing valve kits are to be used.

3. INSTALLATION LOCATION

- Enough space for installation and maintenance shall be preserved.
- The air inlet and outlet should be free from obstacles and strong wind.
- The bearing surface should be flat, able to bear weight of the unit and suitable for installing the unit without increasing noise or vibration.
- Install the unit in a location where operation noise is unlikely to cause disruption. The use of the timer function can reduce this possibility.
- Avoid installing the unit where gas leakage may be present.
- Convenient for piping and wiring.
- If unit is installed indoor, it might cause declination of indoor temperature and noise disturbance, Please take preventive measures for this.
- If the unit needs to be installed on a metal holder, make sure the unit is well insulated and installed in accordance with AS/NZS standards.



CAUTION

- Installing the equipment in any of the following places may lead to malfunction of the equipment (if it is inevitable, consult the supplier).
 - Place where mineral oils such as cutting lubricant is present.
 - Seaside where the salt concentration in air is high.
 - Hot spring area where corrosive gases such as sulfide gas exist.
 - Factories where the power voltage fluctuates extremely.
 - Inside a car or cabin.

- Place like kitchen where oil permeates.
- Place where strong electromagnetic waves exist.
- Place where flammable gases or materials exist.
- Place where acid or alkali gases evaporate.
- Other special environments.

- Use appropriate tools and equipments to transport the unit, and ensure the unit is not damaged during transportation.
- If the unit has to be installed on a metal part of the building, electric insulation must be installed, and the installation must meet relevant AS/NZS standards for electric devices.
- Installation space and duct connection
Before installing the unit, leave enough space for sufficient air flow and ease of maintenance as shown in figure 3-1 to 3-6 below.

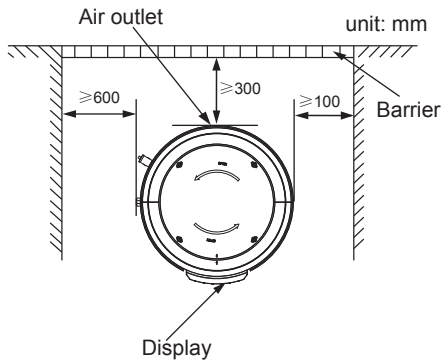


Fig.3-1

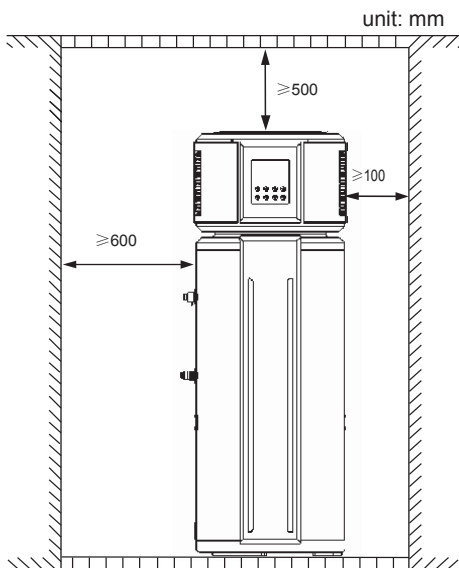


Fig.3-2

4. INSTALLATION



WARNING

- Ask your installer to install the air-source heat pump water heating unit. Inccorrect installation performed may result in water leakage, electric shock, or fire.
 - Unit installed in a complete unsheltered open area is not allowed.
 - The unit must be securely fixed and level, or else may result in noise and vibration.
 - Make sure that there is enough space around the unit.
 - In places where there is strong wind such as seashore or hillside, fix the unit in a location protected from the wind.
-
- Carry the unit onto the site
 - In order to avoid scratch or deformation of the unit surface, apply guard boards to the contacting surface.
 - **Do not incline the unit more than 45° when moving, and keep it vertical when installing.**
 - This system is very heavy, it need to be carried by 2 or more people, otherwise may cause injury or unit damage.
 - Install the unit.
 - The circulating air for every unit should be more than 700m³/h.
 - Make sure there is enough installation space.
 - Outline dimensional drawing(see Fig.4-1, Fig.4-2)

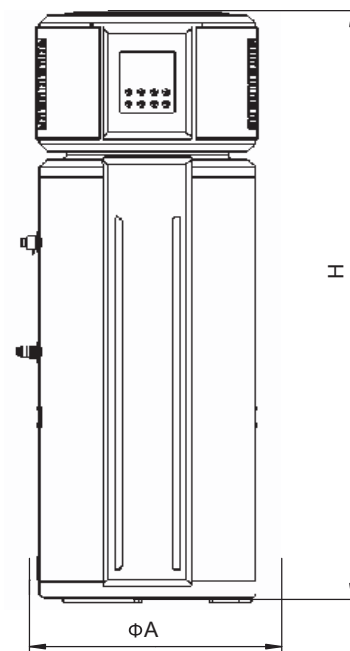


Fig.4.1

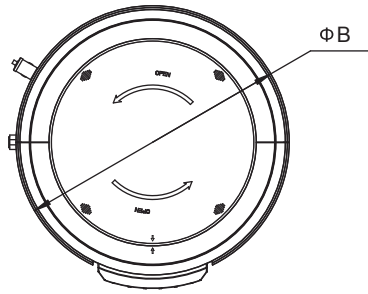


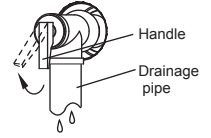
Fig. 4.2

Table 4-1

Dimension	H (mm)	Φ A (mm)
Model		
RSJ-15/190RD3-C	1580	568

NOTE

- TPR valve should be checked by pulling the valve up per half year to ensure there is no blockage of the valve. Please beware of burn caused by the high temperature of water. The drainage pipe should be well installed, in order to avoid freezing in cold weather.



EXPLOSION

- Do not dismantle the TPR valve,
 - Do not block off the drainage pipe,
- Explosion and injury may be caused if installation do not comply with the above instruction.

5. PIPELINE CONNECTION

5.1 Pipeline Connection Sketch

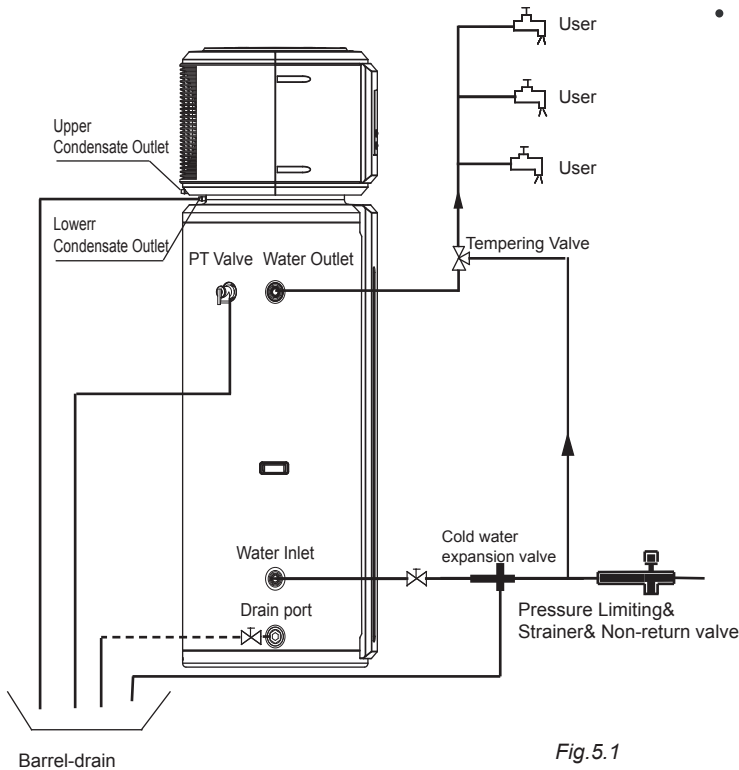


Fig. 5.1

- All installed valves include Pressure Limiting Valve, Filter, Non-return Valve, Cold Water Expansion Valve, and Tempering Valve. These valves must be installed as Australia and New Zealand Standard.
- For indoor installation, a water tray as suggested in Fig 5-2 is recommended to prevent leakage due to blockage during draining.

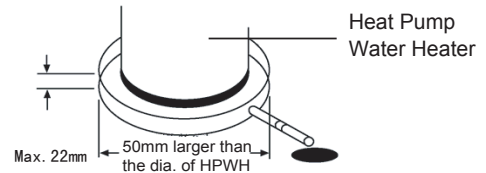


Fig. 5-2

CAUTION

When installing the main unit, please install an isolation valve at the drain line to the drain.

■ Pipeline Connection Explanation

- Install the water inlet/outlet pipes and pipe for TPR valve in accordance with the AS/NZS standards.

6. ELECTRIC CONNECTION



CAUTION

- The power supply for the unit must be specialized according to the rated voltage.
- Earthing must be included in the power circuit, and it must be connected with the effective external ground wire.
- The wiring must be performed by qualified electrician according to the circuit diagram.
- Electric leakage protector should be set according to the relevant AS/NZS electrical standards.
- The power cord and additional display connection cord shall be laid out neatly and properly without mutual interference or in contact with the connection pipe or valve.
- After wire connection is finished, check again to ensure the installation is correct before power is supplied.

- Multimeter is recommended to be used to check if the Earthing is Reliable.

6.1 Specifications of Power Supply

Table. 6-1

Model Name	RSJ-15/190RDN3-C
Power Supply	220-240V~ 50Hz
Min. Diameter of Power Supply Line(mm ²)	2.5/3-core
Earth wire(mm ²)	2.5
Manual Switch(A) Capacity/Fuse	30/20
Creepage Breaker	30 mA ≤ 0.1sec

The power cord type designation is H07RN-F, and it should comply with local electric standard.

6.2 Electric leakage protector

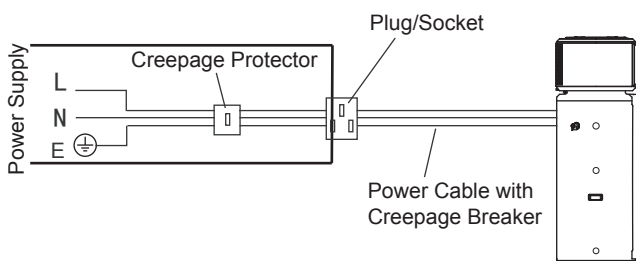


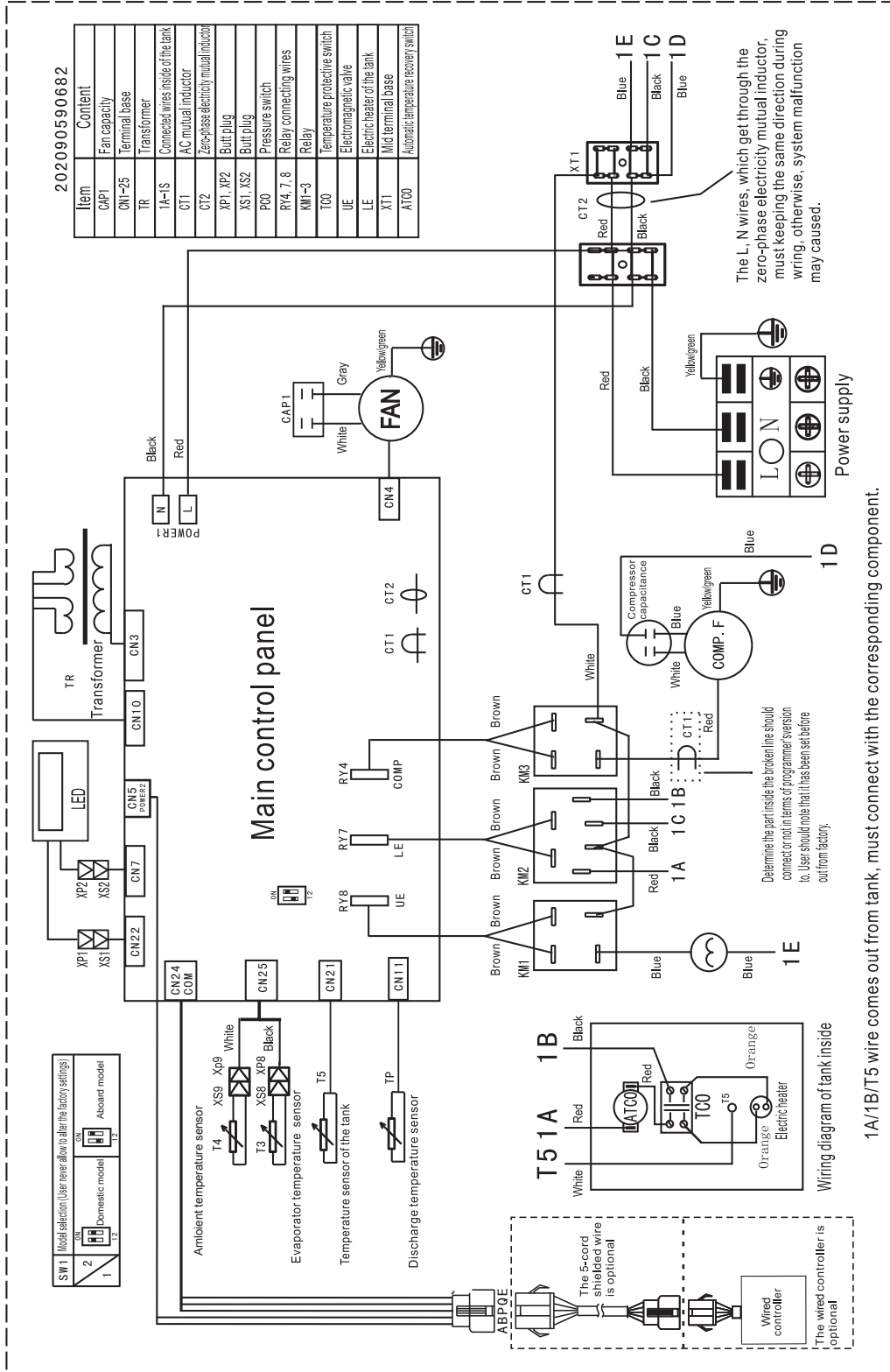
Fig. 6.1



WARNING

The unit must install a Creepage Breaker near the power supply and must be effectively earthed, shown as Fig.6.1

6.3 Electric Wiring Diagram



- TCO: Thermostat TCO
- TOD: Thermostat TOD
- T3: Evaporator Temp. Sensor
- T4: Ambient Temp. Sensor
- T5: Tank Temp. Sensor
- TP: Discharge Temp. Sensor
- Earthing

Fig.6.2

7. OPERATING INSTRUCTION

7.1 Operation steps

Before turning on this unit, please follow the steps below.

Filling water: If the unit is used for the first time or used again after draining the tank, please make sure that the tank is full of water before power is turned on.

See Fig.7-1

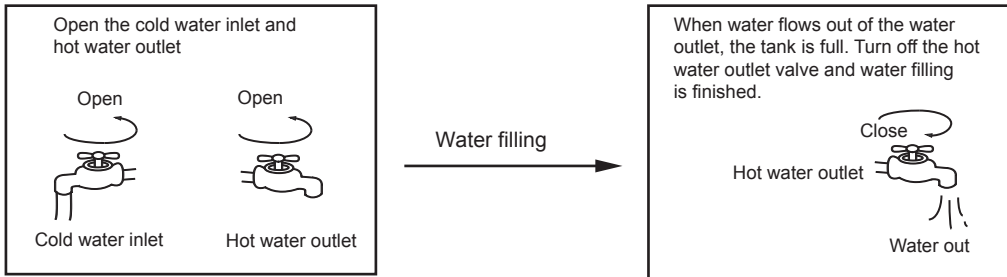
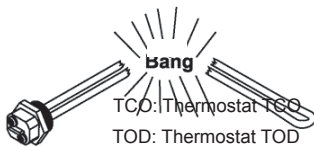


Fig.7-1



CAUTION

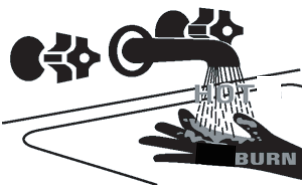


Operation without water in water tank may result in damage of electric element which is not covered by warranty.

Don't operating the unit before filling water.



CAUTION



High temperature hot water may result in serious burn or so caused death. Special attention should be paid to children, disabled and elderly in case of water burn.

Draining: If the unit needs cleaning or moving, the tank should be emptied. Turn off the power supply.

See Fig.7-2:

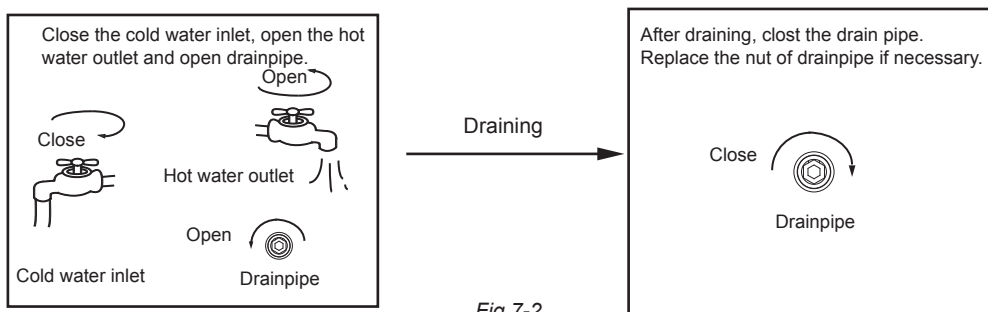


Fig.7-2

7.2 Operation steps

1. Control Panel Explanation

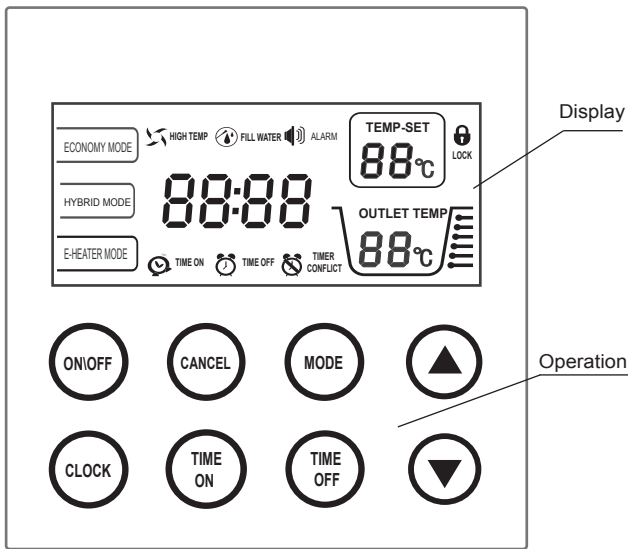


Fig.7.3

2. Display Explanation

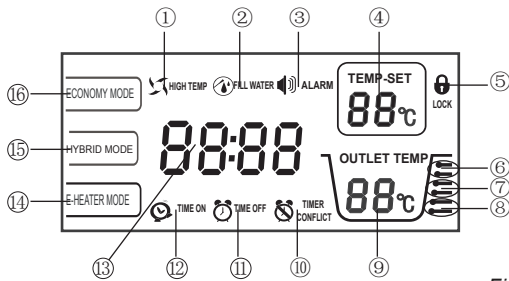


Fig.7.4

⑧	Water temperature indicator: Lights up when the actual water temperature exceeds 40°C.
⑨	OUTLET TEMP indicator: Displays water temperature of the upper part of the tank, which can be used. It always lights.
⑩	TIMER CONFLICT indicator: Lights up when the temperature set through Wired Controller conflicts with that through display.
⑪	TIME OFF indicator: Lights up when time off mode has been set.
⑫	TIME ON indicator: Lights up when time on mode has been set.
⑬	CLOCK indicator: Display present time, blanks when screen protection is activated.
⑭	E-HEATER MODE indicator: Lights up when user sets the E-heating Mode.
⑮	HYBRID MODE indicator: Lights up when user sets the Hybrid Mode.
⑯	ECONOMY MODE indicator: Lights up when user set the Economy Mode.

3. Operation

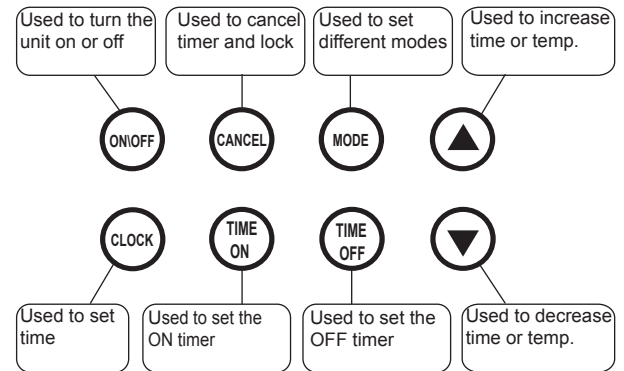


Fig.7.5

Table. 7-1

①	HIGH TEMP indicator: When the setting temperature exceeds 50°C, this indicator will light up.
②	FILL WATER indicator: When the power supply is turned on, it lights up to remind you to refill water if necessary.
③	ALARM indicator: It will flash at malfunction or protection.
④	TEMP-SET indicator: Show error code if there is a problem and display the pre-set target temperature at other times.
⑤	LOCK indicator: Lights when display is locked.
⑥	Water temperature indicator: Lights up when the actual water temperature exceeds 60°C.
⑦	Water temperature indicator: Lights up when the actual water temperature exceeds 50°C.

4. Operation Instruction

■ Preparation before running the unit.

When you turn on the power supply, all the indicators on the display will light for 3 seconds, the buzzer will ring "didi" twice at the same time, then display the preset screen. After no operation for 1 minute, all indicators will go out automatically except for the Fill Water indicator flashing and tank temperature indicator. Buzzer will ring "di" when you press it.

When the tank is full, press the ON/OFF key, the Fill Water indicator will stop flashing and you can continue to set other settings. When all settings have been finished, press the ON/OFF key again and the Fill Water indicator will go out. Then unit can operate.

When the unit is in operation, if there is no operation or malfunction for 20 seconds, the backlight of the display will go out automatically except lights for the operation mode, outlet temperature and lock indicator.

Lock and Unlock

In order to prevent accident operation, a special lock setting function has been designed. If there is no operation for 1 minute, the unit will be locked automatically, and the lock indicator will be displayed.

When the unit is locked, no settings can be changed.

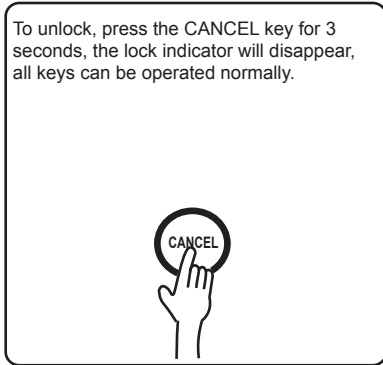


Fig.7.6

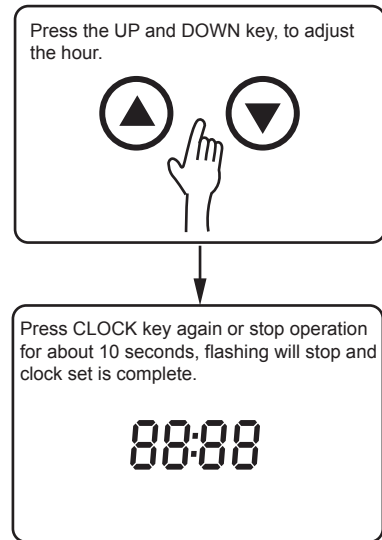
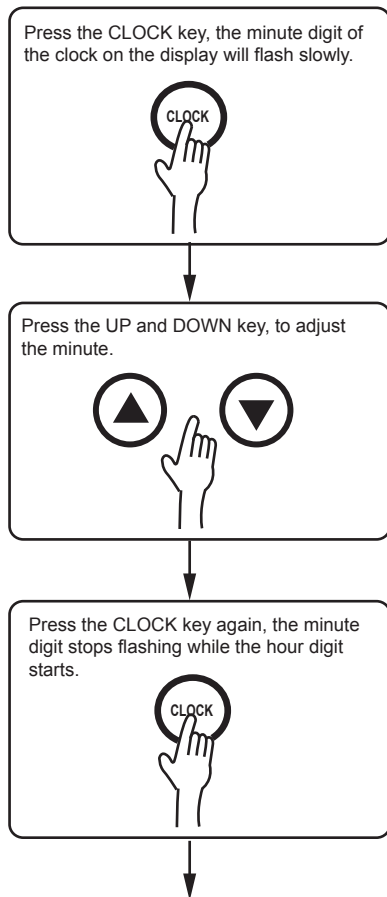


Fig.7.7

Clock Setting

The clock is for a 24-hour system and the initial time is 00:00. To make better use of this unit, it is recommended to set the unit to accurate local time. Every time the unit is powered off, the clock will be reset to the initial time of 00:00.

To set time



Mode Selection

- The unit is enhanced with three operation modes, Economy Mode, Hybrid Mode and E-heater Mode.
- ECONOMY MODE**: The unit heats water only by compressor drive according to heat-pump principle. Use when the ambient temperature is high.
- HYBRID MODE**: The unit heats water by both compressor and electric element. Use when the ambient temperature is low or large amount of hot water is needed.
- E-HEATER MODE**: The unit heats water only by electric element. Use when the ambient temperature is very low.
- To change mode

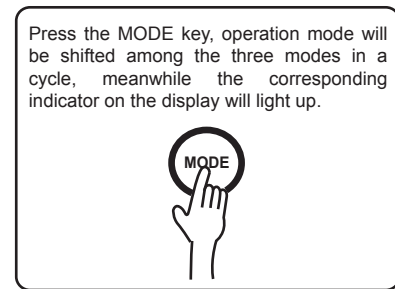


Fig.7.8

Temperature Setting

Temperature displayed is the water temperature in the upper part of the tank. Default is 55°C, setting range is 38~60°C.

To set temperature

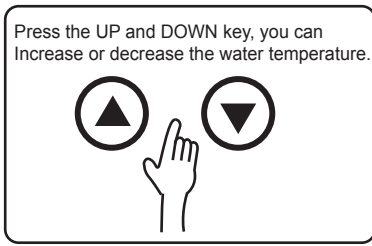


Fig.7.9

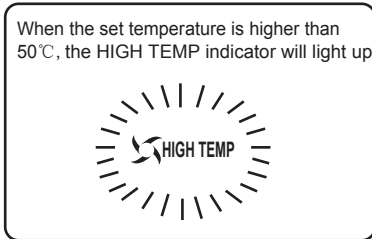


Fig.7.10

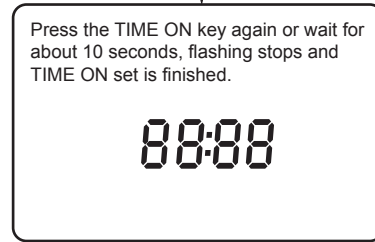
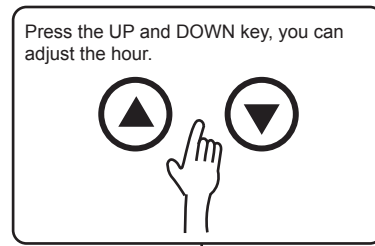


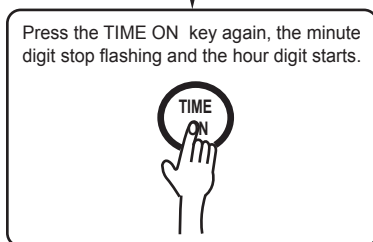
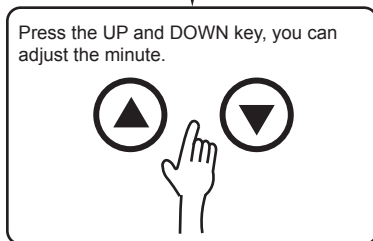
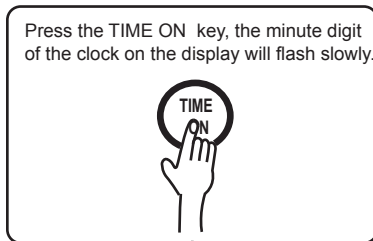
Fig.7.11

■ Timer

User can set up an operating start and stop time by using the timer function. The least duration of timer is ten minutes.

TIME ON: User can set up a start time by this. The unit will automatically operate from the set time to 24:00 on the same day.

To set start time



Cancel:

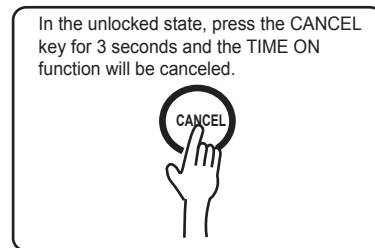


Fig.7.12

- TIME ON and TIME OFF: Users can set up an operating start and stop time. When the start time is earlier than the stop time, the unit will run between the set time. When the start time is later than the stop time, the unit will run between the start time today and the stop time the next day, when user sets the same start and stop time, the stop time will be automatically delayed by ten minutes.

To set stop time

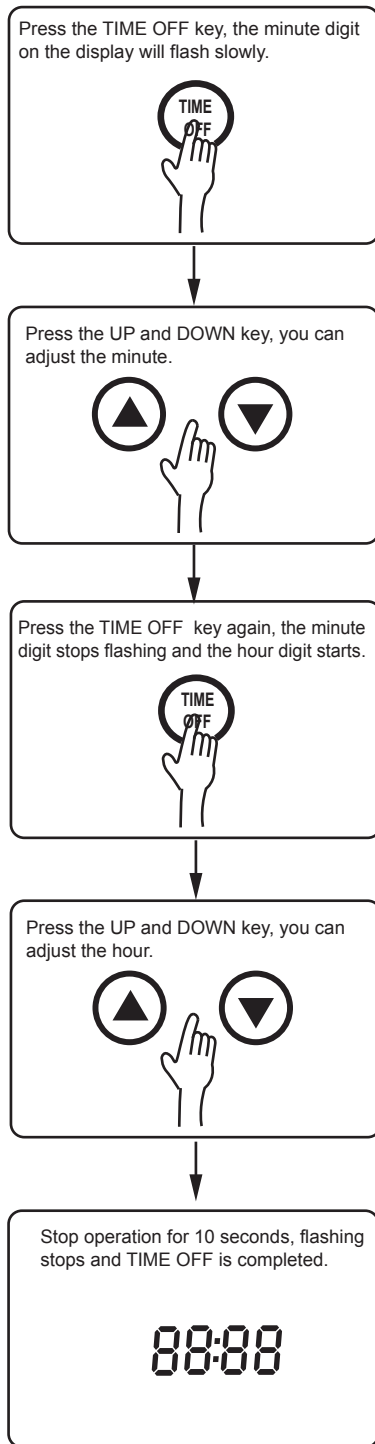


Fig.7.13

Cancel:

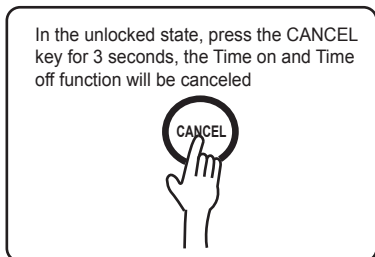


Fig.7.14



NOTE

- TIME ON and TIME OFF cannot be set to the same time. If they are the same, the stop time will delay 10 minutes automatically. For example, TIME ON and TIME OFF set to 1:00 at the same time, then the stop time will adjust to 1:10 automatically.
- TIME OFF function cannot be used alone. The key can be used only after TIME ON has been set. User can press the ON\OFF key manually if long period is required.

■ ON/OFF key

- Power On and Power Off
- Press ON\OFF button after setting have been finished and the system will run as the setting.

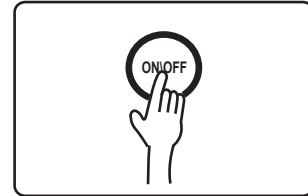


Fig.7.15

■ Operation status

- The Low Ambience (LA) code from the screen of TEMP-SET will appear to remind user when ambience temperature do not meet the operation condition of heat pump unit (beyond -7~43°C).

In such case, the unit will automatically switch to E-heater mode. The unit will return to original setting automatically when the ambient temperature meet the operation condition of heat pump mode and the LA code will be disappear at the same time, the screen will then display nomally.

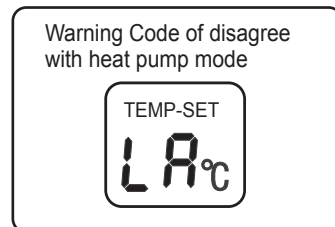


Fig.7.16

In the case when ambient temperature does not meet the heat pump operation requirement (outside the range -7~43°C) for over 20 hours, "LA" will display at TEMP-SET screen and ALARM indicator flashing simultaneously to alarm that the temperature is not suitable for heat pump performance, only E-heater mode could be selected at such circumstance. Please switch to E-heater mode manually for to ensure there is adequate hot water to be supplied. Note that if change of mode is done manually, the desired mode will not return automatically upon unit returning to normal working process. Desired mode must be changed back manually.



Fig.7.17

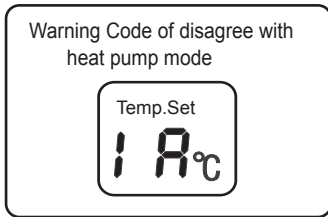


Fig.7.18

■ Trouble Shooting

- If error occurs, the buzzer will buzz 3 times every minute and the ALARM indicator will glitter fast. Hold CANCEL for 3 seconds to stop the buzzer however the light will keep glittering.

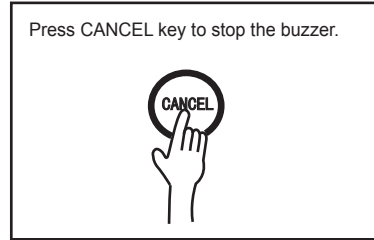


Fig.7.19

- The error code from the screen of TEMP-SET will display when a malfunction happens, the system will display error code after one minute when the key is pressed again and the screen will display set temperature.

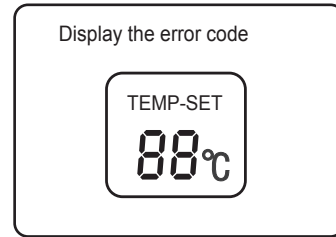


Fig.7.20

- When a malfunction happens in economy mode, the system may still be used when switched to E-heater mode. However, in this case, the system could not reach the expected efficiency. Please contact your supplier for assistance.

Error Code Explanation (See table. 7-2)



WARNING



The covers of the electric element should not be opened unless by a qualified electrician in order to prevent electric shock and other dangers.

Table. 7-2

Display	Malfunction Description
E0	Upper tank temperature sensor (T5U) error
E2	Tank and Wired Controller communication error
E4	Evaporator tube temperature sensor (T3) error
E5	Ambient temperature sensor (T4) error
E6	Discharge temperature sensor (TP) error
E7	Heat Pump system error
E8	Electric leakage protection
E9	Return air temperature sensor (TH) error
P0	Evap. temperature overlow protection
P2	Discharge pipe temperature overheat protection
P4	Compressor overloaded protection
LA	Low Ambience error, ambient temperature is not in the range of 7~43° C

If the errors occur, please contact your installer.

LA

8. RUNNING AND CAPABILITY

8.1 Trial Run

- Before start, please check the following first:
 - Correct installation of the system;
 - Correct connection of pipeline, wiring and earthing;
 - Drainpipe connected;

- Suitable pipe insularion;
- Correct transportation of unit;
- Correct power supply;
- No obstacles outside the air inlet and outlet;
- Complete bleeding air out of hot water cylinder and pipes;
- Effective electric leakage protector;
- Sufficient inlet water pressure($\geq 150\text{kPa}$)

8.2 Operating Capability

■ Water-heating Operating Capability

- Two heating parts are included in the unit, one heat pump and one electric heater, which is installed in the middle. All the heating parts do not work together. This unit has one temperature sensor, which is installed at the upper of the electric heater. see Fig.8.1

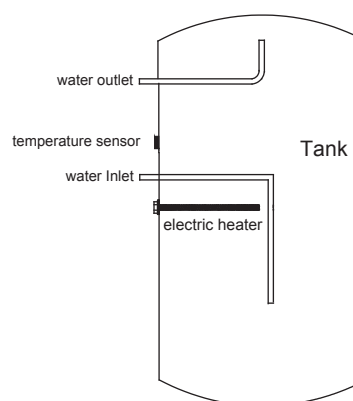


Fig.8.1

- Economy Mode: In this mode, only the heat pump system work. If the ambient temperature is higher than 43°C or lower than 7°C, the heat pump system can't work. (Water outlet temperature range 38~65°C, running ambient 7~43°C)
- Hybrid Mode: In this mode, the system will adjust the working capabilities of E-Heater and heat pump according to the tank water temperature. (Water outlet temperature range 38~70°C, running ambient -30~43°C)
- E-Heater Mode: In this mode, the compressor and the fan motor will not run but the E-Heater work only. (Water outlet temperature range 38~70°C, running ambient -30~43°C).

■ Switch between 3 modes

- Heat pump cannot work properly under Economy mode or Hybrid mode when ambient temperature is below 7°C. Unit will switch to E-Heat mode under this circumstance and recover to the previou mode when ambient temperature is above 7°C automatically.
- When unit switches to E-Heat mode from Economy mode or Hybrid mode, the monitor still reveals Economy mode or Hybrid mode.

The 3 modes can be switched manually at any time.

■ Defrosting during Water-heating

In the Economy Mode and Hybrid Mode, if the evaporation frosts in a cold circumstance, the system will defrost automatically to keep effective performance(3~10 min).

- In defrosting fan motor will run at a high speed and E-Heater will operate.

■ Ambient Temperature

The system's operation temperature is within -30°C~43°C and the following are the operation temperature for each mode.

- Economy Mode: 7°C~43°C
- Hybrid Mode: -30°C~43°C
- E-Heater Mode: -30°C~43°C

■ Mode Selection

Different mode is designed to meet different demand and the following are recommended selections.

- Economy Mode: 7~43°C, a continuous hot water demand below 150L(65°C);
- Hybrid Mode: -30°C~43°C, a continuous hot water demand between 150L~200L(70°C);
- E-Heater Mode: -30°C~43°C, a continuous hot water demand between 150L~200L(70°C).

■ Self-Protection Apparatuses

- When the self-protection happens, the system will be stopped and start self-check, and restart when the protection resolved;
- When the self-protection happens, the buzzer will buzz in every other minute, the ALARM indicator will glitter and the display will indicate the error code and water temperature alternatively. Press CANCEL key for 3sec to stop the alarm. All stop when the protection is resolved and error code disappears from the display.

■ In the following circumstances, self-protection starts:

- Air inlet or outlet is blocked;
- The evaporation is covered with too much dust;
- Incorrect power supply (exceeding the range of 220-240V)



NOTE

When self-protection happens, cut the power supply manually and restart after the error resolved.

■ Water Temperature Display

- The temperature on the display is the water temperature in upper part of water tank (over 1/4) which you will use, but not that of all the water.
- The 6 indicators beside the water temperature on the display are the lower part water temperature. When the temperature is higher than 40°C, the blue one will light up; when it is higher than 50°C, the blue and yellow ones light up; when it is higher than 60°C, the blue, yellow and red ones will light up and when all light up, the water temperature has reached the set point.

- In water using, the temperature of the lower part may decrease while the upper part still keeps a high one, and the system will start heating the lower part. And it is normal.

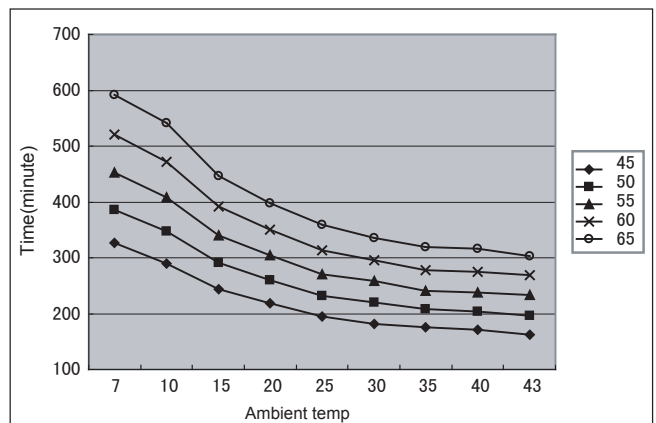
■ Error Shooting

- When common error happens, the system enters Standby Mode and could still work, but not so efficient as normal. Please contact the technician.
- When serious error happens, the system will be unable to carry on. Please contact the technician.
- When error happens, the buzzer will buzz in every other minute, the Warning light glitter and the display indicate the error code and water temperature alternatively. Press CANCEL button for 3sec to stop the alarm.

■ Restart after Long Stop

When the system is started after a long time (trial running included), it is normal if the outlet water is unclear. Keep the tap on and it will be clean soon.

8.3 Heat-up time



EcoSpring ES190



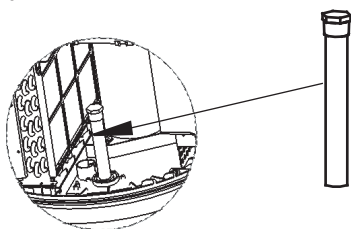
NOTE

The diagram is made in economy mode; in the low ambient temperature, it need time to heat the water, suggest changing to hybrid mode.

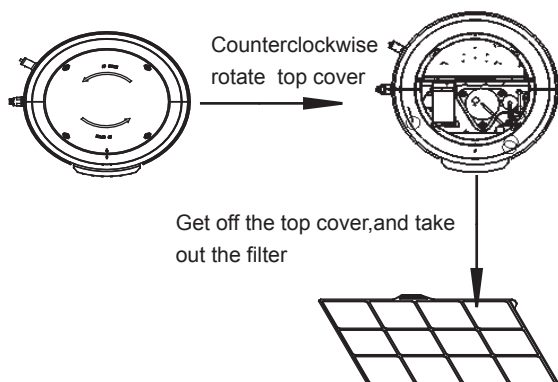
9. MAINTENANCE

9.1 Maintenance

- Check the connection between power supply plug, socket and ground wiring regularly;
- In some cold areas (below 0°C), if the system is to be stopped for a long time, the tank should be drained in case of freezing of water in the inner tank which will damage the electric element.
- It is recommended to drain the inner tank regularly to maintain efficient performance.
- The anode rod should be checked and changed if necessary by qualified installed every year. For more details, please contact the supplier.
- Clean the air filter every year to maintain heating performance.
 - In terms of the filter set in air inlet directly (namely, air inlet without connect with duct), the method to dismantle the filter is: anti-clockwise unscrew the air inlet ring, take out the filter and clean it completely, finally, remount to the unit. For unit with duct, remove duct first then follow above instruction.
- Before shutting the system down for a long period, ensure that:
 - Power supply has been cut off;
 - Water in water tank and pipeline has been drained and all valves has been closed;
- Instruction to change anode rod (for qualified installer)
 - Turn off the power, and turn off the water inlet valve.
 - Open hot water tap, and decrease the pressure of the inner container.
 - Open the temperature pressure valve, and drain out the water until no water flows out.
 - Unscrew anode rod.
 - Replace with a new one, and make sure sealed effectively.
 - Open cold water valve until hot water flows out, and turn off the hot water tap.
 - Restart.



■ Instruction to Take out The Air Filter



9.2 Non-error Malfunction

- 3-minute Protection
 - With the power supplied, an immediate restart after the shutting down have to wait for 3 minutes as to protect the compressor.
- If self-protection occurs and the system stops, check :
 - When the power indicator lights up, whether the system has been forced to run while startup requirement has not been met;
 - If the air outlet or inlet is jammed or strong wind blows to air outlet.
- Defrosting
 - When the environment is humid and cold, the evaporated water may freeze and the water-heating capacity thus decreases. When this happens, the system will stop heating water to defrost, then restart water-heating upon completion.
 - During defrosting, fan stops working, four-way valve reverses the flow direction, and compressor keeps working.
 - The defrosting time varies from 3 minutes to 10 minutes depending on the ambient temperature and the frost.
- Temperature Display
 - When the system stops, a decrease of water temperature is normal as heat loss. When it decreases to a certain point, the system will restart automatically;
 - During water-heating, the displayed water temperature might still decrease or not increase for a period of time because of the heat exchange of the water. When the whole tank of water has reached the set temperature, the system will stop automatically.

9.3 Malfunctions and Resolutions

Table. 9-1

Malfunction	Cause	Resolutions
Outlet water is cold.	<ul style="list-style-type: none"> • Outlet water is set on a low temperature • Outlet water temperature controller is damaged 	<ul style="list-style-type: none"> • Set outlet water to a higher temperature • Contact the installer
No hot water from the outlet.	<ul style="list-style-type: none"> • Tap water has been cut off • Water pressure is too low • Inlet valve has been closed 	<ul style="list-style-type: none"> • Will return to normal after supplied water • Contact installer • Open the inlet water valve
Water leakage	<ul style="list-style-type: none"> • The joints on the pipeline are not sealed well 	<ul style="list-style-type: none"> • Check and reseal all the connections
The display is dark.	<ul style="list-style-type: none"> • Bad connection of power supply plug and socket • Circuit board indicator is damaged 	<ul style="list-style-type: none"> • Reconnect the plug • Contact the installer

9.4 After-Sale Service

If the unit run into malfunction or error, it should be shut down and the power supply cut off. Please contact your installer for assistance.

10. SPECIFICATIONS

Table. 10-1

Model	EcoSpring ES190			
Mode	Economy Mode	Hybrid Mode		E-Heater Mode
Water-heating Cap.	1500W	Heat Pump	E-Heater	2000W
		1500W	2000W	
Rated power/Current	660W/3.0A	*660W/3.0A	*2000W/9.0A	2000W/9.0A
Power supply	220-240V~ 50Hz			
Operation control	Auto/Manual startup, real time control, error alarm, etc			
Protection	High-pressure Protector, Over-load Protector, Temp Controller&Protector, Electric Leakage Protector, etc			
Compressor power	440W			
E-heater Power	2000W			
Regrigerant	R134a(0.8kg)			
Water pipeline system	Outlet water temp.	Default 65℃, (38℃-70℃ adjustable)		
	Water side exchanger	Surface heat exchanger		
	Inlet Pipe Dia.	DN20		
	Outlet Pipe Dia.	DN20		
	Drainpipe Dia.	DN20		
	PT Valve Dia.	DN20		
	Min/Max. Pressure	0.15MPa/0.7MPa		
Exchanger Air side	Material	Hydrophilic aluminum fin, inner groove copper tube		
	Motor power	30W		
	Outlet Air Type	Air out from sideward		
Fusible Link Type	T5A 250VAC			
Dimension	Φ568×1580mm			
Water Tank Cap.	190L			
Net Weight	92.7kg			
<p>* Heat pump and E-Heater are not working at same time, rated input is 2000W</p> <p>The test conditions: Ambient temperature 20/15℃(DB/WB), Water temperature from 15℃ up to 45℃.</p>				

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