ecospring
HOT WATER SYSTEMS

Installation & Owner's Manual

ALL IN ONE Type Air-source Heat Pump Water Heater

EcoSpring ES300

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

⚠ WARNING

This unit is required reliable earthing before usage, may otherwise result in death or injury.

If you can't make sure that your house power supply is earthed well, please don't install the unit.

The unit must be installed by a licensed tradesperson and in accordance with：

- **EcoSpring installation instructions.**
- **AS/NZS 3500.4-"National Plumbing and Drainage Code Hot Water Supply Systems-Acceptable Solutions".**
- **AS/NZS 3000-Wiring Rules.**
- **Local authority regulations.**
- **NZ Building Code.**
- **Local Occupational Health and Satety (OH&S) Regulations.**

NOTICE TO CUSTOMERS

This water heater must be installed by a licensed person as required by the Building Code. Only a licensed person will give you a compliance certificate, showing that the work complies with all the relevant standards.

Please read and understand this booklet.If you have any questions, please contact our service representative on 0800 200 510.

HOT WATER CAN BE DANGEROUS

Warning – Hot water burns. As a safety precaution, young children should always be supervised around hot water fixtures.
Heat pump water heaters can store water at temperatures that can cause scalding. Water temperatures over 50°C can scald and care needs to be taken to ensure that injuries do not occur through incorrect use of your water heater.

As heat pump water heaters can generate water temperatures in excess of 60°C, regulations require that a tempering valve be fitted to the heater to prevent water temperatures going to the home exceeding a preset safe maximum. The tempering valve must be connected to the hot water outlet line from the water heater. The valve must be fitted by an authorized plumber at the time of installation or in retrofitting to existing systems.

Care should be taken to avoid coming into contact with any pipe work or fixtures associated with the water heater pipe lines. **Under NO circumstances should any 'home handy man' type modifications be attempted.**

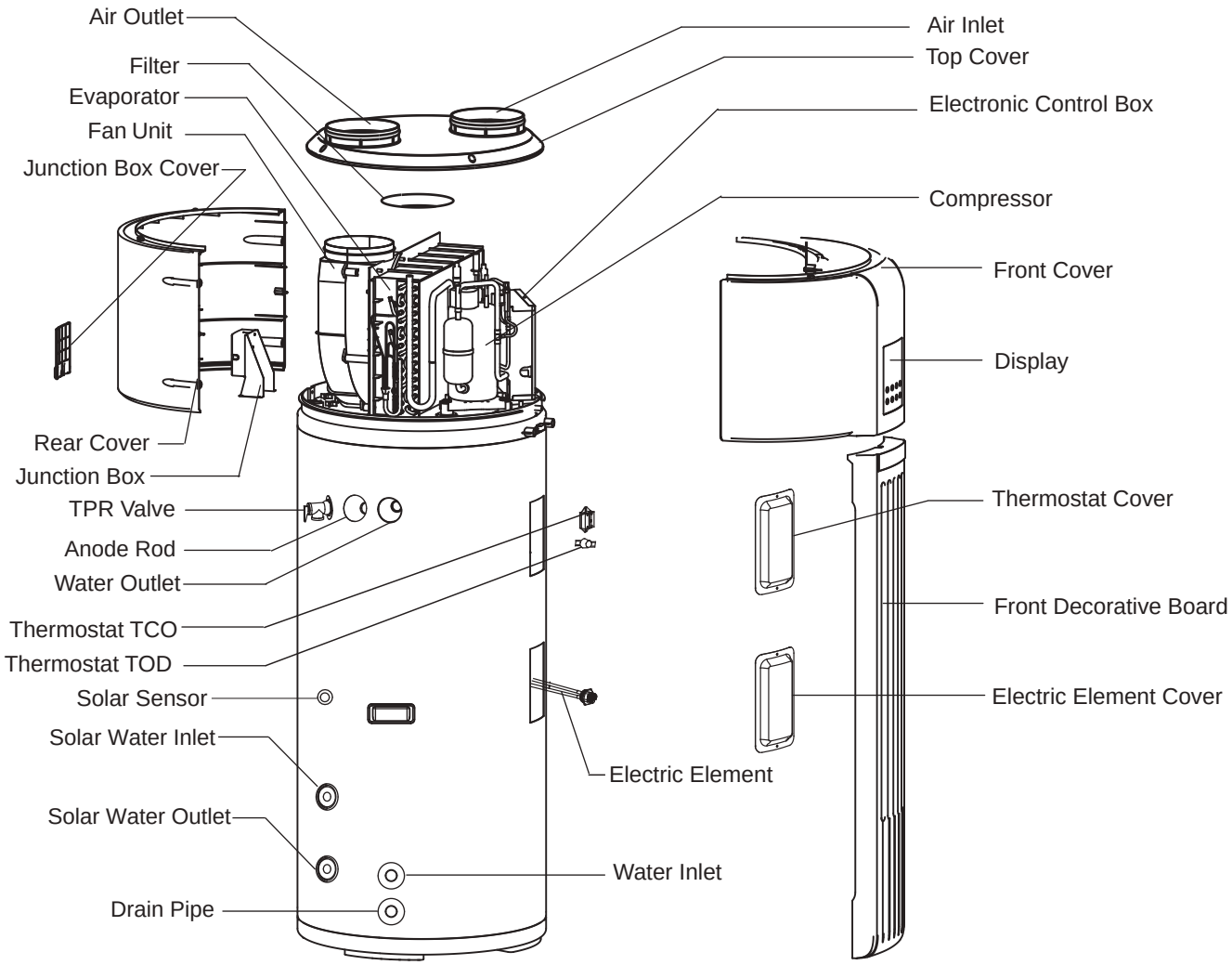
- This appliance is not intended for use by persons (including children) with reduced physical sensory or mental capabilities, or lack of experience and knowledge, that prevents them from using the appliance safely without supervision or instruction. Children should be supervised by a responsible person for their safety to ensure that they do not play with the appliance.

- DANGER: Failure to operate the relief valve easing gear at least once every six months may result in the water heater exploding. Continuous leakage of water from the valve may indicate a problem with the water heater.

- **THE INSTALLATION MUST COMPLY WITH THE REQUIREMENTS OF AS/NZS 3500.4, AS/NZS 3000, and all local codes and regulatory authority requirements. In New Zealand, the installation must conform to the New Zealand Building Code G12.**

The power supply must be protected by an individual circuit breaker at the main electrical supply switchboard and rated to suit the booster size. The supply to the heat pump water heater can be operated directly from the switchboard or via a remotely mounted switch or time clock as requested by the customer. The heater must be provided with a suitable means for disconnecting the power supply.

PARTS NAMES



NOTE

All pictures in this manual are for explanation purpose only. They may be slightly different from the heat pump water heater you purchased. The actual unit shall prevail.

CONTENTS **PAGE**

1. BASIC OPERATION PRINCIPLE

We know from experience, the natural flow of heat, moves from a higher to a lower temperature source, a heat pump can transfer heat from a lower temperature source to a higher temperature source with high efficiency.

The advantage of a heat pump water heater is that it can supply more heat energy, normally 3:1 times than input electricity power by extracting the heat from ambient atmosphere in a free-of charge way and transfer to Sanitary Hot Water. Compared to a traditional water heater, such as electric water heater or gas burner water heater, their efficiency is normally less than 1:1, which means you can dramatically cut off the bill of family daily SHW by the application of heat pump water heater, the following examples will show more details.

Power consumption comparison under the same condition to heat 1 ton of water from 15˚C to 55˚C.

Q=cM(T1-T2)=1(kCal/kg*℃)X1000(kg)X(55-15)(℃)=40000kCal=168MJ
=46.67kW*h

Table 1-1

	HPWH	Gas Burner	E-heater
Energy Resource	Air,Electricity	Gas	Electricity
Transfer Factor	860kCal/kW*h	8905kCal/m^3	860kCal/kW*h
Average Efficiency (W/W)	3.5	0.8	0.95
Energy Consumption	13.33kW*h	210MJ	49.13 kW*h
Unit Cost	0.25 NZD/kW*h	2.2C/MJ	0.25 NZD/kW*h
Running Cost NZD	3.33	4.62	12.28

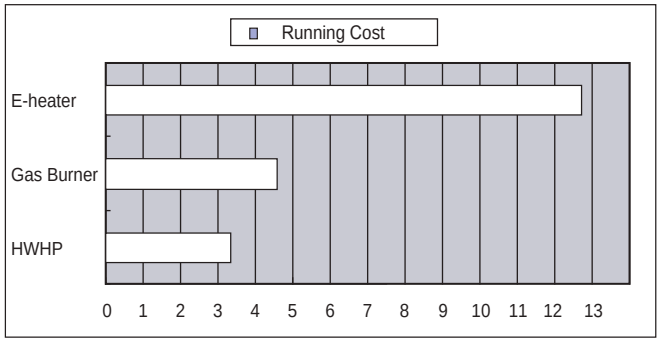


Fig.1-1

NOTE

Above calculations are based on ideal conditions, the final amount will be different the actual running will vary with conditions, such as running period, ambient temperature, etc.

2. SAFETY INFORMATION

Please read thoroughly all of the instrucitons before installing or operating the unit.
The following safety warnings are very important, always read and obey all safety symbols:

WARNING

- The unit must be earthed effectively.
- This appliance must be installed in accordance to AS/NZS standards and the NZ Building code.
- A RCD breaker must be installed adjacent to the power supply.
- Do not remove, cover or deface any permanent instructions, lables, or the data label from either the outside of the unit or inside of unit panels.
- Only qualified persons should perform the installation of this unit in accordance with local national regulations and this manual.

  Improper installation may result in water leakage, electric shock or fire.
- Ask qualified person for relocating, repairing and maintaining the unit.

  Improper installation may result in water leakage, electric shock or fire.
- Electric connection work should comply with the instructions of local power company, local electric utility and this manual.
- Never use an incorrectly fuse rated, otherwise the unit may break down and risk of electrical fire.
- Do not insert fingers, rods or other objects into the air inlet or outlet. The fan is rotating at high speed, and may cause injury.
- Never use a flammable spray such as hair spray, lacquer paint near the unit. It may cause a fire.
- This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance

by a person responsible for their safety. Children should be supervised to ensure that they do not play with the appliance.

- If the supply cord is damaged, it must be replaced by the manufacturer or its service agent or a similarly qualified person.

- DISPOSAL: Do not dispose this product as unsorted municipal waste. Collection of such waste separately for special treatment is necessary. Do not dispose of electrical appliances as unsorted municipal waste, use separate collection facilities. Contact your local government for information regarding the collection systems available.

CAUTION

- The earthing pole of socket must be well grounded, make sure that power supply socket and plug are dry and connected tightly.

- Before cleaning, be sure to stop the operation and turn the breaker off or pull out the power plug. Otherwise, an electric shock and injury may be caused.

- Water temperature over 50℃ 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 required as per NZ Building Code.

- Do not operate the unit with a wet hand. An electric shock may be caused.

- The installation height of power supply should be over 1.8m, if there is any water exposure, steps must be taken to separate the power supply from water.

- A one-way valve must be installed on the water inlet side, as well as an isolation value.

- All valves installed must comply with ASNZS standards.

- It is normal for some water to be released from the PTR valve during operation. But, if there is a large volume of water, call your service agent for instructions. After long term use, check the unit base and fittings. If damaged, the unit may sink, resulting in injury. Arrange the drain pipe to ensure smooth draining. Improper drainage work may cause wetting of the building, furniture etc. Do not touch the inner parts of the controller or remove the front panel. Some parts inside are dangerous to touch, and damage may be caused.

- Do not turn off the power supply.

  System will stop or restart heating automatically. A continuous power supply for water heating is necessary, except service and maintenance.

3. BEFORE INSTALLATION

3.1 Unpacking

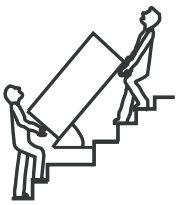
3.1.1 Accessories

Table 3-1

Accessory Name	Qty.	Sharp	Purpose
Owner's & Installation Manual	1		Installation and use instruction This manual
Drain pipe for water condensation	1		Use for draining the condensate water (Has been connected to the lower condensate drain port)

3.1.2 How to transport

1) In order to avoid scratching or deforming the unit surface, apply guard boards to the contacting surfaces.
   No contact of fingers and other things with the vanes.
   Don't incline the unit more than 45° in moving, and keep it vertical when installing.


Gradient limit>45°

2) This unit is heavy, it needs to be carried by two or more persons, othewise might cause injury and damage.

3.2 Location requirements

1) Enough space for installation and maintenance should be preserved.

2) The air inlet and outlet should be free from obstacles and strong wind.

3) The base surface should be flat, surface should be inclined no more than 2° and able to bear the weight of the unit and suitable for installing the unit without increasing noise or vibration.

4) The operating noise and air flow expelled should not affect neighbors.

5) No flammable gas nearby.

6) It should be convenient for piping and wiring.

7) If it is installed in indoor space, it might cause indoor temperature to decrease and noise disturbance, Please take preventive measures for this.

8) If the unit has to be installed on a metal part of building, make sure the electric insulation meets the relevant local electric

Do not install the unit near the following.

- 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.

Note:

- 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.

The insataller will need to check on water quality before installation. This could have an impact on the operation of the unit and the warranty.

■ 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.

■ Indoor installation

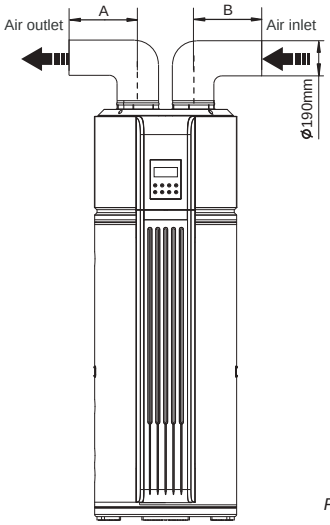


Fig.3-1

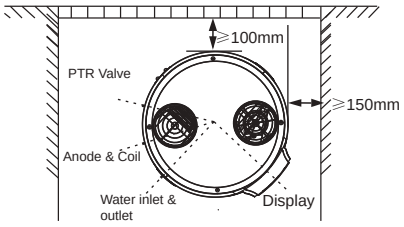


Fig.3-2

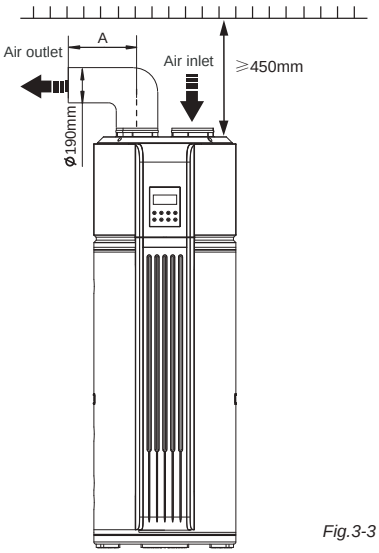


Fig.3-3

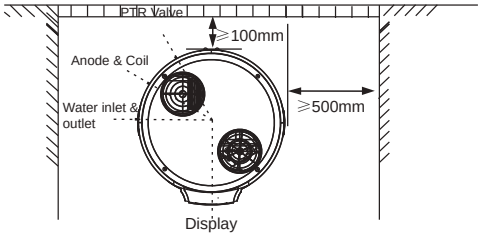


Fig.3-4

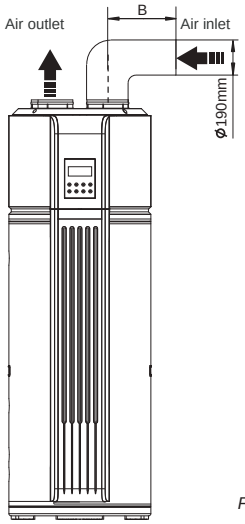


Fig.3-5

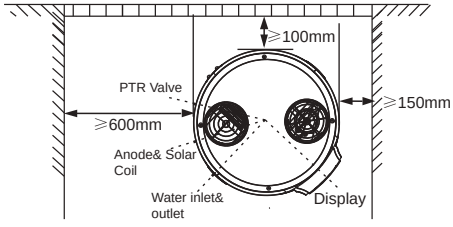


Fig.3-6

Outdoor Installation

■ Installation with Q` hmcover

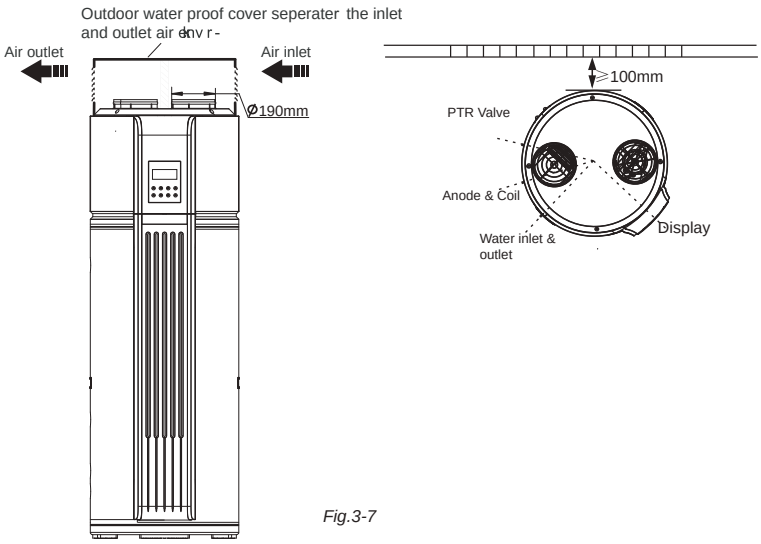


Fig.3-7

Duct Description

Nt scnnqhmr s`kdshmm

Air inlet and outlet+both connectdc with ducts.

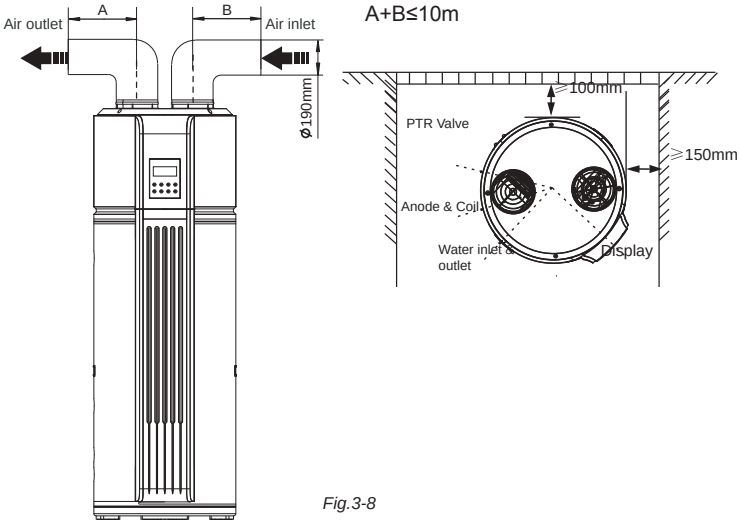


Fig.3-8

Installation taker advantage of warmer air source and cooler air dispensed for other usd-

Different duct connection may result in slightly different system efficiency-

4. INSTALLATION

WARNING

- Ask your installer to install the air-source heat pump water heating unit. Incorrect 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 `cdpt`sd 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 700m^3/h.
- Make sure there is enough installation space.
- Outline dimensional drawing(see *Fig.4-1,Fig.4-2)*

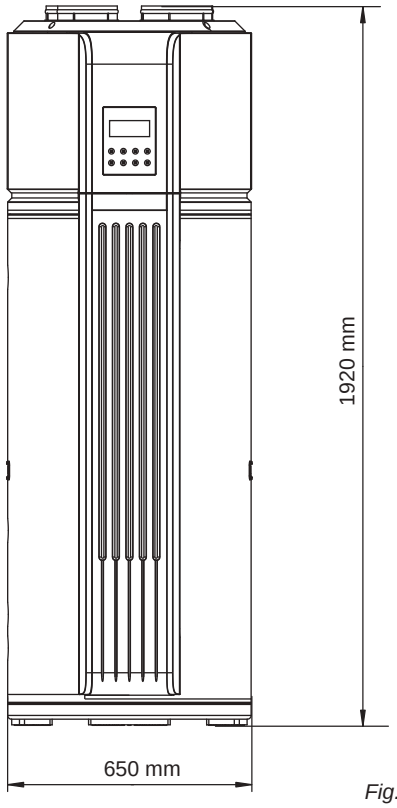


Fig.4-1

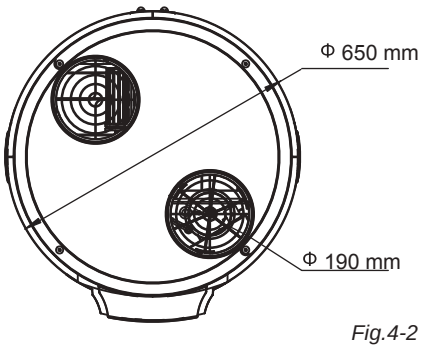
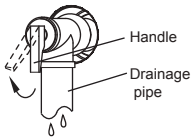


Fig.4-2

NOTE

- TPR valve should be checked by lifting the valve handle up every six months 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

■ Pipeline Connection Sketch

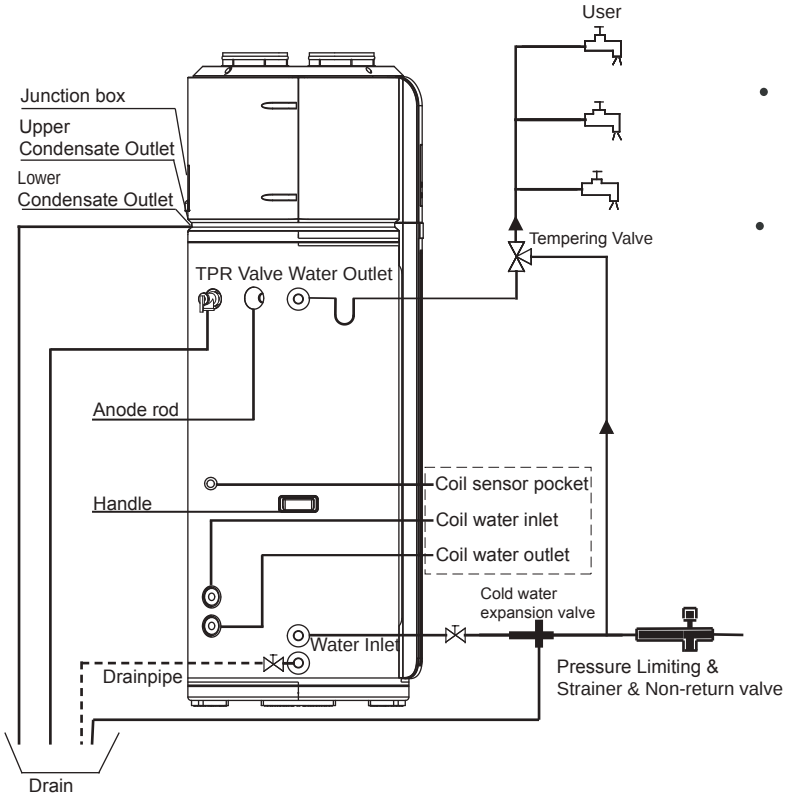


Fig.5-1

CAUTION

When installing the heat pump, please install an isolationg valve at the drain line to the drain.

■ Pipeline Connection Explanation

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

- All installed valves including Pressure Limiting Valve, Filter, Non-return Valve, Cold Water Expansion Valve, and Tempering Valve, must be installed as perAustrilia and New Zealand Standards.

- For indoor installation, a water tray as suggested in *Fig 5-2* is recommended to prevent leakage due to blockage during draining.

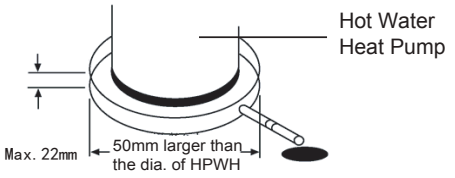


Fig.5-2

6. DUCT CONNECTIONS

6.1 Indoor Installation

Different duct connection may result in slightly different system efficiency

■ Air inlet and outlet both connected with ducts. A+B≤10m

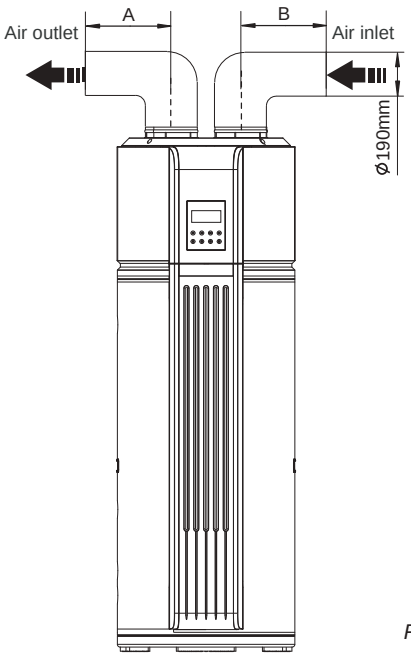


Fig.6-1

Installation takes advantage of the warmer air source and ducts the cold air to other rooms where required.

■ Air inlet without duct, air outlet connected to duct. A≤10m

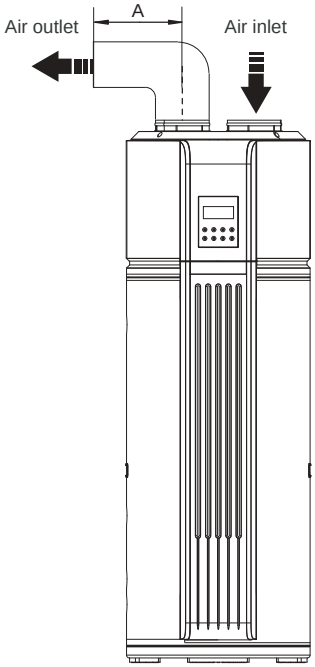


Fig.6-3

Installation that does not want to have the cooler air affect the temperature of the room.

■ Air inlet connected to duct, air outlet without duct. A≤10m

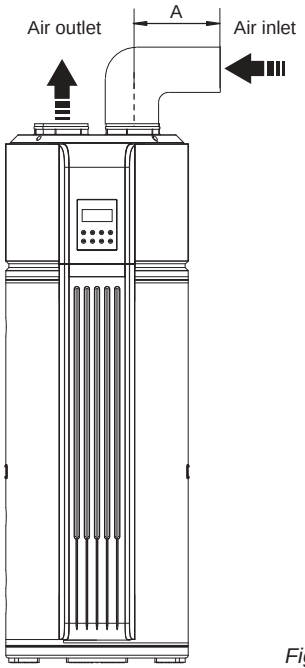


Fig.6-2

Installatoin takes advantage of a warmer air source and discharges the cold air into the room.

6.2 Outdoor Installation

■ Installation with rain cover

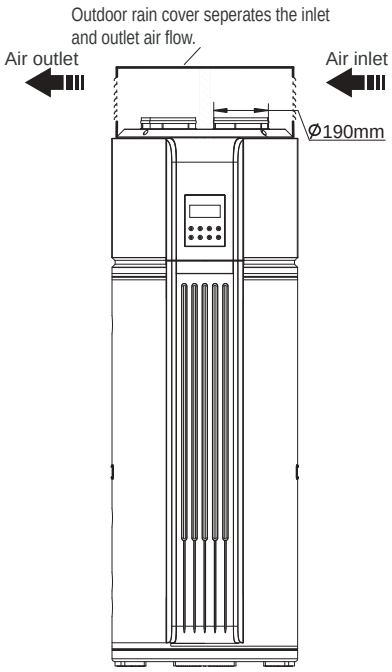


Fig.6-4

Installation uses outdoor air.

Different duct connection may result in slightly different system efficiency

■ Duct Description

Duct	Dimension (mm)	Straight-line pressure drop (Pa/m)	Straight-line length (m)	Bend pressure drop(Pa/Bend)	Bend qty.
Round duct	Φ190	≤2	≤10	≤2	≤5
Rectangle duct	190X190	≤2	≤10	≤2	≤5
Other shaped duct	Refer to above data				

WARNING

- Different duct connections may result in slightly different system efficiency
- The diameter of the duct must ≥190mm, total length of the ducts should not be longer than 10m and the maximum static pressure should not exceed 50kPa. Bear in mind that the number of bends should not exceed five.
- For heat pump air outlet connected with duct, when heat pump is operating, condensated dew will be generated outside the air outlet duct. Please pay attention to the discharge of condensated water.
- Heat pump is not recommend to be installed outdoors where there is no rain cover or weathershed.

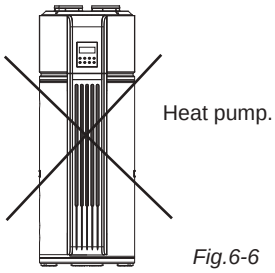


Fig.6-6

- Warning: In case of rain entering the internal components of the heat pump, components might be damaged hence causing physical danger. (*Fig.6-6*)

- In cases where the heat pump is installed outdoors, a reliable water-resistant measure must be used to avoid water ingress into the heat pump. (*Fig.6-7 and Fig. 6-8*)

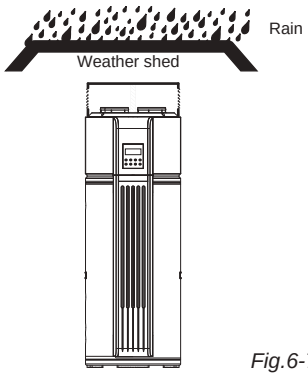


Fig.6-7

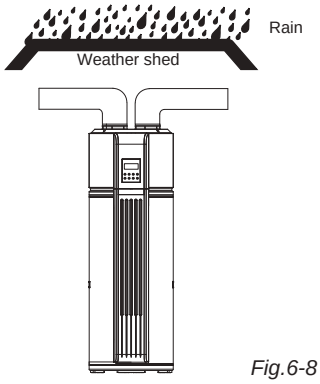


Fig.6-8

- There is a filter on the inlet. In terms of the heat pump connected with duct, additional filter may be put forward to the air inlet of duct to protect possible blockage. (*Fig.6-9 and Fig.6-10*)

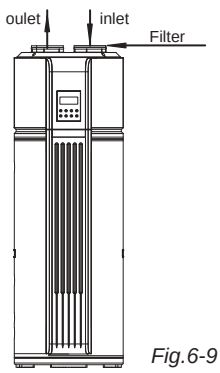


Fig.6-9

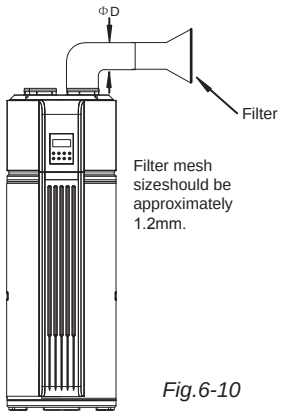


Fig.6-10

- To drain condensated water from evaporator, please install the heat pump on a level platform. The maximum allowed inclination angle of the unit to the ground should be no more than 2° to the drain vent side.

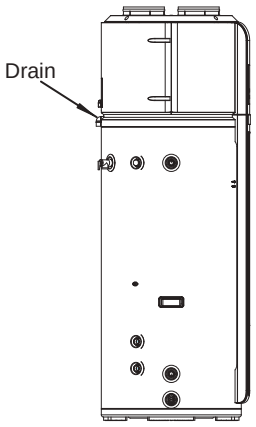


Fig.6-11

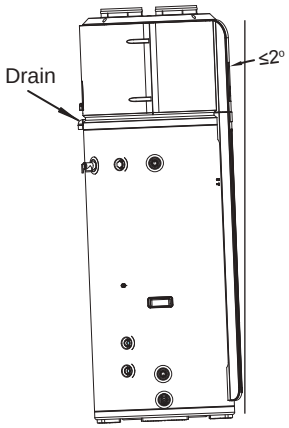


Fig.6-12

7. 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 pipes or valves.
- After wiringconnection is finished, check again to ensure the installation is correct before power is supplied.

7.1 Specifications of Power Supply

Table. 7-1

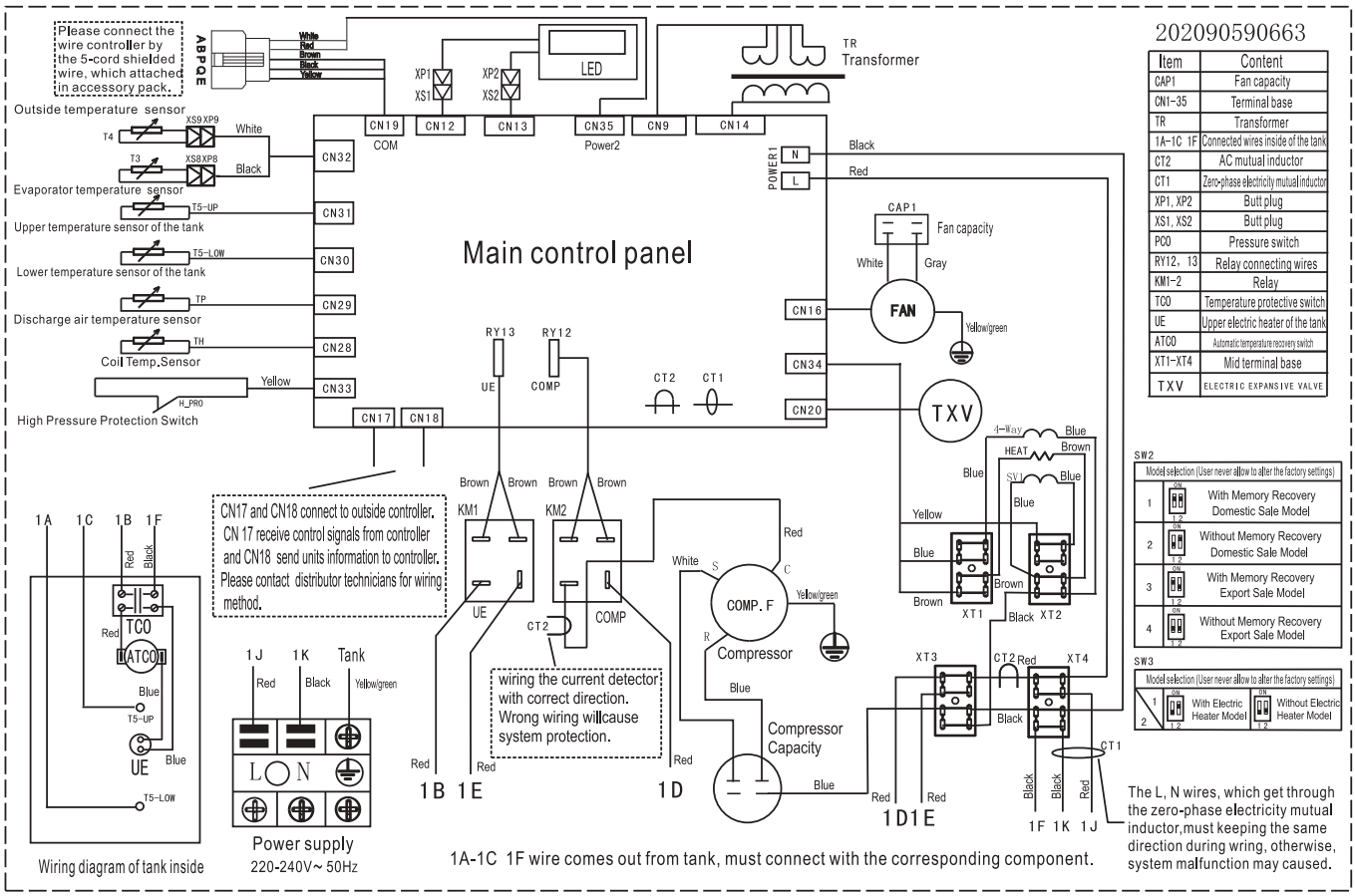
Model Name	RSJ-35/300RDN3-B
Power Supply	220-240V～50Hz
Mlin. Diameter of Power Supply Line(mm^2)	4
Earth Wire(mm^2)	4
Manual Switch(A) Capcity/Fuse	15/5
Creepage Breaker	30 mA ≤0.1sec

- Please select power cables according to above table, and it should comply with ASNZS standards.
- The power cord type designation is H05RN-F.

WARNING

The unit must be installed with an Creepage Breaker near the power and it must be effectively earthed.

7.2 Electric Wiring Illustration



TCO: Thermostat TCO
TOD: Thermostat TOD
T3: Evaporator tube temperature sensor
T4: Ambient temperature sensor
T5U: Tank temperature sensor (upper)
T5L: Tank temperature sensor (lower)
TP: Discharge temperature sensor
TH: Return air temperature sensor
Earthing

Fig.7-1

8. OPERATING INSTRUCTIONS

8.1 Operating steps

Before turning on this Heat Pump, please follow the steps below.

Filling water: If the heat pump 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.8-1*

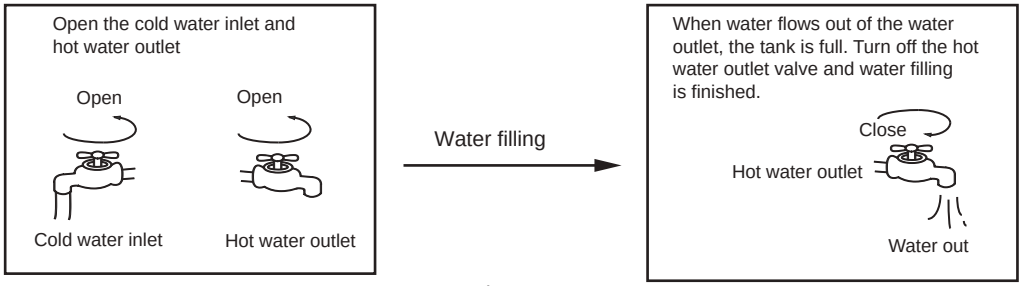
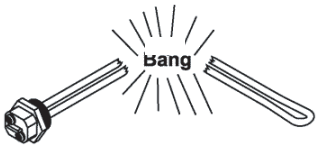


Fig.8-1

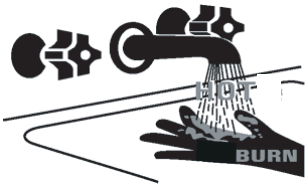
CAUTION



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

Don't operate the heat pump before filling water.

CAUTION



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

Draining: If the heat pumps needs cleaning or moving, the tank should be emptied. Turn off the power supply.
See *Fig.8-2:*

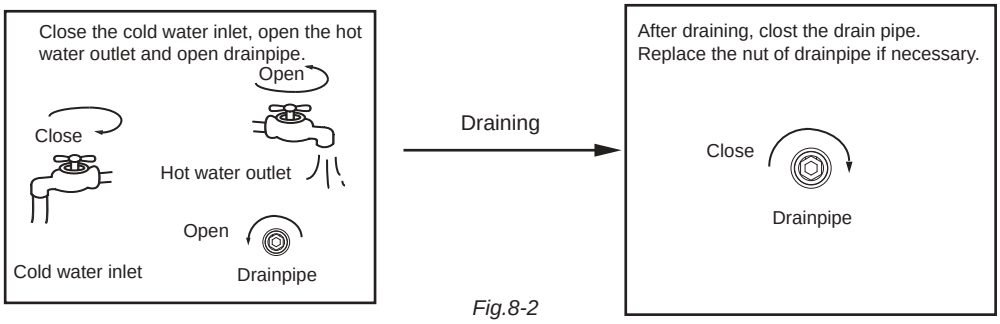


Fig.8-2

8-2 Operating Steps

1 Control Panel Explanation

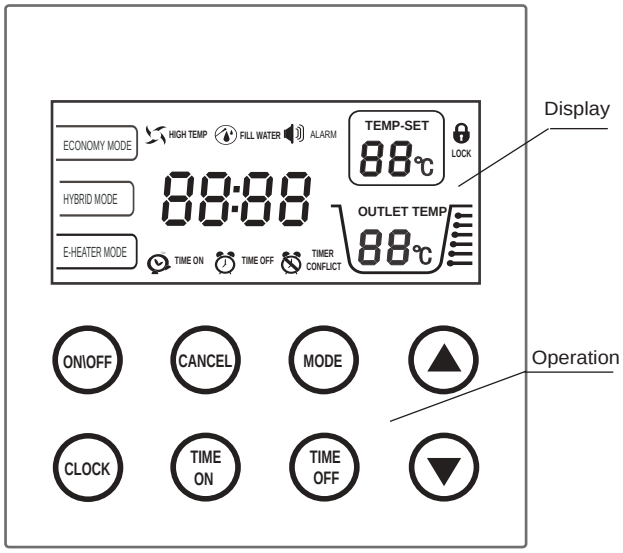


Fig.8-3

2 Display Explanation

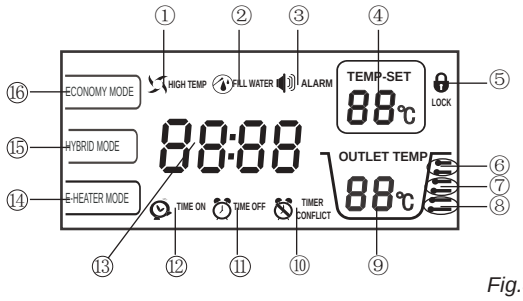


Fig.8-4

Table. 8-5

①	HIGH TEMP indicator: When the setting temperature exceeds 50˚C, this indicator will illuminate..
②	FILL WATER indicator: When the power supply is turned on, it illuminates to remind you to refill water if necessary.
③	ALARM indicator: It will flash due to a malfunction or protection.
④	TEMP-SET indicator: Shows error code if there is a problem and displays the pre-set target temperature at other times.
⑤	LOCK indicator: Illuminates when display is locked.
⑥	Water temperature indicator: Illuminates when the actual water temperature exceeds 60˚C.
⑦	Water temperature indicator: Illuminates when the actual water temperature exceeds 50˚C.
⑧	Water temperature indicator: Illuminates when the actual water temperature exceeds 40˚C.
⑨	OUTLET TEMP indicator: Displays water temperature of the upper part of the tank.
⑩	TIMER CONFLICT indicator: Illuminates when the temperature set through Wired Controller conflicts with that through display.
⑪	TIME OFF indicator: Illuminates when time off mode has been set.
⑫	TIME ON indicator: Illuminates when time on mode has been set.
⑬	CLOCK indicator: Display present time, blanks when screen protection is activated.
⑭	E-HEATER MODE indicator: Illuminates when user sets the E-heating Mode.
⑮	HYBRID MODE indicator: Illuminates when user sets the Hybrid Mode.
⑯	ECONOMY MODE indicator: Illuminates when user set the Economy Mode.

3 Operation Panel

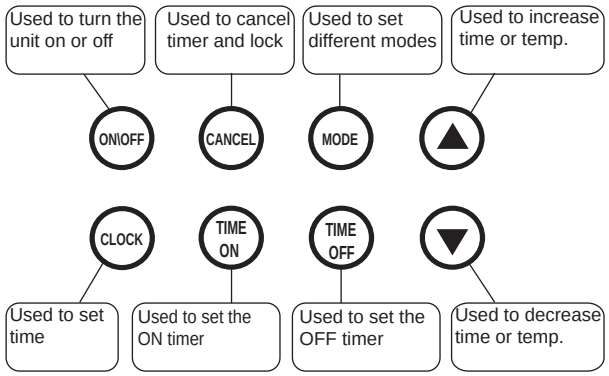


Fig.8-6

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 sound and 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 sound 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 unintended 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.

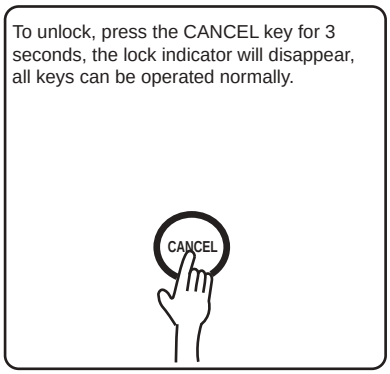
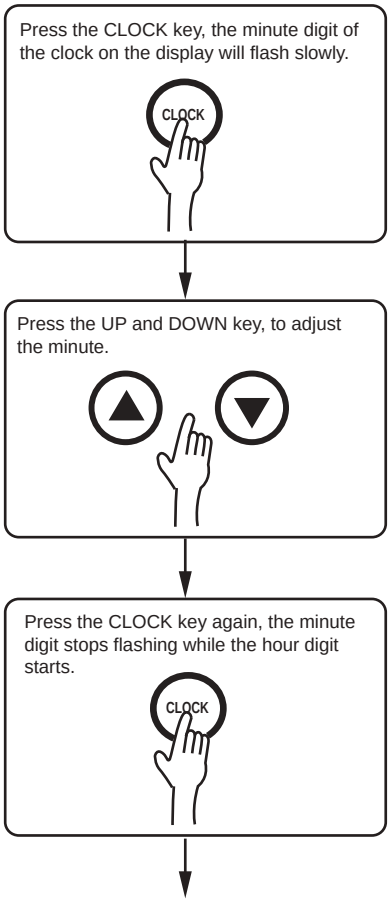


Fig.8-7

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



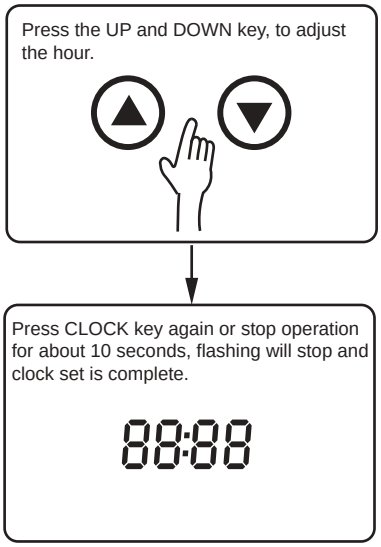


Fig.8-8

■ 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.
- E-HEATER MODE : The unit heats water only by electric element. Use when the ambient temperature is very low.
- To change mode

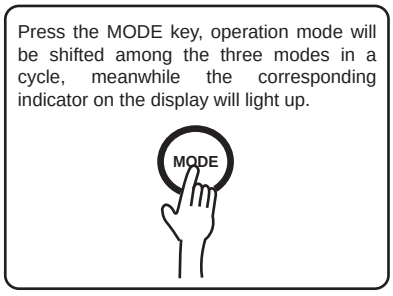


Fig.8-9

■ Temperature Setting

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

To set temperature

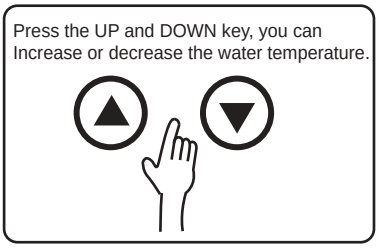


Fig.8-10

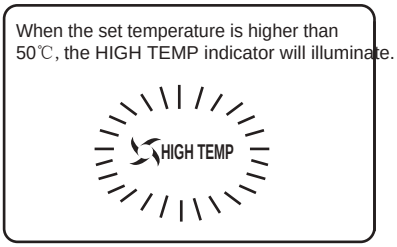


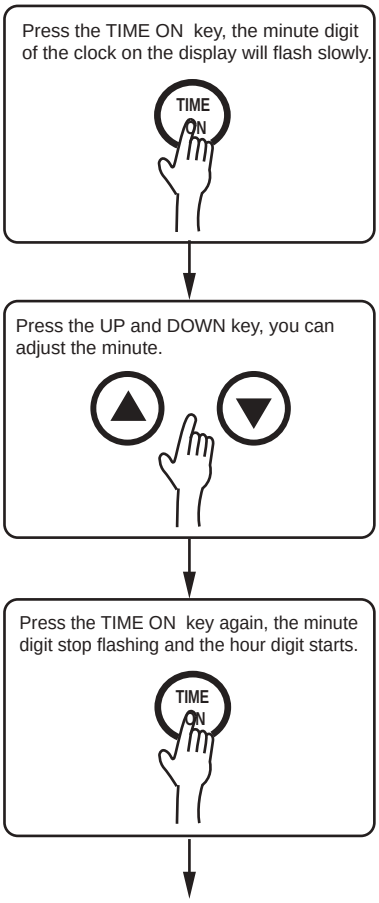
Fig.8-11

■ 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



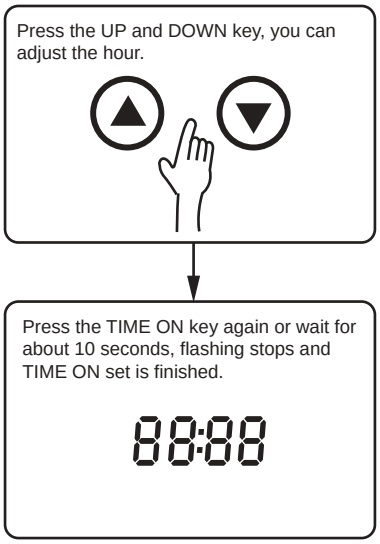


Fig.8-12

Cancel:

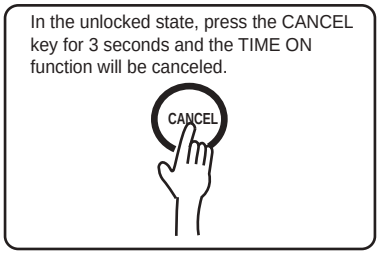


Fig.8 -13

■ 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

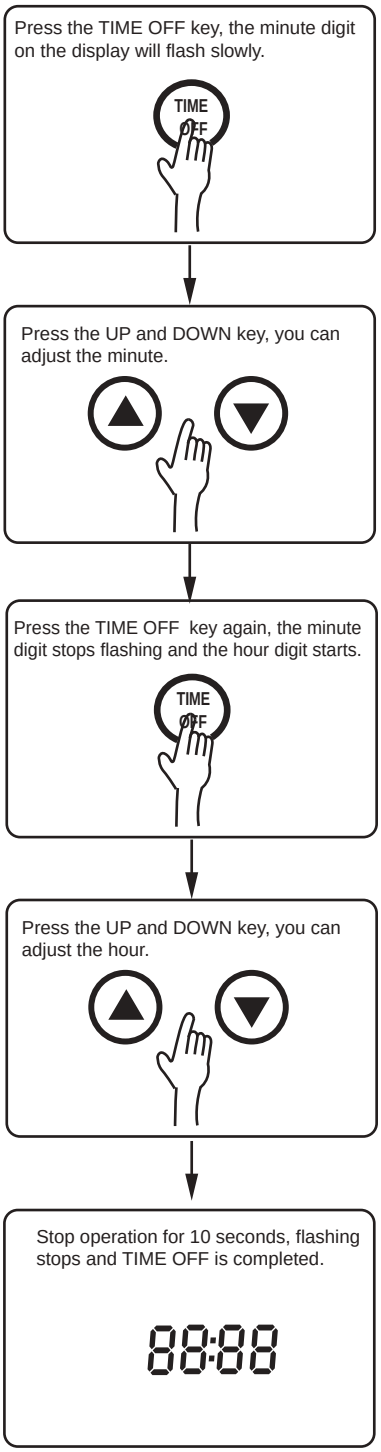


Fig.8-14

Cancel:

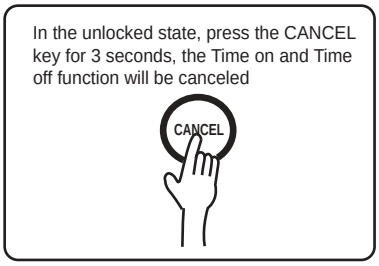


Fig.8-15

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 requied.

■ ON/OFF key

- Power On and Power Off
- Press ON\OFF button after setting has been selected and the system will run at that setting.

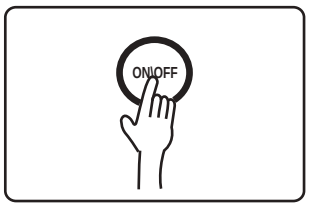


Fig.8-16

■ Operation status

- The Low Ambience (LA) code from the screen of TEMP-SET will appear to remind user when ambience temperature does 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 meets the operating conditions of the heat pump mode and the LA code will be disappear at the same time, the screen will then display nomally.

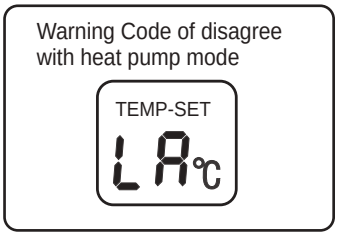


Fig.8-17

- When ambient temperature does not meet the heat pump operational requirement (outside the range -7~43℃) for over 20 hours. “LA” will display at TEMP-SET screen and ALARM indicator flashes 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 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.

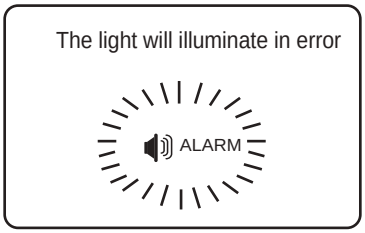


Fig.8-18

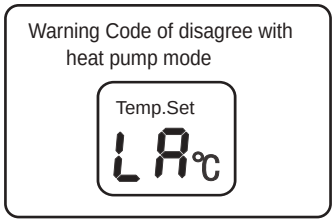
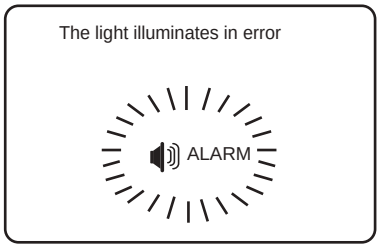


Fig.8-19

■ Trouble Shooting

- If an error occurs, the buzzer will sound 3 times every minute and the ALARM indicator will flash fast. Hold CANCEL for 3 seconds to stop the buzzer however the light will keep illuminating.



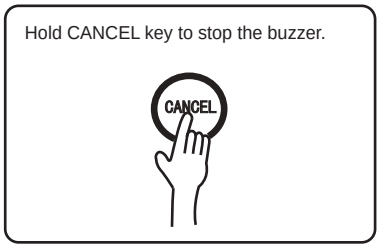


Fig.8-20

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

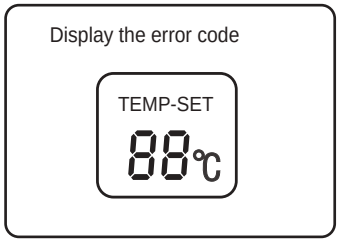


Fig.8-21

- 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 will not reach the expected efficiency.

Error Code Explanation (See table. 8-21)

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. 8-21

Display	Malfunction Description*
E0	Upper tank temperature sensor (T5U) error
E1	Lower tank temperature sensor (T5L) 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
P1	System high pressure protection
P2	Discharge pipe temperature overheat protection
P3	No current flowing in Compressor
P4	Compressor overloaded protection
P8	No current flowing in electric heater
P9	Upper E-heater overloaded protection
LA	Low Ambience error, ambient temperature is not in the range of -7~43° C

* Details refer to page 9, Fig.7-1.

If the errors occur, please contact your installer.

9. RUNNING AND CAPABILITY

9.1 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(≥150kPa)
-

9.2 Operating Capability

■ Water-heating Operating Capability

- There are three types of heat sources that can be used by the heat pump water heater: electric element, heat pump and coil. These three sources do not work together at the same time. Do not use the coil without consulting the supplier.
This unit has two temperature sensors in the hot water cylinder, they are installed at the upper 1/4 and bottom 1/2. The upper one tests the upper temperature, shown in the figure below, and the bottom one is used to test the lower water temperature, which will control the operation of the heating automatically.

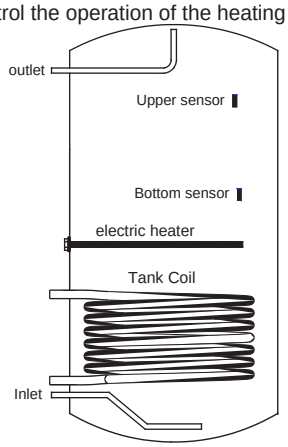


Fig.9-1

■ Water-heating Operating Modes

- ECONOMY MODE : In this mode, the unit heats water only by compressor drive according to heat-pump principle.
(Water outlet temp. range 38～60℃, running ambient -7～43℃)
- HYBRID MODE : In this mode, the system will adjust the working capabilities of electric element and heat pump according to the tank water temperature.
(Water outlet temp. range 38～60℃, running ambient -30～43℃)

- E-HEATER MODE : In this mode, the compressor and the fan motor will not run but the electric element work only.
(Water outlet temp. range 38～60℃， running ambient -30～43℃).

NOTE

In the E-heater mode, the water above the electric element that is being heated is approximately 150L.

■ Defrost during Water-heating

- In the Economy and Hybrid Modes, if the evaporator froze in a cold environment, the system will defrost automatically. (3~10 min).

■ Ambient Temperature

The system's operation temperature is within -30~43℃ and below are the operation temperature for each mode.

1) Economy Mode: -7~43℃
2) Hybrid Mode: -30~43℃
3) E-heater Mode: -30~43℃

NOTE

Economy mode should be used when the ambient temperature is between -7～43℃. When the ambient temperature is under -7℃, the energy efficiency would decrease, E-heater mode should be used in this circumstance.

■ Mode Selection
Different modes are designed to meet different demand and the following are recommended selections.

- Economy Mode: -7~43℃, continuous hot water demand below 250L (60℃);
- Hybrid Mode: -30~43℃, continuous hot water demand between 300L~350L (60℃);
- E-heater Mode: -30~43℃, continuous hot water demand around 150L (60℃).

■ Self-Protection

- Self protection starts in the following circumstances:

① Air inlet or outlet is blocked; Error Code: P1

② The filter is covered with too much dust; Error Code: P2

③ Incorrect power supply (exceeding the range of 220-240V) Error Code: P4

- When self-protection occurs, the system will stop and begin self-check, and restart when the problem is resolved; system will not restart automatically if problem persists, in such case, contact your installer
- When the self-protection happens, the buzzer will buzz every minute, the ALARM indicator flashes and the display indicates the error code and water temperature alternatively. Press CANCEL key for 3 seconds to stop the alarm. Buzzing and flashing stops when the problem is resolved and error code disappears on the display.

NOTE

If the unit fails to restart after self-protection, Switch the power supply off manually and restart after the error has been resolved.

■ Water Temperature Display

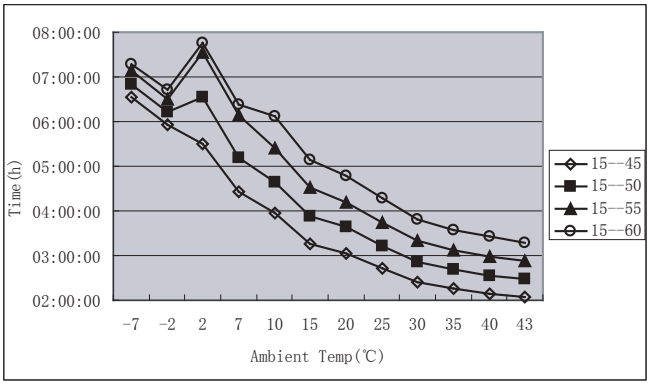
- The temperature on the display is the water temperature in the upper part of the water tank this is approximately 75L of water
- The 6 indicators beside the water temperature on the display are for the temperature in the lower part of the tank. When the temperature is higher than 40℃, the blue indicator will light up; when higher than 50℃, the yellow indicator will also light up; when higher than 60℃, all three colour indicators (blue, yellow and red) will light up. When all indicators light up, the water temperature has reached the set point.
- When using water, the temperature of the lower part may decrease while the upper part still keeps at a high one, and the system will start heating the lower part. This is normal.

■ Trouble Shooting

- When error code appears on the display or the unit is not operating, please contact your installer.
- When an error occur, the buzzer will buzz in every minute, the warning light flashes, the display will indicate the error code and water temperature alternatively. Press CANCEL button for 3 seconds to stop the alarm.

■ Restart after a period of disuse over one year
Please follow the draining and filling water instructions on page 10 to refill the water.

■ Heat-up Time



10. MAINTENANCE

10.1 General Maintenance

■ Check the connection between power supply plug, socket and ground wiring regularly;

■ In some cold areas (below 0℃), if the system is to be stopped for a long time, the tank should be drained of water to prevent damage to the unit.

■ 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.

• Air inlet filter, the method to dismantle the filter is:
unscrew the air inlet ring anti-clockwise, take out the filter and clean it completely, finally, refit to the unit. For unit with ducting, remove duct first then follow above instruction.

■ Before shutting the system down for a long perid, ensure that:

• Power supply has been shut 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 it is sealed effectively.

• Open cold water valve until hot water flows out, and turn off the hot water tap.

• Restart.

10.2 Non-error Malfunction

■ 3-minute Protection
If the power supplied is interupted, a restart after the shutting down will commence in 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 blocked or strong winds are blowing.

■ 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 and go into defrostmode, 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.

10.3 Malfunctions and Resolutions

Table. 10-1

Malfunction	Cause	Resolutions
Outlet water is cold.	• Outlet water is set on a low temperature • Outlet water temperature controller is damaged	• Set outlet water to a higher temperature • Contact the installer
No hot water from the outlet.	• Tap water has been cut off • Water pressure is too low • Inlet valve has been closed	• Will return to normal after supplied water • Contact installer • Open the inlet water valve
Water leakage	•The joints on the pipeline are not sealed well	• Check and reseal all the connections
The display is dark.	• Bad connection of power supply plug and socket • Circuit board indicator is damaged	• Reconnect the plug • Contact the installer

10.4 After-Sale Service

If the unit run into malfunction or error, it should be shut down and the power supply cut off. Please contact Parex Industries Ph 0800 200 510.

11. SPECIFICATIONS

Table. 11-1

Model		EcoSpring ES300		
Mode		Economy Mode	Hybrid Mode	E-heater Mode
Water-heating cap.		3000W	3000W	3000W
Rated input power/Current		1500W/6.5A	4300W/18.7A	3000W/13.0A
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		850W		
E-heater power		3000W		
Regrigerant		R134a(1200g)		
Water pipeline system	Outlet water temp.	Default 55℃，（38-60℃adjustable ）		
	Water side exchanger	Surface heat exchanger		
	Inlet pipe Dia.	DN20		
	Outlet pipe Dia.	DN20		
	Solar water outlet	DN20		
	Solar water inlet	DN20		
	Drain pipe Dia.	DN20		
	TPR valve Dia.	DN20		
	Max. pressure	700-1000kPa, minimum 150kPa		
Exchanger air side	Material	Hydrophilic aluminum fin, inner groove copper tube		
	Motor power	80W		
	Outlet air type	Vertical upflow air supply		
Dimension		Φ650×1920mm		
Water tank cap.		300L		
Net weight		123kg		
Fusible link type		T5A 250VAC		

The test conditions:
Test temperature 15/12℃(DB/WB),
Water temperature from 15℃ up to 45℃.