



Heat Pump System Manual



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HEAT PUMP WATER HEATER - OWNERS INSTRUCTIONS

Owners Information

This appliance is not intended for use by small children or infirm persons without supervision. Young children should be supervised to ensure that they do not play with the appliance.

Your Heat Pump water heater system consists of two major parts;

1. a E-SUN storage tank and,
2. a Heat Pump module.

These instructions are additional and complementary to the "Owners Manual" supplied with the E-SUN electric water heater storage tank.

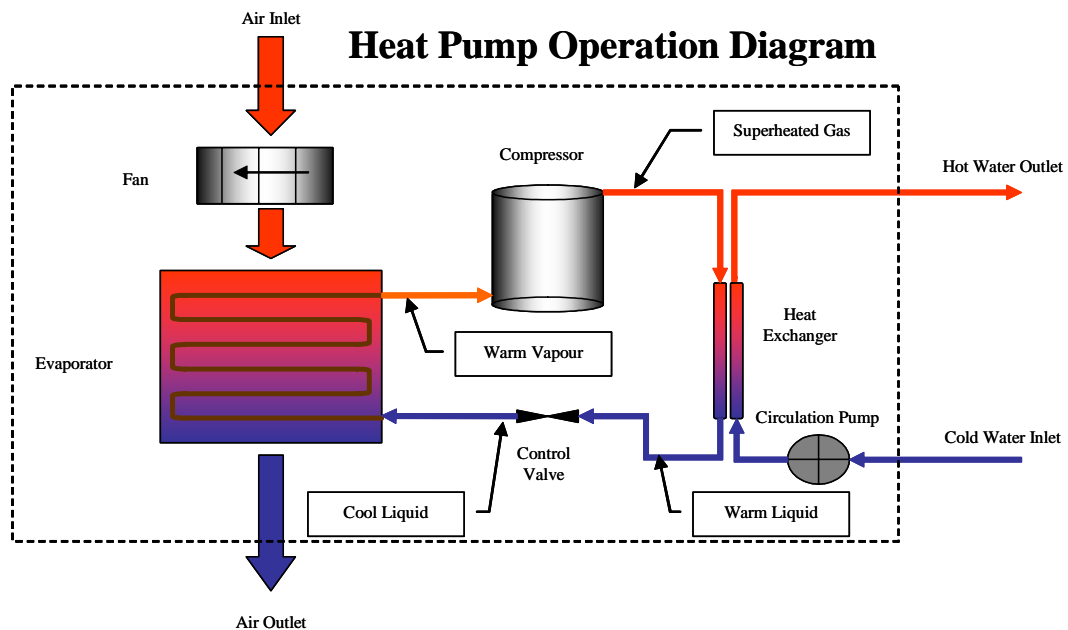
As the owner of a Heat Pump water heater system, there are some questions you may have about the system and how it operates. This manual will provide you with some basic system information.

The E-SUN storage tank is a standard E-SUN electric water heater in which the electric elements have been disabled. The Heat Pump module replaces the disabled electric elements for the generation of hot water within the E-SUN storage tank. Typically the Heat Pump module will produce hot water with an efficiency of around 3.8 to 1 (380%). This means that for every 1 unit of electrical energy you purchase from the supply utility your Heat Pump generates 3.8 units of energy into the water heater. An energy saving of more than 70% when compared to a standard electric water heater.

How Does the Heat Pump Module Work?

A Heat Pump uses simple thermodynamic principles to transfer energy, contained in air being pumped through the module, to heat water passing through the modules internal heat exchanger. The Heat Pump's operational principles are similar as those used in a normal domestic refrigerator except in reverse. In a refrigerator heat energy is drawn from inside the refrigerator (making things cold), concentrated by the compressor then dissipated to the atmosphere via the condenser coil located on the back of the refrigerator cabinet. In a Heat Pump, heat energy is drawn from the outside air (making the air cooler), concentrated by the compressor then transferred into the water passing through the modules internal heat exchanger.

In detail; outside air is drawn into the Heat Pump modules fan and pushed across an internal evaporator. The evaporator transfers energy contained in the air to cool liquid refrigerant causing the refrigerant to increase in temperature and expand into a warm vapour. The warm vapour is then drawn into the compressor where compression causes the temperature of the vapour to increase further, becoming a superheated gas. The superheated gas is then transferred to the Heat Exchanger where it releases its heat energy to the water being circulated through the water heater side of the Heat Exchanger. During the heat exchange process the superheated gas "condenses" back to a warm liquid form before passing through an expansion control valve. As the warm liquid refrigerant passes through the expansion valve the pressure is immediately lowered. The reduction of pressure causes a reduction in temperature of the refrigerant ready for circulation back to the evaporator where the process starts again.



How Do I Operate the System?

The operation of your Heat Pump Water Heater is fully automatic. You do not need to do anything other than turn on the electricity and water supplies.

The Heat Pump module is electrically connected to the storage tank and will start automatically when the water temperature in the storage tank falls below 55°C and continue to run until the water temperature of the complete tank has been increased to 60°C or slightly above.

How Long Will the Heat Pump Run Each Day?

The length of time the Heat Pump module will run each day will vary dependant upon the amount of hot water being used by the household and the average outdoor ambient temperature.

Generally the Heat Pump Module will run longer in winter than in summer because the outside air temperature is cooler in winter therefore contains less energy.

As a running time guide, a correctly designed system will operate between 6 to 12 hours depending on the installation location and the water usage.

How Much Electricity Does the Heat Pump Consume?

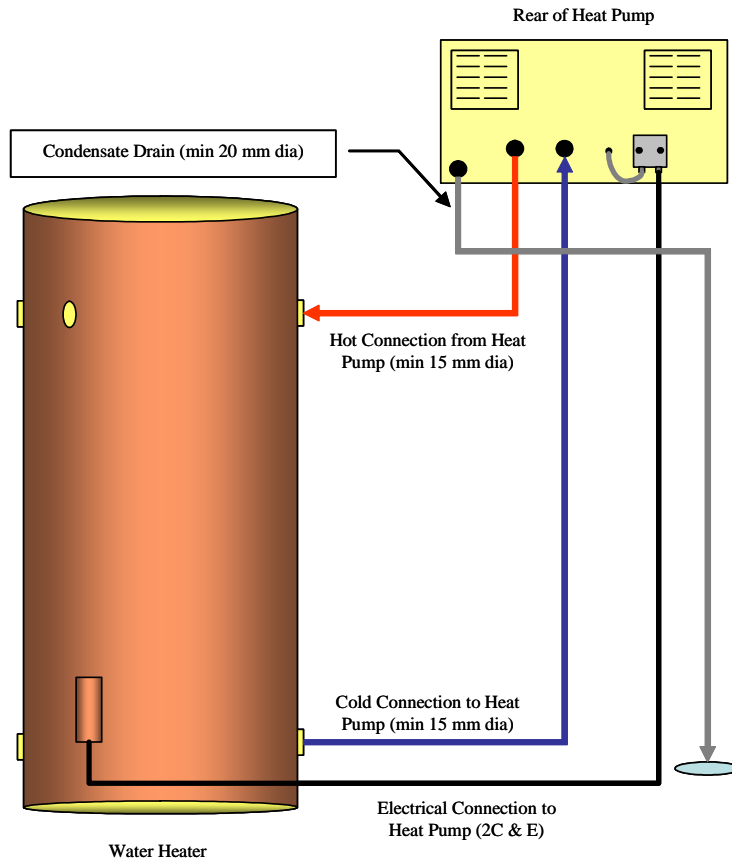
Heat Pump Water Heaters are very efficient in their operation.

The efficiency of the system averaged over a full year is in the order of 380% when compared to a standard electric element type storage water heater.

By comparison a standard electric storage water heater would have an efficiency of 100% of electrical energy consumed. A Heat Pump Water Heater is therefore 280% more efficient. In other terms uses less than 1/3 the energy of an electric resistance type water heater system.

How do the systems components connect together?

The following diagram shows how the typical Heat Pump module and the Storage tank are connected together.



Why is there condensate coming from the Heat Pump module?

Every system will have a condensate drain running from the Heat Pump module to a suitable discharge location. This discharge location is normally a garden bed or similar inconspicuous position.

Condensate production is normal with all devices which use refrigeration principles for their operation, air conditioners are a good example of condensate discharge.

Condensate occurs when relatively warm moist air passes through the cold evaporator. Moisture contained in the air condenses (deposits) onto the evaporator fins then runs down into the drainage system located under the evaporator. It is this water you see flowing from the condensate drain of the system.

The amount of condensate will vary with the humidity of the location so there is no fixed amount of condensate which should flow from the module. It can vary from 0 to 3 – 4 litres per day.

Why does the Heat Pump stop on cold mornings?

The Heat Pump module has an inbuilt automatic freeze control system for those locations where the early morning temperature in winter can be approaching zero. The freeze control system will prevent condensate on the evaporator coil from forming ice which blocks the air flow path.

If the evaporator approaches freezing the system will commence an automatic cycling program that ensures that the evaporator remains frost free. The Heat Pump module will continue the cycling program until the ambient temperature increases to above 4°C or the storage tank is fully heated.

Does the Heat Pump need sunlight to operate?

Unlike Solar Water heaters Heat Pump water heaters extract their energy from the surrounding air and not from sunlight. For this reason they can efficiently produce hot water any time day or night and even on cloudy or overcast days. It is not uncommon for your system to operate during the night.

As your Heat Pump water heater can generate hot water at any time it does not require any form or auxiliary boosting to maintain the water temperature.

A word of CAUTION

All water heaters have the ability to produce hot water in a surprisingly short time. To reduce the risk of scald injury, it is mandatory under the requirements of Australian Standards AS3500 that an Australian Standards approved temperature control valve be fitted to the hot water supply pipe work. This valve should be checked at regular intervals to ensure its operation and settings remain correct.

What should I do during holidays?

If you are going to be away a week or more, it is advisable to turn off the electricity supply to the system. While there is no damage likely if the electricity is left on you will consume energy through storage tank heat losses which can be avoided.

What should I check before making a service call?

If after checking the following points the problem has not been identified, please contact the distributor from whom you purchased the system.

It is important to know that there are no user serviceable components in the system, and as such, it is recommended that no covers be removed and no adjustments made to the system settings by anyone other than an authorised representative.

The system has a long running time

Is there excessive water discharge from the Valves?

If there is a discharge of more than 10 litres per day from any of the system's valves, it indicates there is a problem that requires a service call.

Are you using more hot water than you think?

Often the hot water usage of showers, washing machines and dishwashers is under estimated. Review these appliances to determine if your daily usage is greater than the storage volume of your water heater. If for example you have a 315 litre storage tank and you are using 450 litre of water it is possible that there will be certain times of the day where there maybe insufficient hot water. It is also advisable to inspect tap washers etc. for leakage and replace if necessary.

Condensate is dripping from inside the Heat Pump Module

Check that the discharge location of the condensate drain has not been blocked thereby restricting the condensate flow away from the Heat Pump.

The Heat Pump Module does not Run

Check that the power supply is turned on and that the house Circuit Breakers or Fuses are turned on and correct.

System Maintenance

The Heat Pump water heater is designed such that there is nothing to do regarding system maintenance other than that detailed in the E-SUN Storage Water Heater Owners Manual. The components in the Heat Pump module part of the system do not require maintenance. Personally inspecting or servicing any part of the system is not recommended. Should you decide to personally inspect the system, it is essential that you use all safety devices required to ensure your safety.

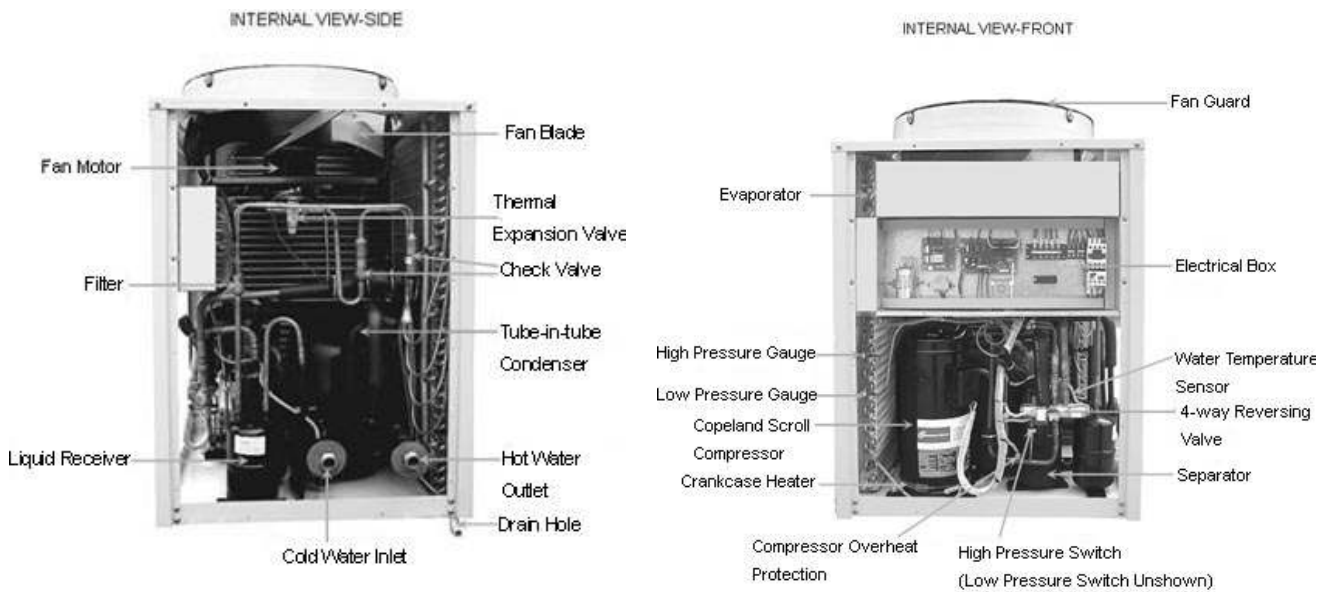
Most importantly the electricity supply must be turned OFF.

As detailed in the Electric Storage Water Heater Owners Manual, each 5 years you should contact the local service agent to replace all safety valves and anodes to ensure continued system life and operational safety. In locations where the potable water has a TDS greater than 600 ppm, this service is recommended each 3 years.

Useful Technical Data

Model	LSQ008CR	LSQ015CR	LSQ02CR	LSQ03CR	LSQ04CR	LSQ05CR
Outlet Water Rated Temp(?)	55					
Outlet Water Max. Temp(?)	60					
Heating Capacity(KW)	2.6	5	6.5	10.6	14	17.8
Rated Power Input(KW)	0.7	1.32	1.7	2.8	3.7	4.68
Power Supply	220V/1PH/50HZ(60HZ)			380V3PH/50HZ(60HZ)		
Compressor Qty	1	1	1	1	1	1
Water Output(L/h)	55	110	150	245	320	420
Pipe size (inch)	3/4"			1"		
Dimensions(mm) L*W*H	760*320*555	1100*350*560		950*400*1050		1000*450*1250
Ambient Air Range	-5? -40?					
Air Discharge	Side					
Weight(kg)	35	50	65	100	130	180

Typical Heat Pump Information



Features:

1. Powder coated steel plate
2. LCD display control panel
3. Automatic unit on/off timer clock
4. Insufficient water flow protection
5. High/Low pressure protection
6. Automatic reversing defrosting function enables units to work reliably in chilling climates

