Electric Storage Water Heater

Owner's Guide & Installer Manual

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Note: This is a confidential document for SolarArk representative use only. This document is to be taken as a basic introduction into solar heating.

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Introduction

Your storage electric/gas storage water heater consists of a vitreous enamel lined steel cylinder, an internally adjustable thermostat, a pre-painted zinc-coated steel shell or exterior, an immersion type element and a sacrificial anode.

Water is stored within the steel inner tank and is heated to the thermostat cut-out temperature by the element for electric powered tank. The PTR valve ensures water pressure and temperature does not exceed safe limits in the heating cycle. As the water is drawn off in normal every-day use, the thermostat will monitor the tank temperature and activate the element to ensure hot water is available. The thermostat is factory set at 60°C and is adjustable from 60°C to 75°C by an authorised person. Please note that the maximum tank temperature is 75°C.

The tank is a Mains pressure solar ready electric storage tank; it is connected to the water supply. If the maximum cold water pressure exceeds 600kPa, a pressure limiting valve must be fitted.

SolarArk electric heated water tank is suitable for connection to either Continuous or Off-Peak Tariffs depending on water usage and household requirements. Where the household requirements for hot water exceed the water heater capacity, Continuous Tariff is generally applicable. Where hot water demand is less than water heater capacity, Off-Peak Tariffs may be applicable. Note that Off-Peak tariff “on” times and costs vary from location to location, however are generally less expensive than Continuous Tariff rates.

The sacrificial anode in your water heater (located in a screw in fitting on the top of the water heater) will slowly dissipate while it protects the cylinder. It is recommended to inspect the anode annually and replace it every three years or more frequently in poor water quality areas.

Water heater life expectancy is dependent on a number of factors including water heater usage patterns, water quality and water pressure. Your electric water heater is, however, protected with a comprehensive warranty. Please see Water Heater Warranty for more information.

Please read the whole manual before proceeding with the installation. There are WARNING, NOTE and IMPORTANT information throughout the manual for each relevant section. Please take note of them. Failure to do so may put the user and installer in harms way and potentially void the warranty.

REGULATORY INFORMATION

Installation and service must be performed by an authorised person. This water heater must be installed in accordance with:

1. **Manufacturers Installation Instructions**
2. **AS/NZS 3500.4 "National Plumbing & Drainage Code"**
3. **AS/NZS 3000 "Wiring Rules"**
4. **Municipal Building Codes**
5. **Any other State or Federal Statutory Regulations**

IMPORTANT: Only a licensed person will give you a Compliance Certificate, showing that the work complies with all relevant Standards. Make sure you use a licensed person to install this water heater and ask for your Compliance Certificate.

LIST OF WARNINGS

1. This appliance is **NOT** suitable for use as a pool heater.
2. Do not operate this water heater until all operating instructions have been read and understood by the homeowner.
3. These water heaters are **NOT** recommended for connection to Bore Water Supplies and warranty may be void in such installations.
4. A properly drained safe tray must be used where property damage could occur from water spillage (see AS3500.4.2). Ensure this safe tray does not become blocked.
5. Do not activate this water heater unless the cylinder is filled with water
6. Do not block or seal the PTR safety valve or drain pipe.
7. The water heater warranty can become void if relief valves or other safety devices are tampered with or if the installation is not in accordance with these instructions.
8. Do not place any articles, chemicals or flammable materials on or near the water heater.
9. Removal of access covers will expose 240V wiring. Do not remove the terminal box cover or gain access to this water heater unless the power supply has been effectively disconnected by an authorised person only.
10. Do not operate this water heater with terminal box cover removed or loose.
11. This water heater is not intended to be moved, operated or adjusted by inexperience or infirm persons.
12. This water heater is intended to be installed as a fixed appliance and must be installed on a hard, level surface. If installation is to be in a wet area or a concrete floor, ensure the water heater is mounted on a suitable and substantial raised base (preferably concrete)

SAFETY

Water Temperature

1. To meet legionnaire regulatory requirements (AS 3498) the temperature of stored water heater **must not be less than 60°C**.
2. All new hot water installations shall, at the outlet of all sanitary fixtures, used primarily for personal hygiene purposes, deliver hot water not exceeding 50 C.
3. The thermostat on your water heater is factory pre-set to 60°C which is suitable for the vast majority of domestic applications.
4. The thermostat setting can be adjusted between 60°C and 75°C. **75°C is the maximum temperature** of the tank.
5. Adjustment must be by an electrician or other suitably qualified trade person.

WARNING: Hot water can cause scalds. Children, disabled and the elderly are at greatest risk. Scalds from hot water can result in severe injuries to young children. Feel the water temperature before bathing or showering. **Please find out from your local health authority for the correct temperature setting.**

Additional temperature control or limiting devices such as tempering valves (not provided) may be required to be fitted to this water heater to meet regulatory requirements regarding limiting of water temperature in your area. Tempering valves can be obtained from your plumber or SolarArk at your own cost.

Hydrogen Gas

If the hot water heater is not used for two weeks or more, a quantity of hydrogen gas, which is highly flammable, may accumulate in the water heater. In order to dissipate the hydrogen gas, it is recommended that a non-electrically operated hot tap be turned on for several minutes at a sink, or bath, but not at dishwasher other appliance. During this procedure there must be no smoking, open flame or any electrical appliance operating nearby. If hydrogen gas is discharged through the tap, it will probably make sounds like air escaping.

Safety Devices

This water heater is fitted with a combination pressure and temperature relief (PTR) valve (approved to AS 1357), a thermostat and an auto-self-resetting over-temperature cut out for each model. It is imperative that safety devices are not tampered with and this can void warranty. Do not operate this water heater unless all safety devices are fitted and functioning normally.

WARNING: Failure to operate the pressure and temperature relief valve (PTRV) lever at least once every six months may result in the water heater failing. It is important that the lever on the valve be raised and lowered

very gently. Failure to do so may result in the PTRV and/or water heater cylinder failing, or under certain circumstances, exploding.

IMPORTANT: Relief valves should be checked to be in sound working order in intervals not exceeding 1 year or more regularly in areas subject to water deposits. Checking should include operation of the relief valve to remove any lime deposits.

NOTE: It is normal that small quantities of water (up to around 15 litres of water in a 24 hour period) are released by the valve in the heating cycle; continuous leakage of water from the valve may indicate a problem with the water heater. If the valve does not discharge water when the easing gear is operated, or does not seal again, a service call should be made without delay. The PTR valve is not serviceable.

WATER QUALITY

Water Quality: This water heater has been designed and constructed to be suitable for connection to most water condition supplies in Australia. However, there are known water chemistries which can have detrimental effects on the tank and its life expectancy. The term to determine chemical in the water content is called Total Dissolved Solids (TDS). TDS can be determined from the study of water conductivity, measured in microsiemens per centimetre (µS/cm), which is direct proportional to the TDS content of the water. TDS (mg/L) is approximately 70% of the conductivity (µS/cm). High TDS in water content can build sediment in the tank, which will damage the tank itself and the components connected to it.

SolarArk warranty will not cover any damage to any tank that uses water supply where the TDS content of the water exceeds 600 mg/L at any time. If you are unsure about the water quality in your area, please contact your local water supply authority for more information.

IMPORTANT: Warranty will be void where water stored in the storage tank exceeds at any time the following levels:

Criterial	**Quantity**
Total hardness	200 mg/Litre
Total dissolved solids	600 mg/Litre
Chloride	300 mg/Litre
Magnesium	10 mg/Litre
Calcium	20 mg/Litre
Sodium	150 mg/Litre
PH	9.5 and not less than 6.5
Iron	1 mg/Litre

Corrosive Water – Water deemed to be corrosive can attack copper parts causing them to fail. When the water supply Saturation Index (check with your local water supplier for additional information) is less than -1.0, water is deemed corrosive and a corrosion resistant heating unit should be used. The effect of scaling water is the build up of calcium carbonate

onto hot metallic surfaces. When the Saturation Index is greater than +0.40, an expansion control valve must be fitted on the cold water line after the non-return valve. Should the Saturation Index exceed +0.80, a low-watts density heating unit should be fitted to your water heater by SolarArk authorised service agent.

Scaling Water – Water that contains levels of calcium carbonate (hardness in excess of 200 mg/L) at any time is considered as scaling water. Scaling water can block and prevent PTR valve from operating, resulting in tank damage and its component. In some areas in Australia including areas with scaling waters, Expansion Control Valves (ECV) is fitted to the cold water inlet line. This valve may discharge a small amount of water in the heating cycle rather that the PTR valve located on the water heater. In South and Western Australia, ECV must be fitted in all scalding water area.

IMPORTANT: Where fitted, gently operate the easing lever on the ECV every six months and replace at intervals not exceeding 5 years or more frequently where there is an incidence of water deposits.

NOTE: Build up of white sediment on water taps or shower roses can be indicative of scaling water.

NOTE: If you intend being away from your house for only a few days, we strongly recommend you leave the water heater switched on to prevent any legionnaire issues.

Warning: Damage causes by water quality affects your warranty. Please refer to warranty page on any inclusion and exclusion to tank damage.

ANODE

Every SolarArk's water heating tanks come with sacrificial anode. The function of sacrificial anode is to protect the inner tank wall from corrosive content in supply water. Instead of corroding the wall, corrosive water will then corrode the sacrificial anode. Hence the anode acts as a protection to the tank to prolong the service life of the tank. All SolarArk's tanks come with black coloured anode. However, for different water quality in your area, please use the table below to determine which anode is best used for your tank.

Anode Colour Code	Anode Type	Water Quality in TDS
Green	Extruded Magnesium (High Potential)	0 - 150 mg/L
Black	Extruded Magnesium (Low Potential)	150 - 600 mg/L
Blue	Extruded Aluminium	600 - 2500 mg/L

Black Anode – Black Anode in SolarArk water heater tanks are designed to suit the water conditions of most metropolitan supplies, where the Total Dissolved Solids (TDS) content of the supply is less than 600 mg/Litre. For use in regions where the water supply TDS exceeds 600 mg/Litre, the black anode may become excessively reactive.

Blue Anode – Should your water supply have a TDS of greater than 600mg/L, the installed anode must be the "blue" one (aluminium) or hydrogen gas can accumulate at the top of the water heater in long periods of no use.

WARNING: Hydrogen gas is flammable! When this is likely to occur, the installer should instruct the householder on how to dissipate the gas safely. This process is explained on the previous page under "Safety". The change of anode must be done by a plumber or authorised service person.

The sacrificial anode in your tank will slowly dissipate as you use the tank. Therefore the anode needs to be check every five years. The anode can be changed to prolong the service life of the tank. It is recommended to change it every 5 years.

WARNING: SolarArk will not replace any tank due to using the wrong anode for the wrong water quality. If you are unsure the water quality in your area, please contact your local water supply authority for more information. Please refer to the table above to determine the right anode for your tank as well.

INSTALLATION INSTRUCTIONS

This storage electric/gas storage water heater tank can be located outdoors or indoors and should be installed in a location as follows:

- As close as practical to the kitchen or area of highest hot water use;
- Foundations must be stable, level and well ventilated and the combined weight of the complete installation including water heater, water and fittings must not affect the integrity of any structure.
- The water heater must be accessible without the use of a ladder or scaffold;
- In a position with safety and ease of service in mind;
- If installed indoors in cupboards or enclosures, ensure a 50mm clearance from the outer case of the water heater to the internal dimensions of the enclosure;
- With access to thermostat and element at the front of the water heater;
- Easy access for replacement of PTR Valve if necessary;
- Adequate provision must be made available for removal of water that escapes from valves to avoid damage to property;
- Electrical Junction Box must be accessible for a Service Agent;
- Information on the technical label must be able to be read;
- If possible, allow for the height of the water heater above the installed water heater for anode removal and replacement; and
- The location must comply with the provisions of AS 3500.4 and AS 3000 and all local codes and requirements. In New Zealand, the installation must also comply with the New Zealand Building Code.

PLUMBING CONNECTIONS

Flush out pipes before connecting this water heater to ensure no foreign matter can block the valve seat and use line strainers where required by local authorities.

Connections to this water heater must not be welded, brazed or soldered connections. Connect only with compression fittings (Internal pipes for inlet, outlet and valve are PPR. These pipes must not be removed).

Water Connection – Cold and Hot Water connections are RP ¾”/20 and market “Inlet” and “Outlet” respectively. All other fittings must be in accordance of the provisions of AS/NZS3500 and local regulatory requirements. It is recommended that a heat trap be installed in the hot water line and that the hot water lines after the heat trap are insulated. Note that where water pipes are to be attached to the tank exterior, screws of maximum length 25mm should be used and any damage to the tank will not be covered by warranty.

PTR Valve Connection – The valve thread is RP ¾”/20 and a reducing bush is supplied to be fitted to the water heater where “VALVE” is indicated. Screw the reducing bush into place

before screwing in the valve. Ensure that the valve probe is straight and undamaged. Carefully apply Teflon tape to the valve and reducer bush ensuring that the tape does not extend past the end of the thread. The 15mm OD (AS3500.4.2) drain pipe must be fitted to the relief valve to carry discharge safely away from the water heater. This pipe must fall continuously, shall be left open to the atmosphere and shall be in a frost free environment.

Fittings – The installer is required to determine whether a pressure limiting valve is required (600kPa is recommended for high pressure areas) and whether a cold water expansion valve (ECV) is required. An ECV is required where "Scaling" water exists having a total hardness in excess of 200mg/Litre (expressed as calcium carbonate) or where the saturation index is in excess of +0.4 as detailed under water quality.

FOR ELECTRICAL CONNECTIONS

The connection to this storage water heater must be from a single phase 240V supply and comply with AS/NZS 3000 Wiring Rules and New Zealand Building Code for installations in New Zealand.

All electrical connection must be made by an authorised person. If there is any doubt regarding the electrical connections or electrical safety, please contact a Registered Electrical Contractor or the local office of the Electricity Supply Authority.

Connection is made at the water heater at the terminal strip located under the terminal box cover. This cover can be removed simply be removing the two screws on the outer casing and lifting off the lid.

IMPORTANT: Ensure the power supply to the water heater is switched and locked off and the fuse removed at the main electrical switchboard before the electrical cover is removed.

The electrical enclosure is tested and approved to IP34.

Electrical Connection – The following must be observed during installation.

- Check all connections as wires may work loose in transit includes element screws.
- Check that thermostat setting is 60°C which is factory setting and adjust if required.
- Ensure that the circuit incorporates a switch or circuit breaker that has an air gap in the active conductor.
- Do not break or remove sections of metallic water tubing used as an earth electrode for an electrical installation before suitable precautions have been taken to ensure it is safe to do so.
- Internal wiring in this water heater is rated at a minimum 20 amps and thermostat contacts are rated at 30 amps.
- The household wiring to the water heater must be rated to withstand the element load.

SERVICE AND REPAIR

Routine Service

Routine service will assist in prolonging the life of your water heater and help ensure trouble free operation.

The Pressure and Temperature valve should be operated every six (6) months by gently raising the lever for a period of around 10 seconds to ensure water flow from the drain pipe. The valve lever can then be gently lowered. Should water not flow, immediately contact a service technician or SolarArk representatives.

The anode should be replaced every three years.

Touch-up paint should be used to cover any scratches that may be visible on the outer skin of the storage tank to prevent rusting.

A regular 3-year service plan by an authorised person would include:

1. Draining the water heater:
    a. Turn off and lock off the power supply to the water heater and remove the fuse at the main switchboard
    b. Turn off the cold water supply to the inlet
    c. Gently raise the lever on the Pressure & Temperature valve to relieve the pressure in the water heater until flow stops
    d. Undo the cold water union and attach a hose to the water heater connection
    e. Operate the lever on the PTR valve again allowing air into the water heater. The water heater will drain through the hose.

2. Filling the water heater
    a. Open all hot taps in the house
    b. Open the cold water line to the heater
    c. Close each tap as water flows freely from it
    d. Check all piping for leaks

3. Flushing the water heater: Complete the Draining operation (1. above) then disconnect the hot water outlet connection and attach a water supply hose to the water heater. Turn on the water supply to the outlet connection and allow flow until the flow from the inlet becomes clear.

4. Element Replacement
    a. Turn off and lock off the power supply to the water heater and remove the fuse at the main switchboard
    b. Drain the water heater as described above

c. Disconnect the element electrical connections from the thermostat
d. Remove the four element fixing bolts and remove the element
e. Insert the replacement element and new rubber seal and replace the four fixing bolts making sure that the element sickle is pointing down and that the four bolts are tensioned evenly and firmly
f. Reconnect the element ensuring connections to the thermostat and element are tight
g. To complete the replacement, reverse the steps for draining the water heater listed above. Ensure that the water heater is full of water before reconnecting the electrical supply.

5. Anode Replacement
    a. Turn off and lock off the power supply to the water heater and remove the fuse at the main switchboard
    b. Turn off the cold water supply to the inlet
    c. Gently raise the lever on the Pressure & Temperature valve to relieve the pressure in the water heater until flow stops
    d. Remove the anode cap located on the top of the water heater and unscrew the anode using a 27mm socket
    e. Remove and replace the anode
    f. Reverse the draining procedure and ensure the water heater is full of water before reconnecting the power supply.

Save a Service Call

In many instances, calling on our service network may be avoided. Check out the following to see whether your hot water service may be returned to service and service agent call out fees averted.

- Lack of hot water – Ensure that the power to the water heater is turned on and the meter box. Generally, there is an isolating switch marked “Hot Water” or “Water Heater”. There may also be another isolating switch near the water heater. Also check the fuse or circuit breaker at the meter box. Note that repeated failure of the fuse or circuit breaker indicates a fault and an authorised service agent should be contacted to investigate the fault.
- High hot water usage – Generally related to increased showering times. Investigate water saving devices such as flow reduction valves or water saving shower roses.
- High electricity bills – Generally linked to the points above. However, leaking valves and pipework may also be responsible and require attention by a plumber. Finally, increases in usage of high tariffs electricity may also be responsible. Check with your energy supplier.

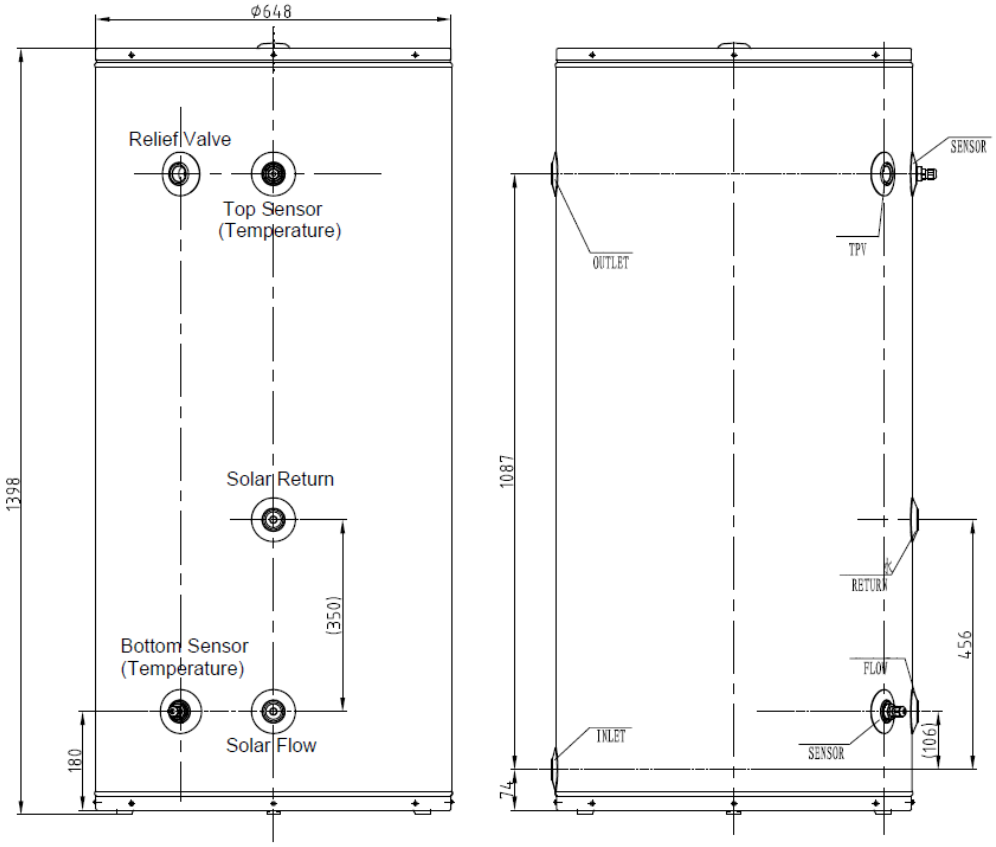
- Continuous discharge from valves - Discharges of more than around 15 litres of water in a 24 hour period indicates that the valve may not be functioning correctly. This may be remedied by gently easing the valve lever for a few seconds as described under Routine Service to dislodge any foreign matter. Continual flow may also indicate high water pressure which will require a pressure limiting valve to be fitted by an authorised person.

Service Contact Detail

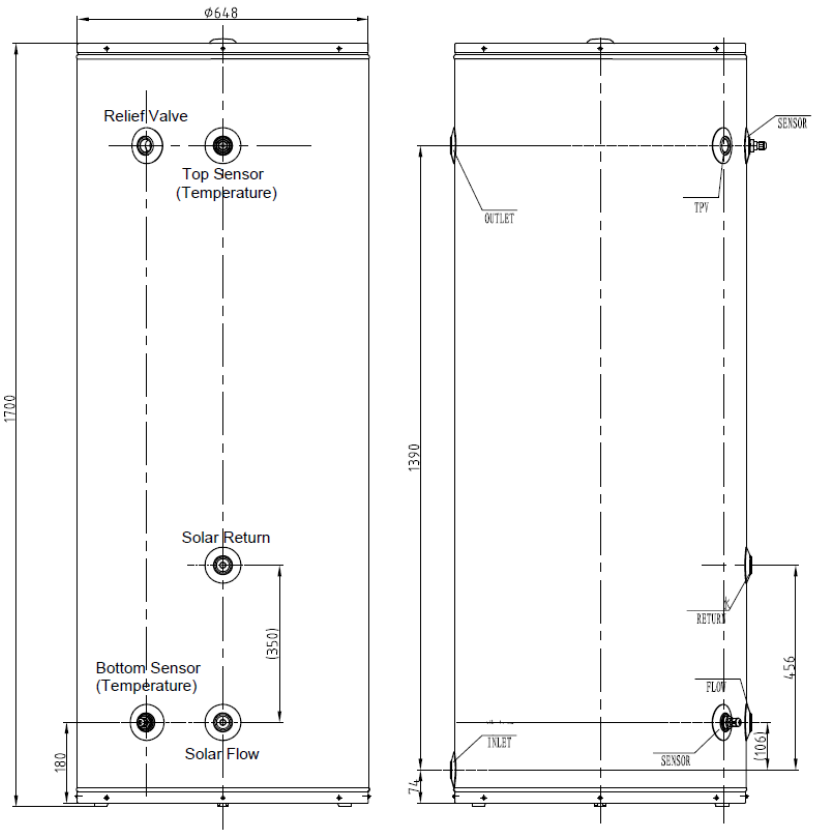
Please contact SolarArk at 1 300 670 966 or info@SolarArk.com.au. To ensure prompt service, please ensure that you have copied the Serial Number and Date of Manufacture from the water heater Technical Label and pass this information to our service department.

DIMENSIONS AND SPECIFICATIONS

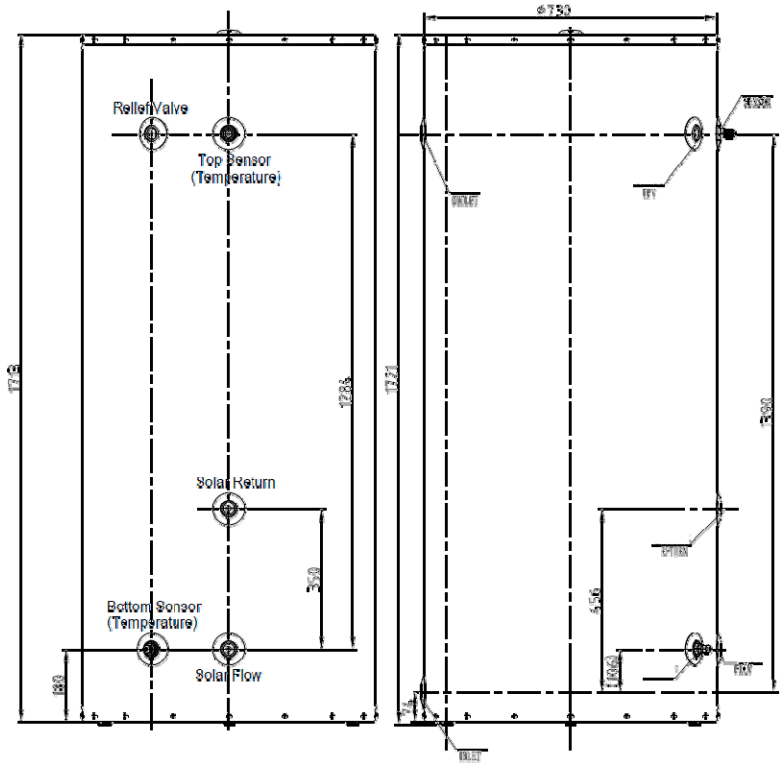
PTR Valve Setting (AVG component)	850 kPa
Expansion Control Valve (ECV) (AVG component)	700 kPa
Max. Water Supply Pressure	750 kPa
Water Connections	RP ¾" 20
Thermostat	Factory Set 60°C (Range 60°C to 75°C)
Outer Case Material	Painted Zinc Coated Steel
Inner Tank Material	Enamel lined Steel Cylinder
Insulation	CFC Free Polyurethane
Indoor / Outdoor Rating	IP34
Warranty❶	All Parts & Labour – 1 Year. Tank Replacement (Excluding Labour after first year) 5 Years (Refer warranty Provisions and Exclusions)



250 L Tank Dimension



315 L Tank Dimension



400 L Tank Dimension

Notes:

1. Please refer to Product Warranty for full explanation regarding items covered and exclusions.
2. Specifications subject to change without notice.
3. Tempering Valve and ECV are not supplied with hot water tank.

PRODUCT WARRANTY

All benefits associated with this warranty are in addition to all other rights regarding this product contained within the Trade Practices Act and other State and Territory laws.

The warranty for this product specifically relates to remedies as a result of defects due to faulty materials and/or workmanship

Parts and labour repair or replacement warranty for this water heater is offered in accordance with the following table and Warranty Conditions:

Tank Only (Steel Cylinder)	Parts	5 Years
	Labour	1 Year
All other parts (inc Valves, Thermostats)	Parts	1 Years
	Labour	1 Years

Warranty Conditions

1. Water heater must be installed in a single family domestic dwelling.
2. All terms of this warranty are effective from the date of manufacture of the water heater except where the date of installation can be clearly verified with a Certificate of Compliance where the installation date is within 6 months of date of manufacture.
3. Water heaters must be installed in accordance with manufacturer's installation instructions (including installation of a safe tray), AS3500.4, AS3000, AS5601 in addition to all local regulations and municipal building codes.
4. Where a failed water heater or component is replaced under warranty, the balance of the original warranty period will remain effective. The replaced water heater or component does not carry a full warranty.
5. Where a water heater is installed outside of the boundaries of a metropolitan area or further than 25km from a registered SOLARARK service agent, the cost of transport, insurance and travelling costs to the installed site shall be the owner's responsibility.
6. Where the water heater is installed in a position that does not allow easy safe access, the cost of accessing the water heater safely, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility.
7. This water heater warranty applies only to the installed water heater and does not apply to installation work undertaken by the installer or any parts including valves, fuses, switches etc that were supplied by the installer.
8. The water heater must be correctly sized to meet the requirements of the household in accordance with the guidelines in the water heater instruction manuals and printed materials.
9. The anode must be replaced at an interval no greater than three years.

Warranty Exclusions

1. THE FOLLOWING WARRANTY EXCLUSIONS MAY VOID THE WATER HEATER WARRANTY AND/OR MAY INCUR ADDITIONAL SERVICE CHARGES AND/OR COSTS OF PARTS.

a) Water quality exceed the following at any time:

Criteria	**Quantity**
Total hardness	200 mg/Litre
Total dissolved solids (TDS)	600 mg/Litre
Chloride	300 mg/Litre
Magnesium	10 mg/Litre
Calcium	20 mg/Litre
Sodium	150 mg/Litre
PH	9.5 and not less than 6.5
Iron	1 mg/Litre

b) Not follow the table below to fit anode in the tank.

Anode Colour Code	Anode Type	Water Quality in TDS
Green	Extruded Magnesium (High Potential)	0 - 150 mg/L
Black	Extruded Magnesium (Low Potential)	150 - 600 mg/L
Blue	Extruded Aluminium	600 - 2500 mg/L

c) Damage due to anode not replaced when it is needed (recommended 3 years).

d) Where the water heater or the water heaters component(s) has failed directly or indirectly as a result of: excessive water pressure, or negative pressure (partial vacuum), excessive temperature and/or thermal input; blocked overflow/vent drain; corrosive atmosphere; ice formation in the pipe work.
   a. Pressures in the tank exceed 500kPa.
   b. Temperature in the tank exceeds 75 degree Celsius.

e) Any damage by not heeding the 'WARNING', 'NOTE' and 'IMPORTANT' listed throughout the manual.

f) Accidental damage to the water heater or any component including: Acts of God, failure due to misuse, incorrect installation, attempts to repair the water heater other than by a SolarArk approved service agent and replace parts which are not authorised by SolarArk approved components.

g) Where it is found that there is nothing wrong with the water heater or the electricity supply is turned off or disconnected

h) Where the complaint is related to excessive discharge of the pressure and temperature liming valve due to high water pressure

i) Where excessive electricity or water usage which occurs as a consequence of failure of the water heater or components or workmanship

j) Where the water heater has failed directly or indirectly as a result of the attachment of accessories other than those approved by the manufacturer, excessive water pressure, excessive temperature or blocked pipework including overflow/vent drain

k) Where faulty plumbing has affected the performance of the water heater and/or the installation including plumbing pipes and fittings or restricted flow

l) Where the water heater is located in a position such that it requires major dismantling of cupboards, walls or doors or use of special equipment to bring the water heater to a serviceable position or return to the manufacturer

m) Repair and/or replacement of the water heater due to scale formation and the effects of corrosive water when the water heater has been connected to a scaling or corrosive water supply or a water supply with a high chloride or low pH level in the Installation Manual under Important Information.

2. SUBJECT TO ANY STATUTORY PROVISIONS TO THE CONTRARY, THIS WARRANTY EXCLUDES ANY AND ALL CLAIMS FOR DAMAGE TO FURNITURE, CARPETS, WALLS, FOUNDATIONSOR ANY OTHER CONSEQUENTIAL LOSS, EITHER DIRECTLY OR INDIRECTLY DUE TO LEAKAGE FROM THE WATER HEATER, OR DUE TO LEAKAGE FROM FITTINGS AND/OR PIPEWORK OF METAL, PLASTIC OR OTHER MATERIALS CAUSED BY WATER TEMPERATURE, WORKMANSHIP OR OTHER MODES OF FAILURE.