



Apricus Solar Hot Water Installation Manual

For Electric Hot Water Tanks (Solar-Ready)

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CHAPTER 1: INTRODUCTION

1.1 TERMINOLOGY

- **Boost:** The process where a heating component (such as an electric element) is used to provide auxiliary heating/
- **Collector:** The Apricus solar collector includes the manifold with heat pipes and evacuated tubes inserted.
- **Expansion Control Valve (ECV):** Installed on the cold mains line to relieve excess pressure.
- **Evacuated Tube:** functions to harness the solar energy by capturing and retaining the heat due to the presence of the vacuum.
- **Flow Line:** The plumbing line running from tank solar flow port to the inlet of the collector. This line incorporates the circulation pump.
- **Manifold:** Refers to the solar collector enclosure that contains the header pipes.
- **Pressure Temperature Relief Valve (PTRV):** installed on the hot water storage tank to relieve pressure, and excessive temperatures.
- **Return Line:** The plumbing line running from the solar collector to the solar return port on the tank.

1.2 SCOPE

This manual has been designed to provide installation instructions for the installer or plumber.

CHAPTER 2: WARNINGS AND PRECAUTIONS

2.1 INSTALLER REQUIREMENTS

Installation of a system must be completed by a licensed plumber and in accordance with the requirements listed below, as well as any relevant local standards and regulations.

- AS/NZS 3500.4 - National Plumbing and Drainage Code
- AS/NZS 4234.2008 - Heated Water Systems - Calculation of Energy Consumption

2.2 OCCUPATIONAL HEALTH AND SAFETY

The installer must adhere to occupational health and safety guidelines and other relevant industry associations. Under no circumstances should any installer attempt to install an Apricus Electric Hot Water (EHW) Tank without reading and understanding this installation manual. For any queries Apricus staff may be contacted on 1300 277 428.

2.3 OVER PRESSURE AND TEMPERATURE PROTECTION

2.3.1 PTRV

Any system design must allow a means of pressure release at no more than 850kPa, using a PTRV. The PTRV must have a downward direction copper pipe connected that is open to the atmosphere, running the expelled hot water or air to a safe, frost free and appropriate drainage location. From time to time the PTRV may discharge small amounts of water under normal operations, this can be up to 10% of tank capacity. If the tank is installed indoors, a safe-tray must be installed beneath the EHW tank to safely collect any water expelled from the PTRV.

2.3.2 MAINS PRESSURE CONTROL

Where the mains supply pressure can exceed or fluctuate beyond the pressure of 500kPa, a pressure-limiting valve

must be fitted to the cold mains line. The device is installed after the duo valve (isolation valve and check valve) and should have a pressure limit of 500kPa.

In some states it is a mandatory requirement that an expansion control valve be fitted on the cold mains line to provide a form of pressure relief. A separate drain line must be run for this relief valve (as per AS/NZS 3500). If unsure please check with the local authority.

Apricus recommends the use of an ECV on every installation.

2.4 WATER QUALITY

2.4.1 WATER QUALITY THRESHOLDS

Water quality is an important aspect of system lifetime. For the system to be warranted, the water used in the system must meet the requirements outlined in Table 1.

Table 1 Water Quality Threshold Values

Total Dissolved Solids	< 600 mg/L or ppm
Total Hardness	< 200 mg/L or ppm
Electrical Conductivity	< 850 μ S/cm
Chloride	< 250 mg/L or ppm
pH Level	Min 6.5 to Max. 8.5
Magnesium	< 10 mg/L or ppm
Sodium	< 150 mg/L or ppm

If in doubt contact your local water authority or have a water test completed. In areas of poor water quality all major components will have a reduced life due to the hardness of the water. In areas with "hard water" (>200 mg/L or ppm), it is advised to install a water softening device to ensure the long term efficient operation of the system is met. It is also advisable that a glass-lined tank is used as opposed to a stainless steel tank, since the glass-lined tank has a sacrificial anode to protect from corrosion. Apricus recommend the anode be inspected at least every three (3) years, and serviced as required.

2.4.2 LEGIONELLA CONTROL

Legionella bacteria can be found naturally in the environment and thrives in warm water and damp places. It can weaken the body's immune system, which can increase the chances of developing Legionnaires' disease. To ensure legionella growth is inhibited, the boosting regime must meet the guidelines as shown in Chapter 8: Auxiliary Heating. This is in accordance with 'AS3498.2009 Authorisation requirements for plumbing products - water heater and hot-water storage tanks' It is therefore, very important that the auxiliary boosting system remains on. It will only activate if the temperature falls below the temperatures outlined.

2.5 EHW TANK

2.5.1 HYDROGEN BUILD UP

Glass lined (vitreous enamel) tanks are fitted with a Magnesium anode to provide corrosion protection for the tank from the storage water. Small quantities of hydrogen gas can be released by the anode, which generally remains dissolved in the water and flushed away as hot water is used from the tank. Depending on the water quality there may be a degree of hydrogen build-up in the tank if the water heater hasn't been used for two or more weeks.

To resolve the build-up of hydrogen within the tank "purge" the tank for approximately 30 seconds from the lever on the PTRV.

WARNING
Ensure there are no open flames or ignition sources close to the tank

CHAPTER 3: SITE INSPECTION

3.1 STORAGE TANK LOCATION

- The storage tanks are able to be installed indoors or outdoors.
- The storage tanks are to be installed at ground or floor level and must stand vertically upright as the manufacturer has intended.
- The storage tank should be located as close as possible to the most frequent draw off points in the building such as the bathroom or kitchen. If the storage tank is located a long way from hot water draw points, a hot water circulation loop on a timer may be considered to reduce the time-lag for water to heat up and resultant water wastage.
- The tank should not obstruct any windows, doors or exits and should cause minimal intrusion to the existing site. Clearances must be allowed for to make servicing and maintenance convenient without the need for ladder or scaffold. For servicing, the PTRV must also be easily accessible.
- For glass-lined tanks, consider the positioning of the tank to allow room for anode removal and replacement maintenance.
- The storage tank must be installed in a properly drained safe tray where leakage may otherwise cause damage. The installation of the storage tank and safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements with regards to its construction, installation and draining. Tanks installed outside must be installed on a suitable concrete slab.
- The tank label must be clearly visible.

- All tanks must be transported upright. Stacking is not recommended for any tanks.
- Products should always be handled with care. Damage incurred during the transportation is not covered under product warranty.

3.2.2 UNPACKING OF COMPONENTS

- When unpacking, take care to ensure that the components are not damaged in the process.
- Avoid using sharp blades or knives as this can scratch the surfaces of the products particularly the tanks.

3.2 TRANSPORTATION AND UNPACKING

3.2.1 TRANSPORTATION OF COMPONENTS

- When transporting boxes, note the orientation of the "THIS WAY UP" arrows.
- Ensure all boxes are strapped and secured to prevent movement during transit.

CHAPTER 4: COMPONENT INSPECTION

4.1 COMPONENTS PROVIDED BY APRICUS

Upon receiving the system prior to installation, check that the following components have been provided. Any concerns must be brought to the attention of Apricus immediately.

4.1.1 STORAGE TANK AND PTRV

- Ensure the tank is accompanied by an appropriate PTRV.
- Ensure the tank has an electric element
- Ensure the tank has two brass plugs

4.2 NECESSARY COMPONENTS

Ensure that the following components have been sourced for the installation. These are not provided as a standard with the system however can be purchased as an additional add-on from Apricus as a “Quickie Kit”.

- Duo valve
- Cold water expansion control valve (mandatory in certain states)
- Pressure reducing valve
- Four way cross

4.3 OTHER COMPONENTS

Other components that may be required for installation that must be sourced from others include:

- Tempering valve solar rated

There may be additional parts or materials required by plumbers/installers for installation not listed here.

CHAPTER 5: SYSTEM PLUMBING

5.1 SYSTEM LAYOUT

The system components that are a part of a typical electric solar hot water systems are depicted in the system schematic in Figure 4 in the Appendix. Refer to the schematic to get an understanding of how the system should be set up.

See Table 2 below for the corresponding numbered components to the schematic for electric systems in the Appendix.

Table 2 Components that make up a typical Electric boosted solar hot water system.

No.	Component	Function
4	Tank	Stores hot water for when you need it
5	PTRV	Pressure Temperature Relief Valve
6	Electric Element	Provides a backup energy source for cloudy days and legionella protection
Below are additional components required to upgrade your tank to a solar hot water system		
1	Evacuated tube collector	Solar energy collection
2	Controller	Monitors temperatures and controls the system
2	Circulation Pump	Circulates water from the tank to the manifold
3	Tempering Valve	Tempers the hot water down to a safe outlet temperature

5.2 PIPING

5.2.1 PIPE MATERIAL AND PIPE SIZE

For domestic installations, the recommended pipe is copper and the size is ½".

Two factors affect the choice of pipe sizing, the flow rate and pressure drop. These two factors are closely related; a higher pressure drop will reduce the flow rate. Pressure

drop increases with decreased pipe diameters as well as the presence of bends, elbows and other components that restrict flow.

It may be necessary for some installations with numerous pipe bends and significant pipe runs to increase the pipe diameter to reduce the pressure drop. All pipe work must be installed in accordance with AS/NZS 3500.4.

IMPORTANT

It is necessary that all valves, fittings and piping connections used are solar rated and are able to withstand temperatures of up to 220°C.

5.3 STORAGE TANK

5.3.1 STORAGE TANK PORTS

Apricus tanks are hot water storage tanks that contain seven ports.

1. Inlet (Mains): Inlet line from mains water supply
2. Solar Flow: Flow line to the collector
3. Solar Return: Return line from the collector
4. Outlet: Outlet line to tempering valve and load
5. Sensor 1 Port: Bottom temperature sensor
6. Sensor 2 Port: Top temperature sensor
7. PTRV: Pressure temperature relief valve location

Two brass plugs are provided with the EHW Tank, these can be used to plug the solar flow and return ports while they are not being used in a solar DHW system set up.

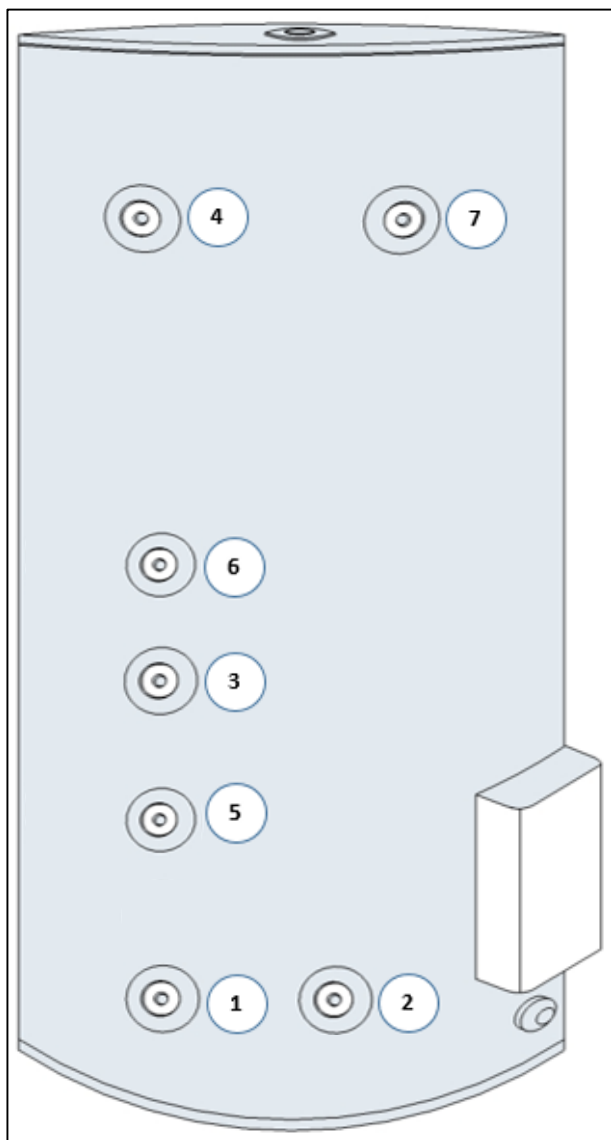


Figure 1 Apricus Storage Tank

All ports on an Apricus Australia storage tank are of 20mm (3/4") BSP. Teflon tape must be used to seal any fitting. Copper olives must be used with all compression fittings.

IMPORTANT

Apricus tanks must be installed in accordance to AS/NZS 3500.4 as well as any other relevant local/government standards.

5.3.1.1 INLET (MAINS)

The mains line should consist of the following brass components when installing:

- Duo valve
- Cold Water ECV
- Pressure Reducing Valve
- Four-Way Cross

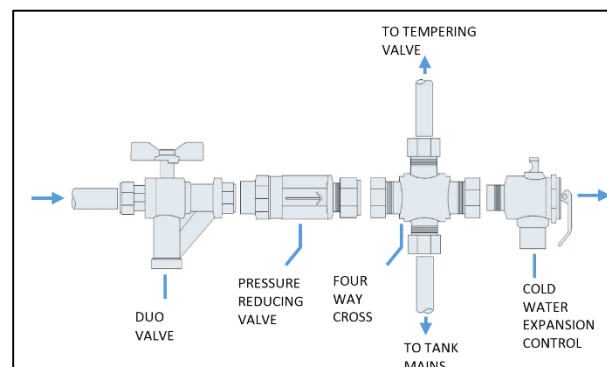


Figure 2 Mains Line Valves

The set of mains line valves can be purchased as a kit from Apricus and provides the above components with insulating jackets to streamline the installation process.

IMPORTANT

The tempering valve must be the last downstream component installed before the hot water reaches the house.

5.3.1.2 SOLAR FLOW

IMPORTANT

Cap this port with brass plugs supplied when solar collectors are not being installed.

When solar domestic hot water system is set up, this port is used for the water line directed up to the solar collectors to be heated. This line consists of the following components in order from closest to furthest away from the solar flow port:

- Circulation Pump
- Flow meter
- Check valve
- Collectors

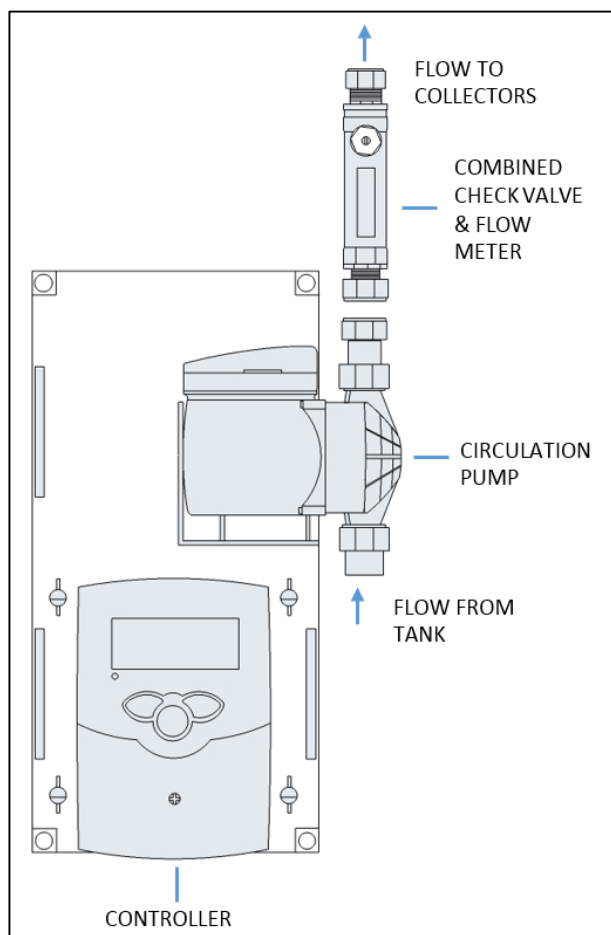


Figure 3 Apricus Pump Station Kit

5.3.1.3 SOLAR RETURN

IMPORTANT

Cap this port with brass plugs supplied when solar collectors are not being installed.

When solar DHW system is set up, this port is used for the water line returning from the solar collectors after being heated. This line does not require any additional components, but should be run as short as possible and have continuous fall back to the solar return port.

Apricus recommends using a three way ball valve and drain on the solar return line to allow convenient system filling and draining.

On the solar return line near the tank port, it is recommended to include a U-shaped heat trap with an approximate 25cm dip in the piping configuration to prevent reverse thermos-siphoning.

5.3.1.4 OUTLET

The outlet is where the hot water from the tank is extracted to be supplied to the household.

5.3.1.5 SENSOR PORTS

When solar DHW system is set up, the sensors must be coated with heat transfer paste and inserted through the cable gland into the appropriate sensor port and tightened. The top sensor port houses S3 and the bottom sensor port houses S2.

The Apricus controller requires three sensor leads be installed into the appropriate sensor ports in the solar system; this is vital for operation of the solar system.

The first temperature sensor port is located on either side of the collector manifold. Sensor 1 (S1) must be connected to the outlet of the manifold (the higher side). Apricus solar rated tanks come with two temperature sensor ports. The bottom port connects to the Sensor 2 (S2), the top port connects to the Sensor 3 (S3) sensor.

5.3.1.6 PTRV PORT

The PTRV port is where the tank 'pressure and temperature relief valve' is to be installed. All PTRV's must be fitted with a copper drain pipe to carry any discharge to an appropriate drain.

IMPORTANT

All storage tanks include a PTRV, which is located in the tank packaging, either in a box, vertical column or element cover.

CHAPTER 6: COMMISSIONING

6.1 SYSTEM FILLING AND AIR PURGE

After all the plumbing connections have been made, EHW tank needs to be filled with water and purged of air.

To fill the system:

1. Open the cold mains line and fill up the tank and open the hot water outlet or hot water taps.

<i>IMPORTANT</i>
For system filling and air purge procedure as a solar DHW system, please refer to the Apricus Domestic Solar Hot Water System Installation Manual.

CHAPTER 7: AUXILIARY HEATING

7.1 WATER HEATING REQUIREMENTS

It is a legal requirement that water be heated on a regular basis to kill Legionella bacteria that can lead to Legionnaires disease. The frequency this temperature must be reached varies, and is explained in the table below.

Table 3 Minimum Heat Requirements

Type of Apricus System Installed	Minimum Heat Requirements
Glass-lined Bottom element electric boosted system	Once per week to 60°C for 32 minutes

7.2 CONNECTIONS

7.2.1 ELECTRICAL CONNECTIONS

IMPORTANT
All electrical connections must be completed by an authorized and licensed person.

The electrical element will be required to be directly connected to a 240V AC 50Hz mains power supply.

Flexible conduit is required to enclose any exposed electrical cables to the storage unit.

7.2.2 THERMOSTAT SETTING

The thermostat should be set to 60°C or above as per AS/NZS 3498.

To adjust the temperature setting:

- Disconnect the electrical power supply to the tank
- Remove the element cover
- Using a screwdriver, rotate the thermostat dial to the desired temperature.

When the electric element is activated it will heat up all the water above the element to 60°C (or the thermostat

setting). This heating can take as long as 3-4 hours if the tank is cold.

Note: Apricus recommends that the electric booster is left on, or controlled by a suitable timer.

7.2.3 WATER CONNECTION

Unions should be used on both the hot and cold water supply lines for connections and the water lines should be purged to remove all debris and air.

CHAPTER 8: POST INSTALLATION

To ensure optimal operation and to maintain the integrity of the Apricus EHW tank, ensure that each of the following processes is carried out prior to leaving the site.

8.1 CHECKLIST PRIOR TO LEAVING INSTALLATION SITE

- EHW tank check: Check all connections for leaks and that all components are installed as per this manual.
- Take photos of all system components for warranty purposes. This should include photos of the plumbing lines to and from the tank.
- Note down the Tank Serial Number

CHAPTER 9: APPENDIX

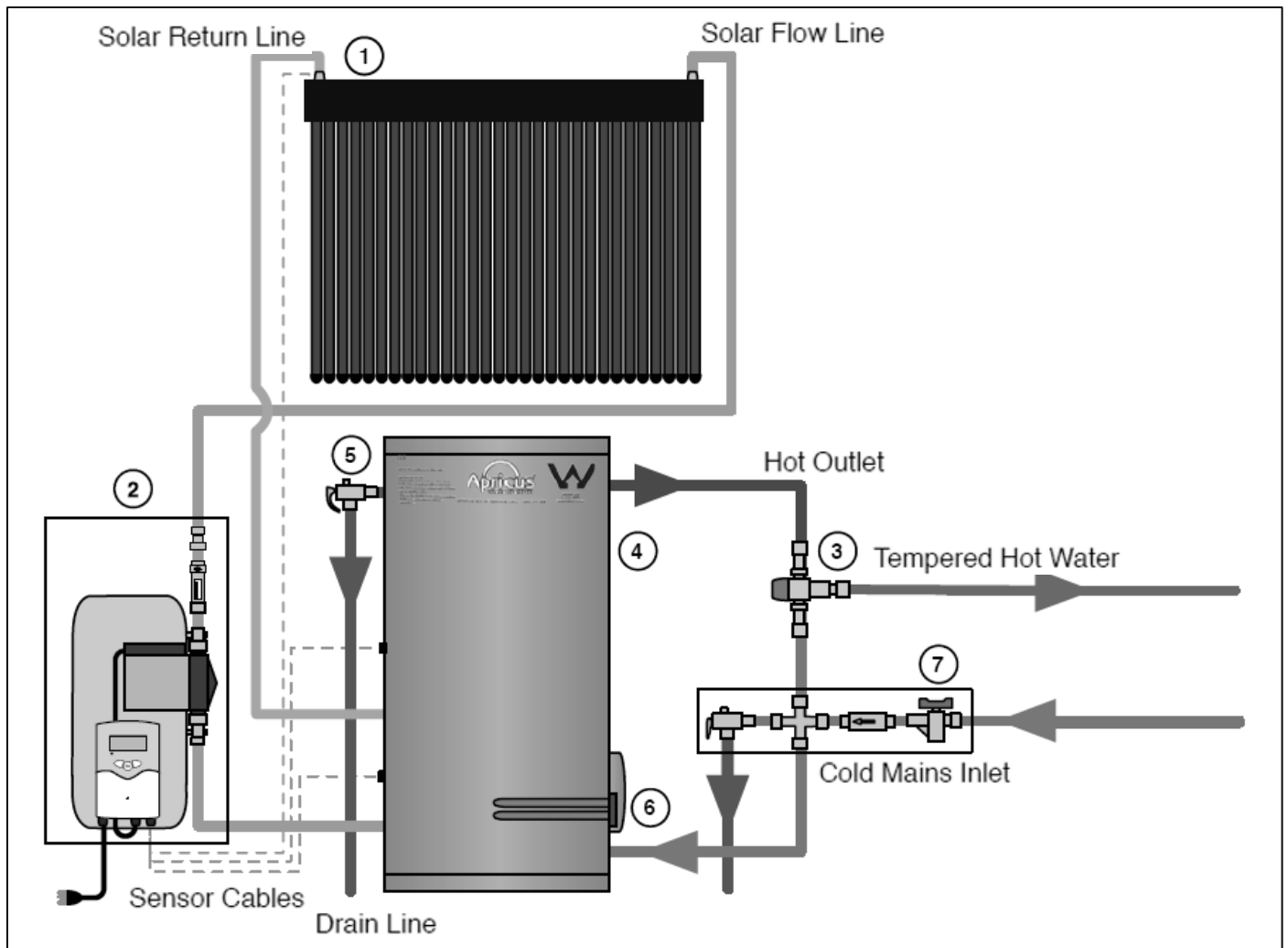


Figure 4 Typical Electric boosted solar hot water system

CHAPTER 10: WARRANTY

This warranty applies to Domestic Electric Hot Water Tanks with tank model numbers: AP250GLE, AP315GLE and AP400GLE.

- 10 Years tank warranty*
- 1 year parts and labour.

For this tank, Apricus Australia Will;

- For the period up to and including the 7th year after the date of installation: repair or replace defective components or, at the discretion of Apricus Australia, provide a replacement unit or parts. The owner will be charged the full costs of repair work (labour) after the first year.
- For the 8th year after the date of installation, the same warranty will apply except that the owner will be charged 60% of cost of replacement parts and full costs of repair work.
- For the 9th year after the date of installation, the same warranty will apply except that the owner will be charged 80% of replacement parts and full costs of repair work.
- For the 10th year after the date of installation, the same warranty will apply except that the owner will be charged 90% of replacement parts and full costs of repair work.

The benefits provided to you by the warranty and replacement guarantee (collectively “Warranty”) are in addition to the guarantees and other rights and remedies available to you under the Australian Consumer Law (“ACL”).

If the Unit fails to conform to this Warranty during the applicable period, Apricus Australia will replace any failed component or where necessary, in the absolute discretion of Apricus Australia, replace the Unit free of charge including reasonable labour costs incurred in normal business working hours.

This Warranty only applies to defects which have arisen solely from faulty materials or workmanship in the Unit and does not apply to other defects which may have arisen as a result of, without limitation, the following: accidental damage, abuse, misuse, maltreatment,

abnormal stress or strain, harsh or adverse water conditions including excessive water pressure or temperature, neglect of any kind or otherwise as a result of any use of the Unit contrary to the product manual or other instructions provided by Apricus Australia. Alterations or repair of the Unit other than by an accredited and licensed service agent or technician are not covered. Attachment of accessories or use of non-genuine replacement parts other than those manufactured or approved by Apricus Australia are not covered by this Warranty.

This Warranty applies only to the Unit and does not cover any ancillary plumbing or electrical parts supplied by the installer such as pressure limiting valve, tempering valve, line strainer, stop cocks, non-return valve, electrical switches, pumps or fuses, or faulty installation.

The Unit must be installed by a licensed tradesperson in accordance with information set out in the manual supplied with the Unit and/or any relevant statutory requirements. If the Unit is located in a position that does not comply with the installation instructions or relevant statutory requirements, then this Warranty does not cover major dismantling or removal of cupboards, doors, walls or special equipment and/ or excessive labour, at the determination of Apricus Australia, to make the Unit accessible for repair or replacement.

As required by legislation, including under the ACL, any claims for damage to furniture, carpets, walls, foundations or any other consequential loss either directly or indirectly due to defects of any kind in a Unit will only be met by Apricus Australia where the damage could be considered reasonably foreseeable and installed complying with the installation instructions and all relevant statutory requirements.

In addition to this Warranty, certain legislation (including the ACL) may give you rights which cannot be excluded, restricted or modified. This Warranty must be read subject to such legislation and nothing in this Warranty has the effect of excluding, restricting or modifying those rights.

If Apricus Australia fails to meet a guarantee under the ACL, your remedy for such failure may be limited to any one or more of the following:

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- Replacement of the Unit;
- Repair of the Unit;
- Refunding the cost of the Unit;
- Payment of reasonable costs of having the Unit repaired;
- Payment in respect of the reduced value of the Unit.

Warranty claims can be placed by completing the following steps:

Contact Apricus Australia on 1300 277 428 and speak to our Warranty and Aftersales Department.

- Provide the serial number and model number of the HWS located on the white compliance sticker.
- Provide full name, address and contact number.
- Provide proof of installation of the unit, for warranty to commence from the Date of Installation of the unit. If proof of installation or purchase cannot be provided, then Date of Manufacture of the unit will be used to determine warranty commencement date.

Our goods come with guarantees that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

For warranty policy for other parts provided by Apricus, please see the Apricus DHW Warranty Policy, available from the Apricus website.

Registering your Apricus solar ready tank will ensure that your details are placed on our computer system streamlining any future after-sales/service requirements. You can register your Apricus Australia product online at: www.apricus.com.au.

Customers are encouraged to take photos of all system components for warranty purposes. This should include photos of the plumbing lines to and from the tank. Take note of your tank serial number.

Contact Details:

Apricus Australia Pty. Ltd.
PO Box 6109
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Australia

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Email: warranty@apricus.com.au
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