

 **Solahart**[®]

power  **store**

Electric Water Heater



Owner's Guide and Installation Instructions

This water heater must be installed and serviced by a qualified person.
Please leave this guide with the householder.

An electronic copy of these Owner's Guide and Installation Instructions can be downloaded from Solahart.com.au.

PATENTS

This water heater may be protected by one or more patents or registered designs in the names of Solahart Industries Pty Ltd or Rheem Australia Pty Ltd.

TRADEMARKS

® Registered trademark of Solahart Industries Pty Ltd or Rheem Australia Pty Ltd.
TM Trademark of Solahart Industries Pty Ltd or Rheem Australia Pty Ltd.

Note: Every care has been taken to ensure the accuracy in preparation of this publication. No liability can be accepted for any consequences, which may arise as a result of its application.

CONTENTS

HOUSEHOLDER

This booklet contains important information about your new water heater, including terms of the Solahart warranty.

We recommend you read pages 7 to 24, and the terms of the Solahart warranty on pages 4 to 6.

The other pages are intended for the installer but may be of interest.

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SOLAHART POWERSTORE ELECTRIC WATER HEATER WARRANTY - AUSTRALIA ONLY

ELECTRIC WATER HEATER MODEL 315PVV

1. THE SOLAHART WARRANTY – GENERAL

- 1.1 This warranty is given by Solahart Industries Pty Limited ABN 45 064 945 848 of 1 Alan Street, Rydalmere New South Wales.
- 1.2 Solahart offers national service through its Dealer network. Solahart will repair or replace components at the address of the water heater subject to the terms of the Solahart warranty. Solahart, in addition can provide preventative maintenance and advice on the operation of your water heater.
- 1.3 For details about this warranty, you can contact us on 1800 638 011.
- 1.4 The terms of this warranty and what is covered by it are set out in sections 2 and 3 and apply to water heaters manufactured from 1st May 2019.
- 1.5 If a subsequent version of this warranty is published, the terms of that warranty and what is covered by it will apply to water heaters manufactured after the date specified in the subsequent version.

2. TERMS OF THE SOLAHART WARRANTY AND EXCLUSIONS TO IT

- 2.1 Solahart may reject a claim under this warranty in its sole discretion if:
 - a) You do not arrange for a major service to be conducted on your water heater in the fifth year after installation, in accordance with Solahart's recommendation in the Owner's Guide and Installation Instructions; and
 - b) The fault giving rise to the warranty claim would have been detected and rectified during that major service.
 - 2.2 The decision of whether to repair or replace a faulty component is at Solahart's sole discretion. Solahart may use new, used, remanufactured or refurbished parts or products when repairing or replacing products under this warranty.
 - 2.3 If you require a call out and we find that the fault is not covered by the Solahart warranty, you are responsible for our standard call out charge. If you wish to have the relevant component repaired or replaced by Solahart, that service will be at your cost.
 - 2.4 Where a failed component or cylinder is replaced under this warranty, the balance of the original warranty period will remain effective. The replacement does not carry a new Solahart warranty.
 - 2.5 Where the water heater is installed outside the boundaries of a metropolitan area as defined by Solahart or further than 30 km from a regional Solahart Dealer, the cost of transport, insurance and travelling between the nearest Solahart Dealer's premises and the installed site shall be the owner's responsibility.
 - 2.6 Where the water heater is installed in a position that does not allow safe or ready access, the cost of that access, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility. In other words, the cost of dismantling or removing cupboards, doors or walls and the cost of any special equipment to bring the water heater to floor or ground level or to a serviceable position is not covered by this warranty.
 - 2.7 This warranty only applies to the original and genuine Solahart water heater in its original installed location and any genuine Solahart replacement parts.
 - 2.8 The Solahart warranty does not cover faults that are a result of:
 - a) Accidental damage to the water heater or any component (for example: (i) Acts of God such as floods, storms, fires, lightning strikes and the like; and (ii) third party acts or omissions).
 - b) Misuse or abnormal use of the water heater.
 - c) Installation not in accordance with the Owner's Guide and Installation Instructions or with relevant statutory and local requirements in the State or Territory in which the water heater is installed.
 - d) Connection at any time to a water supply that does not comply with the water supply guidelines as outlined in the Owner's Guide and Installation Instructions.
 - e) Repairs, attempts to repair or modifications to the water heater by a person other than the Solahart Dealer or a Solahart Accredited Service Agent.
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SOLAHART POWERSTORE ELECTRIC WATER HEATER WARRANTY - AUSTRALIA ONLY

ELECTRIC WATER HEATER MODEL 315PVV

- f) Faulty plumbing or faulty power supply.
 - g) Failure to maintain the water heater in accordance with the Owner's Guide and Installation Instructions.
 - h) Transport damage.
 - i) Fair wear and tear from adverse conditions (for example, corrosion).
 - j) Cosmetic defects.
- 2.9 Subject to any statutory provisions to the contrary, this warranty excludes any and all claims for:
- a) Damage to furniture, carpet, walls, foundations or any other consequential loss either directly or indirectly due to leakage from the water heater, or due to leakage from fittings and/ or pipe work of metal, plastic or other materials caused by water temperature, workmanship or other modes of failure, and
 - b) Loss or damage due to the water heater if it is not connected to or loses connectivity to the internet.
- 2.10 If the water heater is not sized to supply the hot water demand in accordance with the guidelines in Solahart's water heater literature, any resultant fault will not be covered by the Solahart warranty.

3. WHAT IS COVERED BY THE SOLAHART WARRANTY FOR THE WATER HEATERS DETAILED IN THIS DOCUMENT

- 3.1 Solahart will repair or replace a faulty component of your water heater if it fails to operate in accordance with its specifications as follows:

What components are covered	The period from the date of installation in which the fault must appear in order to be covered	What coverage you receive
315PVV model		
All components	Year 1	Repair and/or replacement of the faulty component, free of charge, including labour.
All components (if the water heater is installed in a single-family domestic dwelling)	Years 2 & 3	Repair and/or replacement of the faulty component, free of charge, including labour.
The cylinder (if the water heater is installed in a single-family domestic dwelling)	Years 4 to 10	Replacement cylinder, free of charge. Installation and repair labour costs are the responsibility of the owner.
The cylinder (if the water heater is <u>not</u> installed in a single-family domestic dwelling)	Years 2 & 3	Replacement cylinder, free of charge. Installation and repair labour costs are the responsibility of the owner.

SOLAHART POWERSTORE ELECTRIC WATER HEATER WARRANTY - AUSTRALIA ONLY

ELECTRIC WATER HEATER MODEL 315PVV

4. ENTITLEMENT TO MAKE A CLAIM UNDER THIS WARRANTY

- 4.1 To be entitled to make a claim under this warranty you need to:
- a) Be the owner of the water heater or have consent of the owner to act on their behalf.
 - b) Contact Solahart without undue delay after detection of the defect and, in any event, within the applicable warranty period.
- 4.2 You are not entitled to make a claim under this warranty if your water heater:
- a) Does not have its original serial numbers or rating labels.
 - b) Is not installed in Australia.

5. HOW TO MAKE A CLAIM UNDER THIS WARRANTY

- 5.1 If you wish to make a claim under this warranty, you need to:
- a) Contact Solahart on 1800 638 011 and provide owner's details, address of the water heater, a contact number and date of installation of the water heater or if that's unavailable, the date of manufacture and serial number (from the rating label on the water heater).
 - b) Solahart will arrange for the water heater to be tested and assessed on-site.
 - c) If Solahart determines that you have a valid warranty claim, Solahart will repair or replace the water heater in accordance with this warranty.
- 5.2 Any expenses incurred in the making of a claim under this warranty will be borne by you.

6. THE AUSTRALIAN CONSUMER LAW

- 6.1 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.
- 6.2 The Solahart warranty (set out above) is in addition to any rights and remedies that you may have under the Australian Consumer Law.

7. REPAIR NOTICE UNDER THE AUSTRALIAN CONSUMER LAW

- 7.1 Goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired. Refurbished parts may be used to repair the goods.

SAFETY, WARNINGS AND INSTALLATION NOTES

It is important you read the following safety and warnings information.

SAFETY AND WARNINGS

- This water heater is only intended to be operated by persons who have the experience or the knowledge and the capabilities to do so.
- This water heater is not intended to be operated by persons with reduced physical, sensory or mental capabilities i.e. the infirm, or by children. Children should be supervised to ensure they do not interfere with the water heater.
- If the electrical conduit to the water heater is damaged, it must be replaced by a qualified person in order to avoid a hazard. Phone your nearest Solahart Dealer to arrange for an inspection.
- This water heater uses 220 V – 240 V AC power for the electrically operated components. The removal of the front cover(s) will expose 220 V – 240 V wiring. They must only be removed by a qualified person.
- This water heater is supplied with thermostats, over-temperature cut-outs, temperature sensors and a combination temperature pressure relief valve. These devices must not be tampered with or removed. The water heater must not be operated unless each of these devices is fitted and is in working order.

The Solahart warranty may not cover faults if relief valves or other safety devices are tampered with or if the installation is not in accordance with these instructions.

- **DANGER:** The operation of the over-temperature cut-out on a thermostat indicates a possibly dangerous situation. If the over-temperature cut-out operates, it must not be reset and the water heater must be serviced by a qualified person.
- The water heater will operate until a water temperature of 75°C is reached.

Refer to “**Twin Element Operation**” on page 11 and to “**How Hot Should The Water Be?**” on page 14.

- For continued safety of this water heater it must be installed, operated and maintained in accordance with the Owner’s Guide and Installation Instructions.
- Servicing of a water heater must only be carried out by qualified personnel. Phone your nearest Solahart Dealer.
- The lever on the temperature pressure relief valve and expansion control valve (if fitted) requires to be operated every six (6) months to clear any deposits and to ensure the valve and its drain line are not blocked.

Refer to “**Relief Valves**” on page 9 and “**Minor Maintenance Every Six Months**” on page 17.

- Only a plumber can drain the water heater, if this is required.
- Do not modify this water heater.

INSTALLATION NOTES

This water heater must be installed:

- by a qualified person,
- in accordance with the installation instructions,
- in compliance with the Plumbing Standard AS/NZS 3500.4,
 - This water heater is designed for either indoor or outdoor installation.
 - This water heater is intended to be permanently connected to the water mains and not connected by a hose-set. A braided flexible hose or semi-flexible connector may be used for connection to the water heater, where permitted by AS/NZS 3500.4.
- in compliance with the Australian / New Zealand Wiring Rules AS/NZS 3000,
 - Isolation switches must be installed in the electrical circuit to the water heater in accordance with the Wiring Rules, so the water heater can be switched off.
 - The power supply wires are to be directly connected to the terminal block and earth tab connection, with no excess wire loops inside the front cover. The temperature rating of the power supply wires insulation must suit this application, or the wiring protected by insulating sleeving with an appropriate temperature rating if it can make contact with the internal storage cylinder. The temperature of the internal storage cylinder can reach 75°C under normal operation.
- in compliance with all local codes and regulatory authority requirements.

Installation and commissioning requirements and details for the installing plumber and electrician are contained on [pages 25 to 36](#).

Mains pressure water supply

The water heater is designed to operate at mains pressure by connecting directly to the mains water supply.

The water heater is supplied with a temperature pressure relief valve with a pressure rating of 1000 kPa. If an expansion control valve has been installed on the cold water line to the water heater, this should have a pressure rating of 850 kPa.

The maximum mains water supply pressure for the water heater is 800 kPa if an expansion control valve is not installed, or 680 kPa if an expansion control valve is installed. If the mains supply pressure in your area exceeds these values, a pressure limiting valve must be installed.

The supply pressure should be greater than 350 kPa for true mains pressure operation to be achieved.

RELIEF VALVES

Temperature Pressure Relief Valve

This water heater incorporates a temperature pressure relief valve located near the top of the water heater. This valve is essential for the water heater's safe operation.

It is possible for the valve to discharge a small quantity of water through the drain line during each heating period. This occurs as the water is heated and expands by approximately 1/50 of its volume.

Expansion Control Valve

In many areas, including South Australia, Western Australia and scaling water areas, it is mandatory an expansion control valve is fitted to the cold water line to the water heater.

The expansion control valve will discharge a small quantity of water from its drain line during the heating period instead of the temperature pressure relief valve as it has a lower pressure rating.

Valve Operation

Continuous leakage of water from either valve and its drain line may indicate a problem with the water heater. Refer to **“Temperature Pressure Relief Valve or Expansion Control Valve Running”** on page 21.

⚠ Warning: Never block the outlet of either valve or their drain lines for any reason. A relief valve drain must be left open to atmosphere, and be installed in a continuously downward direction.

In locations where water pipes are prone to freezing, the relief valve drain line must be insulated and not exceed 300 mm in length before discharging into a tundish through an air gap.

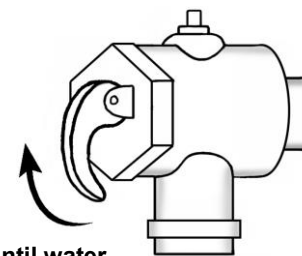
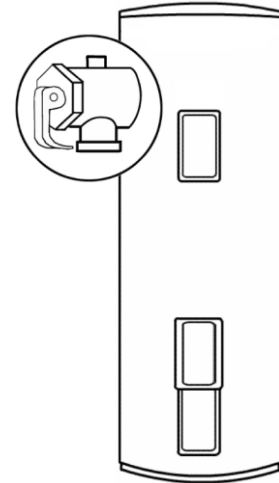
Operate the easing lever on the temperature pressure relief valve and expansion control valve once every six (6) months to clear any deposits and ensure the valve and its drain line are not blocked. **It is very important the lever is raised and lowered gently.** Refer to **“Minor Maintenance Every Six Months”** on page 17.

⚠ Warning: Water discharged from the temperature pressure relief valve drain line will be hot. Exercise care to avoid any splashing of water by standing clear of the drain line's point of discharge when operating either valve's easing lever.

⚠ DANGER: Failure to operate the easing lever on the relief valve once every six (6) months may result in the water heater cylinder failing, or under certain circumstances, exploding.

If water does not flow freely from the drain line when the lever is lifted, then the water heater must be checked. Phone your nearest Solahart Dealer to arrange for an inspection.

The temperature pressure relief valve should be replaced at intervals not exceeding five (5) years and the expansion control valve should be checked for performance or replaced at intervals not exceeding five (5) years. The checking of the valves performance or replacement should occur more frequently in areas where there is a high incidence of water deposits. Refer to **“Water Supplies”** on page 18.



lift until water
flows from the
drain line –
lower gently

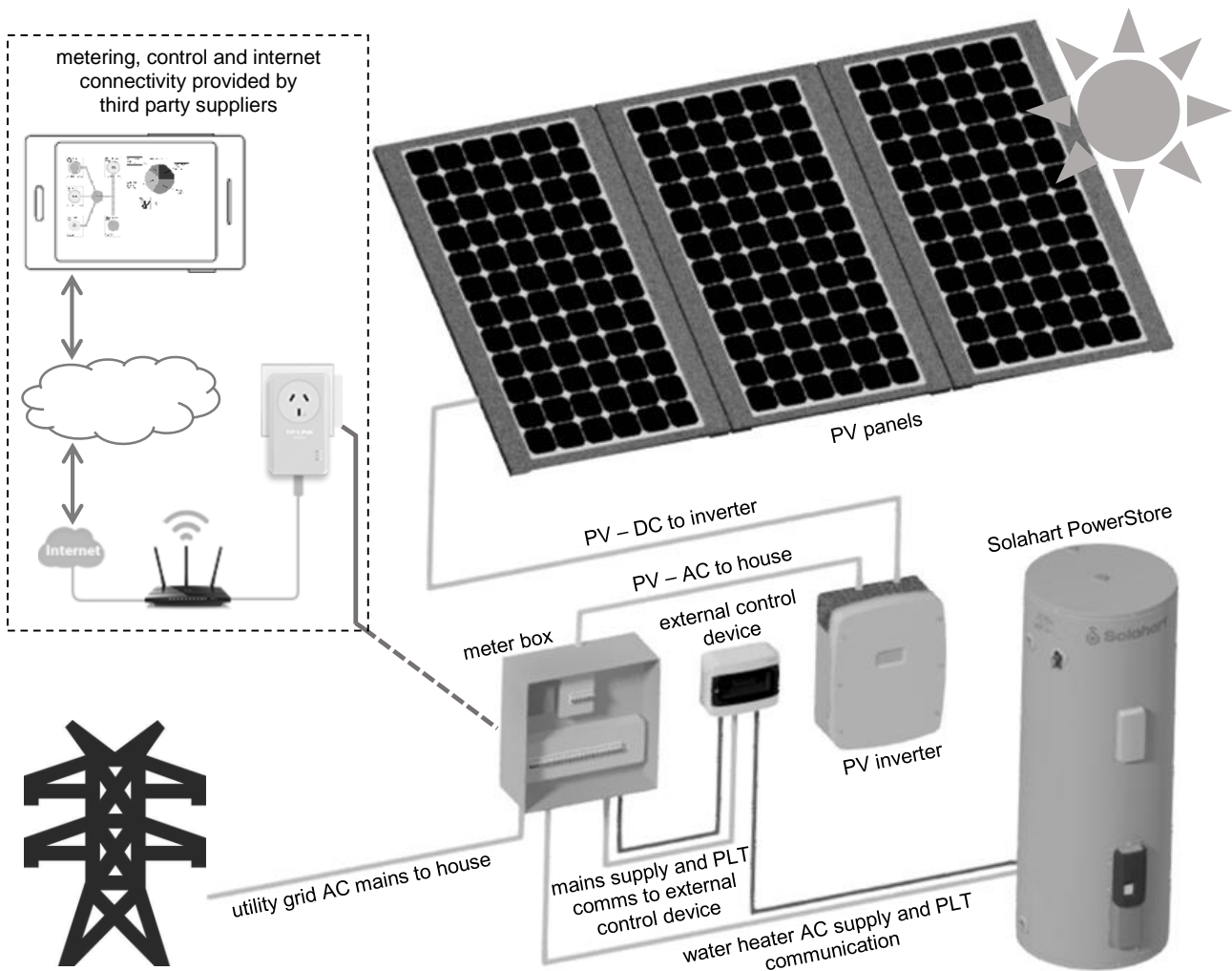
outlet /
drain
line

HOW YOUR WATER HEATER WORKS

ABOUT YOUR SOLAHART POWERSTORE

The Solahart PowerStore 315PVV water heater is a premium electric water heater designed to work in partnership with an external control device in order to take advantage of excess solar PV power production. When installed with an external control device, the PowerStore water heater is able to closely match its power consumption to excess solar PV generation, when the water it contains requires heating. Water is then heated at the expense of the surrendered solar feed-in tariff, rather than purchasing energy from the utility grid to perform the heating.

The Solahart PowerStore also has the ability to tell the external control device the amount of hot water available at any time, enabling it to be used as a key component in a sophisticated home energy management system (HEMS) provided by a third party service provider. This would allow the water heater to use utility grid sourced power for additional water heating or to achieve safety and compliance requirements (when required) at the most economical electricity tariff available.



SYSTEM OPERATION

The Solahart PowerStore operates as a variable power input water heater when there is excess solar PV power production. When excess power generated from the solar PV system is detected and water heating is required, the PowerStore's master controller module and the external control device react enabling the water heater to operate at an equivalent power consumption.

A combination of the unique multi-stage triple blade heating unit design and step-smoothing electronics enables continuously variable input from zero to full power for each of the upper and lower heating units. This variable power control system allows the water heater to operate whenever smaller or larger amounts of excess solar PV power production are detected and water heating is required, making the most of excess solar PV harvesting.

The Solahart PowerStore has inbuilt protection against running low on hot water and will also maintain a fixed minimum water temperature as a safety and compliance requirement. During periods when there is no excess power from solar PV generation and heating of the water is required, electricity from the utility grid will be used to ensure the availability of hot water.

Note: If the water heater tank is installed without either the external control device or connection to a home energy management system (HEMS), it will operate as a conventional twin element electric water heater. It won't be able to take advantage of excess solar PV power production or be part of an intelligent water heating system.

TWIN ELEMENT OPERATION

This water heater has two multi-stage triple blade variable power input heating units, each controlled by the temperature sensors and the control system. One heating unit is near the top of the water heater and the other at the base. The two heating units are wired for non-simultaneous operation, so only one heating unit can operate at a time.

- **Top heating unit**

The top heating unit has priority under normal operation to heat the water in the top portion of the tank.

When there is less than 90 litres of hot water in the tank, the top heating unit will energise to heat the top 150 litres to 60°C using utility grid supplied electricity and if available, also take advantage of excess solar PV power generation.

The top 150 litres of water will then be heated to 75°C during periods of excess solar PV power generation only, without additional utility grid sourced electricity supply *. Heating then switches to the bottom heating unit.

(* A minor amount of grid energy may be used as the PowerStore control system tracks available excess solar PV production. This is normal operation.)

- **Bottom heating unit**

The bottom heating unit is activated under normal operation after the top heating unit has heated the water in the top portion of the tank to 75°C.

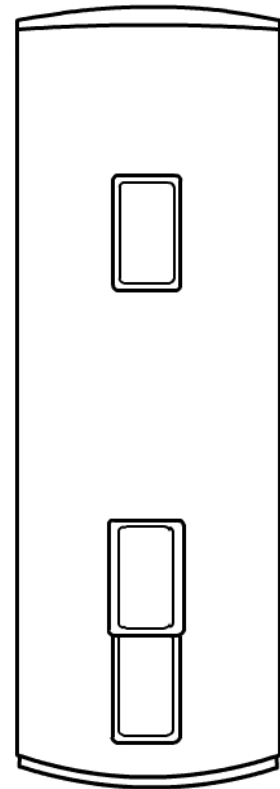
The bottom heating unit heats the water in the lower portion of the tank to a maximum temperature of 75°C during periods of excess solar PV power generation only, without additional utility grid sourced electricity supply.

Note: AS 3498 requires that a water heater provides the means to inhibit the growth of Legionella bacteria in potable water. This requirement is met if at least 90% of the stored water is heated to 60°C once every seven days. If this does not occur during normal operation, the water heater will enter Safety Compliance mode and use utility grid sourced electricity to satisfy this requirement with heating via the bottom heating unit.

- **Electrical connection**

The utility grid sourced power supply to the water heater must be a 24 hour Continuous / Domestic Time of Use type. A separately metered controlled load supply, i.e. Off-Peak / time controlled, is not suitable.

NOTE: Power must be available to the heating units' circuit at all times for this water heater to operate as designed.

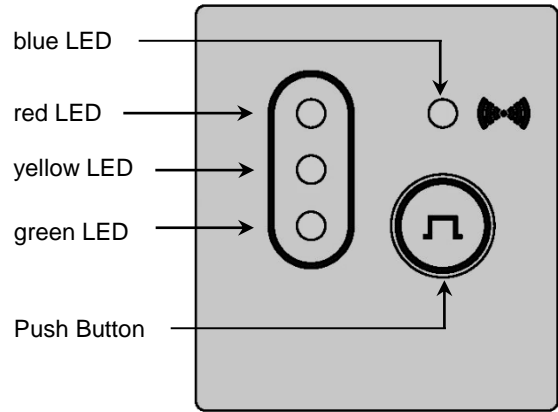


LED OPERATION

The water heater has four coloured LEDs, housed on the front of the Master Controller Module on the lower front of the water heater. The LEDs indicate the operational status of the water heater.

The four colours and their indicating status are:

- Blue indicates the communication status
- Red indicates a fault
- Yellow indicates a warning that there may be a fault
- Green indicates normal operation



LED interface

Types of LED Operation

There are seven (7) types of illumination the LEDs may provide. These are:

Illumination	Time	LEDs
Off	remains off	all LEDs
Solid	remains on	all LEDs
Standard flash	1 sec on, 1 sec off	green, yellow and red LEDs
Fast flash	0.25 sec on, 0.25 sec off	green, yellow and red LEDs
Extra fast flash	0.05 sec on, 0.05 sec off	blue LED only
Blink flash	0.25 sec on, 1.75 sec off	blue LED only
Slow fade flash	0.25 sec on, 0.25 sec fade, 0.25 sec off, 0.25 sec fade	blue LED only

Green LED

The green LED generally indicates various stages of normal operation.

Green LED	Mode	Operational Status
Off no illumination	Disabled mode (abnormal operation)	There may be loss of power, or there may be a fault with the water heater
Solid green	Standby mode (normal operation)	Water is either fully heated, or at set temperature and ready for further heating when excess solar PV power is next available. No heating taking place.
Standard flash (continuous flashes)	Variable Heating mode (normal operation)	Top or bottom heating unit operating, only when excess solar PV power generation is available*
Standard flash (2 x flashes, interval)	Maintenance mode (normal operation)	Top heating unit heating water to 60°C, operating with utility grid electricity supply, and taking advantage of excess solar PV power if available
Standard flash (3 x flashes, interval)	Standalone mode (abnormal operation)	Heating unit operating with utility grid electricity supply due to either a loss of communication with external control device, or if no external control device is connected (advantage of excess solar PV power generation taken if available)
Standard flash (4 x flashes, interval)	Safety Compliance mode (normal operation)	Bottom heating unit heating water to meet a Code safety and compliance requirement, operating with utility grid electricity supply
Standard flash (5 x flashes, interval)	Element Calibration mode (normal operation)	Short intermittent system check on the elements in each heating unit, may operate with utility grid electricity supply
Fast flash	Fault Display Sequence mode (abnormal operation)	In conjunction with 1, 2, 3, 4 or 5 simultaneous yellow and red LED fast flashes – LED display is user initiated

(* A minor amount of grid energy may be used as the PowerStore control system tracks available excess solar PV production. This is normal operation.)

Blue LED

The blue LED is dedicated to display the communication activity between the water heater and the external control device.

Blue LED	Mode	Operational Status
Off or Solid Blue	Disabled mode (abnormal operation)	There may be loss of power, or there may be a problem with the water heater
Extra fast flash	Normal operation	Current or recent communication activity
Blink flash	Abnormal operation	Loss of communication with external control device
Slow fade flash	Normal operation	No current communications activity

Yellow LED

The yellow LED generally indicates a warning that there may be a fault with the water heater.

Yellow LED	Mode	Operational Status
Off	Normal operation	System okay – no potential fault
Solid	Warning mode (abnormal operation)	Warning there may be a fault (green LED will still be functioning)
	Disabled mode (abnormal operation)	In conjunction with a solid green and red LED only, there is a fault with the water heater
Standard flash	Fault mode (abnormal operation)	In conjunction with a red LED standard flash, this indicates a fault code
Fast flash	Fault Display Sequence mode (abnormal operation)	In conjunction with 1, 2, 3, 4 or 5 simultaneous green and red LED fast flashes – LED display is user initiated

Red LED

The red LED generally indicates a fault with the water heater.

Red LED	Mode	Operational Status
Off	Normal operation	System okay – no fault
Solid	Disabled mode (abnormal operation)	In conjunction with a solid green and yellow LED only, there is fault with the water heater
Standard flash	Fault mode (abnormal operation)	In conjunction with a yellow LED standard flash, this indicates a fault code
Fast flash	Fault Display Sequence mode (abnormal operation)	In conjunction with 1, 2, 3, 4 or 5 simultaneous green and yellow LED fast flashes only – LED display is user initiated
	Tank Controller Failure (abnormal operation)	This indicates a fault with the tank Master Controller Module (yellow and green LEDs are off)

Notes:

- A solid yellow, or flashing red and yellow LEDs simultaneously indicates there may be a fault with the water heater.
- If all LEDs are off, there may be either a loss of power to or there may be a fault with the water heater.
- If the green, yellow and red LEDs are solid simultaneously, there may be a fault with the water heater.
- If the red LED is fast flashing and the green and yellow LEDs are off, there may be a fault with the tank Master Controller Module.
- If the blue LED is blink flashing, there is a loss of communications between the external control device and the water heater.
- If any of the above scenarios occur, refer to “LED Operation” on page 22, in the Save A Service Call section of this Owner’s Guide and Installation Instructions.
- For information on Fault Display Sequence mode, refer to “Reset the Water Heater” on page 22.

ABOUT YOUR WATER HEATER

WATER HEATER APPLICATION

This water heater is designed for use in a single family domestic dwelling for the purpose of heating potable water. Its use in an application other than this may shorten its life.

New, used, remanufactured or refurbished parts or products may be used to repair or replace parts or products which are part of this water heater system. Goods presented for repair may be replaced by refurbished goods of the same type rather than being repaired.

MODEL TYPE

The Solahart® 315PVV water heater you have chosen is suitable for either indoor or outdoor installation. The water heater has two heating units (refer to **"Twin Element Operation"** on page 11).

Water is stored in a vitreous enamel lined steel cylinder and heated by the electric immersion heating units. The control system, sensors and thermostats control the temperature of the water and the source of the power supply.

Automatic safety controls are fitted to the water heater to provide safe and efficient operation.

HOW HOT SHOULD THE WATER BE?

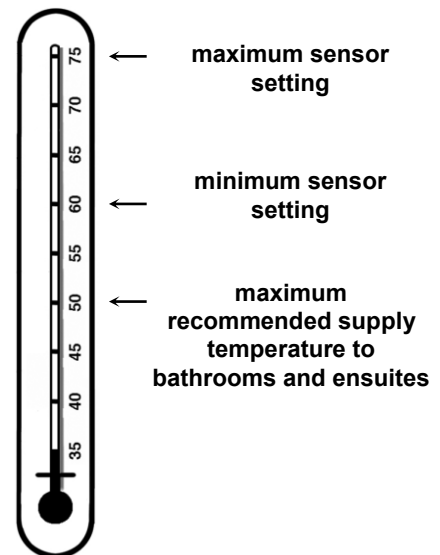
The water heater's control system allows the water to be heated to a minimum temperature of 60°C and a maximum temperature of 75°C. These temperature settings cannot be adjusted.

To meet the requirements of the National Plumbing Standard the temperature of the stored water must not be below 60°C.

HOTTER WATER INCREASES THE RISK OF SCALD INJURY

This water heater can deliver water at temperatures which can cause scalding. Check the water temperature before use, such as when entering a shower or filling a bath or basin, to ensure it is suitable for the application and will not cause scald injury.

We recommend and it may also be required by regulations that an approved temperature limiting device be fitted into the hot water pipe work to the bathroom and ensuite when a Solahart 315PVV water heater is installed. This will keep the water temperature below 50°C at the bathroom and ensuite. The risk of scald injury will be reduced and still allow hotter water to the kitchen and laundry.



TEMPERATURE SENSORS, TEMPERATURE ADJUSTMENT, THERMOSTATS

The temperature sensors control the maximum water temperature in conjunction with the control system. Water is heated to either 60°C or 75°C depending on the mode of operation. These temperature settings are fixed and cannot be adjusted.

Power is only used when heating is required. There is no need to switch the water heater off when it is not in use, except when you are on an extended holiday.

The thermostats act as a backup safety device to control the electricity supply to the heating unit. Each thermostat and its protective over temperature cut out is mounted inside the front covers of the water heater.

PRECAUTIONS

Where damage to property can occur in the event of the water heater leaking, the water heater must be installed in a safe tray. Construction, installation and draining of a safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements.

The water heater must be maintained in accordance with the Owner's Guide and Installation Instructions. Refer to **"Maintenance Requirements"** on page 17 and to **"Anode Inspection and Replacement"** on page 19.

If this water heater is to be used where an uninterrupted hot water supply is necessary for your application or business you should ensure that you have back-up redundancy within the hot water system design. This should ensure the continuity of hot water supply in the event that this water heater were to become inoperable for any reason. We recommend you seek advice from your plumber or specifier about your needs and building back-up redundancy into your hot water supply system.

TO TURN OFF THE WATER HEATER

If you plan to be away from home for only a few nights, we suggest you leave the water heater switched on.

If it is necessary to turn off the water heater:

- Switch off the electrical supply at the water heater isolating switch on the switchboard or at the isolating switch at the water heater (if installed).
- Close the cold water isolation valve at the inlet to the water heater.

TO TURN ON THE WATER HEATER

- Open the cold water isolation valve fully on the cold water line to the water heater.
- Switch on the electrical supply at the water heater isolating switch on the switchboard and at the isolating switch at the water heater (if installed).
 - When the power is turned on, the water heater will enter the Initialisation mode.
 - The green, yellow and red LEDs will flash in an undefined sequence for up to sixty (60) seconds, which will include different types of flashes and may include short periods where the LEDs remain all on or all off.
 - The blue LED will extra fast flash.
 - The water heater will then enter either Maintenance mode if the water in the top of the tank is below 60°C or Standby mode or Variable Heating mode if the water in the top of the tank is above 60°C.

GOING ON HOLIDAY?

If you plan to be away from home for one or two nights, we suggest you leave the water heater switched on. However, if you plan to stay away more than a few nights, conserve energy by switching the water heater off at either the switchboard or isolating switch (if one is installed).

VICTORIAN CUSTOMERS

Notice to Victorian Customers from the Victorian Plumbing Industry Commission. This water heater must be installed by a licensed person as required by the Victorian Building Act 1993. Only a licensed person will give you a Compliance Certificate, showing that the work complies with all the relevant Standards. Only a licensed person will have insurance protecting their workmanship for 6 years. Make sure you use a licensed person to install this water heater and ask for your Compliance Certificate.

DOES THE WATER CHEMISTRY AFFECT THE WATER HEATER?

The water heater is suitable for most public water supplies, however some water chemistries may have detrimental effects on the water heater, its components and fittings. Refer to **"Water Supplies"** on page 18.

If you are in a known harsh water area or you are not sure of your water chemistry, have your water checked against the conditions **described on pages 18 to 20**.

HOW LONG WILL THE WATER HEATER LAST?

The water heater is supported by a manufacturer's warranty (refer to page 4). There are a number of factors that will affect the length of service the water heater will provide. These include but are not limited to the water chemistry, the water pressure, the water temperature (inlet and outlet) and the water usage pattern. Refer to "Precautions" on page 15.

INTELLECTUAL PROPERTY

On purchase, the Solahart water heater becomes your property, except for the intellectual property and any other proprietary rights in the firmware or software ("Software") contained in or accessed through the water heater's master control module. The Software is owned by Rheem Australia Pty Ltd and its licensors. You do not acquire any intellectual property or other proprietary rights in the Software, including without limitation, any rights in patents, inventions, improvements, designs, trademarks, trade secrets, or copyrights.

You are granted a non-exclusive, non-transferable right to run and use the Software and any updated versions that we or our licensor may provide to you, only in and as incorporated in your Solahart water heater and for the normal operation of the water heater. You do not have any rights to obtain future upgrades, updates, or supplements to any Software.

Certain components of the Software are provided under separate third party license terms ("Separately Licensed Code") and your right to use such components is governed by such licence terms.

SOFTWARE UPDATES

Solahart may, in its discretion, provide remote patches or upgrades to the firmware or software ("Software") incorporated in your water heater, either directly or through a third party service provider. Remote upgrades will only be possible if your water heater is connected to the internet through an external control device. Solahart may also provide software or firmware upgrades during service call outs.

MAINTENANCE REQUIREMENTS

MINOR MAINTENANCE EVERY SIX MONTHS

It is recommended minor maintenance be performed every six (6) months. Minor maintenance can be performed by the dwelling occupant.

The minor maintenance includes:

- Operate the easing lever on the temperature pressure relief valve. It is very important you raise and lower the lever gently. Refer to “**Relief Valves**” on page 9.

⚠ Warning: Exercise care to avoid any splashing of water, as water discharged from the drain line will be hot. Stand clear of the drain line’s point of discharge when operating the valve’s lever.

- Operate the easing lever on the expansion control valve (if fitted). It is very important you raise and lower the lever gently. Refer to “**Relief Valves**” on page 9.
- Check the drain line from the safe tray (if one is installed) is not blocked.

MAJOR SERVICE EVERY FIVE YEARS

It is recommended a major service be conducted on the water heater every five (5) years.

⚠ Warning: Servicing of a water heater must only be carried out by qualified personnel. Phone your nearest Solahart Dealer.

Note: The major service and routine replacement of any components, such as the anode and relief valve(s), are not included in the Solahart warranty. A charge will be made for this work. Only genuine replacement parts should be used on this water heater.

The major service includes the following actions:

- Replace the temperature pressure relief valve.
- Inspect and flush the expansion control valve (if fitted). If required, replace the valve.
- Inspect and if required, replace the anode.

If the anode is not replaced, it should be replaced within five (5) years of this service. Refer to “**Anode Inspection and Replacement**” on page 19.

- Check the electric heating units for excessive calcium build-up or corrosion and replace if necessary.
- Visually check the unit for any potential problems.
- Inspect all connections.
- Check the sunshield and master controller module have adequate airflow and are clear of insects.
- Check the drain line from the safe tray (if one is installed) is not blocked.

Note: The water heater may need to be drained during this service. After the completion of the service, the water heater will take some time to reheat the water.

WATER SUPPLIES

This water heater must be installed in accordance with this advice to be covered by the Solahart warranty.

This water heater is manufactured to suit the water conditions of most public reticulated water supplies. However, there are some known water chemistries which can have detrimental effects on the water heater and its operation and / or life expectancy. If you are unsure of your water chemistry, you may be able to obtain information from your local water supply authority. This water heater should only be connected to a water supply which complies with these guidelines for the Solahart warranty to apply.

ANODE

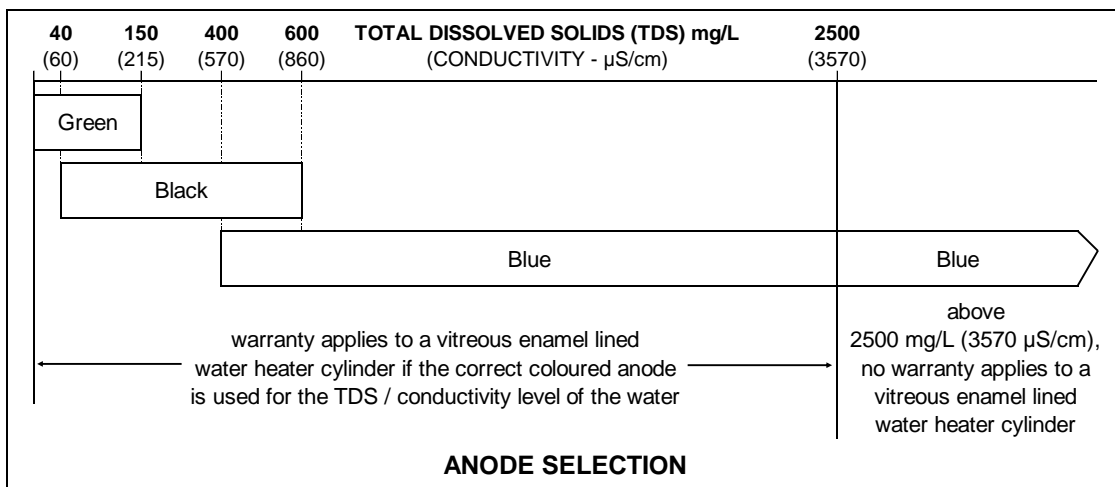
The vitreous enamel lined cylinder of the water heater is only covered by the Solahart warranty when the total dissolved solids (TDS) content in the water is less than 2500 mg/L and when the correct colour coded anode is used. If an incorrect colour coded anode is used in the water heater, any resultant faults will not be covered by the Solahart warranty. In addition, the use of an incorrect colour coded anode may shorten the life of the water heater cylinder.

The correct colour coded anode must be selected and fitted to the water heater in accordance with the following advice and the **Anode Selection chart** on page 18 for the Solahart warranty to apply to the water heater cylinder.

Total Dissolved Solids	Anode colour code
0 – 40 mg/L	Green
40 – 150 mg/L	Green or Black
150 – 400 mg/L	Black
400 – 600 mg/L	Black or Blue
600 – 2500 mg/L	Blue
2500 mg/L +	Blue (no cylinder warranty)

The changing of an anode must be carried out by a qualified person.

Note: Some water analysis reports may state the conductivity of the water rather than the level of total dissolved solids. Conductivity, measured in microsiemens per centimetre ($\mu\text{S} / \text{cm}$), is directly proportional to the TDS content of the water. TDS, in mg / L, is approximately 70% of the conductivity in $\mu\text{S} / \text{cm}$.



ANODE INSPECTION AND REPLACEMENT

The anode installed in your water heater will slowly dissipate whilst protecting the cylinder. The life of the cylinder may be extended by replacing the anode.

For water supplies which are either softened or desalinated, or where the water supply may alternate between a water tank and a reticulated public supply or another supply, or where there is a variable supply (e.g. from a bore or public reticulated supply from various water sources), the anode must be inspected (and replaced if there is any sign of depletion) within five (5) years of installation, and within every five (5) years thereafter.

For all water supplies, if the anode is not replaced during a major service (refer to “**Major Service Every Five Years**” on page 17) then in any event, the anode must be replaced at ten (10) years.

CAUTION

If the water supply has a TDS greater than 150 mg/L and a green anode has not been changed to a black anode, or if the TDS is greater than 600 mg/L and the anode has not been changed to a blue anode, there is the possibility the anode may become overactive and hydrogen gas could accumulate in the top of the water heater during long periods of no use.

If, under these conditions, the water heater has not been used for two or more weeks the following procedure should be carried out before using any electrical appliances (automatic washing machines and dishwashers) which are connected to the hot water supply.

The hydrogen, which is highly flammable, should be vented safely by opening a hot tap and allowing the water to flow. There should be no smoking or naked flame near the tap whilst it is turned on. Any hydrogen gas will be dissipated. This is indicated by an unusual spurting of the water from the tap. Once the water runs freely, any hydrogen in the system will have been released.

SATURATION INDEX

The saturation index is used as a measure of the water's corrosive or scaling properties. The saturation index figures stated are calculated using a water temperature of 80°C.

In a corrosive water supply, the water can attack copper parts and cause them to fail. Where the saturation index is less than -1.0 , the water is very corrosive and the Solahart warranty does not apply to the copper sheathed heating unit.

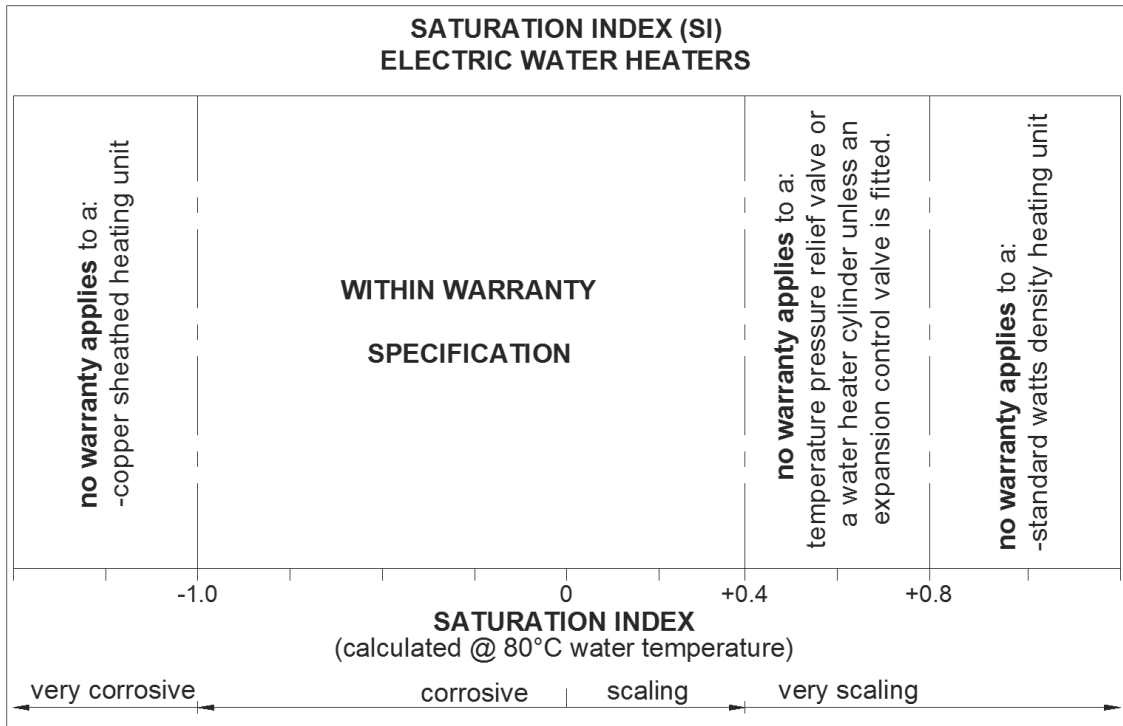
In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface. Where the saturation index exceeds $+0.40$, the water is very scaling. An expansion control valve must be fitted on the cold water line after the non-return valve to protect and for the Solahart warranty to apply to the temperature pressure relief valve and water heater cylinder.

Where the saturation index exceeds $+0.80$, the Solahart warranty does not apply to a standard watts density heating unit. The triple blade heating units fitted as standard to this water heater are a low watts density type.

Water which is scaling may be treated with a water softening device to reduce the saturation index of the water.

Refer to the **Saturation Index chart** on page 20. Refer to the **cold water connection detail on page 31** for the position of the expansion control valve.

Contact your nearest Solahart Dealer if a replacement heating unit is required.



CHANGE OF WATER SUPPLY

The changing or alternating from one water supply to another can have a detrimental effect on the operation and / or life expectation of a water heater cylinder, a temperature pressure relief valve and a heating unit.

Where there is a changeover from one water supply to another, e.g. a rainwater tank supply, bore water supply, desalinated water supply, public reticulated water supply or water brought in from another supply, then water chemistry information should be sought from the supplier or it should be tested to ensure the water supply meets the requirements given in these guidelines for the Solahart warranty to apply.

SUMMARY OF WATER CHEMISTRY ADVICE AFFECTING WARRANTY

The water heater and its components are not suitable for certain water chemistries. Those chemistries are listed below. If the water heater is connected at any time to a water supply with the following water chemistry, the Solahart warranty will not cover any resultant faults on the components listed below:

Water Chemistry	Component
Total Dissolved Solids (TDS) > 2500 mg/L	water heater cylinder
Total Dissolved Solids (TDS) not suitable for anode type	water heater cylinder
Saturation Index (SI) < -1.0	copper sheathed heating unit
Saturation Index (SI) > +0.4 (if expansion control valve is not fitted)	water heater cylinder temperature pressure relief valve
Saturation Index (SI) > +0.8	standard watts density heating unit

SAVE A SERVICE CALL

Check the items below before making a service call. You will be charged for attending to any condition or fault that is not related to the manufacture or failure of a part.

NOT ENOUGH HOT WATER (OR NO HOT WATER)

- **Is the electricity switched on?**

Inspect the isolating switch marked "HOT WATER" or "WATER HEATER" at the switchboard and the isolating switch (if one is installed) near the water heater and ensure they are turned on.

Note: Check the electricity supply to which the water heater is connected. The power supply must be a Continuous / Time of Use electricity supply.

Check the fuse marked "HOT WATER" or "WATER HEATER" at the switchboard.



- **Are you using more hot water than you think?**

Is one outlet (especially the shower) using more hot water than you think?

Very often it is not realised the amount of hot water used, particularly when showering. Carefully review the family's hot water usage. Have your plumber fit a flow control valve to each shower outlet to reduce water usage.

- **Temperature pressure relief valve running**

Is the relief valve discharging too much water?

Refer to "[Temperature Pressure Relief Valve or Expansion Control Valve Running](#)" on page 21.

- **Water heater size**

Do you have the correct size water heater for your requirements?

TEMPERATURE PRESSURE RELIEF VALVE OR EXPANSION CONTROL VALVE RUNNING

- **Normal Operation**

It is normal and desirable the temperature pressure relief valve or expansion control valve (if fitted) allows a small quantity of water to escape during the heating cycle. However, if it discharges more than a bucket full of water in 24 hours, there may be another problem.

The expansion control valve (if fitted) will discharge water instead of the temperature pressure relief valve as it has a lower pressure rating. A benefit is that energy is conserved as the discharged water is cooler. This valve is installed in the cold water line to the water heater (refer to the [cold water connection diagram](#) on page 31).

- **Continuous dribble**

Try gently raising the easing lever on the relief valve for a few seconds (refer to "[Relief Valves](#)" on page 9). This may dislodge a small particle of foreign matter and clear the fault. Release the lever gently.

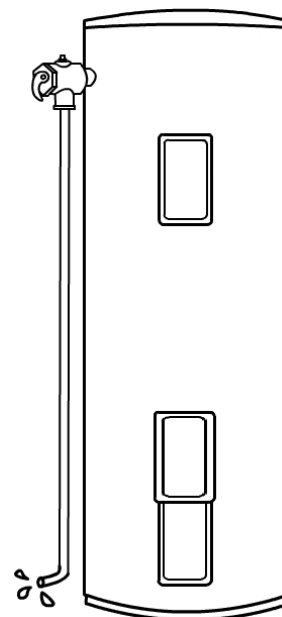
- **Steady flows for long period (often at night)**

This may indicate the mains water pressure sometimes rises above the designed pressure of the water heater. Ask your installing plumber to fit a pressure limiting valve.

⚠ Warning: Never replace the relief valve with one of a higher pressure rating.

- **Heavy flows of hot water from the temperature pressure relief valve until water heater is cold - then stops until water reheats**

The water heater **must** be switched off at the switchboard. Phone your nearest Solahart Dealer to arrange for an inspection.



LED OPERATION

Refer to “Types of LED Operation” on page 12 for further information on the types of flashes the LEDs produce.

- **All LEDs are Off (no illumination)**

If all LEDs remain off, check there is a power supply to the water heater.

Refer to “Is the electricity switched on?” on page 21.

If there is power available, there may be a problem with the water heater. Phone your nearest Solahart Dealer to arrange for an inspection.

- **All LEDs are Solid (constant illumination)**

If all LEDs remain on with a solid illumination, there is a problem with the water heater.

Phone your nearest Solahart Dealer to arrange for an inspection.

- **Yellow LED is Solid (red LED is off)**

If the yellow LED is solid, this is a warning there may be a fault with the water heater. The fault may be cleared by resetting the water heater.

Reset the water heater. Refer to “Reset the Water Heater” on page 22.

- **Red and Yellow LEDs are Standard Flashing Together**

If the red and yellow LEDs are flashing together, with a three (3) second pause between the sequences of flashes, there may be a fault with the water heater.

Reset the water heater. Refer to “Reset the Water Heater” on page 22.

- **Red LED is Fast Flashing (yellow and green LEDs are off)**

If the red LED is fast flashing, there may be a fault with the tank Master Controller Module.

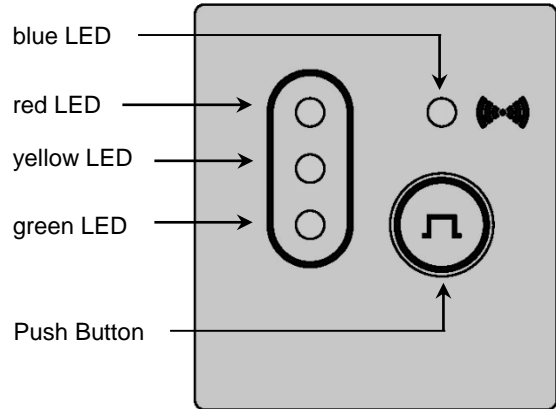
Phone your nearest Solahart Dealer to arrange for an inspection.

- **Blue LED is Blink Flashing**

The blue LED blink flashing indicates the external control device has not communicated with the water heater for more than thirty (30) minutes. Communication may re-initiate after this time, or if not this may indicate a fault with the external control device or the water heater.

Check the operational status of the external control device. Refer to the Owner’s Guide / Instructions supplied with the device. If the external control device is not operating as described in its literature, phone the Service Provider to arrange an inspection.

If the operational status of the external control device is as described, reset the water heater. Refer to “Reset the Water Heater” on page 22.



LED interface

RESET THE WATER HEATER

To reset the water heater:

- Press and hold the Push Button for between three (3) and six (6) seconds, then release.

During this time, the green LED will be solid for three (3) seconds, then go off. Release the Push Button whilst the green LED is off.

The water heater will enter an ‘Initialisation mode’ and the green, yellow and red LEDs will flash in an undefined sequence for up to sixty (60) seconds, which will include different types of flashes and may include short periods where the LEDs are remain all on or all off. This is normal operation. Check the blue LED is extra fast flashing, indicating it is communicating with the external control device.

When the Initialisation mode is complete, and if a potential fault is cleared, the green LED will either be solid (Standby mode) or standard flash to indicate the current operational status of the water heater. The blue LED will continue to extra fast flash.

Red and Yellow LEDs recommence to standard flash

- If the red and yellow LEDs recommence to standard flash:
 - Count the number of red flashes and the number of yellow flashes.
There will be a three (3) second pause, then the sequence of flashes will repeat.
The number of red and yellow flashes determines the fault code.
E.g. 3 x red flashes and 4 x yellow flashes is a fault code 34.
 - Note the fault code and phone your nearest Solahart Dealer to arrange for an inspection.

Yellow LED recommences a solid glow (constant illumination)

- If the yellow LED recommences a solid glow, press the Push Button three (3) times in quick succession.
 - The red, yellow and green LEDs will fast flash once simultaneously (Fault Display Sequence mode).
 - The red and yellow LEDs will then commence to standard flash. This represents a fault code.
 - Count the number of red flashes and the number of yellow flashes.
The number of red and yellow flashes determines the fault code.
E.g. 2 x red flashes and 3 x yellow flashes is a fault code 23.
 - Note the fault code.
 - **Note:** Up to five fault codes may be displayed. If there is more than one fault code, this sequence will repeat except the red, yellow and green LEDs will simultaneously fast flash two (2), three (3), four (4) or five(5) times (Fault Display Sequence mode) before displaying the second, third, fourth or fifth fault code respectively, with a three (3) second delay between each sequence of flashes.
 - Note any additional fault code(s).
 - Three seconds after the last fault code has been displayed, the yellow LED will recommence a solid glow.
 - The above procedure can be repeated by pressing the Push Button again three (3) times in quick succession, if it is necessary to recount and note the red and yellow fault code flashes.
 - After the fault codes have been noted, phone your nearest Solahart Dealer to arrange for an inspection.

Blue LED recommences to blink flash

If the blue LED recommences to blink flash after thirty (30) minutes, phone your nearest Solahart Dealer to arrange for an inspection.

HIGHER THAN EXPECTED ELECTRICITY BILLS

Should you at any time, feel your electricity bill is higher than expected, we suggest you check the following points:

- Are the red and / or yellow LEDs flashing on the Master Controller Module at the front of the water heater?

Red and / or yellow flashing LEDs may indicate the water heater is not operating correctly and it is using more utility grid sourced power or consuming it at a less economical time.

Refer to “LED Operation” on page 22.

- Is the relief valve running excessively?

Refer to “Temperature Pressure Relief Valve or Expansion Control Valve Running” on page 21.

- Is one outlet (especially the shower) using more hot water than you think?

Refer to “Not Enough Hot Water” on page 21.

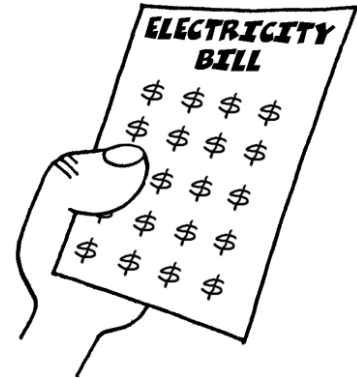
- Is there a leaking hot water pipe, dripping hot water tap, etc?

Even a small leak will waste a surprising quantity of hot water and electricity. Replace faulty tap washers, and have your plumber rectify any leaking pipe work.

- Has there been an increase in hot water usage?

An increase in hot water usage will result in an increase in water heater operation.

- Has your water heating tariff rate been increased by your electricity retailer since your previous bill?



ELECTRICITY TARIFFS

The electricity tariff to which your water heater is connected will determine the overall operating cost of the system. It is important you are aware of this tariff, i.e. Domestic / Continuous Time of Use supply.

IF YOU HAVE CHECKED ALL THE FOREGOING AND STILL BELIEVE YOU NEED ASSISTANCE, PHONE YOUR NEAREST SOLAHART DEALER.

INSTALLATION

THIS WATER HEATER IS NOT SUITABLE FOR POOL HEATING

INSTALLATION STANDARDS

The water heater must be installed:

- by a qualified person, and
- in accordance with the installation instructions, and
- in compliance with Standards AS/NZS 3500.4, AS/NZS 3000 and all local codes and regulatory authority requirements.

All packaging materials must be removed from the water heater prior to its installation. This includes the removal of the cardboard base of the carton from the underside of the water heater.

WATER HEATER APPLICATION

This water heater is designed for use in a single family domestic dwelling for the purpose of heating potable water. Its use in an application other than this may shorten its life.

If this water heater is to be used where an uninterrupted hot water supply is necessary for the application or business, then there should be back-up redundancy within the hot water system design. This should ensure the continuity of hot water supply in the event that this water heater was to become inoperable for any reason. We recommend you provide advice to the system owner about their needs and building back-up redundancy into the hot water supply system.

Notes

- If the water heater tank is installed without either the external control device or connection to a home energy management system (HEMS), then it will operate as a conventional twin element electric water heater only. It will not be able to take advantage of excess solar PV power production or be part of an intelligent water heating system.
- If the water heater is installed on a property that has export limiting capability of the solar PV power production, then it must be connected to a home energy management system (HEMS) for it to operate using excess solar PV power production.

WATER HEATER LOCATION

The water heater is suitable for either indoor or outdoor installation. Whether located outdoor or indoor, the water heater should be installed close to the most frequently used outlet and its position chosen with safety and service in mind.

Clearance must be allowed for servicing of the water heater. The water heater must be accessible without the use of a ladder or scaffold. Make sure the temperature pressure relief valve lever is accessible and the front cover, thermostat, heating unit can be removed for service.

You must be able to read the information on the rating plate. If possible leave headroom of one water heater height so the anode can be inspected or replaced. Remember you may have to take the entire water heater out later for servicing. Remember all local authorities have regulations about putting water heaters into roof spaces.

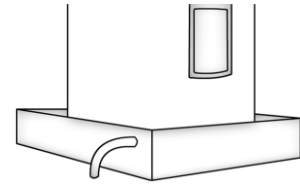
The water heater is to be installed at ground or floor level and must stand vertically upright on a stable base as acceptable to local authorities. The base of the water heater is made of corrosion resistant material, and it may be placed directly in contact with the supporting surface. It is not necessary to allow for free air circulation under the base of the water heater.

Note: The water heater should not be placed in direct contact with a concrete surface that is less than two months old and not fully cured as this may attack the metal coating of the water heater base. A moisture barrier should be used between the two surfaces in this instance.



SAFE TRAY

Where damage to property can occur in the event of the water heater leaking, the water heater must be installed in a safe tray. Construction, installation and draining of a safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements. AS/NZS 3500.4 also has particular requirements when a safe tray must be installed.

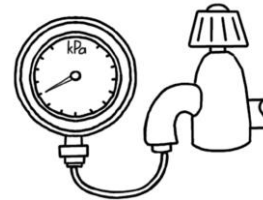


MAINS WATER SUPPLY

Where the mains water supply pressure exceeds that shown in the table below, an approved pressure limiting valve is required and should be fitted as shown in the **cold water connection diagram** on page 31.

Model	315
Temp press relief valve setting	1000 kPa
Expansion control valve setting*	850 kPa
Max. mains supply pressure	
With expansion control valve	680 kPa
Without expansion control valve	800 kPa

* Expansion control valve not supplied with water heater



TANK WATER SUPPLY

If the water heater is supplied with water from a tank supply and a pressure pump system is not installed, then the bottom of the supply tank must be at least 1 m above the highest point of the hot water plumbing system, including the water heater. Care must be taken to avoid air locks. The cold water line to the water heater should be adequately sized and fitted with a full flow gate valve or ball valve.

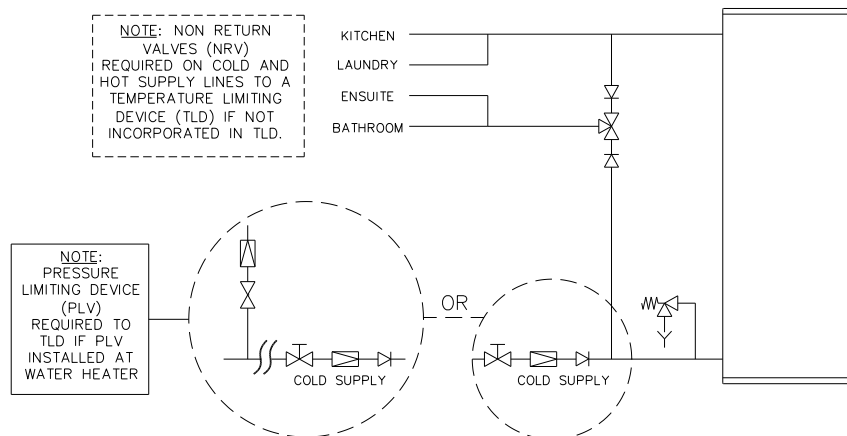
HOT WATER DELIVERY

This water heater can deliver water at temperatures which can cause scalding.

It is necessary and we recommend that a temperature limiting device be fitted between a Solahart 315PVV water heater and the hot water outlets in any ablution area such as a bathroom or ensuite, to reduce the risk of scalding. The installing plumber may have a legal obligation to ensure the installation of this water heater meets the delivery water temperature requirements of AS/NZS 3500.4 so that scalding water temperatures are not delivered to a bathroom, ensuite or other ablution area.

Where a temperature limiting device is installed adjacent to the water heater, the cold water line to the temperature limiting device can be branched off the cold water line either before or after the isolation valve, pressure limiting valve and non-return valve to the water heater. If an expansion control valve is required, it must always be installed after the non-return valve and be the last valve prior to the water heater.

If a pressure limiting valve is installed on the cold water line to the water heater and the cold water line to a temperature limiting device branches off before this valve or from another cold water line in the premises, then a pressure limiting valve of an equal pressure setting may be required prior to the temperature limiting device.



Two Temperature Zones Using a Temperature Limiting Device

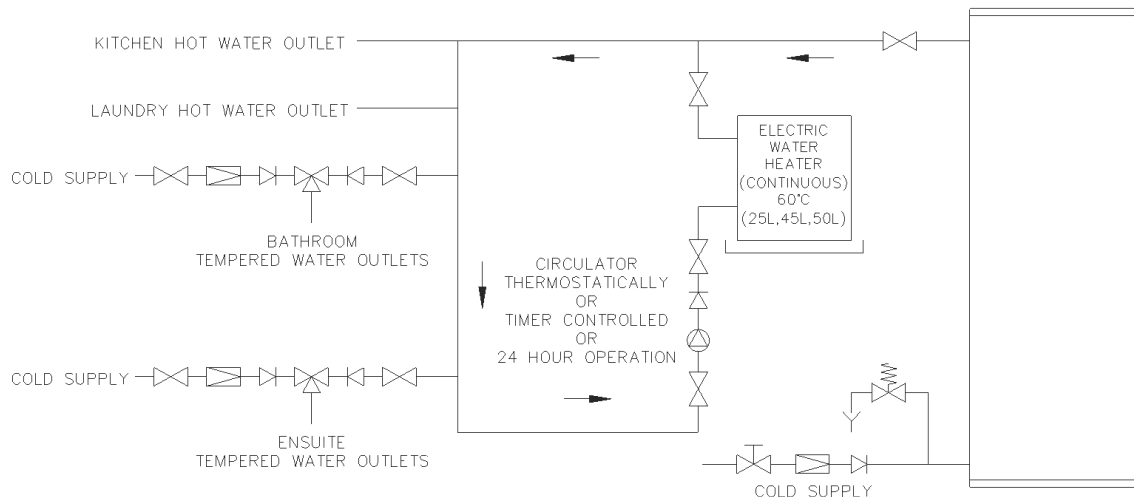
CIRCULATED HOT WATER FLOW AND RETURN SYSTEM

This water heater should not be installed as part of a circulated hot water flow and return system in a building. The benefits of solar gain will be significantly reduced.

If a circulated flow and return system is required, it is necessary to install a secondary water heater supplied from this water heater. The flow and return lines connect to the secondary water heater, not this water heater. The secondary water heater makes up for the pipe heat loss in the flow and return system and must be able to provide a hot water outlet temperature of at least 60°C.

Note: The thermostat or preset outlet temperature of the secondary water heater must always be set to maintain a temperature of at least 60°C in the hot water flow and return line, including making up pipe heat losses in the system.

Refer to the **Circulated Hot Water Flow and Return – Solar PV Electric Water Heater** diagram on page 27.



NOTE: A PLV IS REQUIRED TO BE INSTALLED ON THE COLD SUPPLY LINE TO THE TEMPERING VALVE IF A PLV IS INSTALLED ON THE COLD SUPPLY LINE TO THE WATER HEATER.

**Circulated Hot Water Flow and Return System
Solar PV Electric Water Heater**

Temperature Limiting Device

A temperature limiting device cannot be installed in circulated hot water flow and return pipe work. The tempered water from a temperature limiting device cannot be circulated. Where a circulated hot water flow and return system is required in a building, a temperature limiting device can only be installed on a dead leg, branching off the circulated hot water flow and return pipe.

If circulated tempered water were to be returned back to the secondary or in-series booster water heater, then when the hot taps are closed no water will be supplied to the cold water inlet of the temperature limiting device whilst hot water will continue to be supplied to the hot water inlet of the temperature limiting device.

This condition may result in either water at a temperature exceeding the requirements of AS/NZS 3500.4 being delivered to the hot water outlets in the ablution areas, or the device closing completely and not delivering water at all, or the device failing. Under this condition, the operation and performance of the device cannot be guaranteed.

ANODE

The vitreous enamel lined cylinder of the water heater is only covered by the Solahart warranty when the total dissolved solids (TDS) content in the water is less than 2500 mg/L and when the correct colour coded anode is used. If an incorrect colour coded anode is used in the water heater, any resultant faults will not be covered by the Solahart warranty. In addition, the use of an incorrect colour coded anode may shorten the life of the water heater cylinder.

The correct colour coded anode for the water supply being used must be selected and fitted to the water heater for the Solahart warranty to apply to the water heater cylinder (refer to “Water Supplies” on page 18 and the Anode Selection chart on page 18). The black anode is typically fitted as standard.

Total Dissolved Solids	Anode colour code
0 – 40 mg/L	Green
40 – 150 mg/L	Green or Black
150 – 400 mg/L	Black
400 – 600 mg/L	Black or Blue
600 – 2500 mg/L	Blue
2500 mg/L +	Blue (no cylinder warranty)

If the water supply has a TDS greater than 150 mg/L and a green anode has not been changed to a black anode, or if the TDS is greater than 600 mg/L and the anode has not been changed to a blue anode, there is the possibility the anode may become overactive and hydrogen gas could accumulate in the top of the water heater during long periods of no use. In areas where this is likely to occur, the installer should instruct the householder on how to dissipate the gas safely (refer to “Caution” on page 19).

REDUCING HEAT LOSSES

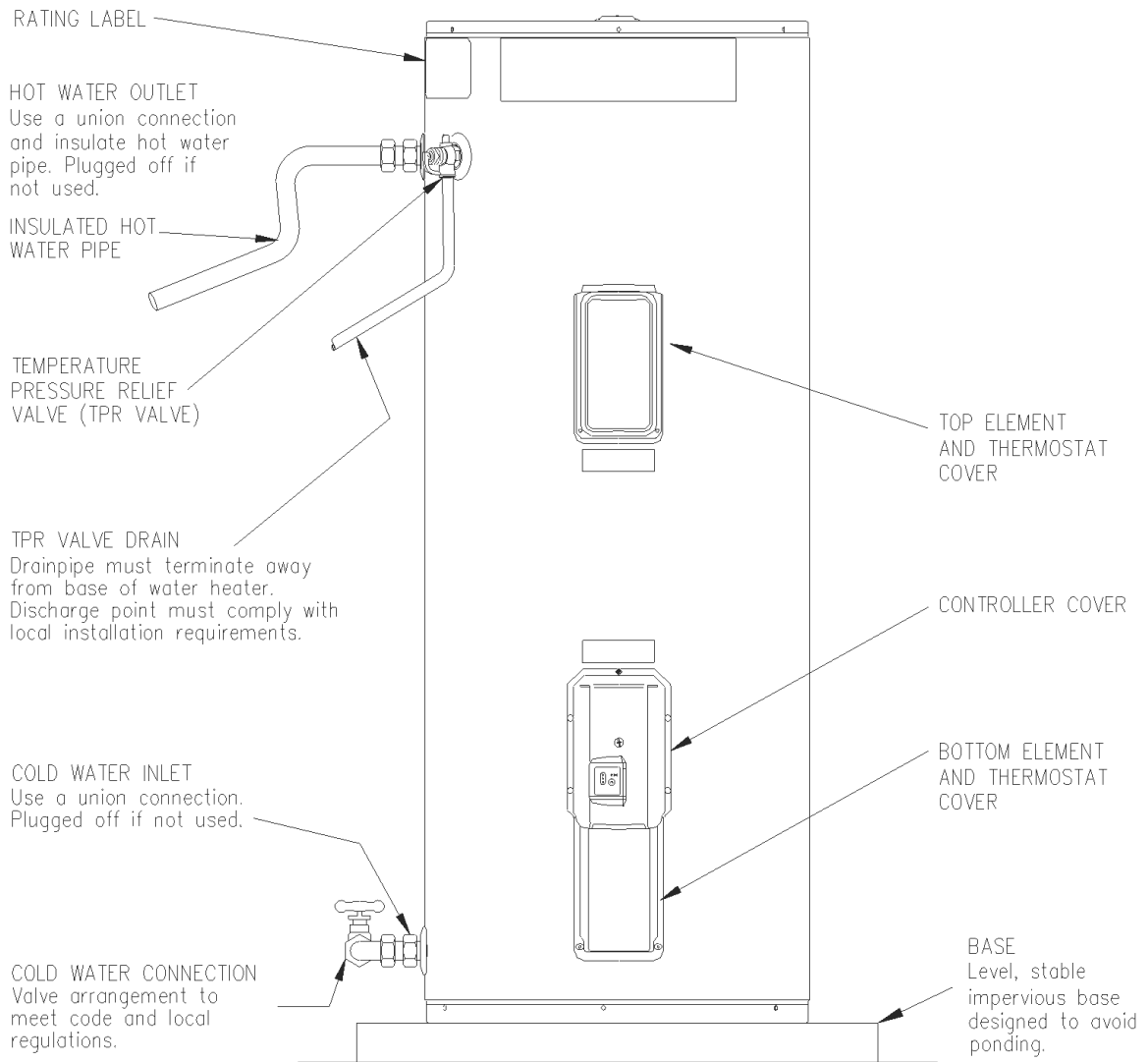
The cold water line to and the hot water line from the water heater must be insulated in accordance with the requirements of AS/NZS 3500.4. The insulation must be weatherproof and UV resistant if exposed.

SADDLING PIPE WORK

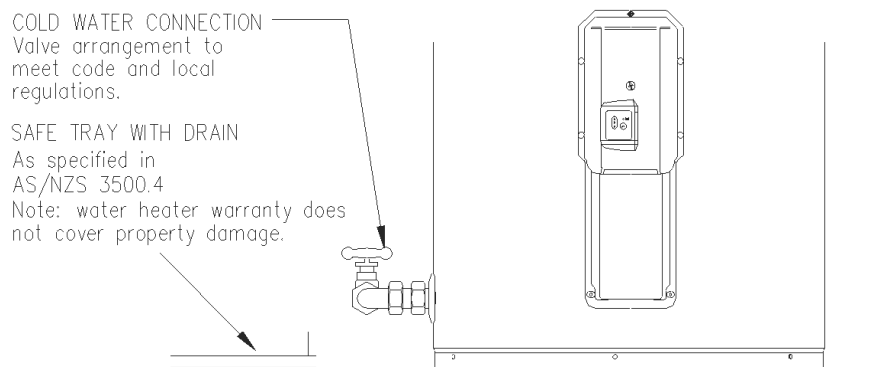
To prevent damage to the cylinder when attaching pipe clips or saddles to the water heater jacket, we recommend the use of self-drilling screws with a maximum length of 13 mm. Should pre-drilling be required, extreme caution must be observed when penetrating the jacket of the water heater.

Note: If the cylinder is damaged as a result of attaching pipe clips or saddles to the jacket, any resultant faults will not be covered by the Solahart warranty.

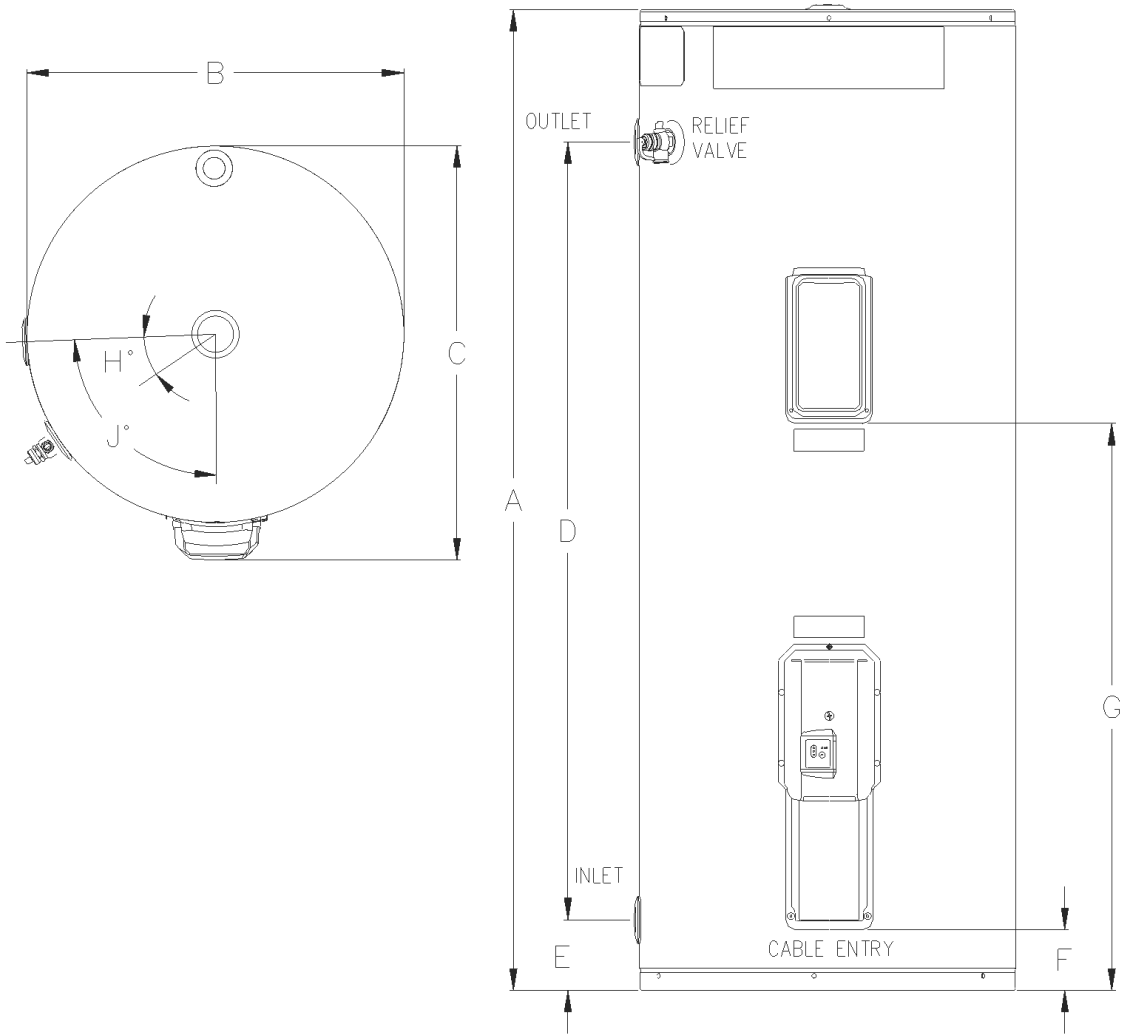
TYPICAL INSTALLATION – OUTDOOR LOCATION



TYPICAL INSTALLATION – INDOOR LOCATION



DIMENSIONS AND TECHNICAL DATA



Model	Hot Water Delivery Rating	Top Element Capacity	Bottom Element Capacity	TPR Valve Rating	Weight Packaged	Weight Full
315PVV	315 litres	150 litres	315 litres	1000 kPa	99 kg	417 kg

Dimensions (mm)	A	B	C	D	E	F	G	H	J
315PVV	1661	638	701	1317	120	104	960	32°	88°

This model is suitable for either indoor or outdoor installation.
 This model has left hand water and TPR valve connections only.
 Technical data is subject to change.

CONNECTIONS – PLUMBING

All plumbing work must be carried out by a qualified person and in accordance with the Standard AS/NZS 3500.4 and all local codes and regulatory authority requirements.

CONNECTION SIZES

- Hot water connection Rp 3/4
- Cold water connection Rp 3/4
- Relief valve connection Rp 1/2

WATER INLET AND OUTLET

All pipe work must be cleared of foreign matter before connection and purged before attempting to operate the water heater. All olive compression fittings must use brass or copper olives. Use an approved thread sealant such as Teflon tape on all sealing threads.

An isolation valve and non-return valve must be installed on the cold water line to the water heater. An acceptable arrangement is shown in the diagram. Refer also to “[Hot Water Delivery](#)” on page 26 and to “[Mains Water Supply](#)” on page 26.

A disconnection union must always be provided at the cold water inlet and hot water outlet on the water heater to allow for disconnection of the water heater. This water heater is intended to be permanently connected to the water mains and not connected by a hose set.

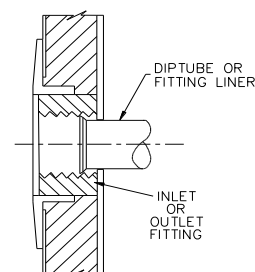
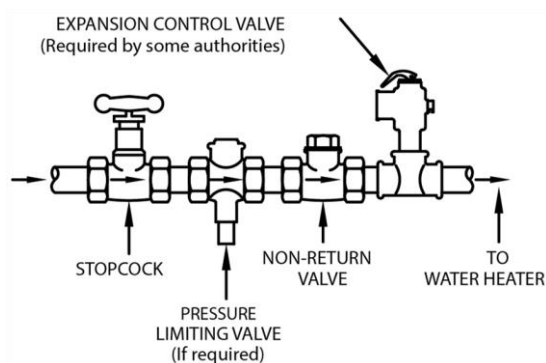
This water heater has either a plastic dip tube or fitting liner in the inlet and outlet fittings (see diagram). These must be in place for the water heater to function properly. Do not remove or damage them by using heat nearby. They will be pushed into the correct position as the fitting is screwed in.

This water heater is intended to be permanently connected to the water mains and not connected by a hose-set. A braided flexible hose or semi-flexible connector may be used for connection to the water heater, where permitted by AS/NZS 3500.4.

PIPE SIZES

To achieve true mains pressure operation, the cold water line to the water heater should be the same size or bigger than the hot water line from the water heater.

The pipe sizing for hot water supply systems should be carried out by persons competent to do so, choosing the most suitable pipe size for each individual application. Reference to the technical specifications of the water heater and local regulatory authority requirements must be made.



TEMPERATURE PRESSURE RELIEF VALVE

The temperature pressure relief valve is shipped in a plastic bag attached to the water heater. The temperature pressure relief valve must be fitted before the water heater is operated. Before fitting the relief valve, make sure the probe has not been bent. Seal the thread with an approved thread sealant such as Teflon tape - never hemp. Make sure the tape does not hang over the end of the thread.

Screw the valve into the selected opening labelled "Relief Valve" (refer to the [installation diagram](#) on page 29) leaving the valve outlet pointing downwards. Do not use a wrench on the valve body - use the spanner flats provided. A copper drain line must be fitted to the temperature pressure relief valve (refer to ["Relief Valve Drain"](#) on page 32).

The valve must be insulated with closed cell polymer insulation or similar (minimum thickness 9 mm) and the insulation installed so as not to impede the operation of the valve. The insulation must be weatherproof and UV resistant if exposed.

EXPANSION CONTROL VALVE

Local regulations may make it mandatory to install an expansion control valve (ECV) in the cold water line to the water heater. In other areas, an ECV is required if the saturation index is greater than +0.4 (refer to ["Water Supplies"](#) on page 18).

The expansion control valve must always be installed after the non-return valve and be the last valve installed prior to the water heater (refer to the [cold water connection diagram](#) on page 31). A copper drain line must be fitted to the expansion control valve (refer to ["Relief Valve Drain"](#) on page 32).

The valve, if installed within 500 mm of the water heater, must be insulated with closed cell polymer insulation or similar (minimum thickness 9 mm) and the insulation installed so as not to impede the operation of the valve. The insulation must be weatherproof and UV resistant if exposed.

RELIEF VALVE DRAIN

DN15 copper drain lines must be fitted to the temperature pressure relief valve and expansion control valve (if one is installed) to carry the discharge clear of the water heater. Connect the drain lines to the valves using disconnection unions. The drain line from the valve to the point of discharge should be as short as possible, have a continuous fall all the way from the water heater to the discharge outlet and have no tap, valves or other restrictions in the pipe work. A drain line from a relief valve must comply with the requirements of AS/NZS 3500.4.

A drain line must be no longer than nine (9) metres with no more than three bends greater than 45° before discharging at an outlet or air break. The maximum length of nine (9) metres for a drain line is reduced by one (1) metre for each additional bend required of greater than 45°, up to a maximum of three additional bends. Where the distance to the point of final discharge exceeds this length, the drain line can discharge into a tundish.

Subject to local regulatory authority approval, the drain lines from the temperature pressure relief valve and expansion control valve from an individual water heater may be interconnected.

The outlet of a drain line must be in such a position that flow out of the pipe can be easily seen, but arranged so discharge will not cause injury, damage or nuisance. The termination point of a drain line must comply with the requirements of AS/NZS 3500.4. Drain lines must not discharge into a safe tray.

In locations where water pipes are prone to freezing, drain lines must be insulated, must not exceed 300 mm in length and are to discharge into a tundish through an air gap of between 75 mm and 150 mm.

If a drain line discharges into a tundish, the drain line from the tundish must be not less than DN20. The drain line from a tundish must meet the same requirements as for a drain line from a relief valve.

⚠ Warning: As the function of the temperature pressure relief valve on this water heater is to discharge high temperature water under certain conditions, it is strongly recommended the pipe work downstream of the relief valve be capable of carrying water exceeding 93°C. Failure to observe this precaution may result in damage to pipe work and property.

CONNECTIONS – ELECTRICAL

The power supply to the water heater must not be switched on until the water heater is filled with water and a satisfactory megger reading is obtained.

All electrical work and permanent wiring must be carried out by a qualified person and in accordance with the edition of the Wiring Rules AS/NZS 3000 in force in the state or territory at the time of installation, and all local codes and regulatory authority requirements.

WATER HEATER

The water heater must be directly connected to a 220 V - 240 V AC, 50 Hz mains power supply with an isolating switch installed at the switchboard. The Wiring Rules AS/NZS 3000:2018 requires a second and lockable isolating switch be installed adjacent to but not on or attached to the water heater, and a residual current device (RCD) installed in the electrical circuit to the water heater.

Total Rating Per Heating Unit	Total Current @ 240 V AC	Variable Staged Ratings of Triple Blade Heating Unit		
3600 Watts	15 Amps	850 Watts	1050 Watts	1700 Watts

The power supply must be a Continuous / Domestic Time of Use type. A separately metered controlled load supply, i.e. Off-Peak / time controlled, is not suitable. Check with the local electricity supply authority as to their requirements. A home management system will provide the maximum financial savings by supplying grid sourced power at cheaper tariff times when additional heating is required. Discuss the power supply requirements with the householder.

A flexible 20 mm conduit is required for the electrical cable to the water heater. The conduit is to be connected to the unit with a 20 mm terminator. Connect the power supply wires directly to the terminal block and earth tab connection, ensuring there are no excess wire loops inside the front cover. The temperature rating of the power supply wires insulation must suit this application, or the wiring protected by insulating sleeving with an appropriate temperature rating if it can make contact with the internal storage cylinder. The temperature of the internal storage cylinder can reach 75°C under normal operation.

Note: If the water heater is installed on a property that has export limiting capability of the solar PV power production, then it must be connected to a home energy management system (HEMS) for it to operate using excess solar PV power production.

SENSOR AND THERMOSTAT SETTINGS

The temperature sensors control the maximum water temperature in conjunction with the control system. Water is heated to either 60°C or 75°C depending on the mode of operation. These temperature settings are fixed and cannot be adjusted. The thermostats act as a backup safety device to control the electricity supply to the heating unit. The thermostats have a fixed temperature setting of 80°C. They are not adjustable.

EXTERNAL CONTROL DEVICE

An external control device must be installed for this water heater to operate as a variable power water heater and take advantage of excess power generated by a solar PV system. The external control device is installed remote from the water heater and is wired directly to the switchboard. The external control device communicates with the Master Controller Module on the water heater. Refer to the installation instructions provided with the external control device for details of its installation.

The PowerStore water heater's Master Controller Module is capable of communications using the power line telecommunications (PLT) protocol. It is not necessary to hard wire an external control device that is PLT capable and protocol compliant with the PowerStore water heater, to the water heater.

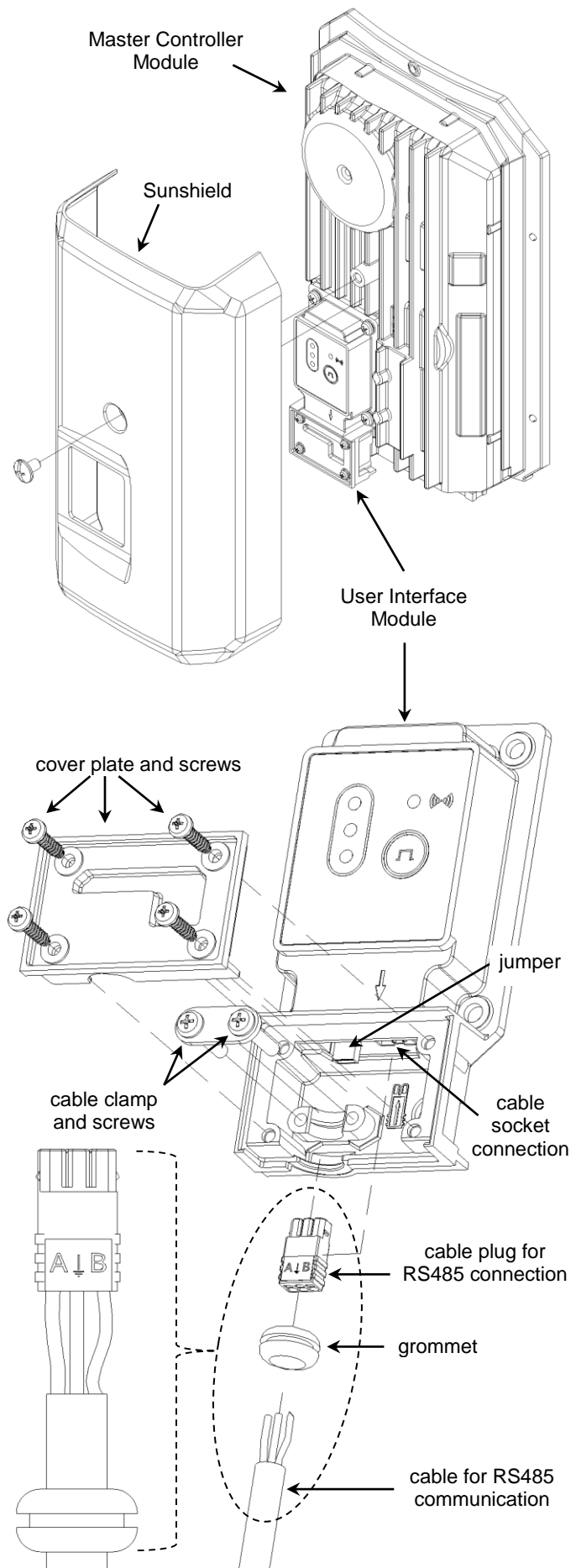
For an external control device that cannot use PLT to communicate with the PowerStore water heater's Master Controller Module, either due to lack of capability or excessive line noise, then a cable suitable for RS485 communication is required to be connected between the external control device and the Master Controller Module on the water heater. The cable must have wire sizes of 0.14 mm² to 0.5 mm² for solid wires or 0.2 mm² to 0.5 mm² for stranded wires to fit the connector supplied. The cable is available from the external control device supplier. Refer to the [RS485 Communication Cable Connection Procedure](#) on page 34 for the connection point on the water heater.

RS485 Communication Cable Connection Procedure

To connect a cable for RS485 communication to the water heater:

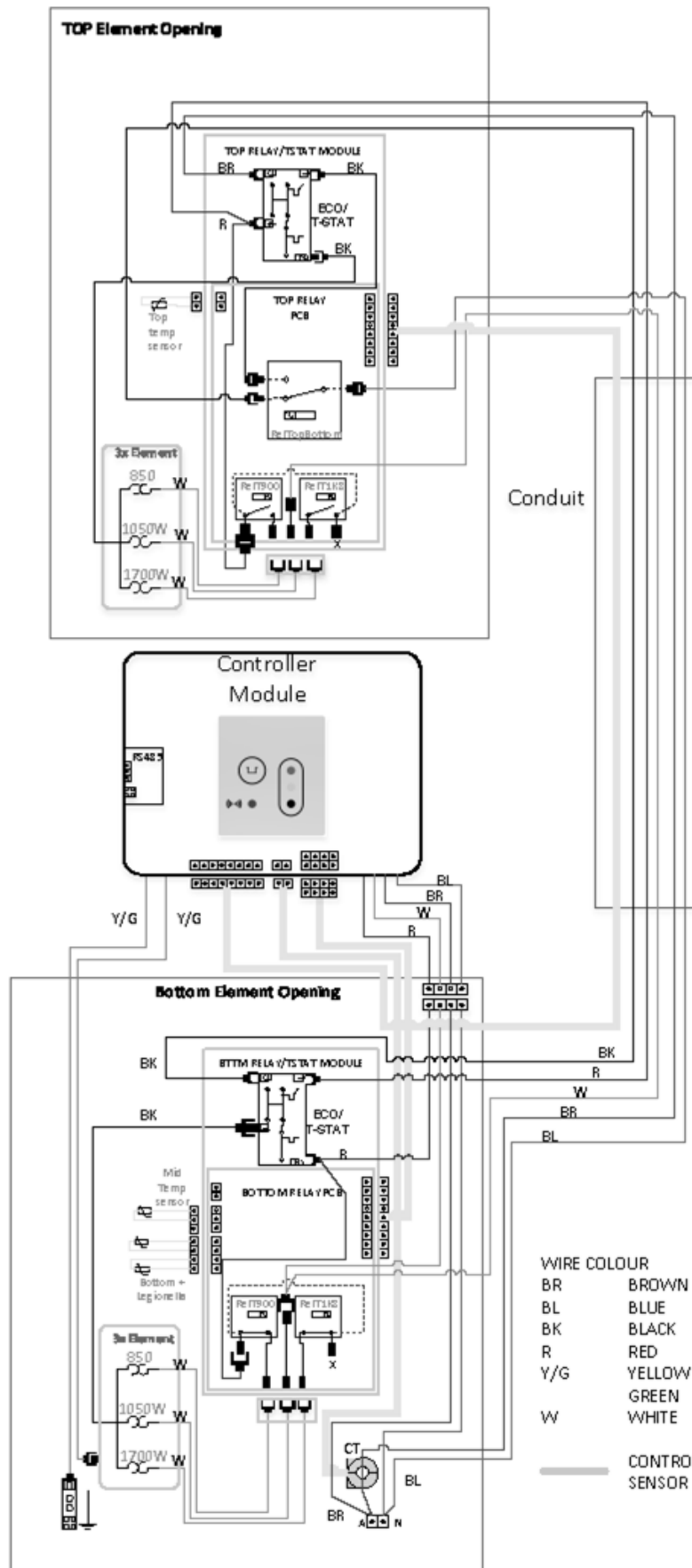
1. Undo the screw securing the Sunshield from the Master Controller Module, and set the Sunshield and screw aside.
2. Undo the four screws securing the cover plate to the front of the User Interface Module, and set the cover plate and screws aside.
3. Undo the two screws securing the cable clamp, and set the cable clamp and screws aside.
4. Remove the black rubber grommet and slide over the end of the cable.
5. Remove the cable plug from the socket located on the upper right hand side of the cavity in the User Interface Module.
6. Connect the cable wires to the cable plug ensuring the correct coloured wires are connected to the connections marked A+, B+, G.
7. Connect the cable plug into the socket securely locking into position.
8. Position the cable, ensuring the cable insulation is seated in the clamp mould.
9. Ensure the black rubber grommet is in position.
10. Refit the cable clamp, securing into position with its two screws.
11. Refit the cover plate, securing into position with its four screws.
12. Refit the Sunshield to the Master Controller Module, securing with its screw.

Note: The Master Controller Module has a termination resistor fitted for RS485 multi-drop applications. The terminator resistor can be removed from the circuit by the removal of the jumper, which is located adjacent to the cable socket connection. The jumper should only be removed in cases where the water heater is part of a multi-drop RS485 installation and the water heater is not the final node on the RS485 drop.



Cable Connection for RS485 Communication

WIRING DIAGRAM



Top thermostat – fixed setting

80°C

Bottom thermostat – fixed setting

80°C.

**Electrical Circuit for Twin Element Variable Power Water Heater
Robertshaw "ST" Thermostats**

COMMISSIONING

TO FILL AND TURN ON THE WATER HEATER

The power supply to the water heater must not be switched on until the water heater is filled with water and a satisfactory megger reading is obtained.

- Open all of the hot water taps in the house (don't forget the shower).
- Open the cold water isolation valve fully on the cold water line to the water heater.
Air will be forced out of the taps.
- Close each tap as water flows freely from it.
- Check the pipe work for leaks.
- Switch on the electrical supply at the water heater isolating switch on the switchboard and at the isolating switch at the water heater (if installed).
- Check the status of the LEDs if an external control device has been installed.
 - When the power is turned on, the water heater will enter the Initialisation mode.
 - The green, yellow and red LEDs will flash in an undefined sequence for up to sixty (60) seconds, which will include different types of flashes and may include short periods where the LEDs remain all on or all off.
 - The blue LED will extra fast flash.
 - The water heater will then enter Maintenance mode.
 - The green LED will display 2 x standard flashes with an interval during Maintenance mode.
 - The blue LED will extra fast flash.

Notes:

- Refer to “LED Operation” on page 12 for further information on the LED operation and definitions of flash speeds.
- After the Initialisation mode, if either all LEDs simultaneously go out or simultaneously turn solid, or there is a solid yellow LED or flashing red and yellow LEDs simultaneously, this indicates there may be a fault with the water heater. Refer to “LED Operation” on page 22, in the Save A Service Call section of this Owner's Guide and Installation Instruction.

Explain to the householder or a responsible officer the functions and operation of the water heater.

Upon completion of the installation and commissioning of the water heater, leave this guide with the householder or a responsible officer.

TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater on completion of the installation, such as on a building site or where the premises is vacant, then;

- Switch off the electrical supply at the water heater isolating switch on the switchboard and at the isolating switch at the water heater (if installed).
- Close the cold water isolation valve at the inlet to the water heater.

DRAINING THE WATER HEATER

⚠ Warning: Exercise care, as water discharged from the water heater may be of a very high temperature.

To drain the water heater:

- Turn off the water heater (refer to **“To Turn Off The Water Heater”** on page 36).
- Close all hot water taps.
- Operate the relief valve release lever - do not let the lever snap back or you will damage the valve seat.

Operating the lever will release the pressure in the water heater.

- Undo the union at the cold water inlet to the water heater and attach a hose to the water heater side of the union.

Let the other end of the hose go to a drain.

- Operate the relief valve again.

This will let air into the water heater and allow the water to drain through the hose.

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SOLAHART OFFICES

International Headquarters

Solahart Industries Pty Ltd
(ABN 45 064 945 848)

Registered and Head Office
1 Alan Street
Rydalmere, New South Wales, 2116
Australia

Postal Address:
PO Box 7508
Silverwater, New South Wales, 2128
Australia

Principal Manufacturing Facility
55 Brodie Street
Rydalmere, New South Wales, 2116
Australia

www.solahart.com.au

Australia

For SERVICE Telephone - **1800 638 011**
or your nearest Solahart Dealer

For Sales Telephone - **1300 769 475**
or your nearest Solahart Dealer

International Sales

Telephone International Sales:
+ 61 8 9351 4600

Facsimile International Sales:
+ 61 8 9351 4698

Email:
solahart@solahart.com.au

Web:
www.solahart.com