Owners Guide and Installation Instructions

Solar Commercial Loline Water Heater System

Install a Rheem

WARNING: Plumber – Be Aware

Use copper pipe **ONLY**. Plastic pipe **MUST NOT** be used. It is a requirement of a solar water heater installation that all pipe work be in copper and not plastic, due to the effects of high water temperatures and pressures.

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

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.

WARNING: Plumber – Be Aware

- The solar hot and solar cold pipes between the solar storage tank and the solar collectors **MUST BE** of copper and fully insulated with fibreglass insulation or similar (minimum thickness 13 mm). Thicker insulation may be required to comply with the requirements of AS/NZS 3500.4. The insulation must be weatherproof and UV resistant if exposed. All compression fittings must use brass or copper olives.
- Closed cell polymer insulation should not be used as it may not be able to withstand the temperature of the water generated by the solar collectors under stagnation conditions.

  Note: Failure to observe these requirements may void the warranty for freeze damage.

- Plastic pipe **MUST NOT** be used, as it will not withstand the temperature and pressure of the water generated by the solar collectors under stagnation conditions. The solar collectors can generate extremely high water temperatures up to 150°C and high water pressure of 1000 kPa. Plastic pipe cannot withstand these temperatures and pressures and **MUST NOT** be used. Failure of plastic pipe can lead to the release of high temperature water and cause severe water damage and flooding. Refer to Warning on page 48.

- A non return valve **MUST BE** installed on the cold water line to the solar storage tank **AFTER** the cold water branch to a temperature limiting device.

PATENTS

This water heater may be protected by one or more patents or registered designs.

CONTENTS

PROPERTY OWNER – We recommend you read pages 4 to 22.
The other pages are intended for the installer but may be of interest.

ABOUT YOUR WATER HEATER

WATER HEATER APPLICATION

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

MODEL TYPE

Congratulations for choosing a Rheem® water heater. Your Rheem commercial solar Loline™ water heater is designed for the solar collectors to be roof mounted and the solar storage tanks to be installed at ground or floor level. The Rheem solar storage tanks are suitable for installation either outdoor or indoor and with Rheem NPT 200 solar collectors. The system is not suitable for installation above 400 metres altitude.

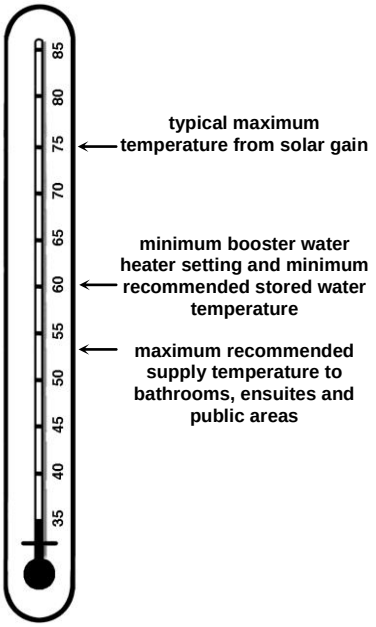
The system when installed in areas subject to freeze conditions must be installed with the solar hot and solar cold pipes fully insulated with fibreglass insulation (minimum thickness 13 mm) and with an auxiliary electric water heater located in the solar cold line to offer protection against freeze damage. Freeze conditions occur below 6°C. The system has NO WARRANTY for freeze damage when installed above 400 metres altitude or if the solar hot and solar cold pipes are uninsulated or if an auxiliary electric water heater has not been installed.(refer to "Warranty Exclusions" on page 70 and to "Pipe Work and Insulation" on page 7).

HOW HOT SHOULD THE WATER BE?

The solar control unit will circulate water through the solar collectors until a temperature of approximately 75°C is reached. During periods of low solar energy gain, the water temperature will be automatically boosted by the in series booster water heater(s). Refer to the Owners Guide and Installation Instructions supplied with the booster water heater(s).

To meet the requirements of the National Plumbing Standard the temperature of the stored water must not be below 60°C. Therefore it is necessary to have in-series booster water heaters as part of the installation.

Rheem recommends the thermostat(s) of the in-series booster water heater(s) be set at 60°C to maximise solar contribution.



ABOUT YOUR WATER HEATER

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 bathing and public areas when this water heater is installed. This will keep the water temperature below the maximum permitted by AS/NZS 3500.4 to these areas. The risk of scald injury will be reduced and still allow hotter water to the kitchen, laundry and other areas requiring sanitising temperatures.

TEMPERATURE ADJUSTMENT

The in-series booster water heater(s) feature adjustable thermostat(s). They may require a licensed tradesperson to make any temperature adjustments. The thermostat(s), depending upon the model of water heater, has a maximum temperature setting of between 65°C and 82°C and a minimum temperature setting of 60°C.

We advise the thermostat(s) of the in-series water heater(s) are adjusted to the lowest setting which meets your needs, especially if there are young children or elderly people in the premises. Refer to “Hotter Water Increases the Risk of Scald Injury” on page 5.

⚠ WARNING

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.

This water heater uses 240 V AC electrical power for operation of the control systems and the electrically operated components. The removal of the solar controller or circulator covers will expose 240 V wiring. They must only be removed by a qualified person.

The power lead from the solar controller must be plugged into a weatherproof electrical outlet if installed outdoors. Take care not to touch the power plug with wet hands.

Care should be taken not to touch the pipe work connecting the solar storage tanks and the solar collectors. Very high temperature hot water can be generated by the solar collectors under certain conditions and flow through the pipe work from the solar collectors to the solar storage tanks.

ABOUT YOUR WATER HEATER

SAFETY

Each solar storage tank is supplied with a combination temperature pressure relief valve. This device must not be tampered with or removed. The solar water heater system must not be operated unless each of these devices is fitted and is in working order.

If the power supply cord or plug to the solar control unit or the electrical conduit to the circulator(s) is damaged, it must be replaced by a qualified person in order to avoid a hazard. The power supply cord and plug must be replaced with a genuine replacement part available from Rheem. Phone your nearest Rheem Service Department or Accredited Service Agent to arrange for an inspection.

The Rheem 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.

TO TURN OFF THE WATER HEATER

If it is necessary to turn off the water heater:

- Switch off the electrical supply at the power outlet to the solar control unit and circulator(s) (refer to note below).Isolate the power to the auxiliary electric heater at the isolating switch.
- Close the cold water isolation valve on the cold water line to the solar storage tanks to shut down the entire system, or;
- Close the isolation valves on the cold, hot and solar hot water branches to shut down an individual solar storage tank in a bank, or;
- Close an isolation valve at each circulator and close the isolation valve at each solar hot water branch to each solar storage tank to isolate the solar collectors only.
- Open the solar cold pipe drain isolation valve or the air bleed valve if one is installed.

  ⚠ **Warning:** The solar collectors should only be isolated if a solar cold pipe drain isolation valve and / or an air bleed valve are installed and at least one of them is opened, or if they are to be drained or serviced.

Note: If there is a risk of freezing conditions, the electrical supply to the solar control unit and auxiliary electric heater should not be switched off unless the solar collectors are drained, otherwise damage could result (refer to “Freeze Protection” on page 9).

ABOUT YOUR WATER HEATER

TO TURN ON THE WATER HEATER

- Ensure the solar cold pipe drain isolation valve and the air bleed valve are closed and the circulator isolation valves are open.
- Open the isolation valves on the cold, hot and solar hot water branches at each solar storage tank.
- Open the cold water isolation valve fully on the cold water line to the solar storage tanks.
- If the solar collectors and solar hot and solar cold pipes have been drained, it will be necessary to bleed the collector circuit (refer to "Bleeding the Solar Collectors" on page 8).
- Switch on the electrical supply at the power outlet to the solar control unit, auxiliary electric heater and circulator(s).

  The power outlet must be switched on for the solar control unit to operate and solar gain to be achieved.

HOW DO I KNOW IF THE WATER HEATER IS INSTALLED CORRECTLY?

Installation requirements are shown on page 18 to 24. 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.

In New Zealand, the installation must also conform with Clause G12 of the New Zealand Building Code.

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 15**. If you are not sure, have your water chemistry checked against the conditions described on pages 15 to 18.

PIPE WORK AND INSULATION

The solar hot and solar cold pipe work between the solar storage tank and the solar collectors and between the solar storage tank and in-series water heater **MUST BE** of copper and fully insulated with fibreglass insulation or similar (minimum thickness 13 mm). The insulation must be weatherproof and UV resistant if exposed. Closed cell polymer insulation should not be used as it

may not be able to withstand the temperature of the water generated by the solar collectors under stagnation conditions.

The insulation is essential to assist in providing freeze protection, will offer corrosion protection to a metal roof against water runoff over the copper pipe, assist in avoiding accidental contact with the solar pipe work and also reduce pipe heat losses. The insulation must be fitted up to the connections on both the solar collectors and the solar storage tank, as very high temperature water can flow from the solar collectors to the solar storage tank under certain conditions.

Plastic pipe **MUST NOT** be used, as it will not withstand the temperature and pressure of the water generated by the solar collectors under certain conditions (refer to Warning on page 48).

HOW LONG WILL THE WATER HEATER LAST?

Your water heater is supported by a manufacturer's warranty (refer to page 70). 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, temperature (inlet and outlet) and the water usage pattern. Refer to "Precautions" on page 8.

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 "Regular Care" on page 12.

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.

BLEEDING THE SOLAR COLLECTORS

It is necessary to purge air from the collector circuit:

- When the solar water heater is to be turned on and the solar collectors and solar hot and solar cold pipes have been drained.

- After maintenance has been conducted on the pipe work and air has entered the system.
- If the circulator appears not to be circulating water around the system.

⚠ **Warning:** Bleeding the solar collectors should be conducted in the morning, within three hours of sunrise, when the water temperature inside the solar collectors is lower.

If an air bleed valve and drain is installed on the solar hot pipe (from the solar collectors), to purge air from the collector circuit:

- Ensure the solar storage tanks are full of water and all of the hot taps are turned off.
- Open the air bleed valve (if it is not already open) fitted adjacent to the solar hot water flow (from collector) pipe.
- The mains pressure will force water to flow from the solar storage tanks and through the pipe work and solar collectors, expelling air from the collector circuit through the air bleed valve. This is evidenced by spurting of water from the drain line connected to the air bleed valve.

  The non return valve installed on the solar hot pipe will prevent water flowing from the solar return connection on the storage tanks during this procedure.

  ⚠ **Warning:** Exercise care to avoid any splashing of water, as water discharged from the solar collectors may be of a very high temperature.
- Close the air bleed valve when water runs freely from the drain line.

This will purge large quantities of air from the collector circuit. Any remaining air will be purged from the system through the automatic air eliminator valve(s) installed at the highest point(s) of the collector circuit. If an air bleed valve and drain is not installed, have your plumber bleed the air from the collector circuit.

FREEZE PROTECTION

The system when installed in areas subject to freeze conditions must be installed with the solar hot and solar cold pipes fully insulated with fibreglass insulation (minimum thickness 13 mm) and with an auxiliary electric water heater located in the solar cold line to offer protection against freeze damage. Freeze conditions occur below 6°C. The system has NO WARRANTY for freeze damage when installed above 400 metres altitude or if the solar hot and solar cold pipes are uninsulated or if an auxiliary electric water heater has not been installed. (refer to “Warranty Exclusions” on page 70 and to “Pipe Work and Insulation” on page 7).

ABOUT YOUR WATER HEATER

The anti freeze control is designed to recirculate a small amount of water from the solar storage tanks through the solar pipe work during periods of low temperatures. This is to prevent the water inside the pipe work from freezing. If insufficient energy is available in the solar storage tanks, the auxiliary electric water heater will be energised to provide sufficient protection of the solar collectors. It is essential that the electrical circuit to the solar control unit, circulator(s) and auxiliary electric heater is continually turned on if there is a risk of freezing. The solar warranty does not cover damage caused by freeze conditions when the electrical circuit to the solar control unit, circulator(s) and auxiliary electric heater is turned off or interrupted.

Notes:

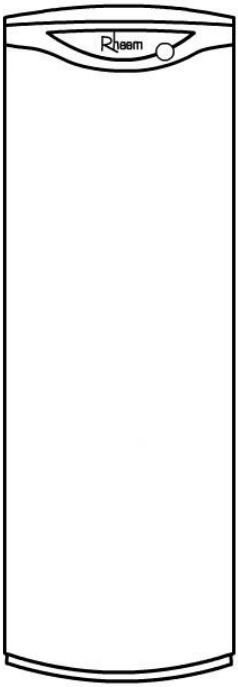
- If it is necessary to switch the power off to the solar control unit, circulator(s) and auxiliary electric heater and there is a risk of freezing, then it is necessary to have your plumber drain the solar collectors and solar flow and return pipe work.
- The freeze protection system will be rendered inoperable if electrical power is not available at the solar control unit, circulator(s) and auxiliary electric heater. Damage caused by freezing due to no power at the solar control unit and circulator(s), is not covered by warranty.
- Pipe work between the solar collectors and solar storage tanks must be insulated.
- The system is not covered for freeze damage above 400 metres altitude.
- Refer to “Warranty Exclusions” on page 70.

HOW YOUR WATER HEATER WORKS

The Rheem solar Loline system has its vitreous enamel lined solar storage tanks installed at ground or floor level, remotely from the solar collectors. As the sun heats the water in the solar collectors the increase in temperature activates the circulator. The circulator then moves the water from the solar collectors through an insulated copper pipe to the solar storage tanks. The circulator switches on whenever the water in the solar collectors is hotter than the water in the tanks. Cooler water from the solar storage tanks is circulated to the solar collectors to be heated by the sun's energy. This process continues while solar energy is available and until the water in the solar storage tanks reaches a temperature of approximately 75°C. Automatic safety controls are fitted to the water heater to provide safe and efficient operation.

MAINS PRESSURE

The water heater is designed to operate at mains pressure by connecting directly to the mains water supply. If the mains supply pressure in your area exceeds that shown on page 27, a pressure limiting valve must be fitted.



The supply pressure should be greater than 350 kPa for true mains pressure operation to be achieved. A minimum water supply pressure equivalent to the static head to the water inlet is required to enable the solar circulator and solar circuit system to operate effectively.

BOOSTING

Water from the solar storage tanks will be automatically heated, if required, by the in series booster water heaters. The booster water heaters are for heating the water at times of low solar energy gain, such as during very cloudy or rainy weather, or during the winter months. Refer to the Owners Guide and Installation Instructions supplied with the booster water heaters for further information on their operation.

VACANT PREMISES

If the premises is to be unoccupied for a few nights, we suggest you leave the system switched on. It is not necessary to switch off the electrical supply at the power outlet to the solar control unit. Refer to "To Turn Off The Water Heater" on page 6. Also if the system is not used for a period in excess of 2 weeks it is recommended the solar collectors be covered.

REGULAR CARE

MINOR SIX MONTH MAINTENANCE

It is recommended minor maintenance be performed every six months by a responsible officer.

The minor maintenance includes:

- Operate the easing lever on the pressure relief valve. It is very important you raise and lower the lever gently. Refer to “Pressure Relief Valve and Expansion Control Valve” on page 29.

  ⚠ **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 “Pressure Relief Valve and Expansion Control Valve” on page 29.

MAJOR FIVE YEAR SERVICE

It is recommended a major five year service be conducted on the water heater. The service must be conducted by a qualified person. Phone Rheem Service or their nearest Accredited Service Agent.

Note: The five year service and routine replacement of any components, such as the anode and relief valve(s), are not included in the Rheem warranty. A charge will be made for this work.

The major service includes:

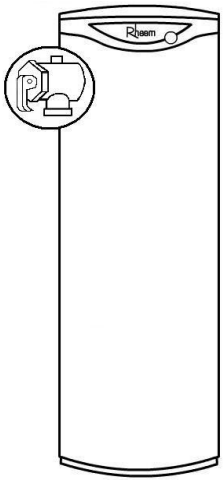
- Replace the pressure relief valve.
- Inspect and flush the expansion control valve (if fitted). If required, replace the valve.
- Check and inspect the heat pump module for operation.
- Visually check the unit for any potential problems.
- Inspect all connections.

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. Depending upon the power supply connection, hot water may not be available until the next day.

REGULAR CARE

TEMPERATURE PRESSURE RELIEF VALVE

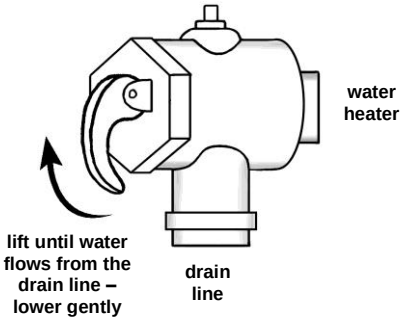
This valve is near the top of the solar storage tank and is essential for its safe operation. It is possible for the valve to release a little water through the drain line during each heating period. This occurs as the water is heated and expands by approximately 1/50 of its volume.



Continuous leakage of water from the valve and its drain line may indicate a problem with the water heater (refer to "Temperature Pressure Relief Valve Running" on page 21).

⚠ **Warning:** Never block the outlet of this valve or its drain line for any reason.

Operate the easing lever on the temperature pressure relief valve once every six months. **It is very important you raise and lower the lever gently.**



⚠ **DANGER:** Failure to do this may result in the water heater cylinder failing, or under certain circumstances, exploding.

⚠ **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.

If water does not flow freely from the drain line when the lever is lifted, then the water heater must be checked. Phone Rheem Service or their nearest Accredited Service Agent to arrange for an inspection.

The temperature pressure relief valve should be checked for performance or replaced at intervals not exceeding 5 years, or more frequently in areas where there is a high incidence of water deposits (refer to "Water Supplies" on page 15).

REGULAR CARE

EXPANSION CONTROL VALVE

In many areas, including South Australia, Western Australia and scaling water areas, an expansion control valve is fitted to the cold water line to the water heater. The expansion control valve may discharge a small quantity of water from its drain line during the heating period instead of the temperature pressure relief valve on the water heater.

Operate the easing lever on the expansion control valve once every six months. **It is very important you raise and lower the lever gently.** The expansion control valve should be replaced at intervals not exceeding 5 years, or more frequently in areas where there is a high incidence of water deposits.

COLLECTOR GLASS

Ensure the glass on your solar collectors is free of dust, salt spray or any other matter, which may reduce the effectiveness of the solar collectors. If the collector glass becomes dirty, hose down or if the solar collectors are accessible, wash the collector glass with water and a soft brush when the solar collectors are cool.

Have any trees trimmed which may shade the solar collectors.

- Rheem solar collectors have passed the AS/NZS 2712 requirements for resistance to hailstone damage, so it is not normally necessary to fit a guard to a collector.
- Flushing The Solar Collectors

It may be necessary to flush the solar collectors if there is sediment in the water supply. This should be conducted in the morning, within three hours of sunrise.

- Open a hot water tap and allow the water to run for five (5) minutes prior to flushing the solar collector(s).
- Close the hot tap.
- Wait a further five (5) minutes before attempting to flush the solar collectors.

  This will assist in the transfer of any high temperature water in the solar collector(s) to the solar storage tank.

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

- To flush the solar collectors, follow the procedure “Bleeding the Solar Collectors” on page 8, allowing the water to flow from the air bleed valve drain line on the solar hot pipe (from the solar collectors) for five minutes before closing the bleed valve. It is recommended to flush the solar collectors every five years. This will assist in keeping the solar collectors, solar hot pipe and solar cold pipe clear of sediment.

WATER SUPPLIES

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

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, a heating unit and a solar collector in a direct solar water heater system.

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 warranty to apply.

ANODE

The vitreous enamel lined cylinder of the water heater is covered by the Rheem 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 Rheem warranty. In addition, the use of an incorrect colour coded anode may shorten the life of the water heater cylinder.

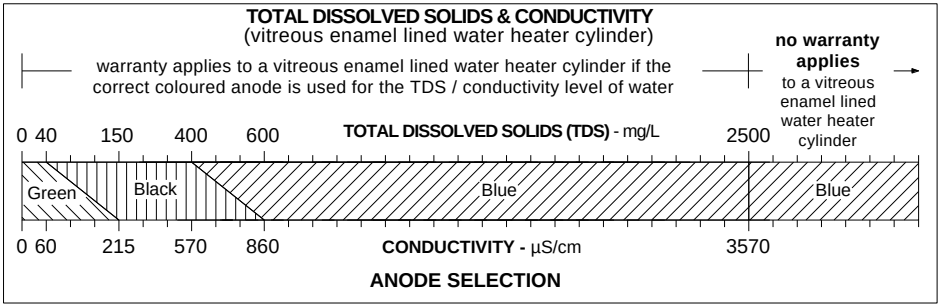
The correct colour coded anode must be selected and fitted to the water heater in accordance with the following advice and the Anode Selection chart on page 16 for warranty to apply to the water heater cylinder.

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)

WATER SUPPLIES

The changing of anodes 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 (μS / cm), is directly proportional to the TDS content of the water. TDS, in mg / L, is approximately 70% of the conductivity in μS / 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.

If the anode is not replaced during a five year service (refer to "Major Five Year Service" on page 12) then the maximum time after installation when the anode should be replaced is 8 years.

For water supplies which are either softened, desalinated or where the water supply may alternate between a water tank and a reticulated public supply or another supply, it is recommended the anode be replaced within 5 years of installation.

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.

WATER SUPPLIES

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.

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 Rheem warranty does not apply to a copper sheathed heating unit or to a solar collector in a direct solar water heater system. A corrosion resistant heating unit must be used for the Rheem warranty to apply to the 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 Rheem warranty to apply to the temperature pressure relief valve and water heater cylinder. Solar collectors in a direct solar water heater system should be covered when the water heater is not intended to be used for more than two weeks.

Where the saturation index exceeds +0.80, the Rheem warranty does not apply to a standard watts density heating unit or to a solar collector in a direct solar water heater system. A low watts density heating unit must be used for the Rheem warranty to apply to the heating unit.

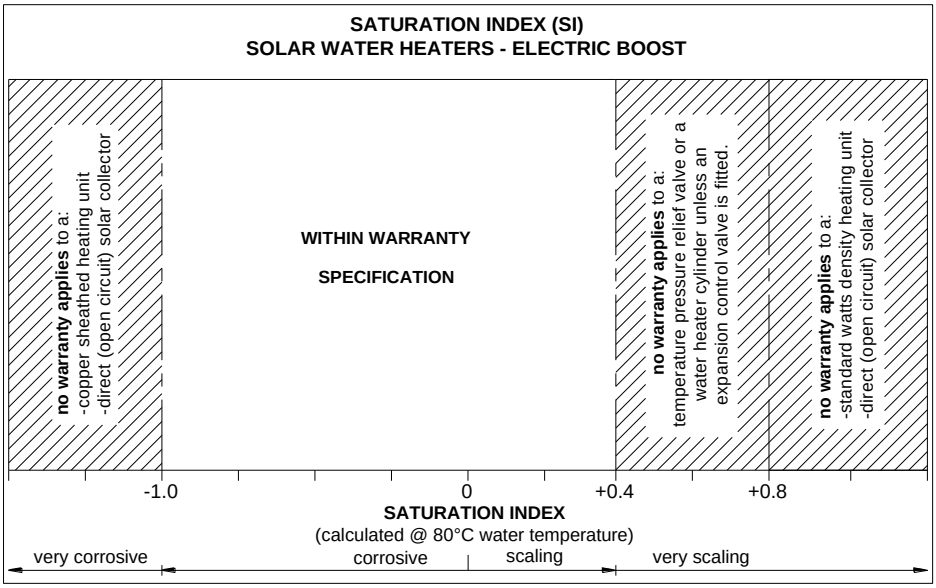
Water which is scaling may be treated with a water softening device to reduce the saturation index of the water.

Refer to the Saturation Index chart on page 18.

Contact Rheem Service or their nearest Accredited Service Agent if a replacement heating unit is required.

Refer to the cold water connection detail on page 28 for the position of the expansion control valve.

WATER SUPPLIES



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 Rheem 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	solar collector copper sheathed heating unit
Saturation Index (SI) > +0.4 (if an expansion control valve is not fitted)	water heater cylinder temperature pressure relief valve
Saturation Index (SI) > +0.8	solar collector 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 manufacture or failure of a part.

NOT ENOUGH HOT WATER (OR NO HOT WATER)

- **Insufficient sunlight**
  Insufficient sunlight due to cloudy weather during summer months or low solar energy contribution in winter months may mean the booster water heaters will operate more often.

- **Booster water heaters(s) not operating**
  Check the operation of the in-series booster water heater(s) to ensure they are operating correctly. Refer to the Owners Guide and Installation Instructions supplied with the water heater(s).

- **Solar Control Unit**
  Check the power outlet for the solar control unit is switched on.

- **Collectors shaded**
  If trees or other objects shade the solar collectors or if the glass is dirty, the effectiveness of the solar collectors will be greatly reduced. Have the trees trimmed or the solar collectors relocated if the obstruction is permanent or clean the collector glass (refer to “Collector Glass” on page 14).

- **Collector area is too small**
  For most installations, the number of solar collectors recommended in Rheem literature has been proven to provide the required solar energy to meet the hot water requirements. However, in some circumstances, it may be necessary to install additional solar collectors.

- **Air in collectors (no solar gain)**
  It is possible under certain conditions, such as when the pipe work has been opened, that air may become trapped in the solar collectors. This will prevent the circulator from moving water around the collector circuit. The air will need to be purged from the solar collectors (refer to “Bleeding The Solar Collectors” on page 8).

SAVE A SERVICE CALL

- **Are you using more hot water than you think?**
  Are outlets (especially the showers) 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 hot water usage. As you have installed an energy saving appliance, energy saving should also be practised. Adjust the water usage pattern to take advantage of maximum solar gains. Have your plumber install 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 Running" on page 21).

- **Thermostat setting**
  Ensure the thermostat setting on the booster water heater(s) is appropriate. You may choose to have your electrician adjust the thermostats upwards to gain additional hot water capacity when boosting.

  ⚠ **Warning:** Hotter water increases the risk of scald injury.

- **Water heater size**
  Do you have the correct size booster water heaters for your requirements? The sizing guides in the sales literature and on the Rheem website (www.rheem.com.au) suggests average sizes that may be needed.

WATER NOT HOT ENOUGH

You may find that due to low solar energy gain the water temperature from the solar storage tanks may be lower than normally expected. The water temperature will be boosted by the in series booster water heater(s).

COLLECTOR GLASS

Warranty **DOES NOT** cover breakage of solar collector glass. Check your household insurance policy covers collector glass breakage.

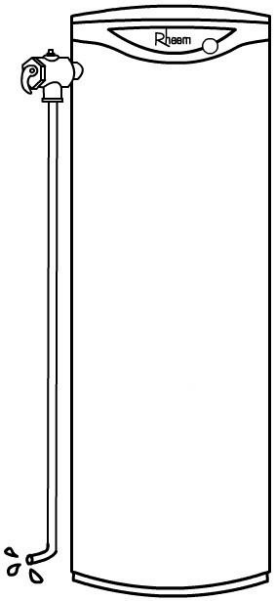
⚠ **Warning:** No attempt should be made to remove or replace broken collector glass.

The collector glass is not offered as a replacement part. Should the solar collector require replacement, contact your nearest Rheem Service Department or Accredited Service Agent.

SAVE A SERVICE CALL

TEMPERATURE PRESSURE RELIEF VALVE RUNNING

- **Normal Operation**
  It is normal and desirable this valve 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.



- **Continuous dribble**
  Try gently raising the easing lever on the relief valve for a few seconds (refer to "Temperature Pressure Relief Valve" on page 13). 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 until the water heater is cold - then stops until water reheats**
  The water heater system **must** be switched off at the isolating switch. Phone your nearest Rheem Service Department or Accredited Service Agent to arrange for an inspection.

EXPANSION CONTROL VALVE RUNNING

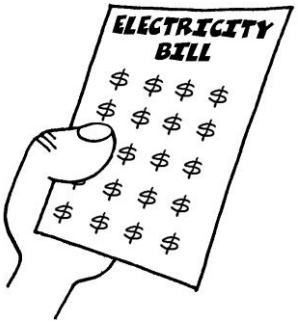
If an expansion control valve is fitted in the cold water line to the water heater (refer to page 58) it may discharge a small quantity of water instead of the temperature pressure relief valve on the water heater. The benefit is that energy is conserved as the discharged water is cooler.

SAVE A SERVICE CALL

HIGH ENERGY BILLS

With the installation of your new solar hot water system, maximum energy savings can be achieved with careful planning of hot water usage. Should you at any time, feel your energy account is too high, we suggest you check the following points:

- Is the relief valve running excessively? (Refer to "Temperature Pressure Relief Valve Running" on page 21).
- Are outlets (especially the showers) using more hot water than you think? (Refer to "Not Enough Hot Water" on page 19).
- Is there a leaking hot water pipe, dripping hot water taps, etc? Even a small leak will waste a surprising quantity of hot water and energy. Replace faulty tap washers, and have your plumber rectify any leaking pipe work.
- Are the booster water heaters being utilised properly? (Refer to the Owners Guide and Installation Instructions supplied with the booster water heaters).
- Consider recent changes to the hot water usage pattern and check if there has been any increase in tariffs since your previous account.



ENERGY TARIFFS

The energy tariff to which your booster water heater(s) is connected will play an important role in the overall effectiveness of the system. It is important you are aware of this tariff to enable you to take full advantage of the energy savings.

IF YOU HAVE CHECKED ALL THE FOREGOING AND STILL BELIEVE YOU NEED ASSISTANCE, CALL YOUR NEAREST RHEEM SERVICE DEPARTMENT OR ACCREDITED SERVICE AGENT.

INSTALLATION – STORAGE TANKS

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.

In New Zealand, the installation must also conform with Clause G12 of the New Zealand Building Code.

WATER HEATER APPLICATION

This water heater is designed 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 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 backup redundancy into the hot water supply system.

GENERAL

The following requirements apply to the installation of Rheem Commercial Solar Loline Systems:

- Suitable Solar Collectors – NPT 200 or L.
- Maximum Altitude – 400m
- When installed in areas subject to freeze conditions (ie below 6°C):
  - Solar hot and cold pipes to be fully insulated with fibreglass insulation (13mm minimum thickness). Thicker insulation may be required to comply with the requirements of AS/NZS 3500.4.
  - Auxiliary electric water heater to be installed in solar cold line.

The system has **NO WARRANTY** for freeze damage if the above conditions have not been met. (refer to "Warranty Exclusions" on page 70 and to "Warning: Plumber Be Aware" on page 48).

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INSTALLATION – STORAGE TANKS

TYPICAL INSTALLATION

Typical installations are shown on pages 25 to 26. All Rheem Commercial Solar Loline installations will include the following:

- One or more solar storage tanks
- Two or more solar collectors
- A solar control unit
- A solar circulator (or dual solar circulator set)
- One or more in line booster water heaters

In addition, the following variables may be applicable:

- In areas subject to freeze conditions, an auxiliary electric water heater installed in solar cold line. Refer to page 44

Collectors may be installed on a pitched roof or on a flat roof with stand.

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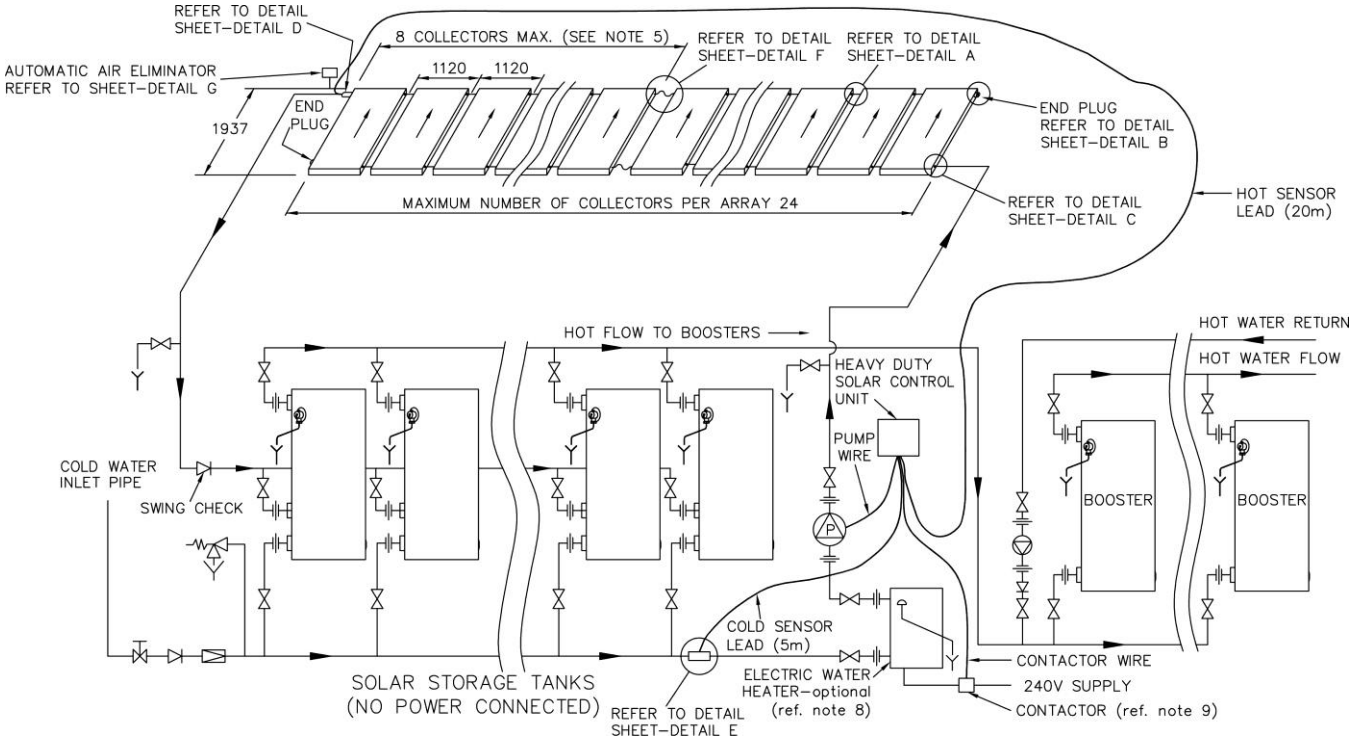
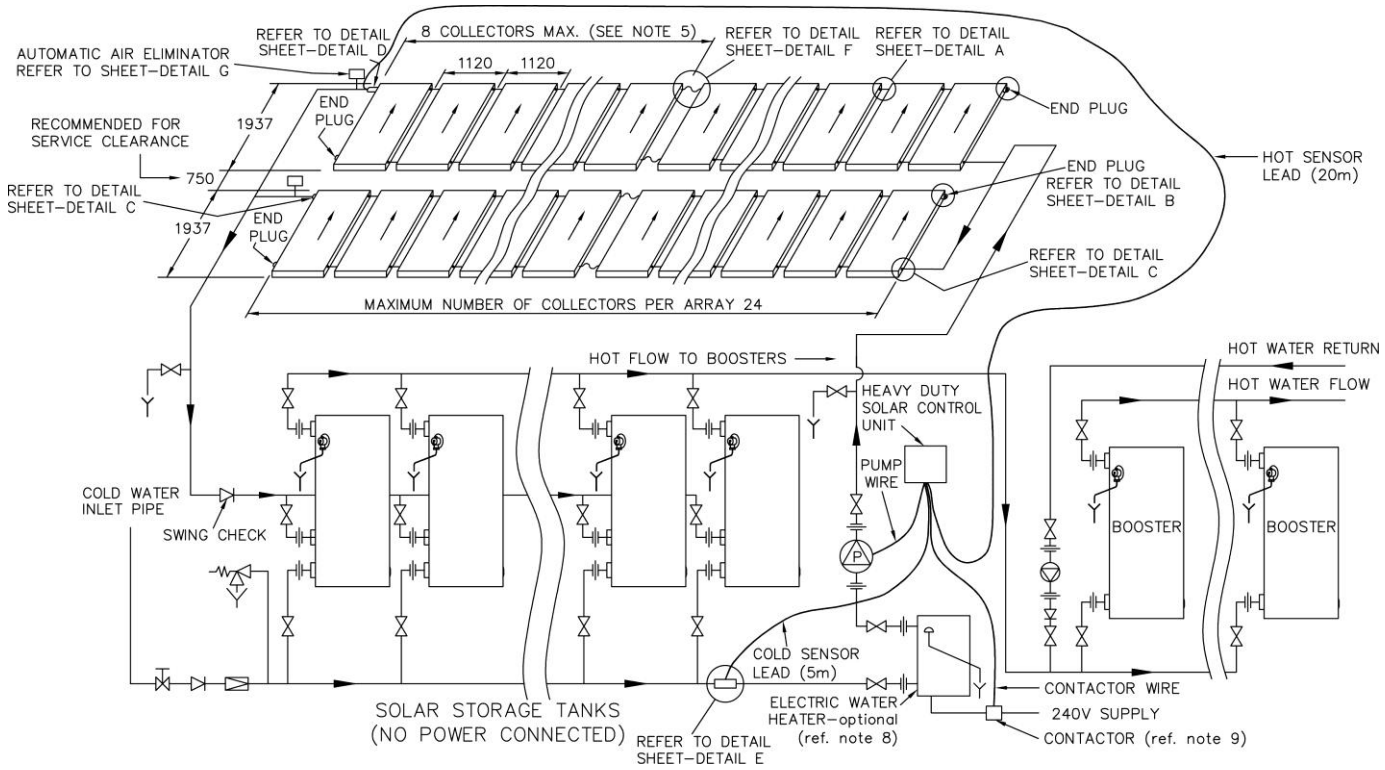
INSTALLATION – STORAGE TANKS



RHEEM COMMERCIAL SOLAR LOLINE DESIGN – SINGLE PANEL ARRAY

INSTALLATION – STORAGE TANKS



RHEEM COMMERCIAL SOLAR LOLINE DESIGN – DOUBLE PANEL ARRAY

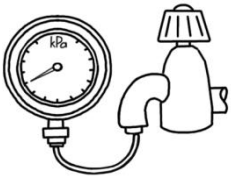
PLUMBING DETAILS

IMPORTANT PLUMBING DETAILS

MAINS WATER SUPPLY

Where the mains water supply exceeds that shown in the table below, an approved pressure limiting valve is required and should be fitted as shown in the installation diagram (refer to diagram on page 58).

Model	340, 430	1000L SS
Relief valve setting	1000 kPa	700 kPa
Expansion control valve setting *	850 kPa	550 kPa
Max. mains supply pressure		
With expansion control valve	680 kPa	450 kPa
Without expansion control valve	800 kPa	550 kPa
Min. mains supply pressure	200 kPa	200 kPa



* Expansion control valve not supplied with the water heater.

TANK WATER SUPPLY

If the water heater is supplied with water from a tank supply and a minimum water supply pressure of 200 kPa at the water heater cannot be achieved, then a pressure pump system must be installed to allow the solar circuit system to operate. Care must be taken to avoid air locks. The cold water line from the supply tank 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 the water heater and the hot water outlets in any ablution area such as a bathroom, ensuite or public area, 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 and public areas.

The temperature limiting device used with a solar water heater should have a specified minimum temperature differential, i.e. between the hot water inlet and the tempered water outlet, of no greater than 10°C.

INSTALLATION – STORAGE TANKS

The temperature limiting device used with a solar water heater should have a specified 'minimum temperature differential' between the hot water inlet and the tempered water outlet of no greater than 10°C.. Refer to the specifications of the temperature limiting device.

COLD WATER SUPPLY

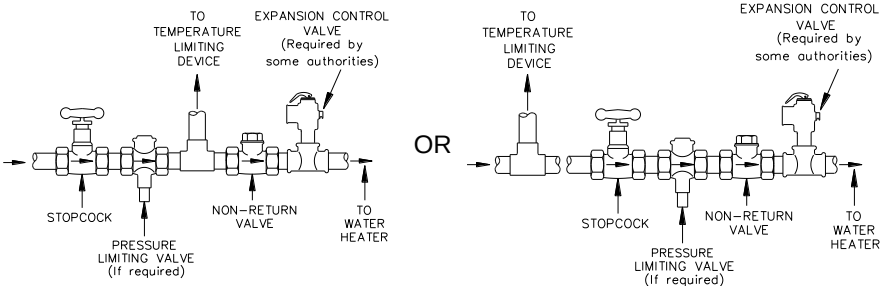
An isolation valve and non return valve must be installed on the cold water line to the solar storage tanks. An acceptable arrangement is shown in the diagram on pages 28

Temperature Limiting Device

⚠ **Warning:** A non return valve **MUST BE** installed on the cold water line to the solar storage tank(s) **AFTER** the cold water branch to a temperature limiting device.

The cold water line to the temperature limiting device can be branched off the cold water line either before or after the isolation valve and pressure limiting valve to the solar storage tank, but it **MUST BE** before the non return valve. 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 solar storage tank.

If a combination isolation valve and non return valve (duo or trio valve) is installed on the cold water line to the solar water heater and the cold water line to the temperature limiting device branches off after this valve, then a second non return valve must be installed between the cold water branch and the solar storage tank.



If a pressure limiting valve is installed on the cold water line to the solar 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.

Note: If this installation is a solar conversion of an existing water heater system and the cold water line to a temperature limiting device branches off the cold

water line after the non return valve to the existing water heater, then the cold water branch **MUST BE** relocated to before the solar storage tanks and the solar preheat system non return valve.

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 not required unless the saturation index is greater than +0.4 (refer to "Water Supplies" on page 15). However, an ECV may be needed in a corrosive water area where there are sufficient quantities of silica dissolved in the water.

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 diagrams on page 58). A copper drain line must be run separately from the drain of the relief valve.

Circulated hot water and temperature limiting device
A temperature limiting device cannot be installed in circulated hot water flow and return pipe work unless it is specifically designed to do so, such as the Rheem Guardian warm water system.

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 water heater, depending on the location of the return line connection on the water supply line to the water heater or storage tank, then either:

- water will be supplied to the cold water inlet of the temperature limiting device at a temperature exceeding the maximum recommended water supply temperature, or
- 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.

These conditions 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 either condition, the operation and performance of the device cannot be guaranteed.

INSTALLATION – STORAGE TANKS

REDUCING HEAT LOSSES

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

The pipe work between the storage tank and collectors must be fully insulated with fibreglass insulation or similar (minimum thickness 13 mm). Thicker insulation may be required to comply with the requirements of AS/NZS 3500.4. The insulation must be weatherproof and UV resistant if exposed. The insulation must be fitted up to the connections on both the solar storage tank and the solar collectors. Refer to "Warning: Plumber – Be Aware" on page 48.

Keep temperature settings down. Lower temperatures reduce heat losses and prolong cylinder life. Do not set the controlling thermostats on the booster water heater(s) above 70°C unless it is necessary.

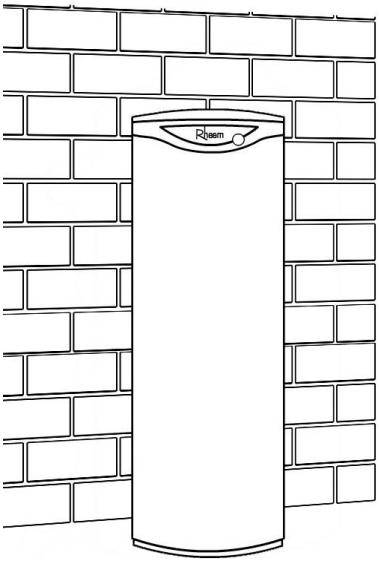
INSTALLATION – SOLAR STORAGE TANKS

SOLAR STORAGE TANK LOCATION

The solar storage tanks are suitable for either outdoor or indoor installation. They should be installed at ground or floor level and must stand vertically upright. Remember all local authorities have regulations about putting water heaters into roof spaces.

The solar storage tanks should be installed close to the booster water heaters and their position chosen with safety and service in mind.

Consideration must also be given to the position of the storage tanks in relation to the solar collectors.



Clearance must be allowed for servicing of the storage tanks. The storage tanks must be accessible without the use of a ladder or scaffold. Make sure the temperature pressure relief valve lever is accessible for service.

You must be able to read the information on the rating plate. If possible leave headroom of one water heater length so the anode can be inspected or replaced. Remember you may have to take the entire solar storage tank out later for servicing.

SAFE TRAY

Where damage to property can occur in the event of the water heater leaking, the solar storage tank 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.

INSTALLATION – STORAGE TANKS

CIRCULATED HOT WATER FLOW AND RETURN SYSTEM

The Rheem Commercial Solar Loline system can be installed as part of a circulated hot water flow and return system in a building if installed as shown in the diagrams on pages 25 and 26. The booster must always be set to at least 60°C.

ANODE TYPES

The vitreous enamel lined cylinder of the water heater is only covered by the Rheem 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 Rheem warranty. In addition, the use of an incorrect colour coded anode may shorten the life of the water heater cylinder.

The correct anode type for the water supply being used must be fitted in vitreous enamel solar storage tanks (refer to "Water Supplies" on page 15). The black anode is fitted as standard.

Total Dissolved Solids in water supply to the water heater	Anode colour code
0 – 40 mg/L	Green
40 – 600 mg/L	Black
600 – 2500 mg/L	Blue

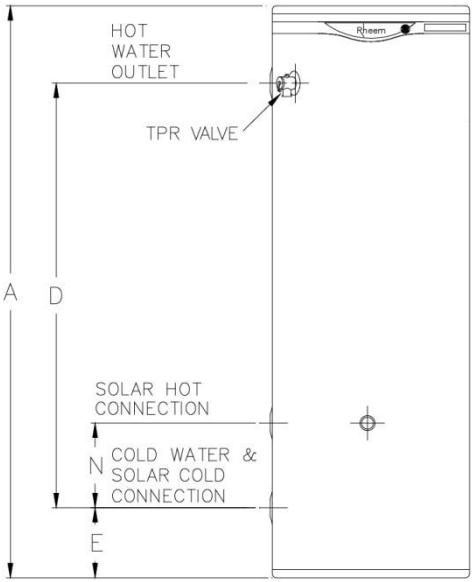
SADDLING - PIPE WORK

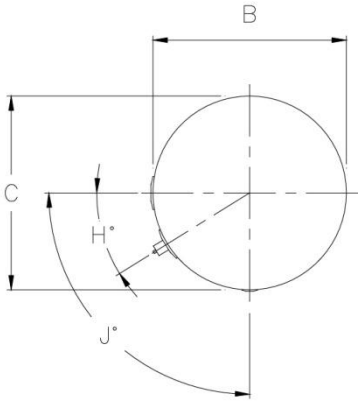
To prevent damage to the cylinder when attaching pipe clips or saddles to the solar storage tank jacket, we recommend the use of self-drilling screws with a maximum length of 13 mm. Should pre drilling be required, extreme caution must be observed when penetrating the jacket of the water heater.

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 Rheem warranty.

INSTALLATION – STORAGE TANKS

DIMENSIONS AND TECHNICAL DATA





Solar storage tank mass (kg)			
Model	Capacity	Empty	Full
340	325 litre	87	412
430	410 litre	111	521
1000 SS	1037 litre	182	1219

Dimensions (mm)	A	B	C	D	E	F	H	J	N
610 340 / 511 340	1640	640	640/680	1298/1357	115/73	-/623	32°	90°	290/561
610 430 / 511 430	1840	690	690/730	1482/1519	108/81	-/533	30°	84°	273/417
1000 SS	2440	880	880	1780	350	-		90°	300

CONNECTION SIZES

	610 340, 430	511 340, 430
• Hot water connection:	RP2/50	RP¾/20
• Cold water connection:	RP2/50	RP¾/20
• Solar hot (from collector) connection:	RP2/50	RP¾/20
• Relief valve connection:	RP¾/20	RP½/15

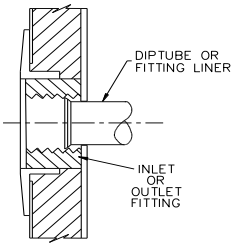
INSTALLATION – STORAGE TANKS

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 thread sealing tape or approved thread sealant on all fittings.

A disconnection union must always be provided at the cold water inlet, solar hot water inlet and hot water outlet on the solar storage tank to allow for disconnection of the solar storage tank.

Each solar storage tank has either a plastic dip tube or fitting liner in the inlet and outlet fittings (see diagram). These must be in place for the solar storage tanks 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.



PIPE SIZES

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.

The pipe work between the storage tank and collectors and circulators must be sized to achieve the correct flow rates with the length and diameter of the pipe work taken into consideration. Refer to "Solar Collector Location" on page 50 and to "Pipe Lengths" on page 35.

Notes:

- It is important not to cross connect the solar cold and solar hot pipes to the incorrect connections.
- The solar cold pipe connects to the bottom of the solar collectors and the solar hot pipe connects to the top of the solar collectors diagonally opposite to the solar cold pipe connection.
- The hot sensor connection is at the solar hot outlet where the solar hot pipe connects to the solar collector.
- Refer to "Warning: Plumber – Be Aware" on page 48.

INSTALLATION – STORAGE TANKS

Commercial Solar Pipe Size / Pump Selection / Speed Setting													
Total Number Collectors	Combined Tank & Array Piping Length (m)*	Total Length (flow and return) Between Storage Tanks and Collector Array (m)**											
		10	20	30	40	50	60	70	80	90	100	150	200
15	30	DN20/20-60/1		DN20/20-60/2						DN20/20-60/3		DN20/32-80/2	DN20/32-80/3
		DN25/20-60/1											DN25/20-60/2
30	53+	DN25/20-45							-	-	-	-	-
		DN25/20-60/2		DN25/20-60/3								DN25/32-80/2	DN32/20-60/2
	53++	DN25/20-45							-	-	-	-	-
		DN25/20-60/2		DN25/20-60/3								DN25/32-80/2	DN32/20-60/2
45	63+	-	DN25/32-80/3				-	-	-	-	-	-	-
			DN32/20-45									DN32/20-60/3	DN32/20-60/3
	90++	-	DN32/20-45						DN32/20-60/3				DN32/32-80/3
60	79+	-	DN32/32-80/3									-	-
			DN40/20-45									DN40/20-60/3	DN40/32-80/3
	120++	-	DN32/32-80/3					-	-	-	-	-	-
			DN40/20-45									DN40/20-60/3	DN40/32-80/3

INSTALLATION – STORAGE TANKS

<table>
<tr><th colspan="9">Commercial Solar Pipe Size / Pump Selection / Speed Setting</th></tr>
<tr><th rowspan="2">Total Number Collectors</th><th rowspan="2">Combined Tank & Array Piping Length (m)*</th><th colspan="7">Total Length (flow and return) Between Storage Tanks and Collector Array (m)**</th></tr>
<tr><th>10</th><th>20</th><th>30</th><th>40</th><th>50 to 100</th><th>150</th><th>200</th></tr>
<tr><td rowspan="2">75</td><td>92+</td><td>-</td><td>-</td><td>DN40/20-60/3</td><td colspan="4">DN40/32-80/3</td></tr>
<tr><td colspan="5">DN50/20-45</td></tr>
<tr><td rowspan="2">111++</td><td>-</td><td>-</td><td colspan="5">DN40/32-80/3</td></tr>
<tr><td colspan="5">DN50/20-45</td></tr>
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<tr><td rowspan="2">105</td><td>118+</td><td>-</td><td>-</td><td>-</td><td colspan="4">DN50/32-80/3</td></tr>
<tr><td>160++</td><td>-</td><td>-</td><td>-</td><td colspan="4">DN50/32-80/3</td></tr>
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<tr><td>215++</td><td>-</td><td>-</td><td>-</td><td colspan="4">DN50/32-80/3</td></tr>
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INSTALLATION – STORAGE TANKS

RELIEF VALVE

The temperature relief valve is shipped either under the top flap of the storage tank carton. The temperature pressure relief valve(s) must be fitted before the water heater is operated. Before fitting the relief valve(s), make sure the probe has not been bent. Seal the thread with Teflon tape - never hemp. Make sure the tape does not hang over the end of the thread.

Screw the valve(s) into the correct opening (refer to the installation diagram on page 40) leaving the valve outlet pointing downwards. Do not use a wrench on the valve body - use the spanner flats provided.

RELIEF VALVE DRAIN

A copper drain line must be fitted to the relief valve to carry the discharge clear of the storage tanks. Connect the drain line to the relief valve using a disconnection union. The pipe work from the relief valve to the drain should be as short as possible and fall all the way from the water heater with no restrictions. It should have no more than three right angle bends in it. Use DN20 pipe for a ¾" relief valve and DN15 pipe for a ½" relief valve.

The outlet of the drain line must be in such a position that flow out of the pipe can be easily seen (refer to AS/NZS 3500.4) - but arranged so hot water discharge will not cause injury, damage or nuisance. The drain line must discharge at an outlet or air break not more than 9 metres from the relief valve.

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

For multiple installations the drain line from each storage tank can discharge into a common tundish (refer to "Multiple Installations" on pages 39 and 40).

⚠ **Warning:** As the function of the temperature pressure relief valve on the storage tank 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.

MULTIPLE INSTALLATIONS

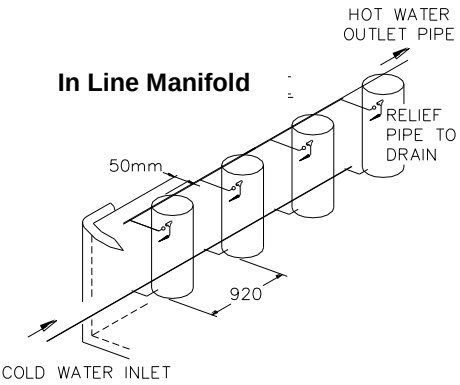
A multiple installation of solar storage tanks on a single manifold or multiple manifolds is possible, using the Equa-Flow® manifold system, where large volumes of hot water is required. The Equa-Flow principle will function with solar storage tanks in line, around a corner or in rows back to back (refer to the diagrams on page 39).

The cold water and hot water manifolds must be designed to balance the flow from each solar storage tank. To achieve this, there are basic installation requirements and principles which must be followed:

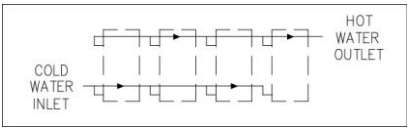
1. The maximum number of solar storage tanks in a bank (with 50mm fittings) should be no more than 10, however several banks of solar storage tanks can be installed.
2. The hot water line from the manifold must leave from the opposite end to which the cold water line enters the manifold.
3. The solar storage tanks must be of the same model.
4. The cold water line, cold and hot water headers and hot water line must be sized to meet the requirements of both AS/NZS 3500.4 and the application.
5. The solar hot water and solar cold water pipes must be sized to meet the requirements of both AS/NZS 3500.4 and the application.
6. A non return valve, isolation valve and if required a pressure limiting valve and expansion control valve, must be installed on the cold water line to the system.
7. A full flow gate valve or ball valve (not a stop tap, as used on a single solar storage tank installation) must be installed on the cold water branch, solar flow branch and hot water branch of each solar storage tank.
8. Non return valves or pressure limiting valves **must not** be installed on the branch lines to the solar storage tanks.
9. All fittings, valves and branch lines must be matched sets all the way along the manifold.
10. Sufficient space must be left to enable access, servicing or removal of any solar storage tank.
11. The temperature pressure relief valve drain line from each solar storage tank can terminate at a common tundish (funnel) with a visible air break at each drain discharge point (refer to the diagram on page 39 and to "Relief Drain Line" on page 37).

Refer to the diagrams on pages 39 to 42 for installation and plant layout details.

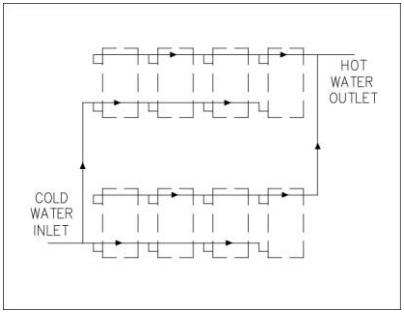
MULTIPLE INSTALLATIONS



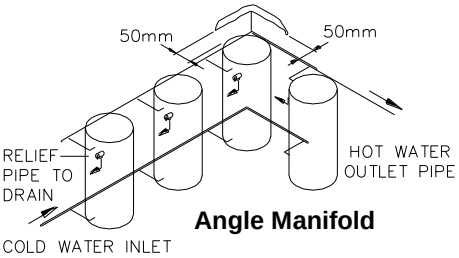
In Line Manifold



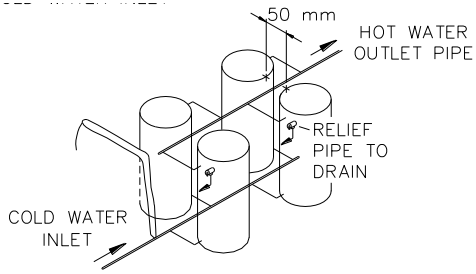
Single Bank of Water Heaters



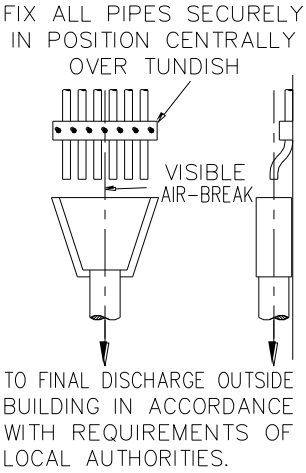
Multiple Banks of Water Heaters



Angle Manifold

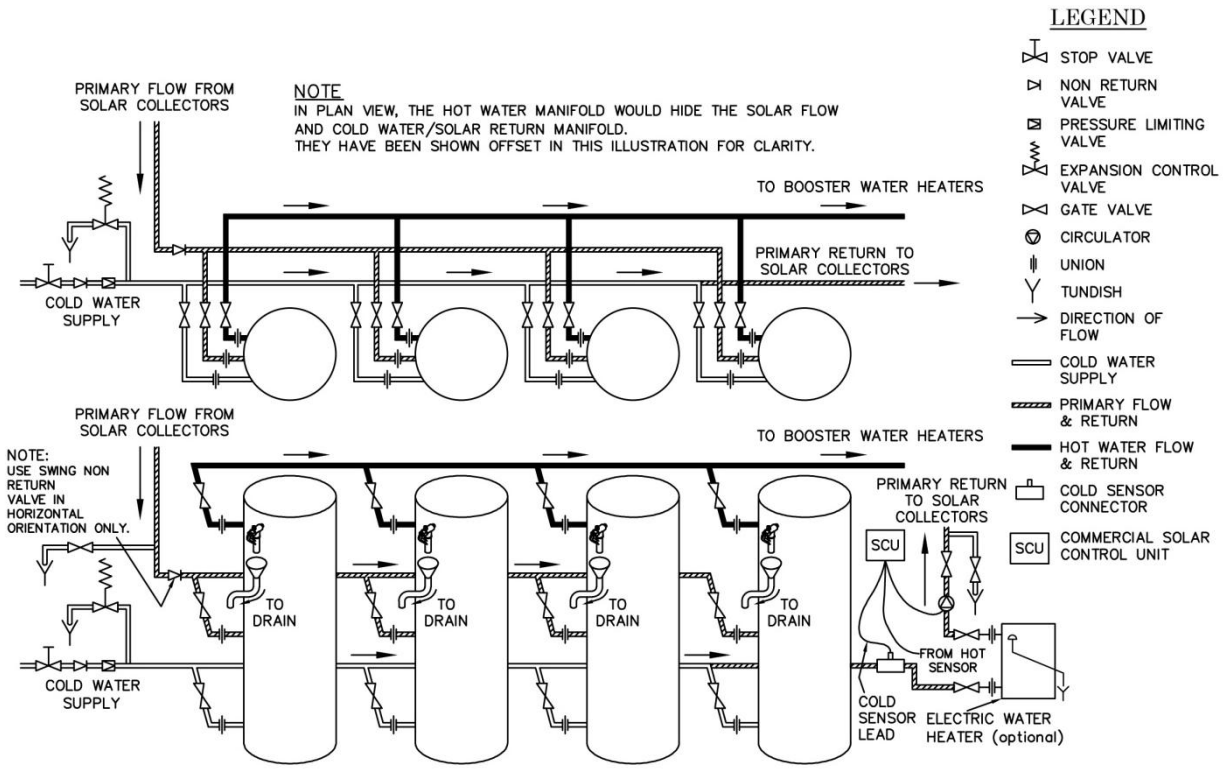


Back to Back Manifold



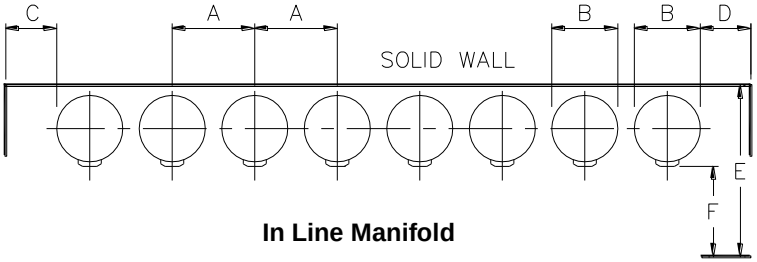
TPR Valve Drain line
Common Discharge Point

MULTIPLE INSTALLATIONS

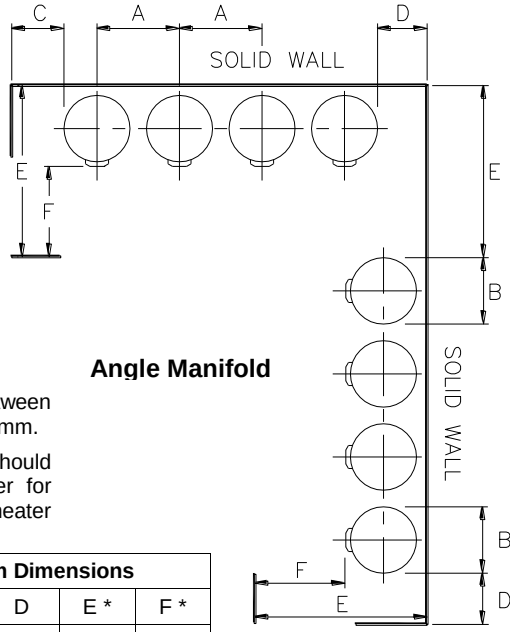


TYPICAL INSTALLATION – RHEEM COMMERCIAL SOLAR LOLINE STORAGE TANKS

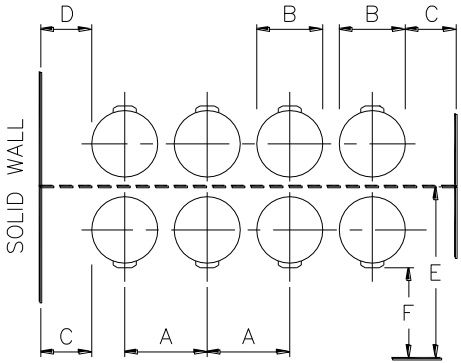
MULTIPLE INSTALLATIONS



In Line Manifold



Angle Manifold



Back to Back Manifold

NOTES:

Minimum recommended space between wall and back of water heater is 100 mm.

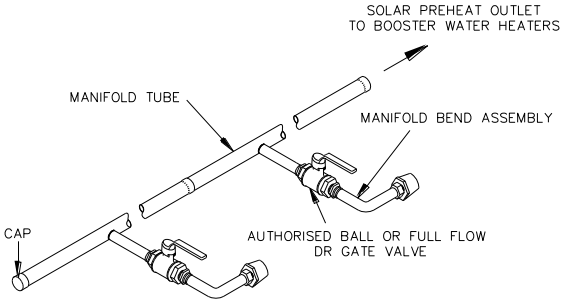
A minimum of 900 mm (E* & F*) should be left in front of the water heater for access, servicing and water heater removal.

Installation Layout Minimum Dimensions						
Model	A	B	C	D	E *	F *
340	900	640	300	100	1640	900
430	940	690	300	100	1690	900

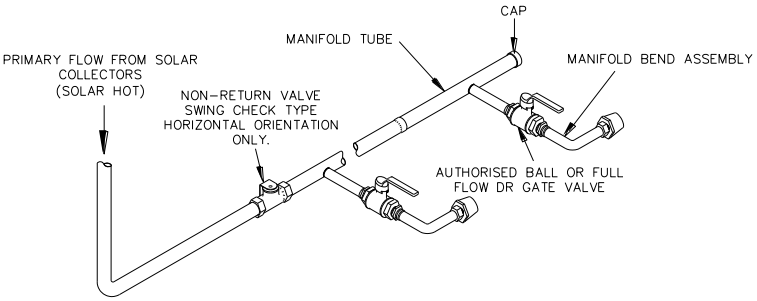
INSTALLATION DIMENSIONS –COMMERCIAL SOLAR LOLINE STORAGE TANKS

MULTIPLE INSTALLATIONS

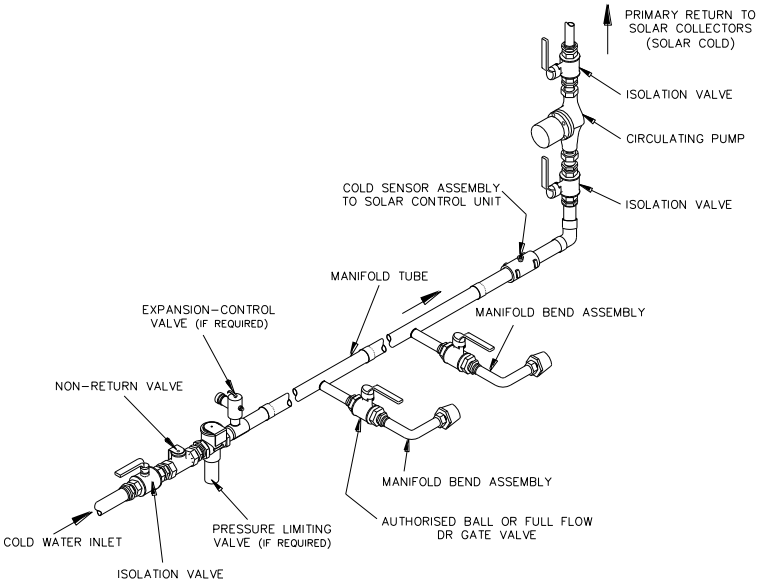
MANIFOLD ARRANGEMENT



Hot Manifold Assembly



Solar Hot Manifold Assembly



Solar Cold Manifold Assembly

INSTALLATION – SOLAR COLD AND SOLAR HOT MANIFOLDS

SOLAR CONTROL UNIT

The solar control unit is designed to be mounted on a wall adjacent to the solar storage tanks or on the side of a solar storage tank. The solar control unit, supplied with a 1.8 metre power cord, requires a 240 V 50 Hz general purpose outlet (GPO) located within 1.2 metres of its installation. The GPO must have a continuous power supply. The GPO is required to be weatherproof if installed outdoors. Refer to "Connections – Electrical" on page 59.

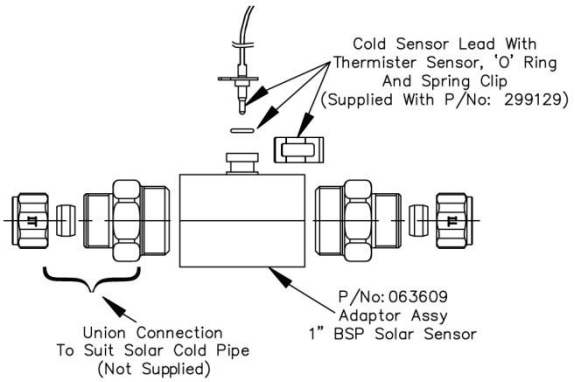
Note: Care must be taken when mounting the solar control unit to the side of the solar storage tank. (refer to "Saddling - Pipe Work" on page 32).

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 Rheem warranty.

SOLAR COLD MANIFOLD

Solar Controller

- Secure the solar control unit to the side of the solar storage tank using the four screws provided or on a wall using suitable screws or anchors.
- Install the cold sensor connector in the solar cold pipe (return to the solar collectors), utilising two adaptor fittings, one on either side of the sensor connector.



DETAIL E – COLD SENSOR ASSEMBLY

- Insert the 5m cold sensor probe into the cold sensor housing, ensuring the 'O' ring is in position on the probe. Lock it into position with the locking washer and clip.

INSTALLATION – SOLAR COLD AND SOLAR HOT MANIFOLDS

Auxiliary Electric Heater

- Install the auxiliary electric heater in the solar cold pipe.

  The auxiliary electric heater is designed to provide additional energy to the solar collectors during frost conditions should there be insufficient solar energy available in the storage tanks.

  In areas not subject to freeze conditions, the auxiliary electric heater is optional.

Solar Circulator

- Install the circulator(s) in the solar cold pipe (return to the solar collectors) after the auxiliary electric heater. Refer to the installation instructions supplied with the circulator.

  A disconnection union and full flow isolation valve must be installed on the inlet and outlet of the auxiliary electric heater and circulator(s). It is not necessary to install a non return valve after the circulator.

Drain Line

- Install a drain line with a full flow isolation valve from the solar cold pipe (flow to the solar collectors) on the solar cold pipe after the solar circulator and its isolation valve. Refer to the diagram on page 40.

  Ensure the drain valve outlet is pointing downwards away from any controls.

- Connect a copper drain line to the drain valve, using a disconnection union, to carry the discharge clear of the solar storage tanks and solar controls.
- The drain line should be as short as possible and fall all the way from the valve with no restrictions. It should have no more than three right angle bends in it.
- The outlet of the drain line must be in such a position that flow out of the pipe can be easily seen (refer to AS/NZS 3500.4) - but arranged so water discharge will not cause injury, damage, nuisance or splashing. The water discharged may be of a high temperature under certain conditions.
- Continue the solar cold pipe to the inlet of the solar collector array.

INSTALLATION – SOLAR COLD AND SOLAR HOT MANIFOLDS

SOLAR HOT MANIFOLD

The solar hot pipe is run from the outlet of the solar collector array.

Air Bleed Valve

Install an air bleed pipe with full flow isolation valve from the solar hot pipe (flow from the solar collectors) on the solar hot pipe just prior to the non return valve (between solar collectors and non return valve). Refer to the diagram on page 40.

Ensure the air bleed valve outlet is pointing downwards away from any controls.

- Connect a copper drain line to the air bleed valve, using a disconnection union, to carry the discharge clear of the storage tanks and solar controls.
- The air bleed drain line should be as short as possible and fall all the way from the valve with no restrictions. It should have no more than three right angle bends in it.
- The outlet of the drain line must be in such a position that flow out of the pipe can be easily seen (refer to AS/NZS 3500.4) - but arranged so water discharge will not cause injury, damage, nuisance or splashing. The water discharged may be of a high temperature under certain conditions.

Non Return Valve

- Install a suitably sized swing type non return valve to the solar hot pipe (flow from the solar collectors).

  The non return valve must be installed in a horizontal orientation in a position between the air bleed pipe and solar storage tanks. The non return valve is required to prevent reverse thermosiphoning and back flow through the solar hot pipe. Refer to the diagram on page 37.
- Connect the solar hot pipe to the solar hot inlet to each solar storage tank. Refer to diagrams on page 40.
- Insulate the solar cold and solar hot pipes, including the air bleed valve and non return valve assemblies, with fibreglass insulation or similar (minimum thickness 13 mm). The insulation must be weatherproof and UV resistant if exposed. Refer to “Warning: Plumber – Be Aware” on page 48.

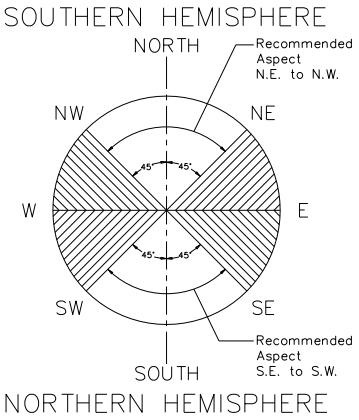
Note: Use thread sealing tape or an approved thread sealant on all fittings.

INSTALLATION – SOLAR COLLECTORS

SOLAR COLLECTOR LOCATION

Consideration must also be given to the position of the solar storage tanks in relation to the solar collectors. The solar hot and solar cold pipes between the solar storage tank and the solar collectors must be sized to achieve the correct flow rates and the circulator with the length and diameter of the pipe work taken into consideration. Refer to "Solar Water Heater Storage Tank Location" on page 31 and to Pipe size and selection chart on pages 35 and 36.

- Solar collectors must be installed in a shade free position.
- The solar collectors are to be installed facing toward the equator (i.e. north facing in the southern hemisphere and south facing in the northern hemisphere). Where this orientation is not practical, a system facing up to 45° from the equator will have its efficiency reduced by approximately 4%.
- Inclination of the solar collectors should be between 90% and 100% of the local latitude angle. The latitudes of some Australian cities are listed on page 47. Solar collectors may be installed at the roof angle on a pitched roof for simplicity of installation and appearance, but must never be flat. If the roof angle varies by 15° from the correct angle, efficiency will be reduced by 10%.



- For an installation on a roof with a pitch less than 10°, a Variable Pitch stand is required. Refer to your local Solar Distributor for details.
- For an installation at right angles to (across) the roof pitch, a Flat Roof stand and an Across Pitch kit are both required. Refer to your local Solar Distributor for details.
- For an installation opposite to (against) the roof pitch, a Flat Roof stand and an Against Pitch kit are both required. Refer to your local Solar Distributor for details.
- For an installation of collectors in a cyclonic or high wind area, a With Pitch frame is required. Refer to your local Solar Distributor for details.

INSTALLATION – SOLAR COLLECTORS

- The collector straps and angles are suitable for installations on a pitched roof with an inclination of up to 45°. Where the solar collectors are installed at inclinations greater than 45°, a With Pitch frame is necessary. Refer to your local Solar Distributor for details.
- The installer must ensure the structural integrity of the building is not compromised by the installation of the solar water heater and the roof structure is suitable to carry the full weight of the solar collector(s). If in doubt the roof structure should be suitably strengthened. Consult a structural engineer.
- The roof area required for each solar collector is approximately 1.2 m wide x 2.0 m deep.
- The roof must be suitable to take the mass of the solar collectors. Each solar collector and its fittings weighs approximately 40 kg when full of water Allow an additional 43 kg per two collectors for Variable Pitch stands used on roof installations with an inclination less than 10°.

LATITUDE OF SOME AUSTRALIAN CITIES

Adelaide	35°S	Cairns	17°S	Hobart	42°S	Port Hedland	20°S
Alice Springs	24°S	Canberra	35°S	Mildura	34°S	Rockhampton	24°S
Brisbane	27°S	Darwin	12°S	Melbourne	38°S	Sydney	34°S
Broken Hill	31°S	Geraldton	28°S	Perth	32°S	Townsville	19°S

INSTALLATION – SOLAR COLLECTORS

WARNING: Plumber – Be Aware

- The solar hot and solar cold pipes between the solar storage tanks and the solar collectors **MUST BE** of copper and fully insulated with fibreglass insulation or similar (minimum thickness 13 mm). Thicker insulation may be required to comply with the requirements of AS/NZS 3500.4. The insulation must be weatherproof and UV resistant if exposed. All compression fittings must use brass or copper olives.
- Closed cell polymer insulation should not be used as it may not be able to withstand the temperature of the water generated by the solar collectors under stagnation conditions.

  Note: Failure to observe these requirements may void the warranty for freeze damage.

- The insulation is essential to assist in providing freeze protection, will offer corrosion protection to a metal roof against water runoff over the copper pipe, assist in avoiding accidental contact with the solar pipe work and also reduce pipe heat losses.

- The insulation must be **fitted up to the connections on both the solar collectors and the solar storage tanks**, as very high temperature water can flow from the solar collectors to the solar storage tanks under certain conditions.

- Plastic pipe **MUST NOT** be used, as it will not withstand the temperature and pressure of the water generated by the solar collectors under stagnation conditions. The solar collectors can generate extremely high water temperatures up to 150°C and high water pressure of 1000 kPa. Plastic pipe cannot withstand these temperatures and pressures and **MUST NOT** be used. Failure of plastic pipe can lead to the release of high temperature water and cause severe water damage and flooding.

- There **must be a continuous fall** in the pipe work between the solar collectors and solar storage tank. The highest point of the solar cold pipe and solar hot pipe must be where they connect to the solar collectors, to avoid the possibility of air locks occurring in the system.

INSTALLATION – SOLAR COLLECTORS

ROOF ASSEMBLY OF SOLAR COLLECTORS

Notes:

- Do not remove the solar collector packaging completely, prior to the installation. Remove only sufficient packaging material to enable the installation. Upon completion of the installation it is necessary to leave the solar collector packaging covering the glass and fittings on the solar collector. The packaging should not be removed until the solar collector is filled with water and ready for use, otherwise damage to the solar collector can occur.
- Connectors, sensor connectors, end plugs, 'O' rings, expansion pipes, copper or brass olives and compression nuts are required for each installation. Collector straps and collector angles are required if the installation is on a pitched roof. These components, identified with a Rheem part number on the detail diagrams, are available from Rheem. All other pipes and fittings shown shall be provided by the contractor.
- Suitable screws or anchors will be required to fix the collector straps and collector angles to the solar collectors and to the rafters for a pitched roof installation. Screws to secure the collector straps and collector angle to the solar collectors must be no longer than 15 mm.
- The maximum number of solar collectors in an array is 24 for NPT 200 collectors, with expansion hose required to be fitted at no more than every eighth solar collector. A gap of approximately 360mm must allowed for in the appropriate section of the array to accommodate the expansion hose. Refer to point 5. Multiple arrays can be installed. Each array should have an equal number of solar collectors.
- All compression fittings must use brass or copper olives.

INSTALLATION – SOLAR COLLECTORS

DO NOT MODIFY THESE PARTS IN ANY WAY.

1. **Solar Collector Location:** Select a suitable position for the solar collectors.

   Refer to "Solar Collector Location" on page 50.

2. **Collector Angle – Pitched Roof Installation:** Determine the location of the collector angle(s). Locate the collector angle(s) adjacent to each other.

   Hook two collector straps to each collector angle.

   Tile Roof: Remove the tiles on the next row above the position of the collector angle to expose the rafters. Ensure the collector angle is horizontal. Once in position, fix the collector straps to the rafters, using suitable screws or anchors. Replace the tiles.

   Metal Roof: Ensure the collector angle is horizontal. Once in position, fix the collector straps to the rafters, through the metal roofing material, using suitable screws for anchors. Care should be taken not to mark Colorbond or other metal roof sheet with a marking pen and to remove all swarf from the metal roof as these can cause deterioration of the metal roofing material.

   Note: Fixings must penetrate only through the high point in the roof material profile.

   Solar Stand – Flat Roof Installation: Determine the location of the Variable Pitch stand(s). Assemble and fix the stand(s) to the roof, following the installation instructions provided with the stand(s).

   Solar Stand – Across Pitch or Against Pitch Installation: Determine the location of each Across Pitch kit and Flat Roof stand or each Against Pitch kit and Flat Roof stand. Assemble and fix the stands to the roof, following the instructions provided with the stands.

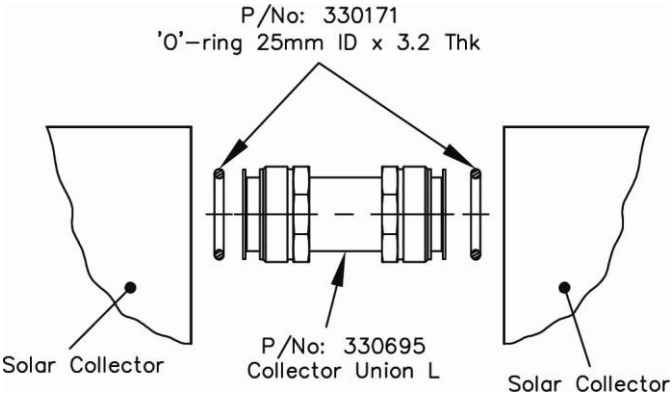
3. **Solar Collectors:** Position the solar collectors with the lower ends seated in the collector angle

4. **Collector Connectors / Unions:** For multiple solar collectors, couple the solar collectors together using the collector unions and 'O' rings.

   - **Note:** An expansion hose may be required in the array if more than 8 collectors in an array are to be installed. A gap of approximately 360mm must allowed for in the appropriate section of the array to accommodate the expansion hose. Refer to point 5.
   - Seat an 'O' ring into each of the collector connections to be joined.

INSTALLATION – SOLAR COLLECTORS

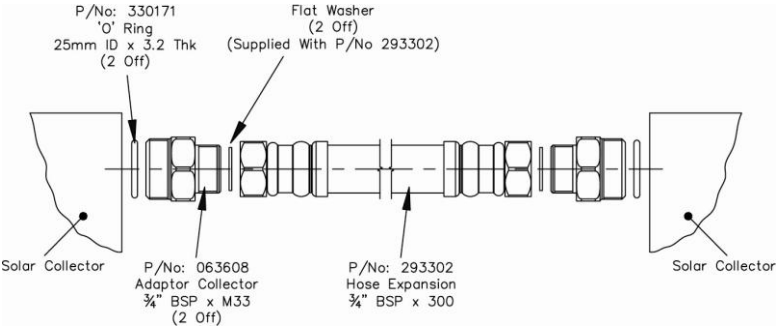
- Fit a collector union to each collector connection of the first solar collector to receive the second solar collector and screw in the unions until they seat firmly against their ‘O’ ring, applying medium pressure with a spanner to tighten.
- Place the collector unions into the collector connections on the second solar collector and screw in the unions until they seat firmly against the ‘O’ rings, applying medium pressure with a spanner to tighten.



DETAIL A – COLLECTOR UNION ASSEMBLY

5. **Expansion hose:** For multiple NPT 200 solar collectors of more than eight in an array, install an expansion hose at the top and bottom of the array at no more than every eighth solar collector.

- A gap of approximately 360mm must be maintained between the two collectors.
- Seat an ‘O’ ring into each of the collector connections to be joined.
- Fit the adapter fitting to each collector and screw in the adaptors until they seat firmly against their ‘O’ ring, applying medium pressure with a spanner to tighten.
- Fit the washer to each end of the expansion hose and connect to the adapter fitting.

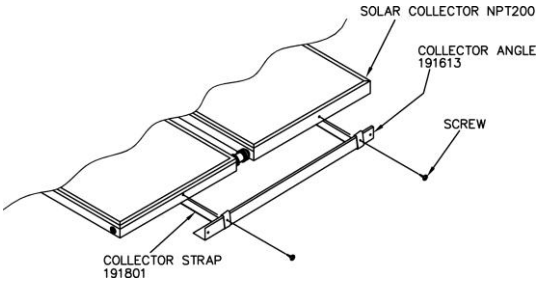


DETAIL F – EXPANSION HOSE ASSEMBLY

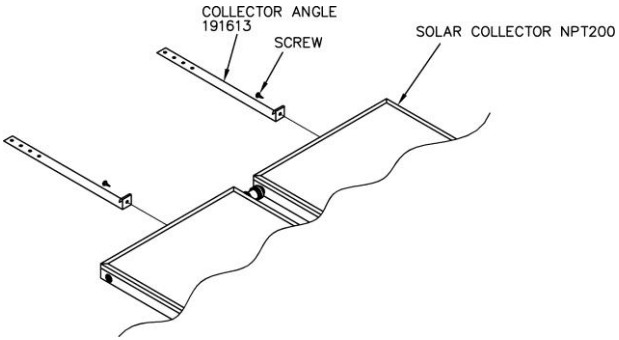
6. Fixing Collector Pitched Roof Installation

Once all connections **between** collectors in an array are complete, the collectors are to be fixed in position.

- **Bottom –** Ensure the solar collectors are well seated in the collector angle. Screw the collector angle to the solar collectors (two screws per collector).



- **Top –** Position a collector strap against the top end of each solar collector.



- *Tile Roof:* Remove the tiles on the next row above the top edge of the solar collectors to expose the rafters. Once in position, fix the collector straps to the rafters, using suitable screws or anchors. Replace the tiles.

Metal Roof: Once in position, fix the collector straps to the rafters, through the metal roofing material, using suitable screws or anchors. The collector straps may be cut to a length of approximately 100 mm to retain the aesthetics of the installation.

Note: Fixings must penetrate only through the high point in the roof material profile.

Screw the collector straps to the solar collectors. Screws must be no longer than 15 mm.

All the commercial owners guides are not linked in the trade search, please link all Commercial products, also there is no heading for Heavy duty electric to differentiate between domestic and commercial.

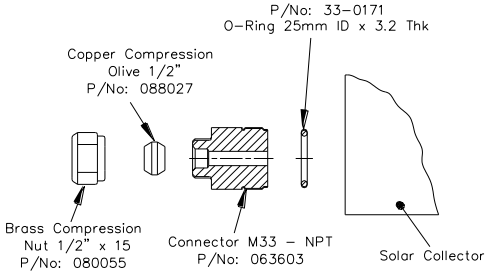
7. **Fixing Collector Flat Roof, Across Pitch or Against Pitch Installation:**

Once all connections **between** collectors in an array are complete, the collectors are to be fixed in position.

- **Solar Stand (bottom and top) –** Ensure the solar collectors are well seated in the collector angle. Clamp the solar collectors (four clamps per collector) to the collector rails, using the clamps, hex screws, washers and nuts provided with the Variable Pitch stand.

8. **Connector:** Fit an inlet/outlet connector to the inlet of the solar collector array using an ‘O’ ring.

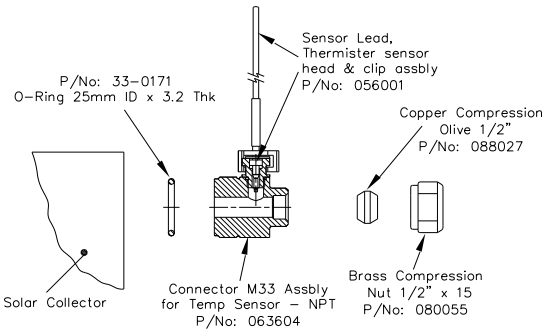
- Seat an ‘O’ ring into the collector connection.
- Place the connector into the collector connection and screw in the union until it seats firmly against the ‘O’ ring, applying medium pressure with a spanner to tighten.
- Place the compression nut and olive over the end of the solar cold pipe. Position the cold pipe into the connector, seat the olive and tighten the compression nut.



DETAIL K – CONNECTOR ASSEMBLY
(WATER CONNECTION TO SOLAR COLLECTOR)

9. **Sensor Connector:** Repeat this procedure with the sensor connector (with hot sensor port) to the outlet of the solar collector array using an 'O' ring.

   Note: If more than one array of solar collectors is to be installed, then use an inlet/outlet connector on the outlet of all but the last array. Only one sensor connector is required for the hot sensor probe connection at the solar collectors.

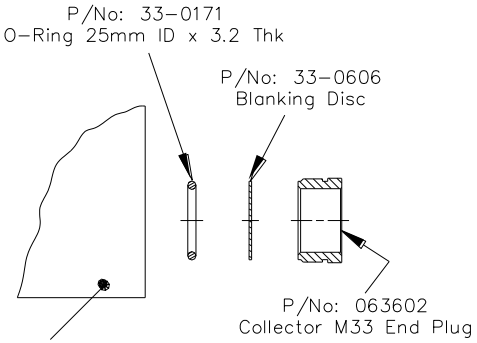


DETAIL L – SENSOR CONNECTOR ASSEMBLY – SCREWED FITTING

10. **End Plugs:** Fit the end plugs to the two remaining solar collector connections using the 'O' rings and blanking discs.

    - Seat an 'O' ring into the collector connection.
    - Place a blanking disc over the seated 'O' ring.

- Place the end plug into the collector connection and screw in until it seats firmly against the blanking disc, applying medium pressure with a spanner to tighten.



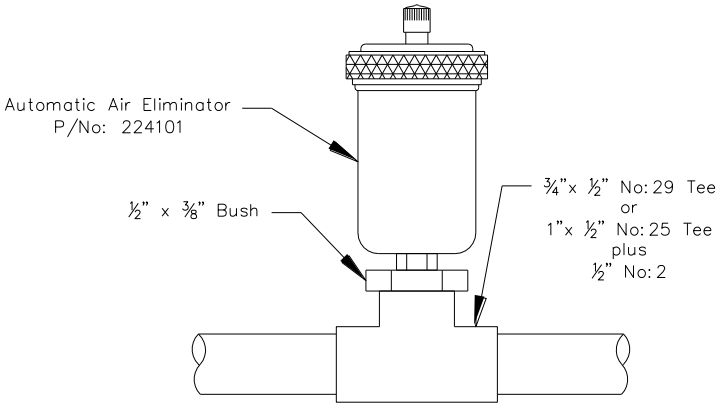
DETAIL J – END PLUG ASSEMBLY

11. **Air Eliminator:** Install an automatic air eliminator at the highest point in the collector array, in the solar hot pipe adjacent to the connection of the outlet of the solar collectors.

    If the solar collectors are installed on stands or frames on a flat or slightly sloping roof and there is more than one collector array, then it is necessary to install an automatic air eliminator adjacent to the outlet of each collector array.

    - Fit a suitably sized Tee with ½" branch to the solar hot pipe adjacent to the outlet of the collector array. Ensure the Tee branch is orientated vertically.
    - Fit a ½" x 3/8" Bush to the Tee.
    - Screw the automatic air eliminator into the Bush.

INSTALLATION – SOLAR COLLECTORS



DETAIL G – AUTOMATIC AIR ELIMINATOR

12. **Solar Cold and Solar Hot Pipes:** Connect the solar cold pipe to the connector at the inlet of the solar collectors and the solar hot pipe to the outlet of the solar collectors using the compression nuts and olives.

    Refer to "Coupling Cold and Hot Pipes to Collector – Screwed Fitting" on page 58 and the installation diagrams on pages 41 and 43.

    The solar hot and solar cold pipes should be sized to suit the installation.

    ⚠ **Warning: Plumber – Be Aware:** It is important you refer to "Warning: Plumber – Be Aware" on page 48 for important information relating to the installation of the solar hot and solar cold pipes.

    Refer also to the installation diagrams on pages 25 and 26.

    Notes:

    - Penetrations through the roofing material must be:
        - at the high point of the roof tile or metal sheet;
        - made neatly and kept as small as practicable;
        - waterproofed upon installation of the solar hot and solar cold pipes.
    - Exposed insulated pipe work between the solar collectors and the penetrations through the roofing material should be kept to a minimum to maintain the aesthetics of the installation.

INSTALLATION – SOLAR COLLECTORS

13. **Hot Sensor Lead:** Insert the sensor probe of the hot sensor lead assembly into the sensor connector, ensuring the 'O' ring is in position on the probe. Lock it into position with the locking washer and clip.

14. **Cable Ties:** Secure the sensor leads at appropriate locations with the cable ties.

15. **Labels:** At ground or floor level, adjacent to the site of the solar storage tanks, attach the 'Solar Cold Pipe' label to the insulation on the solar cold pipe to the solar collectors and the 'Solar Hot Pipe' label to the insulation on the solar hot pipe from the solar collectors.

    Ensure the arrows on the labels are pointing in the correct direction of water flow.

16. **Commissioning:** Upon completion of the installation, commission the system, including bleeding the air from the solar collectors (refer to "Bleeding The Solar Collectors" on page 62) and checking the plumbing and connections for leaks. Refer to "Commissioning" on page 61.

CONNECTIONS – PLUMBING

IN-SERIES WATER HEATER

The pipe work between the solar storage tank and an in-series water heater has a minimum recommended pipe size of DN20, **MUST BE** of copper and be fully insulated in accordance with the requirements of AS/NZS 3500.4. The insulation must be weatherproof and UV resistant if exposed. The insulation must be fitted up to the connections on both the solar storage tank and the in-series water heater. An isolation valve must be installed on the water line to the in-series water heater.

CONNECTIONS – ELECTRICAL

The power supply to the solar control unit and auxiliary electric heater, if installed, must not be switched on until the solar storage tanks, auxiliary electric heater and solar collectors are filled with water and a satisfactory megger reading is obtained. The solar water heating system is designed so the solar storage tanks do not have power connected to them.

All electrical work and permanent wiring must be carried out by a qualified person and in accordance with the Wiring Rules AS/NZS 3000 and local authority requirements.

SOLAR CONTROL UNIT

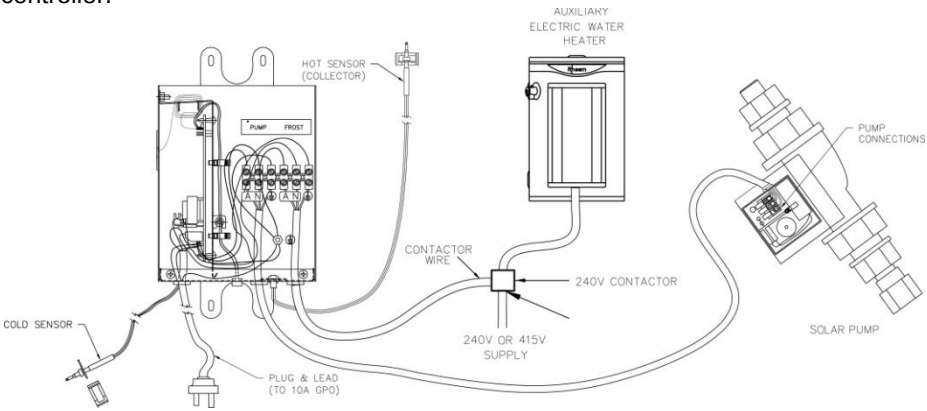
The solar control unit, supplied with a 1.8 metre power cord, requires a 240 V 50 Hz general purpose outlet (GPO) to be located within 1.2 metres of the installation. The GPO must have a continuous power supply originating from a circuit other than the in series booster water heater circuit. The GPO is required to be weatherproof if installed outdoors.

The solar control unit will only operate on a sine wave at 50 Hz. Devices generating a square wave cannot be used to supply power to the system. The solar control unit draws 4 Watts of power as a constant load.

CIRCULATOR(S)

The circulator(s) are to be wired into the terminal block on the solar control unit marked “PUMP” A,N,E. A flexible 20 mm conduit is required for the electrical cable from the solar control unit to the circulator(s). The conduit is to be connected to the solar control unit and circulator(s) with a 20 mm terminator.

A dual circulator system such as Redi-set can be controlled by the solar controller.



Wiring Diagram – Solar Control Unit

CONNECTIONS – ELECTRICAL

AUXILIARY ELECTRIC HEATER

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

The auxiliary electric heater must be connected to either a 240V AC 50 Hz mains power supply or a 3 phase, 415 Volt AC star supply via a contactor of suitable rating. The power rating of the heating unit(s) is shown on the rating label of the auxiliary electric heater and are rated for a 240 Volt power supply. An isolating switch must be installed at the switchboard

Note: The auxiliary electric heater is not suitable for power supplies utilising a 415 V delta connected supply.

A 25 mm flexible conduit is required for the electrical cable to the water heater. The conduit is to be connected to the unit with a 25 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 should suit this application.

The contactor is to be wired into the terminal block on the solar control unit marked “FROST” A,N,E. A flexible 20 mm conduit is required for the electrical cable from the solar control unit to the contactor. The conduit is to be connected to the solar control unit and contactor with a 20 mm terminator.

THERMOSTAT SETTING

For reasons of safety and economy, we advise the thermostats on the booster water heaters be set at the lowest temperature that will provide sufficient hot water during periods when boosting is required. We recommend the thermostats are set at 60°C to maximise solar contribution. Discuss the thermostat setting with a responsible officer.

COMMISSIONING

TO FILL AND TURN ON THE WATER HEATER

The power supply to the solar control unit and circulator(s) must not be switched on until the solar storage tanks and solar collectors are filled with water and a satisfactory megger reading is obtained.

- Ensure the air bleed valve and the solar cold pipe drain isolation valve are closed and the circulator isolation valves are open.
- Open all of the hot water taps in the building (don't forget the showers) and supply cocks and valves in the system.
- Open the air bleed valve on the solar hot pipe from the solar collectors.
- Open the isolation valves fully on the cold, solar flow and hot water branches to the solar storage tanks installed in a bank.
- Open the cold water isolation valve on the cold water line to the solar storage tanks.

  Air will be forced out of the taps and the air bleed valve.
- Close each tap as water flows freely from it.
- As water flows freely from each tap and the air bleed valve, close it.
- Check the pipe work for leaks.
- Bleed the solar collectors (refer to "Bleeding the Solar Collectors" on page 62).
- Plug in the solar control unit at the power outlet and switch on the electrical supply.

  The power outlet must be switched on for the solar control unit to operate and solar gain to be achieved.

Explain to a responsible officer the functions and operation of the solar water heater. Upon completion of the installation and commissioning of the water heater, leave this guide with a responsible officer.

COMMISSIONING

BLEEDING THE SOLAR COLLECTORS

Upon completion of the installation, it is necessary to purge the air from the collector circuit. To purge air from the collector circuit:

- Ensure the solar storage tanks are full of water and all of the hot taps are turned off.
- Open the air bleed valve installed adjacent to the solar hot pipe (flow from collector).

  It may be necessary to remove an end plug from the top of the solar collector at the end of the highest array of solar collectors.

  If the installation is on a flat roof and there is more than one array, then it may be necessary to remove an end plug from the top of each array of solar collectors.
- The mains pressure will force water to flow from the solar storage tanks and through the pipe work, forcing air from the collector circuit through the air bleed valve or solar collectors.

  This is evidenced by spurting of water from the drain line connected to the air bleed valve or from the solar collectors.

  ⚠ **Warning:** Exercise care to avoid any splashing of water, as water discharged from the solar collectors may be of a very high temperature.
- Close the air bleed valve when water runs freely from the drain line and fit the end plug(s) when water runs freely from the solar collectors.

This will purge large quantities of air from the collector circuit. Any remaining air will be purged from the system through the automatic air eliminator valves installed at the highest points of the collector circuit.

COMMISSIONING

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 power outlet to the solar control unit and circulator(s) (refer to note below).
- Close the cold water isolation valve on the cold water line to the solar storage tanks to shut down the entire system, or;
- Close the isolation valves on the cold, solar flow and hot water branches to shut down an individual solar storage tank in a bank, or;
- Close an isolation valve at each circulator and close the isolation valves on the solar flow branches to the solar storage tanks to isolate the solar collectors only.
- Open the solar cold pipe drain isolation valve or the air bleed valve if one is installed.

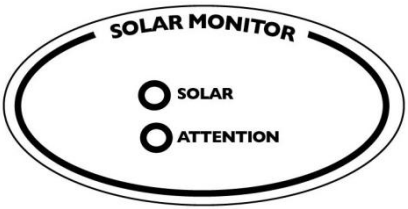
  ⚠ **Warning:** The solar collectors should only be isolated if a solar cold pipe drain isolation valve and / or an air bleed valve are installed and at least one of them is opened. This will prevent both stagnation conditions in the solar collectors under solar radiation and prevent the risk of the water freezing in the solar collectors if freezing conditions were to occur (refer to “Draining The Solar Collectors” on page 66.

Note: The freeze protection system will be rendered inoperable if electrical power is not available. Damage caused by freezing due to the unavailability of power to the solar control unit and circulator(s) is not covered by the Rheem warranty (refer to “Warranty Exclusions” on page 70). If there is a risk of freezing, then it is necessary to drain the solar collectors and connecting pipe work (refer to “Draining the Solar Collectors” on page 66).

COMMISSIONING

DIAGNOSTIC FEATURES OF THE SOLAR CONTROLLER

A solar monitor is located on the side of the solar control unit and houses a green and a red LED.



The green LED, marked “Solar”, indicates the current operational mode of the solar water heater and the red LED, marked “Attention”, indicates a fault mode.

The green LED will emit either a constant glow or a series of flashes, with a 2 second interval between each series.

The red LED will emit a series of flashes, with a 2 second interval between each series, only if there is a particular fault condition with the system.

The modes are:

Flashes	Operational Modes
solid green (remains on)	Standby mode
green slow pulse	Standby mode (power on for less than 48 hours)
green rapid pulse	Circulating water through collectors
3 x green	Circulating water through collectors (power on for less than 48 hours)
no green (remains off)	Power outage or call for service

Flashes	Fault Modes
solid red (remains on)	Hot sensor temperature greater than 130°C
red rapid pulse	Temperature rise across collector greater than 40°C (circulator at full speed)
3 x red	Hot sensor in collector – short circuit
4 x red	Hot sensor in collector – open circuit
5 x red	Cold sensor –short circuit
6 x red	Cold sensor – open circuit

COMMISSIONING

If the power supply to the solar control unit is on and the green LED is off or the red LED is flashing, this indicates there may be a fault with the water heater. The red LED may emit up to six flashes in each series of flashes.

Note: During periods of high solar radiation and if the circulator activates after having been off, such as during start up, it is possible the red LED may emit a rapid pulse for a period of up to ten (10) minutes. This does not indicate a fault. Refer to "To Fill And Turn On The Water Heater" on page 61 for the possible green and red LED flashing sequence during start up procedure.

If the red LED continues to emit a rapid pulse for longer than ten (10) minutes, or emits a series of flashes, then count the number of flashes and phone Rheem Service or their nearest Accredited Service Agent to arrange for an inspection.

DRAINING THE SOLAR COLLECTORS

To drain the solar collectors and the solar hot and solar cold pipes:

- Open a hot water tap and allow the water to run for five minutes immediately prior to draining the solar collectors.

  This will assist in the transfer of any high temperature water in the solar collectors to the solar storage tanks.

- Close the hot water tap.
- To isolate the collector circuit from the storage tanks:
  - Switch off the electrical supply at the power outlet to the solar control unit and circulator(s).
  - Close the isolation valve on the outlet side of each circulator.
  - Open the air bleed valve fitted adjacent to the solar hot pipe (flow from collectors).

    Water will now drain from the solar hot pipe.

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

    The non return valve on the solar hot pipe will prevent back flow from the solar storage tanks.

  - Close the isolation valve(s) on the solar flow branches to the solar storage tanks.

    ⚠ **Warning:** It is important to open the air bleed valve prior to closing the isolation valves on the storage tanks. If solar radiation is available, the water will be heated in the solar collectors causing the water to expand. This thermal expansion will be expelled through the open air bleed valve.

  - Open the solar cold pipe drain isolation valve fitted adjacent to the solar cold pipe (flow to collectors).

    Water will now drain from the solar collectors and the solar cold pipe.

DRAINING THE SOLAR COLLECTORS

- To open the solar circuit to the solar storage tanks:
  - Close the solar cold pipe drain isolation valve fitted adjacent to the solar cold pipe (flow to collectors).
  - Open the isolation valves on the solar flow branches to the solar storage tanks.
  - Close the air bleed valve fitted adjacent to the solar hot pipe (flow from collectors).
  - Open the isolation valve on the outlet side of each circulator.
  - Switch on the electrical supply at the power outlet to the solar control unit and circulator(s).

DRAINING THE SOLAR STORAGE TANK

To drain the solar storage tank:

- Open a hot water tap and allow the water to run for five minutes immediately prior to **draining** the solar storage tank.

  This will assist in the transfer of any high temperature water in the solar collector(s) to the solar storage tank.
- Close the hot water tap.

  ⚠ **Warning:** Exercise care, as water discharged from the solar storage tank may be of a very high temperature.
- Switch off the electrical supply at the power outlet to the solar control unit and circulator(s) if the solar storage tank is not installed in a bank of solar storage tanks.
- Turn off the solar storage tank (refer to "To Turn Off The Water Heater" on page 63).
- 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 solar storage tank.
- Undo the union at the cold water inlet to the solar storage tank and attach a hose to the solar storage tank 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 solar storage tank and allow the water to drain through the hose.

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RHEEM SOLAR WATER HEATER WARRANTY – AUSTRALIA ONLY

COMMERCIAL SOLAR LOLINE WATER HEATER

Colllectors NPT200 & L Storage tanks 610340 & 610430
Solar controller unit 299129
The Rheem Warranty – General

1.1 This warranty is given by Rheem Australia Pty Limited ABN 21 098 823 511 of 1 Alan Street, Rydalmere New South Wales.

1.2 Rheem offer a trained and qualified national service network who will repair or replace components at the address of the water heater subject to the terms of the Rheem warranty. Rheem Service, in addition can provide preventative maintenance and advice on the operation of your water heater. The Rheem Service contact number is available 7 days a week on 131 031 with Service personnel available to take your call from 8am to 8pm daily (hours subject to change).

1.3 For details about this warranty, you can contact us on 131 031 or by email at warrantyenquiry@rheem.com.au (not for service bookings).

1.4 The terms of this warranty are set out in section 2 and apply to water heaters manufactured after 1st November 2011.

1.5 If a subsequent version of this warranty is published, the terms of that warranty will apply to water heaters manufactured after the date specified in the subsequent version.

2. TERMS OF THE RHEEM WARRANTY AND EXCLUSIONS TO IT

2.1 The decision of whether to repair or replace a faulty component is at Rheem's sole discretion.

2.2 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 Rheem warranty.

2.3 Where the water heater is installed outside the boundaries of a metropolitan area as defined by Rheem or further than 25 km from either a regional Rheem branch office or an Accredited Rheem Service Agent's office, the cost of transport, insurance and travelling between the nearest branch office or Rheem Accredited Service Agent's office and the installed site shall be the owner's responsibility.

2.4 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.

2.5 This warranty only applies to the original and genuine Rheem water heater in its original installed location and any genuine Rheem replacement parts.

2.6 If the water heater is not sized to supply the hot water demand in accordance with the guidelines in the Rheem water heater literature, any resultant fault will not be covered by the Rheem warranty.

2.7 The Rheem 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 Rheem Service or a Rheem Accredited Service Agent.

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.

k) Ice formation in the waterways of a water heater system incorporating a freeze protection system: where the electricity supply has been switched off or has failed; or where it is installed at an altitude more than 400 metres above sea level.

l) Breakage of collector glass for any reason including hail damage (we suggest that the collector glass be covered by your home insurance policy).

2.8 If you require a call out and we find that the fault is not covered by the Rheem warranty, you are responsible for our standard call out charge. If you wish to have the relevant component repaired or replaced by Rheem, that service will be at your cost.

2.9 Subject to any statutory provisions to the contrary, this warranty excludes any and all claims for 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.

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

3.1 Rheem 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 in which the fault must appear in order to be covered	What coverage you receive
All components	Year 1	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 2 to 5	Repair and / or replacement of the cylinder, free of charge, including labour.
	Years 6 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 not installed in a single-family domestic dwelling)	Years 2 to 5	Replacement cylinder, free of charge. Installation and repair labour costs are the responsibility of the owner.
The solar collector (all installations)	Years 2 to 5	Replacement solar collector, free of charge. Installation and repair labour costs are the responsibility of the owner.

3.2 For Wilson stainless steel tanks warranty refer to Wilson tank owner's guide.

3.3 If a government rebate has been received for the water heater, the duration of the protection afforded by this warranty may be greater than what is set out above. Please call 131 031 for details.

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 Rheem Service 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 Rheem on 131031 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) Rheem will arrange for the water heater to be tested and assessed on-site.

c) If Rheem determines that you have a valid warranty claim, Rheem 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 Rheem warranty (set out above) is in addition to any rights and remedies that you may have under the *Australian Consumer Law*.

RHEEM AUSTRALIA PTY LTD
A.B.N. 21 098 823 511
www.rheem.com.au

FOR SERVICE TELEPHONE
131 031 AUSTRALIA
0800 657 335 NEW ZEALAND