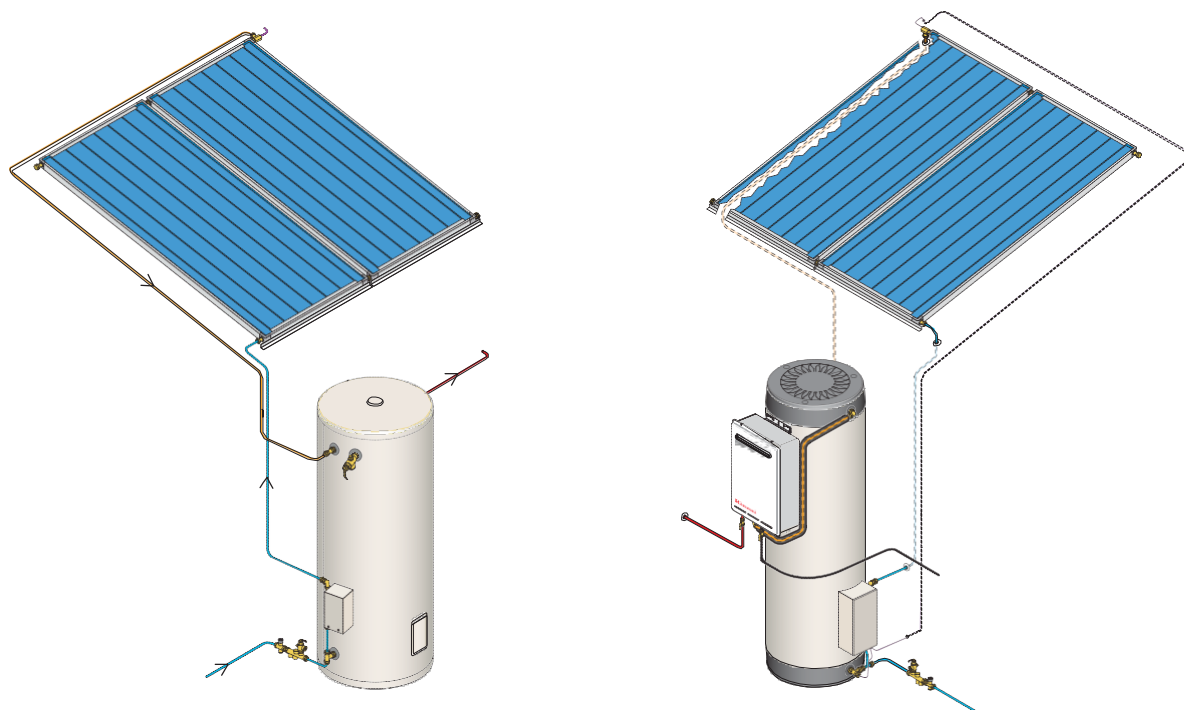


Rinnai

Operation / Installation Manual

RINNAI 'PRESTIGE'® and RINNAI 'SUNMASTER'®

Solar Split Systems Electric and Gas Boosted



The appliance must be installed, commissioned and serviced by an authorised person in accordance with all applicable local rules and regulations.



The collector flow and return pipes should be 15mm copper tube or alternative tube supplied by Rinnai. Plastic pipe must not be used. Plastic pipe is not suited to the high water temperatures and pressures that may occur in the collector flow and return system.

NOT SUITABLE AS A POOL OR SPA HEATER



All Rinnai gas products are AGA certified.



N10378

Certified Product



AS3498 Lic W169
SAI Global

Certified Product



AS3498 Lic W208
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AS 2712
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TABLE OF CONTENTS

IMPORTANT INFORMATION	1
SAFETY	1
OPERATION PRINCIPLE	3
SERVICING AND REPAIR	4
WATER TEMPERATURE	5
TURNING OFF THE WATER HEATING SYSTEM	5
TURNING ON THE WATER HEATING SYSTEM	5
WATER QUALITY	5
DRAINING AND FILLING THE WATER HEATING SYSTEM	5
SAVE A SERVICE CALL	6
SPECIFICATIONS FOR SYSTEMS	8
SPECIFICATIONS FOR COLLECTOR PANELS	10
SPECIFICATIONS FOR STORAGE CYLINDERS	11
SPECIFICATIONS FOR GAS BOOSTERS	15
INSTALLATION & MAINTENANCE - ALL SYSTEMS	16
REGULATIONS AND OCCUPATIONAL HEALTH AND SAFETY (OH&S)	16
LOCATION - GENERAL INFORMATION	16
STORAGE CYLINDER LOCATION	16
GAS BOOSTER LOCATION AND MOUNTING (where applicable)	17
WATER PIPES	17
WATER SUPPLY	17
HOT WATER DELIVERY TEMPERATURE	17
VALVES & FITTINGS	18
INSTALLATION & MAINTENANCE - GAS BOOSTED SYSTEMS	19
OVERVIEW OF SYSTEM COMPONENTS	20
GAS BOOSTER LOCATING AND MOUNTING	20
GAS SUPPLY	20
HOT WATER DELIVERY TEMPERATURE	20
CLEARANCES	21
INSTALLATION PROCEDURE	23
FILLING THE SYSTEM	24
CHECKING SOLAR PUMP OPERATION	25
PRE SOLAR HEATING CHECKS	25
SOLAR HEATING	26
FINISHING THE INSTALLATION	26
DRAINING INSTRUCTIONS	26
INSTALLATION & MAINTENANCE - ELECTRIC BOOSTED SYSTEMS	27
OVERVIEW OF SYSTEM COMPONENTS	28
ELECTRIC SUPPLY	28
HOT WATER STORAGE AND DELIVERY TEMPERATURES	28
INSTALLATION PROCEDURE	28
FILLING THE SYSTEM	31
CHECKING SOLAR PUMP OPERATION	31
ADJUSTING FLOW CONTROL VALVE (if applicable)	32
PRE SOLAR HEATING CHECKS	32
SOLAR HEATING	32
FINISHING THE INSTALLATION	32
DRAINING INSTRUCTIONS	33
INSTALLATION OF SOLAR COLLECTORS	34
REGULATIONS AND OCCUPATIONAL HEALTH AND SAFETY (OH&S)	34
SYSTEM ORIENTATION AND INCLINATION	34
SOLAR COLLECTOR ROOF MOUNTING OPTIONS	35
STANDARD INSTALLATION - INCLINED TILED ROOF	36
STANDARD INSTALLATION - INCLINED IRON ROOF	37
FLAT ROOF FRAME INSTALLATION INSTRUCTIONS	37
CYCLONE FRAME INSTALLATION	39
SIDE-PITCH FRAME INSTALLATION	42
REVERSE-PITCH ROOF FRAME INSTALLATION	44
CONTACT INFORMATION	45

IMPORTANT INFORMATION

SAFETY



- This appliance must be installed, commissioned and serviced by an authorised person in accordance with all applicable local rules and regulations.
- Access covers of water heating system components will expose 240V wiring and must be removed by authorised persons only.
- This water heating system is not intended to be operated, adjusted or tampered with by young children or infirm persons. Young children should be supervised to ensure they do not interfere with the water heater.
- Any power leads from water heater system components must be plugged into an external, weatherproof electrical outlet. If the power supply cord or plug of any water heating components is damaged, it must be replaced by an authorised person in order to avoid a hazard, using genuine replacement parts available from Rinnai. Take care not to touch the power plugs with wet hands.
- Care should be taken not to touch the pipe work connecting to the solar storage cylinder and solar collectors. The pipes that are used to connect the cylinders to the collectors must be copper, or alternative material pipes as supplied by Rinnai. Plastic pipe is not suited to the high water temperatures and pressures that may occur in the collector flow and return system. The size of the pipe for the collector flow and return pipes should be at least 15 mm.

Hydrogen Gas

In the case of systems using a vitreous enamel lined cylinder, if the hot water unit is not used for two weeks or more, a quantity of hydrogen gas, which is highly flammable, may accumulate in the water heater. To dissipate this safety, it is recommended that a non electrically operated hot tap be turned on for two minutes at a sink, basin, or bath, but not at dishwasher or other appliance. During this procedure there must be no smoking, open flame or any electrical appliance operating nearby. If hydrogen is discharged through the tap, it will probably make a sound like air escaping.

Scald Hazards



Hot Water can cause scalds.

Children, disabled, and the elderly are at the highest risk of being scalded.

Feel water temperature before bathing or showering.

Scalds from hot water taps can result in severe injuries to young children.

Scalds can occur when children are exposed directly to hot water when they are placed into a bath which is too hot.

DO

- Do stay with children whenever they are in the bathroom (Take the phone off the hook).
- Do take them out of the bathroom if you need to answer the phone or door.
- Do test the temperature of the water with your elbow before placing your child in the bath.
- Do make sure that the tap is turned off tightly.
- Do install a child proof tap cover OR
- Do install a child resistant tap.
- Consider child-resistant taps or tap covers, which prevent a small hand being able to turn on the tap.
- Consider installing tempering valves or thermostatic mixing valves which reduce the hot water temperature delivered to taps. Your local plumbing authority may already require that these be fitted. Contact your installer or local plumbing authority if in doubt.

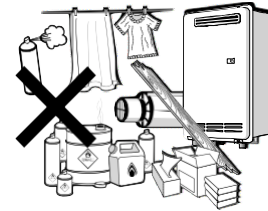
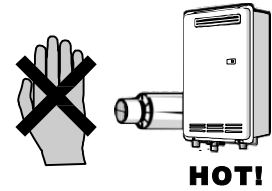
DON'T

- DO NOT leave a toddler in the care of another small child. The older child may not have set the water temperature to a safe level.

IMPORTANT INFORMATION

Gas boosted models only

- **Do not** touch the flue outlet or do not insert any objects into the flue outlet.
- Keep flammable materials, spray cans, fuel containers, trees, shrubs and pool chemicals etc. well clear of the flue outlet.
- **Do not** use the gas types other than those designated on the data plate. For example, do not use Propane/Butane gas mixtures on appliances marked Propane Gas.
- **Do not** use Propane gas on appliances marked as Natural Gas and vice versa.



Safety Devices

The water heating system is supplied with various safety devices including temperature sensors, overheat sensors and switches and a Pressure & Temperature Relief (P&TR) valve. These devices must not be tampered with or removed. The water heating system must not be operated unless each of these devices is fitted and is in good working order.



- DO NOT tamper with or remove safety devices.
- DO NOT operate the water heater unless all safety devices are fitted and in good working order.
- DO NOT block or seal the P&TR Valve and drain pipe.

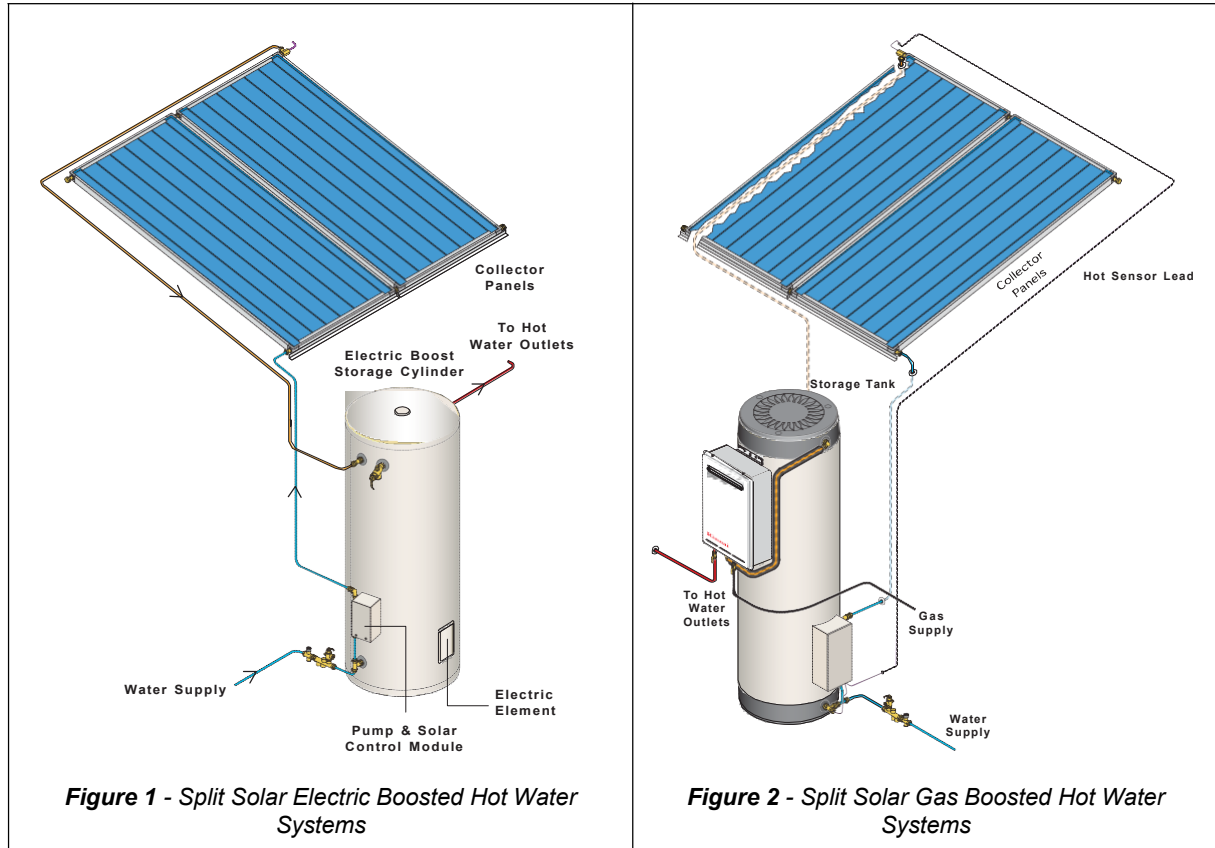
IMPORTANT INFORMATION

OPERATION PRINCIPLE

This system is designed to have the solar collectors on the roof and the storage cylinder installed at ground or floor level.

Electric and Gas boosted models are available. The system comprises a hot water storage cylinder, solar panels, pump circulation system solar control unit and temperature sensors. The solar control unit ensures water circulates between the solar collectors and the storage cylinder to transfer heat from the solar collectors to the water in the cylinder if enough heat is available from the sun.

Supplementary heating is provided if insufficient heat is available from sun (such as during cloudy or rainy weather or during winter months) either via an electric heating element(s) located inside the storage cylinder or via a Gas booster located external to the storage cylinder. The following diagrams illustrates the Split Solar Hot Water System set up for both the Electric and Gas boosting.



REGULAR CARE

Over flow tray and drain

The overflow tray (supplied by installer) and drain underneath the storage cylinder (if fitted) should be periodically checked to ensure there are no blockages.

IMPORTANT INFORMATION

Pressure and Temperature Relief (P&TR) Valve

This valve is located near the top of the water heater and is essential for safe operation. It is normal for the valve to release a small quantity of water through the drain line during heating. However, continuous leakage of water from the valve and its drain line may indicate a problem with the water heater.

The valve may be either of the two illustrated.

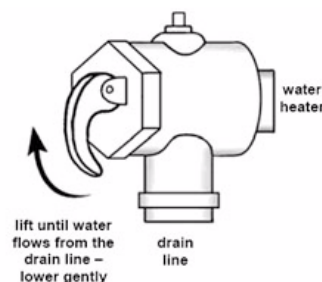


- Never block the outlet of the P&TR valve or its drain line for any reason. The easing gear must be operated at least once every six months or more frequently in areas with a high incidence of water deposits. It is very important you raise and lower the easing gear gently.
- Failure to do this may result in the water heater cylinder failing or under certain circumstances, exploding.

Twist cap until water flows from the drain line.



Rinnai Prestige® P&TR Valve



Rinnai Sunmaster® (RMC) P&TR Valve



- If the valve does not discharge water when the easing gear lever is opened, or does not seal again when the easing gear is closed, shut down electrical power to the system and arrange attendance by an authorised person. The P&TR valve is not serviceable.

Expansion Control Valve (ECV) if fitted

This valve is located on the cold water inlet piping to the cylinder. Operate the easing lever on the expansion control valve once every six months. It is very important you raise and lower the lever gently.

SERVICING AND REPAIR

Our Servicing network personnel are fully trained and equipped to give the best service on your appliance. If your appliance needs service, ring one of the service contact numbers on the back of this booklet.

It is recommended that the system be serviced at least every 5 years.

The pressure and temperature relief valve and expansion control valve must be checked for performance or replaced by an authorised person at intervals not exceeding 5 years or more frequently in areas where the water is classified as scaling water (refer to 'Warranty Terms and Conditions' document - 'Water Quality').

It is recommended that the sacrificial anode fitted to Sunmaster® cylinders be inspected every 5 years or more frequently in areas where there is a high incidence of water deposits. This does not apply to Rinnai Prestige® cylinders.

If the electric conduit, power supply cord or plug to the water heater is damaged, they must be replaced by an authorised person in order to avoid a hazard. The power supply cord and plug (if fitted) must be replaced by a genuine replacement part available from Rinnai.

IMPORTANT INFORMATION

WATER TEMPERATURE

The solar control unit and pump ensure water circulates between the solar collectors and storage cylinder until the water at the base of the cylinder reaches approximately 65°C. Under these conditions water at the hot outlet may exceed 85°C. During periods of low solar gain supplementary heating occurs to a minimum of 60°C as required.



- To meet Australian regulatory requirements, supplementary heating temperature settings must be at least 60°C.

TURNING OFF THE WATER HEATING SYSTEM

If you plan to be away for only a few nights, we suggest you leave the water heating system switched on. If it is necessary to switch off the water heater, do so as outlined below:

Electric Boosted systems

- Switch off the electric supply to the supplementary heating element. The switch is usually marked and located in the electricity meter box of the dwelling.
- Switch off the electric supply to the solar controller and pump.

Gas Boosted systems

- Switch off the electric supply to the gas booster.
- Switch off the electric supply to the solar controller and pump.

TURNING ON THE WATER HEATING SYSTEM

Electric Boosted system

- Switch on the electric supply to the supplementary heating element(s). The switch is usually marked and located in the electricity meter box of the dwelling.
- Switch on the electric supply to the solar controller pump. Electric and solar water heating will now occur as required. It may take a number of hours before hot water is available.

Gas Boosted systems

- Switch on the electric supply to the gas booster.
- Switch on the electric supply to the solar controller and pump. Solar water heating will now occur. Hot water is available immediately from the gas booster when hot water tap is opened, irrespective of solar heat gain.

WATER QUALITY

The water quality of most public supplies is suitable for the water heating system. The water quality from bore wells is generally unsuitable for the water heating system. Refer to separate 'Warranty Terms and Conditions' document for water quality parameters and how they affect the warranty conditions. If in doubt about the water quality, have it checked against the parameters listed in the warranty conditions. The system is not suitable as a pool or spa heater.


DRAINING AND FILLING THE WATER HEATING SYSTEM

- Draining or filling normally occur only during installation or servicing and must be carried out by an authorised person.

SAVE A SERVICE CALL

Before calling Rinnai for service, perform the fault finding steps in the **Table 1** below. If the problem persists, contact Rinnai. Service calls attending to any condition or fault that is not related to the Rinnai product and components may be chargeable.

Table 1 - Troubleshooting

Problem	Cause	Remedy
Insufficient or no hot Water	Booster heating not operating Or Insufficient gas supply for gas boosted heating system	<p>Electric boosted Systems: Check to ensure the electric isolating switch(es) at the switchboard (usually marked "Hot water" or "water heater") is switched 'On'. Check to ensure that the electric fuses for hot water at the switchboard are intact.</p> <p>Gas Boosted Systems: Check to ensure the power cord of the gas booster is plugged in and the power point switched 'on'. Check gas is available and turned 'On'. Close the hot tap and wait for 10 seconds and open it again. The hot tap must be opened enough to ensure that the flow rate is not less than 2.4 L/min. gas the gas booster burners will not light if it is less than 2.4 L/min. Check the isolation valve in the gas line is opened. If there is gas supply to other appliances in the rest of the house, try lighting another gas appliance. Refer to your plumber to ensure the gas line has been purged of air after installation.</p>
	Excessive hot water consumption	<p>Electric Boosted Systems: If the water goes cold, are you using more hot water than you think? Often end users are surprised at the amount of hot water used, especially when showering. If the amount of hot water used during the day exceeds the storage capacity of the cylinder, it is likely that there will be insufficient hot water. Has your plumber install water saving fixtures and/or flow control or pressure limiting valves to reduce consumption.</p> <p>Gas Boosted Systems: Insufficient flow may occur if multiple outlets are in use at the same time and exceed the rated flow capacity of the gas booster. If so, reduce the number of outlets in use. Have your plumber install water saving fixtures and/or flow control or pressure limiting valves to reduce consumption. Check correct size gas booster is fitted.</p>
	Incorrect Solar system size	Do you have the correct system size and configuration for your requirements? Refer to Rinnai literature for information.
	Temperature and pressure relief valve / Expansion Control valve discharging water continuously	<p>Pressure and Temperature Relief (P&TR) valve It is normal and desirable that this valve allows a small quantity of water to be discharged during the heating cycle. If it discharges more than a bucket of water during a 24 hour period or discharges continuously there may be another problem.</p> <p>If the valve dribbles continuously, try easing the valve gear for a few seconds as described under 'Regular Care'. This may dislodge any foreign matter and alleviate the problem.</p> <p>If the valve discharges at high flows, especially at night, it may be as a result of the water pressure exceeding the design pressure of the water heater. Ask your installer to fit a Pressure Limiting Valve (PLV).</p>
		<ul style="list-style-type: none"> Never replace the P&TR valve with one which has a higher pressure rating than is specified for your water heater. If the valve discharges hot water at high flows, (dumps) there may be a serious problem. Switch off the power supply in the meter box (the switch marked 'WATER HEATER' or 'HOT WATER') or the isolating switch installed near the water heater and contact Rinnai.
Insufficient or no hot Water Continued		<p>Expansion Control Valve (ECV) - if fitted It is normal and desirable that this valve allows a small quantity of water to be discharged during the heating cycle. If it discharges more than a bucket of water during a 24 hour period or discharges continuously there may be another problem.</p> <p>If the valve leaks continuously, try easing the valve gear for a few seconds as described under 'Regular Care'. This may dislodge any foreign matter and alleviate the problem. If this does not alleviate the problem contact Rinnai.</p>

SAVE A SERVICE CALL

Problem	Cause	Remedy
Insufficient or no hot Water continued	Booster element Thermostat Settings	<p>Electric Boosted Systems: The end user can check the temperature of hot water delivered with a thermometer placed under the closest non tempered outlet (usually the kitchen sink). CAUTION: Take care to avoid scalding. This test should be done early in the morning after overnight electrical boosting before any hot water is used. The temperature of the water delivered should be at least 55° C (allowing for heat losses in pipe work). If this is not the case or the temperature needs to be increased contact Rinnai. The thermostat settings of the heating element thermostat can also be confirmed directly by a qualified person as described under 'hot water storage & delivery temperature'. The settings can be increased if required. Contact Rinnai.</p> <p>Gas Boosted Systems: The delivery temperature of gas boosted systems is normally 60 or 65° C. If temperatures are higher than this, the flow of water through the gas booster will reduce and may result in insufficient flow rate. The end user can check the temperature of hot water delivered with a thermometer placed under the closest outlet (usually the kitchen sink). CAUTION: Take care to avoid scalding. If the temperature is higher than 65°C the gas booster may be preset incorrectly. Contact Rinnai.</p>
No Water from the hot tap	Restriction in the hot tap or failure of the cold water supply to the water heater.	Check for water flow at the other taps and that the cold water isolation is fully open.
Gas Booster operating too frequently	Insufficient Sunlight - Collectors shaded	<p>Ensure the trees or other objects are not shading onto the collector surface (Trim the trees or relocate the solar collector if the obstruction is permanent). Make sure the glass on the collector panel is not dirty.</p>
High electricity or gas bill	Excessive hot water consumption	See entry under 'Insufficient hot water'.
	Solar Control unit switched off	If the solar control unit is switched off there will be no solar pre-heating of water resulting in the water being heated entirely by electricity or gas' boosting'. Check the power outlet for the solar control unit is switched on.
	Temperature and pressure relief valve / Expansion Control valve discharging water continuously	See entry under 'Insufficient hot water'.
	Lack of solar gain	<p>Reduced sunlight: Reduced sunlight due to overcast weather in summer or low solar contribution in winter will result in an increased dependence on electricity or gas boosting. Higher electricity or gas bills under these conditions, especially in winter, are normal. Collectors shaded: If the solar collectors are shaded by trees or other objects, or the glass is dirty, the effectiveness of the panels is greatly reduced. Arrange for trimming of the trees or relocation of the solar panels if the obstruction is permanent. Arrange for cleaning of the collector glass. Solar panels incorrectly positioned Check that positioning and alignment of solar panels is in accordance with the section 'Location and alignment of solar collectors'. WARNING: Persons working from elevated surfaces such as roofs must be adequately trained and qualified in accordance with local OH&S requirements.</p>
	High Electricity Tariffs (electric boosted systems only)	<p>Electric Boosted Systems The electricity tariff will determine the running costs of the system. It is important the end user is aware of the applicable tariffs. Contact your electricity supplier to confirm what these tariffs are.</p>
	Little or no water circulation in the solar 'flow and return' loop	There are numerous causes of little or no circulation in the solar 'flow and return' circuit the circulation of water through the panels. These causes must be investigated by a qualified person. Contact Rinnai.
Water flow fluctuations	One or more hot taps opened at the same time	<p>More than one or two hot taps in use at the same time may cause a decrease in the hot water flow from the taps.</p> <ul style="list-style-type: none"> Is there more than one or two hot taps open, or are appliances such as a dishwasher or washing machine, in use at the same time? Ensure only one or two hot taps are on at one time. Check the flow of the water from one tap, eg. the shower. The shower should be adjusted so the hot tap is fully open.
Water Hammer	Hot and cold water plumbing in the premises	Have a plumber check clipping of hot and cold water pipework and install a pressure limiting valve and water hammer arrestor as required.

SPECIFICATIONS FOR SYSTEMS

GENERAL

Split solar hot water systems are specified according to the grade of storage cylinder material, cylinder capacity, number of solar panels and boost type and capacity. Boost capacity for gas boosted system depends on the gas booster model selected. Boost capacity for electrically boosted systems depends on the power rating of electric heating elements and whether one or two electric heating elements are fitted.

SYSTEM SPECIFICATIONS AND DIMENSIONS

Specifications and principal dimensions for the various systems and components are shown below.

Table 2 - Systems Specifications

System Type	Rinnai 'Sunmaster®' Systems SG175, SG215, SE160, SE200	Rinnai 'Sunmaster®' Systems SG270, SG340, SE250, SE315	Rinnai 'Prestige®' Systems
Connections:	All connection parallel pipe threads of Whitworth form		
Solar flow and return	1/2"	1/2"	1/2"
P & TR Valve	1/2"	1/2"	3/4"
Cold Inlet	3/4"	3/4"	3/4"
Hot Outlet	3/4"	3/4"	3/4"
P & TR Valve setting (kPa)	1000	850	850
Rating of P & TR Valve supplied (kW)	10	10	10
Expansion Control Valve (ECV) setting (kPa)	850	700	700
Max supply pressure with ECV (kPa)	680	550	560
Max supply pressure without ECV (kPa)	800	680	700
Pressure limiting valve rating (kPa) (supplied by installer if required)	500	500	500

Table 3 - Circulation Pump Specifications

Ports:	1/2" BSP
Maximum Temperature:	95°C
Material:	Brass construction
Drive:	Magnetic

FLOW CONTROL VALVE

A flow control valve is fitted onto some Rinnai Split Solar Systems. If no valve is fitted, the flow rate is fixed using a restrictor disk and no adjustment is needed.

The purpose of the flow control valve is to allow the water flow rate through the collector panels and storage cylinder to be controlled to optimise the performance of the system. The optimum flow rate for the system will depend on the type of system (electric or gas boost), the number of collector panels, and the location of the installation (see the solar zone shown in **Figure 3**).

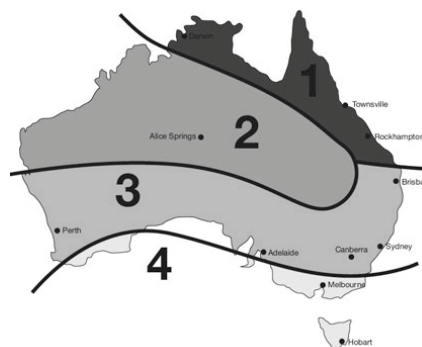


Figure 3 - Australian Solar Zones

SPECIFICATIONS FOR SYSTEMS

The installer will need to set the flow rate to the value shown in **Table 4** below.

Table 4 - Optimum Flow Rate (Litres/min).

	No. of Collectors	Zones 1, 2 & 3	Zone 4
Electric Boosted	1	0.50	0.50
	2	1.00	0.65
	3	1.25	1.00
Gas Boosted	1	0.50	0.50
	2	1.25	1.25
	3	2.10	2.10

Differential Temperature Controller

The primary task of the differential temperature controller is to control the operation of the pump to optimize solar energy collection. This task is performed by measuring the temperature differential between the hot sensor and the cold sensor. When the differential exceeds 9°C the pump is activated and water passes through the collectors collecting solar energy. When the differential falls below 5°C the pump is shut down.

A secondary task of the controller is to stop energy collection when the cylinder is full of hot water. This is referred to as no load protection and the pump is shut down if the temperature of the water going to the collectors exceeds 65°C. At such a temperature in the base of the cylinder, the temperature of water in the top of the cylinder is expected to be about 85°C.