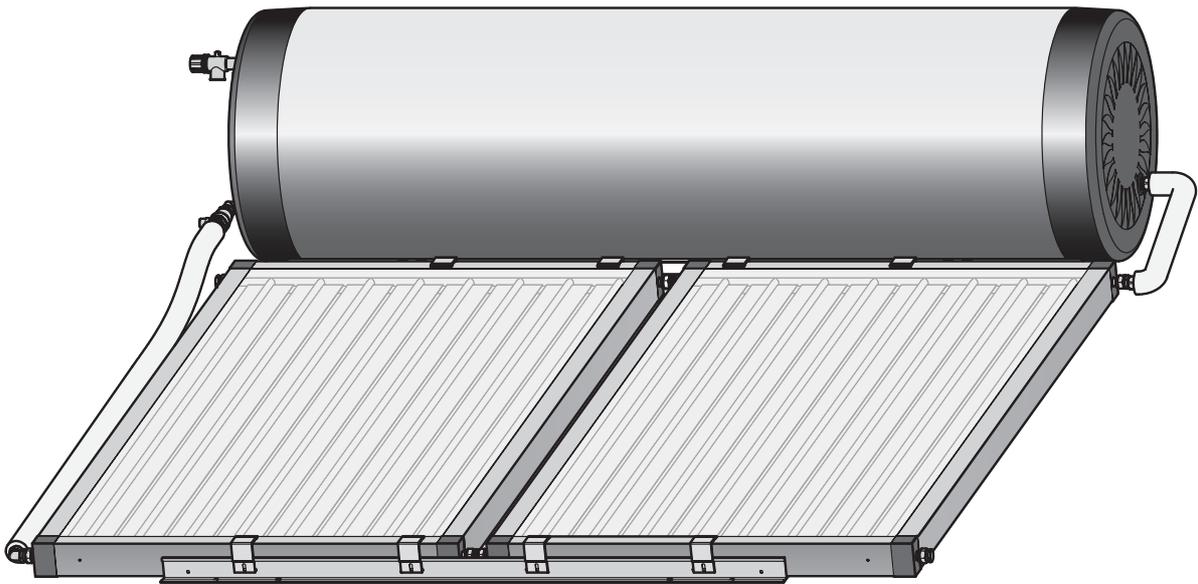


Rinnai

Operation / Installation Manual

Rinnai Prestige® Close Coupled Systems



NOTE

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

NOT SUITABLE AS A POOL OR SPA HEATER.



The Australian
Gas Association
All Rinnai gas products
are A.G.A. certified.

Certified
Product



WaterMark
AS3498 Lic W169
SAI Global



AS 2712
Lic No.1849
SAI Global



N10378

Certified
Product



WaterMark
AS3498 Lic W208
SAI Global



Quality
Endorsed
Company

ISO 9001 Lic 4983
SAI Global
Head Office Certified

15401022

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IMPORTANT INFORMATION & WARNINGS

SAFETY & REGULATORY INFORMATION



DO NOT operate this system before reading the manufacturers instructions.

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 an authorised person.

This appliance is not intended for use by persons (including children) with reduced physical, sensory or mental capabilities, or lack of experience and knowledge, unless they have been given supervision or instruction concerning use of the appliance by a person responsible for their safety.

For continued safety of this appliance it must be installed, operated and maintained in accordance with the manufacturers instructions.

Children should be supervised to ensure they **DO NOT** play with the appliance.

Any power leads from the water heater system components **MUST BE** plugged into an external weatherproof electrical outlet. If the power supply cord 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 as it may be **HOT!** The pipes between the solar collectors and storage cylinder **MUST BE** copper, or alternative material pipes that may be supplied by Rinnai. Plastic pipe is **NOT** suited to the water temperatures and pressures that may occur in the system.

DO NOT place articles on or against this appliance.

DO NOT store chemicals or flammable materials near this appliance.

DO NOT operate with collectors or covers removed from this appliance.

DO NOT activate pump unless cylinder is full of water.

NEVER use a flammable spray such as hair spray, lacquer, paint, etc near this unit as this may cause a fire.

NOTICE TO VICTORIAN CONSUMERS

This appliance must be installed by a person licensed with the Plumbing Industry Commission.

Only a licensed person will have insurance protecting their workmanship.

So make sure you use a licensed person to install this appliance and ask for your Compliance Certificate.

For Further information contact the Plumbing Industry Commission on 1800 015 129.

IMPORTANT INFORMATION & WARNINGS

SCALDS HAZARDS



HOT WATER CAN CAUSE SCALDS.

CHILDREN, DISABLED, ELDERLY AND THE INFIRM 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 OCCUR WHEN CHILDREN ARE EXPOSED DIRECTLY TO HOT WATER WHEN THEY ARE PLACED INTO A BATH WHICH IS TOO HOT.

ALWAYS.....

Test the temperature of the water with your elbow before placing your child in the bath, also carefully feel water before bathing or showering yourself.

Supervise children whenever they are in the bathroom.

Make sure that the hot water tap is turned off tightly.

CONSIDER.....

Installing child proof tap covers or child resistant taps (both approaches will prevent a small hand being able to turn on the tap).

Installing tempering valves or thermostatic mixing valves which reduce the hot water temperature delivered to the taps. Your local plumbing authority may already require that these be fitted. Contact your installer or local plumbing authority if in doubt.

NEVER.....

Leave a toddler in the care of another child. They may not understand the need to have the water temperature set at a safe level.

IMPORTANT INFORMATION & WARNINGS

OPERATION PRINCIPLE

Close Coupled systems are designed to have the solar collectors on the roof and the storage cylinder above the collectors, all mounted using available mounting brackets. Electric and Gas boosted models are available. The system comprises of a hot water storage cylinder and solar collectors. The Close Coupled Solar System uses thermo-syphoning principle to circulate the water through the collectors and then to the storage cylinder without the need for a pump.

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 located inside the storage cylinder or via a Gas booster located external to the storage cylinder. The following diagrams illustrates the Close Coupled Solar Hot Water System set up for both the Electric and Gas boosting.

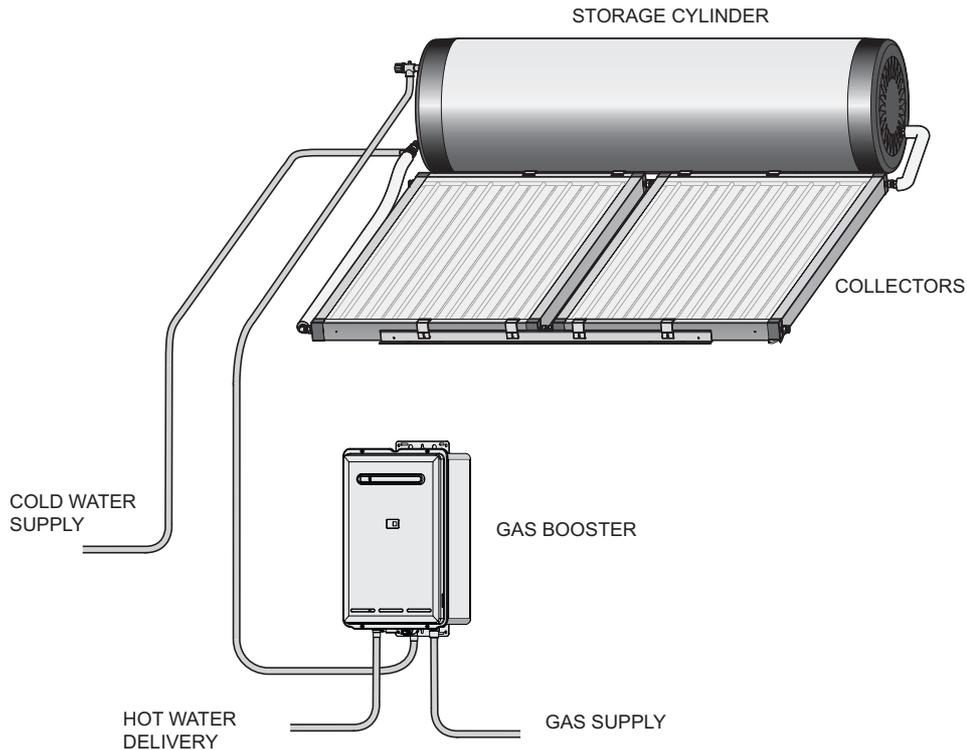


Figure 1. Close Coupled Gas Boosted Solar Hot Water Systems

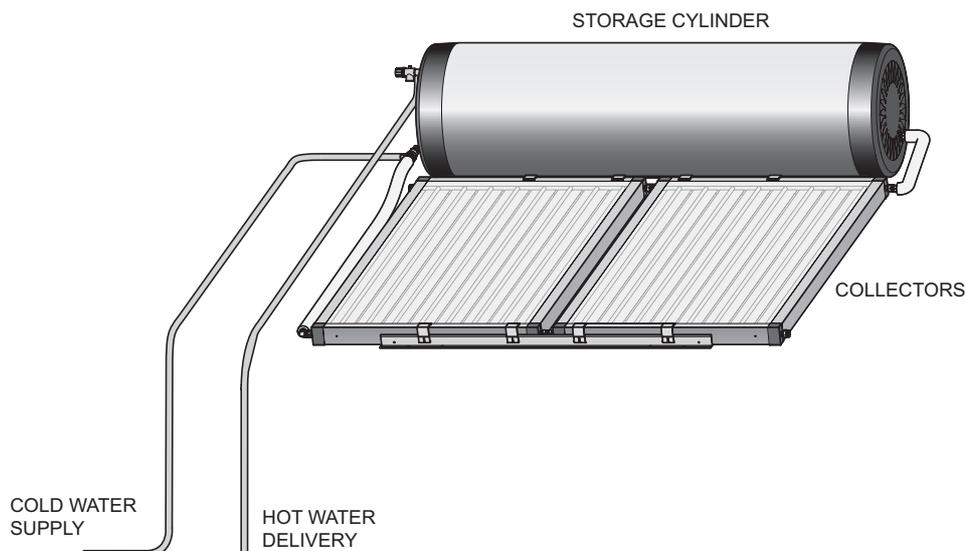


Figure 2. Close Coupled Electric Boosted Solar Hot Water Systems

IMPORTANT INFORMATION & WARNINGS

SAFETY DEVICES

The water heating system is supplied with various safety devices including temperature sensors, overheat sensors and switches and a Pressure & Temperature Relief (PTR) 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 working order.



DO NOT tamper with or remove safety devices.

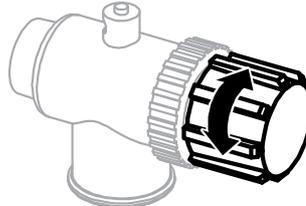
DO NOT operate the water heater unless all safety devices are fitted and in working order.

DO NOT block or seal the PTR Valve and drain pipe.

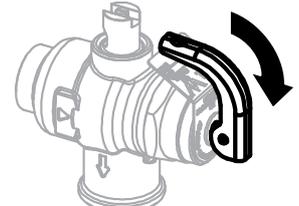
Pressure & Temperature Relief (PTR) Valve

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.



Twist cap until water flows from drain line



Lift lever until water flows from drain line
(Lower lever gently!)



Never block the outlet of the PTR valve or its drain line for any reason. The easing gear must be operated at least every 6 months to remove lime deposits and verify that it is not blocked. Failure to do this may result in the water heater failing.

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, attendance by an authorised person must be arranged without delay. The PTR valve is not serviceable.

EXCESSIVE DISCHARGE FROM SAFETY DEVICES

Pressure & Temperature Relief (PTR) 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.

If the valve dribbles continuously, try easing the valve gear for a few seconds as described above. This may dislodge any foreign matter and alleviate the problem.

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).



NEVER replace the PTR valve with one which has a higher pressure rating than is specified for your water heater.

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.

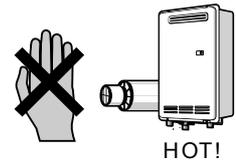
If the valve leaks continuously, try easing the valve gear for a few seconds. This may dislodge any foreign matter and alleviate the problem. If this does not alleviate the problem contact Rinnai.

Operate the easing gear regularly to remove any lime deposits and to verify that it is not blocked.

IMPORTANT INFORMATION & WARNINGS

Gas boosted models

- 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.



WATER TEMPERATURE

The water gets heated by the solar energy contributed from the sun and heats the water until the water at the base of the storage cylinder reaches approximately 65°C. At this time water at the hot outlet can be up to 88°C. Continued heating is prevented by the 'No Load' protection, a Thermo-arrestor (TA) valve that prevents water passing from the cylinder to the collectors. 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.

IMPORTANT INFORMATION & WARNINGS

MAINTENANCE AND REGULAR CARE

Operate the easing gear of the PTR as described under "SAFETY DEVICES" on page 5.

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

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').

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.

SAVE A SERVICE CALL

SAVE A SERVICE CALL

Before calling Rinnai for service, perform the fault finding steps in the **Table 1**. 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	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. 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.
	Excessive hot water consumption	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. 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.
	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	Pressure and Temperature Relief (PTR) 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. 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. 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).
 WARNING	<ul style="list-style-type: none"> • Never replace the PTR 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		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. 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.

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	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 is not dirty.
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.</p> <p>Collectors shaded: If the solar collectors are shaded by trees or other objects, or the glass is dirty, the effectiveness of the collectors is greatly reduced. Arrange for trimming of the trees or relocation of the solar collectors if the obstruction is permanent. Arrange for cleaning of the collector glass.</p> <p>Solar collectors incorrectly positioned Check that positioning and alignment of solar collectors 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 OHS 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 collectors. 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> <p>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?</p> <p>Ensure only one or two hot taps are on at one time.</p> <p>Check the flow of the water from one tap, eg. the shower. The shower should be adjusted so the hot tap is fully open.</p>
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

SYSTEM SPECIFICATIONS

Close Coupled hot water systems are specified according to the cylinder capacity, number of solar collectors 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 the electric heating element.

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

Table 2 - Systems Specifications	
Connections	
- Solar flow and return	3/4"
- PTR Valve	3/4"
- Cold Inlet	3/4"
- Hot Outlet	3/4"
PTR Valve setting (kPa)	850
Rating of PTR Valve supplied (kW)	10
Expansion Control Valve (ECV) setting (kPa) - Supplied by Installer if required	700
Max supply pressure with ECV (kPa)	500
Max supply pressure without ECV (kPa)	700
Pressure limiting valve rating (kPa) - Supplied by Installer if required	500
Electric Element Power Rating for Electric Systems (kW)	24, or 3.6 standard 1.8 or 4.8 available separately
Gas Booster	S20, S26 or other Rinnai Infinity Models converted to Solar. * (Refer section on gas booster specification)

SYSTEM SPECIFICATIONS

SYSTEM DIMENSIONS

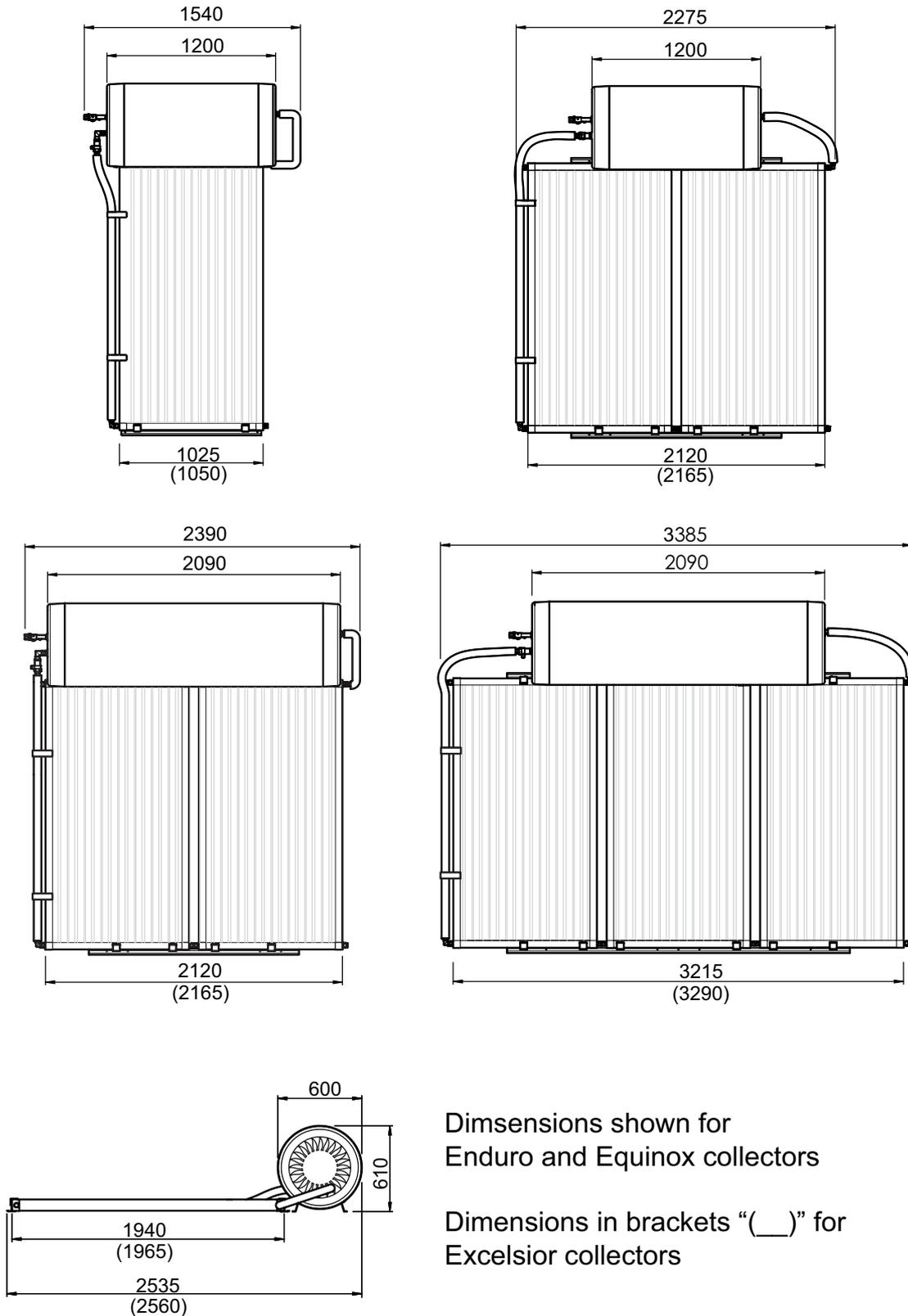


Figure 3 - System Dimensions

SPECIFICATIONS

COLLECTOR SPECIFICATIONS

Table 4 - Collectors Specifications

MODEL NUMBERS AND SPECIFICATIONS		
CHARACTERISTICS	Enduro / Equinox (SP200A) or (SP200A FTC)	Excelsior (EXT OR EXT FTC)
TYPE	Flat plate	Flat plate
CONSTRUCTION		
- Waterways	Copper	Copper
- Absorber	Aluminium	Copper
- Selective Surface	High Performance	Sputtered Titanium Oxide
Maximum Operating Pressure	850 kPa	
Casing Material	Aluminium	
Overall Dimensions (L x W x H) (mm)	1940 x 1025 x 80	1964 x 1047 x 81
Weight empty (STD/FTC) (kg).	33 / 35	35 / 38
Water volume (Litres)	1.3	1.5
Number risers	8	10
Potential Solar Output at PTR relief conditions (kW)	1.25	
Frost Protection	* Standard version - no frost protection FTC Version - Frost Protection to -5°C	
	* FOR MORE INFORMATION ON FROST PROTECTION REFER TO WARRANTY BOOKLET	

GAS BOOSTER SPECIFICATIONS

*** Table 5 - Gas Boosters Specifications**

Model Name		S20	S26
Boost Capacity:	(L/min)		
- L/min. @ 20°C rise		20	26
- L/min @ 25°C rise		16	24
Maximum Rated Flow:	(L/min)	20	26
Minimum Supply Pressure for Maximum rated flow: ⁽¹⁾	(kPa)	120	200
Minimum Flow for Operation:	(L/min)	2.4	2.4
Frost Protection:		Yes	Yes
Gas Consumption (Maximum / Minimum):	(MJ/Hr.)	125 - 18	188 - 23
Star Rating (AS 4552 - 1998):		5.5	5.0
Hot Water Delivery Temperature: ⁽²⁾		60°C	60°C
Dimensions: Height x Width x Depth:	(mm)	530 x 350 x 194	530 x 350 x 194
Weight:	(kg)	15	21

⁽¹⁾ - Units will operate at lower pressures but the rated flow will not be achieved.

⁽²⁾ - Gas boosters for Solar hot water applications should be preset to deliver a minimum temperature of 60°C. Gas boosters factory preset to 60°C or 65°C will be marked as such. If there are no temperature markings on the water heater, on site conversion is required. Other models of Rinnai Infinity Water Heaters (including internal units) can be converted to solar gas boosters. Contact Rinnai for details.

INSTALLATION INFORMATION

REGULATIONS AND OCCUPATIONAL HEALTH AND SAFETY (OH&S)



Installation and commissioning must be performed by authorised persons. Rinnai solar systems must be installed in accordance with these instructions and all regulatory requirements which exist in your area including those in relation to manual lifting, working at heights and on roofs. Applicable publications and regulations may include:

- AS 5601 Gas Installations
- AS/NZS 3500 National Plumbing and Drainage
- AS/NZS 3000 Wiring rules
- Building Codes of Australia (BCA)
- Local Occupational Health and Safety (OH&S) regulations

This appliance is not suitable for use as a domestic spa pool or swimming pool heater.

Solar collectors and cylinders are heavy and bulky items and are usually positioned on the roofs of buildings. Australian State and Territories have a principal Occupational Health and Safety (OH&S) Act which contains requirements relating to the handling of large, bulky or awkward items and the prevention of falls from elevated surfaces. Persons installing solar collectors must be aware of their responsibilities and be adequately trained and qualified, in accordance with local OH&S requirements.

LOCATION

System Location

Select suitable areas of roof on which to install the solar collectors and cylinder. It is essential that the roof structure is suitable for the solar collector/cylinder combination and can support the weight of these items when full of water. It is the installers responsibility to ensure the roof can safely support the system and to visually check the roof, and if there is any damage that requires attention (such as cracked tiles etc.), to inform the owner. If this affects the safe installation of any part of the system, installation should not proceed until the damage has been rectified. Collectors should be positioned for optimum solar benefit. Refer to section "SYSTEM ORIENTATION AND INCLINATION" on page 16 for more information.

All system components must be in an accessible location. Sufficient clearances shall allow access to, and removal of, all serviceable parts. Ensure the PTR valve, drain lines, thermostat and elements for electric systems have sufficient clearances and are accessible for service and removal. The information on any data plates must also be readable.

All electrically boosted solar hot water heating elements must be connected to an independent, fused, AC 240V 50 Hz power supply with an isolating switch installed at the switch board.

Gas Booster Location (where applicable)

The S20 & S26 gas booster are designed for 'Outdoor' Installation only. As such, it must be located in an above ground open air situation with natural ventilation, without stagnant areas, where gas leakage and products of combustion are rapidly dispersed by wind and natural convection.

If an internal model which has been converted to a solar gas booster follow information supplied with the unit for location, mounting and flueing requirements.

WATER PIPES

All hot water pipework should be insulated with sealed Polyethylene foamed or equivalent insulation to optimise performance and energy efficiency. Such insulation may also be mandatory under local regulations. With the exception of solar collector flow and return pipes, water pipe sizing should be performed in accordance with AS/NZS 3500.



- The collector flow and return pipes must be a minimum of 1/2" copper tube or alternative material pipe supplied by Rinnai. Plastic pipe must not be used between collectors and cylinder or booster. Plastic pipe is not suited to the high water temperatures and pressures that may occur in the collector flow and return system.

INSTALLATION INFORMATION

WATER SUPPLY

The minimum and maximum water pressures for the various systems are listed in **Table 5**. Approved pressure limiting valves may be required if the 'Maximum' rated water supply pressures are exceeded. For gas boosted systems to achieve the rated flow through the outlet of the continuous flow water heater, the minimum water supply pressures must be supplied.

The systems will operate at lower pressures but the rated flow will not be achieved.

Water chemistry and impurity limits are detailed in the separate 'Warranty conditions' document. Most metropolitan water supplies fall within these requirements. If you are unsure about water quality, contact your water authority. If sludge or foreign matter is present in the water supply, a suitable filter should be incorporated in the water supply to the storage cylinder.

HOT WATER DELIVERY TEMPERATURE

Local regulations and/or the requirements of AS/NZS 3500.4 must be considered regarding the temperature limitations of hot water supplied to areas used primarily for personal hygiene. The temperature of water to these areas is limited to 45°C for early childhood centres, primary and secondary schools and nursing homes or similar facilities for young, aged, sick or people with disabilities and 50°C for all other buildings. To comply with these requirements, a temperature limiting device, such as a thermostatic mixing or tempering valve, will be required on all solar hot water systems as detailed in **Figures 4 and 5**.

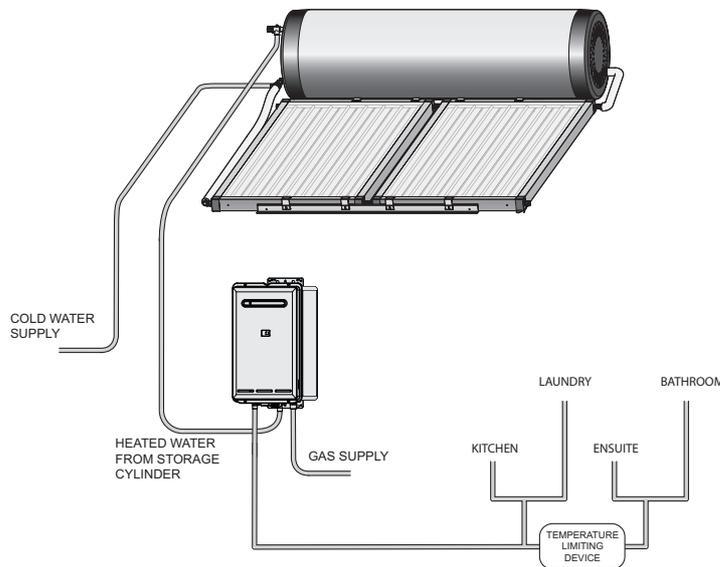


Figure 4 - Tempered Gas hot water systems

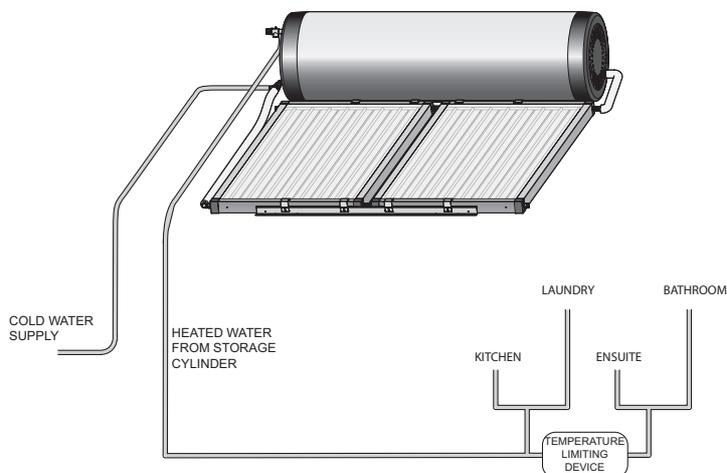


Figure 5 - Tempered Electric hot water systems

INSTALLATION INFORMATION

VALVES AND FITTINGS

Components Supplied by Installer

The following valves & fittings are to be supplied by the installer:

- A cold water expansion control valve (ECV). An ECV must be fitted in Western Australia and South Australia to the cold water supply to the storage cylinder to comply with local regulations. An ECV is recommended in all other geographical areas where the water supply has a tendency to cause scaling. This will reduce hot water discharge from the Pressure and Temperature Relief (PTR) valve which minimises wear on this valve.
- A stop cock, non return valve and line strainer. Combination valves incorporating two or more of these functions (such as 'Trio' valves) are suitable. These are fitted to the cold water supply to the storage cylinder by the installer.
- Cold water supply and hot water discharge pipework to and from the storage cylinder.
- An isolating valve and connection union for the gas supply to the gas booster.
- A approved pressure limiting valve is required if the maximum rated water supply pressure in **Table 2** is exceeded.

Components Supplied with System

The following valves are supplied with your solar hot water system:

- A combined pressure and temperature (PTR) relief valve, capacity 10 kW.
Relief valve pressure settings vary with models. This valve is fitted at the top of the storage cylinder. The PTR valve is a safety device and it is mandatory that it is fitted by the installer in all installations.
- Thermo-Arrestor (TA) valve. This valve is fitted on the inlet pipe to the Solar Collectors.
- For gas boosted systems, elbow connections for the hot, cold and gas supply are fitted at the bottom of the gas booster.
- Fittings as shown in **Figures 24 to 27**.

INSTALLATION INFORMATION

SYSTEM ORIENTATION AND INCLINATION

The performance of any solar hot water system is determined by the way that the system is installed.

In Australia, the solar collectors should face the equator (North) as shown below. Where this orientation is not practical, collectors facing within 45 degrees from North (between North-East and North-West) area acceptable, with a reduction in efficiency of approximately 5%. If the bulk of hot water consumption occurs before 2 pm face the collectors in a North - Easterly direction. If the bulk of hot water consumption occurs after 2 pm face the collectors in a North Westerly direction.

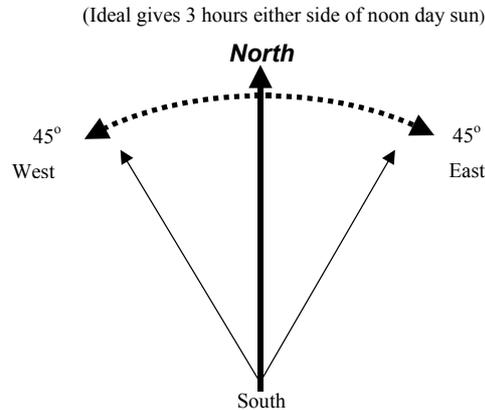


Figure 6 - Orientation angle of Collectors

The inclination of the solar collectors should ideally be the same as the latitude angle of the site. Inclinations within 20 degrees of the latitude angle of the site are acceptable, with a reduction in efficiency of approximately 5%. Most roofs within Australia have a slope of between 20° and 25° and provide an appropriately angled mounting surface.

To ensure operation of the system the inclination **MUST NOT** be less than 10°.

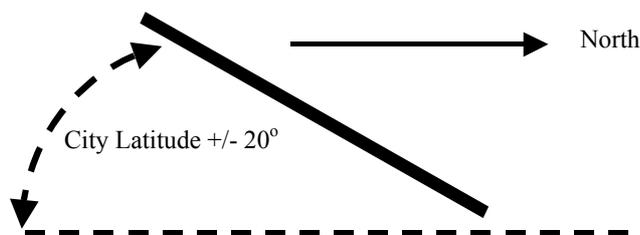


Figure 7 - Inclination of Collector

Table 7: Latitudes of Australian Cities

City	Latitude	City	Latitude	City	Latitude	City	Latitude
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 INFORMATION

For all installations the collector bank must slope upwards approximately 8 mm per collector from inlet to outlet as shown below:

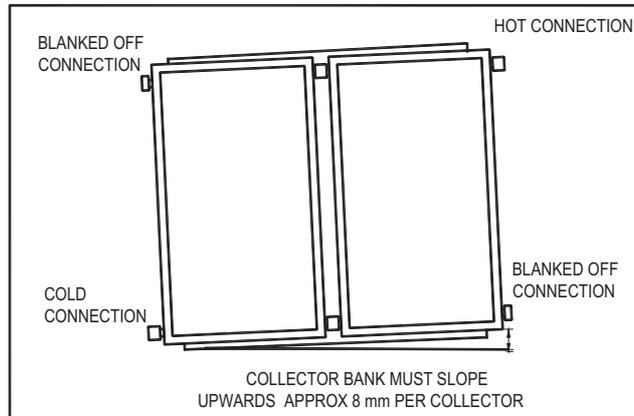


Figure 8 - Collector Banks

ROOF MOUNTING OPTIONS

For mounting options not shown in **Figure 9**, for example in areas where the cyclone frame can not be used, consult your nearest Rinnai Branch or Rinnai Representative.

For roofs with a slope of 10° or less a flat roof frame must be used.

Rinnai do not recommend installing Close Coupled systems on roofs with a pitch greater than 30°. An additional strap should be used to prevent the cylinder from tipping over if a system is installed in this manner. Refer page 24.

It is normal to mount the solar collectors down close to the gutter. Roof construction must be checked to ensure that the roof timbers are capable of supporting the additional load. (Refer to AS 3500.4 Appendix H).

For tiled roof installations. Check for cracked or damaged tiles in the area of proposed installation. Replace any faulty tiles.

If spare tiles are not available, swap damaged tiles with good ones from along the gutter line.

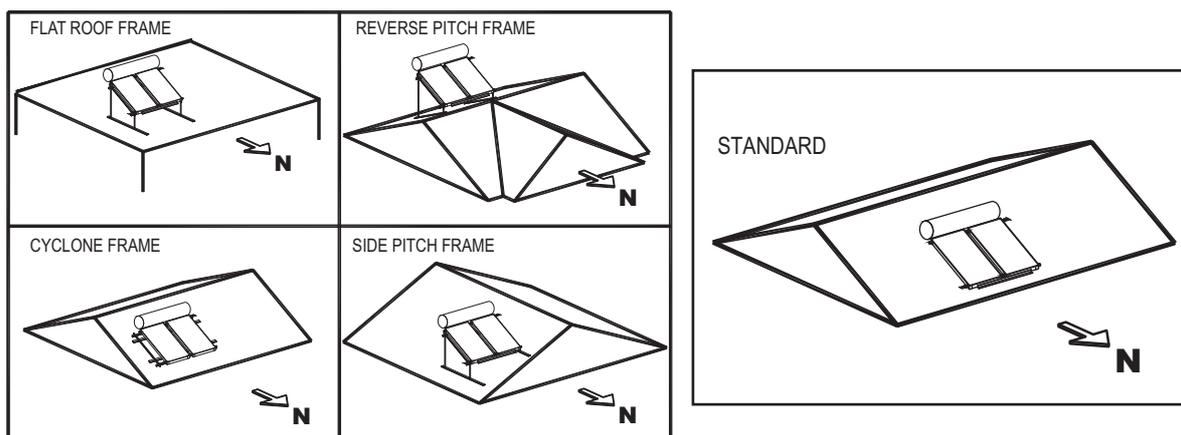
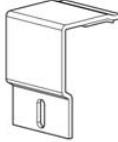


Figure 9 - Solar Collector Roof Mounting Options

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

TABLE 8 - MOUNTING COMPONENTS

MOUNTING COMPONENTS (supplied in the Installation Kit)				
Size of Cylinder / Number of Collectors				Part Name / Number
180 / 1	180 / 2	330 / 2	330 / 3	
2	-	-	-	 Mounting Rail Small 14201196
-	2	2	-	 Mounting Rail Medium 14201197
-	-	-	2	 Mounting Rail Large 14201198
2* + 2#	4*	4*	6*	 Collector Mounting Strap * supplied with collectors, # supplied in collector installation kit 12401012
4	4	4	4	 M8 Bolt, Washer and Nut (used to bolt collector mounting strap to mounting rail) BOLT 22601052 WASHER 17401072 NUT 16801062
4	8	8	12	 Collector Retainer 26601706
4	8	8	12	 M6 Bolt, Washer and Nut (used with collector retainers) BOLT 22601073 WASHER 17401073 NUT 16801007

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

STANDARD INSTALLATION

Cylinder Mounting Component Pre Assembly for a Standard Installation



This installation is not suitable for use in cyclonic areas. For further details, please contact your local Rinnai Solar distributor.

- Assemble the cylinder cradle components and the lower collector rail components as shown in **Figure 10**.
- Only loosely attach the collector retainers to the rails.

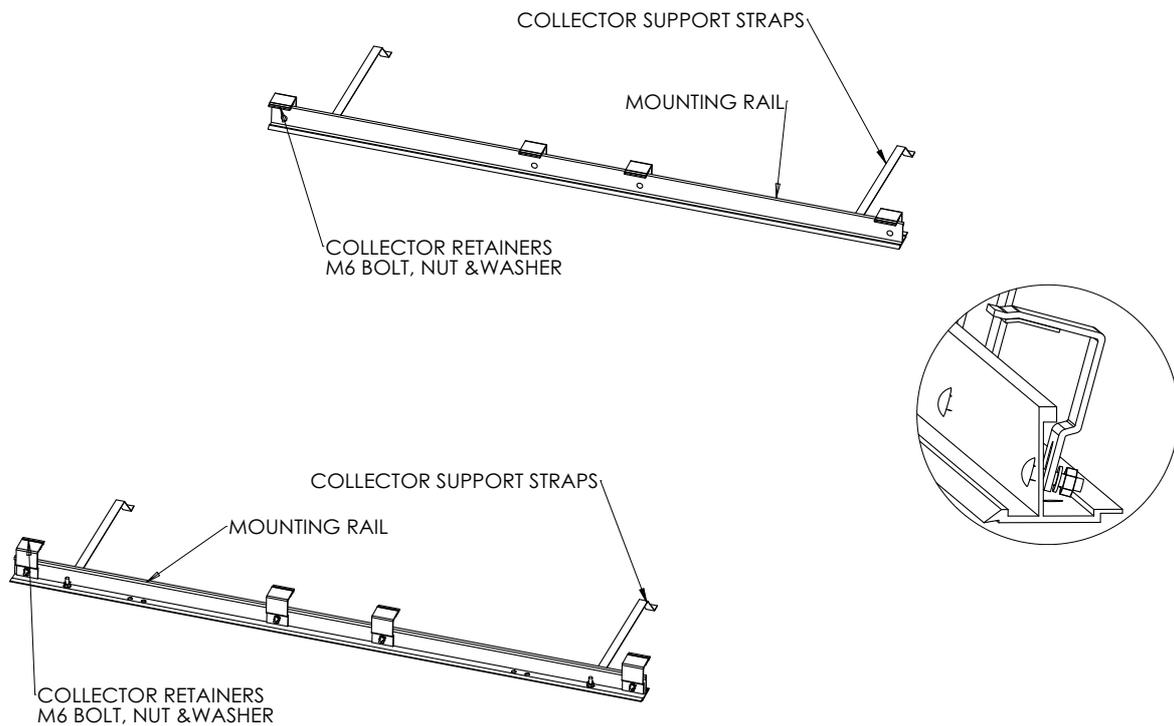


Figure 10 - Cylinder Mounting

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

STANDARD INSTALLATION CONTINUED

Fastening (Collectors to a Tiled Roof)



This installation is not suitable for in cyclonic areas. For further details, please contact your local Rinnai Solar distributor.

- Position the lower collector mounting rail assembly so that the rail is angled to ensure the collectors have an 8 mm / collector rise.
- Attach the collector mounting straps to the rafter or truss under the tiles as shown in **Figure 11**.

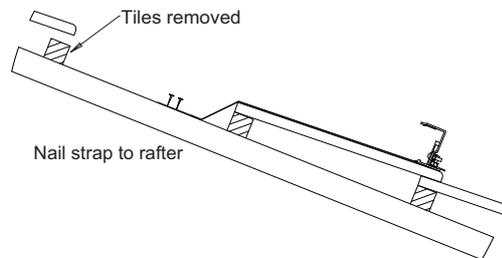


Figure 11 - Mount Lower Collector Rail

- Place the collector(s) onto the roof above the lower rail. If more than one collector is being installed then join them together using the compression fittings supplied.
- Push down on the collector retainers to clamp the collector and tighten the nuts as shown in **Figure 12**.

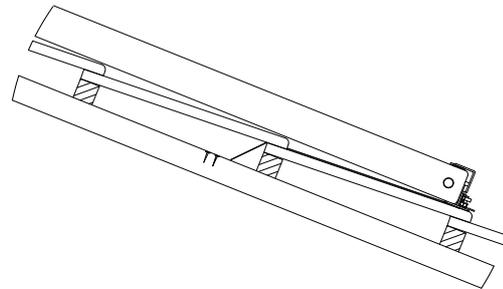


Figure 12 - Mount collector on Roof

- Position the upper collector rail above the collectors. Push down on the retainers to clamp the collector and tighten the nuts.
- Attach the collector mounting straps to the rafter or truss under the tiles as shown in **Figure 13**.

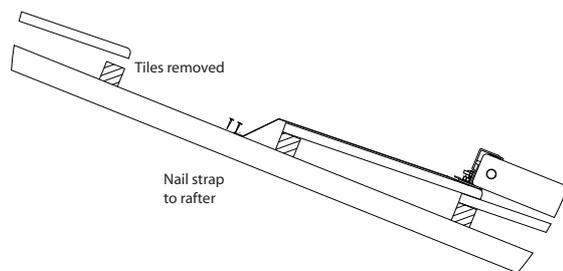


Figure 13 - Attach Mounting Straps

- Replace the tiles and ensure the collector is secure as shown in **Figure 14**.

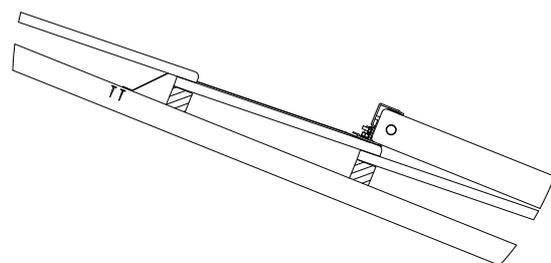


Figure 14 - Replace Tiles

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

STANDARD INSTALLATION CONTINUED

Fastening (Collectors to a Metal Roof)



This installation is not suitable for use in cyclonic areas. For further details, please contact your local Rinnai Solar distributor.

- Position the lower collector mounting rail assembly so that the rail is over the roof purlin and the rail is angled ensure the collectors have an 8 mm / collector rise.
- Drill through the roof iron and purlin using the holes in the rail as a guide. Apply some silicone sealant down the holes to ensure no water leakage.
- Bolt the rail to the roof purlin using a suitable fastener as shown in **Figure 15**.

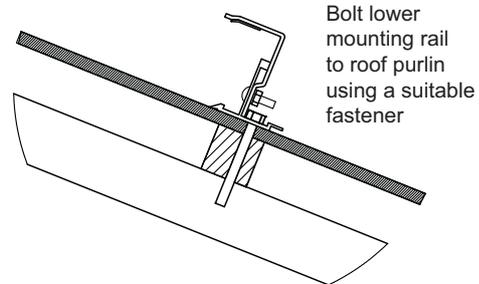


Figure 15 - Mount Lower Collector Rail

- Position the collector(s) onto the roof above the lower rail. If more than one collector is being installed, join them together using the compression fittings supplied.
- Push down on the collector retainers to clamp the collector and tighten the nuts.
- Place the upper collector mounting rail above the collectors. Push down on the collector retainers to clamp the collector and tighten the nuts.
- Drill through the roof iron and purlin using the upper mounting rail as a guide. Apply some silicone sealant down the holes to ensure no water leakage and secure with suitable fasteners as shown in **Figure 16**. Alternatively the rail can be attached to the roof using the collector mounting straps.

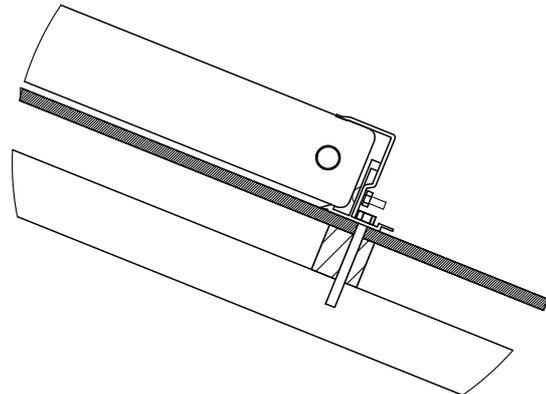


Figure 16 - Mount Collector on Roof

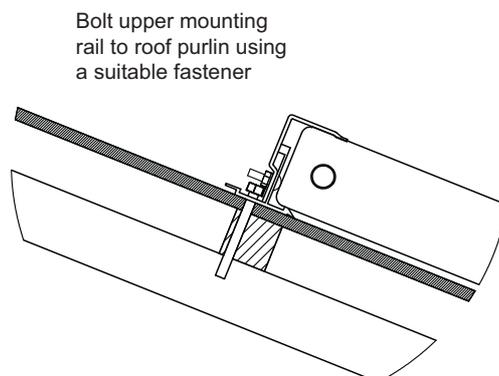


Figure 17 - Attach Upper Rail

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

ATTACHING MOUNTING RAIL TO CYLINDER

Depending on the packaging, either one or two rails are attached to the cylinder.

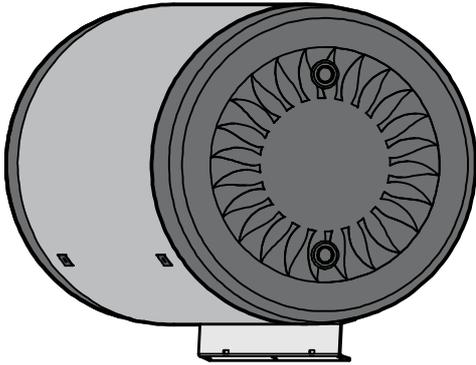


Figure 18 - Cylinder with one rail

- The extra rail and fastenings are packed with the cylinder. They are screwed into the rail mounting holes in the cylinder.

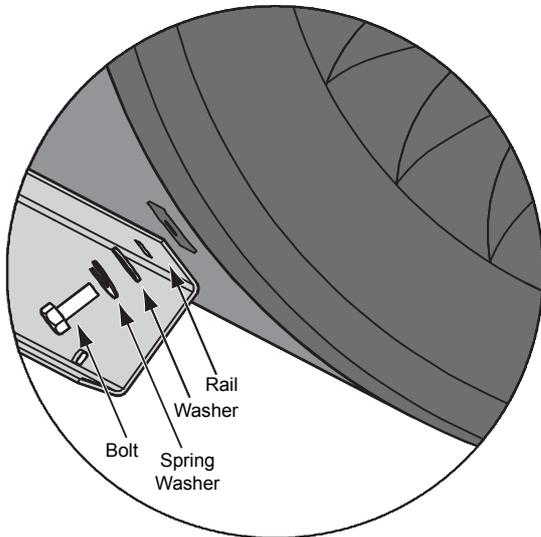


Figure 19 - Attachment of rail

- Attach the rail using the bolts, washers and spring washers in the order shown.
- Ensure the feet on the rails face outwards
- Ensure that the bolt is tightened sufficiently to flatten the spring washer. This ensures that the bolt is adequately tightened.

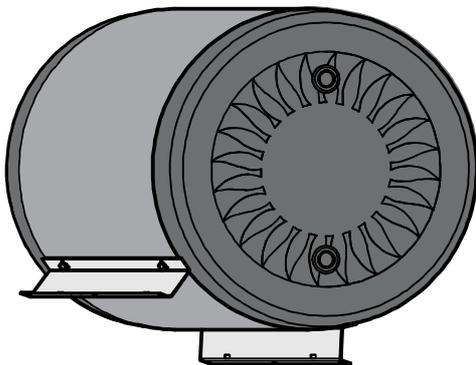


Figure 20 - Cylinder with both rails

- Once the rail is attached and suitably tightened, continue the cylinder installation as shown on the next page.

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

STANDARD INSTALLATION CONTINUED

Fastening Cylinder to a Tiled Roof

- Lift the storage cylinder onto the roof and locate it above the collector bank. The cylinder's position should be as central as possible to the collector bank. The lower rail must be on a load bearing surface.
- Slide the cylinder support strap into the slots located in the uppermost cylinder support bracket (shown in **Figure 21**) so that the strap are in line with the rafter or as close as possible to them.

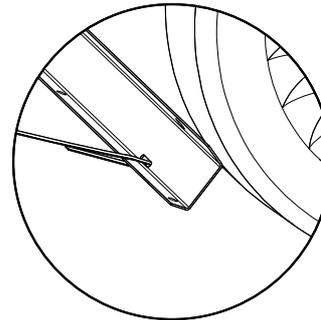


Figure 21 - Cylinder Support Strap

- Remove tiles one row up from the storage cylinder. Apply tension to the straps and attach them to the rafters using a suitable fastener.
- Replace the tiles

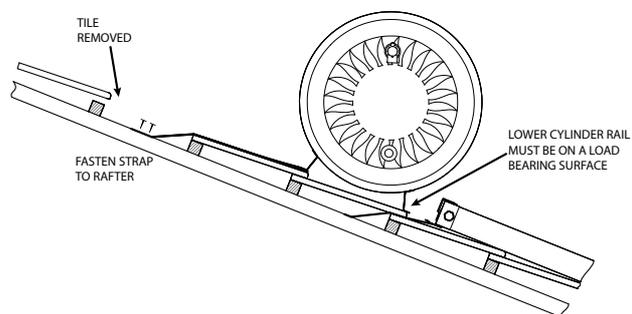


Figure 22 - Cylinder Installation Tiled Roof

Fastening Cylinder to a Metal Roof

- Lift the storage cylinder onto the roof and locate it above the collector bank. The cylinder's position should be as central as possible to the collector bank. The lower rail must be on a load bearing surface.
- Slide the cylinder support strap into the slots located in the uppermost cylinder support bracket (shown in **Figure 21**) so that the strap are in line with a suitable fastening point.
- Bolt the lower support rail to the roof using a suitable fastener.
- Apply tension to the cylinder support straps and attach them to the rafters using a suitable fastener.
- Seal any holes in roof using a suitable sealant to ensure roof is water tight.

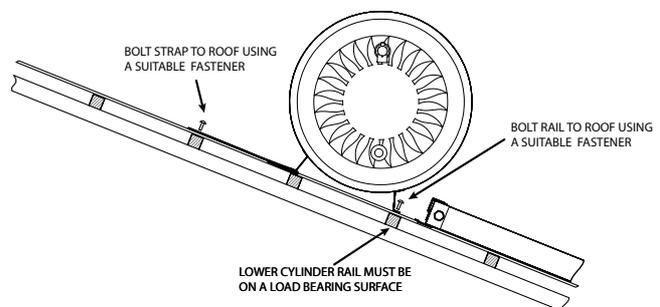
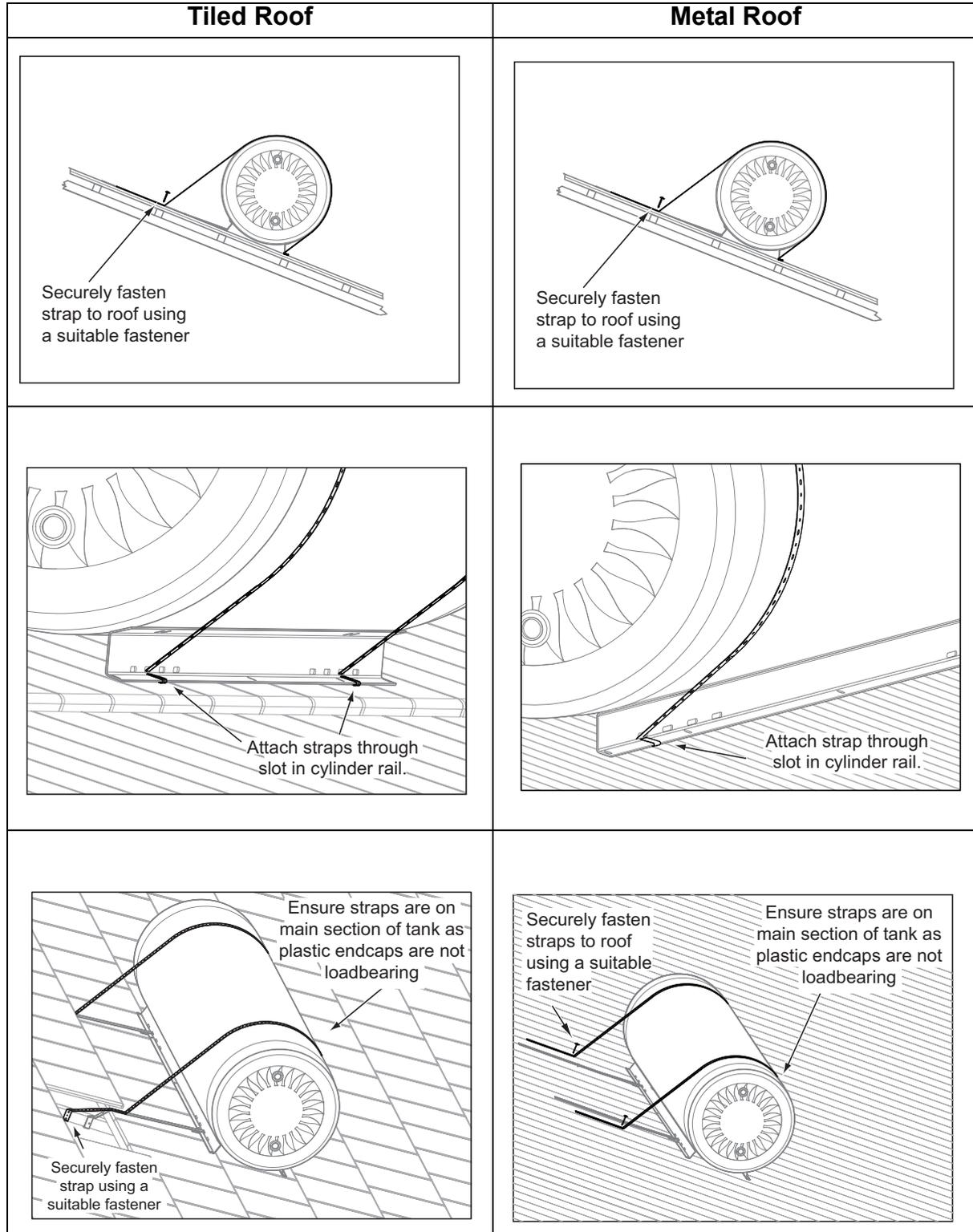


Figure 23 - Cylinder Installation Metal Roof

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

ROOF PITCH GREATER THAN 30°

In situations where a Close Coupled System is installed onto a roof with a pitch of 30° or greater, an additional strap must be used to prevent the cylinder tipping over. Builders strapping available from hardware stores is suitable for this. The strapping is attached through the slots in the front cylinder rail, goes over the tank and is then fastened to the roof behind the cylinder.



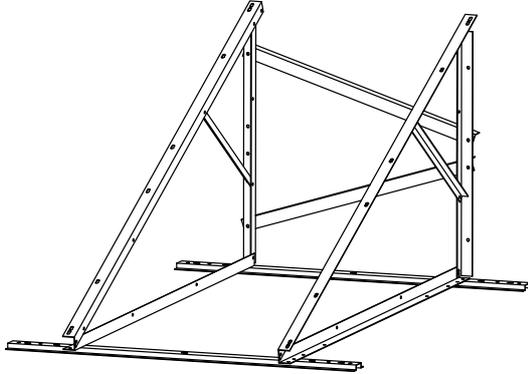
INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

FRAMED INSTALLATIONS - FLAT, REVERSE AND SIDE PITCH



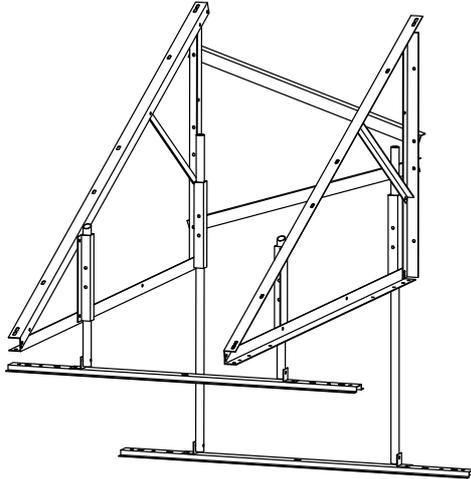
This installation is not suitable in cyclonic areas. For the correct frame for use in cyclone areas, contact your local Rinnai Solar distributor.

Table 9 - Framed Installations



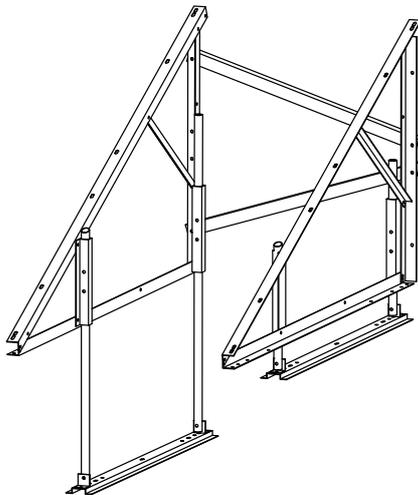
FLAT ROOF FRAME

- For use on a flat roof or where the roof pitch is too low.
- This frame allows the system to be installed at a suitable inclination.
- Installations instructions are provided in the Rinnai Frame Installation Manual.



REVERSE PITCH FRAME

- These comprise of a Close Coupled system flat roof frame and a side/reverse pitch kit.
- They can be used when the system need to be installed in the reverse direction to the direction the roof is facing.
- For example, using a reverse pitch frame on a South facing roof enables the system to be oriented to the North.
- Installations instructions are provided in the Rinnai Frame Installation Manual.



SIDE PITCH FRAME

- These comprise of a Close Coupled system flat roof frame and a side/reverse pitch kit.
- They can be used when the system need to be installed side on to the direction the roof is facing.
- For example, using a side pitch frame on an East or West facing roof to enables the system to be oriented to the North.
- Installations instructions are provided in the Rinnai Frame Installation Manual.

FRAMED INSTALLATIONS - CYCLONE FRAME

- Assemble cyclone frame and mount components as described in instructions provide with cyclone frame kit.

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

180 Litre Cylinder with 1 Collector

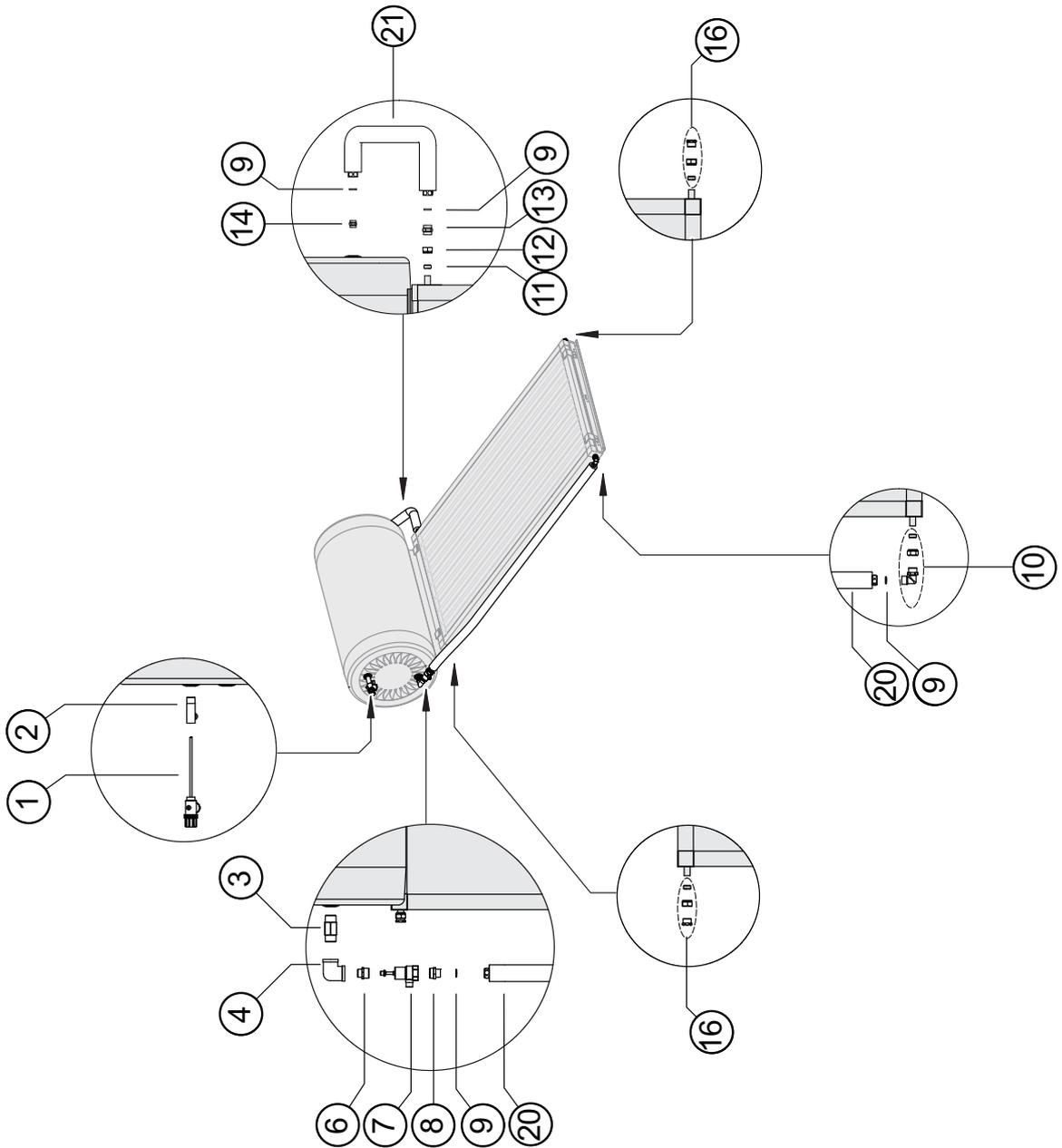


Figure 24 - 180 Litre Cylinder with 1 Collector

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

180 litre cylinder with 1 collector Installation Kit IK180CCT01A

Qty	Item / Part Number	Qty	Item / Part Number	Qty	Item / Part Number
1	 P&TR Valve *supplied with cylinder 11004784	1	 Adaptor M33 x G 3/4 (Flexi) 16601065	1	 Adapting Nipple R 3/4 x G 3/4 (Flexi) 17201006
1	 T adaptor hot outlet *supplied with cylinder 19001018	4	 Fibre washer 3/4 17401008	2	 Stop end assembly - 1 G 3/4 plug - 1 3/4 Kinco nut + 1 3/4 Kinco olive) 28801025
1	 R 3/4 Nipple (long) 17201011	1	 Elbow assembly - 1 x Elbow G 3/4 (Flexi) x G 3/4 (Kinco) - 1 x Kinco nut and olive 3/4 21201013	1	 Flexi pipe 1930 mm with insulation 11601099
1	 Elbow Rp 3/4 x Rp 3/4 21201004	1	 Kinco nut 3/4 16801018	1	 Flexi Pipe 600 mm with Insulation 11601097
1	 Reducing Nipple R1 x R 3/4 17201036	1	 Kinco olive 3/4 33001011		
1	 TA Valve 11007711	1	 Adapting Nipple G 3/4 (Flexi) x G 3/4 (Kinco) 17201007		

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

180 Litre Cylinder with 2 Collectors

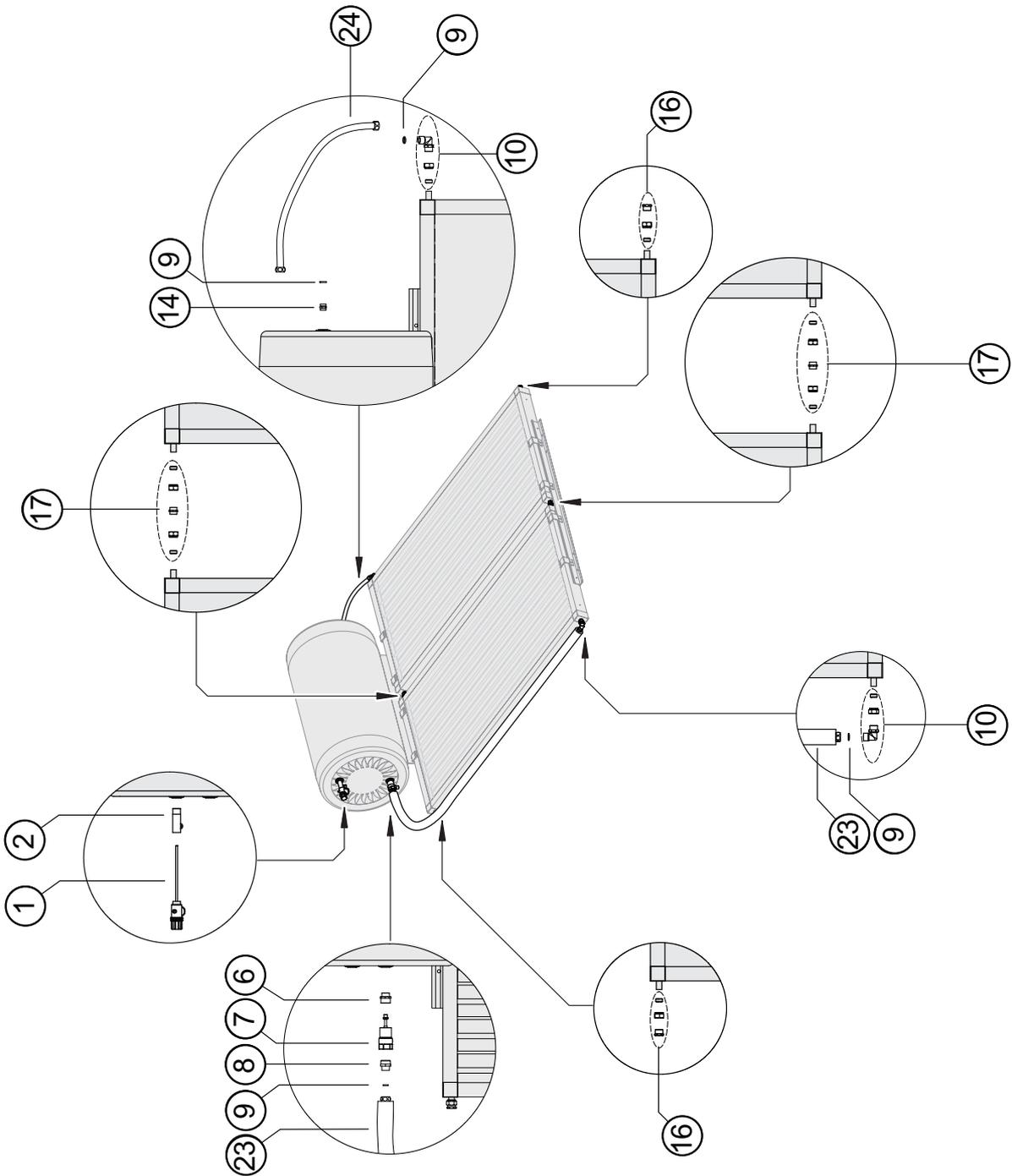


Figure 25 - 180 Litre Cylinder with 2 Collectors

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

180 litre cylinder with 2 collectors Installation Kit IK180CCT02A

Qty	Item / Part Number	Qty	Item / Part Number	Qty	Item / Part Number
1	 P&TR Valve 11004784 <i>*supplied with cylinder</i>	1	 Adaptor M33 x G $\frac{3}{4}$ (Flexi) 16601065	2	 Stop end assembly 28801025 - 1 G $\frac{3}{4}$ plug - 1 $\frac{3}{4}$ Kinco nut + 1 $\frac{3}{4}$ Kinco olive
1	 T adaptor hot outlet 19001018 <i>*supplied with cylinder</i>	4	 Fibre washer $\frac{3}{4}$ 17401008	2	 Union compression $\frac{3}{4}$ - 1 x nipple G3/4 - 2 x Kinco nut and olive $\frac{3}{4}$ 32201709
1	 Reducing Nipple R1 x R $\frac{3}{4}$ 17201036	2	 Elbow assembly 21201013 - 1 x Elbow G $\frac{3}{4}$ (Flexi) x G $\frac{3}{4}$ (Kinco) - 1 x Kinco nut and olive $\frac{3}{4}$	1	 Flexi Pipe 2450 mm with insulation 11601095
1	 TA Valve 11007711	1	 Adapting Nipple R $\frac{3}{4}$ x G $\frac{3}{4}$ (Flexi) 17201006	1	 Flexi Pipe 670 mm with insulation 11601098

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

330 Litre Cylinder with 2 Collectors

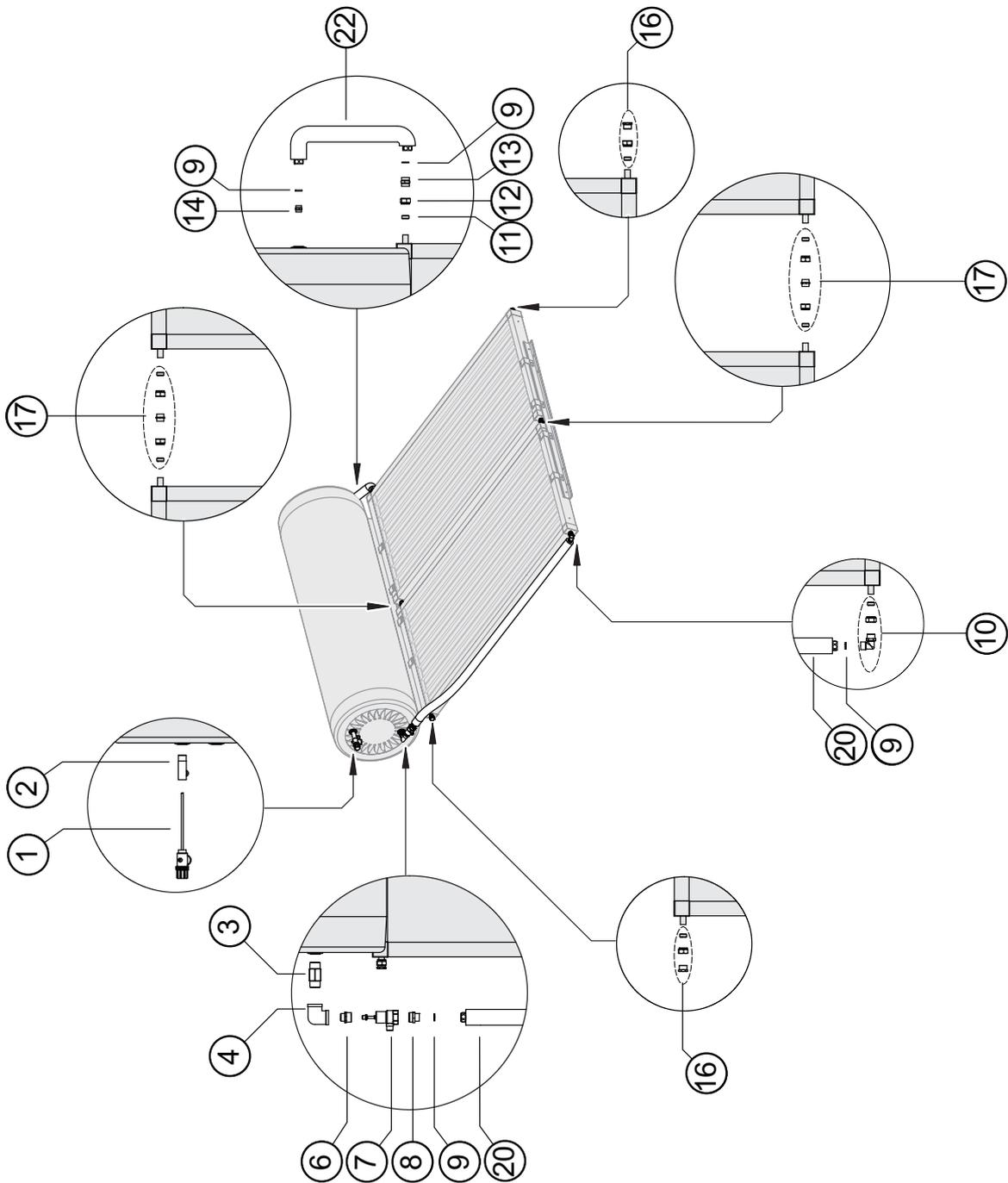


Figure 26 - 330 Litre Cylinder with 2 Collectors

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

330 litre cylinder with 2 collectors Installation Kit IK330CCT02A

Qty	Item / Part Number	Qty	Item / Part Number	Qty	Item / Part Number
1	 P&TR Valve 11004784 <i>*supplied with cylinder</i>	1	 Adaptor M33 x G 3/4 (Flexi) 16601065	1	 Adapting Nipple R 3/4 x G 3/4 (Flexi) 17201006
1	 T adaptor hot outlet 19001018 <i>*supplied with cylinder</i>	4	 Fibre washer 3/4 17401008	2	 Stop end assembly 1 G 3/4 plug - 1 3/4 Kinco nut + 1 3/4 Kinco olive) 28801025
1	 R 3/4 Nipple (long) 17201011	1	 Elbow assembly 21201013 - 1 x Elbow G 3/4 (Flexi) x G 3/4 (Kinco) - 1 x Kinco nut and olive 3/4	2	 Union compression 3/4 33201709 - 1 x nipple G 3/4 - 2 x Kinco nut and olive 3/4
1	 Elbow Rp 3/4 x Rp 3/4 21201004	1	 Kinco nut 3/4 16801018	1	 Flexi pipe 1930 mm with insulation 11601099
1	 Reducing Nipple R1 x R 3/4 17201036	1	 Kinco olive 3/4 33001011	1	 Flexi Pipe 480 mm with insulation 11601064
1	 TA Valve 11007711	1	 Adapting Nipple G 3/4 (Flexi) x G 3/4 (Kinco) 17201007		

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

330 Litre Cylinder with 3 Collectors

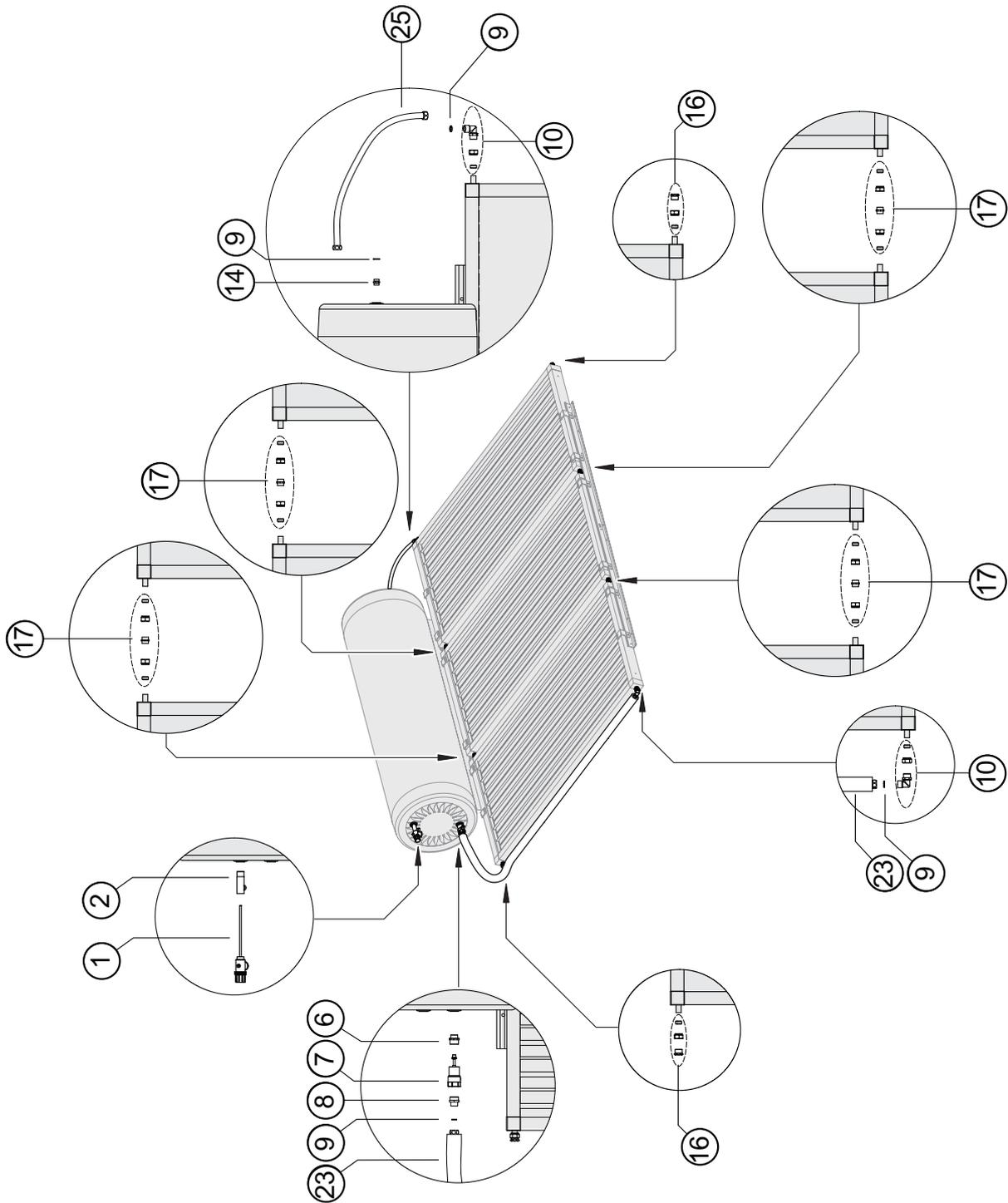


Figure 27 - 330 Litre Cylinder with 3 Collectors

INSTALLATION OF SOLAR COLLECTORS & CYLINDERS

330 litre cylinder with 3 collectors Installation Kit IK330CCT03A

Qty	Item / Part Number	Qty	Item / Part Number	Qty	Item / Part Number
1	 P&TR Valve 11004784 <i>*supplied with cylinder</i>	1	 Adaptor M33 x G 3/4 (Flexi) 16601065	2	 Stop end assembly 28801025 - 1 G 3/4 plug - 1 3/4 Kinco nut + 1 3/4 Kinco olive
1	 T adaptor hot outlet 19001018 <i>*supplied with cylinder</i>	4	 Fibre washer 3/4 17401008	4	 Union compression 3/4 32201709 - 1 x nipple G 3/4 - 2 x Kinco nut and olive 3/4
1	 Reducing Nipple R1 x R 3/4 17201036	2	 Elbow assembly 21201013 - 1 x Elbow G 3/4 (Flexi) x G 3/4 (Kinco) - 1 x Kinco nut and olive 3/4	1	 Flexi Pipe 2450 mm with Insulation 11601095
1	 TA Valve 11007711	1	 Adapting Nipple R 3/4 x G 3/4 (Flexi) 17201006	1	 Flexi Pipe 770 mm with Insulation 11601096

INSTALLATION & MAINTENANCE - GAS BOOSTED SYSTEMS

GAS BOOSTER LOCATION

The gas booster is designed for 'Outdoor' Installation only. As such, it must be located in an above ground open air situation with natural ventilation, without stagnant areas, where gas leakage and products of combustion are rapidly dispersed by wind and natural convection. The location must comply with the clearances specified in AS 5601.

The gas booster must be mounted on a vertical structure with the water and gas connections on the underside pointing downwards. The heated outlet of the cylinder is connected to cold water inlet of the gas booster.

Ensure that the wall or structure on which it is to be mounted are capable of supporting the weight of the appliance and associated pipe work. See **Table 5** for individual gas booster weights. For gas boosters installed on elevated structures or under floors specific requirements apply.

Refer to AS 5601 for details.

- Attach the gas booster to the wall using screws.
- Location of the gas booster flue terminal must be in accordance with **Figure 5.3 of AS 5601**.
- If an internal model which has been converted to a solar gas booster follow information supplied with the unit for location, mounting and flueing requirements.

GAS SUPPLY

The maximum gas consumption of the gas booster and the required gas pressure are shown on the appliance data plate. If the gas pipe sizing is insufficient the customer will not get the full performance benefit. Gas pipe sizing must consider the gas input to the gas booster as well as all the other gas appliances on the premises. The gas meter and regulator must be specified for this gas rate. An approved sizing chart such as the one in AS 5601 should be used. An approved full flow isolation valve and disconnection union must be fitted to the gas supply inlet of the gas booster. Isolation valves must not be fitted directly.

HOT WATER DELIVERY TEMPERATURE

Gas boosters for use in solar hot water systems are preset to deliver a fixed temperature of 60°C in accordance with plumbing regulations. In addition, they contain the warning stating "Rinnai Water Controllers are NOT compatible with solar hot water installations and MUST NOT BE USED" in the vicinity of the temperature controller connections inside the appliance.



- Gas Boosters other than models designated "S20", S26" or "Solar" must not be used.
- Gas Boosters marked with the text: "THIS APPLIANCE DELIVERS WATER NOT EXCEEDING 50°C IN ACCORDANCE WITH AS 3498" are incompatible with solar hot water systems and must not be used.

SMARTSTART®

Smartstart® Function

The Smartstart® is a separate system that works in conjunction with the Rinnai solar hot water system.

When activated by the manual activation switch, water in the pipework connected between the solar hot water system and the hot water outlets is warmed before any outlets are opened. This results in water savings and added convenience. Refer the **Figure 28** for installation details.

INSTALLATION & MAINTENANCE - GAS BOOSTED SYSTEMS

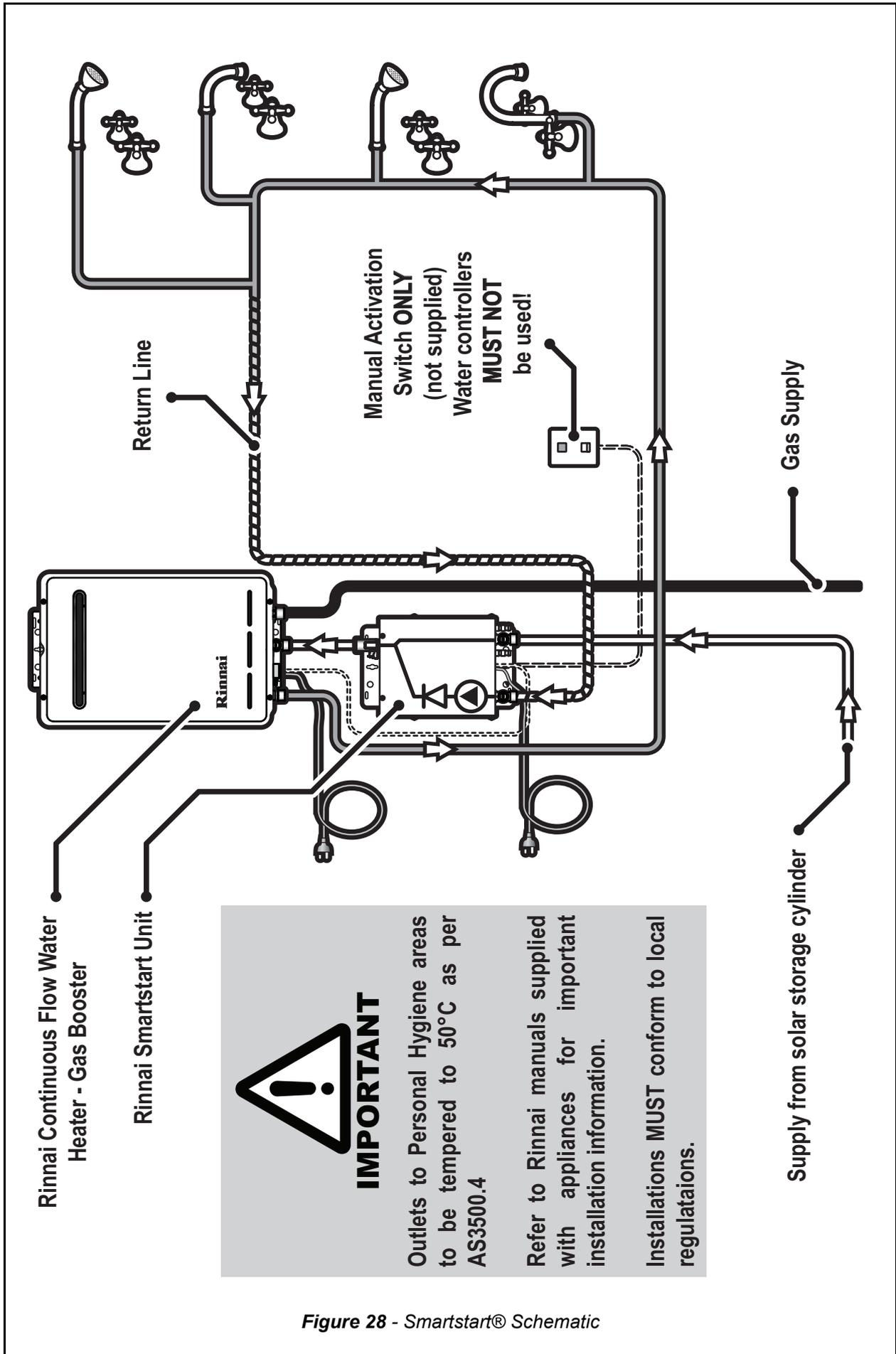
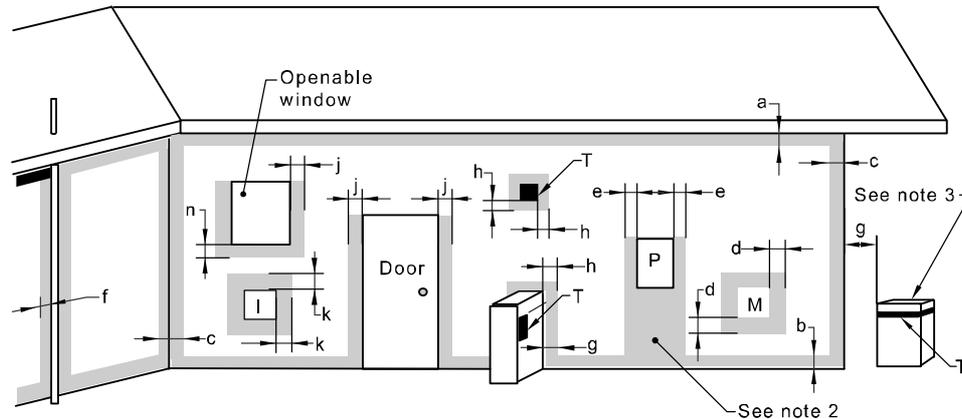


Figure 28 - Smartstart® Schematic

INSTALLATION MAINTENANCE - GAS BOOSTED SYSTEMS

CLEARANCES

Figure 5.3 is reproduced below. Note that AS 5601-2004 was current at time of printing but may have been superseded. It is the installer's responsibility to ensure current requirements are met.



LEGEND:

T = Flue terminal
 I = Mechanical air inlet
 M = Gas meter
 P = Electricity meter or fuse box
 Shading indicates prohibited areas for flue terminals

Ref .	Item	Minimum clearances (mm)	
		Natural draft	Fan assisted
a	Below eaves, balconies and other projections:		
	• Appliances up to 50 MJ/h input	300	200
	• Appliances over 50 MJ/h input	500	300
b	From the ground, above a balcony or other surface †	300	300
c	From a return wall or external corner †	500	300
d	From a gas meter (M) (see 4.7.11 for vent terminal location of regulator)	1000	1000
e	From an electricity meter or fuse box (P)	500	500
f	From a drain pipe or soil pipe	150	75
g	Horizontally from any building structure † or obstruction facing a terminal	500	500
h	From any other flue terminal, cowl, or combustion air intake †	500	300
j	Horizontally from an openable window, door, non-mechanical air inlet, or any other opening into a building with the exception of sub-floor ventilation:		
	• Appliances up to 150 MJ/h input	500	300
	• Appliances over 150 MJ/h input up to 200 MJ/h input	1500	300
	• Appliances over 200 MJ/h input up to 250 MJ/h input †	1500	500
	• Appliances over 250 MJ/h input †	1500	1500
k	From a mechanical air inlet, including a spa blower	1500	1000
n	Vertically below an openable window, non-mechanical air inlet, or any other opening into a building with the exception of sub-floor ventilation:		
	• Space heaters up to 50 MJ/h input	150	150
	• Other appliances up to 50 MJ/h input	500	500
	• Appliances over 50 MJ/h input and up to 150 MJ/h input	1000	1000
	• Appliances over 150 MJ/h input	1500	1500

† Unless appliance is certified for closer installation

All distances are measured to the nearest part of the terminal.

Prohibited area below electricity meter or fuse box extends to ground level.

See Clause 5.13.6.6 for restrictions on a flue terminal under a covered area.

See Appendix J, Figures J2(a) and J3(a), for clearances required from a flue terminal to an LP Gas cylinder. A flue terminal is considered to be a source of ignition.

For appliances not addressed above acceptance should be obtained from the technical regulator

FIGURE 5.3 (in part) MINIMUM CLEARANCES REQUIRED FOR BALANCED FLUE TERMINALS, FAN-ASSISTED FLUE TERMINALS, ROOM-SEALED APPLIANCE TERMINALS OR THE TERMINALS OF OUTDOOR APPLIANCES

AS 5601 - Figure 5.3 'Clearances' - Gas Booster Flue Terminal

INSTALLATION MAINTENANCE - GAS BOOSTED SYSTEMS

INSTALLATION PROCEDURE

1. Install Solar Collectors and cylinders

- Position and install the solar collectors and cylinder in accordance with the section 'INSTALLATION OF SOLAR COLLECTORS AND CYLINDERS'.

2. Connect PTR Valve

- Connect the PTR Valve in the location shown in the relevant diagram of **Figures 24 to 27**. Leave the valve outlet pointing down. Tighten the valve using the spanner flats - never use the valve body.
- The PTR Valve must be adequate for the thermal loading applied to the storage cylinder. In the case of gas boosted systems, the thermal load is applied only by the solar collectors. The continuous flow hot water heater does not apply thermal load to the storage cylinder. The potential solar output for the solar collectors at PTR Valve relief conditions is listed in **Table 3**.
- The PTR Valve pressure ratings vary according the cylinder specifications. The maximum heater input rating is 10.0 kW. The PTR valve rating **MUST EXCEED** the total input from the solar collectors. If it does not, the PTR valve **MUST** be exchanged for a model of higher capacity.
- *For example, for a gas boosted solar system with 3 x SP200A collectors, the thermal load is $3 \times 1.25 = 3.75$ kW. This is less than 10.0 kW, hence the supplied PTR valve is of sufficient capacity.*
- Use Teflon thread tape on the valve, never use hemp or other sealing materials. Ensure the tape does not protrude past the end of the thread, which could result in it hanging over the end of the thread and blocking the water passage through the valve.

3. Mount Gas Booster

- Mount the gas booster in accordance with the section 'GAS BOOSTER LOCATION & MOUNTING'.

4. Connect Water to Gas Booster

- Connect the outlet of the storage cylinder to the water inlet of the gas booster.

5. Connect Fittings

- Connect fittings and pipe work as shown in the relevant diagram in **Figures 24 to 27**.

6. Cold Water Supply

- Connect cold water supply to the inlet 'T'. Ensure that the relevant valves as described in the section "VALVES AND FITTINGS" are fitted.
- Purge the cold water supply lines to remove air and swarf before final connection.

7. Relief Drain Lines

- Independent 15 mm copper pipes must be fitted to the drain outlets of the PTR and ECV. Each pipe must be open to atmosphere and run with a continual downward grade in a frost free environment to a visible discharge point. Drain lines must not exceed 9 metres in length.
- Valves or other restrictions **must not** be placed in the relief valve drain outlet line.



Some water will drip from the drain lines during heating of the water in the storage cylinder. It is recommended to discharge directly above a drain.

8. Hot Water Discharge

- Connect the hot water outlet of the gas booster to the pipe work supplying hot water to the premises.



A temperature limiting device may be required as detailed in the section "HOT WATER DELIVERY TEMPERATURE".

9. Connect Gas to Booster

- Connect a suitable gas supply and isolating valve to the gas booster. Follow instructions supplied with gas booster. Keep gas booster isolated at this stage.

INSTALLATION MAINTENANCE - GAS BOOSTED SYSTEMS

FILLING THE SYSTEM



Ensure building occupants are warned to stay clear of the solar system components, building perimeter and roof since hot water or steam may be discharged from pipes or components.

1. Ensure the gas supply to the continuous flow water heater is isolated.
2. Turn on one or more hot water taps at the sink. Open the stop cock in the cold water mains supply line. The entire system will now be filled with cold water.
3. Turn off the hot tap at the sink when water flows freely without air bubbles or air bursts. Check all connections for leakage and tighten if necessary. This applies especially to fittings in positions not easily assessed such as near the solar collectors. Operate the easing gear of both the PTR and ECV valves at the storage cylinder to ensure these valves are functional.



If leaks are detected the system must be drained and leaks repaired before the system is refilled. If this is necessary, temporarily cover the solar collectors with packaging cardboard or a tarp to prevent them from heating which could result in steam or hot water being discharged from fittings.

PRE SOLAR HEATING CHECKS

Before commencing solar heating of the water in the system ensure the following actions have been completed:

Solar Collectors

1. Are the solar collectors installed with the correct slope and orientation to the sun?
2. Is the installation finished neatly with the roof made good, all tiles and flashings in place?
3. Are the bolts tight on the roof framework?
4. Are all solar collector straps fitted and correctly anchored to the roof structure?
5. If leak testing completed & successful, have any covers been removed from the solar collectors?

Gas Booster

1. Ensure the gas supply is isolated. Remove the test point screw located on the gas inlet connection and attach a pressure gauge.
2. Turn on the electrical power to the gas booster and turn on the gas supply.
3. Ensure the cold water inlet ('trio') valve on the storage cylinder inlet is open. Open all available hot water taps.
4. Operate ALL other gas appliances at their maximum gas rate, in accordance with manufacturers instructions.



Ensure building occupants do not have access to hot water outlets during this procedure.

5. With all gas appliances in operation at the maximum gas rate, the pressure should read between 1.13 - 3.0 kPa on Natural Gas. On LPG the pressure should be 2.75 - 3.0 kPa. If the pressure is lower, the gas supply is inadequate and the appliance will not operate to specification. It is the installers responsibility to check the gas meter, service regulator and pipe work for correct operation/ sizing & rectify as required. Note that the gas regulator on the appliance is electronically controlled and factory pre-set. Under normal circumstances it **DOES NOT** need adjustment during installation. Make adjustments only if the gas booster is not operating correctly and all other possible causes for incorrect operation have been eliminated. Instructions for gas pressure setting are located in the pocket behind the front cover of the gas booster.
6. Close the hot water taps including the shower.

INSTALLATION MAINTENANCE - GAS BOOSTED SYSTEMS

7. Check the hot water delivery temperature by placing a suitable thermometer at the hot water outlet closest to the gas booster. This is usually the hot water outlet in the kitchen. The delivery temperature should be greater than 55°C (this temperature allows for heat losses in pipe work). If the delivery temperature at the hot water outlet is lower than 55°C, check the delivery temperature at the outlet of the gas booster. It should be within 2°C of the set point, usually 60°C. If not, refer to the section '**Hot Water Delivery temperature**' refer to page 34.
8. Close the cold water inlet ('trio') valve on the storage cylinder inlet and inspect and clean the strainer. Repeat for the strainer connected at the inlet of the gas booster. This procedure may need to be repeated to ensure the strainers remains clear, especially on new installations.
9. Confirm the hot water delivery temperature from the gas booster. This is done by checking the hot water delivery temperature at an untempered outlet close to the water heater. This is usually the hot water outlet in the kitchen. The untempered hot water delivery should be between 55°C & 60°C.

Temperature Limiting Devices

1. Commission any temperature limiting devices in accordance with the instructions supplied by the manufacturer.
2. Confirm the hot water delivery temperature at a tempered water outlet. Tempered water outlets should be those supplying areas primarily used for the purposes of personal hygiene such as bathrooms. The hot water delivery temperature should not exceed 50°C or 45°C as detailed in the section '**Hot Water Delivery temperature**' refer to page 34.

SOLAR HEATING

1. Remove any cardboard or tarp covers that may have been placed over the solar collectors to prevent them from heating water during installation and commissioning.
2. Activate electrical power to the Rinnai gas booster. Solar heating of the water in the cylinder will now commence when sufficient solar radiation is available.

FINISHING THE INSTALLATION

- After testing is completed explain to the householder the functions and operation of solar water heater components. Also explain to the householder the importance of carrying out Maintenance as per separate 'Warranty Terms and Conditions' document.
- Leave this Manual with the householder.
- Remind the householder to complete the 'Warranty Certificate' provided in the separate 'Warranty Terms and Conditions' document.

DRAINING INSTRUCTIONS

1. The power supply to the gas booster must be switched off.
2. Close the cold water mains supply stop cock.
3. Open a hot tap to relieve pressure.
4. Disconnect the cold water connection to the Thermo-arrest (T/A) valve.
5. Remove the brass plug on the bottom right hand side of the collector bank.
6. Disconnect the 'water inlet' and 'water outlet' connections at the gas booster.
7. The system will now drain all water.

INSTALLATION PROCEDURE

1. Install Solar Collectors and Cylinders

Position and install the solar collectors and cylinder in accordance with the section "INSTALLATION OF SOLAR COLLECTORS AND CYLINDER".

2. Connect PTR Valve

- Connect the PTR Valve in the location shown in the relevant diagram of **Figures 24 to 27**.
Leave the valve outlet pointing down. Tighten the valve using the spanner flats - never use the valve body.
- The PTR Valve must be adequate for the thermal loading applied to the storage cylinder. In the case of gas boosted systems, the thermal load is applied only by the solar collectors. The continuous flow hot water heater does not apply thermal load to the storage cylinder. The potential solar output for the solar collectors at PTR Valve relief conditions is listed in **Table 3**.
- The PTR Valve pressure ratings vary according the cylinder specifications. The maximum heater input rating is 10.0 kW. The PTR valve rating **MUST EXCEED** the total input from the solar collectors. If it does not, the PTR valve **MUST** be exchanged for a model of higher capacity.
- *For example, for a gas boosted solar system with 3 x SP200A collectors, the thermal load is $3 \times 1.25 = 3.75$ kW. This is less than 10.0 kW, hence the supplied PTR valve is of sufficient capacity.*
- Use Teflon thread tape on the valve, never use hemp or other sealing materials. Ensure the tape does not protrude past the end of the thread, which could result in it hanging over the end of the thread and blocking the water passage through the valve.

3. Connect Fittings

- Connect fittings and pipe work as shown in the relevant diagram in **Figures 24 to 27**.

4. Cold Water Supply

- Connect cold water supply to the inlet 'T'. Ensure that the relevant valves as described in the section "VALVES AND FITTINGS" are fitted.
- Purge the cold water supply lines to remove air and swarf before final connection.

5. Relief Drain Lines

- Independent 15 mm copper pipes must be fitted to the drain outlets of the PTR and ECV. Each pipe must be open to atmosphere and run with a continual downward grade in a frost free environment to a visible discharge point. Drain lines must not exceed 9 metres in length.
- Valves or other restrictions **must not** be placed in the relief valve drain outlet line.



Some water will drip from the drain lines during heating of the water in the storage cylinder. It is recommended to discharge directly above a drain.

NOTE

6. Hot Water Discharge

- Connect the hot water outlet of the storage cylinder to the pipe work supplying hot water to the premises.



A temperature limiting device may be required as detailed in the section "HOT WATER DELIVERY TEMPERATURE".

WARNING

INSTALLATION & MAINTENANCE - ELECTRIC SYSTEMS

7. ELECTRIC SUPPLY



The power supply to the heating elements must not be activated until the system is filled with water.

- The power supply can be either Off-Peak (overnight), Extended Off-Peak (overnight and day) or continuous, depending on the tariffs available from the local electricity supply authority. The Off-Peak (overnight) power supply minimises the cost of any required electric boosting. Discuss power supply requirements with the end user and electricity supply authority as required.
- Connections for elements **Figure 29** shows the wiring detail for the water heater.
- A flexible 20 mm conduit is required for the electrical cable to the storage cylinder. The conduit is to be connected to the unit with a 20 mm terminator. Connect the power supply wires directly to the terminal block and earth tab connections ensuring there are no excess wire loops inside the front cover.

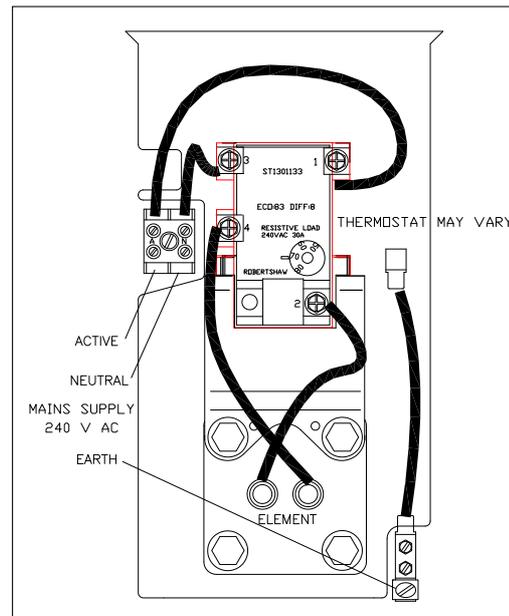


Figure 29 - Wiring detail

Heating Element Thermostat Temperature Settings

Australian Standards require a minimum thermostat set point of 60°C to inhibit the growth of Legionella Pneumophila bacteria.

FILLING THE SYSTEM



Ensure building occupants are warned to stay clear of the solar system components, building perimeter and roof since hot water or steam may be discharged from pipes or components.

1. Ensure the electric power supply to the heating element is switched off and fuses removed.
2. Turn ON one or more hot water taps at the sink. Open the stop cock in the cold water mains supply line. The entire system will now be filled with cold water.
3. Turn OFF the hot tap at the sink when water flows freely without air bubbles or air bursts. Check all connections for leakage and tighten if necessary. This applies especially to fittings in positions not easily assessed such as near the solar collectors. Operate the easing gear of both the PTR and ECV valves at the storage cylinder to ensure these valves are functional.



If leaks are detected the system must be drained and leaks repaired before the system is refilled. If this is necessary, temporarily cover the solar collectors with packaging cardboard or a tarp to prevent them from heating which could result in steam or hot water being discharged from fittings.

INSTALLATION & MAINTENANCE - ELECTRIC SYSTEMS

PRE SOLAR HEATING CHECKS

Before commencing solar heating of the water in the system ensure the following actions have been completed:

Solar Collectors

1. Are the solar collectors installed with the correct slope and orientation to the sun?
2. Is the installation finished neatly with the roof made good, all tiles and flashings in place?
3. Are the bolts tight on the roof framework?
4. Are all solar collector straps fitted and correctly anchored to the roof structure?
5. If leak testing completed and successful, have any covers been removed from the solar collectors?

Electric Heating Element

1. Has the thermostat set point been set to at least 60°C and no greater than 70°C?

Temperature Limiting Devices

1. Commission any temperature limiting devices in accordance with the instructions supplied by the manufacturer.
2. Confirm the hot water delivery temperature at a tempered water outlet. Tempered water outlets should be those supplying areas primarily used for the purposes of personal hygiene such as bathrooms. The hot water delivery temperature should not exceed 50°C or 45°C as detailed in the section "Hot water delivery temperature" of these instructions.

SOLAR HEATING

1. Remove any cardboard or tarp covers that may have been placed over the solar collectors to prevent them from heating water during installation and commissioning.

Auxiliary Energy Supply

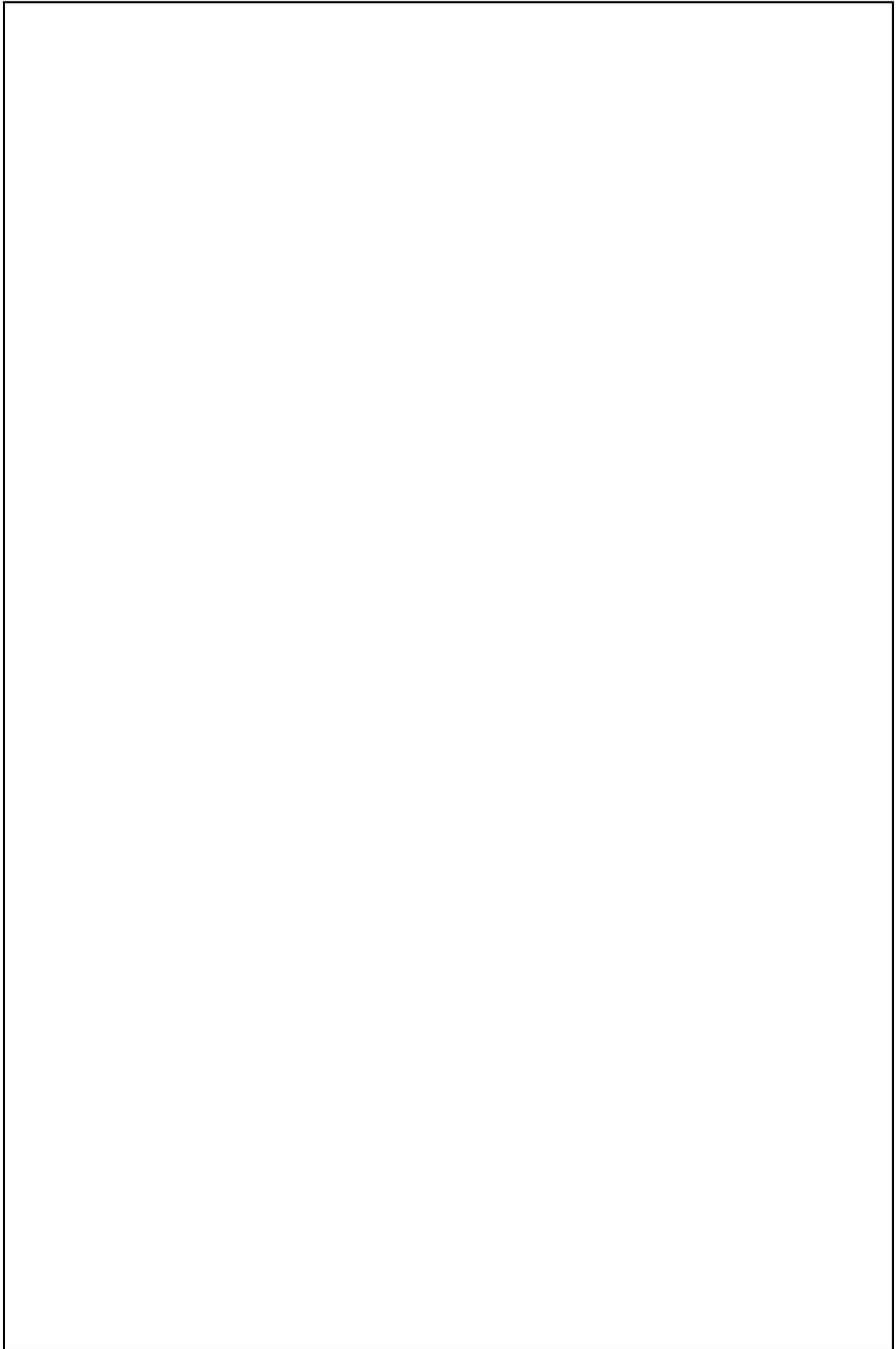
1. Connect the electrical element to the power supply (off peak if available).
2. When the system is fully of water turn on electrical supply to element.

FINISHING THE INSTALLATION

- After testing is completed explain to the householder the functions and operation of solar water heater components. Also explain to the householder the importance of carrying out Maintenance as per separate 'Warranty Terms and Conditions' document.
- Leave this Manual with the householder.
- Remind the householder to complete the 'Warranty Certificate' provided in the separate 'Warranty Terms and Conditions' document.

DRAINING INSTRUCTIONS

1. The power supply to the element must be switched off.
2. Close the cold water mains supply stock cock.
3. Open a hot tap to relieve pressure.
4. Disconnect 'cold water inlet' connection to the T/A valve.
5. Remove the brass plug on the bottom right hand side of the collector bank.
6. The system will now drain all water.



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Rinnai has a Service and Spare Parts network with personnel who are fully trained and equipped to give the best service on your Rinnai appliance. If your appliance requires a service, please call our National Help Line.

Internet: www.rinnai.com.au
E-mail: enquiry@rinnai.com.au

National Help Line

Spare Parts & Technical Info
Tel: 1300 555 545*
Fax: 1300 300 141*

**Cost of a local call Higher from mobile or public phones.*

Hot Water Service Line
Tel: 1800 000 340

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