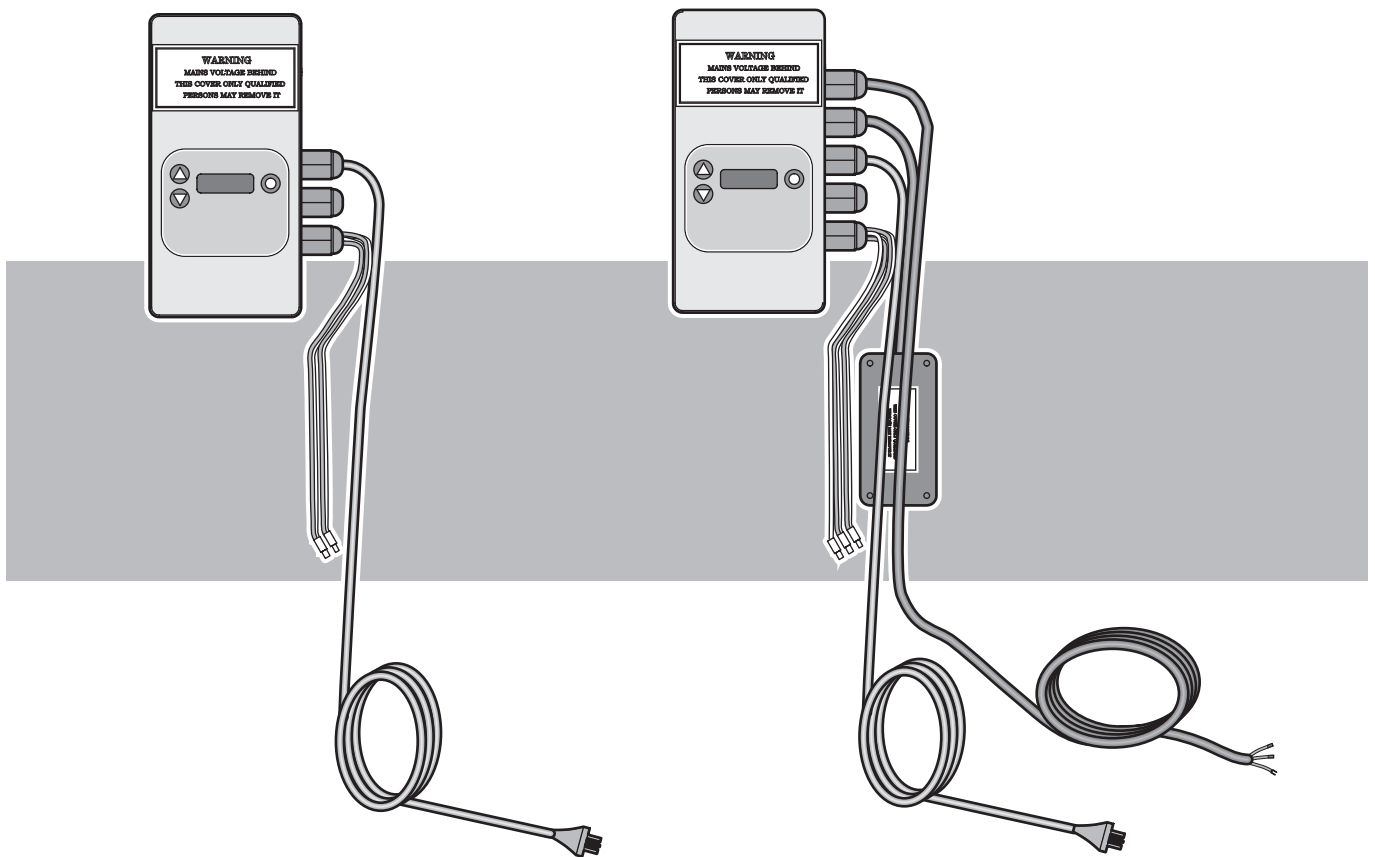


# Rinnai

## Operation & Installation Manual

### Residential Solar Hot Water Controller



#### This appliance shall be installed in accordance with:

- Manufacturer's Installation Instructions
  - Current AS/NZS 3000 & AS/NZS 3500
  - Local Regulations and Municipal Building Codes including local OH&S requirements
- This appliance must be installed, maintained and removed only by an Authorised Person.  
For continued safety of this appliance it must be installed and maintained in accordance with the manufacturers instructions.



Certified  
Product



WaterMark  
AS3498 Lic W208  
SAI Global



Australian  
Standard  
AS/NZS 2712  
Lic No. 1849  
SAI Global



# SCOPE OF MANUAL

This manual covers the operation of the solar controllers with display used with pumped solar hot water systems.

Full information on the complete system installation can be found in the manual(s) provided with the system or on the Rinnai website. [www.rinnai.com.au](http://www.rinnai.com.au).

All information and warnings in the relevant installation manual are applicable to this installation.

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# WARNINGS AND IMPORTANT INFORMATION



READ ALL INSTRUCTIONS BEFORE OPERATING THE SYSTEM.

**Always comply with the following precautions to avoid dangerous situations and to ensure optimum performance.**

**Failure to carefully read and follow all instructions in this manual can result in equipment malfunction, property damage, personal injury and/or death.**

**DANGER:** Indicates an imminently hazardous situation which, if not avoided, will result in personal injury or death.

**WARNINGS:** Indicates a potentially hazardous situation which, if not avoided, could result in personal injury or death.

**CAUTIONS:** Indicates a potentially hazardous situation which, if not avoided, could result in minor or moderate injury or damage to the appliance. It may also be used to alert against unsafe practices.



## REGULATORY INFORMATION

**Your Rinnai solar hot water system has been certified by the SAI global. The certification number is shown on the data plate of the solar collector and tank.**

**The system must be installed correctly by an appropriately licensed tradesperson. The installation of gas, water, and electricity must conform to local regulations.**

**The installation of gas, water, and electricity must conform to local regulations, including local OH&S requirements.**

**The installation must also comply with the instructions supplied by Rinnai in all manuals relevant to the installation.**

**Please keep this instruction booklet in a safe place for future reference.**

**All dimensions referred to in these instructions are in millimetres, unless otherwise specified.**



## Notice to Victorian Consumers

**This appliance must be installed by a person licensed with the Victorian Building Authority.**

**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 Victorian Building Authority on 1300 815 127.**



## HAZARDS

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. Components used to join pipes must use metallic materials to achieve sealing.

**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.



**WARNING ABOUT HOT WATER**

Hot water can cause scalding. Those most at risk are children and disabled, elderly and infirm persons. (65°C water can severely burn a child in half a second).

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. .

ALWAYS test the water temperature before use, such as when filling a bath or basin or entering a shower, to ensure it is suitable for the application and will not cause scald injury.

ALWAYS supervise children whenever they are in the bathroom or near other sources of hot water. Ensure any hot water taps are closed firmly after use.



**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 the service contact numbers on the back of this booklet.

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.

## STANDARD SOLAR CONTROLLER

The standard solar controller is used either with a gas boosted solar hot water system or an electric boosted system with an independently controlled element.

It should **NOT** be used for systems with a tank with a mid sensor port.

The standard solar controller has two temperature sensors:

- the cold sensor is positioned low in the tank
- the hot sensor is positioned at the outlet of the solar collector.

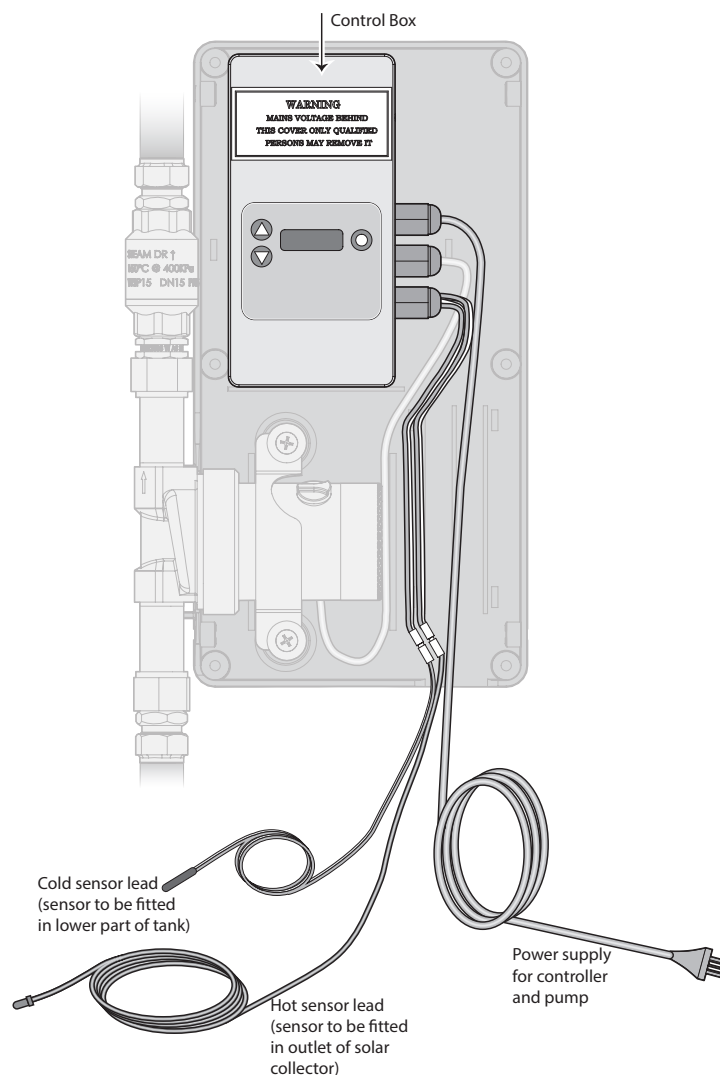
The controller uses the temperatures from these sensors to determine when to operate the pump to optimise solar heating and for frost protection (when enabled).

The difference in temperatures is used to determine when to operate the pump to circulate water between the collectors and tank to collect solar energy. When the temperature from the cold sensor indicates that all the water in the tank is heated, the pump is turned off.

To minimise the likelihood of frost damage, the controller can enable the pump to circulate water through the collectors when the temperature at the solar collectors is low. This is called 'Pumped Frost Protection' (PFP). PFP mode can be enabled or disabled from the controllers programmable display. See page 10 for more details.

Power supply :

240V AC 10A weatherproof power point for power lead.



To meet Australian regulatory requirements, supplementary heating must be operational.

### DELUXE SOLAR CONTROLLER

The deluxe solar controller is used with an electric boosted solar hot water system using a tank with a mid sensor port. It cannot be used when the tank does not have the mid sensor port. The standard controller should be used in this case.

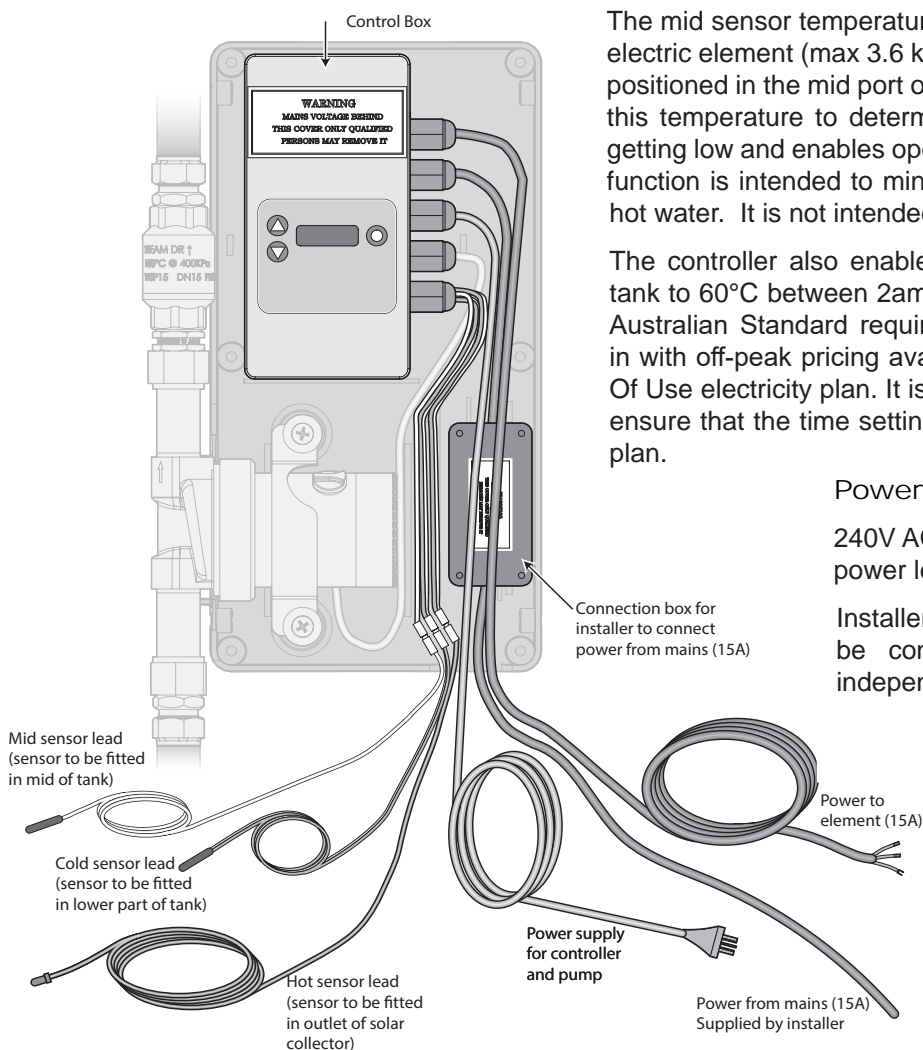
The controller has three temperature sensors:

- the cold sensor is positioned low in the tank
- the hot sensor is positioned at the outlet of the solar collector.
- the mid sensor is positioned in the middle section of the tank. It has a white lead to help identify it.

The controller uses the temperatures from these sensors to determine when to operate the pump to optimise solar heating and for frost protection (when enabled).

The difference between the cold and hot sensor temperatures is used to determine when to operate the pump to circulate water between the solar collectors and tank to collect solar energy. When the temperature from the cold sensor indicates that all the water in the tank is heated, the pump is turned off.

To minimise the likelihood of frost damage, the controller can enable the pump to circulate water through the collectors when the temperature at the solar collectors is low. This is called 'Pumped Frost Protection' (PFP). PFP mode can be enabled or disabled from the programmable display on the controller. See page 10 for more details.




The mid sensor temperature is used to enable operation of an electric element (max 3.6 kW). It has a white lead and must be positioned in the mid port of the solar tank. The controller uses this temperature to determine when the tank temperature is getting low and enables operation of the electric element. This function is intended to minimise the chance of running out of hot water. It is not intended to heat the whole tank.

The controller also enables the element to heat part of the tank to 60°C between 2am and 6am each day to comply with Australian Standard requirements. This time period may fit in with off-peak pricing availability for consumers with a Time Of Use electricity plan. It is the responsibility of the installer to ensure that the time setting will suit the consumers electricity plan.

**Power supply:**

240V AC 10A weatherproof power point for power lead.

Installer supplied lead for element must be connected to continually available, independent, fused, 240V AC 15A power.

 **IMPORTANT** To meet Australian regulatory requirements, supplementary heating must be operational. The white sensor lead **MUST** be positioned in the mid port of the tank.

# INSTALLATION

## PUMP AND CONTROLLER ASSEMBLY

Fasten the assembly to the tank and connect fittings and flow and return lines as described in the installation manual provided with the kit.

Fill the tank with water as described in the installation manual.

## ELECTRICAL ELEMENT CONNECTION (DELUXE CONTROLLER)

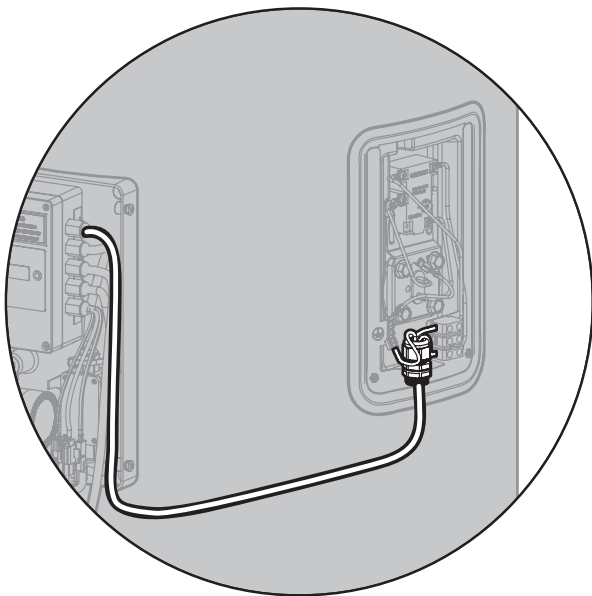


Do not turn on power to the element until the tank is filled with water.



Installation and commissioning must only be performed by authorised person.

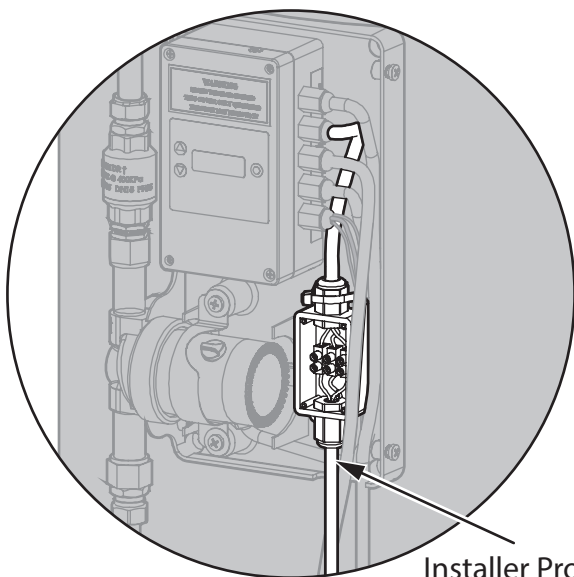
Installation and commissioning must be undertaken in accordance with these instructions and all regulatory requirements that may exist in your area. This includes AS/NZS 3000 wiring rules.



Connect the 15A wire from the controller to the element on the tank. Ensure the wiring corresponds to the wiring diagram on the tank. Protect the exposed 15A wire with a conduit.

Set thermostat for the element to 60°C.

Note: The thermostat provides control of the element operation and safety. The solar controller limits the time that electricity is available for use by the element, so that solar energy collection can be prioritised.

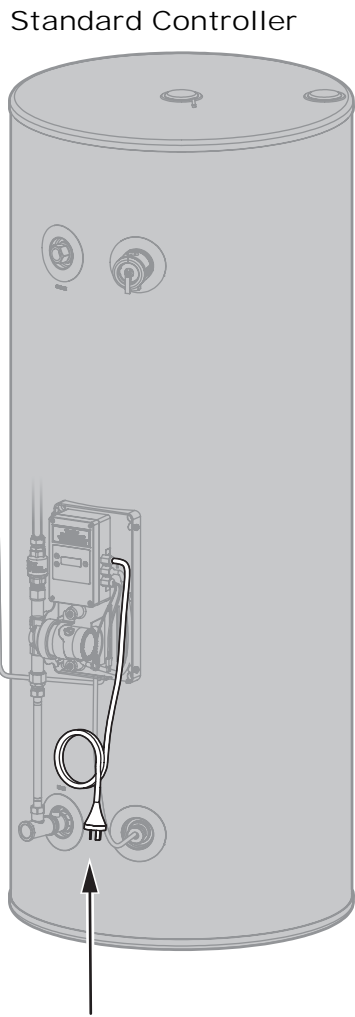


Installer Provided  
Wiring to Mains  
(provides power  
for element only)

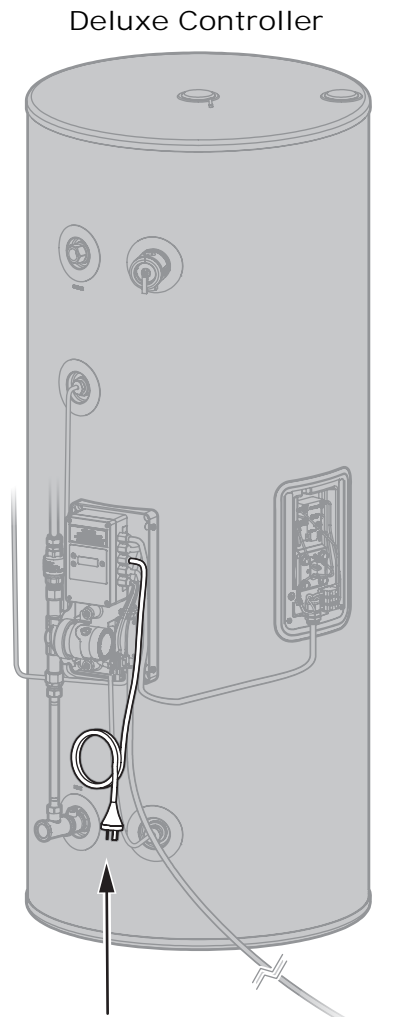
Connect a suitable wire from an independent, fused 240VAC power supply with an isolating switch installed at the switch board, to the junction box supplied. Replace the cover on this box to protect other users from 240V power.

Do not turn on power to the element until the tank is full of water. Doing so may damage the tank.

CONNECT CONTROLLER TO POWER POINT



Plug into Power Point



Plug into Power Point (power for controller and pump only) To Mains

A 240V AC 10A weatherproof power point must be supplied to plug in the controller.

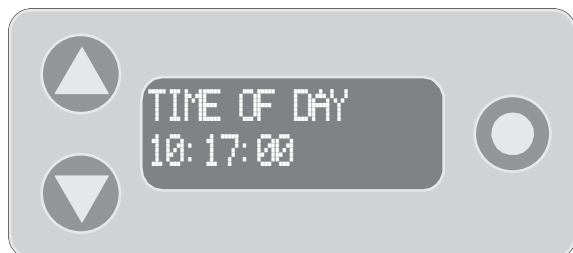


Do not turn on power to pump and controller until the tank is filled with water. Operation of pump without water can damage it.



## SETTING CONTROLLER

## Set time on controller



Before the controller will function the time of day must be set.

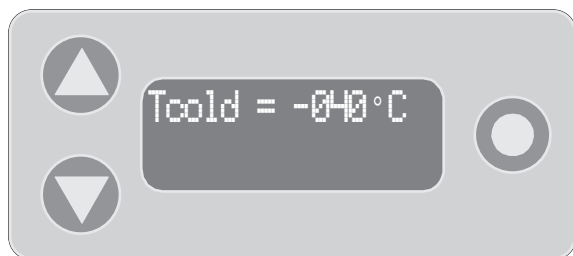
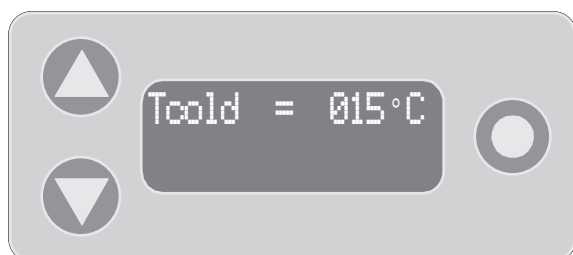
For the Deluxe controller it is important that this is done correctly to ensure tank sterilisation happens overnight and isn't competing with solar energy collection. Having the correct time is also important if the consumer has a lower tariff at night.

Be aware that the controller does not adjust for daylight savings. Ensure that any changes to or from daylight savings time will not cause the element to operate it's sterilisation heating (2am to 6 am) during a potentially higher cost time of day.

**To change the time, press and hold the circle button until the minutes flash. Use the arrow buttons to adjust until the minutes are correct. Press the round button and repeat the process with the hours (24 hour time).**

If the time has previously been set, scroll through the display screens until the time of day is shown, then check time and correct if necessary.

## Check Sensor Readings



**Scroll through the display screens (use arrow buttons) to check that temperatures of the hot, cold and mid (for electric element controller only) sensors are showing a sensible value.**

If a sensor is not connected, a temperature of -040°C will be displayed. Additionally the error display screen will identify that the sensor is giving a faulty reading.

Fix any sensor connection problems to ensure correct operation of the system.

Set PFP mode



**Scroll using the arrow buttons to the PFP (Pumped Frost Protection) screen. Press and hold the circle button to enable or disable.**

When frost protection is enabled, the pump will circulate water through the solar collectors when the temperature at the solar collectors (hot sensor) is cold enough. This flow of water reduces the likelihood of frost damage to the collectors.

Depending on the system, it may be mandatory for PFP to be enabled for warranty against frost damage. Check the warranty booklet for more details.



Set DBE mode



When enabled the DBE (Daytime Bottom Element) function prevents the solar pump from operating during the day at the same time as the electric element.

In Victoria, it must be enabled on bottom element tanks for legislative purposes. For all other systems and locations it can be disabled.

**Scroll using the arrow buttons to the DBE screen. Press and hold the circle button to enable or disable as required.**



Check there are no errors



**Scroll to the error screen and check if any errors are displayed. If there are errors determine the cause and fix them.**



### Check Pump Operation



Check that the pump is operating correctly by enabling the Pump Test function. This function operates the pump regardless of the readings of the temperature sensor. It is only used for commissioning and service.

**Scroll using the arrow buttons to the Pump Test screen. Press and hold the circle button to enable. The pump should switch on.**

**Once pump operation is checked and OK, turn the pump off by pressing and holding the circle button.**

Note: The function will automatically disable after 5 minutes to prevent it accidentally being left on.

### Normal Operation



Scroll using the down arrow button to the main display screen. During normal operation this display will show either collecting mode or storage mode.

Collecting Mode is shown when the pump is operating and solar energy is being gathered.

PFP Mode is shown to indicate when the pump is operational due to cold temperatures at the solar collector.

At other times Storage Mode will be shown. This indicates that the pump is not operating.



## FINISH INSTALLATION

Complete the remainder of the installation as described in the system operation and installation manual.

# Rinnai

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ABN 74 005 138 769

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Keysborough, Victoria 3173**

**P.O. Box 460  
Braeside, Victoria 3195**

**AU45204**

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 service, please call our National Help Line. Rinnai recommends that this appliance be serviced at least every 2 years.

With our policy of continuous improvement, we reserve the right to change, or discontinue at any time, specifications or designs without notice.

**Product Sales & Service National Help Line**

Tel: 1300 555 545\* Fax: 1300 555 655  
\*Monday to Friday, 8.00am to 5.30pm EST

For further information visit [www.rinnai.com.au](http://www.rinnai.com.au)  
or email [enquiry@rinnai.com.au](mailto:enquiry@rinnai.com.au)