

Rinnai

Installation Manual

Smartstart® - REU-CUG1



This appliance shall be installed in accordance with:

- Manufacturer's Installation Instructions
 - Current AS/NZS 3000, AS/NZS 3500 & AS/NZS 5601
 - Local Regulations and Municipal Building Codes including local OH&S requirements
- This appliance must be installed, maintained and removed by an Authorised Person.
For continued safety of this appliance it must be installed operated and maintained in accordance with the manufacturers instructions.



N10378



This Appliance complies
with AS 3498:2009
SAI GLOBAL LIC. W208

RINNAI SMARTSTART (REU-CUG1-AK) INSTALLATION MANUAL

You must install this appliance in accordance with these Instructions and all regulatory requirements which exist in your area. Applicable publications may include:

- AS/NZS 5601 - Gas Installations
- AS/NZS 3500 - National Plumbing and Drainage
- AS/NZS 3000 - Wiring Rules
- Building Codes of Australia

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.

THE SMARTSTART SYSTEM MUST BE MOUNTED ON A VERTICAL WALL OR STRUCTURE.

THE SMARTSTART SYSTEM CANNOT BE USED BY ITSELF OR WITH ANOTHER MANUFACTURERS WATER HEATER OR WATER CONTROLLERS.

- The Rinnai Smartstart system is Certified and compatible only with the Rinnai INFINITY Water Heaters REU-VR, REU-VRM and REU-KM Series.
- At least one Water Controller must be used in conjunction with the water heater and the Smartstart system. Alternatively, if Water Controllers cannot be used a manual activation switch is available from electrical wholesalers.
- The installation of the water heater and water controllers must be performed in accordance with the 'Operation / Installation manual' supplied with the water heater.
- The Smartstart system is designed for domestic installations. However, it may be suitable for certain non domestic installations. Contact Rinnai for more information.

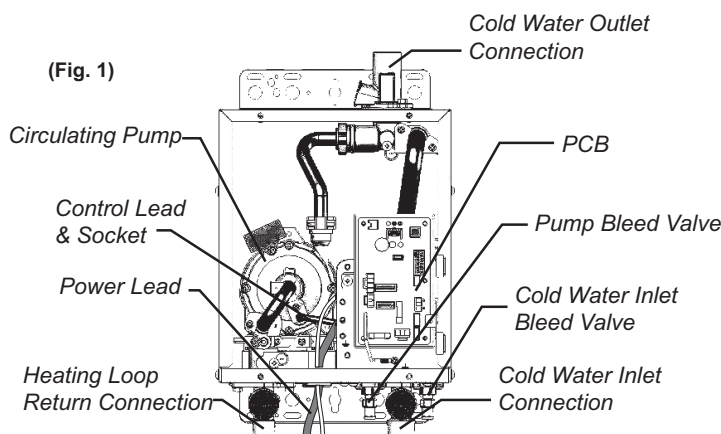
SMARTSTART KIT CONTENTS (Fig.1)

The Rinnai Smartstart kit comprises an enclosure containing circulating pump, water connections for cold water inlet, cold water outlet and heating loop return, control wiring and printed circuit board. It is fitted with an electric power cord with three pin plug suitable for connection to a 240V 50Hz 10Amp GPO. It is also fitted with a control lead for connection to the Rinnai water heater.

A Switch Harness (Part No. U268-605) is also provided for connection to a Manual Activation Switch (if required).

The Rinnai Smartstart kit does not include:

- 240V 50Hz 10Amp GPO
- Heating loop flow and return pipework
- Gas and water isolating valves
- Control valves (non return valve, pressure limiting valve, expansion relief valve)
- Plumbing Connections between the Smartstart enclosure and Rinnai Water Heater and Rinnai Water Controllers

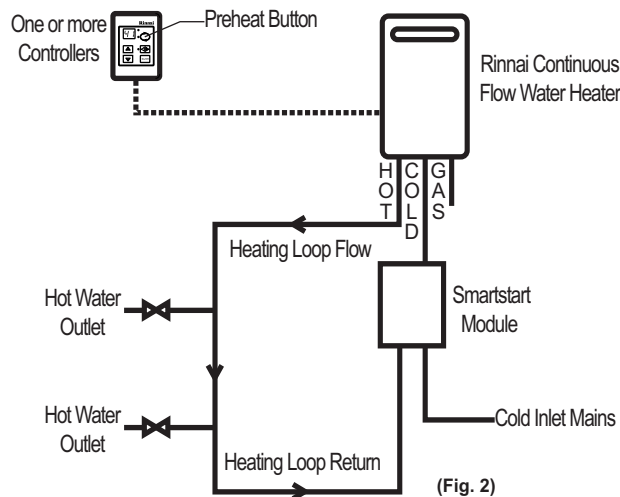


PRINCIPLE OF OPERATION (Fig. 2)

The Smartstart system heats the water in the pipework water connected between the water heater and the hot water outlets before any outlets are opened using the 'flow and return' pipework principle. This results in water savings and reduced waiting time for heated water delivery from the outlet when opened.

Traditional 'flow and return' systems usually keep the water in the pipework heated continuously. The Smartstart system however, only heats the water before the outlet is opened. This results in significant energy savings because water is not heated unnecessarily whilst retaining the benefits of traditional flow and return systems.

A schematic of the Smartstart system installed in conjunction with a Rinnai water heater and water controller is shown in (Fig. 2) below.

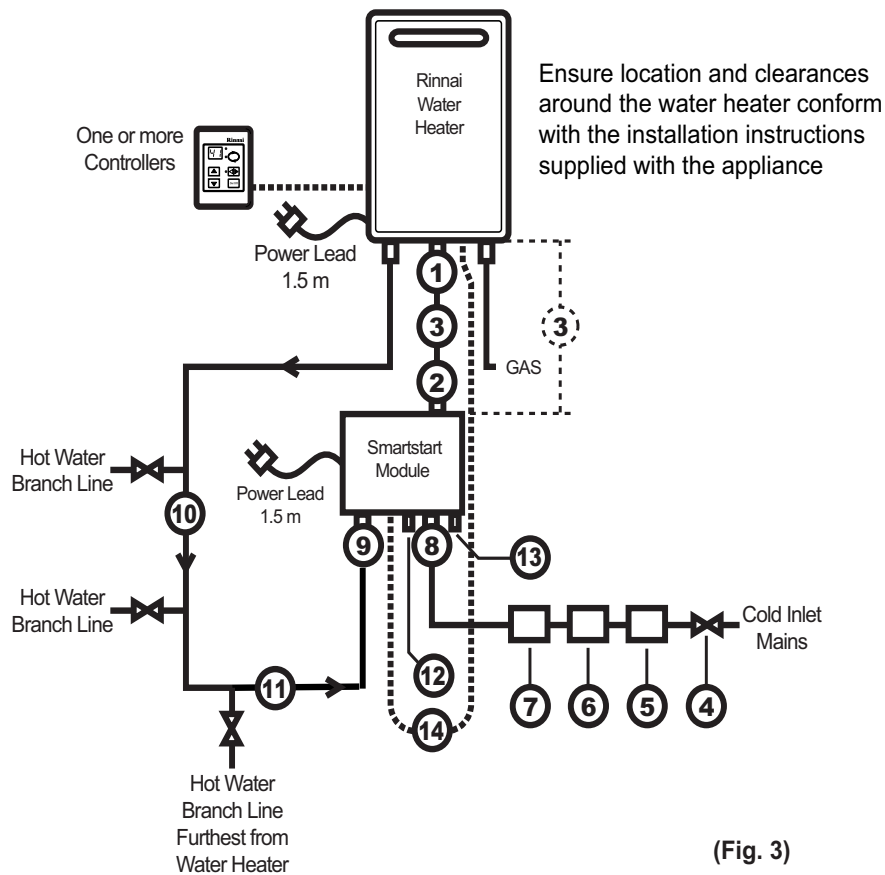


The Smartstart system works as follows:

1. Before hot water is required, the user activates the Smartstart system by pressing the 'preheat' button on the water controller or by pressing the Manual Activation Switch.
2. This activates the Smartstart system and the integral pump is switched on.
3. Water flows from the pump and passes through the water heater. This in turn activates the water heater burner and water in the flow and return heating loop begins to heat.
4. When the Smartstart control module senses that the water in the full length of the flow and return heating loop has been heated, the pump and water heater stop operating.
5. The user opens the desired hot water outlet. Preheated water will be delivered from the flow and return heating loop to the outlet.

LOCATION (Fig. 3)

- Location and clearance requirements for the Rinnai continuous flow water heaters are detailed in the Installation Instructions supplied with it.
- The Smartstart module weighs 7.5 kg and the wall or structure on which it is to be mounted must be capable of supporting the combined weight of the Smartstart unit, water heater and any associated pipework.
- Both the water heater and Smartstart module must be in an accessible location. Sufficient clearance shall allow access to, and removal of, all serviceable components. Water heater and Smartstart modules must not be mounted higher than 3.5 metres from the ground or floor level unless the customer can arrange permanent and safe access or can arrange another means of access, for example, by means of scissor or boom lifts.
- The Smartstart module is usually located below the Rinnai water heater. However, it can be mounted anywhere within a 1.0 metre distance from the water heater (length of communication cable is one metre).
- A 240V 50Hz 10Amp weatherproof external earthed power point shall be provided adjacent to the Smartstart module (the power cord is 1.5 metres long).
- Alternatively, the water heater and Smartstart module can share the same power point provided it is of the dual outlet type.
- Double adaptors and extension leads must not be used.
- The power point must be kept clear of pipework connections, relief valve discharge points and the water heater flue outlet.



(Fig. 3)

LEGEND TO (Fig. 3)

1. Water heater cold water inlet connection R3/4" (20mm).
2. Smartstart module cold water outlet connection R3/4" (20mm).
3. Copper tube R3/4" (20mm), length approximately 300mm (maximum length 1000mm).
4. Isolating valve.
5. Non Return valve.
6. Pressure limiting valve, 500 kPa rating. **OTHER RATINGS ARE UNSUITABLE!**
7. Expansion control valve, 700 kPa rating. **OTHER RATINGS ARE UNSUITABLE!**
Ensure the drain line is installed in accordance with the requirements of AS/NZS 3500.
8. Smartstart module cold water inlet connection R3/4" (20mm).
9. Smartstart module heating return loop inlet connection R1/2" (15mm).
10. Insulated heating loop 'Flow' pipework R3/4" (20mm).
11. Insulated heating loop 'Return' pipework R3/4"(20mm).



Total length of items 10 & 11 not to exceed 60 metres. Flow and return pipe sizes smaller R 3/4" (20mm) may result in inadequate performance.

12. Pump bleed valve.
13. Cold water inlet bleed valve.
14. Smartstart water heater communication cable.

SERVICE CONNECTION POINTS

Positions and sizes of the connection points to the water heater and pipework are shown in (Fig.3) and the Dimensional drawings.

VALVES (Fig. 3)

- Approved isolation and non return valves must be fitted to the cold water inlet.
- A combination isolating and non return valve may be used. Approved pressure limiting and expansion control valves must also be fitted. A combination pressure limiting and expansion control valve may be used. The pressure limiting valve must be rated at 500 kPa.
- The Expansion Control valve must be rated at 700 kPa. **OTHER RATING COMBINATIONS ARE NOT SUITABLE!**
- Valves must not be connected directly to the Smartstart module or Rinnai water heater.
- It may be necessary to fit a temperature limiting device for delivery to areas used primarily for the purposes of personal hygiene. Refer to the 'Heated Water Delivery Temperature' section of this document.

PIPEWORK (Fig. 3)

- All hot water pipework should be insulated to optimise performance and minimise energy wastage. This may also be required by local regulations.
- The flow section of the pipework should be R3/4" (20mm) type B copper or equivalent. The return section of the pipework should be R3/4" (20mm) type B copper or equivalent. Total combined length of the flow and return pipe should not exceed 60 metres.
- The branch lines from the flow and return pipework to the hot water outlets should be sized in accordance with AS/NZS 3500.

MOUNTING THE SMARTSTART MODULE (Fig. 3)

The Smartstart module is usually located below the Rinnai water heater. However, it can be mounted anywhere within a 1.5 metre distance from the water heater. These instructions assume it is located below the water heater.



Do not remove the front cover of the Smartstart or the water heater unless the power supply is isolated. It is not necessary to remove the front cover of either appliances for the purposes of mounting the Smartstart module.

1. Draw a line vertically down from the cold water inlet connection of the Rinnai water heater.
2. Mount the Smartstart module so the top edge of the enclosure is approximately 300 mm below the Rinnai water heater with the water outlet connection of the Smartstart module in line with the water inlet connection of the Rinnai water heater as shown in (Fig. 3).
3. Fasten the Smartstart module to the wall or supporting structure. The top bracket has a keyhole slot so that the Smartstart module can be positioned by hanging it on one screw, then the other screws can be secured.
4. Connect a piece of R3/4" (20mm) type B copper or equivalent between the outlet of the Smartstart module and the cold water inlet of the Rinnai water heater.
5. Connect the isolating, non return, pressure limiting and expansion control valves and an adequately sized cold water supply pipe to the cold water inlet of the Smartstart module.
6. Plan the route of the 'flow and return' pipework to ensure the shortest distance between the pipework and the hot water outlets.
7. Connect the 'flow and return' pipework between the hot water outlet of the Rinnai water heater and the heating loop return connection on the Smartstart module. Insulate pipework. The 'return' section of the pipework should be connected after the branch line furthest away from the water heater.
8. Install branch lines from the pipework to hot water outlets.



Install temperature limiting device in accordance with the 'Heated Water Delivery Temperature' section of this document.

COMMUNICATION CABLE

- Electronic signals are communicated between the Smartstart module and the Rinnai water heater via the communications cable already connected to the Smartstart module.
- The communications cable is connected to the remote control connection terminals on the Rinnai water heater in the same way as cables from the water controller(s). Refer to the 'WATER CONTROLLERS' section of the 'Operation / Installation Manual' supplied with the Rinnai water heater for details.

MANUAL ACTIVATION SWITCH

- To obtain the full benefits of the water heater and Smartstart system, water controllers should be used. However it is possible to use a manual activation switch to activate the Smartstart system if water controllers are not fitted.



This type of switch must be used with a Smartstart that is operating on a solar system. Refer to (Fig.6) Solar System Connections.

Parts required:

- Two core sheathed (double insulated) flex with minimum cross sectional area of 0.5 mm².
- Switch Harness (Part No. U268-605) this comes supplied with the Smartstart system.
- One or more manual activation switch(es). Suggested part is Clipsal 30PBL or equivalent.

Procedure:

- Install the manual activation switch(es) in the desired location in accordance with manufacturer instructions.
- Run the cable between the manual activation switches and the Smartstart system.



If more than one manual activation switch is used then the cables will need to be connected in parallel before entering the Smartstart system. Only one cable can be connected to the terminals of the Smartstart system.

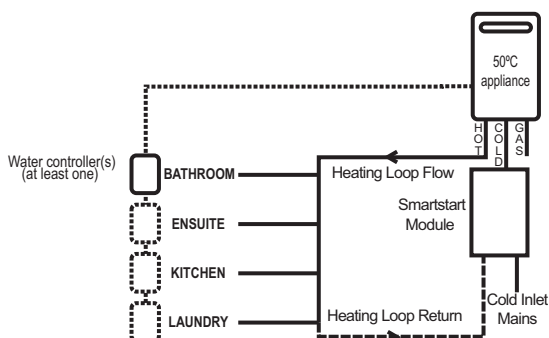
- Run the cable into the Smartstart enclosure using the same entry point as the communication cable fitted between the Smartstart and the Rinnai Water heater.
- The switch harness is connection between the cable from the manual activation switch(es) and the Printed Circuit Board (PCB) of the Smartstart. Connect the two wires from the manual activation switch cable to the Blue and Black wires on the switch harness (polarity does not apply). If an LED indicator is used, connect the two wires from the LED indicator to the Red and Black wires on the switch harness. (The LED required is 12V 5 mA Maximum) **Note: that the Orange wire on the switch harness is not used.**
- Plug the switch harness into the PCB as shown in the Circuit Diagram on page 9.

WATER CONTROLLERS

- At least one controller must be fitted to enable activation of the Smartstart system. Up to three or four controllers can be fitted depending on water heater model. Refer to the 'WATER CONTROLLERS' section of the 'Installation Instructions' supplied with the Rinnai water heater for details.

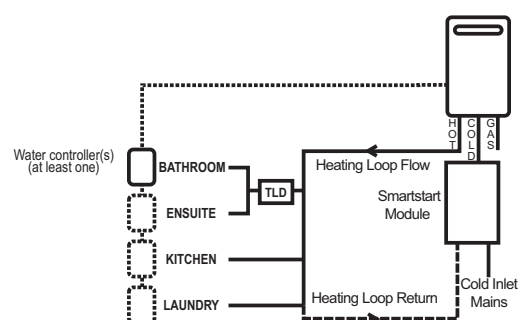
HEATED WATER DELIVERY TEMPERATURE

The maximum water temperature delivered at the hot water outlets is determined by the pre-set limit programmed into the water heater. Local regulations and/or the requirements of AS/NZS 3500 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 may be limited to 50°C or less. If you are unsure about local regulations, contact your regulating authority or Rinnai.



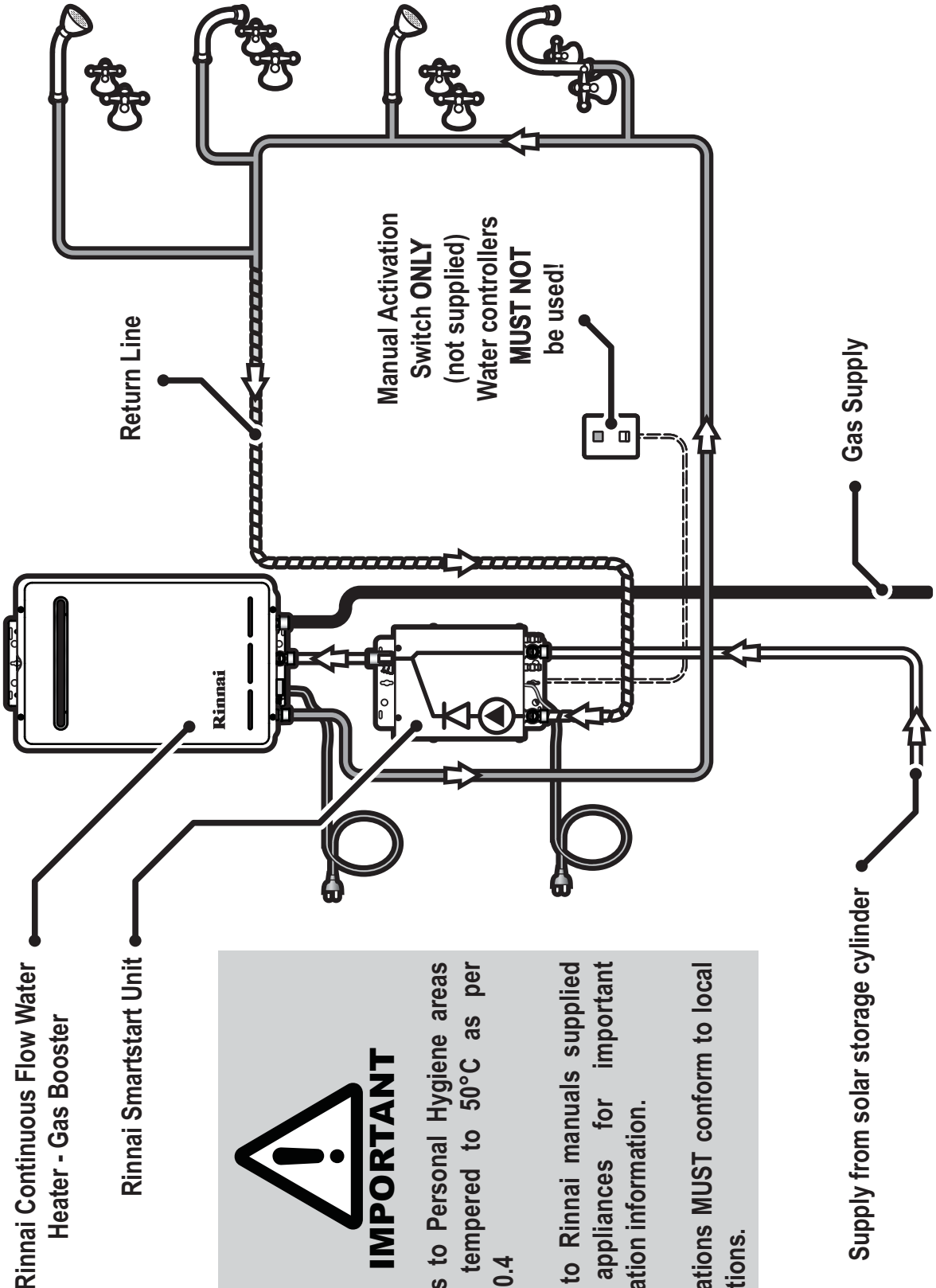
(Fig.4) - 50°C Appliance
Minimum length of pipe from hot outlet to nearest hot water tap 2 metres.

If the water heater is marked to state that it delivers water not exceeding 50°C, local regulations may permit installation without a Temperature Limiting Device shown in (Fig. 4).



(Fig.5) - Not a 50°C Appliance.
Note: TLD = Temperature Limiting Device

If the appliance is NOT marked to state that it delivers water not exceeding 50°C, or your local regulations require installation with a Temperature Limiting Device, then the installation should be in accordance with (Fig. 5).



!

IMPORTANT

Outlets to Personal Hygiene areas to be tempered to 50°C as per AS3500.4

Refer to Rinnai manuals supplied with appliances for important installation information.

Installations **MUST** conform to local regulations.

(Fig. 6) - Solar System Connections

TESTING AND COMMISSIONING

1. Ensure the power supply to the Smartstart unit is switched 'off'.
2. Carry out steps 1-12 of the 'Testing' in the Commissioning section from the 'Operation / Installation Manual' supplied with the water heater.
3. Inspect and clean the strainer located on the cold water inlet connection of the Smartstart module. This procedure may need to be repeated to ensure the strainer remains clear, especially on new installations.
4. Turn 'off' the power supply to both the water heater and Smartstart units.
5. Open all available hot water taps, including the shower, again until water from all outlets is cold. Then close the hot water taps.



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

6. Open the Smartstart module Pump and Cold Water inlet bleed valves items (12) & (13) of (Fig.3) (actual position of 'bleed valves' is shown on dimensional drawing) until all air pockets are released and a steady stream of water is discharged.
7. Activate the power supply to both the water heater and Smartstart unit.
8. **If water controllers are fitted:** Press the 'on/off' button on the water control panel. The 'on' indicator next to the transfer button will glow when the control panel has been switched 'on'. Then adjust the temperature to the hottest setting by pressing the 'hotter' button until the temperature displayed on the control panel cannot be increased any further. Then press the 'preheat' button on the control panel. The 'preheat' indicator next to the preheat button will glow indicating that the preheat system has been activated.

If a manual activation switch is fitted: Press the switch once.

With the Smartstart unit now activated via the water controller or manual activation switch, the pump should start running immediately afterwards which is indicated by the left LED on the Smartstart PCB glowing green continuously. Check that this is the case. If the left LED on the Smartstart PCB does not glow green the pump has not started. In this case there is probably an incorrect or missing wiring connection between water controllers or manual activation switch and the water heater or Smartstart unit. Check all wiring and connections between these items.

If the pump activates as required, shortly afterwards the water heater should turn on also. Wait two minutes. This will allow the water in the pipework to be warmed. If the water heater does not turn on re check electrical connections and installation.

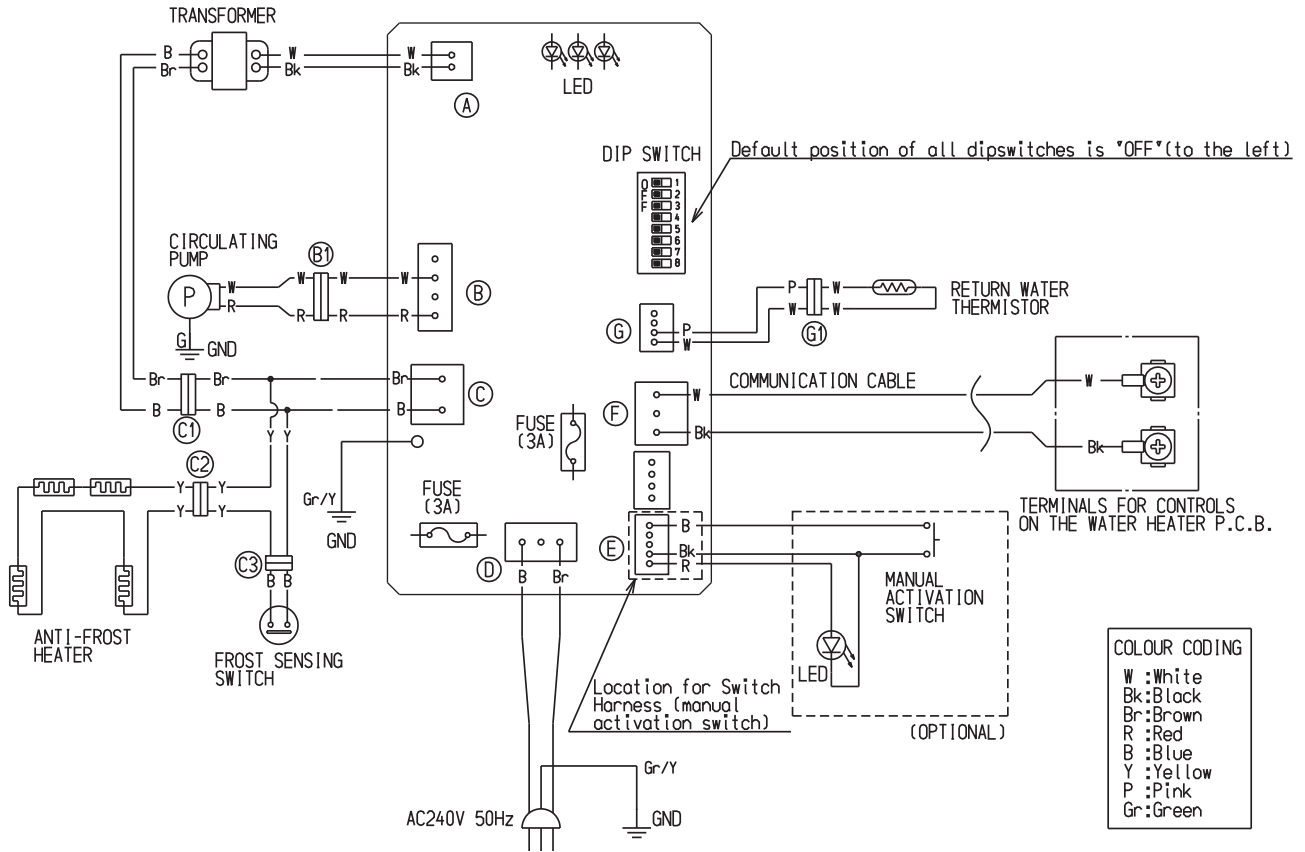
9. Open the heated water outlet furthest away from the water heater. The water should become warm in a matter of seconds.



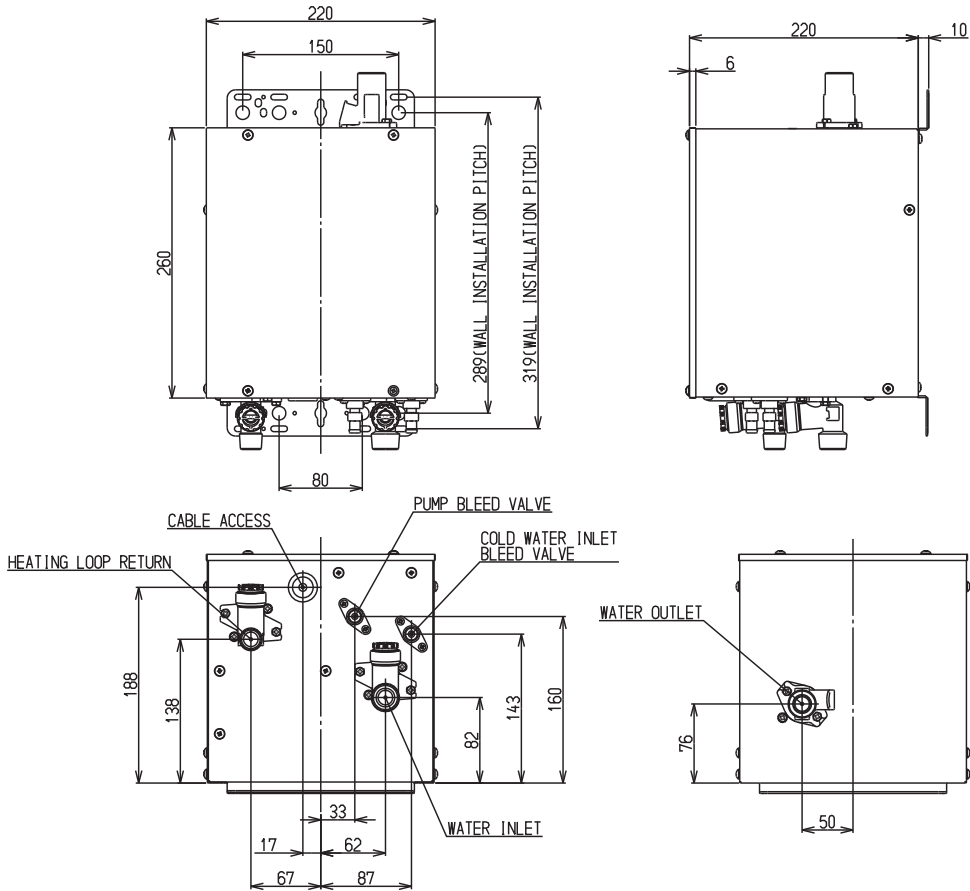
The waiting time for heated water delivery will vary depending on the size and layout of the branch line.

10. Inspect and clean the strainer located on the heating return loop inlet connection of the Smartstart module. This procedure may need to be repeated to ensure the strainer remains clear, especially on new installations.
11. Confirm the temperature delivered at the outlet with a suitable thermometer or digital temperature indicator. It should not exceed the temperature displayed on the water controller or the pre-set limit programmed into the printed circuit boards of either the Smartstart module or water heater.
12. After testing is completed, explain to the householder the functions and operation of the water heater, Water controller(s) and the Smartstart module. Explain to the householder that some temperature fluctuations may be experienced some of the time as a result of installing Smartstart.
13. Ensure the customer record section of the 'Operation / Installation manual' is filled in and that the booklet is handed to the customer.
14. The preheat function is cancelled 5 minutes after activation and the 'preheat' indicator will go out. This is to conserve energy. To reactivate, simply repeat steps 7-9 above.

CIRCUIT DIAGRAM



DIMENSIONAL DRAWINGS



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Rinnai

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

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

National Help Line

Tel: 1300 555 545*
Fax: 1300 555 655*

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

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