Owner's Guide

and

Installation Instructions

Rheem Guardian Warm Water

Install a Rheem

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

IMPORTANT

It is a requirement in NSW and may be a requirement in other states that the owner of a Warm Water system is to register the installation with the local council or regulatory authority.

Notice to Victorian Customers from the Victorian Plumbing Industry Commission.

This warm water unit must be installed by a licensed person as required by the Victorian Building Act 1993.

Only a licensed person will give you a Compliance Certificate, showing that the work complies with all the relevant Standards. Only a licensed person will have insurance protecting their workmanship for 6 years. Make sure you use a licensed person to install this water heater and ask for your Compliance Certificate.

PATENTS

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

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CONTENTS

RESPONSIBLE OFFICER - We recommend you read pages 4 - 10
The other pages are intended for the installer but may be of interest.

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ABOUT YOUR WARM WATER SYSTEM

WATER HEATER APPLICATION
This warm water system is designed for the purpose of providing potable water. Its use in an application other than this may shorten its life.

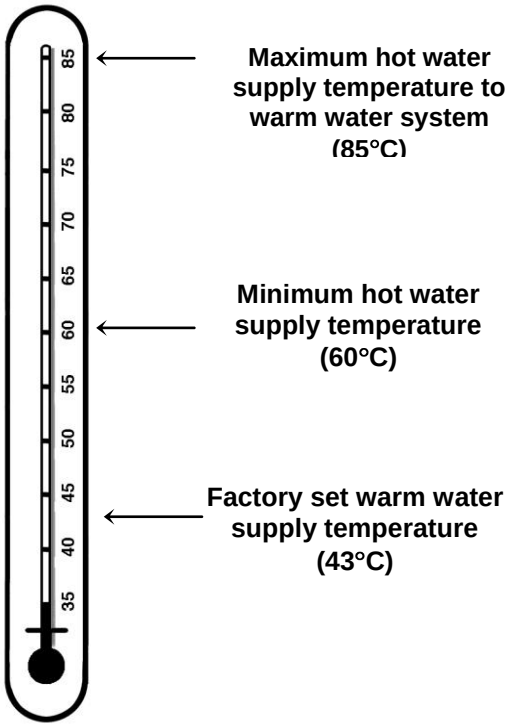
MODEL TYPE
Congratulations for choosing Rheem Guardian Warm Water. The model you have chosen will be either an 80, 160 or 240 litre/min model. Warm water is produced by blending hot water from separate water heating plant, with cold water by means of thermostatic mixing valve(s). The warm water unit can be installed either indoor or outdoor. The system is supplied in a tamperproof cabinet. A UV disinfection unit is supplied with the warm water system and forms part of a maintenance regime to safeguard against Legionella.

MAINS PRESSURE
Rheem Guardian is designed to operate at mains pressure by connecting directly to the mains water supply. The cold and hot water supply to the unit is taken from the same source and the pressures should be nominally balanced. If the mains supply pressure in your area exceeds that shown on page 11, a pressure limiting valve must be fitted. The supply pressure should be greater than 500 kPa for true mains pressure operation to be achieved.

HOW HOT SHOULD THE WATER BE?
The water temperature should be set in accordance with local authority requirements for the intended application.

The system is factory set at 43°C. Following commissioning, the system can be set to operate within the temperature limits as shown on page 7 under normal operating conditions.
Normal Operating Conditions are considered as:
- inlet pressures nominally balanced to within 10% of each other during flow.
- a differential of approximately 50°C between the hot and cold inlet temperatures, and with differentials of 15-35°C between the blend setting and either supply.
- installation and usage environment not subject to extremes of temperature, unauthorised tampering or willful abuse.

To meet the requirements of the National Plumbing Standard the temperature of stored hot water must not be below 60°C.



TEMPERATURE ADJUSTMENT
The warm water system features tradesperson adjustable thermostats. They require a licensed tradesperson to make any temperature adjustments. We advise the thermostats are adjusted to the lowest temperature setting that meets your needs, especially if there are young children or elderly people in the premises.

The Rheem warranty may not cover faults if relief valves or other safety devices are tampered with or if the installation is not in accordance with these instructions.

PRECAUTIONS
Where damage to property can occur in the event of the water heater leaking, the water heater must be installed in a safe tray. Construction, installation and draining of a safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements.

If this warm water system is to be used where an uninterrupted warm water supply is necessary for your application or business you should ensure that you have back up redundancy within the hot water system design. This should ensure the continuity of warm water system in the event that this warm water system were to become inoperable for any reason. We recommend you seek advice from your plumber or specifier about your needs and building back up redundancy into your warm water system.

ABOUT YOUR WARM WATER SYSTEM

SAFETY WARNING
The function of this warm water system is to deliver water consistently at a safe temperature. This requires that:
1. This product is used within the specification limits given in this Owners Guide.
2. It is installed, commissioned, operated and maintained in accordance with the recommendations given in this Owners Guide.
Note: Recommended maintenance guidelines are given in the **MAINTENANCE** section on page 24.

Ultimately, the user or attendant must exercise due diligence to ensure that the delivery of warm water is at a stable, safe temperature. This is particularly important in such healthcare procedures as supervised bathing of patients unable to respond immediately to unsafe temperatures.

MAINTENANCE ADVICE
Provided that the warm water system is installed, commissioned and maintained according to this Owners Guide, the risk of malfunction, if not eliminated, is considerably reduced.

Malfunction of thermostatic mixing valves is almost always progressive in nature and may be detected by the use of proper temperature checking and maintenance routines.

Note: Certain types of system design can result in the warm water system having excessive 'dead-legs' of pipe work. Others allow an auxiliary cold water supply to be added to the mixed water from the main plant. Such systems can disguise the onset of thermostatic mixing valve malfunction.

HOW DO I KNOW IF THE WARM WATER SYSTEM IS INSTALLED CORRECTLY?
Installation requirements are shown on pages 10 to 16. The warm water system must be installed:

- by a qualified person, and
- in accordance the installation instructions, and
- in compliance with Standards AS/NZS 3500.4, AS/NZS 3000 and all local codes and regulatory authority requirements.

In New Zealand the installation must also conform with the New Zealand Building Code.

VICTORIAN CUSTOMERS
Notice to Victorian Customers from the Victorian Plumbing Industry Commission. This water heater must be installed by a licensed person as required by the Victorian Building Act 1993.

Only a licensed person will give you a Compliance Certificate, showing that the work complies with all the relevant Standards. Only a licensed person will have insurance protecting their workmanship for 6 years. Make sure you use a licensed person to install this water heater and ask for your Compliance Certificate.

DOES WATER CHEMISTRY AFFECT THE WARM WATER SYSTEM?
The warm water system is suitable for most public water supplies, however some chemistries may have detrimental effects on the warm water system, its components and fittings.

If you are in a known harsh water area or you are not sure, have your water quality checked against the conditions described on page 29.

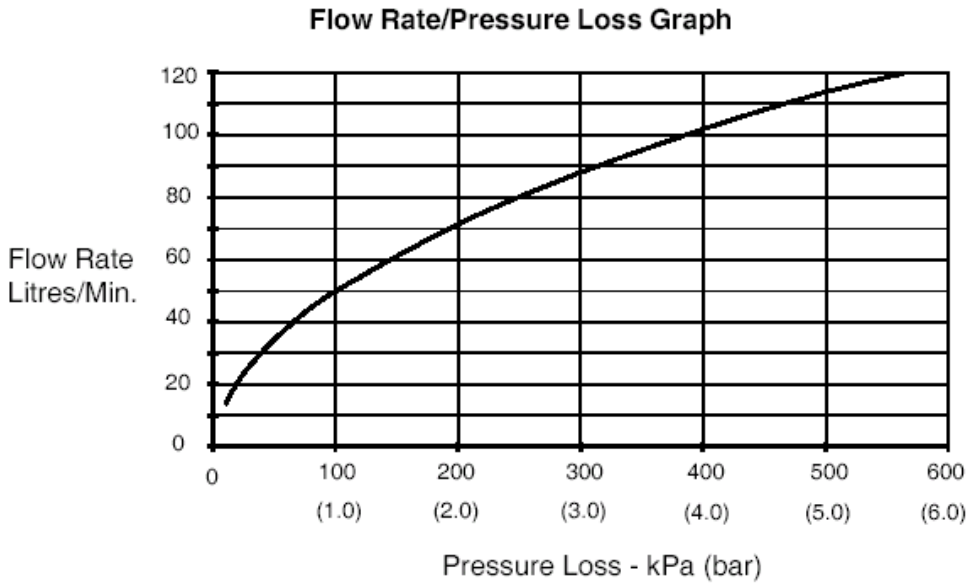
HOW LONG WILL THE WARM WATER SYSTEM LAST?
The water heater is supported by a manufacturer's warranty (refer to page 31).There are a number of factors that will affect the length of service the warm water system will provide. These include but are not limited to the water chemistry, the water pressure, the water temperature (inlet and outlet), the water usage pattern and the quality of maintenance. Refer to "Precautions" on page 4.

Note: Critical components within the system require periodic replacement (see MAINTENANCE on page 24)

OPERATING PARAMETERS

PESSURES AND FLOW RATES
For optimum performance, supply pressures should be nominally equal under flow conditions.
Recommended Minimum Supply Pressure: 500 kPa
Recommended Minimum Flow Rate at mid-blend with equal supply pressures (see table below)
Nominal Flow Rate at mid-blend for a maximum pressure loss of 250 kPa (see table below)
Maximum Supply Pressure: **1000 kPa**

Model	940 080	940 160	940 240
Minimum Flow Rate (L/min)	8	16	24
Nominal Flow Rate (L/min)	80	160	240



Note: the above pressure/flow graph relates to a single valve unit. For multiple valve units, multiply the flow rate on the vertical axis by the number of valves to give the total system flow at a given pressure loss.

TEMPERATURES
Hot Water Supply Maximum: 85°C.
Hot Water Supply Minimum: Blend water temperature plus 15°C.
Cold Water Supply Maximum: Blend water temperature less 15°C.
Cold Water supply Minimum: 1°C
Thermostatic Control Range: approximately 25-60°C.
Optimum Thermostatic Control Range: 35 - 46 °

WATER SUPPLIES

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

This warm water system is manufactured to suit the water conditions of most public reticulated water supplies. However, there are some known water chemistries which can have detrimental effects on the warm water system and its operation and / or life expectancy. If you are unsure of your water chemistry, you may be able to obtain information from your local water supply authority. This warm water system should only be connected to a water supply which complies with these guidelines for the Rheem warranty to apply.

Note: Some water analysis reports may state the conductivity of the water rather than the level of total dissolved solids. Conductivity, measured in microsiemens per centimetre (μS / cm), is directly proportional to the TDS content of the water. TDS, in mg / L, is approximately 70% of the conductivity in μS / cm.

CHLORIDE AND PH

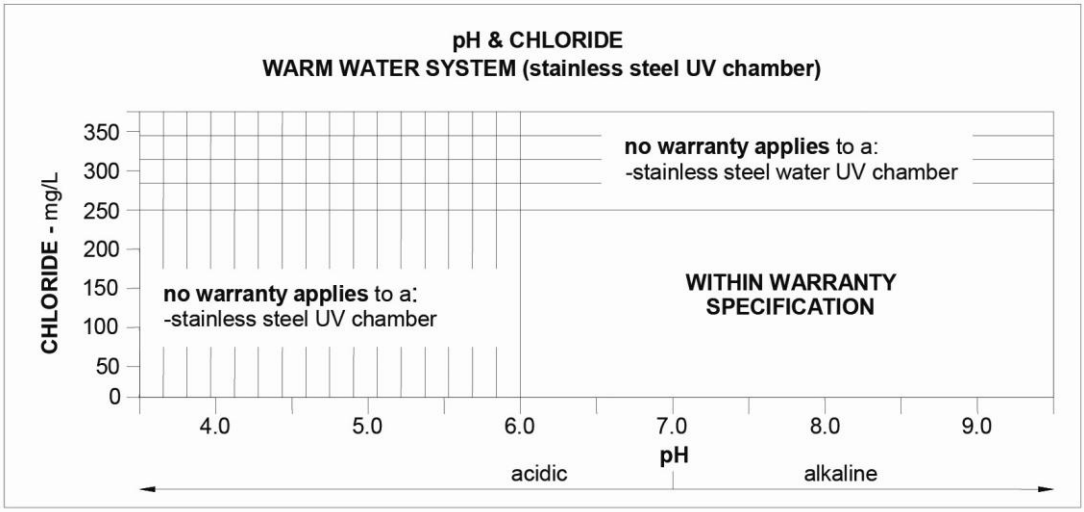
In a high chloride water supply, the water can corrode stainless steel parts and cause them to fail.

Where the chloride level exceeds 250 mg/L the Rheem warranty does not apply to the stainless steel UV chamber in the ultra violet disinfection system

pH is a measure of whether the water is alkaline or acid. In an acidic water supply, the water can attack stainless steel parts and cause them to fail.

Where the pH is less than 6.0 the Rheem warranty does not apply to the stainless steel UV chamber in the ultra violet disinfection system.

Water with a pH less than 6.0 may be treated to raise the pH. The water supply from a rainwater tank in a metropolitan area is likely to be corrosive due to the dissolution of atmospheric contaminants. This may result in pH of less than 6.0. It is recommended an analysis on the water from a rainwater tank be conducted prior to connecting this type of water supply to a system employing a stainless steel ultra violet disinfection system.



WATER SUPPLIES

SATURATION INDEX

The saturation index is used as a measure of the water's corrosive or scaling properties.

In a corrosive water supply, the water can attack copper parts and cause them to fail.

Where the saturation index is less than –1.0, the water is very corrosive and the Rheem warranty does not apply to a Guardian Warm Water system.

In a scaling water supply calcium carbonate is deposited out of the water onto any hot metallic surface.

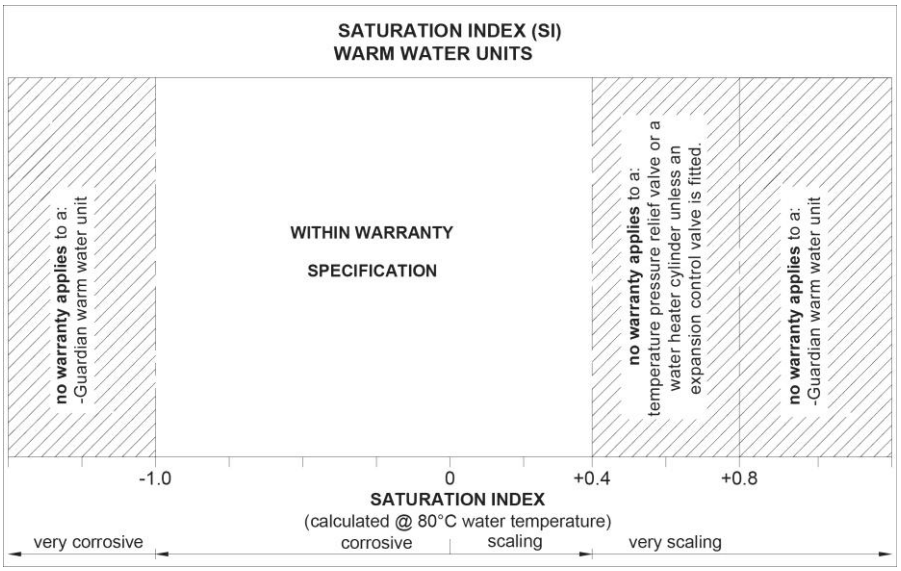
Where the saturation index exceeds +0.40, the water is very scaling. An expansion control valve must be fitted on the cold water line after the non-return valve to protect and for the Rheem warranty to apply to the temperature pressure relief valve and cylinder of the water heater connected to the warm water system.

Where the saturation index exceeds +0.80, the Rheem warranty does not apply to a Guardian Warm Water system.

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

Contact Rheem Service or their nearest Accredited Service Agent if a replacement warm water system is required.

Refer to the Saturation Index chart on page 8**Error! Bookmark not defined.**.



WATER SUPPLIES

CHANGE OF WATER SUPPLY

The changing or alternating from one water supply to another can have a detrimental effect on the operation and / or life expectation of the warm water system.

Where there is a changeover from one water supply to another, e.g. a rainwater tank supply, bore water supply, desalinated water supply, public reticulated water supply or water brought in from another supply, then water chemistry information should be sought from the supplier or it should be tested to ensure the water supply meets the requirements given in these guidelines for warranty to apply.

SUMMARY OF WATER CHEMISTRY ADVICE AFFECTING WARRANTY

The Rheem warranty of this warm water system does not apply on the components listed below if the warm unit is connected at any time to a water supply with water chemistry of:

Water Chemistry	**Component**
Chloride > 250 mg/L	Stainless steel UV chamber
pH < 6.0	Stainless steel UV chamber
Saturation Index (SI) < -1.0	copper components
Saturation Index (SI) > +0.4 (if expansion control valve is not fitted)	water heater cylinder temperature pressure relief valve
Saturation Index (SI) > +0.8	Warm water system

SAVE A SERVICE CALL

Check the items below before making a service call. You will be charged for attending to any condition or fault that is not related to manufacture or failure of a part.

INSUFFICIENT WARM WATER TEMPERATURE

- **Are you using more water than you think?**
  Are outlets (showers, kitchen, laundry) using more hot / warm water than you think? Very often it is not realised the amount of hot water used, particularly when showering. Carefully review the hot water usage. Have your plumber fit a flow control valve to each shower outlet to reduce water usage.

- **Temperature pressure relief valve running**
  Is the relief valve on the water heating plant discharging too much water? (Refer to water heating plant owners manual)

- **Warm water plant set temperature**
  Has the temperature setting of the warm water plant been checked?

- **System heat losses**
  Is the warm water circulating pump operating at the recommended flow rate? Have you checked the heat loss in the system? As warm water is supplied at or near user temperatures, heat loss reduction is a critical factor in ensuring suitable temperatures are delivered at the taps.

- **Water heating plant thermostat setting**
  Ensure the thermostat setting of the water heating plant is appropriate. You may choose to have the thermostats adjusted upwards to gain additional hot water capacity.

- **Water heater size**
  Do you have the correct size water heating plant for your requirements? The sizing guide in the Rheem sales literature and on the Rheem website (www.rheem.com.au) suggests average sizes that may be needed. Alternatively, the Free Rheem Technical Advisory Service can provide guidance.
  Check line strainers and hot and cold lines are not blocked.

NO WARM WATER FLOWING FROM TAPS

This may indicate the system has shut down due to loss of hot or cold water supply. Check hot and cold water supplies are available to the warm water system.

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

INSTALLATION

THIS WATER HEATER IS NOT SUITABLE FOR POOL HEATING

INSTALLATION STANDARDS
The warm water system must be installed:

- by a qualified person, and
- in accordance the installation instructions, and
- in compliance with Standards AS/NZS 3500.4, AS/NZS 3000 and all local codes and regulatory authority requirements.

In New Zealand the installation must also conform with the New Zealand Building Code.

All packaging materials must be removed from the warm water unit and UV unit prior to their installation.

WARM WATER UNIT APPLICATION
This warm water system is designed for the purpose of providing potable water. Its use in an application other than this may shorten its life.

If this warm water system is to be used where an uninterrupted warm water supply is necessary for your application or business you should ensure that you have back up redundancy within the warm water system design. This should ensure the continuity of warm water system in the event that this warm water system were to become inoperable for any reason. We recommend you seek advice from your plumber or specifier about your needs and building back up redundancy into your warm water system.

LOCATION
The warm water unit is suitable for both indoor and outdoor installation. The warm water unit should be installed in close proximity to the water heating plant. The location should be chosen with safety and service in mind. The cold water supply to the warm water unit and to the water heating plant MUST be supplied from the same source for the correct operation of system recirculation. This will also help ensure balanced inlet pressures to the warm water unit.

Clearance must be allowed for servicing of the thermostatic mixing valves. The unit must be secured to a solid wall using the brackets supplied and be accessible without the use of a ladder or scaffold.
Note: The UV disinfection system requires specific minimum clearance for servicing (refer to UV instructions for details).

It is recommended the warm water unit be installed at ground or floor level. Remember all local authorities have regulations about putting plumbing equipment into roof spaces.

SAFE TRAY
Where damage to property can occur in the event of the warm water system leaking, the warm water system must be installed over a safe tray. Construction, installation and draining of a safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements. AS/NZS 3500.4 also has particular requirements when a safe tray must be installed.

WARM WATER UNIT INSTALLATION
Plan the installation layout of the warm water unit in relation to the water heating plant and UV disinfection, prior to securing to the wall (refer to warm water unit dimension drawing on page 13.

Using one of the supplied brackets as a template, mark and drill mounting holes at the correct height for the top bracket. Insert suitable anchors and secure the top bracket to the wall.

Note: the mass of the warm water unit may dictate additional lifting equipment be used when mounting the unit on the wall.

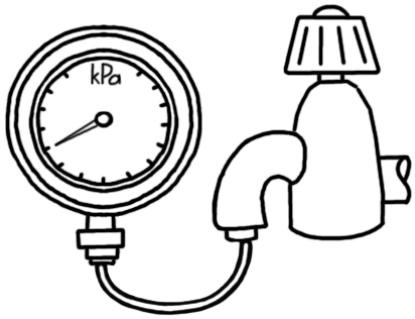
Hang the warm water unit from the top bracket. Secure the bottom of the warm water unit to the wall using the remaining bracket with suitable anchors.

INSTALLATION

MAINS WATER SUPPLY

Where the mains water supply pressure exceeds that shown in the table below, an approved pressure limiting valve is required and should be fitted as shown in the installation diagram (refer to installation diagram on page 17).

Warm water maximum pressure	1000kPa
Warm water maximum supply pressure	800kPa
When installed with Rheem and Raypak commercial water heaters, further pressure limitations may apply:	
Water heater relief valve setting	1000kPa
Expansion control valve setting*	850kPa
Max. mains supply pressure	
Without expansion control valve	800kPa
With expansion control valve	680kPa



* Expansion control valve not supplied with system

TANK WATER SUPPLY

This warm water system is not suitable for use on gravity fed tank supply systems. If a tank supply is used, a booster pump must be installed to supply cold water to the water heating plant and warm water unit.

REDUCING HEAT LOSSES & PIPE SIZING

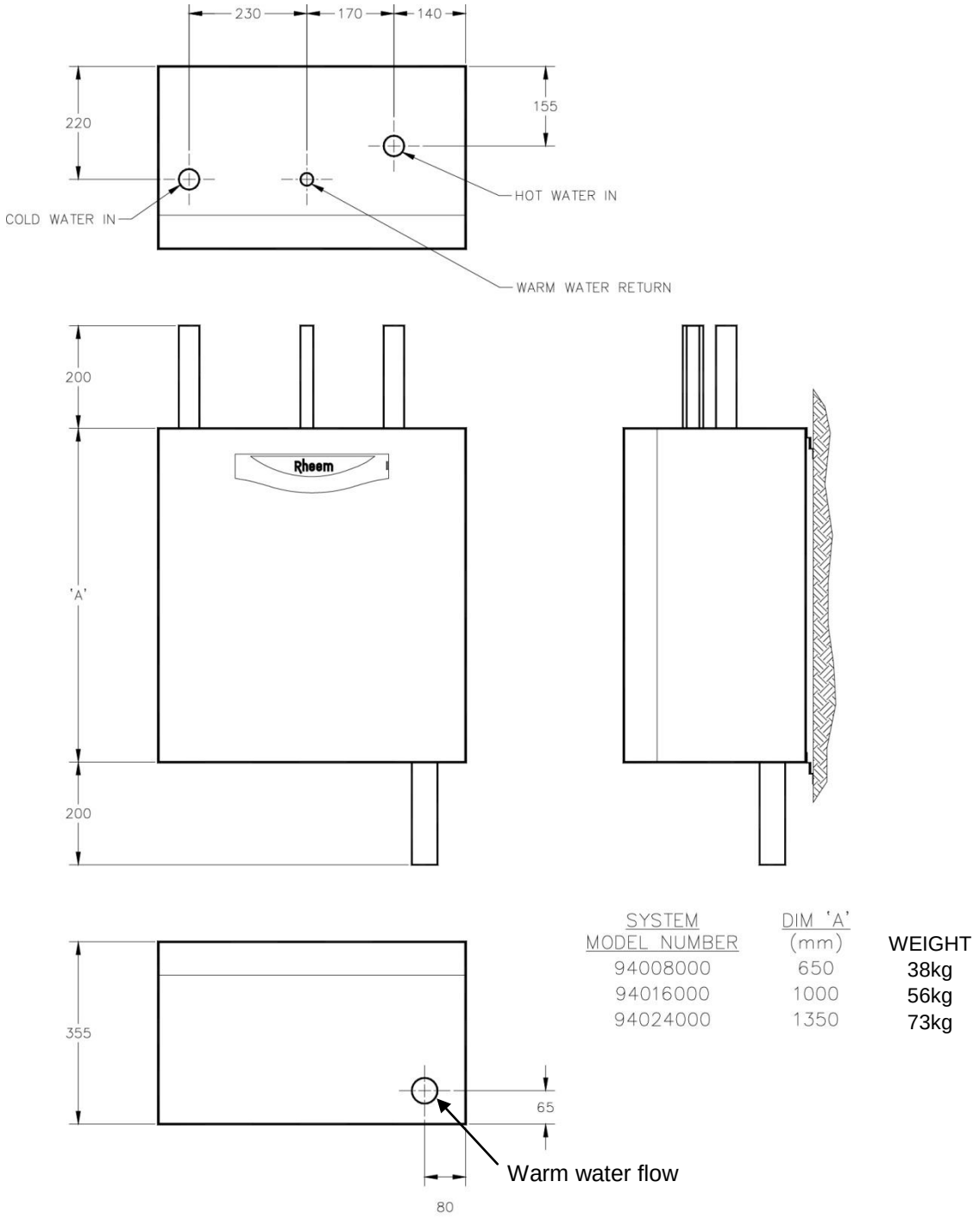
Maintaining the required temperature at the point of use is critical to the performance of a warm water system. Sizing of pipes and specification of insulation and circulator must be carried out by persons competent to do so.

All plumbing lines downstream of the non-return valve on the cold water supply to the system must be insulated in accordance with the requirements of AS/NZS 3500.4. Reference to local regulatory authority requirements must be made.

PLUMBING CONNECTIONS

The cold water supply to the warm water unit and to the water heating plant MUST be supplied from the same source for the correct operation of system recirculation. This will also help ensure balanced inlet pressures to the warm water unit (refer to drawings on pages 13 to 16.

INSTALLATION

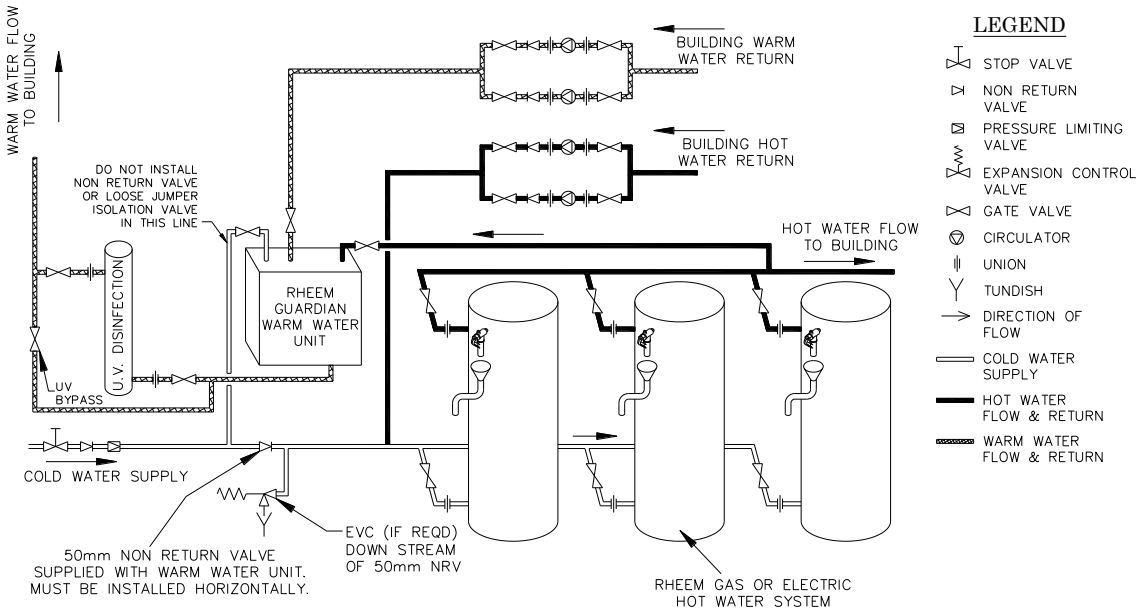


SYSTEM MODEL NUMBER	DIM 'A' (mm)	WEIGHT
94008000	650	38kg
94016000	1000	56kg
94024000	1350	73kg

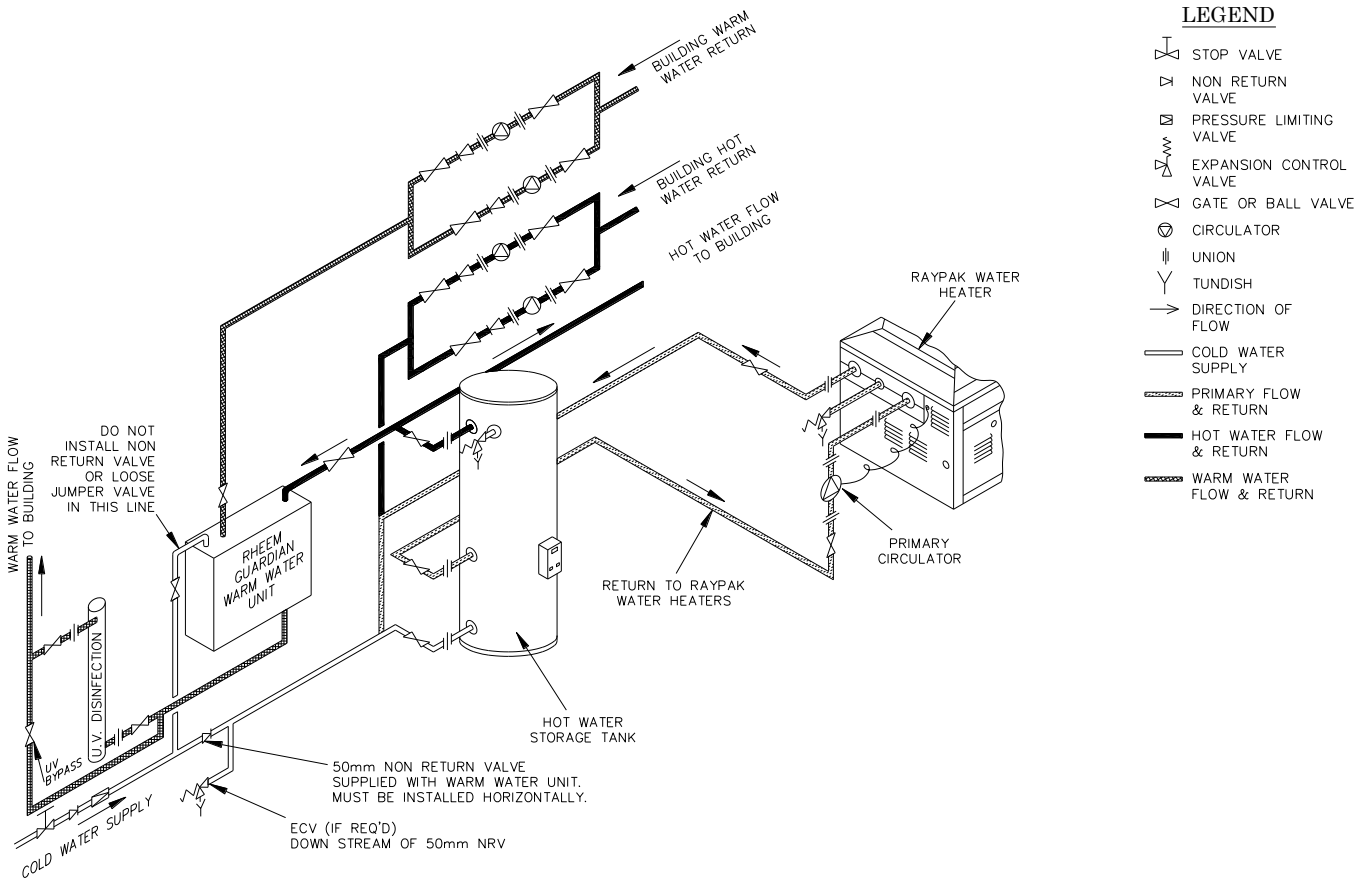
ALL DIMENSIONS IN MILLIMETRES

WARM WATER UNIT DIMENSIONS

INSTALLATION

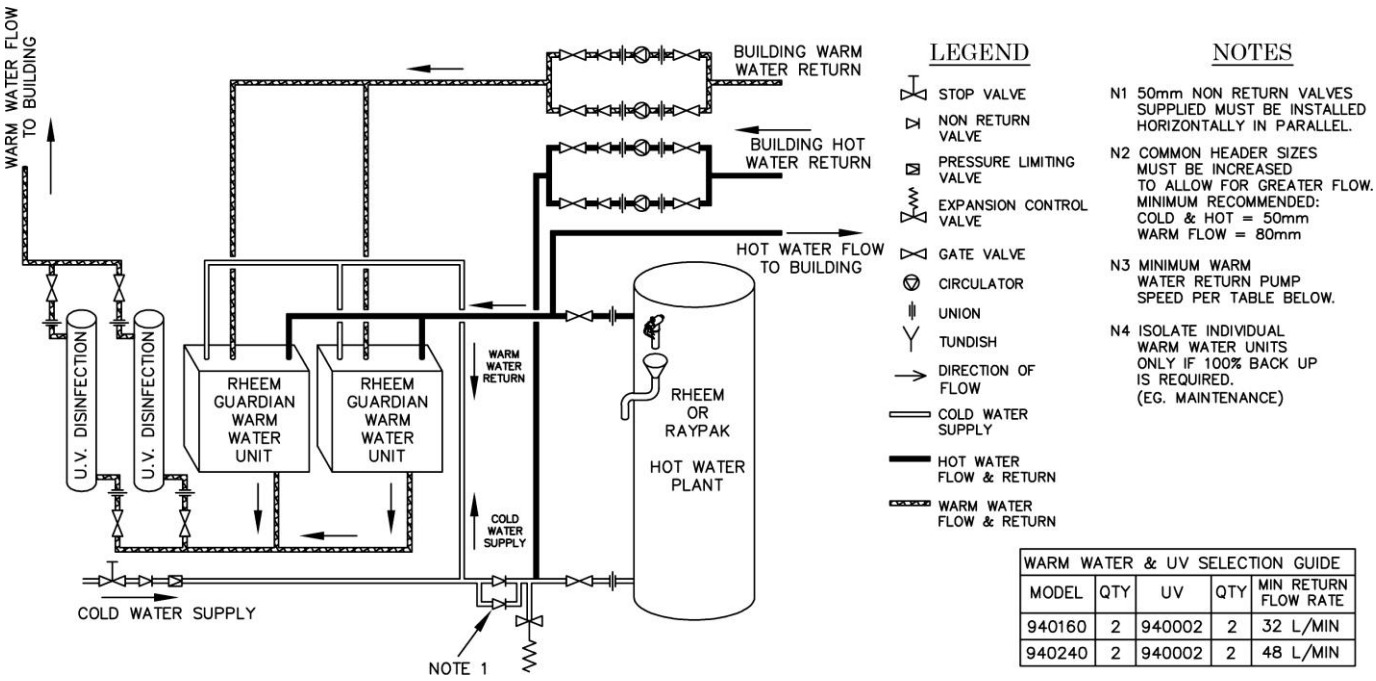


TYPICAL INSTALLATION WARM WATER WITH RHEEM COMMERCIAL WATER HEATERS



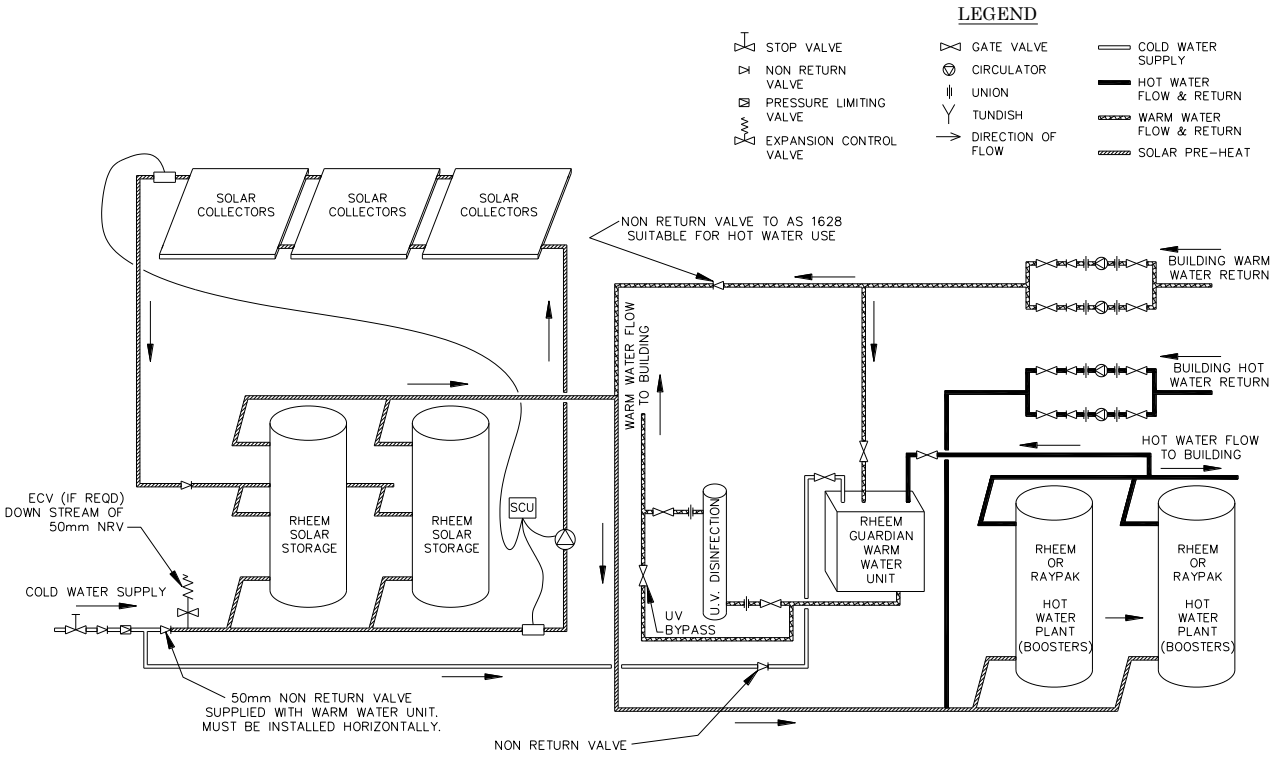
TYPICAL INSTALLATION WARM WATER WITH RAYPAK COMMERCIALWATER HEATERS

INSTALLATION



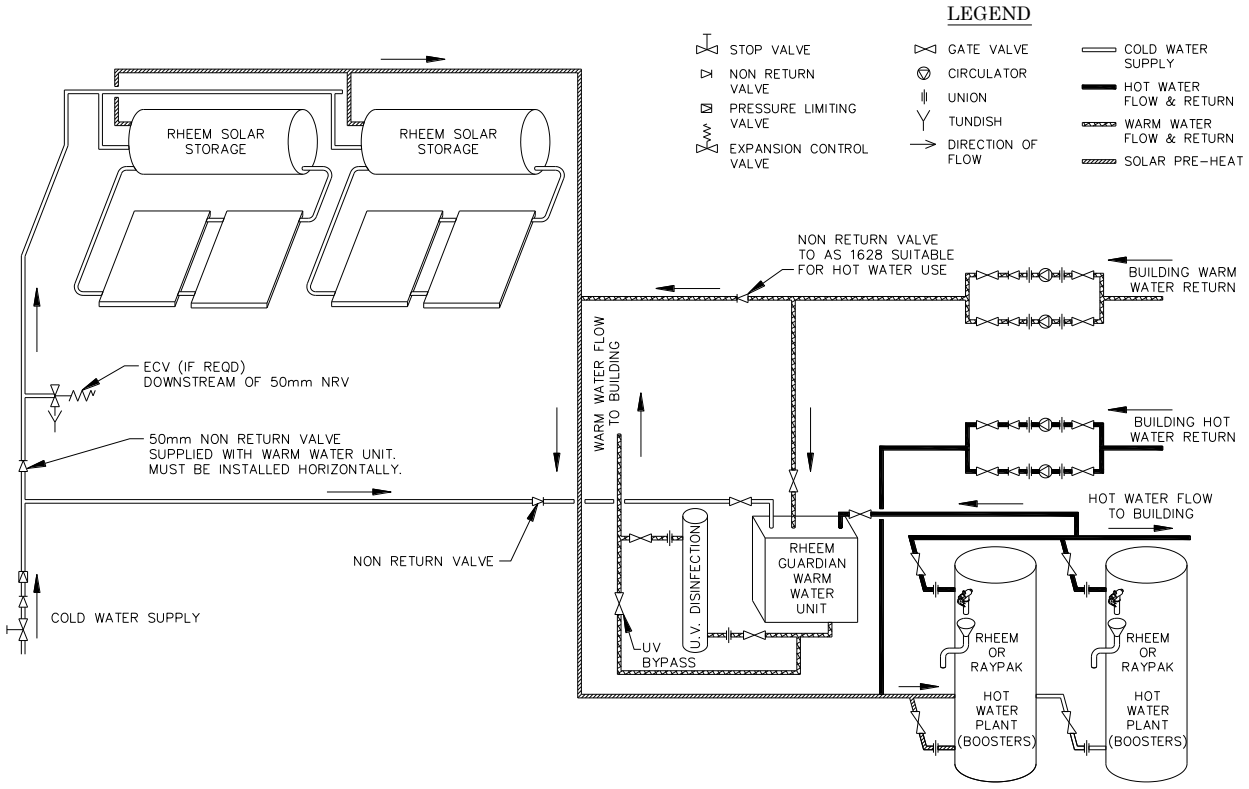
WARM WATER & UV SELECTION GUIDE				
MODEL	QTY	UV	QTY	MIN RETURN FLOW RATE
940160	2	940002	2	32 L/MIN
940240	2	940002	2	48 L/MIN

TYPICAL INSTALLATION MANIFOLDED WARM WATER UNITS

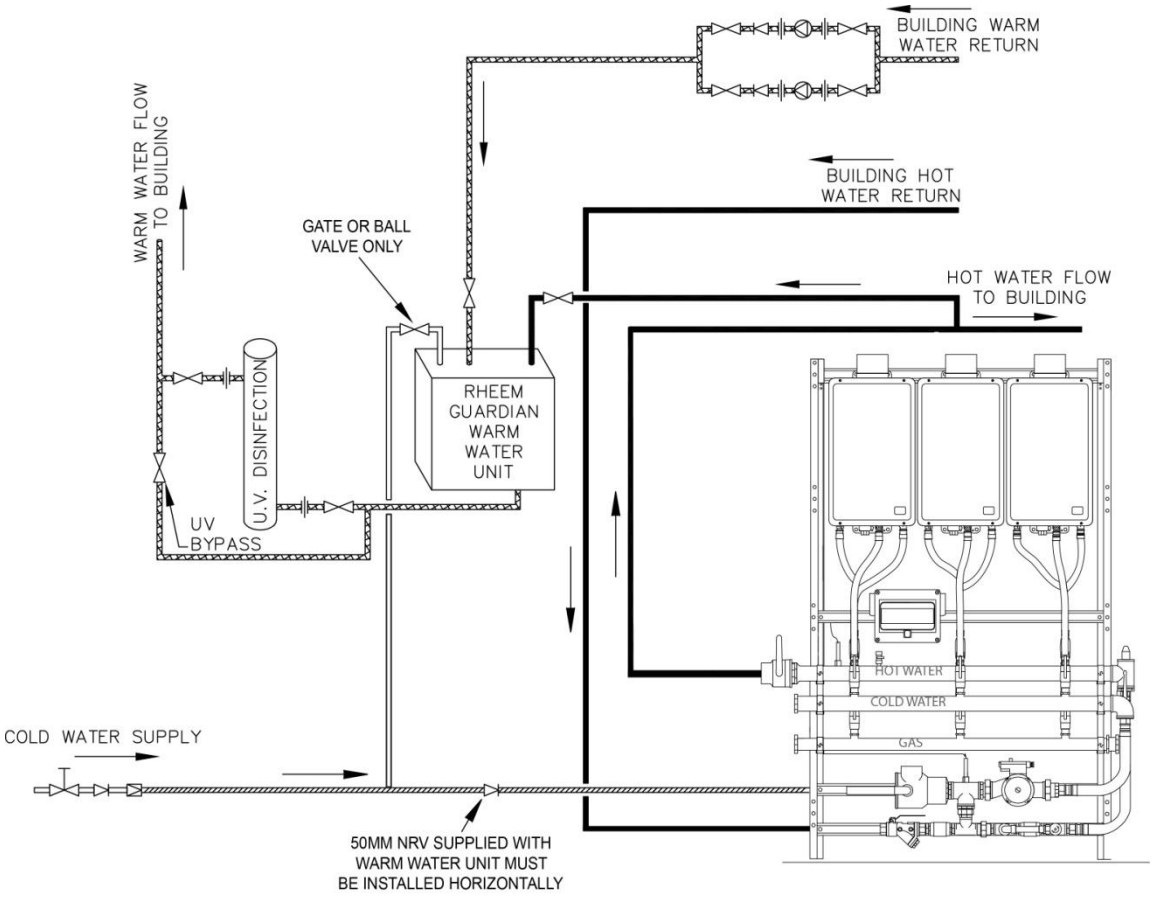


TYPICAL INSTALLATION WARM WATER WITH LOLINE SOLAR PRE-HEAT

INSTALLATION



TYPICAL INSTALLATION WARM WATER WITH HILINE SOLAR PRE-HEAT



TYPICAL INSTALLATION WARM WATER WITH COMMPAK

INSTALLATION

CONNECTION SIZES

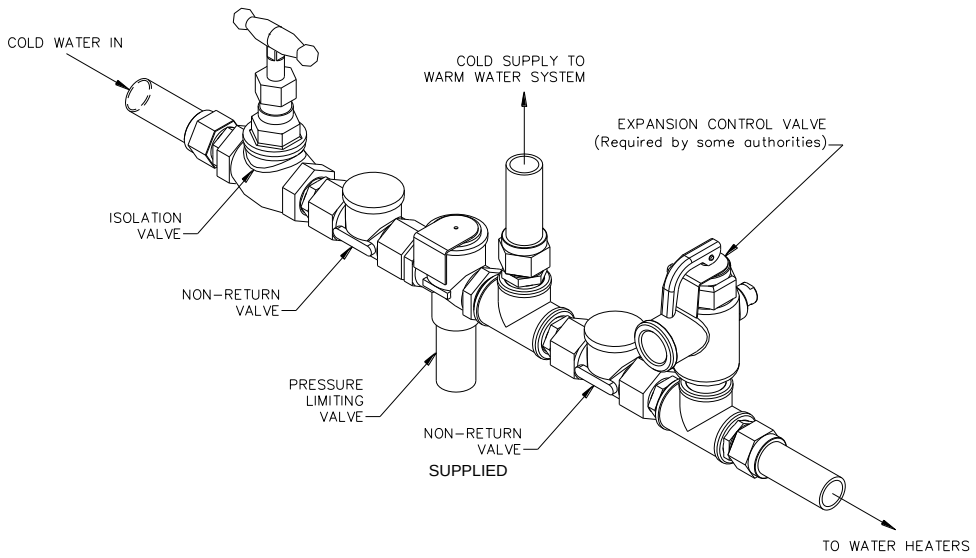
- Cold water connection: DN 40 copper
- Hot water connection: DN 40 copper
- Warm water flow connection: DN 50 copper
- Warm water return connection: DN 25 copper
- UV inlet and outlet connections: 2” BSP male

COLD WATER CONNECTION DETAIL

The main cold water supply is fed to the cold water inlet of both the water heating plant and the warm water unit. Refer to the cold water connection details below. The cold water supply to the warm water unit is branched from the main cold supply after the main isolating valve, non-return valve and pressure limiting valve (if required).

A DN 50 check valve suitable for use with hot water is supplied with the warm water unit. This is to be fitted horizontally in the cold water line, after the cold water supply take-off to the warm water unit, and before any expansion control valve (if fitted). If a HOT water return line is fitted it must enter between the DN 50 check valve and the cold water inlet to the water heating plant. The pipe work must be cleared of foreign matter before connection.

Where solar preheat forms a part of the system particular attention needs to be given to the cold water supply and warm water return lines to the warm water unit. Refer to the diagrams on pages 15 and 16



COLD WATER CONNECTION DETAILS

INLET CONNECTIONS

Connections can be made directly to the warm water unit without the need for disconnection unions.
Note: It is recommended to install a full-flow gate or ball valve in the cold and hot water lines to the warm water unit to facilitate cleaning of the line strainers.

IMPORTANT:A ‘loose jumper’ type isolating valve MUST NOT be installed in the cold water supply line to the warm water unit. This line is utilised to divert part of the building warm water return back to the main water heating plant for re-heating. A loose jumper can act as a non return valve which will interfere with the correct operation of this function

Connect the cold supply to the pipe marked COLD on the warm water unit. Connect the hot water line from the water heating plant to the pipe marked HOT on the warm water unit.

INSTALLATION

UV CHAMBER
Depending on the model, a total minimum dimension of 2,000mm or 2,600mm is required for the installation of the UV system to facilitate installation and removal of the UV lamp and quartz thimble. (refer to UV Owners Guide and Installation Instructions).

The UV system power box must be installed within 1.5 m of the UV chamber. The power box is supplied with a 1.5 metre power cord and requires a 240 V general power outlet (GPO) to be located within this distance.

The UV chamber may be installed in the vertical or horizontal orientation however not upside down, ie with the 25mm lamp opening facing downwards.

Noting the requirements for the positioning of the power box, select a suitable position for the UV chamber and then mark, drill and mount it on the wall.

OUTLET CONNECTIONS
Connect from the pipe marked WARM WATER on the bottom of the warm water unit to the inlet of the UV chamber with an isolation valve and disconnection union.

Note: It is recommended a tap be installed on a branch between the outlet of the warm water unit and the inlet of the UV chamber to facilitate local testing.

Fit a union and isolating valve to the outlet of the UV chamber and connect to the building warm water flow line.

Note: If a UV system is not a part of the installation, an isolating valve MUST be fitted before connecting to the building flow line.

WARM WATER BY-PASS
To facilitate continuing warm water supply whilst servicing the UV unit, a warm water by-pass should be installed prior to the isolating valve at the inlet and after the isolating valve at the outlet of the UV unit. It is recommended to remove the handle from the by-pass isolating valve and place it in the warm water cabinet during normal operation.

WARM WATER RETURN
Connect the building warm water return line via the circulator to the pipe marked WARM WATER RETURN on the warm water unit. The circulator must have isolating valves and disconnection unions fitted to facilitate isolation and removal.
Note: A non-return valve is fitted in the warm water return line within the warm water unit and an additional non-return valve is not required.

HOT WATER BY-PASS
In the interest of safety a hot water bypass between the water heaters and the warm water outlet should not be installed. The thermostatic mixing valves can be adjusted to supply high temperature water for sanitisation if required.

UV POWER BOX
The power supply to the UV unit must not be switched on until the system is filled with water.

REFER TO THE UV OWNERS GUIDE AND INSTALLATION INSTRUCTIONS FOR DETAILS ON INSTALLING THE UV POWER BOX.

INSTALLATION

TO FILL THE SYSTEM

To initially fill the system, follow the procedure below:

- Open all of the warm water taps in the building (don't forget the showers).
- Close the cold water isolation valve(s) at the inlet(s) to the thermostatic mixing valve(s) located inside the warm water unit.
- Progressively open the remaining isolation valves in the system including any isolation valves on the water heating plant and the circulator(s).
- Air will begin to be forced out of the taps. As water flows freely from each tap, close it.
- Open the cold water isolation valve(s) at the inlet(s) to the thermostatic mixing valve(s).
- Open the nearest warm water outlet, any remaining air will be forced out. Once water flows freely from the tap, close it.
- Check the pipe work for leaks.
- Open the TPR valve on each water heater or storage tank, in turn, to check that each is filled with water.
- Turn on the primary water heating plant.

IMPORTANT! TO ENSURE HOT WATER IS NOT SUPPLIED TO THE BUILDING PRIOR TO COMMISSIONING, CLOSE THE ISOLATING VALVE AT THE OUTLET OF THE UV CHAMBER.

COMMISSIONING

Commissioning must be carried out in accordance with these instructions, and must be conducted by qualified and competent personnel.

Rheem provides a comprehensive commissioning service, which may have been included with the purchase of the warm water system. Call the nearest Rheem Service Department to arrange for commissioning if required.
Note: if not included in the purchase price, a commissioning fee will be applicable.

CHECKLIST
Check the following items prior to commissioning the warm water system:

- The warm water unit is installed in accordance with these installation instructions.
- UV system is installed in accordance with the UV Owners Guide and Installation Instructions and the power is turned off.
- Water heating plant is installed and commissioned in accordance with the relevant instructions.
- Water supply lines have been flushed and cleaned.
- Line strainers have been cleaned
- Water in storage cylinders is hot (>60^{o}C).
- Valve on UV chamber outlet is open.

MAXIMUM TEMPERATURE
The maximum blend temperature obtainable by the user should be set in accordance with AS3500.4 and local regulations depending on the application.

The thermostatic mixing valves are fully performance tested individually and the maximum blend temperature is pre-set at the factory to approximately 43^{o}C under ideal installation conditions.

Site conditions, sanitising prior to commissioning or personal preference will mean the maximum blend temperature has to be re-set following installation.
Temperatures should always be recorded using a calibrated thermometer with suitable accuracy.

EXERCISING THE THERMOSTAT
Thermostatic mixing valves with wax thermostats are inclined to lose their responsiveness, if not used. Valves which have been in storage, installed but not commissioned, or simply not used for some time should be exercised before setting the blend temperature or carrying out any tests.

A simple way to provide this exercise is:

1. Ensure that the hot and cold water are available at the valve inlets, and a warm water outlet is open.
2. Remove the temperature knob and hub using the 3mm allen key supplied (refer to **Figure 1)**
3. Move the spindle by hand (do not use tools) rapidly to the clockwise limit, and pause.
4. Move the spindle rapidly to the anti-clockwise limit, and pause.
5. Repeat Steps 3 and 4 several times.
6. Repeat for each valve in the unit.
7. Close the warm water outlet.

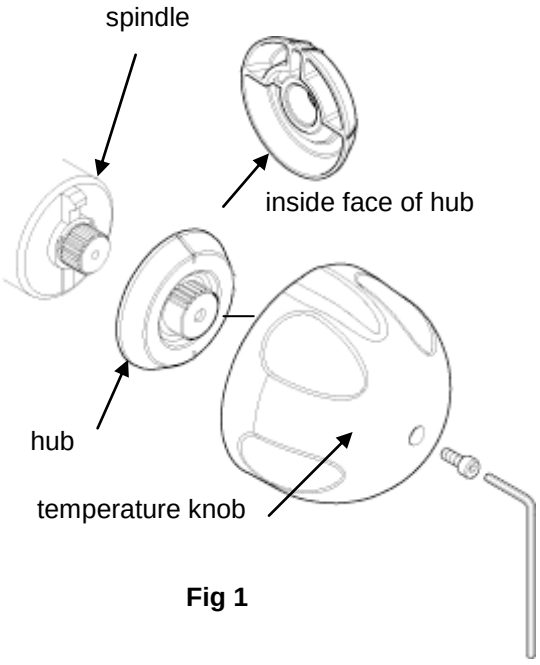


Fig 1

SANITISING THE SYSTEM
⚠ **DANGER! During the sanitising procedure, hot water at scalding temperatures will be delivered to the warm water outlets. Warm water outlets must not be used while sanitising is taking place, except as detailed in the procedure below.**

COMMISSIONING

- Switch on the electrical supply to the circulator(s).
- If necessary, remove the temperature knob and hub using the 3mm allen key supplied.
- Rotate the spindle(s) of the thermostatic mixing valve(s) fully anti-clockwise (ie full hot)
- Measure the temperature at the cold water inlet test point in the warm water unit.
- When the system has reached at least 60°C allow the water to circulate for at least 1 hour. During this period it is recommended the pipe work be checked again for leaks.

Note: if the system temperature fails to reach 60°C check the temperature setting of the water heating plant.

SETTING THE TEMPERATURE

For multiple valve systems, each valve should be set individually and then the whole system checked for overall performance.

Test points are provided for convenient temperature measurements.

1. Ensure the warm water return circulator is turned off and isolated during this procedure.
2. Open the cold and hot water isolating valves on the first mixing valve and isolate the second & third mixing valve, if applicable.
3. Remove the temperature knob using the 3 mm Allen key (supplied)
4. Pull off the hub (refer to Figure 1)
5. Open a warm water tap or the test/drain tap so that a flow rate in excess of 8 L/min is achieved.
6. Rotate the spindle until the required maximum blend temperature is obtained at the test point.

(CLOCKWISE = DECREASE TEMPERATURE, ANTICLOCKWISE = INCREASE TEMPERATURE)

When resistance is felt do not use force to turn any further, as this can damage the internal parts.

7. Once the desired maximum blend temperature is achieved, re-fit the hub without disturbing the spindle, positioning it so that the centre stop slot in the hub fits over the top of the cartridge stop (refer to **Figure 2**), preventing any further rotation in either direction. Check that the blend temperature has not altered.
8. Refit the temperature knob. Make sure that the indicator points to 6 o'clock.
9. Record the temperature measured at the test point in the Commissioning Log on page 23.
10. Isolate the first valve and repeat steps 2 to 9 for the second and third valves in turn.
11. When complete, open all mixing valves in the system. Open sufficient taps to at least exceed the minimum flow rate required for the system (refer pg 7) and check temperature at the test point on the warm water system, and the nearest warm water outlet in the building.

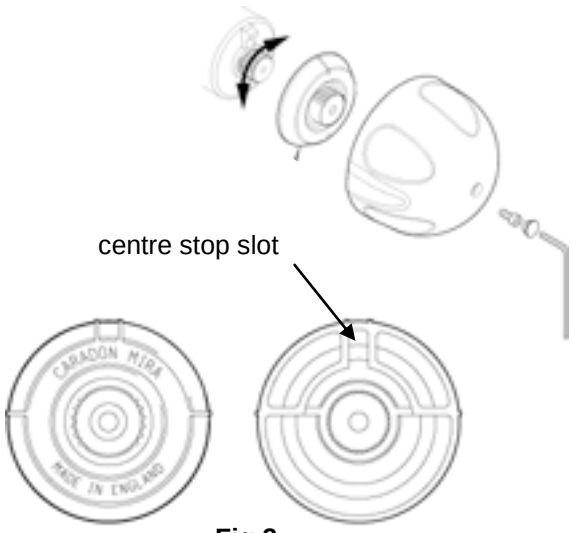


Fig 2

12. Open more taps in the building to create a high flow and check and record temperatures at the test point and nearest warm water outlet.

Note: depending on the layout of the establishment, it may be necessary to adjust the temperature leaving the warm water system to achieve the required temperature at the nearest outlet.

CHARGING THE SYSTEM

Turn on the warm water return circulator and set to the highest speed.

Water in the warm line will begin to return to the mixing plant. Monitor the return temperature. Rheem Guardian is capable of maintaining system temperature with a differential between outlet and return of 2°C. System design will dictate the actual differential achievable.

Note: if the system was filled with hot water for sanitising, the system may need to be flushed at the furthest outlet prior to turning on the pump, until all hot water is removed from the system.

COMMISSIONING

COLD WATER FAILURE TEST
Whilst the system is operating under high flow conditions, isolate the cold water to the thermostatic mixing valves.
The system will automatically shut down.
Record the maximum and stabilised temperature recorded at the test point and at the first outlet in the building.
Reinstate the cold water supply to the mixing valves.

UV DISINFECTION
Energise the UV system. Refer to the UV manual for commissioning details.

RECORDING
Record relevant system details in the Commissioning Log on pg. 23

COMMISSIONING

COMMISSIONING LOG

Rheem Guardian Warm Water

Model Number:_____

Serial Number: _____

Date of Manufacture:_____

Item	Result		Comments
Date Commissioned			
All lines flushed • With cold water • With hot water			
Line strainers cleaned			
Cold water: (5-25 °C) • Supply pressure • Temperature			
Hot water: (60-85 °C) • Supply pressure • Temperature			
Warm Water: • Valves exercised			
Test point temperature: • Valve 1 • Valve 2 • Valve 3 • Combined valves	**@ Full Flow**	**@ Min Flow**	
• Return temperature • Pump speed setting			
First outlet temperature			
Last outlet temperature			
Cold Water Failure Test • Max temp recorded • Stabilised temp	**Test Point**	**First Outlet**	
UV System operating			

Commissioned by (name): _____

Company Name: _____

Signature: _____

Date: _____

MAINTENANCE CHECK LOG – RHEEM GUARDIAN WARM WATER

MODEL NUMBER _____ **SERIAL NUMBER** _____

Signature								
Comments								
UV tube cleaned								
UV hours run								
Shut off test final								
Shut off test max								
Return test point temp								
Nearest outlet temp								
Valve 3 test point temp								
Valve 2 test point temp								
Valve 1 test point temp								
System test point temp								
Date								

WATER QUALITY TEST RESULT LOG – RHEEM GUARDIAN WARM WATER

Model Number _____ **Serial Number** _____

Date	Sample Point ID		Report No	Result	Report Filed	Signature
	Sample 1	Sample 2				

MAINTENANCE

IMPORTANT
It is a requirement in NSW and may be a requirement in other states that the owner of a Warm Water system is to register the installation with the local council or regulatory authority.

GENERAL
The maintenance of this product must be carried out in accordance with instructions given in this Owners Guide, and must be conducted by designated, qualified and competent personnel.

A table is provided in the Maintenance Log Sections on pg 24 and 25, which can be copied and used as a template for recording purposes.

Rheem Service provides a comprehensive maintenance program structured to meet the most stringent requirements to maintain the product at peak performance and monitor for the presence of Legionella. Contact your nearest Rheem Service Department or Accredited Service Agent to arrange a Service Contract inspection.

Rheem Guardian contains precision-engineered components and should give continued superior and safe performance, provided:
- It is installed, commissioned, operated and maintained in accordance with the recommendations stated in this Owners Guide.
- Periodic attention is given as necessary to maintain the product and its associated installation components in good functional order. Guidelines are given below:

In-service Tests - performed at 6-8 and 12-15 weeks after commissioning. These initial in-service tests determine the frequency of further testing.

Legionella Sampling – Unless prescribed by a regulating authority sampling at the following rates is recommended:
1st 3 months - 2 samples, once per month.
Month 6 – 2 samples
6 monthly there after – 2 samples
The above rates are applicable as long as legionella results are below prescribed limits

Monthly
- Temperature Tests – measure and record system temperatures. Also record any abnormal temperature occurrences as they are reported.

6 Monthly Check
- Check temperatures of system
- Check performance of non return valves
- Check and clean line strainers
- Check operation of UV, clean quartz tube if necessary

Annually
- As above and replace O-rings in UV
- Replace UV lamp

3 Years – (health applications) replace mixing valve cartridges (5 years other applications)

Planned Maintenance Programmes
(Preventative/Precautionary Maintenance)
The frequency and extent of attention required will vary according to prevailing site and operational conditions. In applications (such as non-healthcare) where the risks to the user are too slight to justify the full In-service Test Procedure and maintenance logging process, the procedure under Performance Check is suggested to cover average duty and site conditions. In all other cases it is recommended that a routine of preventative maintenance be employed which is based upon assessment of the risks to the user. The following practices are intended to support such a routine:
- In-service tests
- Regular temperature checking in between In-service tests
- Maintenance of a log of In-service tests and temperature checks together with details of cartridge replacements and any other service work.

MAINTENANCE

The mixing valve used in Rheem Guardian has functional parts contained within service-free cartridges (except the temperature or locking knob), so any maintenance requirement is reduced to temperature, performance and functional checks and inspection, with cartridge renewal when necessary. It is good policy to stock a spare cartridge so that no facility need be out of commission for more than the time it takes to exchange the cartridge.

Thermostatic mixing valves only operate correctly when all components have been serviced and have been tested for correct performance. If any component is faulty, including the thermostat, the valve will not operate correctly and could allow full hot water to pass through the valve.

As with all other thermostatic mixing valves, the critical sensing element in the Rheem Guardian mixing valve together with other critical components will exhibit wear over a period of time and usage. All of these parts are contained within the cartridge. The designed minimum service life of the cartridge is 5 years providing the appliance is operated within the recommended operating conditions and operating parameters. However when supply conditions and/or usage patterns do not conform to the recommended operating parameters and/or the recommended operating conditions the cartridge may need to be replaced more frequently ('recommended operating conditions' and 'recommended parameters' are defined on page 5 and 7 of this product manual under the headings of 'normal operating conditions' and 'operating parameters').

Important! In healthcare applications such as hospitals, aged person facilities, residential care homes, etc. and in any other applications where the user is similarly at risk, irrespective of supply and usage conditions or the evidence of in-service tests, the cartridge should be replaced at intervals of no more than 3 years.

Maintenance must be carried out in accordance with these instructions, and must be conducted by designated, qualified and competent personnel.
This mixing valve is designed for minimal maintenance under conditions of normal use.

External surfaces may be wiped clean with a soft cloth, and if necessary, a mild washing-up type detergent or soap solution can be used.
Warning! Many household and industrial cleaning products contain mild abrasives and chemical concentrates, and should not be used on polished, chromed or plastic surfaces.

Should an internal malfunction occur then this will probably require cartridge renewal. The cartridge assembly and check valves contain no user-serviceable parts, and must not be dismantled. Contact your nearest Rheem Rheem Service Department or Accredited Service Agent.

Lubricants
Important! All seals are pre-lubricated. If you need to lubricate the seals, use only a small amount of silicone-only based lubricants on this product. Do not use oil-based or other lubricant types as these may cause rapid deterioration of seals.

PERFORMANCE CHECK
Six Monthly
Exercising the Thermostat: If the valve has not been in regular or recent use, the thermostat should be exercised before any other checking.
Exercising of the thermostat can be achieved as described in **COMMISSIONING**.
CAUTION! It will be necessary to isolate the main flow line and return line prior to exercising the thermostat.

Blend Temperature: check for correct blend setting and/or maximum preset temperature. Reset as necessary. Record details in log as necessary.

Check and record warm water temperature regularly to confirm correct operating performance of the system. In health care applications such as hospitals, aged persons facility, nursing homes etc. Such checks must be made at least every month.

More regular temperature checks should be made where increased risks are perceived such as where patients are unable to immediately respond to an increase in water temperature by either shutting the water off or removing themselves from contact with the water. Records of warm water temperature checks should be included in a log book.

MAINTENANCE

Performance: check blend stability against known datum (e.g. commissioning check) for an induced pressure or flow change. Renew thermostatic cartridge when necessary.

Function: isolate warm water return, and check thermostatic mixing valve inlet pipe work temperature for correct function of check valves, and maintain/renew as necessary. Check and clean strainers as appropriate.
Lubricate accessible seals when necessary using silicone-only based lubricant.

IN-SERVICE TEST
The principal means for determining the continuing satisfactory performance of the mixing valve is the In-service test.
The In-service test procedure is shown on page 31. This should be carried out at both 6 to 8 weeks and 12 to 15 weeks after commissioning the valve. The results of these tests are used to determine when, after initial commissioning, the In-service test is next repeated.

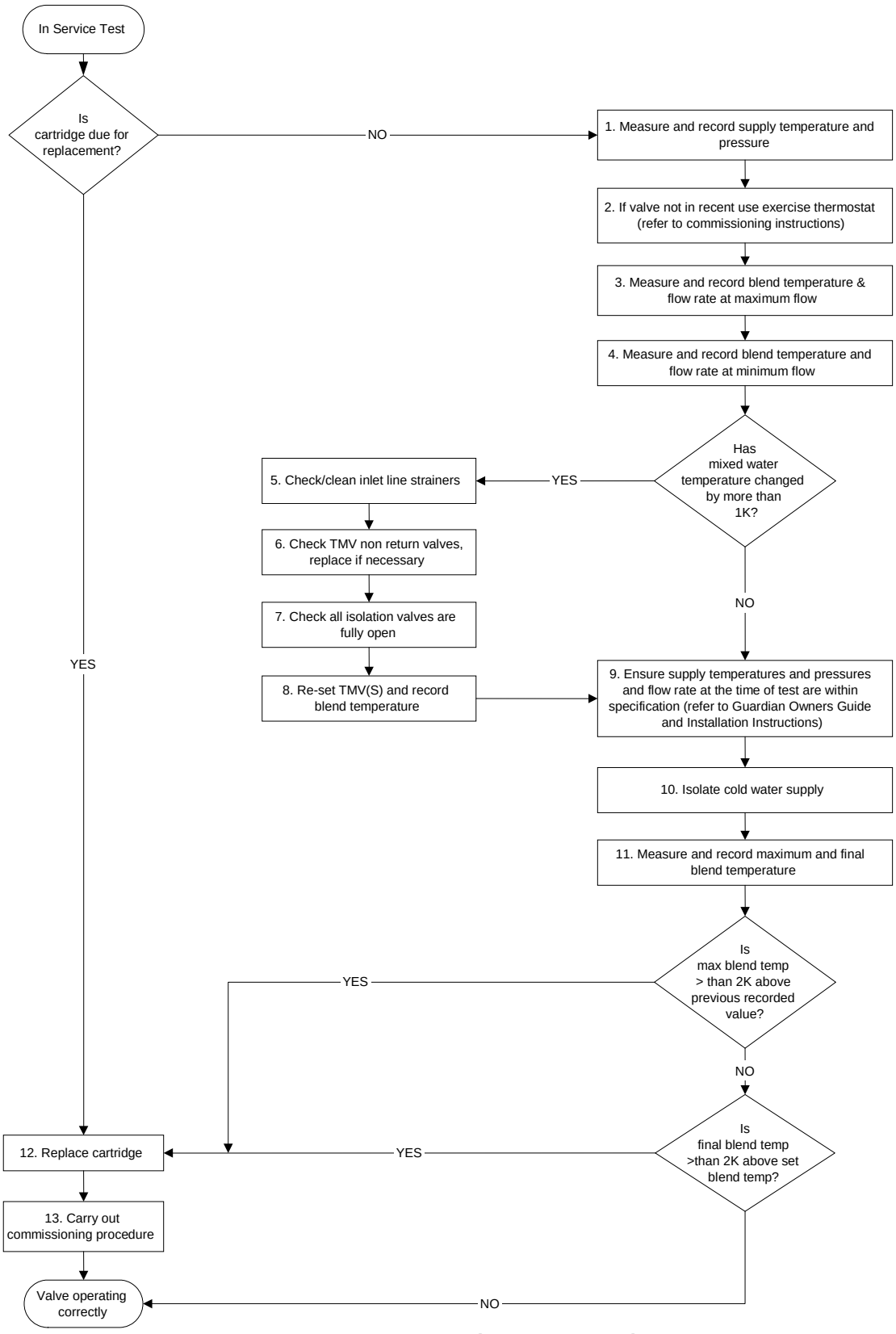
Whenever a cartridge is replaced, the In-service test should be repeated as if it was a new valve.

Note! In-service tests should be carried out with a frequency, which identifies a need for service work before an unsafe water temperature can result. The general principal to be observed after the first 2 or 3 in-service tests, is that intervals of future tests should be set to those which previous tests have shown can be achieved with no more than a small change in mixed water temperature. But in no case longer than 12 months.

Maintenance personnel should also ensure that the user's staff is aware of the importance of reporting temperature variations and that when detected, these should be recorded in the log.

It is recommended that the user maintains a log of the in-service tests described herein, together with a record of any service work carried out and the replacement of cartridges. It is also recommended that any maintenance personnel sign the user log in respect of the warm water system examined on each attendance at the user's premises. Refer to 'Maintenance Check Log' on page 24.

MAINTENANCE



In-service Test Procedure

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RHEEM WARM WATER WARRANTY - AUSTRALIA ONLY

WARM WATER MODELS 940080, 940160, 940240

1. THE RHEEM WARRANTY – GENERAL

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

1.2 Rheem offer a trained and qualified national service network who will repair or replace components at the address of the warm water unit subject to the terms of the Rheem warranty. Rheem Service, in addition can provide preventative maintenance and advice on the operation of your warm water unit. The Rheem Service contact number is available 7 days a week on 131031 with Service personnel available to take your call from 8am to 8pm daily (hours subject to change).

1.3 For details about this warranty, you can contact us on 131031 or by email at warrantyenquiry@rheem.com.au (not for service bookings).

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

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

2. TERMS OF THE RHEEM WARRANTY AND EXCLUSIONS TO IT

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

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

2.3 Where a failed component is replaced under this warranty, the balance of the original warranty period will remain effective. The replacement does not carry a new Rheem warranty.

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

2.5 Where the Rheem warm water system is installed in a position that does not allow safe or ready access, the cost of that access, including the cost of additional materials handling and/or safety equipment, shall be the owner's responsibility. In other words, the cost of dismantling or removing cupboards, doors or walls and the cost of any special equipment to bring the warm water unit to floor or ground level or to a serviceable position is not covered by this warranty.

2.6 This warranty only applies to the original and genuine Rheem warm water unit in its original installed location and any genuine Rheem replacement parts.

2.7 The Rheem warranty does not cover faults that are a result of:

a) Accidental damage to the warm water unit or any component (for example: (i) Acts of God such as floods, storms, fires, lightning strikes and the like; and (ii) third party acts or omissions).

b) Misuse or abnormal use of the warm water units.

c) Installation not in accordance with the Owner's Guide and Installation Instructions or with relevant statutory and local requirements in the State or Territory in which the warm water unit is installed.

d) Connection at any time to a water supply that does not comply with the water supply guidelines as outlined in the Owner's Guide and Installation Instructions.

e) Repairs, attempts to repair or modifications to the warm water unit by a person other than Rheem Service or a Rheem Accredited Service Agent.

f) Faulty plumbing or faulty power supply.

g) Failure to maintain the warm water unit in accordance with the Owner's Guide and Installation Instructions.

h) Transport damage.

i) Fair wear and tear from adverse conditions (for example, corrosion).

j) Cosmetic defects.

2.8 Subject to any statutory provisions to the contrary, this warranty excludes any and all claims for damage to furniture, carpet, walls, foundations or any other consequential loss either directly or indirectly due to leakage from the warm water unit, or due to leakage from fittings and/ or pipe work of metal, plastic or other materials caused by water temperature, workmanship or other modes of failure.

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

RHEEM WARM WATER WARRANTY - AUSTRALIA ONLY

WARM WATER MODELS 940080, 940160, 940240

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

3.1 Rheem will repair or replace a faulty component of your warm water system if it fails to operate in accordance with its specifications as follows:

What components are covered	The period in which the fault must appear in order to be covered	What coverage you receive
All components	Year 1	Repair and/or replacement of the faulty component, free of charge, including labour. Excludes UV lamp (see below)
Warm Water Cartridge (from date of installation or replacement)		
Cartridge	Year 2	Repair and / or replacement free of charge, including labour.

4. ENTITLEMENT TO MAKE A CLAIM UNDER THIS WARRANTY

4.1 To be entitled to make a claim under this warranty you need to:

a) Be the owner of the warm water unit or have consent of the owner to act on their behalf.

b) Contact Rheem Service without undue delay after detection of the defect and, in any event, within the applicable warranty period.

4.2 You are **not** entitled to make a claim under this warranty if your warm water unit:

a) Does not have its original serial numbers or rating labels.

b) Is not installed in Australia.

5. HOW TO MAKE A CLAIM UNDER THIS WARRANTY

5.1 If you wish to make a claim under this warranty, you need to:

a) Contact Rheem on 131031 and provide owner's details, address of the warm water unit, a contact number and date of installation of the warm water unit or if that's unavailable, the date of manufacture and serial number (from the rating label on the warm water unit).

b) Rheem will arrange for the warm water unit to be tested and assessed on-site.

c) If Rheem determines that you have a valid warranty claim, Rheem will repair or replace the warm water unit in accordance with this warranty.

5.2 Any expenses incurred in the making of a claim under this warranty will be borne by you.

6. THE AUSTRALIAN CONSUMER LAW

6.1 Our goods come with guarantees that cannot be excluded under the *Australian Consumer Law*. You are entitled to a replacement or refund for a major failure and for compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the goods repaired or replaced if the goods fail to be of acceptable quality and the failure does not amount to a major failure.

6.2 The Rheem warranty (set out above) is in addition to any rights and remedies that you may have under the *Australian Consumer Law*.

RHEEM AUSTRALIA PTY LTD, A.B.N. 21 098 823 511, www.rheem.com.au
For Service Telephone 131 031 AUSTRALIA or 0800 657 335 NEW ZEALAND

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