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## Tempering Valve Application and Installation Guide

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## **Important Information**

Tempering Valves must be installed by a licensed plumber in accordance with AS/NZS 3500, any State or Local Authority requirements and the manufacturer's installation instructions.

Failure to comply with any of the above may result in unsafe operation of the valve and/or water heater and may result in serious injury. The warranty conditions of REFLEX water heater valves may be rendered void if the valve is not appropriately specified and/or installed correctly.

Tempering valves are not a product that can be classified as "set and forget". Tempering valves should be inspected annually, as per AS 4032.3, or, if installed in a region of dramatically changing climatic conditions, at the beginning of each of the 4 climatic seasons. Seasonality, specifically sustained water supply temperature and/or water pressure changes, DOES play a significant role in the supply of tempered water.

Supply conditions, at the time of commissioning, are the controlling factors for the valve's subsequent performance. Therefore, if water supply temperature and/or water supply pressure change by more than 10% of the values at time of commissioning, the valve may require re-adjustment if the outlet temperature is to be maintained.

***All tempering valves must be tested at intervals of not more than 12 months and replaced at intervals not exceeding 5 years, as outlined in AS 4032.3 - 2004.***

## Specifications

Hot water supply temperature <sup>1</sup> :	65°C – 99 <sup>2</sup> °C
Cold water supply temperature:	5°C - 30°C
Adjustable outlet temperature range <sup>3</sup> :	40°C - 55°C (Reflex Tempering Valve – RTV) 35°C - 55°C (Reflex Mini Tempering Valve - RMTV)
Accuracy of outlet temperature:	±3°C (tested to AS4032.2 between 40°C & 50°C)
Minimum temperature differential <sup>4</sup> :	10°C
Maximum supply pressure hot & cold:	1600kPa Static
Maximum supply pressure hot & cold:	500kPa Dynamic
Maximum supply pressure imbalance <sup>5,6</sup> :	2:1 Dynamic
Maximum inlet pressure variation <sup>7,8</sup> :	±10%
Flow rate minimum:	4 litres/min

## Notes

1. The minimum storage temperature for hot water is 60°C, as stipulated by AS3500.4.2 Clause 1.6, to inhibit legionella growth.
2. 99°C for tempering valves suitable for solar heater applications.
3. For applications outside of the requirements of AS/NZS1357.2 and AS3500, the valve can be set to deliver tempered water as low as 35°C or as high as 55°C (site conditions dependent).
4. This is the minimum temperature differential required between the hot water supply and the tempered water outlet to ensure shut-off of the outlet flow in the event of cold water supply failure. This minimum temperature differential is in accordance with test procedures for AS4032.2, provided the valve is set between 40°C and 50°C.
5. For optimum performance it is recommended that both hot and cold water pressure (dynamic) are equal.
6. To control the outlet temperature to  $\pm 3^\circ\text{C}$ , this ratio, measured at the time of commissioning, is the maximum, dynamic supply pressure imbalance and must not be exceeded. For optimum performance it is recommended that both hot and cold water pressure are equal.
7. The maximum allowable sustained variation, post commissioning of the valve, for either the hot or cold water supply if the mixed temperature is to be maintained.
8. Temperature spiking at the outlet, beyond the  $\pm 3^\circ$  tolerance, may occur following a rapid change in supply pressure. All necessary steps must be taken on site to minimise or eliminate possible causes to sudden supply pressure variations.

## Valve Application Guide

Valve Model	Cap Colour	Application	Notes
Mini Tempering Valve – Standard	Red	Storage Heaters	Ideal for confined spaces
Mini Tempering Valve – Solar	Orange	Storage, Instantaneous, Heat Pump & Solar Heaters	Ideal for confined spaces
Maxi Tempering Valve – Standard	Red	Storage Heaters	Ideal for systems requiring greater flow
Maxi Tempering Valve – High Performance	Blue	Storage, Instantaneous & Heat Pump Heaters , Pumper Ring-mains	Ideal for systems requiring greater flow
Maxi Tempering Valve – Solar	Orange	Storage, Instantaneous, Heat Pump & Solar Heaters, Pumped Ring-mains	Ideal for systems requiring greater flow

# Valve Installation

## Check List

- REFLEX Tempering Valves must be installed by a licensed plumber in accordance with AS/NZS 3500, any State or Local Authority requirements and the Manufacturer's installation instructions.
- Refer to the Valve Application Guide to ensure the appropriate valve is installed
- It is strongly recommended the valve be installed where it can be easily accessed for servicing<sup>9</sup> or replacement.
- If the site is not plumbed with a dual, hot water circuit, i.e. an untempered, hot water supply to the laundry (s) and kitchen(s) fixtures and a dedicated tempered water supply to all sanitary fixtures, it is strongly recommended installing the Tempering Valve downstream of all kitchen and laundry fixtures if practicable.
- Ensure pressure and temperature characteristics of the site are within the valve specifications prior to installation.
- Do not subject the valve to any external heat source as this may damage internal and/or external components.
- The Tempering Valve must be insulated in all environments as per AS/NZS 3500. In areas of frosts and freezing conditions, all exposed pipework must also be insulated.
- The non-return valves supplied with the Tempering Valve must not be removed as they are critical for the prevention of cross-connection of unbalanced hot and cold water pressure. The non-return valves must be fitted to the hot and cold water inlet ports for the Tempering Valve to function correctly.
- Thread tape, hemp, liquid sealant or any other sealing compound must not be used with this valve. Blocked strainers, fouled non-return valves and/or clogged valve internals prevent the valve from working correctly.
- Ensure both the hot and cold water supply lines are thoroughly flushed of dirt and debris prior to installation.
- Failure to adequately flush the supply lines will result in the valve not functioning correctly and the warranty will be void.
- As per AS/NZS 3500, ensure an isolating valve, line strainer, non-return valve, pressure control device and expansion control valve are fitted upstream of the Tempering Valve to provide the valve with optimum operating conditions.
- Ensure the hot and cold water supply lines are connected to the correct inlet port. To help with this, "H", "C" and "↓" have been forged into the body of the valve to indicate hot inlet port, cold inlet port and outlet port.
- Set the valve to the desired temperature by following the commissioning instructions.
- The valve must not be fitted directly to the water heater.
- If the valve is fitted at the water heater, there must be a minimum one metre length of copper pipe length between the outlet of the water heater and the hot water inlet to the valve, although it can be fitted anywhere in the hot water supply line if necessary.
- If the valve is fitted at the point-of-use, there must be a minimum 300mm of pipe between the outlet of the valve and the inlet of the fixture.
- The installation detail sticker must be completed by the installing plumber, attached to the water heater or placed in a prominent, visible location or a position as specified by the State and/or Local Authority.

<sup>9</sup> Servicing a Tempering Valve includes the flushing of line strainers, ensuring the non-return valves are free of debris, flushing the 2 x inlet ports and 1 x outlet port, adjustment of the outlet temperature and the measuring of water supply conditions at site to ensure it is within the valve specifications.

The removal of the internal temperature assembly should never be undertaken or all warranties will be rendered void.

Please refer to AS4032.3 for further advice regarding the servicing of Tempering Valves.

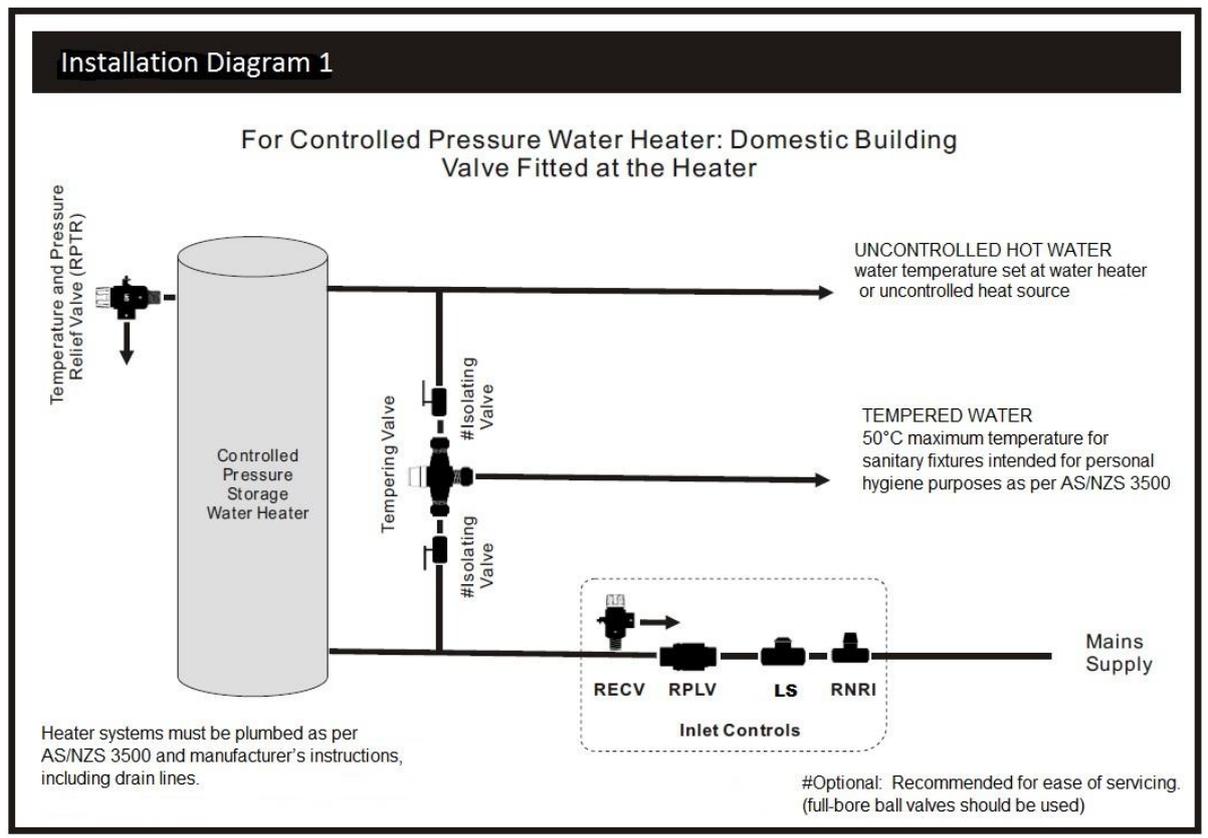
#### Note

Tempering Valves provide optimum performance when installed with hot and cold supplies of equal DYNAMIC pressure, i.e. pressure under flow conditions. Further, static supply pressure rarely provides an indication of dynamic supply pressure.

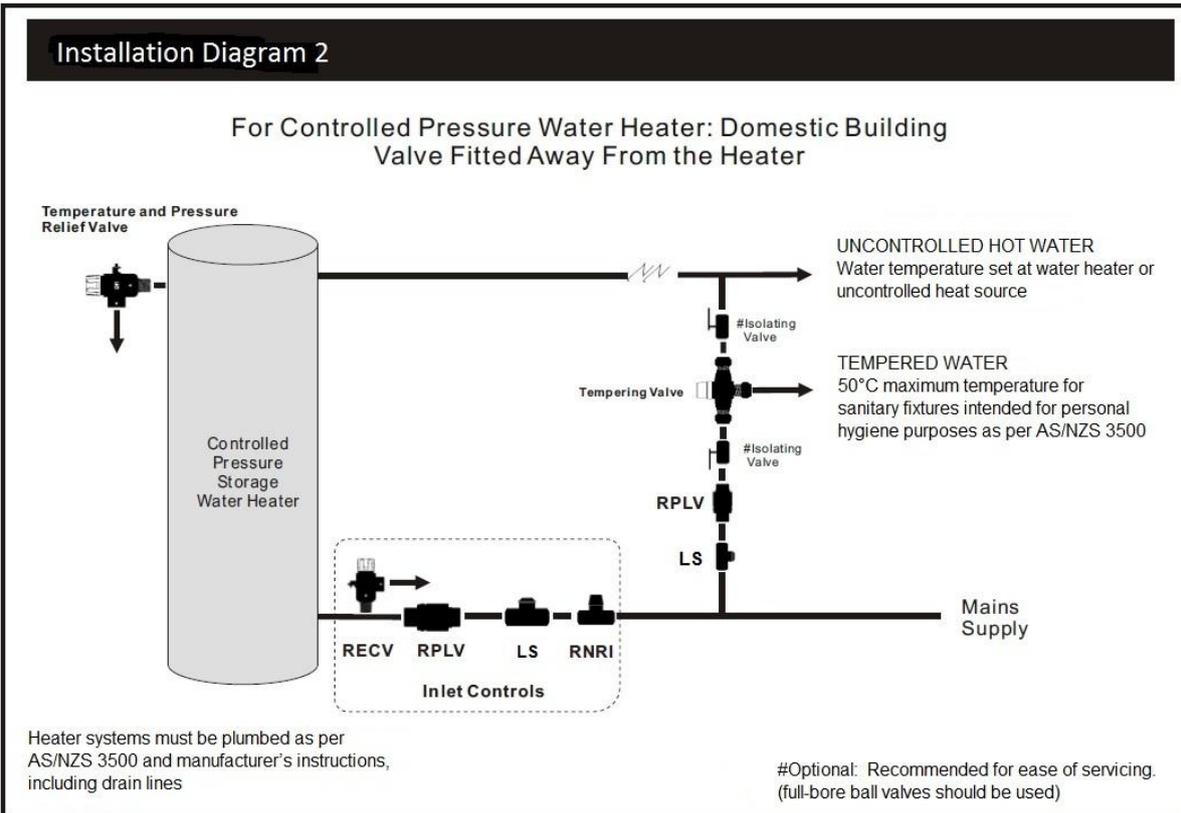
For commercial installations, it is strongly recommended that both the hot and cold water supply lines feeding individual Thermostatic Mixing Valves be fitted with pressure reduction valves.

In most domestic installations it should be possible to fit a pressure control device at the boundary of the property to control pressure to the whole site.

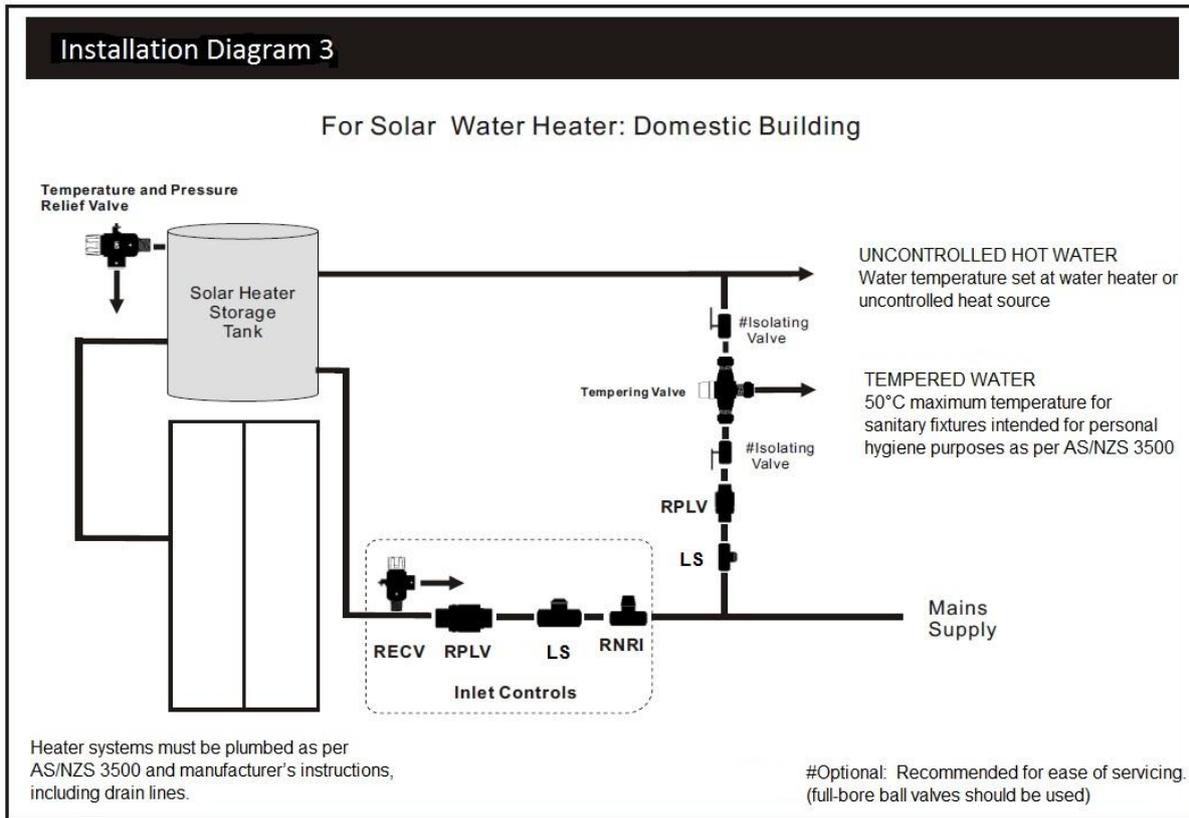
# Installation Diagram 1



# Installation Diagram 2



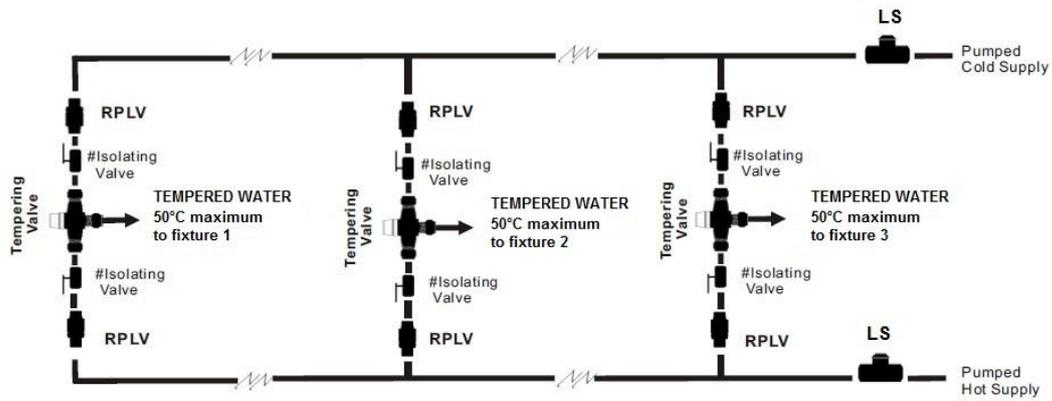
# Installation Diagram 3



# Installation Diagram 4

## Installation Diagram 4

For Pumped Supplies & Multiple Valves: Commercial Building

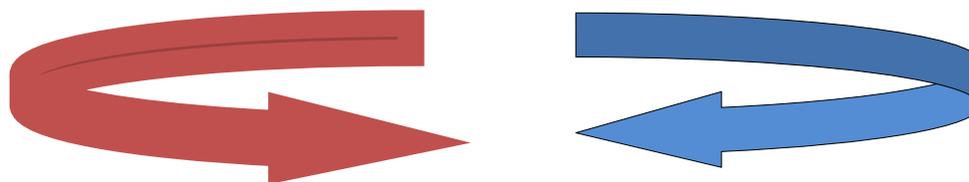


Heater systems must be plumbed as per AS/NZS 3500 and manufacturer's instructions.

#Optional: Recommended for ease of servicing. (full-bore ball valves should be used)

## Commissioning the Tempering Valve

- It is critical that every REFLEX Tempering Valve is commissioned on completion of the installation to ensure the accurate delivery of the desired mixed water temperature.
- Ensure the water heater is turned on and delivering hot water at 65°C (a minimum of 60°C as per AS/NZS 3500.4.2 Clause 1.6). In order to achieve thermal shut-off, a 15°C differential between the hot water supplying the valve and the outlet temperature must be created.
- Locate the nearest, downstream fixture that is supplied hot water via the Tempering Valve.
- Open the fixture's hot water outlet, ensuring the water is flowing at a minimum of 4 litres per minute. Allow the water to flow for at least 1 to 2 minutes to ensure the water temperature has stabilised.
- Use a digital thermometer to measure the temperature of the tempered water.
- To adjust the outlet temperature to the desired level, remove the cap from the valve, turn it upside-down<sup>10</sup> and place the triangular cavity over the triangular adjustment screw or place the hex key<sup>11</sup> into the hex cavity located in the top of the adjustment screw. Turn the adjustment screw ANTI-CLOCKWISE to INCREASE the temperature and CLOCKWISE to DECREASE the temperature of the tempered water.



- Never install the Tempering Valve with the temperature adjustment screw set in the maximum hot or maximum cold position.
- When the temperature has been set replace the cap to prevent accidental adjustment.

<sup>10</sup>Maxi Tempering Valve Series

<sup>11</sup>Mini Tempering Valve Series

## Servicing Requirements

- **All Tempering Valves must be tested at intervals of not more than 12 months and replaced at intervals not exceeding 5 years, as outlined in AS 4032.3 - 2004**
- The REFLEX Tempering Valve is a safety product and should only be serviced<sup>12</sup> by a licensed plumber or Reflex factory-trained technician.
- The Tempering Valve and internal components are not serviceable and the valve replaced if believed to be faulty.
- Tempering Valves should be inspected annually or, if installed in a region of dramatically changing climatic conditions, at the beginning of each of the 4 climatic seasons by a licensed plumber to ensure its safe operation.
- Tempering Valves are not a product that can be classified as “set and forget”. Seasonality, specifically water supply temperature and/or water pressure, DOES play a significant role in the supply of tempered water.
- In areas of poor water quality SAVEUR PACIFIC recommends REFLEX Tempering Valves be serviced at more frequent intervals.
- If Tempering Valve line strainers become blocked on a regular basis due to poor water conditions, additional line strainers must be fitted upstream of the Tempering Valve.
- When servicing<sup>12</sup> the REFLEX Tempering Valve, tempered water delivery temperature must be checked at the same outlet as the outlet used at the time of commissioning.
- There will be some variation in the temperature of the water delivered from a Tempering Valve due to seasonal temperature variations with the cold water supply.
- If water supply temperature and/or water supply pressure remain changed by more than 10% of the values at time of commissioning, the valve will require re-adjustment.

Servicing<sup>12</sup> a Tempering Valve includes the flushing of line strainers, ensuring the non-return valves are free of debris, flushing the 2 x inlet ports and 1 x outlet port, adjustment of the outlet temperature and the measuring of water supply conditions at site to ensure it is within the valve specifications.

The removal of the internal cartridge should never be undertaken or all warranties will be void.

# Troubleshooting

Symptom	Possible Cause	Solution
<b>The valve is noisy</b>	<ul style="list-style-type: none"> <li>• The water velocity is too high</li> <li>• Dynamic pressures supplying the tempering valve are greater than a ratio of 2:1</li> <li>• The adjustment screw is set to the maximum hot position or maximum cold position</li> </ul>	<ul style="list-style-type: none"> <li>• Install a pressure control device to reduce water velocity</li> <li>• Ensure dynamic pressures are within specifications</li> <li>• Ensure the adjustment screw is not set to the maximum hot position or maximum cold position</li> </ul>
<b>There is no flow from tempering valve outlet</b>	<ul style="list-style-type: none"> <li>• Hot or cold water supply failure</li> <li>• Tempering valve line strainers are blocked</li> <li>• The hot and cold water supply are connected in reverse</li> <li>• The hot and/or cold water supply is isolated</li> <li>• The adjustment screw is set to the maximum hot position or maximum cold position</li> </ul>	<ul style="list-style-type: none"> <li>• Restore the water inlet supply and set outlet temperature</li> <li>• Remove valve, flush thoroughly to remove all debris from strainers</li> <li>• Disconnect hot and cold water supply and reconnect to correct port</li> <li>• Remove valve and check both the hot and cold water supply is delivering water as required</li> <li>• Adjust the temperature setting to the middle position and reset the outlet temperature of the valve</li> </ul>
<b>The water temperature is fluctuating or changing over time</b>	<ul style="list-style-type: none"> <li>• Tempering valve line strainers are blocked</li> <li>• Varying water inlet supply pressure</li> <li>• Sustained pressure and/or temperature variations have altered outlet temperature</li> </ul>	<ul style="list-style-type: none"> <li>• Remove the valve, flush thoroughly to remove all debris from strainers</li> <li>• Install a pressure control device to service the whole property or install pressure control devices to both the hot and cold water supply</li> <li>• Reset outlet temperature of the valve to suit current conditions</li> </ul>
<b>Receiving only hot or cold water from the outlet of the tempering valve or from the outlet of a fixture</b>	<ul style="list-style-type: none"> <li>• The hot and cold water supply are connected in reverse</li> <li>• The outlet temperature is not set properly</li> <li>• Tempering valve line strainers are blocked</li> <li>• There is a cross-connection of the hot and cold water</li> </ul>	<ul style="list-style-type: none"> <li>• Disconnect hot and cold water supply and reconnect to correct port</li> <li>• Reset outlet temperature of the valve</li> <li>• Remove the valve, flush thoroughly to remove all debris</li> <li>• Ensure the non-return valves are free of debris and can seat properly, and thoroughly flush the valve</li> </ul>
<b>Low or fluctuating water flow from tempering valve</b>	<ul style="list-style-type: none"> <li>• Tempering valve line strainers are blocked</li> <li>• Varying water inlet supply pressure</li> </ul>	<ul style="list-style-type: none"> <li>• Remove the valve, flush thoroughly to remove all debris</li> <li>• Install additional strainers to both the hot and cold water supply lines to the valve</li> <li>• Install a pressure control device to service the whole property or install pressure control devices to both the hot and cold water supply</li> </ul>
<b>Outlet temperature of the tempering valve is not adjustable</b>	<ul style="list-style-type: none"> <li>• The hot and cold water supply are connected in reverse</li> </ul>	<ul style="list-style-type: none"> <li>• Disconnect hot and cold water supply and reconnect to correct port</li> </ul>
<b>Unable to set the desired mixed water temperature of the tempering valve or the valve is difficult to set</b>	<ul style="list-style-type: none"> <li>• Tempering valve line strainers are blocked</li> <li>• The tempering valve contains debris</li> <li>• The hot and cold water supply are connected in reverse</li> <li>• The hot water inlet temperature is not within the specified temperature for the valve to function correctly</li> </ul>	<ul style="list-style-type: none"> <li>• Remove the valve, flush thoroughly to remove all debris</li> <li>• Ensure the non-return valves are free of debris and can seat properly, and thoroughly flush the valve</li> <li>• Disconnect hot and cold water supply and reconnect to correct port</li> <li>• Ensure the hot water supply is at least 15°C hotter than the desired outlet temperature of the valve</li> </ul>

## Warranty Statement and Conditions

This warranty is provided by Saveur Pacific Pty Ltd, 27B Prosperity Place, Geebung Queensland 4034. We may be contacted by phone at +61 7 3266 4794 or at [www.savpac.com.au](http://www.savpac.com.au)

All products sold by Saveur Pacific come with a warranty that cannot be excluded under Australian Consumer Law (ACL).

You are entitled to a replacement or refund for a major failure and, if reasonably foreseeable, compensation for other loss or damage.

If the goods fail to be of acceptable quality and failure does not amount to a major failure, Saveur Pacific has the right to provide you with a repair or replacement product.

In addition to all rights you are entitled to under any Australian law(s), all REFLEX Water Heater Valves are guaranteed free from manufacturing defects and/or faulty workmanship for a period of 2 years from the date of manufacture<sup>13</sup> found stamped on the valve, subject to the conditions outlined below.

If any other party within the supply chain wishes to provide additional warranty or change any warranty conditions, it does so without any authority from Saveur Pacific.

### Warranty Conditions

1. The valve must have been installed by a licensed plumber in accordance with the Reflex Application and Installation Guide supplied with the valve. The plumber must also strictly adhere to the requirements of the National Plumbing & Drainage Code AS/NZS 3500 current at the time of installation and all relevant statutory and local requirements of the State or Territory in which the valve is installed.
2. Where the valve comprises part of a hot water system, installation of that system must be in accordance with the manufacturer's recommendations, the Code and all relevant statutory and local requirements of the State or Territory in which the valve is installed.
3. The valve must be returned to Saveur Pacific together with a fully-completed Saveur Pacific Warranty Claim Form. The valve will be tested to the relevant Australian Standard to determine if the valve has failed and a report detailing the findings of the test provided to the claimant.
4. Where the valve is replaced under warranty, the replacement valve only covers the remaining warranty period of the original purchase.

Warranty is offered in good faith in accordance with all Australian consumer law(s). However, our liability under this manufacturer's warranty is subject to us being satisfied that a defect was caused by defective workmanship or materials and was not caused by or substantially contributed to by factors or circumstances beyond our control including (but not limited to) the following;

1. Where damage to the valve is caused by accident, acts of God, misuse or incorrect installation.
2. The failure of the valve is due, in part or in whole, to faulty manufacture or incorrect installation of the hot water heater and/or system of which the valve forms part.
3. The valve has failed, directly or indirectly, as a result of excessive water pressure or water temperature, thermal input, corrosive environment, non-compliance with the REFLEX Application and Installation Guide or failure to adhere to all relevant statutory and local requirements of the State or Territory in which the valve is installed.

4. Failure of the valve was due to foreign matter or debris, either from installation or poor water conditions, blocking valve components.
5. Failure of the valve due to scale formation in the waterways of the valve.
6. If the valve has been tampered with or disassembled beyond the definition for servicing found within the Application and Installation Guide.

<sup>13</sup>The date of manufacture can be found stamped on all valves represented as either DD/MM/YY or MM/YY.

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