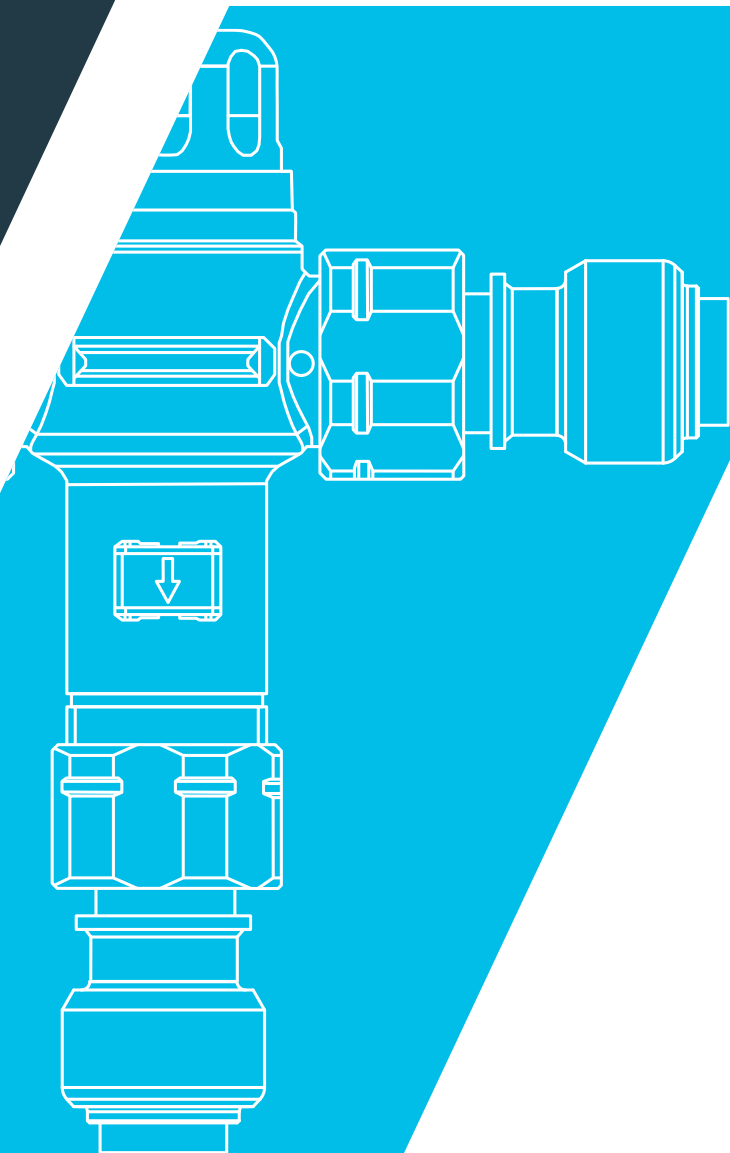


HeatGuard[®] Tempering Valves **Installation Manual**





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Introduction

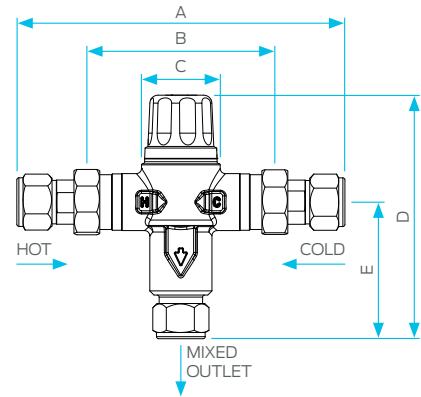
The HeatGuard® Tempering Valve Range

HeatGuard® Standard Tempering Valve - Insulated

DIMENSIONS

Product Code	Size	A	B	C	D	E
MIX15	15mm	158	92	38	116	66
MIX20	20mm	164	92	38	118	66

Note: All measurements in mm unless otherwise stated.

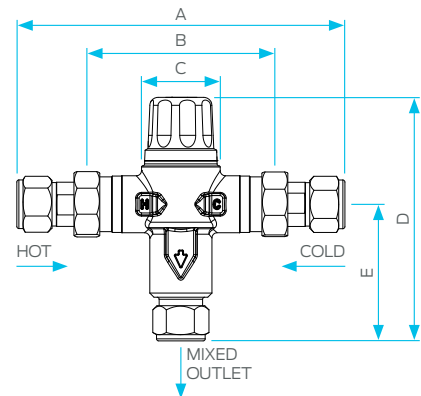


HeatGuard® Ultra Tempering Valve - Insulated

DIMENSIONS

Product Code	Size	A	B	C	D	E
MIX15U	15mm	158	92	38	116	66
MIX20U	20mm	164	92	38	118	66

Note: All measurements in mm unless otherwise stated.

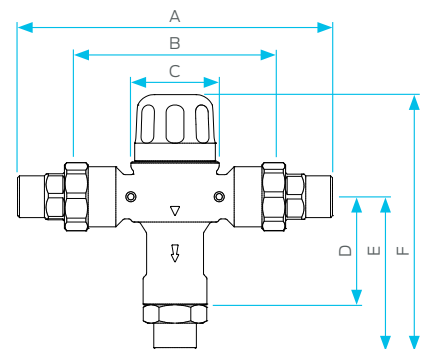


HeatGuard® Solar HF Tempering Valve

DIMENSIONS

Product Code	Size	A	B	C	D	E	F
MIX11511	DN20	200	128	57	68	97	166

Note: All measurements in mm unless otherwise stated.



Introduction

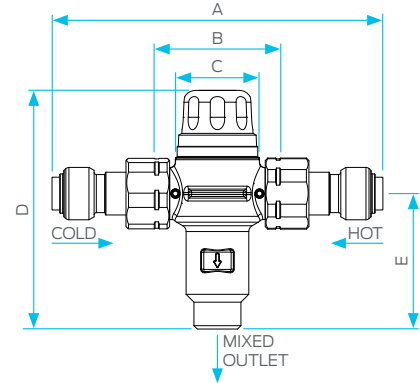
Dimensions

HeatGuard® Tempering Valve with SharkBite® Fittings

DIMENSIONS

Product Code	Size	A	B	C	D	E
MIXF11012I	20mm PEX (Ins)	158	38	60	107	¾C
MIXRA11009I	DN15 Copper (Ins)	148	37	60	107	½C

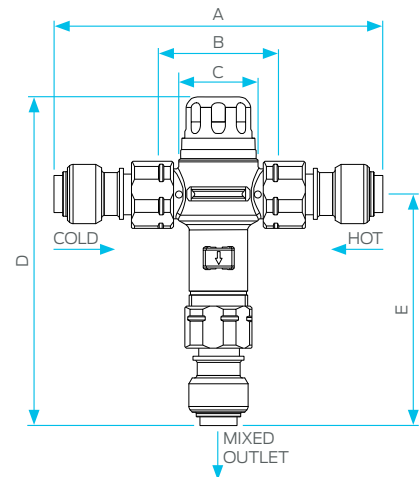
Note: All measurements in mm unless otherwise stated. (Ins) - Insulated.



DIMENSIONS

Product Code	Size	A	B	C	D	E
MIXSB16	16mm PEX	138	37	60	146	½C

Note: All measurements in mm unless otherwise stated. (Ins) - Insulated.

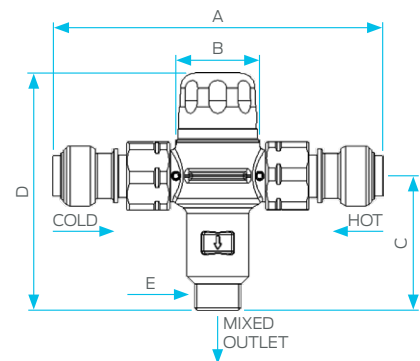


HeatGuard® Ultra Tempering Valve with SharkBite® Fittings

DIMENSIONS

Product Code	Size	A	B	C	D	E
MIXF11116I	16mm PEX (Ins)	148	37	60	107	½C
MIXF11117I	20mm PEX (Ins)	158	38	60	107	¾C
MIXRA11116I	DN15 Copper (Ins)	148	37	60	107	½C

Note: All measurements in mm unless otherwise stated. (Ins) - Insulated.



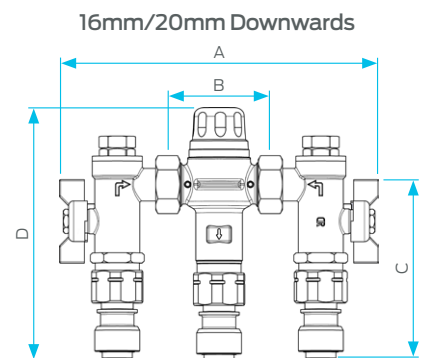
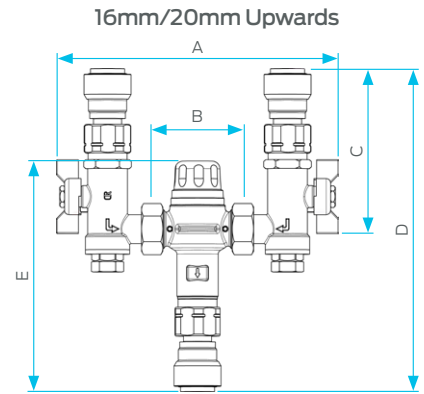
Introduction

Dimensions

HeatGuard® SharkBite® 4-in-1

DIMENSIONS						
Size	Model	A	B	C	D	E
16mm Upwards	MIX11014U	190	58	104	210	152
16mm Downwards	MIX11014D	190	58	104	152	-
20mm Upwards	MIX11013U	190	58	109	219	155
20mm Downwards	MIX11013D	190	58	109	155	-

Note: All measurements in mm unless otherwise stated.



Introduction

Failure to comply with all aspects of these instructions may result in unsafe performance. All installations must comply with AS/NZS 3500 and any State or Local Authority requirements.

Choosing the Correct Model

Ensure you have chosen the correct model HeatGuard® for the application.

Do not use ANY HeatGuard® model on steam-supplied systems.



	HEATGUARD® (STANDARD)	HEATGUARD® ULTRA (HIGH PERFORMANCE)	HEATGUARD® ULTRA HF (LARGE HIGH FLOW)
1. MAINS PRESSURE STORAGE			
Stable supply pressure	✓	✓	✓
Fluctuating supply pressure	-	✓	-
2. SOLAR			
Suitable for mains pressure solar	-	✓	✓
Suitable for gravity fed solar	-	-	✓
Suitable for uncontrolled heat source	-	✓	✓
3. OTHER SYSTEMS/REQUIREMENTS			
Continuous flow water heaters	-	✓	-
Instantaneous water heaters	-	✓	-
Heat exchange water heaters	-	✓	-
Pumped ring main / trace heated systems / fluctuating supply pressures	-	✓	-
Low pressure storage	-	-	✓
Valve fitted remote from water heater near point of use	-	✓	-
Insulation Included	✓	✓	-

Checking Site Parameters

Check site parameters against the specifications of the chosen valve. If the site conditions are outside those specified for the valve, they must be rectified prior to installing the valve.

Installation Instructions

How to Install the Valve

- It is recommended the valve be installed as close as possible to the hot water system, however it may be fitted anywhere on the hot water supply pipe if necessary.
- If the valve is fitted at the point-of-use there must be a minimum one (1) metre pipe run between the valve and the outlet fixture.
- Insulation is provided with this valve. Insulation must be fitted in situations where freezing is a possibility.

Step 1 – Flush the system thoroughly before fitting HeatGuard®. It is CRITICAL that all debris is flushed from the pipework prior to installing the valve. Not flushing the system properly is the most common cause of difficulties.

Step 2 – If the water supply is of poor quality so that the valve's strainers will continue to block, fit an additional filter or strainer to the system.

Step 3 – Install HeatGuard® in accordance with the **Installation Diagrams** section. Do not use excess thread sealant as this may cause the valve to fail.

Step 4 – Set the valve at the desired temperature by following the instructions in the **How to Set the Desired Temperature** section.

Step 5 – Enter installation details on sticker provided, and affix near system.

- Valve MUST NOT be subjected to heat during installation as this may damage the valve internals.
- It is recommended that isolating valves be fitted to allow easy access to the valve if the strainers need to be cleaned.
- In situations where the hot pressure may exceed the cold pressure and on pumped ring main systems, non-return valves MUST be fitted to BOTH inlets.

Diagram 1 – Fitting Configuration

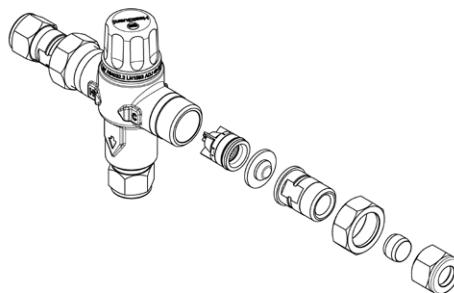
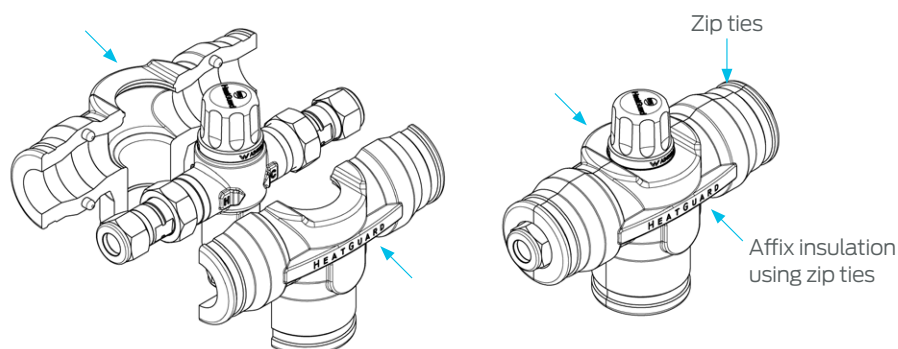


Diagram 2 – Insulation



Installation Instructions

How to Install SharkBite® Joints

HeatGuard® SharkBite®, HeatGuard® Ultra SharkBite® & HeatGuard® SharkBite® 4-in-1

- To make the perfect SharkBite® joint, check that fittings and tubing are clean, in good condition and are free from damage and foreign objects. Do not use any additional lubricant or sealing compounds. To ensure fittings stay clean and the O-Ring is protected from damage, fittings must be kept in their original packaging until immediately prior to installation.
- Do not apply excessive force to insert the pipe into the fitting. Need for excessive force may indicate damage to the end of the pipe. If pipe is to be refitted to a SharkBite® fitting, it is important to trim the pipe before making the joint.
- Do not apply direct heat to any part of SharkBite® fittings (except brazing adaptors).
- Ensure the pipe is free of scoring, cuts and abrasion. If the pipe has been engaged with the fitting and then requires removal, it is important that the pipe be trimmed prior to re-engaging.
- Always refer to AS/NZS 3500 when installing any plumbing system and ensure any installation is performed in accordance to the requirements of the standard. Installations of a SharkBite® plumbing system must comply with AS/NZS 3500.
- Use SharkBite® Copper or SharkBite® PEX pipe only for hot and cold water distribution.
- Install SharkBite® Copper or SharkBite® PEX plumbing systems to the appropriate local plumbing codes.
- Only use pipe, fittings and accessories that have been tested and approved for the SharkBite® Copper or SharkBite® PEX plumbing system.
- Pressure test the system on completion (AS/NZS 3500 16.3.1 requires 1500kPa for at least 30 minutes).

PEX Connections

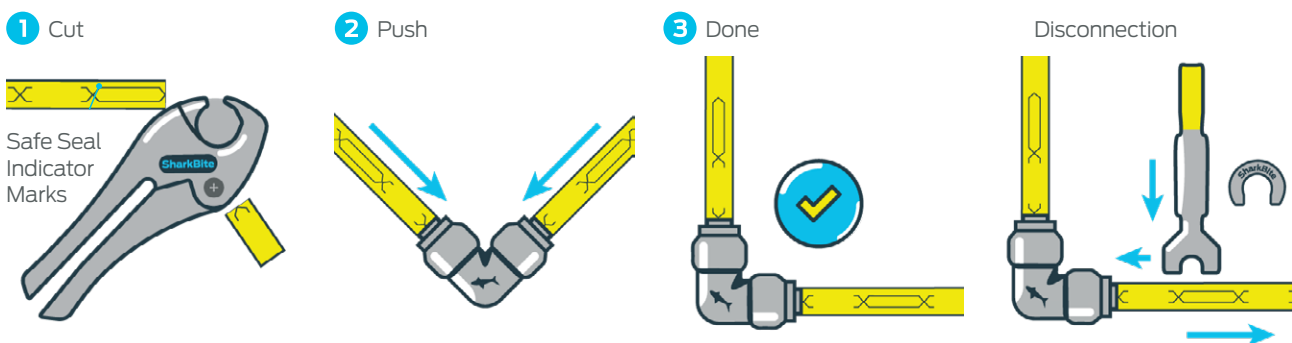
Step 1 – Using SharkBite® PEX Pipe Cutters, cut the pipe squarely between two of the SharkBite® safe seal indicator marks as shown in **Diagram 3**. Ensure pipe is round, clean and free of debris.

Step 2 – Insert the pipe through the release collar to rest against the grab ring. Push the pipe firmly with a twisting action until it reaches the pipe stop with a positive 'click'.

Step 3 – Ensure the SharkBite® safe seal indicator mark aligns with the release collar as shown.

Disconnection Procedure – Using the Disassembly Tongs or Clip, fittings can be easily changed, removed and the fittings reused.

Diagram 3 – SharkBite® PEX Joints Installation



Installation Instructions

How to Install SharkBite® Joints

HeatGuard® SharkBite®, HeatGuard® Ultra SharkBite® & HeatGuard® SharkBite® 4-in-1

Copper Connections

Step 1 – Using a pipe cutter, cut the copper tube to length making sure the pipe is cut squarely. Ensure pipe is round, clean and free of debris.

Step 2 – Remove burrs from the pipe using the SharkBite® deburrer and depth gauge.

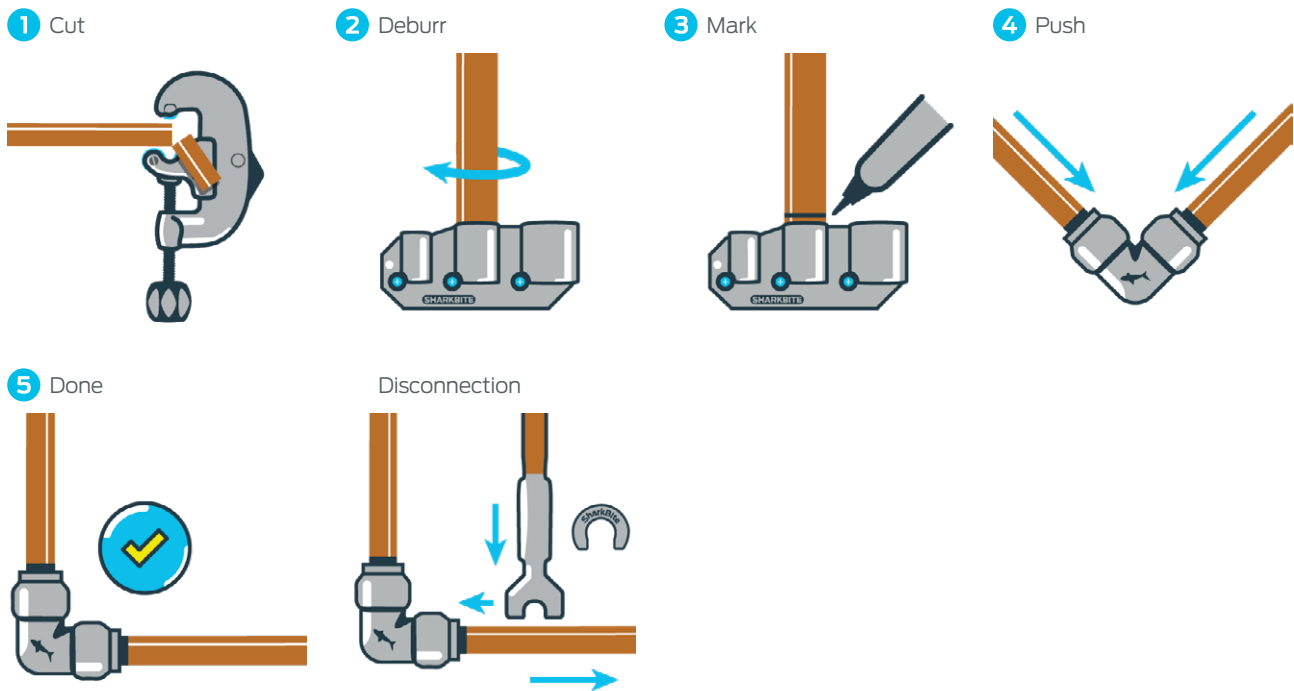
Step 3 – Mark the pipe with a marker using the depth gauge.

Step 4 – Insert the pipe by pushing firmly until a positive click is heard.

Step 5 – Ensure the mark made with depth gauge aligns with the release collar.

Disconnection Procedure – Using the Disassembly Tongs or Clip, fittings can be easily changed, removed and the fittings reused.

Diagram 4 – SharkBite® Copper Joints Installation



Installation Instructions

About Supply Pressures

Tempering valves provide optimum performance when installed with hot and cold supplies of equal dynamic pressure, i.e. pressure under flow conditions. (The static supply pressures often give NO indication of the dynamic supply pressures). It is recommended that the hot and cold supplies to each tempering valve be delivered via pressure control valves. In most domestic installations it should be possible to fit one control valve at the property boundary to control pressure to the whole site. For commercial installations it is recommended to fit a pressure control valve on each inlet to the tempering valve.

How to Set the Desired Temperature

- Every valve must be commissioned on-site to ensure correct delivery of the desired mixed water temperature, as installation conditions can vary from site to site.
- Prior to commissioning the valve the hot water system must be switched on and delivering hot water at a minimum of 60°C.

Step 1 – Locate the nearest outlet being supplied by the valve.

Step 2 – Open the outlet to allow a flow rate of at least four (4) litres/minute.

Step 3 – Allow the water to run for at least one minute to ensure the mixed water temperature has settled.

Step 4 – Using a thermometer, check the mixed water temperature. Is desired temperature achieved?

Yes? – go to Step 7.

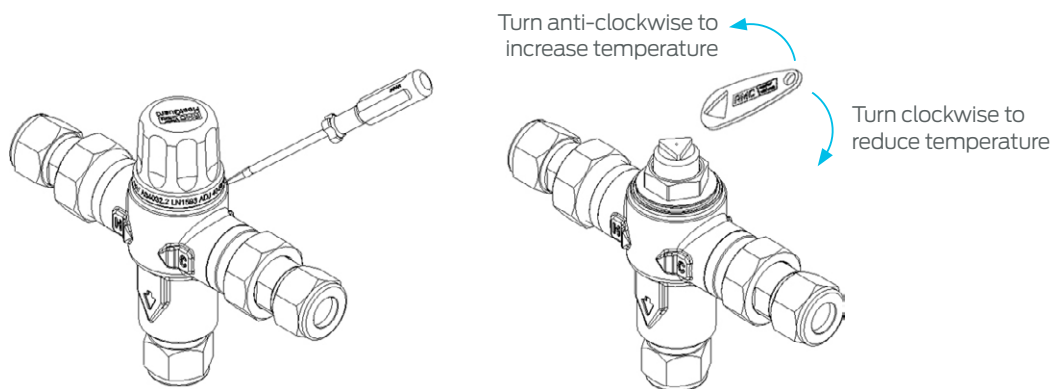
No? – go to next Step.

Step 5 – Adjust the valve as shown in **Diagram 5** until desired mixed outlet temperature is achieved.

Step 6 – Repeat Steps 1-4.

Step 7 – Replace the cap.

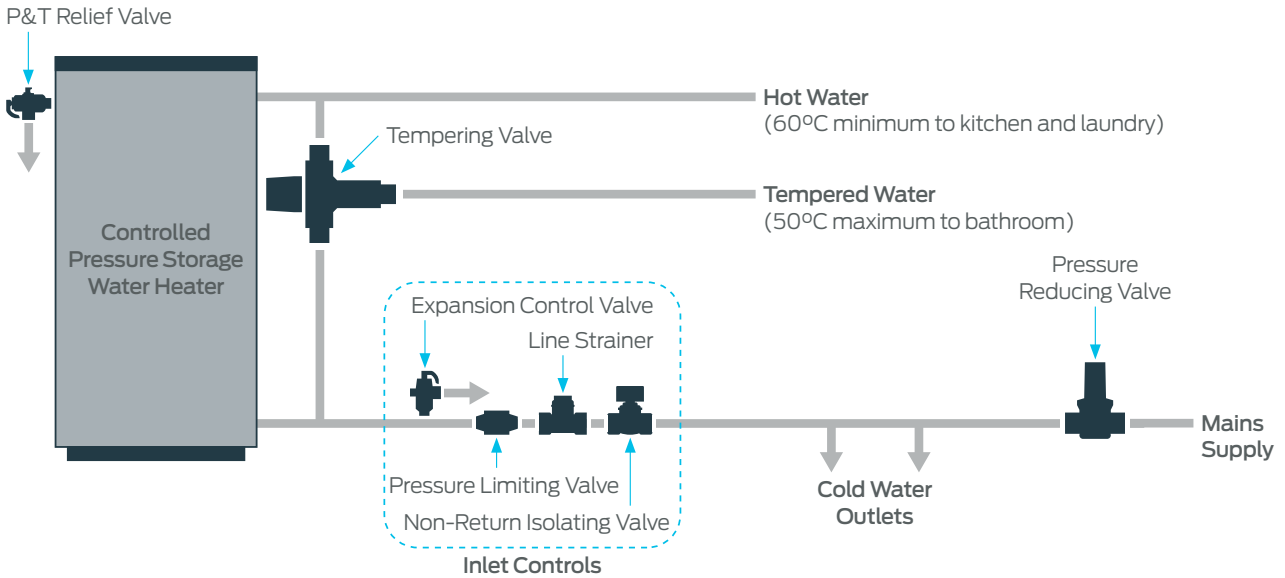
Diagram 5 – Temperature Adjustment



Installation Diagrams

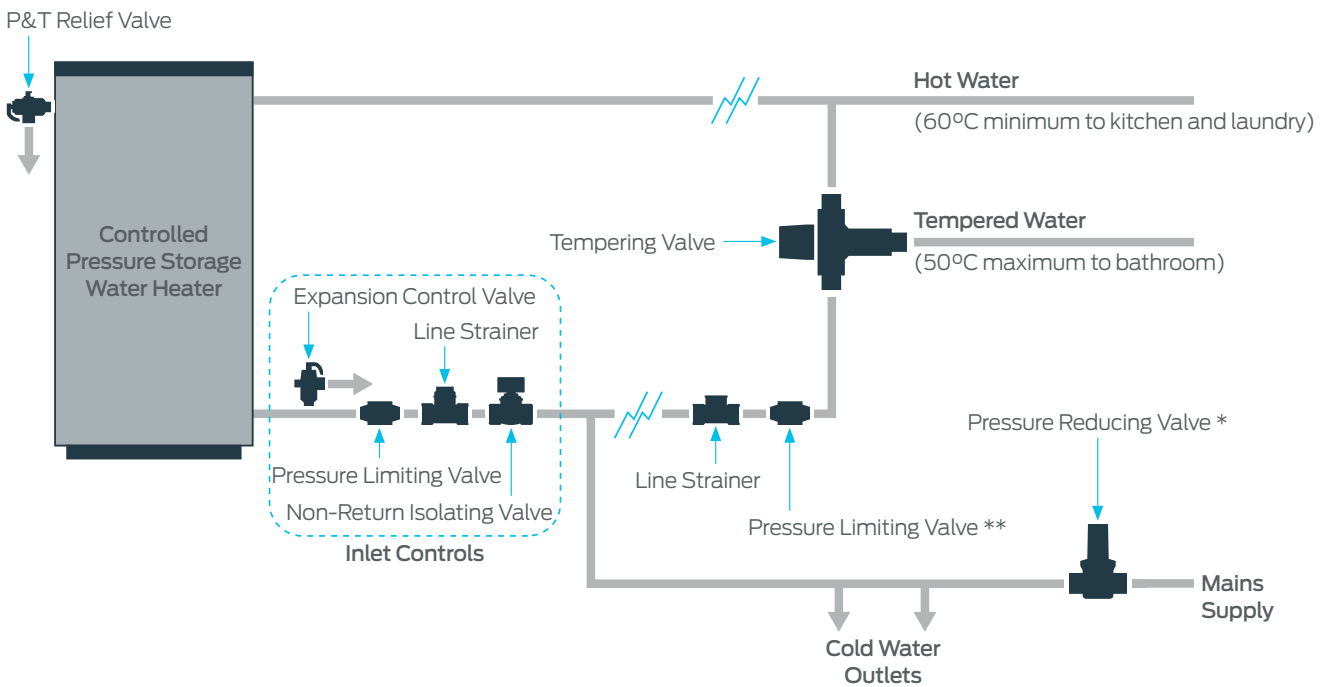
For Controlled Pressure Water Heater: Domestic Buildings

Valve Fitted at the Heater



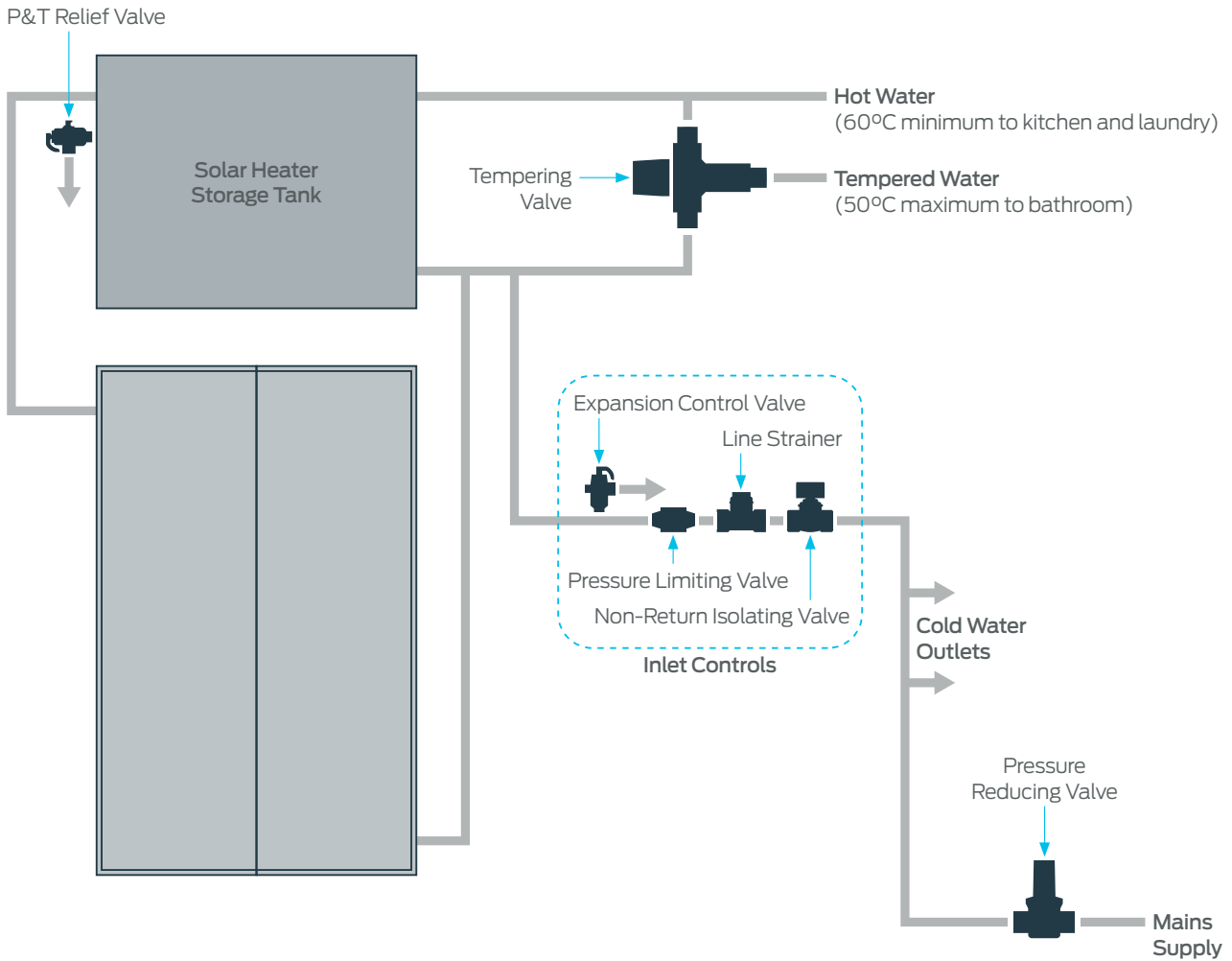
Valve Fitted Remotely from the Heater

Where there is no Pressure Reducing Valve controlling the whole installation (*), it is recommended that the cold supply to the tempering valve be controlled by a Pressure Limiting Valve (**) of the same pressure setting as the valve supplying the water heater.



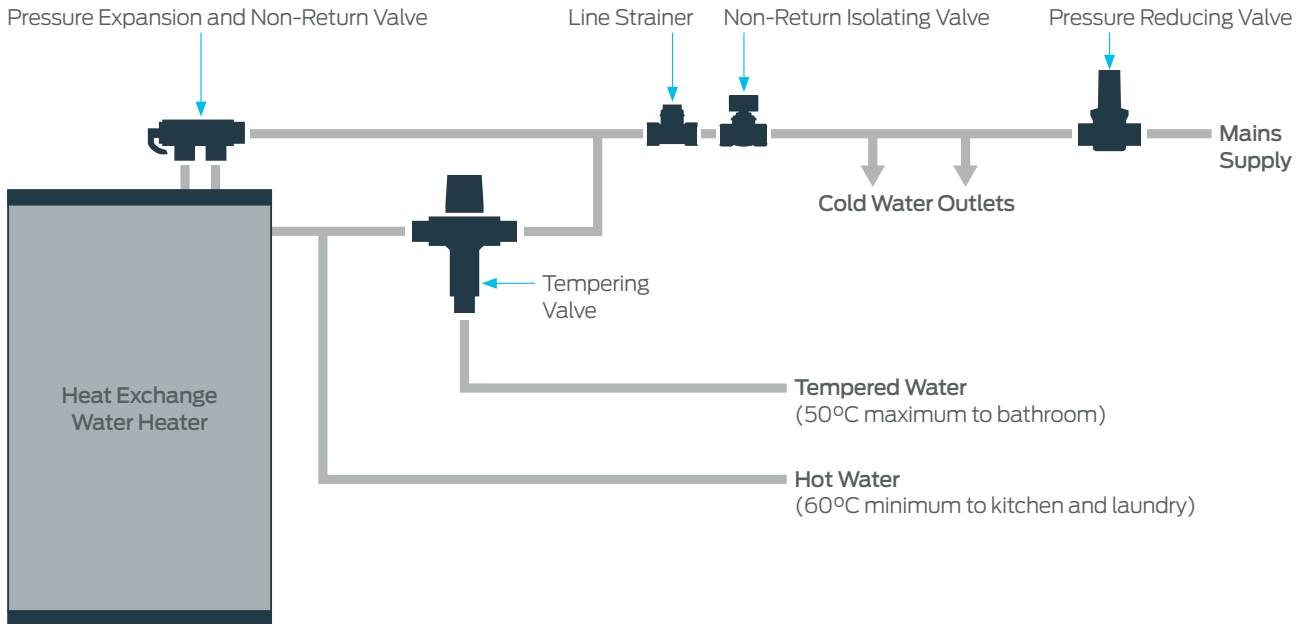
Installation Diagrams

For Solar Water Heater: Domestic Buildings



Installation Diagrams

For Heat Exchange Water Heater: Domestic Buildings

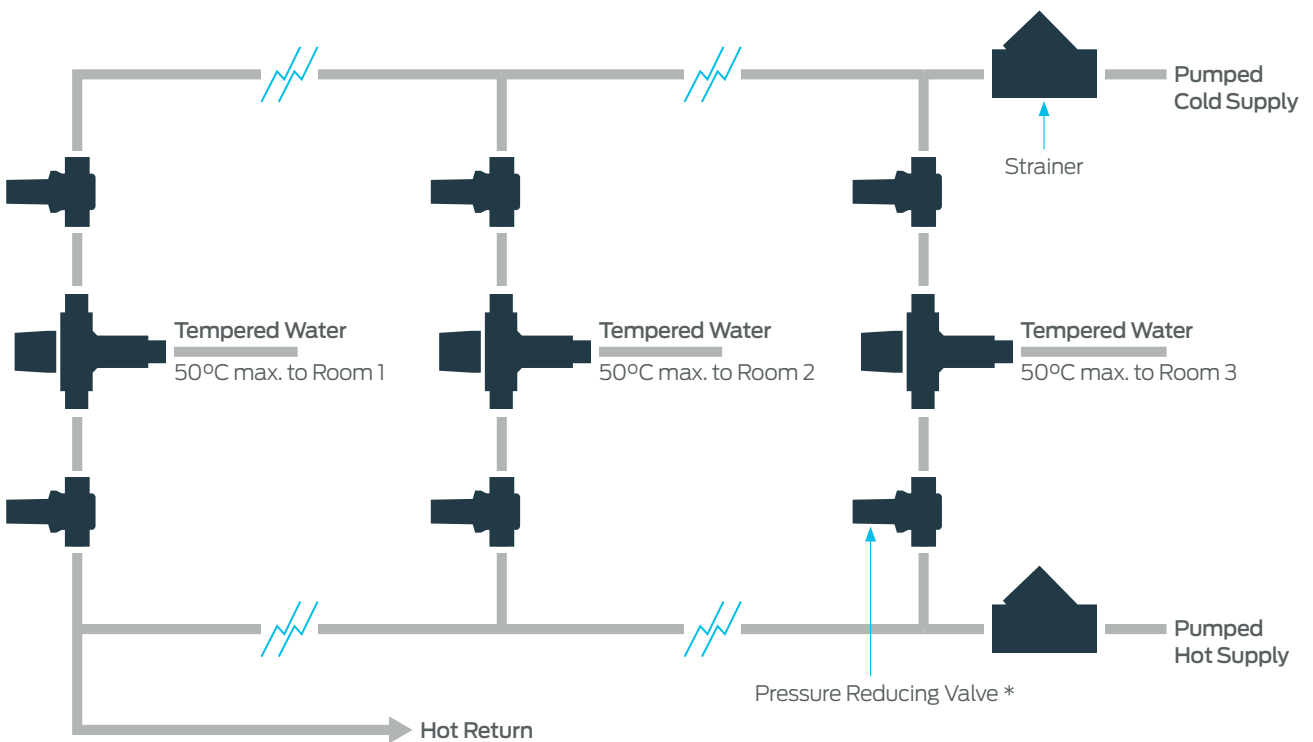


Installation Diagrams

For Pumped Supplies, Multiple Valves: Commercial Buildings

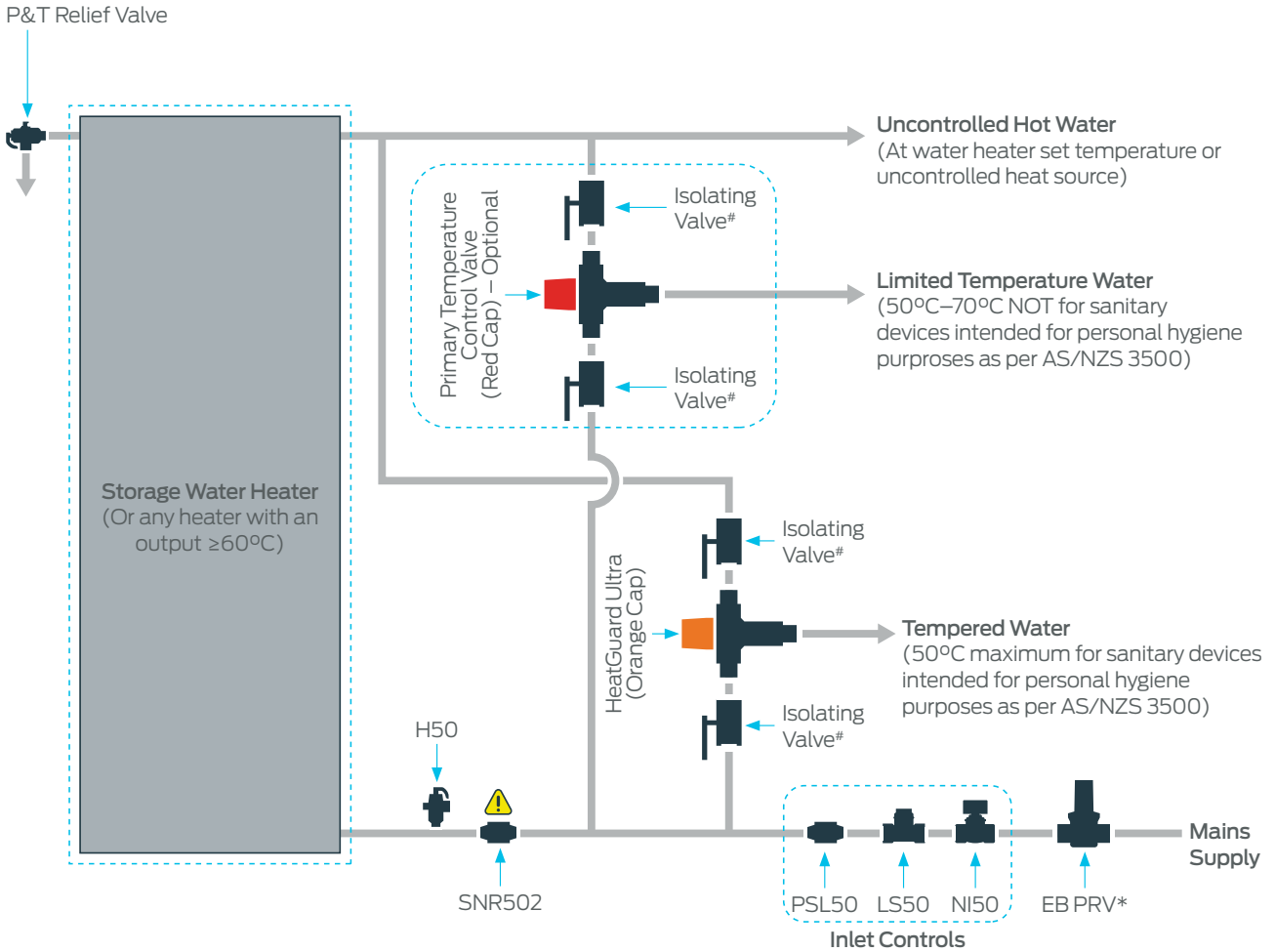
It is recommended that Pressure Reducing Valves are installed for each valve to ensure any pressure fluctuations from the pumped supply or other source are minimised prior to supplying water to the tempering valves.

There MUST be non-return valves fitted to BOTH hot and cold inlets for this type of installation. Easily accessed, fully serviceable strainers (in addition to the strainers supplied with the Tempering Valve) should be installed on each floor or circuit.



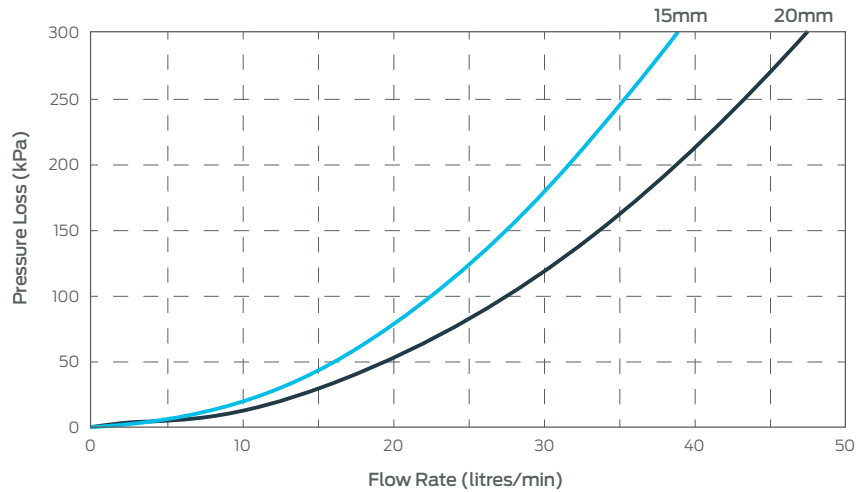
Installation Diagrams

Typical HeatGuard® Ultra Tempering Valve Installation



Technical Information

Flow Characteristics



Maintenance

We recommend the valve is checked annually to ensure its continued function. For installations with poor or unknown water quality, or other adverse supply conditions, it may be necessary to check the valve more frequently.

The temperature should be checked at the same outlet as was used for commissioning in the first instance (refer to the installation sticker). If the temperature is more than 2°C from the commissioning temperature or outside the requirements of AS/NZS 3500.4, refer to the **Troubleshooting** section.

The strainers and non-return valves can be easily accessed for cleaning via the union connections.

The valve itself cannot be serviced. If the valve fails it must be replaced. Do not disassemble the valve other than to remove the snap-on cap, strainers and non-return valves as shown.

Technical Information

Valve Specifications

Cold water supply temperature	5°C – 30°C
Hot water supply temperature	60°C – 90°C ¹
Optimum outlet temperature range	40°C – 50°C ²
Set temperature	Must be commissioned on site to achieve desired outlet temperature
Accuracy of outlet temperature	±3°C - tested to AS 4032.2 between 40°C and 50°C
Minimum temperature differential (between hot supply and outlet temperature)	10°C (Ultra Valves) ³ 15°C (Standard Valves) ³
Supply pressure, static	1600kPa maximum
Supply pressure, dynamic	500kPa maximum
Supply pressure imbalance, dynamic (at time of commissioning)	2 : 1 maximum ⁴
Maximum permitted pressure variation in either supply, in order to control outlet temperature to ±3°C (from supply pressure at commissioning)	±10% maximum ^{5,6}
Minimum flow rate	4 litres/min

Notes:

1. AS/NZS 3500.4 Clause 1.9.1 requires the minimum hot water storage temperature to be 60°C.
2. For applications outside the requirements of AS/NZS 3500 and AS 4032.2, it is possible to set the valve as high as 55°C or as low as 35°C, depending on site conditions
3. This is the minimum difference required to ensure shut-off of outlet flow in the event of cold supply failure in accordance with AS 4032.2, providing the valve is set between 40°C and 50°C.
4. The maximum permitted ratio of supply pressures, under dynamic (flow) conditions. For optimum performance it is recommended that the hot and cold pressures at commissioning are as close as possible to equal.
5. The maximum permitted variation in either supply pressure from the pressure at commissioning in order to control the outlet temperature to ±3°C.
6. Note that rapid changes in supply pressure can result in a spike in the outlet temperature beyond ±3°C. Following a rapid change in supply pressure it may take a number of seconds for the temperature to return to within a ±3°C limit. Steps should be taken on-site to eliminate any cause of rapid supply pressure variation.

Technical Information

Troubleshooting

If the desired mixed water temperature cannot be obtained or valve is difficult to set:

POSSIBLE CAUSE	SOLUTION
Inlet temperatures are not within specified limits	Ensure inlet temperatures are within the specified limits for the valve
Hot and cold supplies are reversed	Refit the valve with Hot/Cold supplies fitted to the correct connections
Valve contains debris	Flush water through valve and clean strainers
Strainers contain debris	Clean strainers, ensuring debris is removed

If the mix temperature is unstable or changing over time:

POSSIBLE CAUSE	SOLUTION
Fluctuating supply pressures	Install pressure reducing valves
Strainers contain debris	Clean strainers, ensuring debris is removed
Inlet temperatures may have altered due to seasonal temperature variations	Reset valve (refer section How to Set the Desired Temperature)

If either full hot or full cold water is flowing from the outlet fixture:

POSSIBLE CAUSE	SOLUTION
Hot and cold supplies are reversed	Refit the valve with Hot/Cold supplies fitted to the correct connections
Hot/Cold water has migrated to other inlet. Refer also point 1.	Check non-return valve is not fouled. Flush as necessary

If there is no flow from the valve outlet:

POSSIBLE CAUSE	SOLUTION
Hot or cold water supply failure	Restore inlet supplies and check mix temperature
Strainers are blocked by debris	Clean strainers, ensuring debris is removed

If the flow rate is reduced or fluctuating:

POSSIBLE CAUSE	SOLUTION
Inlets fouled by debris	Check valve and fittings for blockages – clean or flush as necessary
Fluctuating supply pressures	Install pressure reducing valves

If the mixed water temperature does not change when the temperature adjuster is altered:

POSSIBLE CAUSE	SOLUTION
Hot and cold supplies are reversed	Refit the valve with Hot/Cold supplies fitted to the correct connections


If hot water flows into the cold water system or vice versa:


POSSIBLE CAUSE	SOLUTION
Non-return valves fouled by debris	Flush water through valve and clean strainers

If the valve is noisy:

POSSIBLE CAUSE	SOLUTION
Water velocity above velocity requirements of AS/NZS 3500.1	Reduce water velocity (best achieved by fitting a pressure reducing valve)



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