EMERGENCY MIXING VALVE ASSEMBLY

EMF50L

INSTALLATION, OPERATION AND MAINTENANCE

MANUAL

Designed to provide tepid flushing fluid

for emergency eye/facewash units

in compliance with AS4775.

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DISTRIBUTOR

All Valve Industries Pty Ltd
Unit 2, 18-28 Sir Joseph Banks Drive, Kurnell NSW 2231
Ph: +61 2 8543 9811
E: sales@allvalve.com.au

GENERAL

The EMF50L emergency mixing assembly has been designed specifically to provide temperature controlled water to emergency eye/facewash fixtures as detailed in ANSI Z358.1-2014 and AS4775-2026 to achieve an optimum temperature control range of 20°C – 37°C.

The correct flushing fluid temperature is considered necessary in all types of emergency equipment applications. The temperature range is defined in the standard, as a “temperature ranging between 15 °C and 37 °C (and ideally between 20 °C and 25 °C).”

Generally, temperatures higher than 37°C may cause chemical interactions with the skin and result in further damage. At 15°C and below hypothermia becomes a concern. Consulting a safety/health advisor will be a helpful aid in the determination of the best temperature parameters. No two hazards are exactly the same and each should be evaluated on a case-by-case basis.

PRODUCT FEATURES

- Maintains tepid outlet temperature (20–37°C) in accordance with AS4775 and ANSI Z358.1-2014.
- Cold water bypass activates only when required, preserving full thermostatic control under normal operating conditions
- Tamper-resistant, lockable temperature adjustment
- Rapid thermal shut-off on cold water supply failure
- Watermark approved tempering valve to AS4032.2

OPERATION

The EMF50L emergency mixing assembly is suitable for installation at or near a point of use for direct tepid water supply to an emergency eye/facewash fixture or grouping of fixtures. Groups of fixtures must meet the valve’s flow capacity requirements if there is a potential for simultaneous operation.

For Emergency Eye / Facewash; the EMF50L will provide up to 50 l/min at 50kPa pressure loss. For single or multiple Emergency Eye Wash Station installations, the EMF50L will control accurately at flow rates from 50 l/min down to 6 l/min.

The cold water bypass is provided by a pressure reducing valve (PRV) that continuously monitors downstream pressure. If pressure loss across the tempering valve — whether from high flow, a partial blockage, or failure of the heated water supply — would otherwise reduce downstream pressure below 300kPa, the PRV opens to supplement flow. Under normal operating conditions, the tempering valve alone delivers the full required flow with complete temperature control; the PRV bypass activates only when needed, so temperature stability is not affected by blended bypass flow during normal use. This feature has been integrated to ensure the functionality and integrity of the emergency eye / facewash is maintained. The cold water bypass provides a minimum of 30l/min in case of a complete shutoff of the tempering valve flow.

Note: If the flow rate exceeds approx. 50 l/min (50kPa pressure loss), or if there is a blockage in one of the mixing valve inlets, then the bypass PRV may open and allow some cold water to enter the tepid outlet, thereby supplying slightly lower temperature water from the assembly to the emergency eye / face wash fixture.

SAFETY WARNINGS

The function of a EMF50L is to deliver water consistently at a pre-designated temperature. The Caleffi tempering valves are precision engineered to give continued superior and safe performance provided:

1. They are installed, commissioned, operated and maintained in accordance with the recommendations provided and accepted plumbing practices.
2. Periodic attention is given, as necessary, to maintain the product, the accessory fittings and the plumbing system in good functional order.
3. Eye / facewash must be maintained in accordance with AS4775.

In keeping with every other mechanical product, The EMF50L should not be considered as functionally infallible and, as such will never totally replace the vigilance and attention of maintenance, supervisory and safety staff, provided that they are installed, commissioned, operated and maintained, the risk of product failure and its associated consequences, if not eliminated, are reduced to the minimum achievable.

WARNING: Pipework and metal fittings on or near this assembly may become hot during normal operation. Installers and maintenance personnel should take care to avoid contact with hot surfaces.

COMPLIANCE

The EMF50L utilises a specially made tempering valve, Watermark approved to AS4032.2. This assembly is intended for use with potable water only and must be installed in accordance with the Plumbing Code of Australia, AS/NZS 3500, and all relevant local regulatory authority requirements.

This product must be installed, commissioned and serviced by a suitably licensed plumbing practitioner, in accordance with this manual and all applicable codes and standards.

This product is compliant with the Lead Free requirements of NCC Volume Three.

TECHNICAL DATA

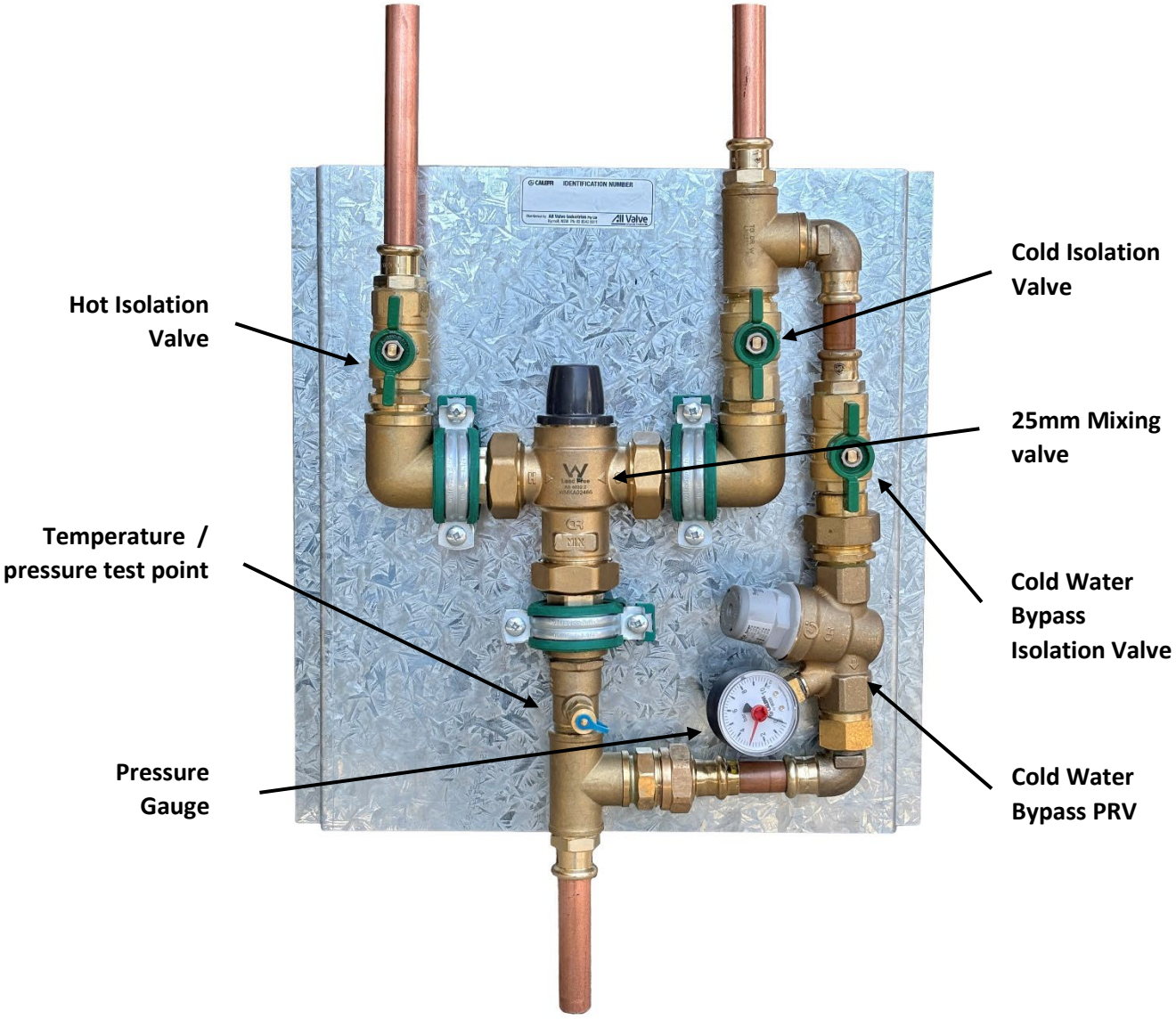
Connections	20mm copper pipe
Pre-set temperature:	Approx 25°C *(must be commissioned on site)*
Temperature control:	±3°C
Cold inlet temperature range:	5°C - 20°C
Hot inlet temperature range:	55°C - 85°C
Unbalanced dynamic supply (hot/cold or cold/hot):	Max 2:1 ratio. Recommend +/- 10%
Minimum temperature differential between hot water inlet and mixed water outlet to ensure shut off function:	10°C
Minimum temperature differential between mixed water outlet and cold water inlet to ensure stable operation:	5°C
Tempering Valve max flow rate @ 50kPa pressure loss	50 l/min
Minimum flow rate for stable operation:	6 l/min
Cold water bypass flow (bypass active)	30 l/min cold water (min @ 70kPa dP)
Max static pressure (testing purposes):	1400 kPa
Bypass pressure reducing valve setting (default)	300kPa
Recommended hot & cold inlet working pressure (dynamic):	350kPa – 500kPa

* Recommended dynamic inlet pressure of 350kPa (minimum) based on the cumulative pressure loss of;

- 50kPa mixing valve
- 70kPa for the cold water bypass PRV operation
- 210kPa minimum required after the assembly to the emergency fixtures to comply with AS4775

Note: Pipe friction losses, other valves and fittings not included in minimum inlet pressure recommendation.

DIMENSIONS / COMPONENTS



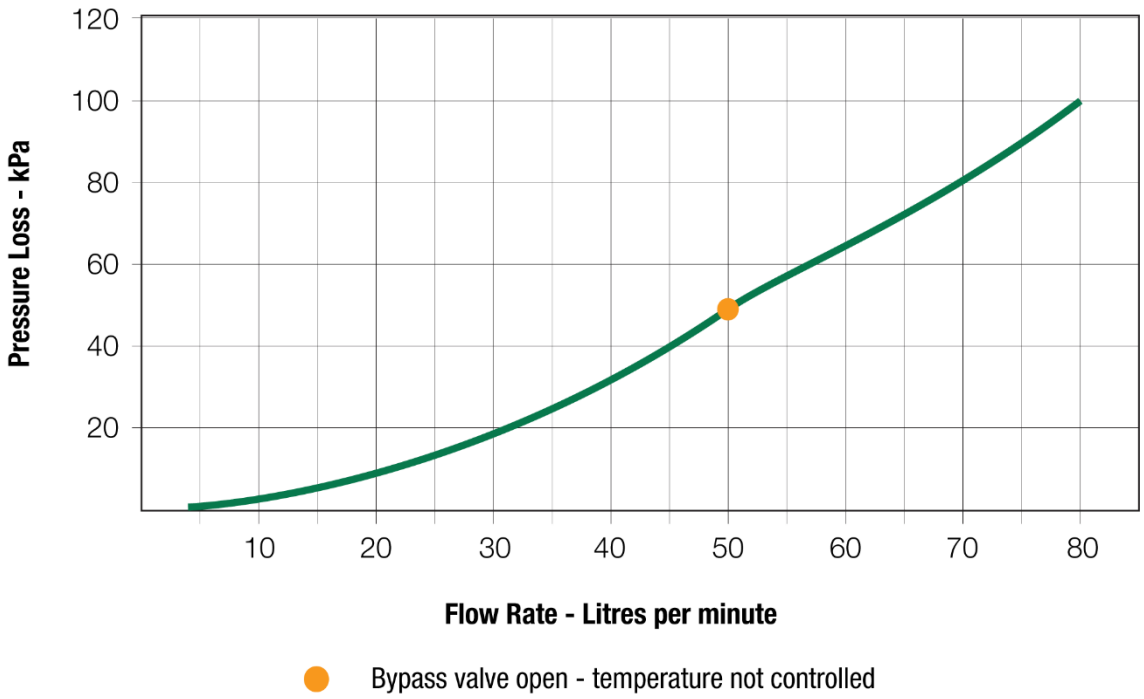
Dimensions (EMF50L-FP)	
Height	400mm
Width	350mm
Depth	80mm
Copper Pipe	100mm

Dimensions (EMF50L-SS)*	
Plumbed in SS box with hinged lid	
Height	650mm
Width	400mm
Depth	70mm
Copper Pipe	100mm

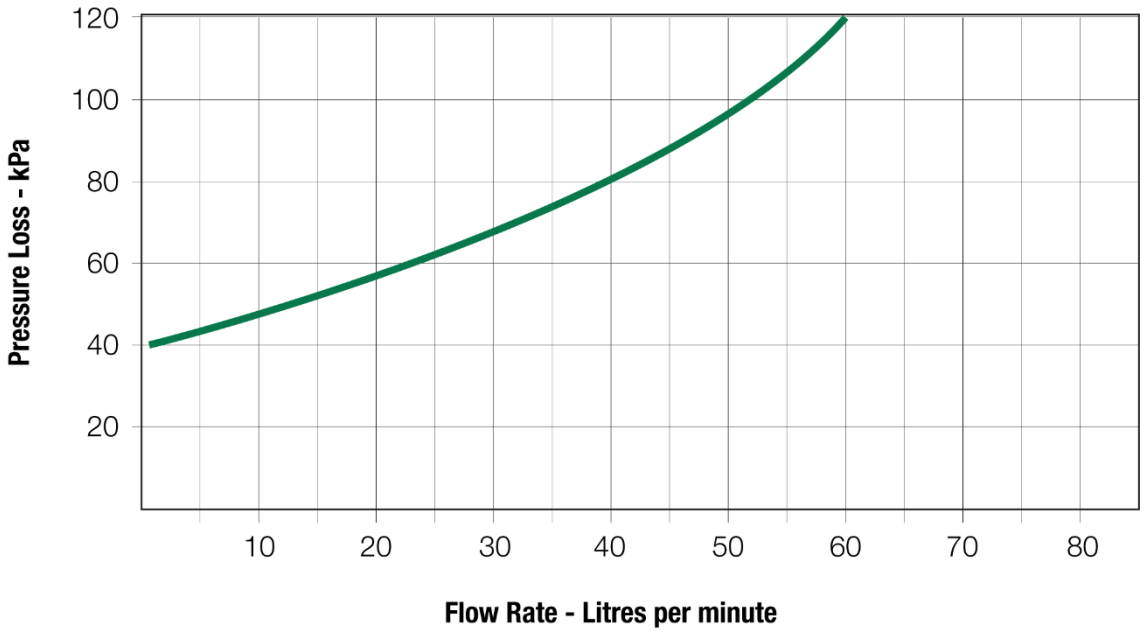
* Contact us for details on the recessed stainless steel enclosure option.

PRESSURE LOSS CHARTS

EMF50L SYSTEM – PRESSURE LOSS



COLD WATER BYPASS – PRESSURE LOSS



INSTALLATION

PROCEDURE

1) Flush and clean the supply pipework before connecting the assembly (see System Parameters).
2) Secure the assembly to a solid wall at the selected location, allowing clearance for servicing.
3) Connect the hot and cold water supplies to the 20mm copper tails, and the outlet to the emergency fixture pipework.
4) Where required, install a safe tray beneath the assembly in accordance with AS/NZS 3500.4.
5) Open the hot and cold isolation valves and check all connections for leaks before proceeding to Commissioning.

SYSTEM PARAMETERS

Prior to the installation of the EMF50L, the system must be checked to ensure that the system operating specifications fall within the recommended operating range of the unit, i.e. verify supply temperatures and pressures, etc, as well as any documented risk assessments in line with AS4775-2026.

The supply system into which the EMF50L is to be installed must be thoroughly flushed and cleaned to remove any debris which may accumulate during the installation. Failure to remove any debris will affect the performance and the manufacturer's warranty on the product.

WATER QUALITY

The EMF50L is compatible with most public water supplies; however, certain water chemistries may negatively impact the system, its components, and fittings.

In areas that are subject to high levels of aggressive water, provision must be made to treat the water prior to it entering the unit.

LOCATION

- The EMF50L is suitable for installation indoors, or outdoors under cover.
- The unit should be installed at a location where it can easily be cleaned, adjusted or repaired.
- Clearance must be allowed for servicing of the tempering valve.
- The unit must be secured to a solid wall and be accessible without the use of a ladder / scaffold.
- The assembly should be installed as close as practicable to the emergency fixture to ensure the flushing fluid reaches the outlet at the required temperature as quickly as possible.
- Where damage to property can occur in the event of the unit leaking, it must be installed over a safe tray. Installation and use of a safe tray must comply with AS/NZS 3500.4 and all local codes and regulatory authority requirements.

COMMISSIONING

Upon completion of the installation, the assembly should be tested and commissioned in accordance with AS 4032.3, AS4775, as per the procedure outlined below or as specified by the local authority.

The following instructions should be read and understood prior to commissioning the EMF50L assembly. If, under any circumstances, there are aspects of the installation/system which do not comply with your requirements or the specifications as laid down, the valve must not be put into service until the installation/system does comply.

We recommend that the commissioning of temperatures are carried out using a suitably calibrated and accurate digital thermometer. The valve is commissioned by measuring the mixed water temperature at the outlet.

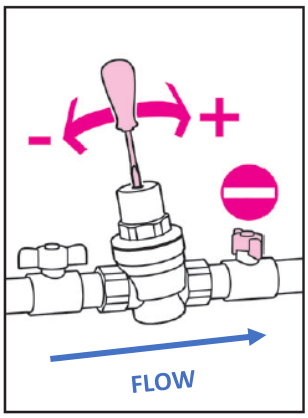
In accordance with the requirements of AS4775, the mixing valve assembly shall deliver tepid water at the outlet of the emergency fixtures at a temperature no more than 37°C. The unit is capable of a temperature range from 20 – 50°C; it is therefore imperative that the temperature is set correctly during commissioning to avoid any risk of scalding, and taking into consideration the chemicals available on site.

TEMPERING VALVE SETTING

The temperature at the outlet of the valve must be set taking into consideration any fluctuations which may occur within the system due to simultaneous demand. Once the supply temperatures are stabilised and the normal operating conditions are established, the valve can be commissioned.

1) Close the cold water bypass isolation valve.
2) We suggest that the following sequence is followed when commissioning the valve.
    a) Open the eye (eye/face) wash outlet.
    b) Set the mixed water discharge temperature to the required temperature (see temperature adjustment section).
    c) Measure and record the temperature of the water discharging from the outlet and ensure the required blend temperature is achieved.
    d) Measure and record the temperature of hot and cold water supplies at the connections to the valve.
    e) Measure and record the downstream pressure shown on the PRV gauge. Ensure it is greater than 300kPa during flow.
    f) Perform the thermal shut-off test. Isolate the cold water supply to the Caleffi tempering valve and monitor the mixed water temperature. The outlet flow should quickly cease flowing. If it does not stop, then review the troubleshooting guide in this manual.
    g) Restore the cold water supply to the valve and measure and record the outlet temperature after the mixed water temperature has stabilised. The final temperature found during this test should not exceed the permitted values +/-3°C.
    h) Once the desired temperature has been reached, the adjustment spindle can be locked in position using the locking nut supplied with the valve and replace the cap to prevent tampering by unauthorised persons.

COLD WATER BYPASS SETTING



1) Close the hot and cold inlet isolation valves to the tempering valve.
2) Briefly open the emergency fixture to bleed some pressure from the assembly and then close the fixture again.
3) Verify the cold water bypass pressure reducing valve setting during no flow conditions.
   It should be set to 300kPa, or 10% lower than the downstream pressure recorded during
   Step 2) e) of the tempering valve commissioning, whichever is greater.
4) If required, reset the pressure by turning the screw on the top of the plastic cover. Turn it clockwise to increase the pressure and anticlockwise to decrease it and verify the pressure on the gauge.
   Note: Step 2 may need to be repeated whilst setting the PRV.

COLD WATER BYPASS FLOW TEST

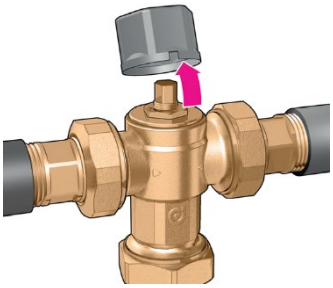
1) Open all isolation valves and then open the eye (eye/face) wash outlet.
2) Simulate a hot water failure by closing the hot water isolation valve to the tempering valve. The water supply to the eye / face wash should now be cold.
3) Time the outlet flow into a container of known volume and confirm the calculated rate.
   The minimum flow rate should be 30 l/min. If not, review the troubleshooting guide of this manual
   Note: The cold water bypass design allows for minimum flow in the unlikely event that the heated water source or tempering valve fails, thereby ensuring the functionality of the emergency fixture is maintained as required by ANSI Z358.1-2014.
4) Restore the hot water supply to the valve and measure and record the outlet temperature after the mixed water temperature has stabilised. The final temperature found during this test should not exceed the permitted values +/-3°C.

FINAL COMMISSIONING

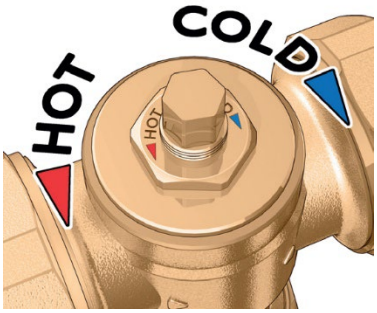
1) When the tempering valve and pressure cold water bypass has been commissioned, open all cold and hot tempering valve isolation valves, including the cold water bypass PRV isolation valve.
2) If multiple emergency eye (eye/face) wash fixtures are serviced from the EMF50L unit and expected to operate simultaneously, then open all the connected outlets for simultaneous flow. *
3) Measure and record the temperature at the outlets.
   Note: If the final measured temperature with all valves operating at the outlet is higher than the required temperature, then it is necessary to repeat steps the commissioning of the tempering valve and cold water bypass.
4) We recommend that the above information is recorded in the Commissioning Report and updated on a Service Report when any work is carried out on the valve.

* Note: If the flow rate exceeds approx. 50 l/min (50kPa pressure loss), or if there is a blockage in one of the mixing valve inlets, then the bypass PRV may open and allow some cold water to enter the tepid outlet, thereby supplying slightly lower temperature water from the assembly to the emergency eye / face wash fixture.

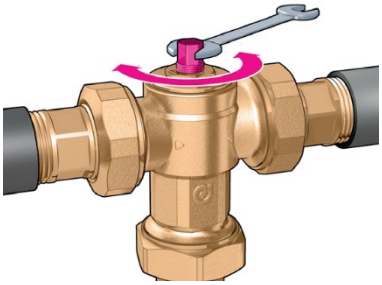
TEMPERATURE ADJUSTMENT



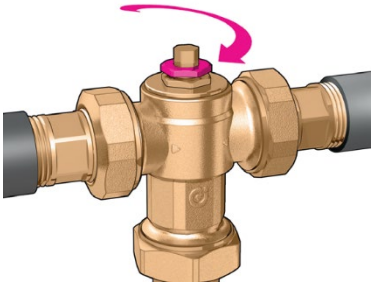
1. Using a flat-blade screwdriver, remove the tamper-resistant cap from the top of the valve.



2. Direction of temperature adjustment.



3. Rotate the cap clockwise to reduce the outlet temperature, or anticlockwise to increase it, monitoring the temperature at the test point until the required set-point is reached.



4. Remove the adjustment cap, then tighten the locking nut to lock the spindle in position and refit the tamper-resistant cap.

MAINTENANCE

Tests should be carried out periodically to monitor the performance of the valve in accordance with AS 4032.3. Deterioration in performance can indicate the need for varying water supply conditions and/or maintenance or replacement of the valve. If, during these tests, the mixed water temperature has changed significantly from the previous test results, record the change before re-adjusting the mixed water temperature. If the final mixed water temperature is greater than the permitted values, we recommend that the details quoted in Installation and Commissioning sections are verified and that service work is required.

We recommend that the following checks are carried out at least every 12 months.

TEMPERING VALVE

With reference to the exploded diagram in the Spare Parts section:

1) On the Caleffi 5213 series valves, the inlet strainers (8) on both hot and cold water inlets can be removed for cleaning by unscrewing the inlet union nuts and carefully pulling apart the connecting pipework.
2) The built-in check valves (7) on the Caleffi 5213 series valves can be accessed in a similar way to 1) to ensure freedom of operation and correct seating.
3) Limescale can be removed by immersion in a suitable de-scaling fluid.
4) The valve body must not be disassembled.

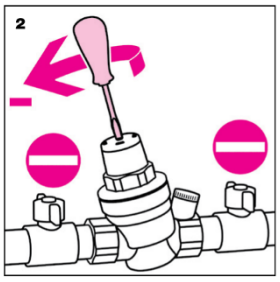
When this maintenance is complete, we recommend that the commissioning process is repeated. Should the valve still not function correctly, it may be necessary to replace it. We recommend that, as a safety measure, the Caleffi 5213 series is replaced after 5 years service.

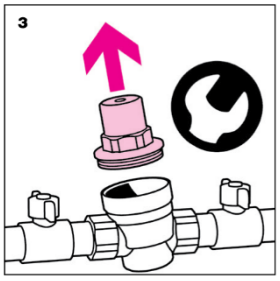
PRESSURE REDUCING VALVE

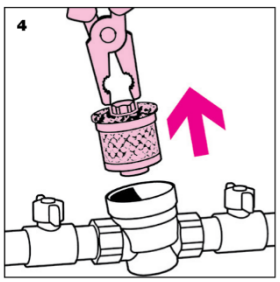
Even when installed, commissioned and serviced properly, the reducing valve's internal components are subject to normal wear and tear, which may result in leaks and other malfunctions. We advise that you check that it is in good working order and service and clean the cartridge at least every 12 months.

Proceed as follows for periodic cleaning of the strainer and inspection of the cartridge:

1) Turn off upstream water supply to the pressure reducing valve and tempering valve, and open an outlet downstream to relieve pressure
2) Unscrew (anticlockwise) the setting screw to decompress the spring inside.
3) Unscrew the cover.
4) Extract the cartridge with the aid of pincers to grip the head of the screw.
5) After inspection and cleaning, refit the cartridge or, alternatively, fit a replacement cartridge
   (cover tightening torque: 20–25 N·m).
6) Reset the valve (see Commissioning).

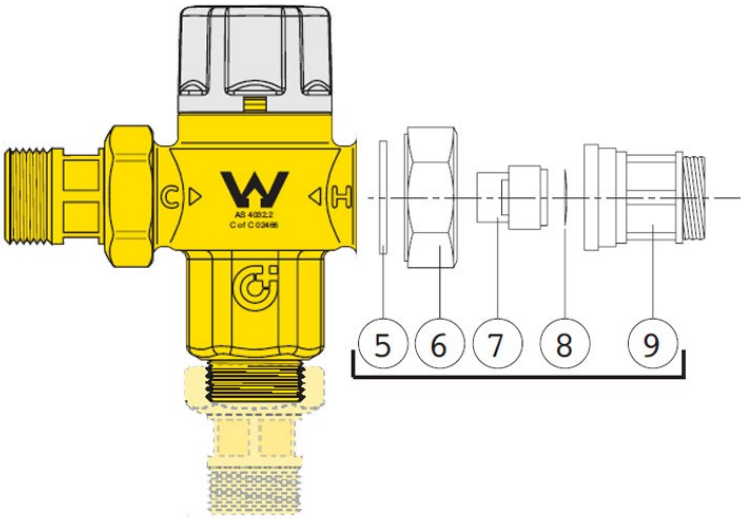






SPARE PARTS

TEMPERING VALVE



Code: **R0002064**

Complete set of valve tail pieces;
2x with check valves & strainer (inlets)
1x without check (outlet)
3x nuts and washers

PRESSURE REDUCING VALVE

Code: **533000H**

Replacement pressure reducing valve cartridge.

TROUBLESHOOTING

Symptom	Cause	Corrective Action
Hot water at the fixture	a) Operation of the insert check valve is hindered; check valve is not sealing correctly. b) Dynamic o-ring in tempering valve not sealing or is compromised.	• Replace faulty check valves • Clean debris or scale from valve. • Replace tempering valve
Cold water at the fixture	a) Cold water bypass pressure reducing valve not operating correctly – incorrect setting, wear or debris. b) Operation of the insert check valve is hindered; check valve is not sealing correctly. c) Dynamic o-ring in tempering valve not sealing or is compromised.	• Check PRV setting (commissioning) • Service or replace PRV cartridge • Replace faulty check valves • Clean debris or scale from valve. • Replace tempering valve
Fluctuating mixed water temperature	a) Erratic supply temperatures at the inlets of the valve. b) Starvation of the water supplies at the inlets of the valve. c) Incorrect commissioning of the valve.	• Restore inlet conditions within the limits of the valve.
Erratic flow of water from the valve	a) Insufficient water supplies. b) Fluctuations in supply pressures/temperatures. c) Adverse effect created by other draw off points on the system.	• Stabilise inlet supply conditions.
Reduced or no flow of water from the tempering valve	a) In-line filters blocked. b) Insufficient supply pressures. c) Debris obstructing valve operation.	• Clean filters. • Restore inlet supplies. • Clean debris or scale from valve.
Tempering valve does not shutoff when tested	a) Installation not in accordance with our recommendations. b) The minimum temperature differential not achieved. c) Internal mechanism hindered by debris.	• Install as outlined in the instructions. • Raise hot water temperature. • Clean debris or scale from valve.
Not sufficient flow through CW bypass pressure reducing valve (< 30l/min)	a) Installation not in accordance with our recommendations b) Insufficient supply pressures. c) Debris obstructing valve operation.	• Install as outlined in the instructions. • Restore inlet supplies. • Clean debris or scale from valve.

COMMISSIONING REPORT

EMF50L Emergency Mixing Valve Assembly

Owner/occupier _____ **Authorized tester** _____

Address _____ **Licence number** _____

Date of test _____

Location of valve: _____

DETAILS OF TEST AND MAINTENANCE

Strainers	Cleaned ☐	Replaced ☐
Non-return valves	Cleaned ☐	Replaced ☐
O-rings and seals	Cleaned ☐	Replaced ☐
Tempering Valve	Cleaned ☐	Replaced ☐
PRV cartridge	Cleaned ☐	Replaced ☐
Other _____	Cleaned ☐	Replaced ☐

TEMPERING VALVE COMMISSIONING

Temperature of hot water °C _____

Temperature of cold water °C _____

Temperature of mixed water at single fixture flow °C _____

at simultaneous flow °C (if applicable) _____

Downstream pressure during flow _____

Cold water bypass test Passed ☐

COLD WATER BYPASS COMMISSIONING

Cold water bypass setting (no flow) _____

Hot water isolation test (CW bypass active) Passed ☐

Cold water bypass flow rate _____

Element/critical component replacement due: _____

Next field test and maintenance due: _____

Authorized tester's signature _____ Date: _____

This report must be retained on site in accordance with AS4032.3.

WARRANTY

1. The product is warranted for 12 months from date of purchase subject to the terms and conditions contained herein.
2. To claim under this warranty, the product must cease to be used at the time any fault arises and All Valve Industries Pty Ltd ("the Company") must be contacted and notified of the fault.
3. Any claims under this warranty must be sent to the Company in writing by email to info@allvalve.com.au.
4. Subject to compliance with Clauses 2 and 3, the product will be replaced, repaired or parts replaced free of charge by the Company if, at the sole determination of the Company, the product is found to be faulty within the warranty period.
5. This warranty only applies to products sold and distributed within Australia by the Company on or by the authorised distributors of the Company.
6. This warranty only applies if the product has been used in accordance with the manufacturer's instructions under normal use and with reasonable care (in the opinion of the Company) subject to all terms and conditions set out in this document and in the instruction manuals.
7. This warranty does not cover:
    i. Defects or damages resulting from the misuse of this product.
    ii. Defects or damages from abnormal use, improper storage or corrosive environments, unauthorised modifications, unauthorised repair, neglect, rough handling, abuse, accident, alteration, improper installation, ingress of dirt, dust, acts of God.
    iii. Breakage or damage to parts unless caused directly by defects in materials or workmanship.
    iv. The cost of delivery or transportation of the product.
    v. Normal wear and tear and reasonable abrasion.
    vi. If the product has been modified or repaired by anyone other than by the Company arising from a warranty service or if it is repaired using unauthorised spare parts.
    vii. The cost of new installation or complete removal of the product.
    viii. Damage to the components due to improper installation or improper use of the product
8. The Company is not liable for any damages incurred while using this product or if this product becomes faulty during use.
9. Our product comes with a guarantee that cannot be excluded under the Australian Consumer Law. You are entitled to a replacement or refund for a major failure and compensation for any other reasonably foreseeable loss or damage. You are also entitled to have the product repaired or replaced if the product fails to be of acceptable quality and the failure does not amount to a major failure.

LIMITED WARRANTY

NOTHING IN THIS PRODUCT WARRANTY INFORMATION IS INTENDED TO HAVE THE EFFECT OF CONTRACTING OUT OF ANY APPLICABLE PROVISIONS OR RIGHTS AND REMDEIES OF THE AUSTRALIAN CONSUMER LAW, EXCEPT TO THE EXTENT PERMITTED WHERE APPLICABLE. TO THE EXTENT PERMITTED BY APPLICABLE LAW, THIS LIMITED WARRANTY IS YOUR SOLE AND EXCLUSIVE REMEDY AGAINST THE COMPANY. HOWEVER, THIS LIMITED WARRANTY SHALL NOT EXCLUDE NOR LIMIT ANY OF YOUR LEGAL (STATUTORY) RIGHTS UNDER THE APPLICABLE NATIONAL LAWS. TO THE EXTENT PERMITTED BY APPLICABLE LAW THE COMPANY DOES NOT ASSUME ANY LIABILITY FOR LOSS OF OR DAMAGE TO OR CORRUPTION OF DATA, FOR ANY LOSS OF PROFIT, LOSS OF USE OF PRODUCTS OR FUNCTIONALITY, LOSS OF BUSINESS, LOSS OF REVENUES OR LOSS OF ANTICIPATED PROFIT, INCREASED COSTS OR EXPENSES OR FOR ANY INDIRECT, OR SPECIAL OR CONSEQUENTIAL LOSS OR DAMAGE. TO THE EXTENT PERMITTED BY APPLICABLE LAW. THE COMPANY'S LIABILITY IS LIMITED TO THE PURCHASE VALUE OF THE PRODUCT. THE ABOVE LIMITATIONS SHALL NOT APPLY TO DEATH OR PERSONAL INJURY CAUSED BY DEFECT OF PRODUCT IN MATERIAL, DESIGN AND WORKMANSHIP.