

## SinkMixer™ Scald Protection Thermostatic Mixing Valve

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**code 521201A, AP**

### INSTALLATION AND COMMISSIONING MANUAL

#### Function



The Caleffi SinkMixer™ provides water at a safe and usable temperature in situations where the control of the temperature of the water discharging from a terminal fixture is of the utmost importance, i.e. within hospitals, schools, nursing homes, etc. The SinkMixer is used in under sink and under counter applications where the user must be protected from the danger of scalding caused by hot water. The valve is designed to prevent the flow of water discharging from the mixed water outlet in the event of the failure of hot or cold supply. The compact design provided with mounting bracket allows for easy installation. The cold water outlet to the fixture eliminates the need for additional piping and tee used with three-port mixing valves. For single-pipe fixtures (tempered water only), code 521201AP includes a plug for the valve cold outlet port and copper compression fittings kit for hard pipe installations. The valve is complete with check valves on the hot and cold inlets and meets certification requirements for the Low Lead Plumbing Laws and NSF/ANSI/CAN 61 by ICC-ES, ASSE 1070 listed (temperature cannot exceed 120°F).

#### Product range

**NSF/ANSI/CAN 61**

521201A SinkMixer scald protection thermostatic mixing valve,..... 3/8" compression  
 521201AP includes plug for cold water outlet and copper compression fittings kit.....  
 3/8" compression

#### Technical specifications

##### Materials:

- Valve body, regulating spindle, spring holder and cold inlet union nut: Low-lead brass (<0.25% lead content)
- Internal shutter: Polysulfone
- Hot inlet strainer: AISI 304 stainless steel
- Spring: AISI 302 stainless steel
- Seals: Peroxide-cured EPDM
- Cover: ABS white
- Mounting bracket and adjustment key: Polyamide Nylon

Temperature adjustment range: 95–120°F (35–50°C)  
 Temperature set: must be commissioned on site to achieve desired temperature  
 Temperature stability: ±3°F (±2°C)

Cold inlet temperature: Minimum 39°F (4°C); Maximum 85°F (29°C)  
 Hot inlet temperature: Minimum 120°F (49°C); Maximum 195°F (90°C)  
 Factory setting: 113°F (45°C)  
 Maximum operating differential pressure: Static: 150 psi (10 bar); Dynamic: 70 psi (5 bar)  
 Minimum operating differential pressure (dynamic): 1.5 psi (0.1 bar)  
 Maximum unbalanced dynamic supply (hot/cold or cold/hot): 2:1  
 Minimum temperature differential between hot water inlet and mixed water outlet to ensure thermal shutoff function: 18°F (10°C)  
 Minimum temperature differential between mixed water outlet and cold water inlet to ensure stable operation: 9°F (5°C)  
 Minimum flow rate for optimum operation: 0.35 gpm (1.3 l/min)  
 Maximum flow rate for optimum operation: 2.3 gpm (8.5 l/min)

**Certifications:**

1. ASSE 1070/CSA B125.3-2012, certified by ICC-ES, file PMG-1358.
2. NSF/ANSI 372, Drinking Water System Components-Lead Content Reduction of Lead in Drinking Water Act, California Health and Safety Code 116875 S.3874, Reduction in Drinking Water Act, Vermont Act 193 - The Lead in Plumbing Supplies Law and Maryland's Lead Free Law HB.372, certified by ICC-ES, file PMG-1360.
3. NSF/ANSI/CAN 61-2018, Drinking Water System Components –Health Effects, certified by ICC-ES, file PMG-1512.
4. Complies with codes IPC, IRC, UPC and NPC.



**SAFETY INSTRUCTION**

This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety alert symbol means **ATTENTION! BECOME ALERT! YOUR SAFETY IS INVOLVED! FAILURE TO FOLLOW THESE INSTRUCTIONS MAY RESULT IN A SAFETY HAZARD.**



**WARNING:** This product can expose you to chemicals including lead, which is known to the State of California to cause cancer and birth defects or other reproductive harm. For more information go to [www.P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).



**CAUTION:** All work must be performed by qualified personnel trained in the proper application, installation, and maintenance of systems in accordance with all applicable codes and ordinances.



**CAUTION:** If the thermostatic mixing valve is not installed, commissioned and maintained properly, according to the instructions contained in this manual, it may not operate correctly and may endanger the user.



**CAUTION:** Make sure that all the connecting pipework is water tight.



**CAUTION:** When making the water connections, make sure that the pipework connecting the thermostatic mixing valve is not mechanically over-stressed. Over time this could cause breakages, with consequent water losses which, in turn, could cause harm to property and/or people.



**CAUTION:** Water temperatures higher than 100°F can be dangerous. During the installation, commissioning and maintenance of the thermostatic mixing valve, take the necessary precautions to ensure that such temperatures do not endanger people.

**Leave this manual for the user.**



**CAUTION:** To prevent any damage which will cause the thermostatic mixing valve to not operate correctly, treat highly aggressive water before entering the thermostatic mixing valve.



## CONSIGNE DE SÉCURITÉ

Ce symbole d'avertissement servira dans ce manuel à attirer l'attention sur la sécurité concernant instructions. Lorsqu'il est utilisé, ce symbole signifie.

**ATTENTION! DEVEZ ALERTE ! VOTRE SÉCURITÉ EST EN JEU ! NE PAS SUIVRE CES INSTRUCTIONS PEUT PROVOQUER UN RISQUE DE SECURITE.**



**AVERTISSEMENT:** Ce produit peut vous exposer à des produits chimiques comme le plomb, qui est connu dans l'État de Californie pour causer le cancer, dommages à la naissance ou autre. our plus d'informations rendez-vous [www. P65Warnings.ca.gov](http://www.P65Warnings.ca.gov).



**ATTENTION:** Tous les travaux doivent être effectués par du personnel qualifié formé à la bonne application, installation et maintenance des systèmes conformément aux codes et règlements locaux.



**ATTENTION:** Si le réducteur de pression, thermostatico regolabile, n'est pas installé, mis en service et entretenu correctement, selon les instructions contenues dans ce manuel, il peut ne pas fonctionner correctement et peut mettre en danger l'utilisateur.



**ATTENTION:** S'assurer que tous les raccordements sont étanches.



**ATTENTION:** Lorsque vous effectuez les raccordements d'eau, assurez-vous que la tuyauterie reliant le thermostatico regolabile n'est pas mécaniquement overstressed. Au fil du temps, ceci pourrait causer des ruptures, avec pour conséquence des pertes en eau qui, à leur tour, peuvent causer des dommages à la propriété et/ou les gens.



**ATTENTION:** Les températures de l'eau supérieure à 100°F (38°C) peut être dangereux. Au cours de l'installation, mise en service et l'entretien de le réducteur de pression, le thermostatico regolabile, prendre les précautions nécessaires afin de s'assurer que de tels températures ne compromettent pas les gens.



**ATTENTION:** Pour prévenir tout dommage qui provoque le thermostatico regolabile à ne pas fonctionner correctement, le traitement de l'eau très agressive avant d'entrer dans la vanne de le thermostatico regolabile.

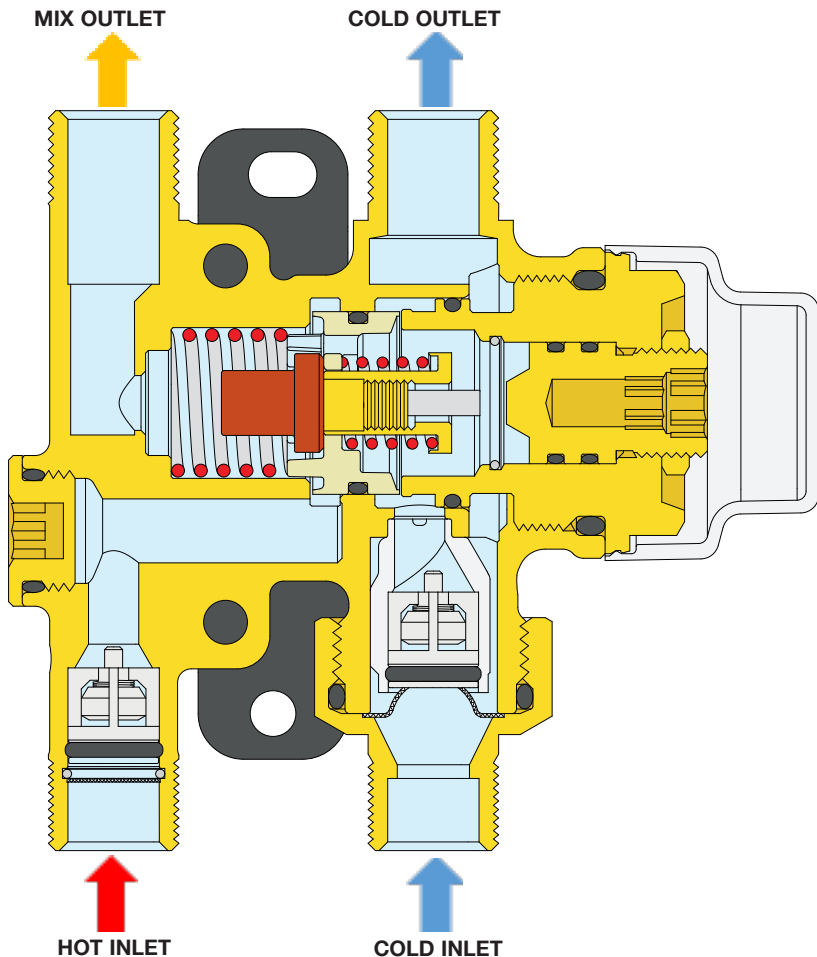
**LAISSEZ CE MANUEL AVEC L'UTILISATEUR**

## Operating principle

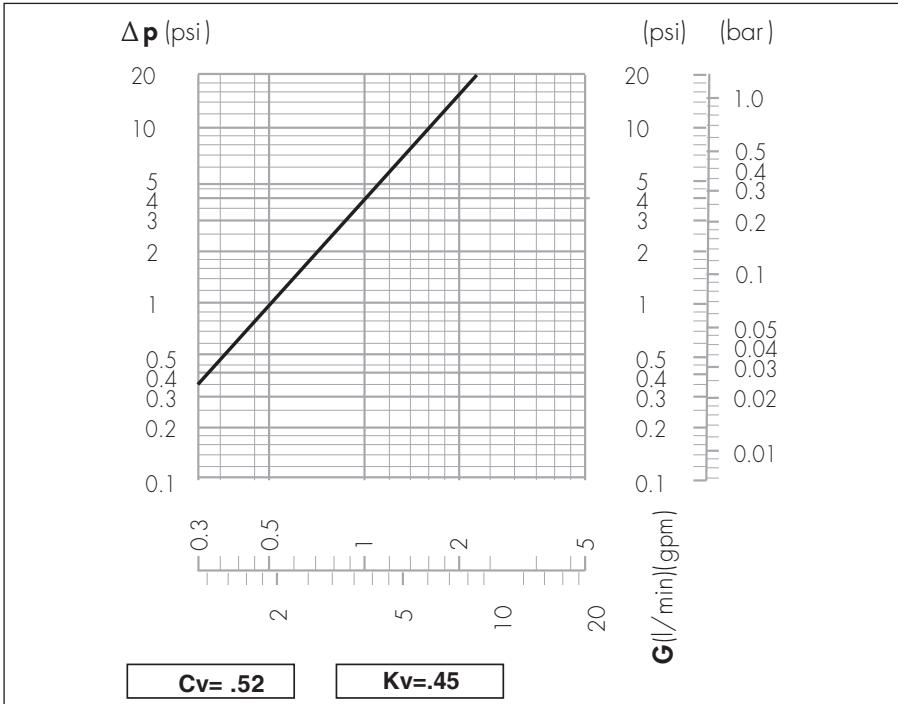
The thermostatic mixing valve mixes hot and cold water in such a way as to maintain constant set temperature of the mixed water at the outlet. A thermostatic element is fully immersed into the mixed water. This element then contracts or expands causing movement of the piston, closing either the hot or cold inlets, regulating the flow rates entering the valve. If there are variations of temperature or pressure at the inlets, the internal element automatically reacts to restore the original temperature setting. In the event of a failure of either the hot or cold supply, the piston will shut off, stopping water discharging from the mixed water outlet.

## Thermal shutoff

In the event of a failure of the hot supply port, the piston closes the cold supply port. Similarly, if the cold water supply fails, the piston closes the hot supply port. The thermostatic mixing valve requires a minimum temperature differential from hot inlet to mixed water outlet of 18°F (10°C) to ensure the correct operation of the thermal shutoff feature.



## Flow curve



Flow should never exceed standards for pipe size and materials.

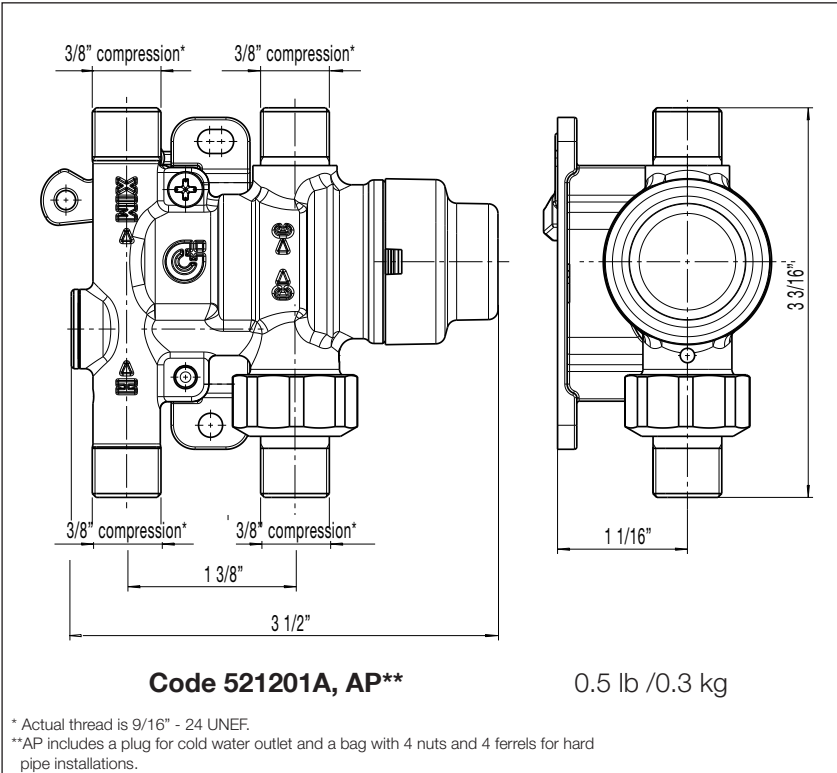
## Use

The Caleffi SinkMixer thermostatic mixing valve is intended for use in under sink and under counter applications in accordance with installation rules and indications specified in ASSE 1070 standards.

The system must be sized taking into account the current legislation with regard to the nominal flow rate of each outlet.

The SinkMixer is used to prevent accidental scalding with the outlet water temperature properly adjusted using a thermometer at the faucet to measure the desired temperature.

## Dimensions



## Replacement parts

Replacement check valve and strainers for 521201A under sink thermostatic mixing valves.



F0001270.....check valve and two strainers, one set for the cold inlet port and one set for the hot inlet port.

5-pack of plugs/nuts to plug the valve cold outlet port when using 521201A with a single-pipe fixture.



NA10741.....plug/nut  
 3/8" compression (5-pack)

## Installation

The following instructions must be read prior to the installation of a Caleffi SinkMixer thermostatic mixing valve. The installer should also be aware of his responsibility and duty of care to ensure that all aspects of the installation comply with current regulations and legislation. The Caleffi SinkMixer should be installed using the appropriate standard, code of practice and legislation applicable to each state and following the details in this manual. The Caleffi SinkMixer series must be installed by a licensed plumber.

Prior to the installation of the valve, the system must be checked to ensure that the **system operating conditions fall within the recommended operating range of the valve, i.e. verify supply temperatures, supply pressures, risk assessments, etc.**

The supply system into which the Caleffi SinkMixer 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. In areas that are subject to high levels of aggressive water, provision must be made to treat the water prior to it entering the valve.

The valve is recommended to be installed in a position oriented with the cover to the right with cold inlet/outlet on the right side (allowing direct connection to the sink's cold water inlet fitting) resulting in the hot inlet/mix outlet on the left aligning direct to the hot water inlet sink fitting. It is essential that the access to the valve is not obstructed for future maintenance that may be required to the valve or associated fittings.

It is essential that when the installation is designed and/or installed, all current legislation is noted, e.g. the maximum distance from the outlet of the valve to any terminal fitting.

The connecting hot and cold water supplies must be connected to the valve strictly in accordance with the indications on the body of the valve. The inlets of the valves are clearly marked with the letter H (Hot) and C (Cold). The outlet is marked with the word MIX. The valve has male 3/8" compression threads for connection to standard 3/8" compression faucet connectors and stops.

Where one or both the incoming supply pressures are excessive, a Caleffi pressure reducing valve should be installed to reduce the pressure(s) within the limits.

The Caleffi SinkMixer valve is supplied complete with the check valves at the hot and cold inlets.

Mount the SinkMixer valve to the wall underneath the sink with black plastic mounting bracket supplied with valve but not attached. Use mounting screw to attach the mounting bracket to the valve to meet the orientation described above. Break off the adjustment key for adjusting the temperature, see commissioning section.

To ensure that the performance of the Caleffi SinkMixer valve is maintained (in the event of cold water failure), the temperature of the hot water supply at the point of entry to the valve must be a minimum of 18°F higher than the set mixed water discharge temperature.

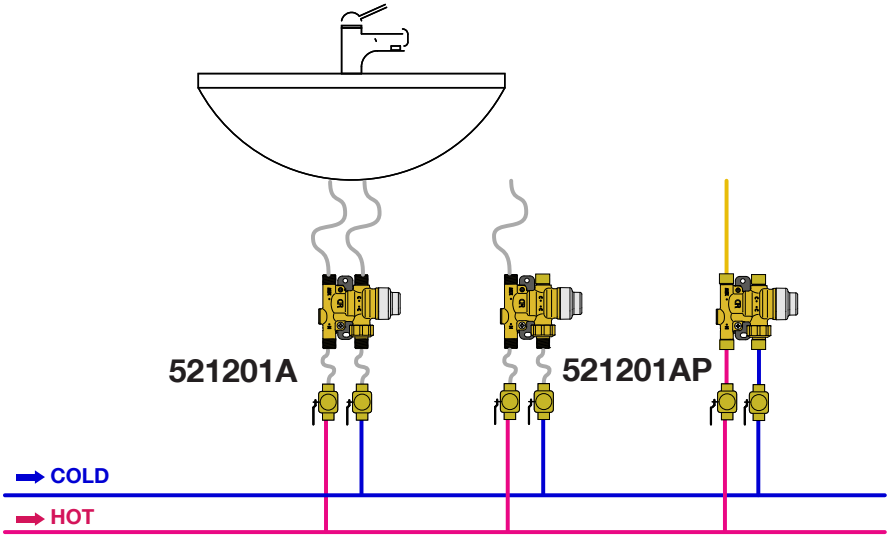
If the valve is not installed correctly, it will not function correctly and may put the user in danger.

For single-pipe fixtures (tempered water only), code 521201AP comes complete with a plug/nut for the valve cold outlet port. Code NA10741 is a 5-pack of plugs/nuts to plug cold outlet port when installing code 521201A (unit coming without this plug/nut) in single pipe fixture undersink piping. Code 521201AP also includes a copper compression fittings kit for hard pipe installations.



# Installation diagram

Point of use





## Commissioning

Upon completion of the installation, the valve should be tested and commissioned as per the procedure outlined below or as specified by the local authority.

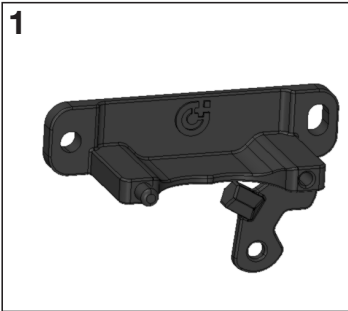
The following instructions should be read and understood prior to commissioning the Caleffi SinkMixer thermostatic mixing valve. If, under any circumstances, there are aspects of the installation/system which do not comply with our requirements or the specifications as listed, the valve must not be put into service until the installation/system does comply.

- 1) Ensure that the system is thoroughly clean and free from debris prior to commissioning the thermostatic mixing valve.
- 2) Use a suitably calibrated, accurate digital thermometer to commission temperatures by measuring the mixed water temperature at the outlet.
- 3) In accordance with the anti-scald requirements, water installation shall deliver hot water at the outlet of the sanitary fixtures used primarily for personal hygiene purposes at a temperature not exceeding 120°F (49°C) or as specified by authority having jurisdiction.
- 4) The temperature at the outlet of each valve must be set taking into consideration any fluctuations which may occur within the system due to simultaneous demand.
- 5) Once the supply temperatures are stabilized and the normal operating conditions are established, the valve can be commissioned. The temperature setting can be adjusted by with the black plastic adjustment 1/4" hex key, included separately in the box.  
Break off from the mounting bracket. Use the following sequence when commissioning the valve.
  - a) Using a thermometer, measure the temperature of the sink faucet discharge with the hot tap open, cold tap closed. The temperature should not exceed the temperature allowed by the applicable standard or code of practice for each state.
  - b) Adjust mixing valve to desired faucet discharge temperature, with provided 1/4" hex key.
  - c) Perform the thermal shut-off test. Isolate the cold water supply to the Caleffi valve and monitor the mixed water temperature. The outlet flow should quickly cease flowing.
  - d) Restore the cold water supply to the valve and measure and record the outlet temperature after the mixed water temperature has stabilized. The final temperature found during this test should not exceed the permitted values  $\pm 3^{\circ}\text{F}$ .
- 6) Once the desired temperature has been reached, remove the adjustment key and store in a safe place that can be located if required in the future.

We recommend that the above information is recorded in the Commissioning Report and updated on the Service Report when any work is performed on the valve.

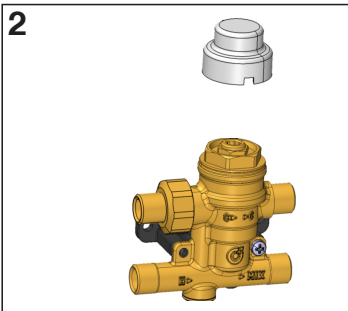
## Temperature adjustment

1



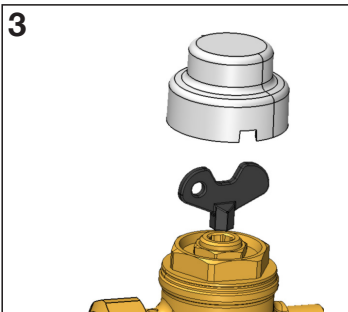
Remove 1/4" hex key from mounting bracket.

2



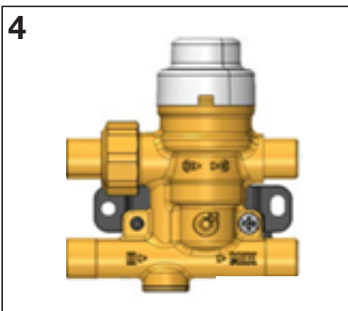
Remove white cap.

3



Adjust temperature setting with 1/4" hex key. After adjustment, lock the temperature with locking nut.

4



Replace cap and store key in safe place.

## Maintenance

In service tests should be conducted regularly to monitor and record the performance of the valve. Deterioration in performance can indicate the need for servicing of the valve and/or water supply. 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, Verify details quoted in the Installation and Commissioning sections of this manual and that service work is required.

The following actions are recommended at least every 12 months, or more frequently if the need arises, and that the following steps are checked to maintain optimum valve performance.

Use the following recommended procedure:

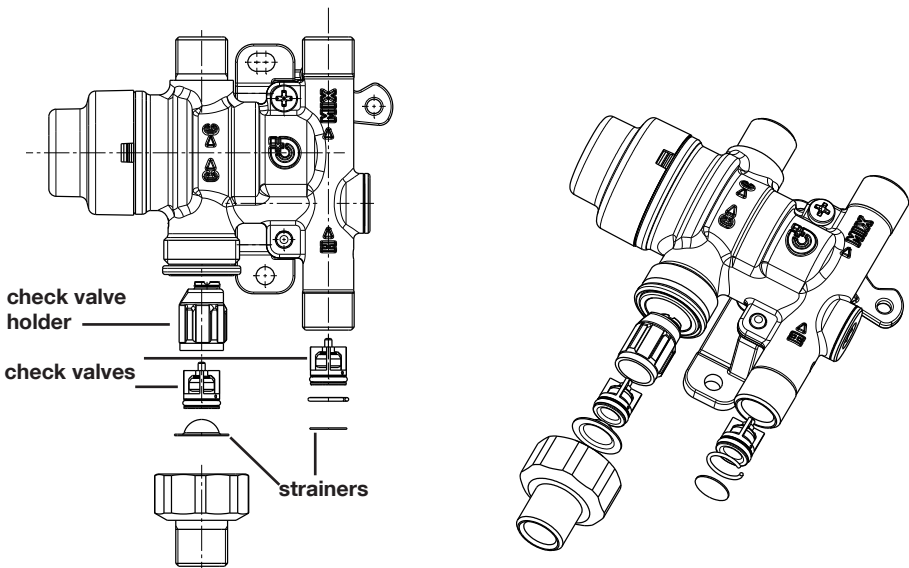
- 1) On the Caleffi SinkMixer valves, the inlet strainers on both the hot and cold water inlet ports can be removed for cleaning by unscrewing the inlet union nut on the cold port and, with a screw driver, pop strainer out of the hot port.
- 2) If service is required, cleaning and de-scale as needed, or replace these check valves, see page 6 for code numbers.

Once the above servicing is performed follow the commissioning details in the previous section ensuring that a suitably accurate thermometer is used.

Should the valve still not function correctly, it may be necessary to replace the valve entirely. Contact Caleffi Technical Support for details and advice.

## Spare parts

Spare parts are available for the Caleffi SinkMixer valves, see page 6.



## Troubleshooting

Under normal operating conditions the Caleffi 5212 series thermostatic mixing valve will provide a very high level of performance. However, in some circumstances, when the included maintenance plan is not properly performed, the following problems may arise.

Sympton	Cause	Corrective action
Hot water at the cold faucets	<ul style="list-style-type: none"> <li>a) Inserted check operation failed.</li> <li>b) Check valves not installed.</li> </ul>	Replace faulty check valves.
Fluctuating mixed water temperature	<ul style="list-style-type: none"> <li>a) Erratic supply temperatures at the valve inlets.</li> <li>b) Starvation of the water supplies at the valve inlets.</li> <li>c) Incorrect commissioning of the valve.</li> </ul>	Restore inlet conditions within the limits of the valve.
Erratic flow of water from the valve	<ul style="list-style-type: none"> <li>a) Insufficient water supplies.</li> <li>b) Fluctuations in supply pressure and/ or temperatures.</li> <li>c) Adverse effect created by other draw-off points on the system.</li> </ul>	Stabilize inlet supply conditions.
No water flowing from the valve	<ul style="list-style-type: none"> <li>a) In-line strainers blocked.</li> <li>b) Insufficient supply pressures.</li> <li>c) Debris obstructing valve operation.</li> </ul>	<ul style="list-style-type: none"> <li>a) Clean or replace strainers.</li> <li>b) Restore inlet supplies.</li> <li>c) Clean debris or scale from valve internals.</li> </ul>



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