

TankMixer™ and TankMixer™ Compact thermostatic mixing valve kit

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520 Series



Function

The Caleffi TankMixer™ maintains the desired output temperature of the mixed water supplied at a constant setpoint compensating for both temperature and pressure fluctuations of the incoming hot and colder water. The TankMixer allows the water heater thermostat to be set higher than the mixing valve setting, increasing the effective capacity of the heater.

The TankMixer series combines the high-performing AngleMix three-way point of distribution thermostatic mixing valve with a cold water supply cross, which contains an integral check valve for the flow to the mixing valve and ½” NPT female threaded recirculation tap, that can be plugged if not used. The AngleMix angle style mixing valve body design offers improved fluid dynamics for better performance and reduces installation labor and materials, eliminating a piping elbow in typical installations. The AngleMix also features a thermal shut-off function that operates in the event of a cold water supply failure at the inlet.

The TankMixer features a flexible pipe for easy installation directly on a typical gas-fired water heater and other water heaters that have a flue or fan-powered exhaust in between the cold inlet and hot outlet pipe nipples.

The TankMixer Compact provides two pivoting brass connectors for easy installation directly on typical electric water heaters and heat pump water heaters. It has unique ¾” pivot connectors that adapt to heater nipples spaced from 3” to 8” on-center.

**ASSE 1017
NSF/ANSI/CAN 372**



The TankMixer thermostatic mixing valve kits have been certified to ASSE 1017, CSA B125.3 and US and Canadian plumbing codes. The products also meet NSF/ANSI/CAN 372 for low lead and lead free materials requirements for products in drinking water systems. Certified and listed by ICC-ES.

Product range

TankMixer

52050_AX series kit:

Adjustable 3-way thermostatic mixing valve kit, with flexible pipe.....
union system connections ¾” sweat, press, and NPT male

52051_AX series kit: 52050_AX series kit with mixed outlet temperature gauge.

TankMixer Compact

52051_AP series kit:

Adjustable 3-way thermostatic mixing valve kit, with pivot connectors.....
union system connections ¾” sweat, press, and NPT male

All kits contain angle mixing valve body with cold water cross and ¾” NPT female connection to water heater.

Technical specification

Materials

Valve and cold water cross bodies:

DZR low-lead* brass

Shutter, seats and slide guides:

PSU

Springs:

stainless steel

Seals:

peroxide-cured EPDM

Adjustment knob:

ABS

Flexible pipe:

stainless steel

Recirc. port plug:

low-lead* brass

Performance

Suitable fluids:

water

Setting range:

95 – 150 °F (35 – 65 °C)

Tolerance:

±3 °F (±2 °C)

Minimum temperature difference between hot water inlet and mixed water outlet for stable operation with balanced supply pressure conditions:

9 °F (5 °C)

Recommended minimum temperature difference between hot water inlet and mixed water outlet for optimal performance:

18 °F (10 °C)

Required minimum temperature difference between hot water inlet and mixed water outlet for thermal shut-off function:

18 °F (10 °C)

Min. flow rate for stable operation with balanced supply pressure conditions:

0.5 gpm (2 l/min)

Max. working pressure (static): 150 psi (10 bar)

Max. working pressure (dynamic): 75 psi (5 bar)

Max. hot water inlet temperature: 195 °F (90 °C)

Max. inlet pressure ratio (H/C or C/H) for optimal performance:

2:1

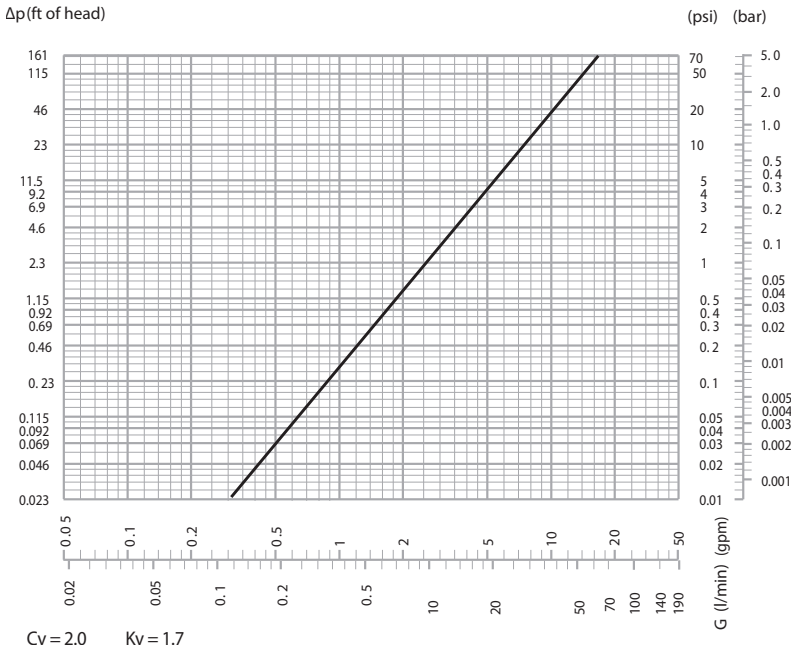
* Meets the "lead free" requirement of Section 1417 of the Safe Drinking Water Act (SDWA). This product has a weighted average lead content of less than 0.25% for its wetted surfaces contacted with consumable water.

Certifications:

1. ASSE 1017, CSA B125.3, UPC, IPC, IRC and NPC for use in accordance with U.S. and Canadian plumbing codes. Certified and listed by ICC-ES, File PMG 1357.

2. NSF/ANSI/CAN 372, US and Canadian Low-Lead and Lead-Free materials contents laws for drinking water system components. Certified by ICC-ES, PMG File 1360.

Flow curve





SAFETY INSTRUCTION

This safety alert symbol will be used in this manual to draw attention to safety related instructions. When used, the safety 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.



CAUTION: All work must be preformed 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 kit 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: If installed in an ASSE 1017 application, check valves shall be used.



CAUTION: When making the water connections, make sure that the pipework connecting the thermostatic mixing valve kit is not mechanically overstressed. 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 (38 °C) 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.



CAUTION: To prevent any damage which will cause the electronic mixing valve to not operate correctly, treat highly aggressive water before entering the thermostatic mixing valve. Be sure water hardness is less than 10 grains.



WARNING: The outer surface of the device, especially in polymer type components, must not come into contact with any chemical substance, either on purpose or accidentally. The system fluid and any chemical additives used within the water piping system – whether for washing or as protection – must be compatible with the materials used to make the device and with the function it performs.

LEAVE THIS MANUAL WITH THE USER.



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-VOUS ÊTRE ALERTES ! VOTRE SÉCURITÉ EST EN JEU ! NE PAS SUIVRE CES INSTRUCTIONS PEUT PROVOQUER UN RISQUE DE SÉCURITÉ.



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. Pour plus d'informations rendez-vous 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: S'il est installé dans un pays de ASSE 1017 application, vérifiez les robinets doivent être utilisés.



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 telles températures ne compromettent pas les gens.



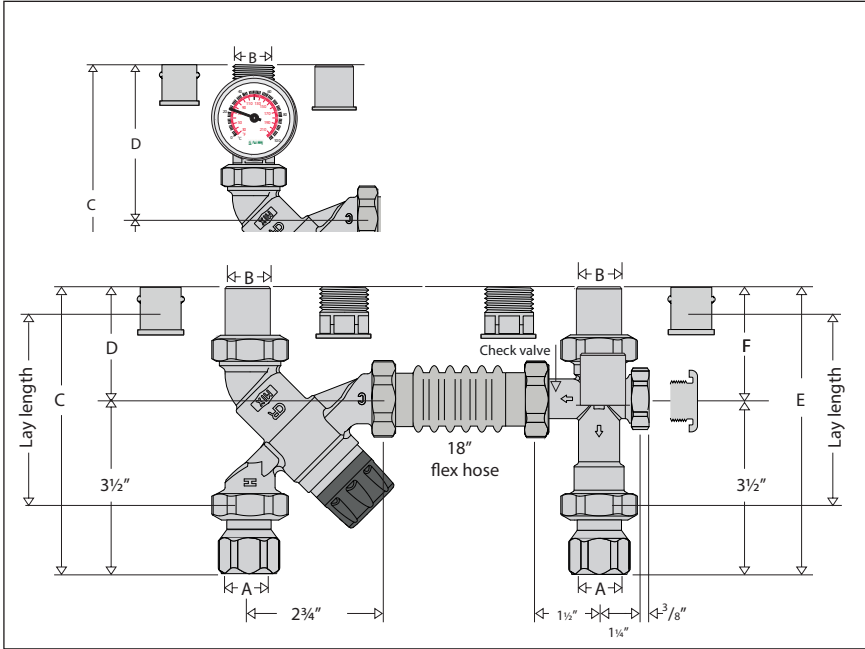
ATTENTION: Pour prévenir tout dommage qui provoque le mitigeur électronique à ne pas fonctionner correctement, le traitement de l'eau très agressive avant d'entrer dans la thermostatico regolabile. Assurez-vous que la dureté de l'eau est inférieure à 10 grains.



AVERTISSEMENT: La surface extérieure de l'appareil, en particulier les composants de type polymère, ne doit pas entrer en contact avec des substances chimiques, que ce soit volontairement ou accidentellement. Le produit et les additifs chimiques utilisés dans les canalisations d'eau - que ce soit pour le lavage ou la protection - doivent être compatibles avec les matériaux utilisés pour la fabrication de l'appareil et avec la fonction qu'il remplit.

LAISSEZ CE MANUEL AVEC L'UTILISATEUR

Dimensions, TankMixer Kit



No temperature gauge.

Code	A	B	C	D	E	F	Wt. (lb.)
520500AX	$\frac{3}{4}$ "NPTF	$\frac{3}{4}$ "NPTM	$5\frac{9}{16}$ "	$2\frac{1}{4}$ "	$5\frac{5}{8}$ "	$2\frac{1}{4}$ "	2.4
520506AX	$\frac{3}{4}$ "NPTF	$\frac{3}{4}$ "PRESS	$5\frac{13}{16}$ "	$2\frac{9}{16}$ "	$5\frac{7}{8}$ "	$2\frac{9}{16}$ "	2.4
520509AX	$\frac{3}{4}$ "NPTF	$\frac{3}{4}$ " SWT	$5\frac{1}{2}$ "	$2\frac{3}{16}$ "	$5\frac{1}{2}$ "	$2\frac{3}{16}$ "	2.4

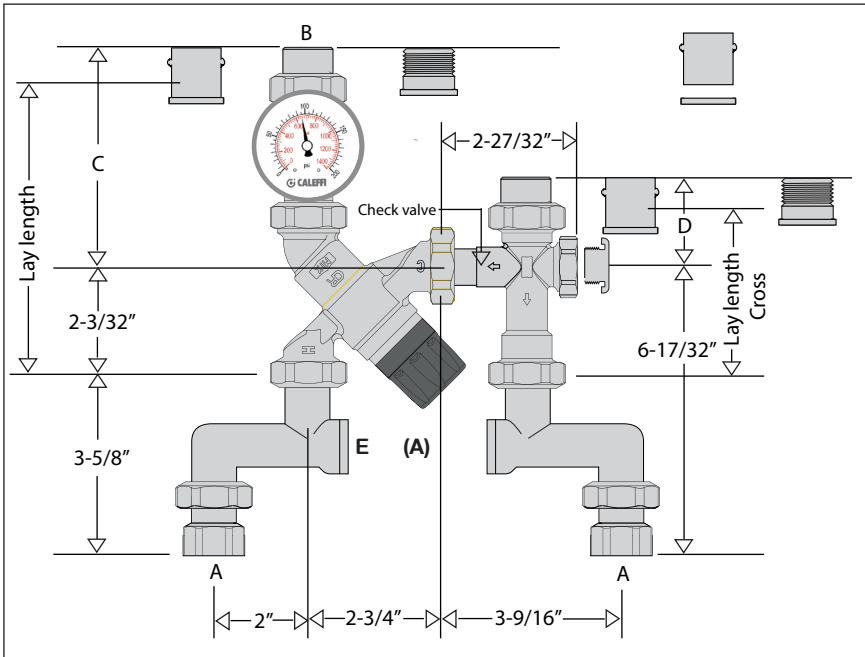
Lay length (hot inlet to mix outlet) for press: $3\frac{3}{8}$ "; for sweat: $3\frac{3}{8}$ ".

With temperature gauge.

Code	A	B	C	D	E	F	Wt. (lb.)
520510AX	$\frac{3}{4}$ "NPTF	$\frac{3}{4}$ "NPTM	$7\frac{7}{8}$ "	$4\frac{1}{4}$ "	$5\frac{5}{8}$ "	$2\frac{1}{4}$ "	2.9
520516AX	$\frac{3}{4}$ "NPTF	$\frac{3}{4}$ "PRESS	8"	$4\frac{9}{16}$ "	$5\frac{7}{8}$ "	$2\frac{9}{16}$ "	2.9
520519AX	$\frac{3}{4}$ "NPTF	$\frac{3}{4}$ " SWT	$7\frac{3}{4}$ "	$4\frac{3}{16}$ "	$5\frac{1}{2}$ "	$2\frac{3}{16}$ "	2.9

Lay length (hot inlet to mix outlet) for press: $5\frac{9}{16}$ "; for sweat: $5\frac{9}{16}$ ".

Dimensions, TankMixer Compact Kit



(A) This kit provides one pivot connector with a $\frac{3}{4}$ " FNPT port (E), which can be used for applications where there is no pressure relief valve on the tank. Install that pivot connector on the hot side to add a pressure relief valve. For applications where a pressure relief valve is present on the tank, install the pivot connector with the FNPT port on the cold side for incorporating an expansion tank.

Code	A	B	C	D	E	Wt. (lb.)
520510AP		$\frac{3}{4}$ " NPTM	$4\frac{3}{16}$ "	2"		4.5
520516AP	$\frac{3}{4}$ " NPTF	$\frac{3}{4}$ " PRESS	$4\frac{17}{32}$ "	$2\frac{13}{32}$ "	$\frac{3}{4}$ " NPTF	4.4
520519AP		$\frac{3}{4}$ " SWT	$3\frac{9}{16}$ "	$1\frac{15}{16}$ "		4.1

Lay length (hot inlet to mix outlet) for press: $5\frac{11}{16}$ "; for sweat: $4\frac{11}{16}$ ".

Lay length (Cross) for press: $3\frac{9}{32}$ "; for sweat: $3\frac{17}{32}$ ".



Use

The Caleffi TankMixer and TankMixer Compact thermostatic mixing valve kits are intended for installation directly to the water heater at the point of distribution. These products are not designed to provide scald or thermal shock protection. Due to minimal flow requirements these products are not suitable for tempering water temperature at individual fixtures and should not be used as point-of-use valves. For safety, it is recommended to limit the maximum mixed water temperature to 120 °F and install scald protection devices at each fixture.

Before installing a Caleffi TankMixer or TankMixer Compact thermostatic mixing valve kit, the system must be inspected to ensure that its operating conditions are within the range of the mixing valve, checking, for example, the supply temperature, supply pressure, etc.

Systems where these thermostatic mixing valves will be installed must be drained and cleaned out to remove any dirt or debris which may have accumulated during installation.

The installation of appropriately sized filters at the inlet from the main water supply is always advisable

Caleffi TankMixer or TankMixer Compact thermostatic mixing valve kits must be installed by qualified personnel in accordance with the diagrams in this instruction sheet, taking into account all current applicable standards.

These thermostatic mixing valve kits can be installed in any position, either vertical or horizontal, or upside down.

The following are shown on the thermostatic mixing valve body:

- Hot water inlet, marked "H".
- Cold water inlet, marked "C".
- Mixed water outlet, marked "MIX".

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Thermal shut-off

In the event of unexpected cold water supply failure, the AngleMix internal cartridge will block the hot water passage to prevent potential scalding water from being delivered. This function is guaranteed only when the hot water supplied to the mixing valve is at least 18°F above the mixed water outlet set point.

Temperature setting

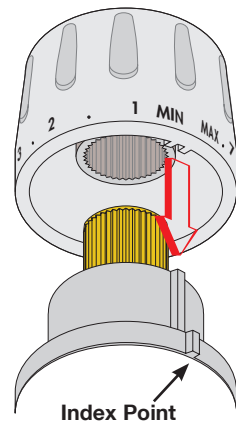
The control knob permits temperature setting between minimum and maximum in one turn (360 °). The temperature is set to the required value by means of the knob with the graduated scale, on the top of the valve.

Pos.	Min.	1	2	3	4	5	6	7	Max.
T (°F)	95	105	115	120	125	132	140	145	150
T (°C)	35	40	45	48	52	56	60	63	65

with: $T_{HOT} = 158 \text{ } ^\circ\text{F} (70 \text{ } ^\circ\text{C})$, with: $T_{cold} = 59 \text{ } ^\circ\text{F} (15 \text{ } ^\circ\text{C})$, $P = 43 \text{ psi} (3 \text{ bar})$

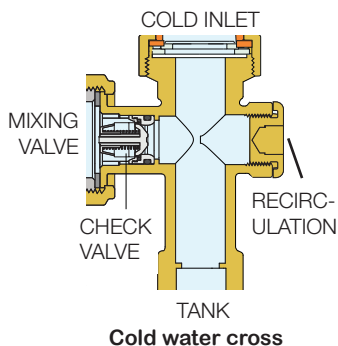
Locking the temperature setting knob with the tamper-proof system

1. Align the index point to the desired temperature setting by rotating the control knob.
2. Unscrew the head screw and remove the control knob.
3. Position the knob so that the boss, indicated by red arrow in figure, fits into the internal slot of the control knob.
4. Tighten the head screw and the control knob will no longer be able to rotate to adjust the mixing setting.



Check valve

In systems with thermostatic mixing valves, check valves should be installed to prevent undesired backflow. The TankMixer and TankMixer Compact thermostatic mixing valve kits are supplied complete with a check valve on the cold water cross outlet port to the mixing valve.



Commissioning

The Caleffi TankMixer and TankMixer Compact thermostatic mixing valve kits must be commissioned in accordance with current standards by qualified personnel using temperature measuring equipment. Caleffi TankMixer 52051_AX series, and TankMixer Compact 52051_AP series with outlet port temperature gauge provide a time-saving temperature setting process to get close to the desired temperature. Use of a digital thermometer is recommended for confirming the final setting of the mixed water temperature.

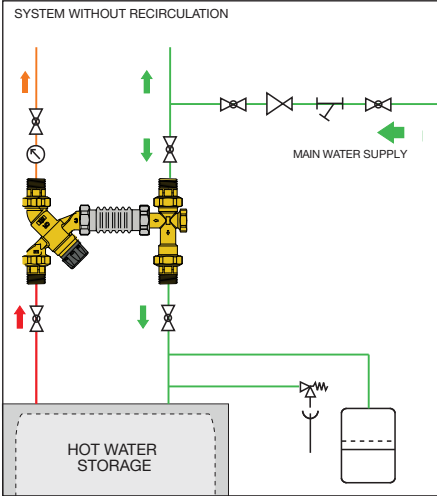
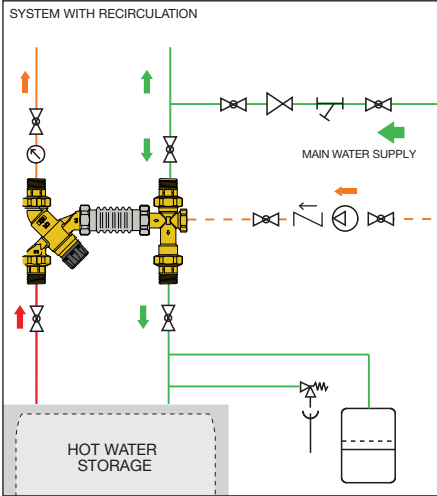
After installation, the valve must be tested and commissioned in accordance with instructions given below, taking into account current applicable standards.

- 1) Ensure that the system is clean and free from dirt or debris before commissioning the thermostatic mixer.
- 2) It is recommended that the temperature is set using a suitable calibrated digital thermometer. The valve must be commissioned by measuring the temperature of the mixed water emerging at the point of use.
- 3) The maximum outlet temperature from the valve must be set accounting for fluctuations due to simultaneous use. It is essential for these conditions to be stabilized before commissioning.
- 4) Adjust the temperature using the adjusting knob on the valve. For safety reasons, it is advisable to limit the maximum mixed water temperature to 120 °F in domestic hot water systems.
- 5) The temperature may be adjusted using the control knob.
 - a) Adjust the temperature of the mixed water to the desired value.
 - b) Measure and record the temperature at the cold and hot water inlets.
 - c) Measure and record the temperature of the water delivered from the tap at the lowest and highest flow rates.
 - d) Run a test of the thermal shut-off function. Close the cold water inlet shut-off valve and check the mixed water delivery. The delivery flow rate should quickly drop to zero.
 - e) Measure and record the maximum mixed water temperature. The temperature may not exceed the values permitted in any applicable legislation or code of practice.
 - f) Restore the cold water inlet supply and measure the water delivery temperature after it has stabilized. The final temperature measured in this test may not exceed the permitted values by ± 3 °F (± 2 °C).

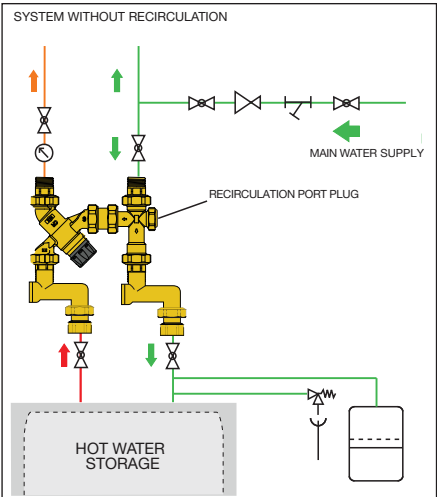
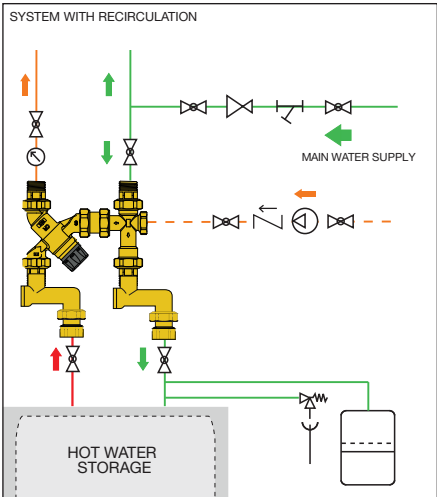
In case of change to temperature setting, repeat tests in accordance with points d, e, f. All the above information should be recorded in the commissioning report and updated in the maintenance report whenever the valve is worked on.

Application diagrams

TankMixer



TankMixer Compact



Troubleshooting and recommended maintenance schedule

Under normal operating conditions the Caleffi TankMixer and TankMixer Compact thermostatic mixing valves will provide a very high level of performance. However, in some circumstances, where the following maintenance schedule is not followed problems may arise.

Tests should be conducted regularly to monitor the thermostatic mixing valve performance, as deterioration of performance could indicate that the valve and/or the system require maintenance. If, during these tests, the temperature of the mixed water has changed significantly in comparison with the previous test, the details given in the installation and commissioning sections should be checked and maintenance conducted.

The following should be checked regularly to ensure that the optimum performance levels of the valve are maintained. Check every 12 months at least, or more often if necessary.

- 1) Check and clean the system filters.
- 2) Check that any check valves positioned upstream of the Caleffi thermostatic mixing valve are operating correctly, without problems caused by impurities.
- 3) Limescale can be removed from internal components of the thermostatic mixing valve by immersion in a suitable de-scaling fluid.
- 4) When the components which can be maintained have been checked, commission the valve.

Common troubleshooting symptoms:

Symptoms	Cause	Corrective action
Temperature will not adjust when adjustment knob is turned	a) Thermostatic element is calcified or full of lime/minerals.	- Soak body in a de-scaling fluid
Hot water at the cold taps	a) Operation of check valve is hindered; Check valve is not sealing correctly. b) Check valves not installed.	- Replace faulty check valve.
Fluctuating mixed water temperature	a) Erratic supply temperatures at the inlets of the mixing valve. b) Flow through the valve is less than it's minimum flow rate. c) Incorrect commissioning of the valve.	- Restore inlet conditions within the limits of the recirculation circuit.
Erratic flow of water from the valve	a) Flow through the valve is less than it's minimum flow rate. b) Fluctuations in the supply pressures/temperatures. c) Adverse effect created by other draw off points on the system.	- Stabilize inlet supply conditions.
No flow of water from the valve	a) In-line filters or strainers blocked. b) Insufficient supply pressures. c) Debris obstructing valve operation.	- Clean filters or strainers. - Restore inlet supplies. - Clean debris or scale from the valve.
Valve shut-off function not performed when tested	a) Mixing valve not properly installed per instructions. b) Minimum temperature difference not reached. c) Valve mechanism blocked by dirt.	- Re-install per instructions. - Increase hot water temperature. - Remove dirt/limescale from the valve.

NOTES

LEAVE THIS MANUAL WITH THE USER.

Laissez ce manuel à la disposition de l'utilisateur.

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