

Scald Protection point of use thermostatic mixing valve

series 5213



Function

Thermostatic mixing valves are used in applications where the user must be protected from the danger of scalding caused by hot water. The Caleffi 5213 series provides water at a safe and usable temperature in situations where the control of the temperature of the water discharging from a terminal fitting is of the utmost importance, i.e. within hospitals, schools, nursing homes, etc.

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 Caleffi 5213 series is a high performance combination thermostatic and pressure balanced mixing valve and has been specifically certified to NSF and ASSE 1070 (temperature can not exceed 120°F and check valves are recommended).

The valve is complete with check valve at both hot and cold inlets.



ASSE 1070

Product Range

5213 Series Scald Protection and anti-chill point of use thermostatic mixing valve with threaded connections _____ Sizes 1/2", 3/4", 1"
5213 Series Scald Protection and anti-chill point of use thermostatic mixing valve with sweat connections _____ Sizes 1/2", 3/4", 1"

Technical specification

Materials: - Valve body: DZR brass
- Regulating spindle: DZR brass
- Internal shutter: PPO
- Sealing elements: EPDM
- Cover: ABS

Temperature adjustment range: 85÷120°F (29÷49°C)
Temperature set: must be commissioned on site to achieve desired temperature

Temperature control: ±3°F (±2°C)

Minimum cold inlet temperature: 39°F (4°C)

Maximum cold inlet temperature: 85°F (29°C)

Minimum hot inlet temperature: 120°F (49°C)

Maximum hot inlet temperature: 185°F (85°C)

Maximum working pressure (static): 140 psi (10 bar)

Maximum working pressure (dynamic): 70 psi (5 bar)

Minimum working pressure (dynamic): 1.5 psi (0.1 bar)

Maximum unbalanced dynamic supply (hot/cold or cold/hot): 6:1

Minimum temperature differential between hot water inlet and mixed water outlet to ensure thermal shutoff function: 18°F (10°C)

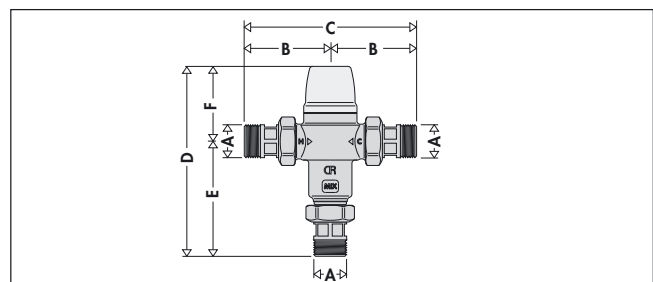
Minimum temperature differential between mixed water outlet and cold water inlet to ensure stable operation: 9°F (5°C)

Minimum flow rate for stable operation: 1 gpm (4 l/min)

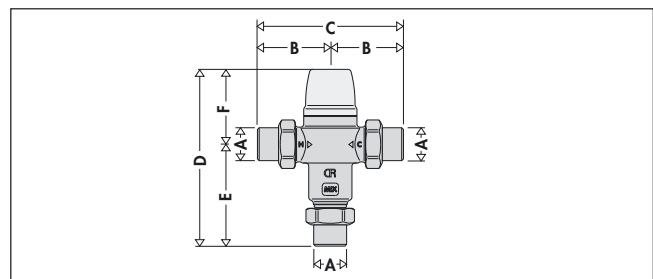
Certified to: NSF and ASSE 1070

Connections: 1/2" ÷ 1" NPT male with union
1/2" ÷ 1" sweat with union

Dimensions



Code	A	B	C	D	E	F	Weight (lb)
521342A	1/2"	2 13/16"	5 11/16"	4 15/16"	3"	1 15/16"	1.50
521352A	3/4"	2 13/16"	5 11/16"	4 15/16"	3"	1 15/16"	1.65
521362A	1"	2 15/16"	5 7/8"	5 3/16"	3 1/4"	1 15/16"	1.85



Code	A	B	C	D	E	F	Weight (lb)
521349A	1/2"	2 11/16"	5 7/16"	4 5/8"	2 11/16"	1 15/16"	1.40
521359A	3/4"	2 7/8"	5 3/4"	4 13/16"	2 15/16"	1 15/16"	1.55
521369A	1"	3 1/8"	5 5/16"	5 3/8"	3 1/4"	1 15/16"	1.74

Legionella-Pneumophila risk

In systems producing domestic hot water with storage, in order to avoid the dangerous infection known as *Legionella*, the hot water must be stored at a temperature of at least 140°F. At this temperature it is certain that the growth of the bacteria causing this infection will be totally eliminated.

At this temperature, however, the water cannot be used directly. As shown on the diagram opposite, temperatures of more than 120°F can cause burning very quickly. For example, at 130°F partial burning will occur in approximately 30 seconds, while at 140°F partial burning will occur in approximately 5 seconds. The time may be reduced by 50 percent or more for children and elderly people.

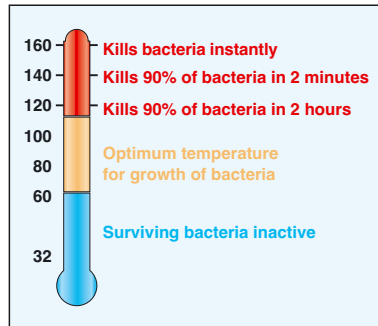
In view of the above, it is necessary to install a thermostatic mixing valve which can:

- reduce the temperature at the point of use to a value lower than that of storage and suitable for sanitary users;
- maintain the temperature constant at the point of use when the incoming pressure and temperature conditions vary;
- have a thermal shut off function in the event of failure of either hot or cold supply.

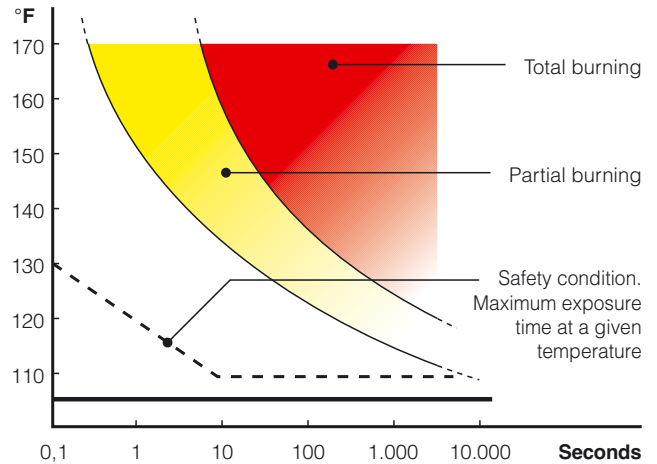
Thermal disinfection

The diagram shows the behavior of the bacteria *Legionella Pneumophila* when the temperature conditions of the water in which it is contained vary.

In order to ensure proper thermal "disinfection", the values must not be below 140°F.



Temperature - Exposure time



Exposure time for partial burns

Temperature	Adult	Children 0÷5 years
160°F	1 s	--
150°F	2 s	0.5 s
140°F	5 s	1 s
130°F	30 s	10 s
120°F	5 min	2.5 min

Description of operation

A 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.

Construction details

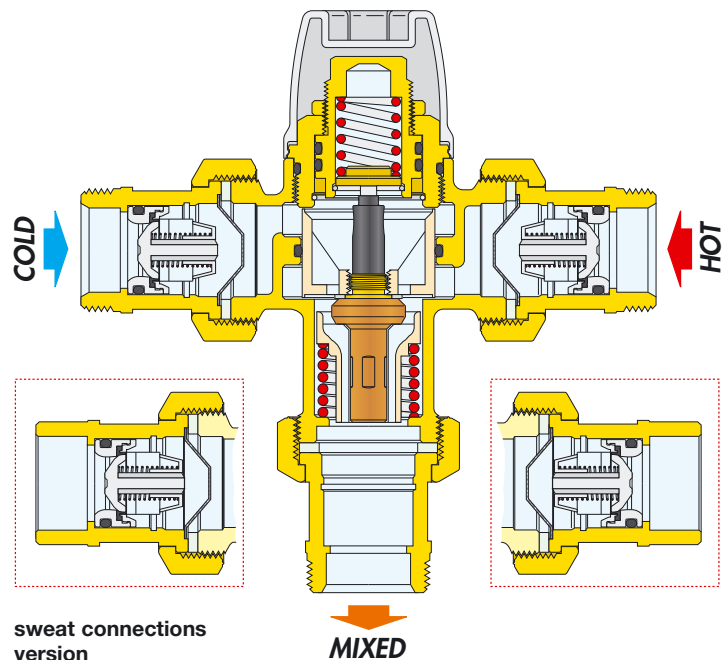
Anti-scale materials

The material used in the construction of the mixer eliminates the problem of jamming caused by lime deposits. All the working parts are made of a special anti-scale material, with a low friction coefficient, guaranteeing that the performance will be maintained over the long term.

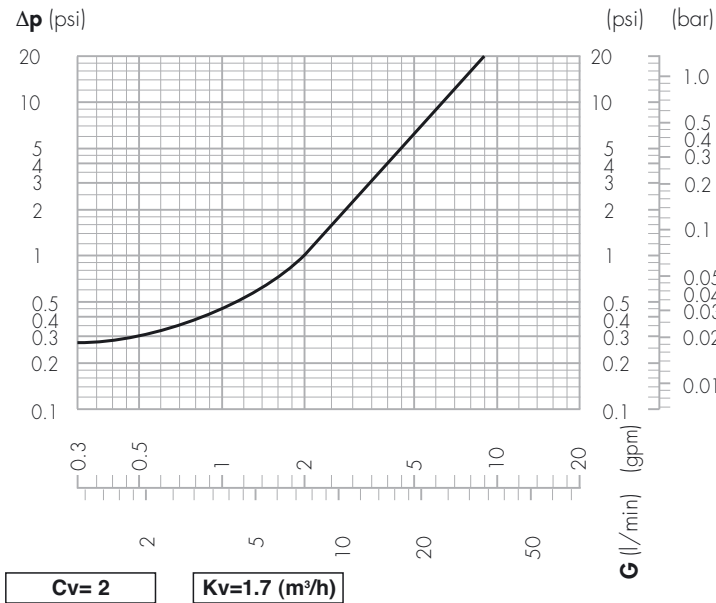
Thermal shutoff

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.

The Caleffi 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 function.



Flow curves



Flow rate-use

The Caleffi 5213 series is a thermostatic mixing valve suitable for **point of use application**. For this reason, the flow rate through the valve is the same as that of the final outlet, e.g. mixer or tap for washbasin, shower or bath. In order to ensure the set temperature, the thermostatic mixing valve must have a minimum flow rate of 1 gpm (4 l/min).

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

Public buildings, hospitals, schools

In these applications, for the type of users of hot water like children, elderly or disabled people, the risk of being scalded is very high.

In these installations, the two supply lines of the hot water from the storage and of the cold water can have different origin and work at different pressures.

In the event of failure of the cold or hot water supply, the thermostatic mixing valve shuts off the water flow from the outlet, thus avoiding possible scalding or thermal shocks.

Installation

Before installing a Caleffi Series 5213 mixer, the system must be inspected to ensure that its operating conditions are within the range of the mixer, checking, for example, the supply temperature, supply pressure, etc.

Systems where the Caleffi Series 5213 mixer is to be fitted must be drained and cleaned out to remove any dirt or debris which may have accumulated during installation.

The installation of filters of appropriate capacity at the inlet of the water from the mains supply is always advisable.

Caleffi Series 5213 mixers must be installed by qualified personnel in accordance with the diagrams in this brochure, taking into account all current applicable standards.

Caleffi Series 5213 mixers can be installed in any position, either vertical or horizontal.

The following are shown on the mixer body:

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

Check valves

In order to prevent undesirable cross flow, check valves should be installed in systems with thermostatic mixing valves. The Caleffi 5213 series is supplied complete with the check valves at the hot and cold inlets.

Commissioning

In view of the special purpose of the thermostatic mixing valve, it must be commissioned in accordance with current standards by qualified personnel using suitable temperature measuring equipment. Use of a digital thermometer is recommended for measurement of the mixed water temperature.

Temperature adjustment

Temperature setting can be adjusted by removing the cap from the valve body and reversing the cap onto the temperature adjustment spindle.

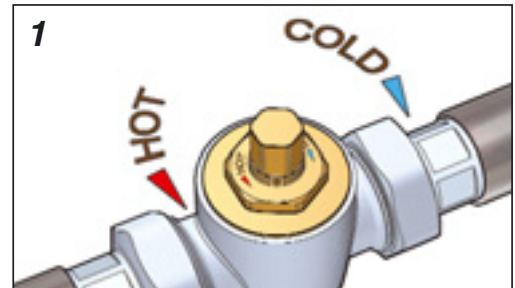
In accordance with the anti-scald requirements, mixed water at the outlet of the sanitary fixtures must not exceed the following values:

120°F (49°C) for domestic or normal buildings

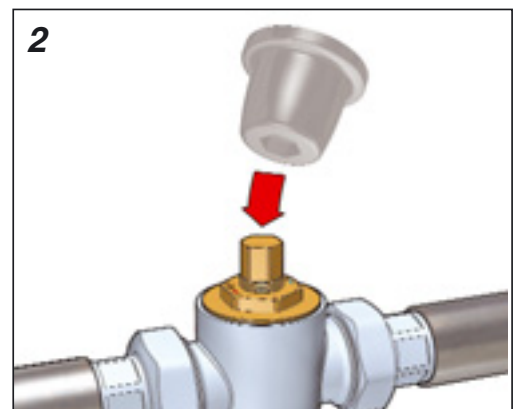
110°F (43,3°C) for hospitals or special buildings

100°F (38°C) for children

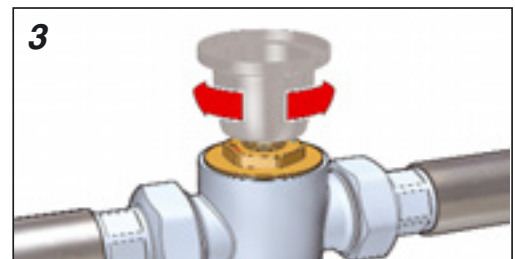
Temperature setting can then be locked at the desired value using the locking nut.



View of temperature adjustment



Fitting temperature adjustment cap

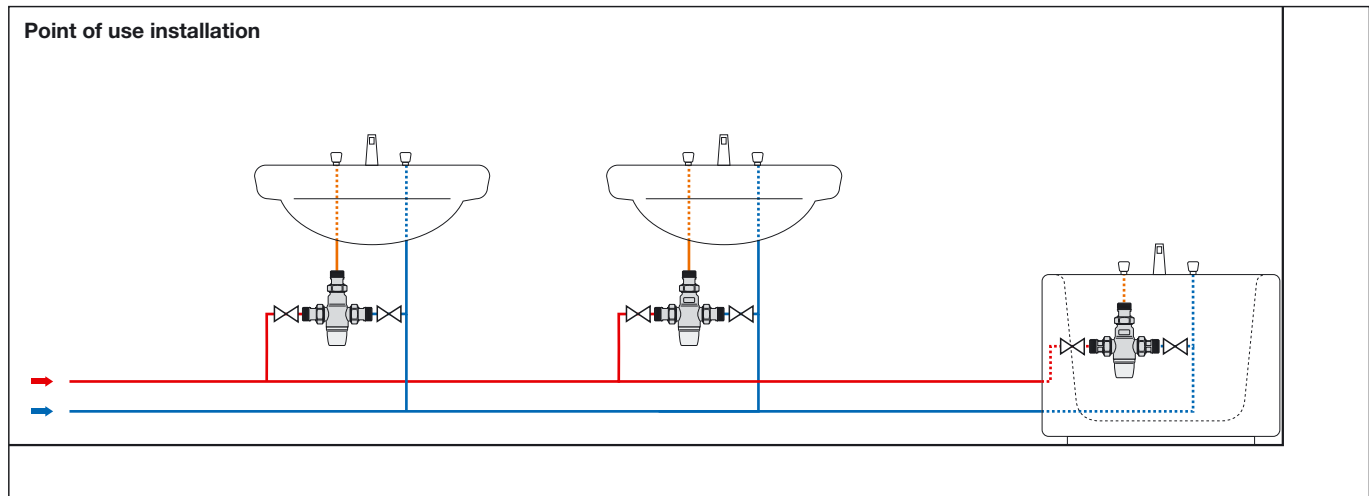


Temperature adjustment cap in place



Locking adjustment spindle with locking nut

Application diagrams



SPECIFICATION SUMMARIES

Series 5213

Scald protection point of use thermostatic mixing valve certified to NSF and ASSE 1070. Threaded connections 1/2" (3/4" or 1") NPT M with union tailpieces. DZR alloy body. Shutter in anti-scale plastic. Seals EPDM. Stainless steel spring. Maximum working temperature 185°F. Setting range 85°F to 120°F. Tolerance $\pm 3^\circ\text{F}$. Maximum working pressure 140 psi. Maximum supply pressure unbalancing 6:1. Provided with tamper-proof setting lock and check valves at the inlets.

Series 5213

Scald protection point of use thermostatic mixing valve certified to NSF and ASSE 1070. Sweat connections 1/2" (3/4" or 1") with union tailpieces. DZR alloy body. Shutter in anti-scale plastic. Seals EPDM. Stainless steel spring. Maximum working temperature 185°F. Setting range 85°F to 120°F. Tolerance $\pm 3^\circ\text{F}$. Maximum working pressure 140 psi. Maximum supply pressure unbalancing 6:1. Provided with tamper-proof setting lock and check valves at the inlets.

We reserve the right to change our products and their relevant technical data, contained in this publication, at any time and without prior notice.



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