Thermostatic mixing valve with interchangeable cartridge for centralised systems

5230 series

01080/10 GB
replaces 01080/06 GB



Function

The thermostatic mixing valve is used in systems for domestic hot water production. Its function is to maintain the temperature of the mixed water supplied to the user constant at the set value when there are variations in the temperature and supply pressure of the incoming hot and cold water or in the draw-off flow rate.
This particular series of mixing valves is specifically designed for systems which require high flow rates, such as centralised systems or groups of equal users.
These systems also require stable and accurate temperature adjustment, especially in relation to variations in the flow rate drawn off by the users.

Patent application No. MI2001A001645.

Product range

Code 5230.0 Thermostatic mixing valve with interchangeable cartridge for centralised systems sizes 1/2" - 3/4" - 1" - 1 1/4" - 1 1/2" - 2"
Code 5230.3 Thermostatic mixing valve with interchangeable cartridge, with check valves at the inlet sizes 1/2" - 3/4" - 1" - 1 1/4"
Code 5230.2 Thermostatic mixing valve with interchangeable cartridge, with check valves at the inlet sizes Ø 22 and Ø 28 mm for copper pipe
Code 523005 Spare cartridge for 1/2", 3/4" and Ø 22 mixing valves
Code 523006 Spare cartridge for 1", 1 1/4" and Ø 28 mixing valves
Code 523008 Spare cartridge for 1 1/2" and 2" mixing valves

Technical specifications

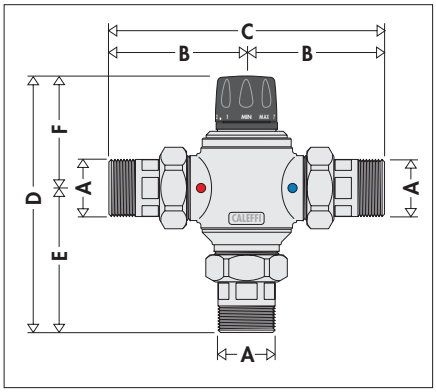
Materials

Body:	brass EN 12165 CW617N, chrome plated
Cartridge and obturator:	brass EN 12164 CW614N
Springs:	stainless steel
Seals:	EPDM

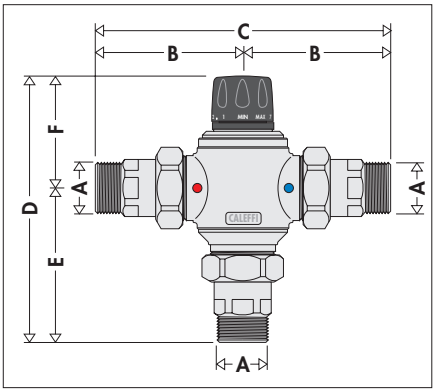
Performance

Medium:	water
Max. working pressure (static):	14 bar
Max. working pressure (dynamic):	5 bar
Max. inlet temperature:	85°C
Max. inlet pressure ratio (H/C or C/H):	2:1
Adjustment range: 1/2"–1 1/4", Ø 22, Ø 28:	30–65°C
1 1/2", 2":	36–60°C
Accuracy:	±2°C
Minimum temperature difference between inlet hot water and outlet mixed water to ensure optimal performance:	15°C
Connections:	1/2"–2" M with union
	Ø 22, Ø 28 mm for copper pipe

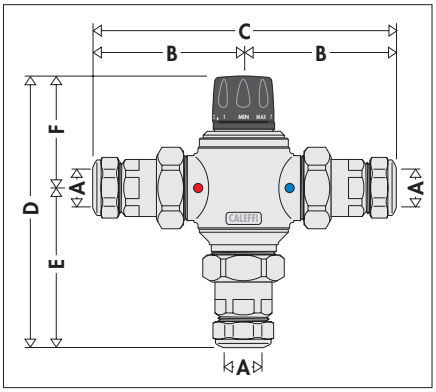
Dimensions



Code	A	B	C	D	E	F	Mass (kg)
523040	1/2"	85	170	169	95	74	1,65
523050	3/4"	85	170	169	95	74	1,68
523060	1"	101	202	195	107	88	3,09
523070	1 1/4"	101	202	195	107	88	3,07
523080	1 1/2"	129	258	243	135	108	8,00
523090	2"	129	258	243	135	108	8,24



Code	A	B	C	D	E	F	Mass (kg)
523043	1/2"	91	182	175	101	74	1,69
523053	3/4"	91	182	175	101	74	1,72
523063	1"	111	222	202	114	88	3,22
523073	1 1/4"	111	222	202	114	88	3,20



Code	A	B	C	D	E	F	Mass (kg)
523052	Ø 22	92	184	176	102	74	1,80
523062	Ø 28	116	232	207	119	88	3,31

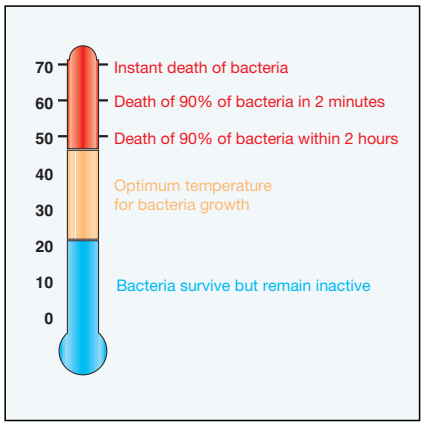
Legionella - scalding risk

In systems producing domestic hot water with storage, in order to prevent the dangerous infection known as *Legionnaire's disease*, the hot water must be stored at a temperature of at least 60°C. At this temperature it is certain that the growth of the bacteria causing this infection will be completely prevented. However, the hot water cannot be used directly at this temperature, as it may cause scalding. For example, at 55°C, partial burn occurs in about 30 seconds, whereas at 60°C partial burn occurs in about 5 seconds.
In view of the above, it is therefore necessary to use a thermostatic mixing valve able to:

- reduce the temperature at the user outlet to a lower value than the storage temperature;
- keep this temperature constant in spite of variations in the inlet pressure and temperature.

Thermal disinfection

The diagram below shows the behaviour of *Legionella Pneumophila* bacteria as the temperature of the water containing the bacteria varies.
To ensure correct thermal disinfection, it is necessary to go up to values of no less than 60°C.



Energy saving

Energy saving is governed in Italy by Presidential Decree 412/93, making it compulsory to use mixing valves on domestic water systems with storage in order to limit the temperature of the water at the inlet of the delivery network to 48°C with a tolerance of +5°C.
The purpose of limiting the temperature is to reduce passive thermal losses through the delivery network, as much as possible, and to prevent the delivery of water at a higher temperature than necessary.

Operating principle

The regulating element in the thermostatic mixing valve consists of a temperature sensor (1) fully immersed in the mixed water outlet pipe which, by expanding and contracting, continuously ensures correct proportioning of hot and cold water at the inlet.
The water proportions are regulated by a piston (2) that slides inside a special cylinder placed between the hot (3) and cold (4) water passage channels.
Even if the pressure drops due to hot or cold water drawn-off by other users or temperature variations at the inlet, the mixing valve automatically adjusts the water flow rate until the set temperature is achieved.

Construction details

Double seat

The mixing valve has a special obturator which acts on a double water passage seat. This ensures a high flow rate with a reduced overall dimension, while maintaining an accurate temperature control.

Interchangeable cartridge

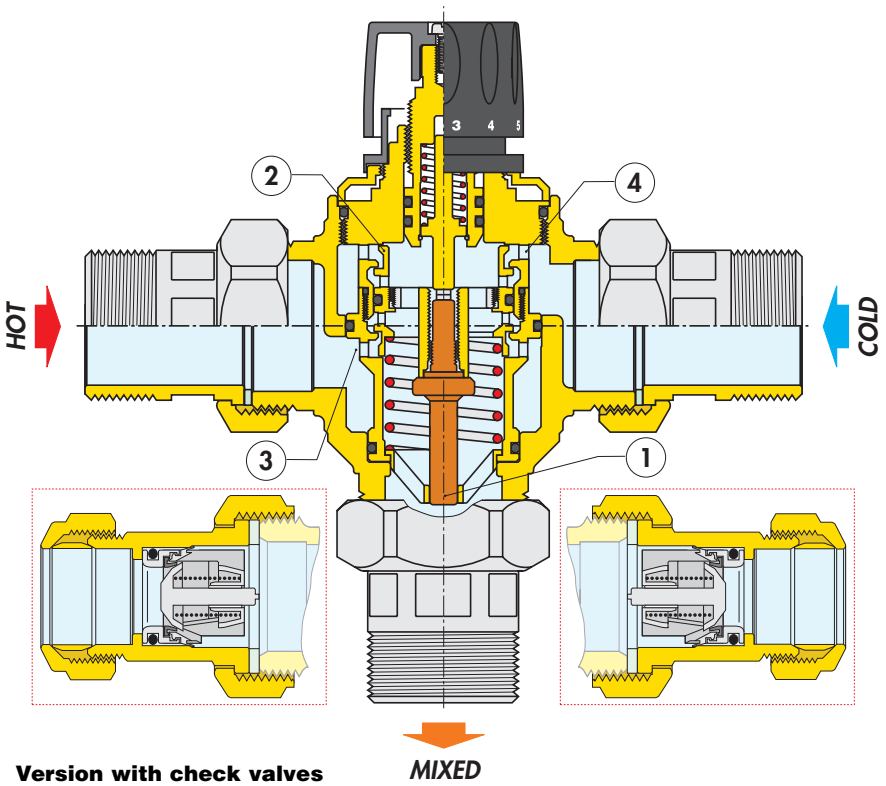
The internal cartridge containing all the control components is preassembled in a single body and can easily be inspected for cleaning or replacement if necessary, without any need to take the valve body out of the pipe.

Low-inertia thermostat

The temperature-sensitive element, the "engine" of the thermostatic mixing valve, has low thermal inertia; in this way it can quickly react to changes in the conditions of inlet pressure and temperature, shortening the valve response time.

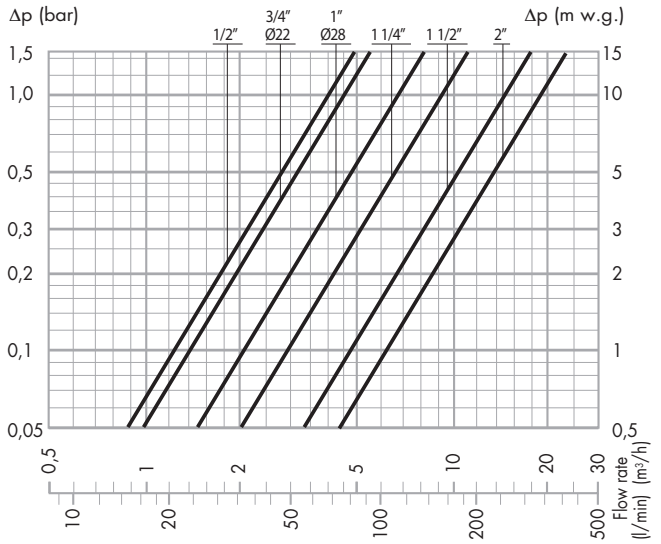
Temperature adjustment and locking

The control knob is used to adjust the temperature in a full turn (360°) between min. and max. It also has tamper protection for locking the temperature at the set value.



Version with check valves

Hydraulic characteristics



Recommended FLOW RATES to ensure stable operation and an accuracy of ± 2°C

	Kv (m³/h)
1/2"	4,0
3/4" - Ø 22	4,5
1" - Ø 28	6,9
1 1/4"	9,1
1 1/2"	14,5
2"	19,0

	Minimum (m³/h)	Maximum* (m³/h)
1/2"	0,4	4,9
3/4"	0,5	5,5
1"	0,8	8,5
1 1/4"	1,0	11,2
1 1/2"	2,8	17,7
2"	3,0	23,2

* ΔP = 1,5 bar

Application

In view of their flow rate characteristics, Caleffi 5230 series thermostatic mixing valves can be installed in centralised systems with a number of user outlets or used to control groups of user outlets, such as shower units, washbasin units, etc.

Installation

The system in which the Caleffi 5230 series mixing valve is to be installed must be flushed and cleaned to remove any dirt that may have accumulated during installation.

It is recommended to always install strainers of adequate performance at the water inlet from the supply network.

Caleffi 5230 series thermostatic mixing valves must be installed according to the diagrams shown in this manual, taking account of the current applicable regulations.

Caleffi 5230 series thermostatic mixing valves can be installed in any position, horizontally or vertically.
The following marks are indicated on the mixing valve body:
· hot water inlet, indicated with the colour red;
· cold water inlet, indicated with the colour blue.

Check valves

In systems with thermostatic mixing valves, check valves must be installed to prevent undesired medium backflows.
Thermostatic mixing valves are also available with built-in check valves at the hot and cold water inlets.

Commissioning

In view of the special purpose of the thermostatic mixing valve, it must be commissioned in accordance with current regulations by qualified personnel, using appropriate temperature measurement equipment. We recommend using a digital thermometer for measuring the mixed water temperature.

Temperature adjustment

The temperature is set at the desired value using the control knob with the graduated scale on the valve.

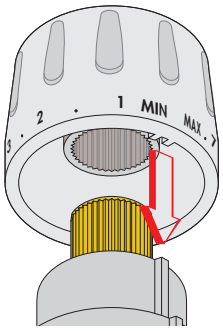
Temperature adjustment table

Position	Min	1	2	3	4	5	6	7	Max
1/2" - 3/4" - Ø 22; **T (°C)**	25	29	33	39	43	48	52	58	65
1" - 1 1/4" - Ø 28; **T (°C)**	27	32	38	44	49	53	58	63	67
1 1/2" - 2"; **T (°C)**	36	39	42	45	48	51	54	57	60

Reference values: T_{hot} = 68°C; T_{cold} = 13°C; Hot and cold water inlet pressures = 3 bar

Locking the setting

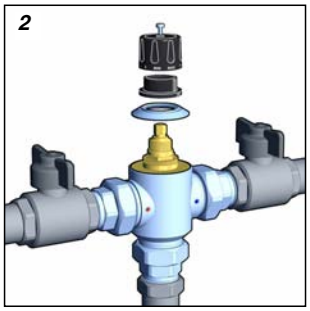
Turn the knob onto the required number, unscrew the upper screw, remove the knob and put it back on so that the internal reference couples with the protrusion on the knob holder nut.

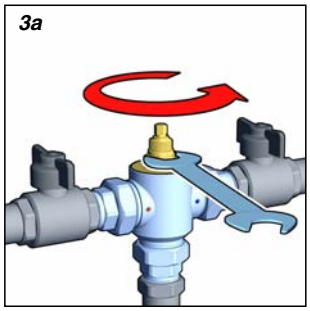


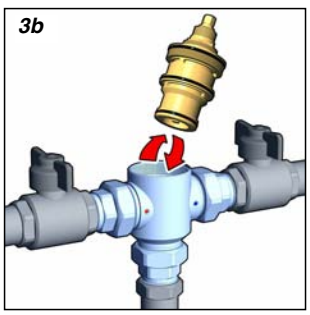
Replacement of the cartridge

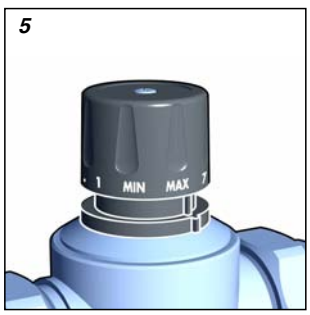
The internal cartridge, containing all the control components, can be inspected and replaced if necessary, without any need to take the valve body out of the pipe.

1) Close the shut-off valves on the hot and cold inlets. Turn the knob to the highest value.
2) Remove the temperature adjustment knob after unscrewing the locking screw at the top.
Remove the plastic knob holder nut. Unscrew the chrome plated protection cover using the hexagonal control (1" - 1 1/4").
3) Remove the internal cartridge for inspection or replacement, using the hexagonal control.
4) Replace the chrome plated protection cover. Replace the knob holder nut so that the position indicator can be seen.
5) The spare cartridge is supplied preset to the highest value.
Next, position the adjustment knob so that the text MAX is aligned with the position indicator.
By rotating the knob clockwise, adjustment should be possible from the maximum to the minimum value.
Secure the knob with the locking screw.
6) Reopen the shut-off valves and adjust the mixing valve to the desired temperature value.





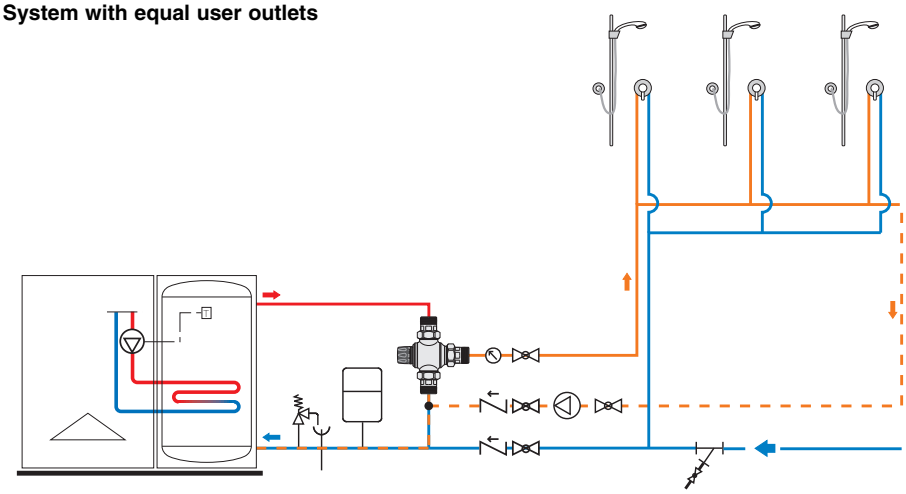




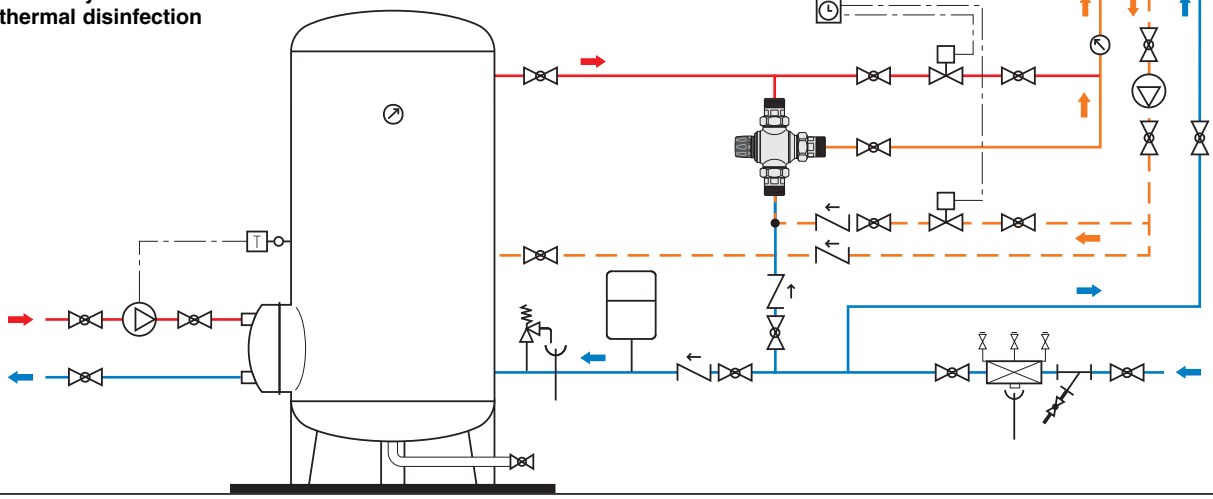
Application diagrams

- Check valve
- Ball valve
- Ball valve with built-in check valve
- Temperature gauge
- Backflow preventer
- Motorised valve
- Clock
- Pump
- Expansion vessel
- Thermostat
- Safety relief valve
- Strainer

System with equal user outlets



Centralised system with thermal disinfection



SPECIFICATION SUMMARY

Code 5230 . 0

Adjustable thermostatic mixing valve with interchangeable cartridge. Connections 1/2" M (from 1/2" to 2") with union. Brass body. Chrome plated. Brass cartridge and obturator. Stainless steel springs. EPDM seals. Maximum inlet temperature 85°C. Adjustment temperature range from 30°C to 65°C (from 36° to 60° for 1 1/2" and 2"). Maximum working pressure (static) 14 bar. Maximum working pressure (dynamic) 5 bar. Accuracy ±2°C. Minimum temperature difference between hot water inlet and mixed water outlet to ensure optimal performance 15°C. Tamper protection system to lock the set temperature.

Code 5230 . 3

Adjustable thermostatic mixing valve with interchangeable cartridge. Connections 1/2" M (from 1/2" to 1 1/4") with union. Brass body. Chrome plated. Brass cartridge and obturator. Stainless steel springs. Complete with check valves at the inlets. EPDM seals. Maximum inlet temperature 85°C. Adjustment range from 30°C to 65°C. Maximum working pressure (static) 14 bar. Maximum working pressure (dynamic) 5 bar. Accuracy ±2°C. Minimum temperature difference between hot water inlet and mixed water outlet to ensure optimal peformance 15°C. Tamper protection system to lock the set temperature.

Code 5230 . 2

Adjustable thermostatic mixing valve with interchangeable cartridge. Ø 22 mm (Ø 22 and Ø 28 mm) connections for copper pipe. Brass body. Chrome plated. Brass cartridge and obturator. Stainless steel springs. Complete with check valves at the inlets. EPDM seals. Maximum inlet temperature 85°C. Adjustment range from 30°C to 65°C. Maximum working pressure (static) 14 bar. Maximum working pressure (dynamic) 5 bar. Accuracy ±2°C. Minimum temperature difference between hot water inlet and mixed water outlet to ensure optimala performance 15°C. Tamper protection system to lock the set temperature.

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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