Thermostatic mixing valve with interchangeable cartridge for solar systems

2523 series

01129/05 GB

Function

The thermostatic mixing valve is used in systems for the production of domestic hot water.
It is designed to maintain the set temperature of the mixed water supplied to the user when there are variations in the temperature and pressure conditions of the incoming hot and cold water or in the flow rate.
This particular series of mixing valves has been designed specifically for systems requiring high flow rates and can function continuously at the high temperatures of the incoming hot water from the solar storage tank.

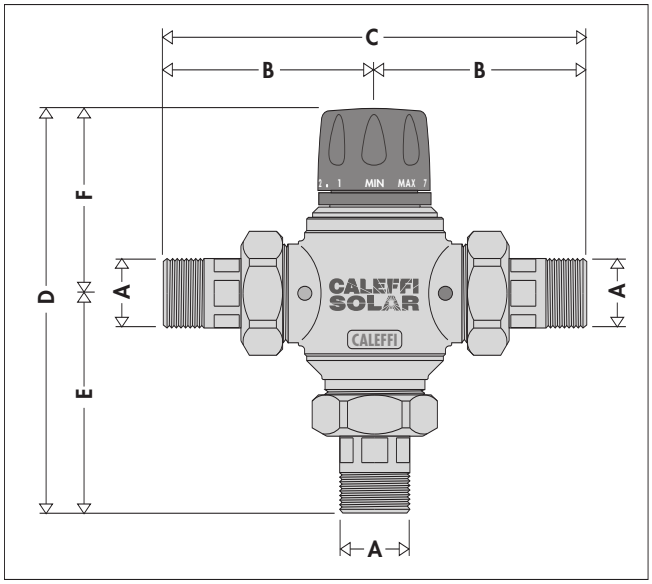
Product range

2523 series	Thermostatic mixing valve with interchangeable cartridge for solar systems	Sizes 1/2" - 3/4"

Technical specifications

Materials: - body:	brass EN 12165 CW617N, chrome-plated
- cartridge and shutter:	brass EN 12164 CW614N, electroless nickel plated
- springs:	stainless steel
- seal components:	EPDM
Setting range:	30-65°C
Accuracy:	±2°C
Max working pressure (static):	14 bar
Max working pressure (dynamic):	5 bar
Min working pressure (dynamic):	0,2 bar
Max inlet temperature:	110°C
Max inlet pressures ratio (H/C or C/H):	2:1
Min flow rate to ensure stable temperature:	1/2": 6,7 l/min 3/4": 8,4 l/min
Connections:	1/2" and 3/4" M with union

Dimensions



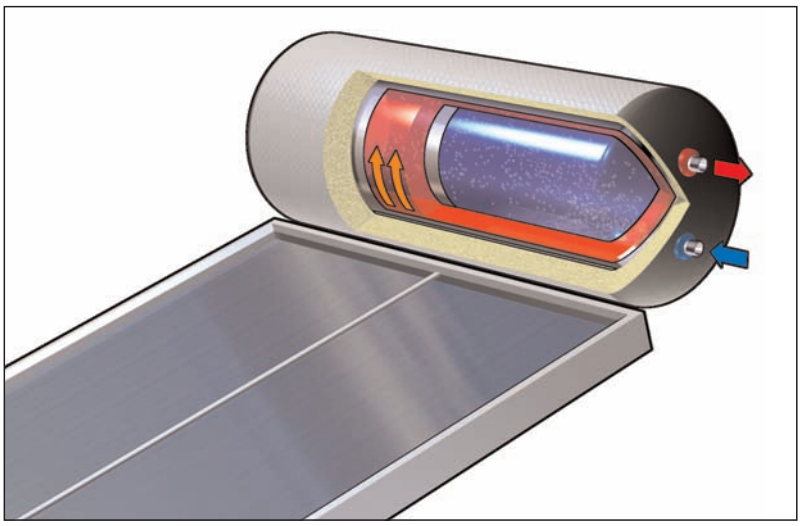
Code	A	B	C	D	E	F	Weight (kg)
252340	1/2"	85	170	169	95	74	1,65
252350	3/4"	85	170	169	95	74	1,68

Solar systems - high temperatures

In solar systems with natural circulation in the primary circuit and storage tank with heating jacket, the temperature of the water in the storage tank can vary considerably depending on the degree of solar radiation, and can reach very high temperatures over long periods.
In summer, and if there is little water usage, the hot water at the storage tank outlet can actually reach temperatures around 98°C before the pressure and temperature safety valves are actuated.
At these temperatures, the hot water cannot be used directly, because of the danger of scalding. Water temperatures over 50°C can cause burns very quickly. For example, at 55°C, partial burn occurs in about 30 seconds, whereas at 60°C partial burn occurs in about 5 seconds.

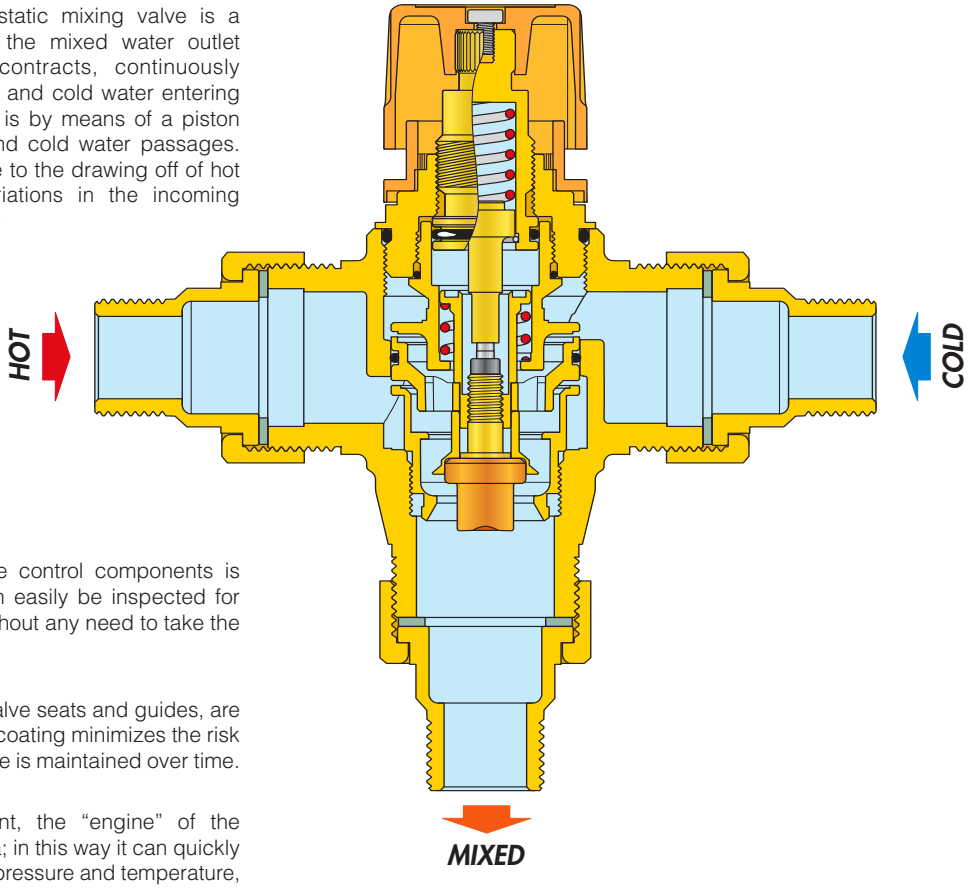
Consequently, the thermostatic mixing valve installed must be able to:

- reduce the temperature of the water supplied through the hot water system to a lower value than to the storage tank, i.e. a value usable by the consumer. For reasons of safety, we advise adjusting the temperature of the mixed water supplied to the user to a value not higher than 50°C.
- maintain a constant temperature in the mixed water when there are variations in the inlet temperatures and pressures.
- maintain function and efficiency over time, without being affected by continuous high temperature of the hot water at the inlet.
- ensure that water is stored at high temperature for longer periods, and supplied to the water system at a lower temperature.



Operating principle

The controlling element of the thermostatic mixing valve is a temperature sensor fully immersed in the mixed water outlet passage which, as it expands or contracts, continuously establishes the correct proportion of hot and cold water entering the valve. The regulation of these flows is by means of a piston sliding in a cylinder between the hot and cold water passages. Even when there are pressure drops due to the drawing off of hot or cold water for other uses, or variations in the incoming temperature, the mixer automatically regulates the water flow to obtain the required temperature.



Construction details

High heat resistance
The internal flow regulation components are designed to maintain performance of the mixing valve with inlet hot water temperatures up to 110°C, in continuous operation.

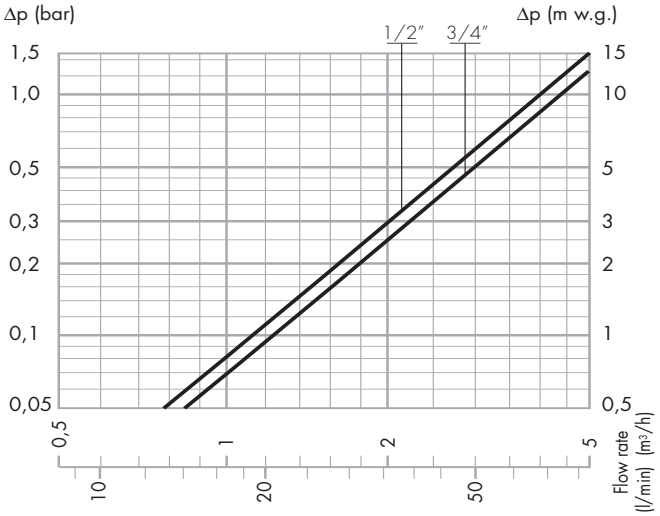
Interchangeable cartridge
The internal cartridge containing all the control components is preassembled in a single body and can easily be inspected for cleaning or replacement if necessary, without any need to take the valve body out of the pipework.

Wearproof coating
All functional parts, such as the shutter, valve seats and guides, are electroless nickel plated. This wearproof coating minimizes the risk of scale forming and ensures performance is maintained over time.

Low-inertia thermostat
The most temperature-sensitive element, the “engine” of the thermostatic mixer, 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 setting and locking
The control knob permits temperature setting between minimum and maximum in one turn (360°). It also has a tamper-proof system to lock the temperature at the set value.

Hydraulic characteristics



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

	Kv (m³/h)
1/2"	4,0
3/4"	4,5

	Minimum (l/min)	Maximum* (l/min)
1/2"	6,7	82,0
3/4"	8,4	92,0

* ΔP = 1,5 bar

Use

2523 series thermostatic mixing valves are typically installed at the outlet of hot water storage tanks in solar systems, to ensure constant temperature of the mixed water supplied to the user.
2523 series thermostatic mixing valves, because of their flow characteristics, can be installed in centralised systems with many different user fittings or for controlling groups of fittings, such as shower units, washbasin units, etc. In order to guarantee the delivery of mixed water at the set temperature, the thermostatic mixing valves must have a minimum flow rate of 6,7 l/min (1/2") and 8,4 l/min (3/4").

Installation

Before installing the mixing valve, pipes should be flushed to remove any impurities that could impair performance. We recommend always installing filters of sufficient capacity at the inlet of the water system.

2523 series thermostatic mixing valves must be installed as shown in the installation diagrams in this leaflet, taking account of the current applicable regulations.

2523 series thermostatic mixing valves can be installed in any position, horizontally or vertically.
The following are indicated on the body of the mixing valve:
· 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 should be installed to prevent undesired back flows.

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 temperature measuring equipment. Use of a digital thermometer is recommended for measurement of the mixed water temperature.

Temperature adjustment

The temperature is set at the desired value by means of the knob with the graduated scale, on the top of the valve.

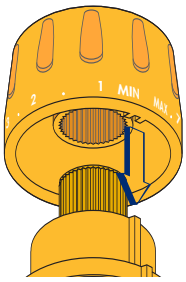
Temperature adjustment table

Position	Min	1	2	3	4	5	6	7	Max
T (°C)	25	29	33	39	43	48	52	58	65

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

Locking the setting

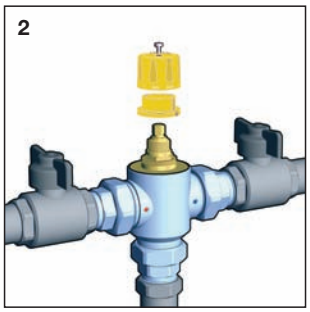
Turn the knob onto the required number, undo the locking screw, remove the knob and put it back on so that the internal reference couples with the protrusion on the knob carrier ring nut.

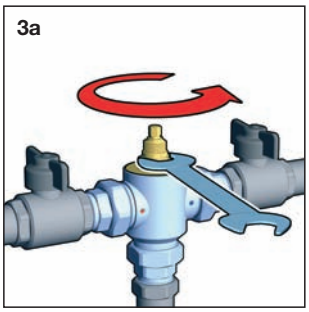


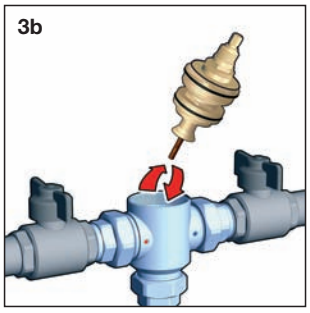
Replacing the cartridge

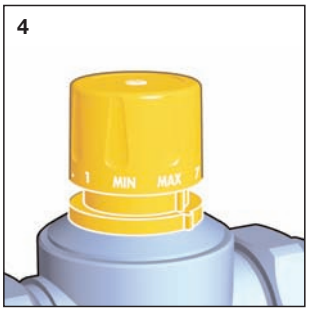
The internal cartridge containing all the control components can be inspected and replaced if necessary, without any need to take the valve body out of the pipework.

1) Close the shut-off valves on the hot and cold inlets. Set the knob to the maximum value.
2) Remove the temperature adjustment knob after unscrewing the lock screw on the top. Remove the plastic knob carrier ring nut.
3) Remove the internal cartridge for inspection or replacement with a new one, using a suitably sized spanner.
4) Fit the knob carrier ring nut back on so that the position indicator is visible.
5) The spare cartridge is supplied preset on the highest value. Then put the control knob back on so that the word MAX align with the position indicator.
By turning the knob clockwise it must be possible to make the adjustment from the maximum to the minimum value.
Secure the knob with the lock screw.
6) Reopen the shut-off valves and adjust the mixing value onto the required temperature.

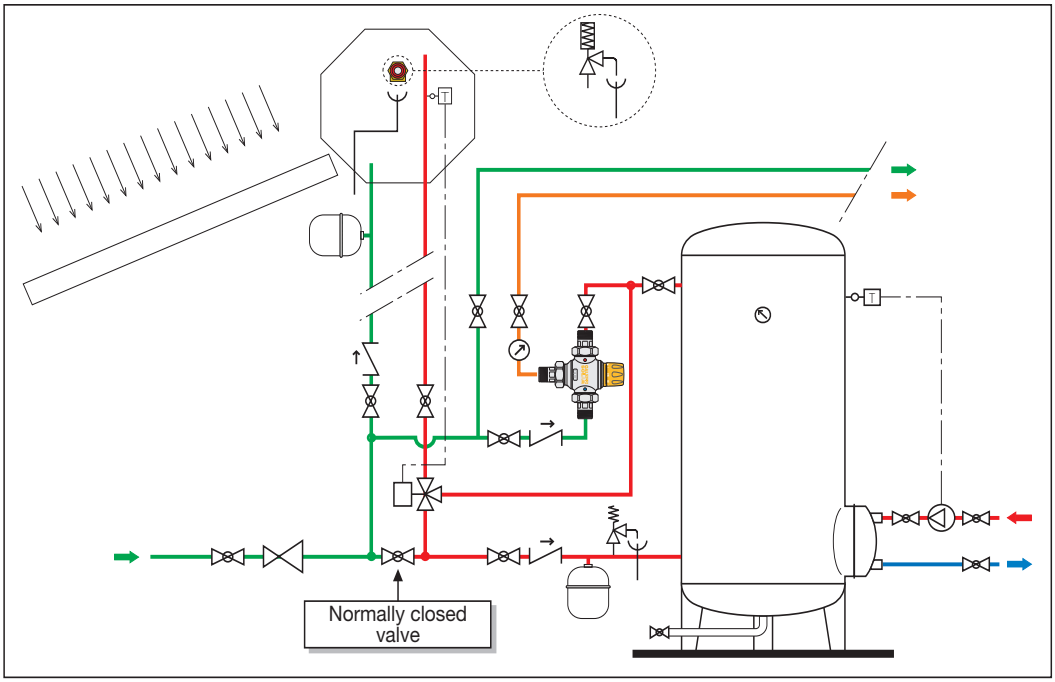


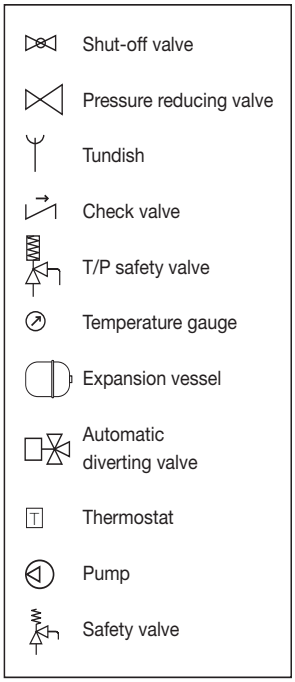




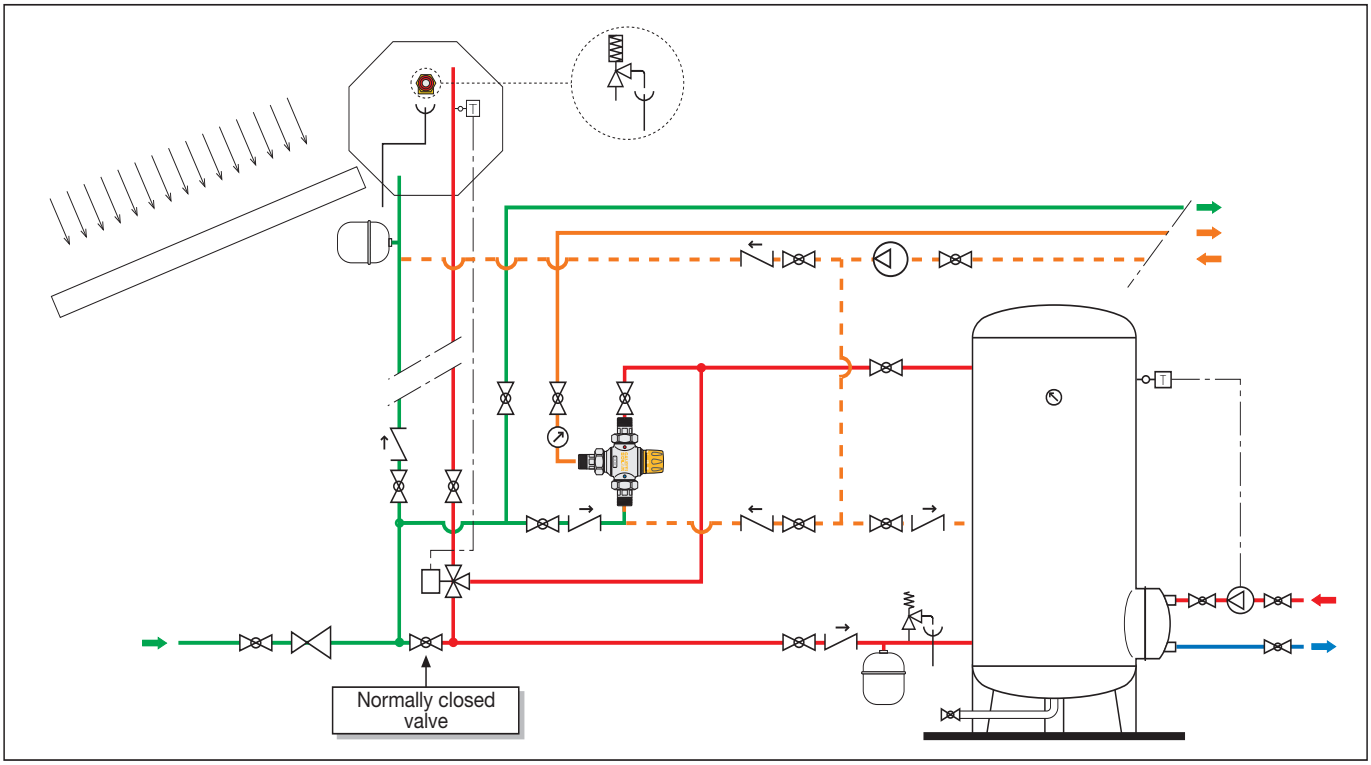


Application diagrams - System with thermal integration





System with thermal integration and recirculation



SPECIFICATION SUMMARIES

2523 Series

Adjustable thermostatic mixing valve with interchangeable cartridge for solar systems. 1/2" (1/2" or 3/4") M connections with union. Brass body. Chrome-plated. Electroless nickel plated brass shutter and cartridge. Stainless steel springs. Seals of EPDM. Maximum inlet temperature 110°C. Adjustment range from 30°C to 65°C. Maximum working pressure (static) 14 bar. Maximum working pressure (dynamic) 5 bar. Accuracy ±2°C. Provided with tamper-proof setting lock.

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