

# Tempering valve adjustable with knob, for installation at the point of distribution



01193/11 GB

## 5218 series



### Function

The tempering valve is used in systems producing domestic hot water. Its function is to maintain the temperature of the mixed water supplied to the user constant at the set value despite any variations in the supply conditions of the incoming hot and cold water.

The tempering valve also features a thermal shut-off function that operates in the event of a cold water supply failure at the inlet. This particular series of tempering valves has been certified as in compliance with the requirements of EN 15092 standard, for applications at the point of distribution.

Patent application No. MI2010A001306.



### Product range

5218 series Tempering valve adjustable with knob, complete with strainers and check valves at the inlet \_\_\_\_\_ size 1/2", 3/4" and 1"

### Technical specifications

#### Materials

Body: dezincification resistant alloy **CR**  
EN 12165 CW602N, outside chrome plated  
Obturator: PSU  
Springs: stainless steel  
Seals: EPDM  
Knob: ABS

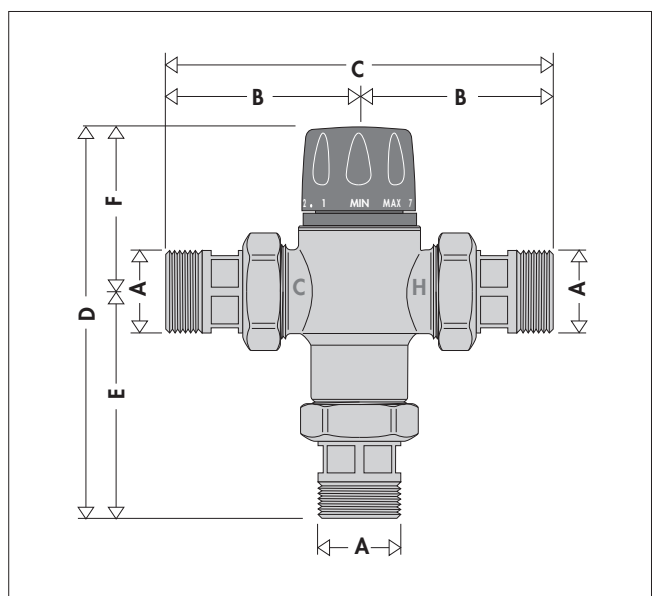
#### Performance

Adjustment temperature range: 45-65°C  
Adjustment temperature range according to standard:  
45-65°C (EN 15092)  
55-60°C (DTC scheme UK)  
Accuracy: ±2°C  
Max. working pressure (static): 10 bar  
Max. working pressure (dynamic): 5 bar  
Max. inlet temperature: 90°C  
Max. inlet pressure ratio (H/C or C/H): 2:1  
Minimum temperature difference between hot water inlet and mixed water outlet to ensure thermal shut-off function: 15°C  
Minimum flow rate for stable operation: 4 l/min (1/2" and 3/4")  
6 l/min (1")

Certified to standard: EN 15092 and DTC (UK)  
Designation: Type 2 (adjustable)

Connections: 1/2", 3/4", 1" M with union

### Dimensions

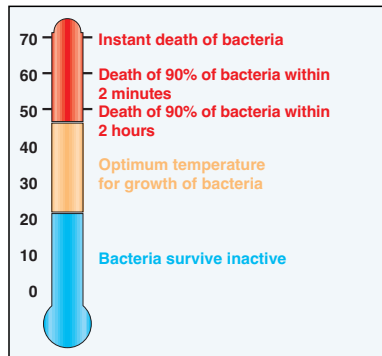


Code	A	B	C	D	E	F	Mass (kg)
521814	1/2"	62,5	125	136	82	54	0,64
521815	3/4"	67	134	137	82	55	0,81
521816	1"	83,5	167	173	100,5	72	1,20

## Legionella - point of distribution

According to the most recent legislation and standards, in order to prevent the growth of the dangerous Legionella bacterium in centralised systems producing domestic hot water with storage, 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 will be totally eliminated.

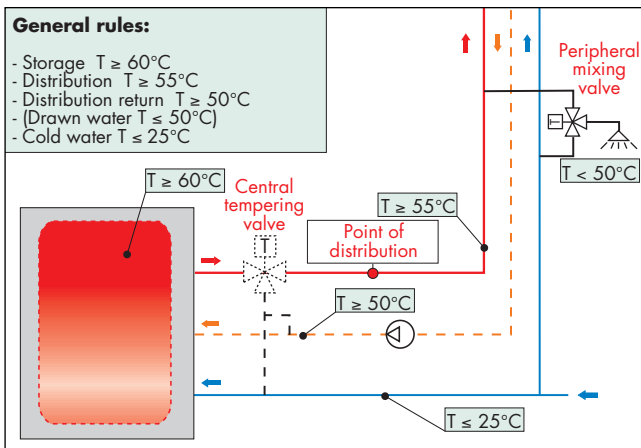
The adjacent diagram shows the behaviour of *Legionella Pneumophila* bacteria as the temperature conditions of the water containing the bacteria vary. To ensure correct thermal disinfection, it is necessary to go up to values of at least 60°C.



In this type of system, it often happens that the temperature at the storage outlet is unstable and highly variable. This occurs because of multiple operating conditions, in terms of pressure and heat exchange with the primary energy source and the drawn flow rate. Also, in combination with solar systems, the storage temperature can reach very high levels.

Therefore, the distribution system temperature is not controlled and it is not kept at values able to ensure an efficient energy saving as well as the thermal disinfection of the system itself. Furthermore, the optimum operating conditions required to guarantee anti-scald safety at peripheral thermostatic mixing valves are not ensured.

In centralised systems, it often occurs that the hot and cold water networks are of different origin and at different pressures. In the event of a cold water supply failure at the inlet, it is important to avoid sudden, unexpected increases in the temperature of the distributed hot water.



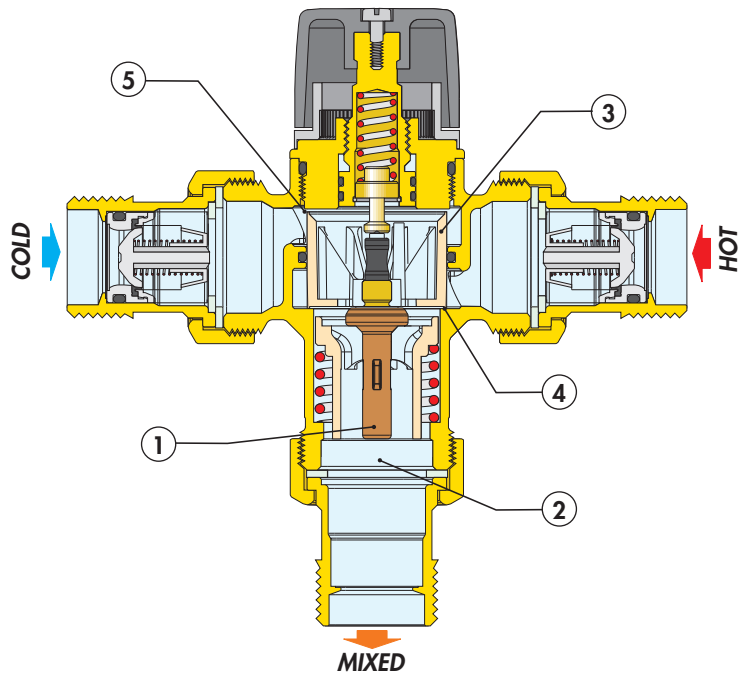
For all these reasons, therefore, a tempering valve must be installed on the hot water storage outlet line, at the inlet point of the distribution system, which is able to:

- reduce the temperature at the point of distribution to a value lower than that of the storage, in a controlled way to make it suitable for domestic use,
- have a temperature adjustment range that makes it possible to perform a thermal disinfection of the system, should this be necessary,
- allow the temperature to be adjusted at the desired value, with a tamper-proof locking system,
- keep the distribution temperature constant despite variations in temperature, inlet pressure and drawn flow rate,
- have a thermal shut-off function that operates in the event of a cold water supply failure at the inlet,
- have performance certified in accordance with the specific product standards for these applications.

## Operating principle

The tempering valve mixes the hot and cold water at the inlet so as to maintain the mixed water at a constant set temperature at the outlet.

A thermostatic element (1) is fully immersed in the mixed water flow (2). It contracts or expands, moving an obturator (3) which controls the passage of hot (4) or cold (5) water at the inlet. If the inlet temperature or pressure changes, the internal element automatically reacts to restore the set temperature at the outlet.



## Construction details

### Anti-scale materials

The materials used in constructing the tempering valve were selected to eliminate seizing due to limescale deposits.

All functional parts are made using a special anti-scale material with low friction coefficient, which ensures that performance is maintained over time.

### Thermal shut-off

If the event of accidental cold water supply failure at the inlet, the obturator shuts off the hot water passage, thus preventing the delivery of mixed water. This performance is guaranteed only when there is a minimum temperature difference between the inlet hot water and the outlet mixed water of 15°C (performance according to EN 15092).

## European certification

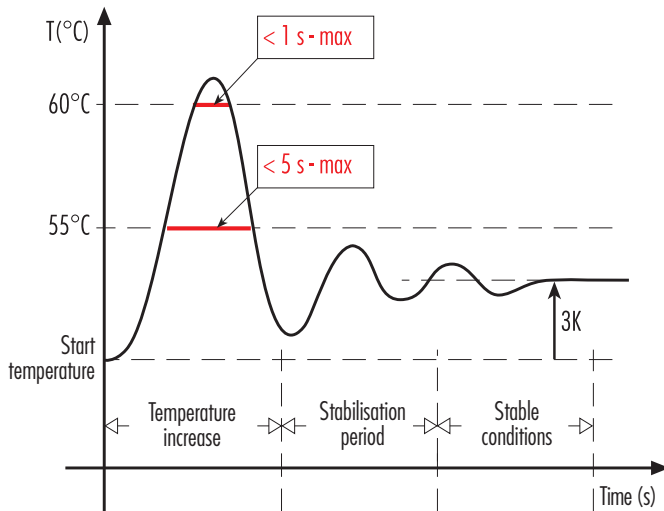
European standard EN 15092 "*Inline hot water supply tempering valves. - Tests and requirements*", specifies the performance characteristics for tempering valves installed at the point of distribution in domestic water systems made in accordance with the recent European standards EN 806-1/2/3/4/5.

The 5218 series tempering valves are certified as compliant with these standards by the certification agency Buildcert and DTC (UK).

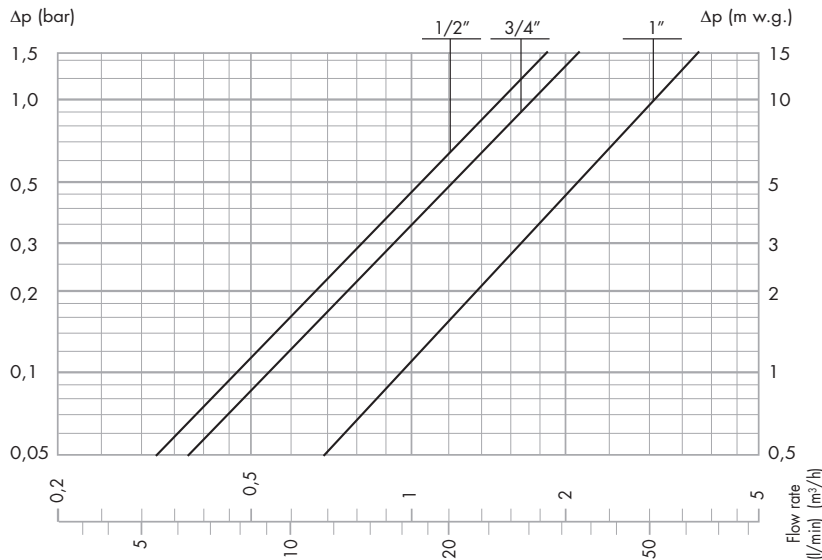
	Use limits	Recommended operating limits
Dynamic pressure	0,2 bar min.	1 bar ≤ p ≤ 5 bar
Static pressure	10 bar max.	
Hot water inlet temp.	T ≤ 90°C	60°C ≤ T ≤ 80°C
Cold water inlet temp.	T ≤ 25°C	T ≤ 25°C
<b>Distribution (outlet) temp. EN 15092</b>	<b>45°C ≤ T ≤ 65°C</b>	
<b>Distribution (outlet) temp. DTC scheme</b>	<b>55°C ≤ T ≤ 60°C</b>	

## Thermal transient

During the transient, as a consequence of rapid changes in pressure, temperature or flow rate, the temperature increases with respect to the initial set point and this increase must be of limited duration. Requirements according to EN15092.



## Hydraulic characteristics



Recommended flow rate values to ensure stable operation and an accuracy of  $\pm 2^\circ\text{C}$

* $\Delta p = 1,5 \text{ bar}$	Minimum (m³/h)	Maximum* (m³/h)
1/2"	0,24	1,80
3/4"	0,24	2,00
1"	0,36	3,60

Code	Ø	Kv (m³/h)
521814	1/2"	1,5
521815	3/4"	1,7
521816	1"	3,0

## Application

The 5218 series tempering valves are used, in accordance with EN 15092 standard requirements, for applications at the point of distribution, to control the temperature of the domestic hot water distributed in the network. They are not intended to control the water temperature at the point of use.

**The 5218 series tempering valves are not safety devices.**

Specific anti-scald mixing valves must be used for this purpose.

To ensure a stable operation, the tempering valve must have a minimum flow rate of 4 l/min (1/2"; 3/4") and 6 l/min (1").

## Choice of tempering valve size

Given the design flow rate, taking into account simultaneous use of the domestic appliances, the tempering valve size should be selected by checking the head loss on the provided graph. In this case, it is necessary to check the available pressure, the head loss in the system downstream of the tempering valve and the residual pressure to be guaranteed for user appliances.

Sizing software is available on [www.caleffi.it](http://www.caleffi.it).

## Installation

Before installing the tempering valve, the connecting pipes should be flushed to remove any impurities that could impair performance. The installation of strainers of adequate performance at the water inlet from the water supply network is always recommended.

The 5218 series tempering valves are equipped with strainers at the hot and cold water inlets.

The 5218 series tempering valves must be installed according to the diagrams shown in the instruction sheet or in this leaflet.

The 5218 series tempering valves can be installed in any position, horizontally or vertically.

The following indications are on the valve body:

- hot water inlet, indicated by the letter "H" (Hot)
- cold water inlet, indicated by the letter "C" (Cold)
- mixed water outlet, indicated by the word "MIX".

## Check valves

In systems with thermostatic mixing valves, EN 13959 certified check valves must be installed to prevent undesired backflow. The 5218 series tempering valves are equipped with EN 13959 certified check valves at the hot and cold water inlets.

## Commissioning

In view of the special applications of the thermostatic tempering valve, it must be commissioned in accordance with current regulations by qualified technicians, 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.

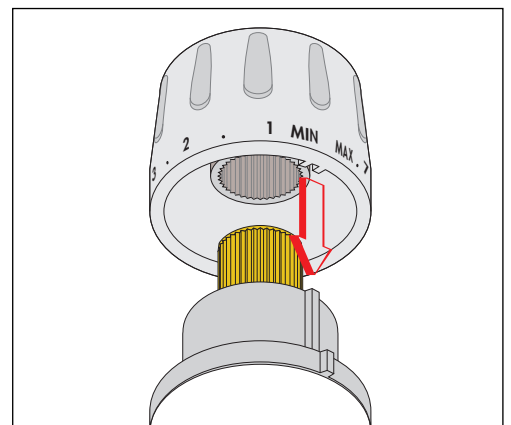
Pos.	Min.	1	2	3	4	5	6	7	Max.
1/2" - 3/4" T (°C)	45	48	51	53	55	58	60	63	65
1" T (°C)	45	47	49	51	54	56	59	62	65

With  $T_{hot} = 70^\circ\text{C}$  ·  $T_{cold} = 15^\circ\text{C}$











$P_{hot} = 3 \text{ bar}$  ·  $P_{cold} = 3 \text{ bar}$

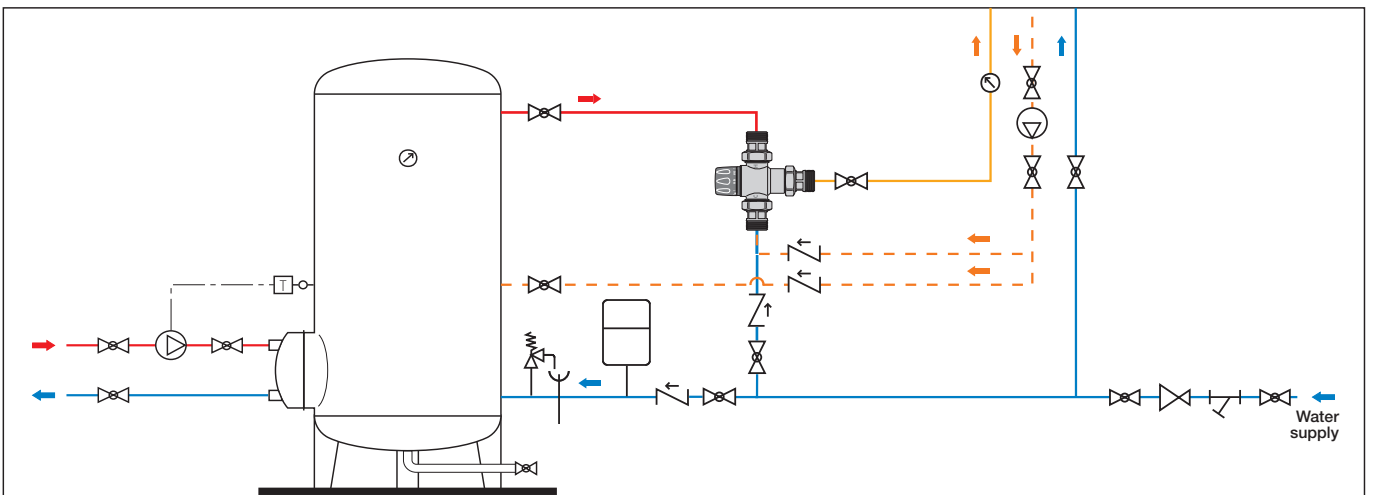
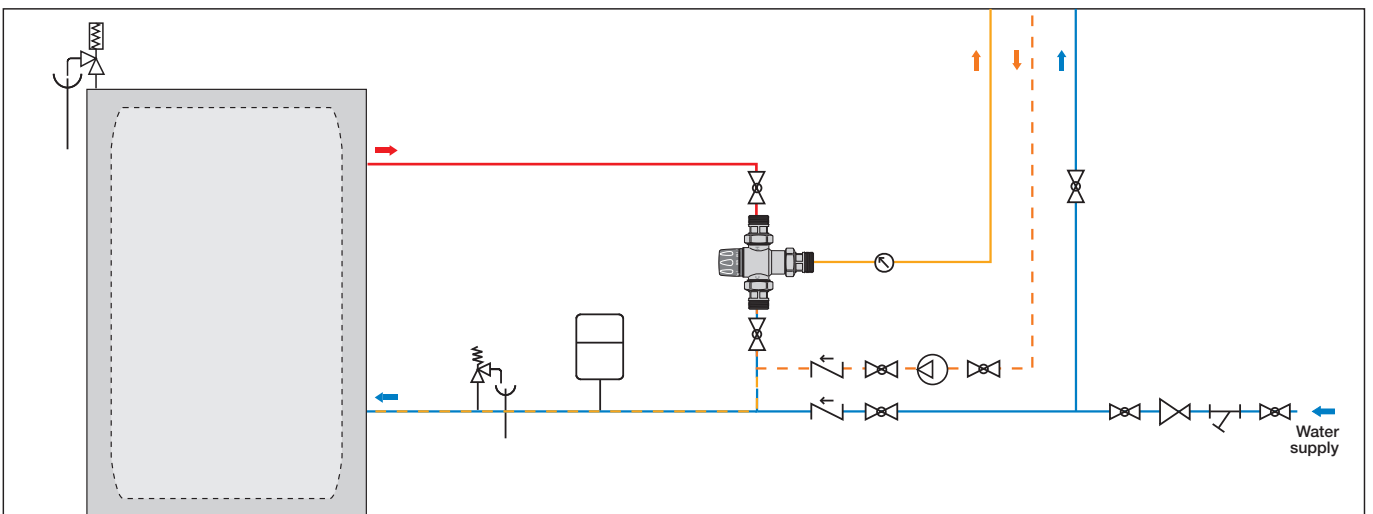
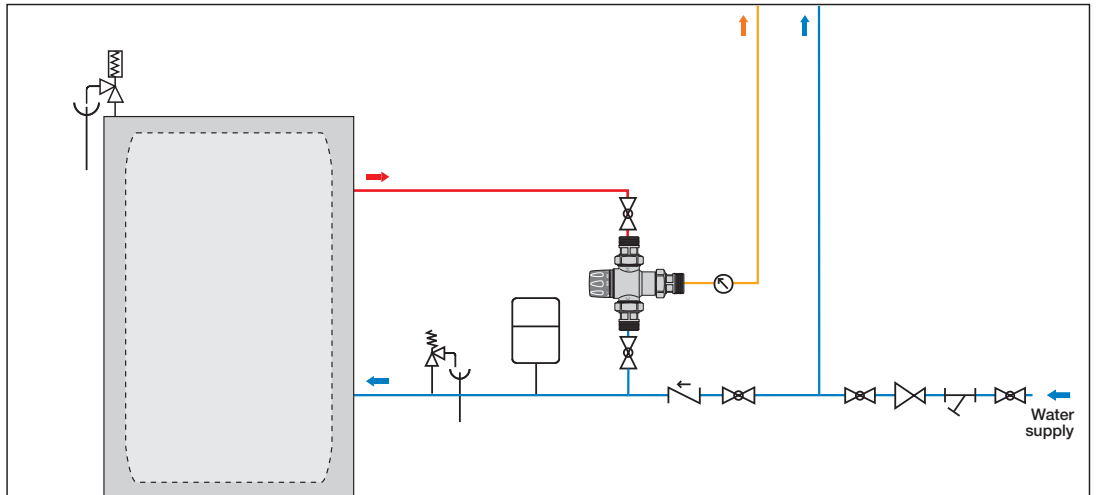
## Locking the setting

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.



## Application diagrams

	Ball valve
	Ball valve with check valve
	Temperature gauge
	Pump
	Expansion vessel
	Thermostat
	Temperature/pressure safety relief valve
	Safety relief valve
	Pressure reducing valve
	Y-strainer



## SPECIFICATION SUMMARY

### 5218 series

Tempering valve adjustable with knob. Certified in compliance with standard EN 15092. Connections 1/2" M (3/4" and 1") with union. Dezincification resistant alloy body. Chrome plated. PSU obturator. Stainless steel springs. EPDM seal elements. ABS control knob. Maximum inlet temperature 90°C. Adjustment temperature range 45°C to 65°C. Accuracy ±2°C. Maximum working pressure (static) 10 bar. Maximum working pressure (dynamic) 5 bar. Maximum inlet pressure ratio (H/C or C/H) 2:1. Complete with strainers and check valves at the inlets. Equipped with tamper-proof temperature 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.*



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