

5214 adjustable

thermostatic mixing valves



altecnic
Caleffi group

5214 adjustable thermostatic mixing valve



Application

Thermostatic mixing valves are used to maintain the domestic hot water supplied to the user at a constant and safe temperature, when variations in the hot and cold water supply conditions and draw off flow rates occur.

The valves are also equipped with an anti-scald safety function which immediately shuts off the flow of hot water in the event of a failure in the cold water supply.

The failsafe design also shuts off the mixed water flow automatically in the event of disruption in the hot water supply to the valve.

5214 mixing valves also offer an override function which makes it possible, during the disinfection process, to supply users with water at the same temperature of the hot water inlet.

TMV2

Altecnic 5214 thermostatic mixing valves meet the requirements of BS EN 1111: 1999 and BS EN 1287: 1999 and the TMV2 Type Scheme. The valves have been independently tested and approved as a type 2 valve under the Buildcert TMV2 scheme by the WRC - NSF Limited / Buildcert Limited.

Altecnic 5214 thermostatic mixing valves are suitable for use in domestic housing and commercial building for single user outlets including wash basins, showers, baths and bidets but are also suitable for multiple outlet use.

Construction Details

Component	Material	Grade
Body	DZR - chrome plated	BS EN 12165 CW602N
Shutter	PSU	
Springs	Stainless steel	
Seals	EPDM	
Knob	ABS	

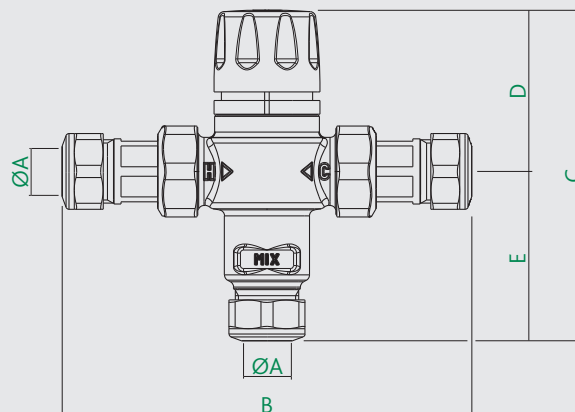
Product Code	Size	Connection	Type
521411	15 mm	compression	Cu x Cu x Cu
521412	22 mm	compression	Cu x Cu x Cu

Safety

The Altecnic 5214 thermostatic mixing valve ensures stable operation when installed, commissioned and maintained according to the instructions provided.

The valve shall not be considered as an alternative to proper care during its operation.

Dimensions



Prod Code	A	B	C	D	E	kg
521411	15	135	109	53	56	1.1
521412	22	150	110	53	57	1.1

Technical Data

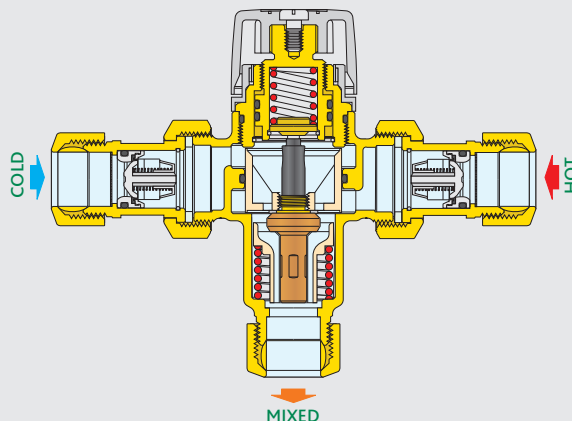
Max. working pressure:	10 bar - Static
Max. working pressure:	5 bar - Dynamic
Max. inlet temperature:	90°C
Temperature Setting Range:	30 to 50°C + T _D
Override function:	T _D = T _{HOT}
Inlet temperature recommended for optimum performance:	≤65°C
Max. inlet pressure ratio (H/C or C/H):	4:1
Accuracy:	±2°C
Min. temperature difference between inlet hot water and outlet mixed water:	15°C
Min. flow for stable operation	4 l/m
T _D = disinfection temperature	
T _{HOT} = hot water inlet temperature	

Operating Principle

The thermostatic mixing 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.

The thermostatic element is fully immersed in the mixed water flow. It contracts or expands, moving an obturator which controls the passage of hot or cold water at the inlet.

If the inlet temperature or pressure changes, the internal element automatically reacts to restore the set temperature at the outlet.



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Operating Principle

Anti-scald safety function

In the event of a failure of the cold supply, the shutter will shut off the hot water passage, stopping water discharging from the mixed water outlet.

To ensure the correct operation of the thermal shut-off feature, it is required a minimum temperature differential from hot inlet to mixed water outlet of 15°C.

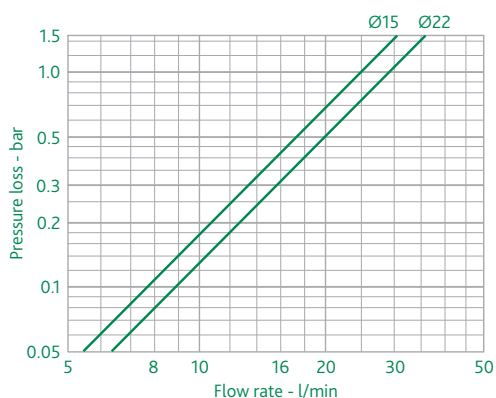
Override function



When the knob is set to the override function, water is supplied to users at the same temperature as the water at the hot inlet.

Special care must therefore be taken in order to prevent serious scalding.

Flow Characteristics and Kv Values



Ø15 - Kv = 1.5 m³/hr

Ø22 - Kv = 1.7 m³/hr

In view of their flow rate characteristics, the Altecnic 5214 thermostatic mixing valves can be used for application at the delivery point or for a limited number of users, for example a bathroom.

For this reason, the flow rate passing through the mixing valve is generally the same passing through the user water outlet, for example the basin tap, shower, bidet, etc.

To ensure optimal performance, a minimum flow rate of 4 l/min must be guaranteed to the mixing valve.

The system must always be sized taking into account current legislation regarding the nominal flow rate for each water outlet.

Installation

Check the system before installing the 5214 mixing valve to ensure that the system operating parameters fall within the functional range of the mixing valve, for example in terms of supply temperature and pressure, etc.

5214 mixing valves must be installed by an authorised technician in accordance with current applicable legislation and the instructions provided.

The system must be flushed and cleaned to remove any debris that may have accumulated during installation.

Failure to remove impurities may affect valve performance and invalidate the manufacturer's warranty.

Installation continued

If the water is highly aggressive, it must be treated before being supplied to the mixing valve.

It is essential that access to the valve is not obstructed, in order to allow maintenance of the valve or fittings if required.

The pipes must not be used to support the weight of the valve.

When installing the unit, observe all current legislation regarding the maximum distance between the valve outlet and every user tap.

The valve should be installed as close as possible to the user it is serving.

5214 mixing valves can be installed in any position, vertical or horizontal.

The hot and cold water inlets must be connected as shown on the valve body itself.

The hot water inlet is marked with the letter 'H' and the cold with the letter 'C'.

The mixed water outlet is marked with the text 'MIX'.

The thermostatic mixing valves must be installed complete with shut-off valves, strainers and check valves at the inlets.

The shut-off valves are required to isolate the water supply to the valve if maintenance is needed.

The strainers are essential to prevent debris from entering the mixing valve.

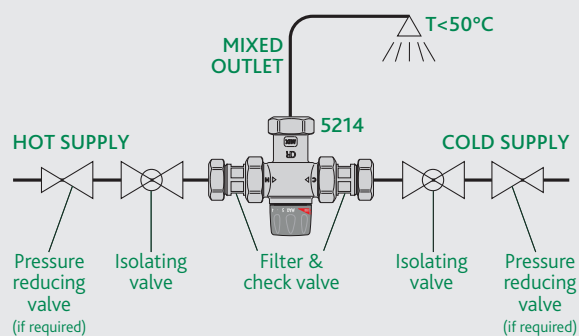
The check valves are necessary to prevent undesired circulation and backflow.

5214 series mixing valves are supplied complete with strainers and check valves at the hot and cold water inlets.

If the valve is not installed correctly, it may not work properly, thus endangering the user.

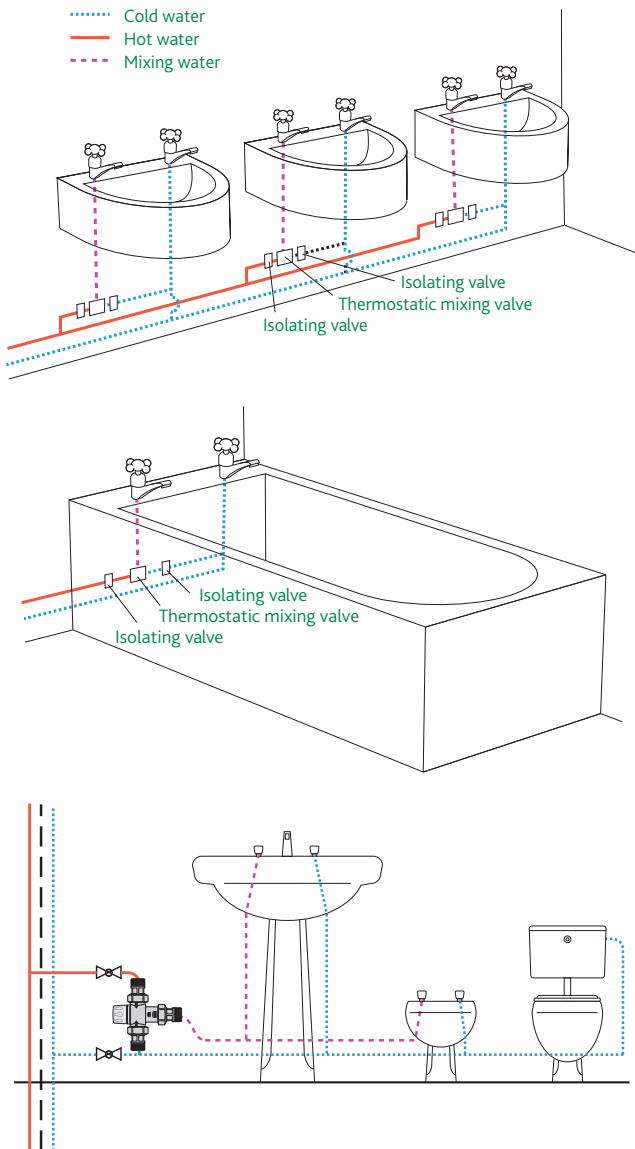
Application

5214 mixing valves are suited to point-of-use applications in systems in which the hot water is stored and distributed to the user at high temperature ($T > 50^{\circ}\text{C}$).



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Application



Commissioning

After installation, the mixing valve must be tested and commissioned by an authorised technician in accordance with the procedure given below and as specified by current applicable legislation.

The following instructions must be read and understood before commissioning the 5214 thermostatic mixing valve.

If there are any aspects of the installation or the system which do not correspond to the specified requirements, the valve must not be commissioned until the installation/system is made to conform to the said requirements.

- 1 Make sure that the system is clean and free from dirt before commissioning the thermostatic mixing valve.
- 2 Set the mixed water temperature, with a calibrated digital thermometer. Measure the temperature of the mixed water with the probe immersed in water flowing from a water outlet.
- 3 Depending on the intended use and associated risk, the temperature at the outlet must be regulated so it does not present a danger to the user and so that it remains within the limits stipulated by established legislation.

Commissioning Continued

- 4 The temperature at the valve outlet must be set while taking into account potential temperature fluctuations caused by the simultaneous drawing of water from more than one user fitting.

These conditions must be stabilized before the valve is commissioned.

Within the adjustment scale, the T_{MIX} temperature varies from 30°C to 50°C. Beyond the adjustment scale, with the knob in the HOT position, the temperature of the mixed water (T_{MIX}) is the same as the temperature of the hot water at the inlet during the override function (T_{HOT}).

- 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 stabilised. The final temperature measured in this test may not exceed the permitted values by $\pm 2^\circ\text{C}$.

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.

Temperature Adjustment



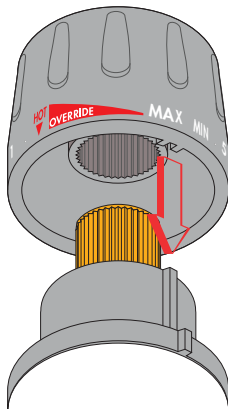
HOT	MAX	5	4	3	2	1	MIN
T_{MIX}	>54°C	53°C	51°C	49°C	45°C	40°C	<30°C
<small>with: $T_{HOT}=70^\circ\text{C}$ • $T_{COLD}=15^\circ\text{C}$ • $P_{HOT}=3\text{ bar}$ • $P_{COLD}=3\text{ bar}$</small>							

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Preset Locking

Position the handle to the number required. Unscrew the head screw, pull off the handle and reposition it so that the handle fits into the internal slot of the knob.

Tighten the head screw.



Problem Solving

In normal operating conditions, Altecnic 5214 thermostatic mixing valves offer outstanding performance.

However, in certain circumstances or if the maintenance schedule is not observed, the following problems may arise:

Problem	Cause	Solution
Hot water delivery at cold tap	a) Inlet check valve not operating correctly or seals worn/damaged b) Check valves not fitted	• Replace damaged check valves
Fluctuations in temperature of mixed water	a) Incorrect inlet water temperature b) Insufficient inlet water flow c) Commissioned incorrectly	• Restore inlet conditions to within valve specification range
Incorrect valve outlet flow rate	a) Insufficient water supply b) Fluctuations in temperature/ pressure at inlet c) Unfavourable conditions created by the operation of other water outlets	• Stabilise water supply to the valve
No outlet flow rate	a) In-line filters blocked b) Insufficient supply pressure c) Debris blocking water flow through valve	• Clean filters • Restore supply conditions • Remove debris/limescale from the valve
Valve anti-scald safety function not performing when tested	a) Installation not compliant with instructions b) Minimum temperature difference not achieved c) Valve mechanism blocked by debris	• Follow installation instructions • Increase hot water temperature • Remove debris/ limescale from the valve

Safety



- The thermostatic mixing valve must be installed by an approved installer in accordance with national regulations and/or relevant local requirements.

- If the mixing valve 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.
- Make sure that all the connecting pipework is water tight.
- When making the water connections, make sure that the mixer connecting pipework is not mechanically over-stressed. Over time this could cause breakages, with consequent water losses which, in turn, could cause harm to property and/or people.
- Water temperatures higher than 50°C can cause serious scalds.

Maintenance

In service tests should be carried out regularly to monitor the mixer 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 carried out.

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

With reference to the exploded view:

- 1 The hot and cold water inlet strainers can be removed for cleaning by unscrewing the locking nut of the union, please refer to the cross sectional illustration shown in Operating Principles.
- 2 The check valves can be inspected as explained in point 1 to ensure that they are perfectly operational and watertight.
- 3 The best way to remove limescale from the components inside the valve is to immerse the complete valve in a limescale de-scaler.

Check the O-rings and lubricate them with a suitable lubricant.
- 4 After checking any components requiring maintenance, repeat the mixing valve commissioning procedure.

Safety Continued

- During the installation, commissioning and maintenance of the mixing valve, take the necessary precautions to ensure that such temperatures do not endanger people.
- In the case of highly aggressive water, arrangements must be made to treat the water before it enters the mixing valve, in accordance with current legislation. Otherwise the mixer may be damaged and will not operate correctly

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Altecnic Ltd Mustang Drive, Stafford, Staffordshire ST16 1GW

T: +44 (0)1785 218200 E: sales@altecnic.co.uk

Registered in England No: 2095101

altecnic.co.uk

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