Control unit for domestic hot water temperature

5201 series

01267/16 GB

Function

The control unit for domestic hot water temperature is used in systems that produce domestic hot water. 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 supply conditions of the incoming hot and cold water and to facilitate connections of the cold water and recirculation pipes to the storage.
The mixing valve also features a thermal shut-off function that operates in the event of a cold water supply failure at the inlet.

The unit allows easy connection of the cold water filling and hot water outlet pipes from the water storage in a restricted space.

The unit is offered in a version with or without accessories for connection to the recirculation pipe in order to meet all installation needs.

Referred to the thermostatic mixing valve

Product range

5201 series	Control unit for domestic hot water temperature	size DN 20 (3/4") and DN 25 (1")
Code 520005	Accessory kit for recirculation connection	size DN 20 (3/4")
Code 520155	Control unit for domestic hot water temperature complete with recirculation connection	size DN 20 (3/4")

Technical specifications

Materials

Body:	dezincification resistant alloy CR EN 1982 CC768S
Connection fittings:	brass EN 12165 CW617N
Obturator:	PSU
Springs:	stainless steel EN 10270-3 (AISI 302)
Seals:	EPDM
Knob:	ABS

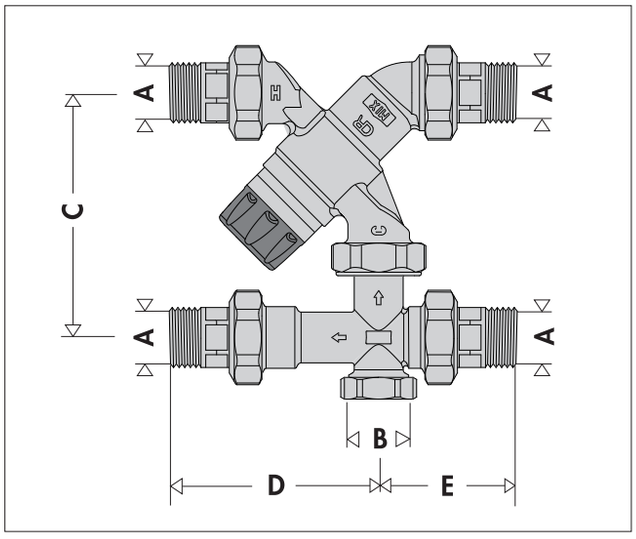
Performance

Adjustment temperature range:	35–65°C
Accuracy:	±2°C
Max. working pressure (static):	10 bar
Max. working pressure (dynamic):	5 bar
Max. inlet temperature:	90°C
Maximum 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
Min. flow rate for stable operation:	4 l/min (DN 20) 6 l/min (DN 25)

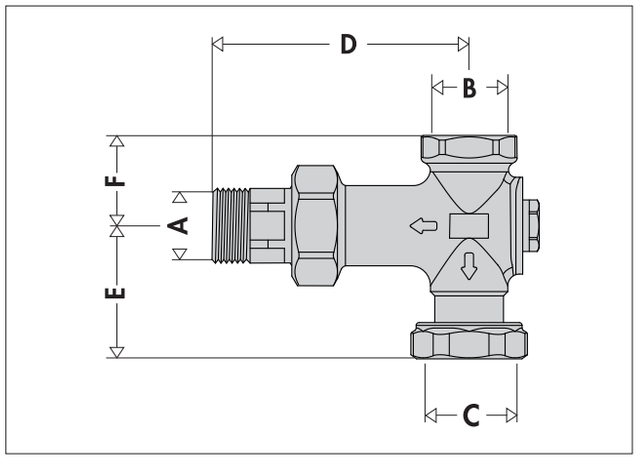
Connections:

- 5201 series:	3/4"–1" M (ISO 228/-1) with union
- 520005:	3/4" M with union x 3/4" F x 1" F (ISO 228-1) with nut
- 520155:	3/4" M with union x 3/4" M (ISO 228-1)

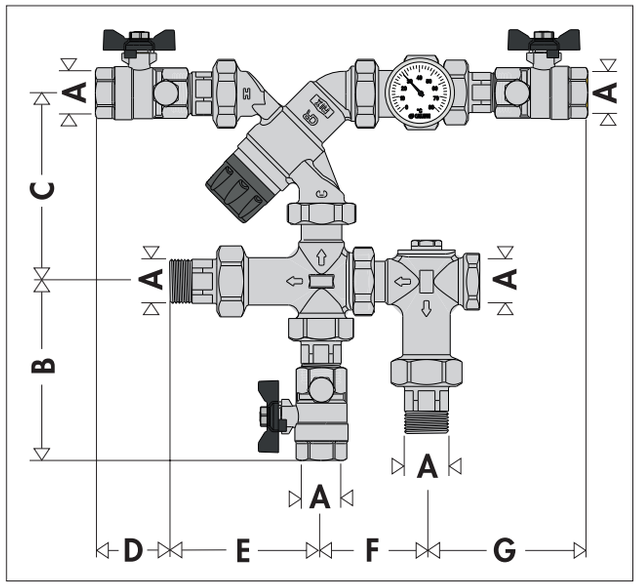
Dimensions



Code	A	B	C	D	E	Mass (kg)
520150	3/4″	1″	110	90,5	61,5	1,400
520160	1″	1″	135	115,5	76,5	2,457



Code	A	B	C	D	E	F	Mass (kg)
520005	3/4″	3/4″	1″	90,5	38	31,5	0,550

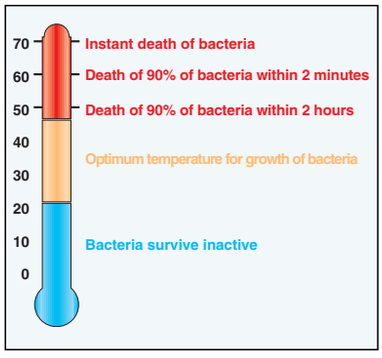


Code	A	B	C	D	E	F	G	Mass (kg)
520155	3/4″	113,5	110	46	90,5	64	100,5	3,200

Legionella - point of distribution

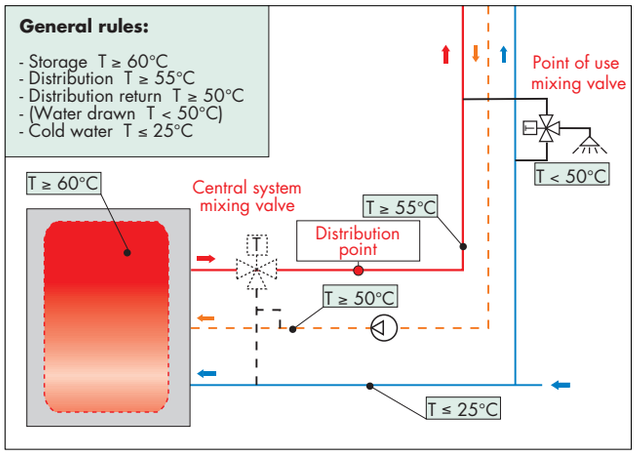
According to the most recent legislation and standards, in order to prevent the growth of the dangerous Legionella bacterium in centralised systems producing domestic hot water with storage, the hot water must be stored at a temperature of at least 60°C. At this temperature it is certain that the growth 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. For all these reasons, therefore, a thermostatic mixing valve must be installed on the hot water storage outlet line, at the inlet point of the distribution system, which is able to:

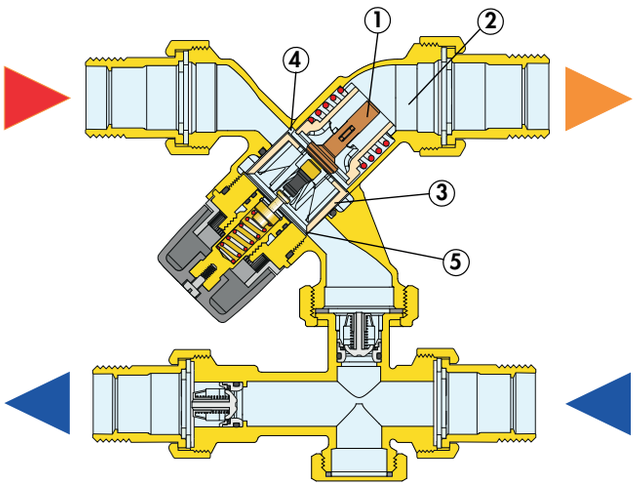
- reduce the temperature at the point of distribution to a value lower than that of the storage, in a controlled way to make it suitable for domestic use,
- have a temperature adjustment range that makes it possible to perform a thermal disinfection of the system, should this be necessary,
- allow the 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.



The mixing valves must be installed taking great care in positioning the connecting pipes correctly, fitting suitable check valves where necessary.

Operating principle

The thermostatic mixing valve mixes the hot and cold water at the inlet so as to maintain the mixed water constantly at the 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 there are changes in inlet temperature or pressure, the internal element reacts automatically to restore the set temperature at the outlet.



Construction details

Dezincification resistant material with very low lead contents (Low Lead)
The material used to make the mixing valve body is perfectly in line with the new normative provision concerning contact with potable water. This is an innovative alloy with very low lead contents and dezincification resistant properties.

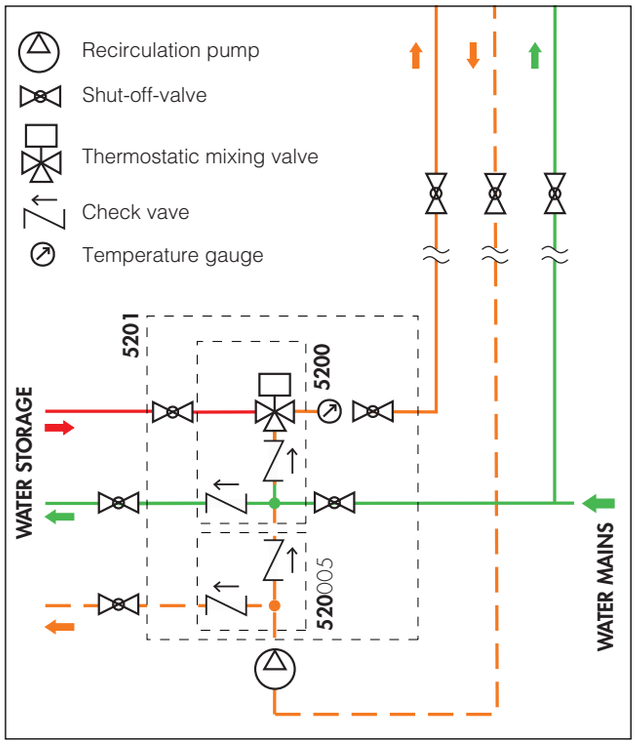
Anti-scale materials
The materials used in constructing the mixing valve were selected to eliminate seizing due to limescale deposits. All functional parts have been made using a special anti-scale material with low friction coefficient, which ensures over time performance.

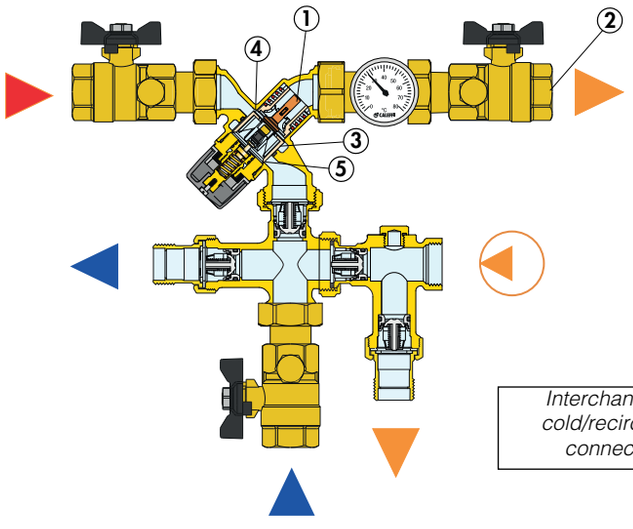
Thermal shut-off
In the event of accidental cold water supply failure, the obturator shuts off the hot water passage, thus preventing the delivery of mixed water. This is only guaranteed when there is a minimum temperature difference between the inlet hot water and the mixed water delivery of 15°C.

Certification
The thermostatic mixing valves of the control units are certified by the Buildcert and Kiwa bodies as compliant with the requirements of EN 1111 and EN 1287.

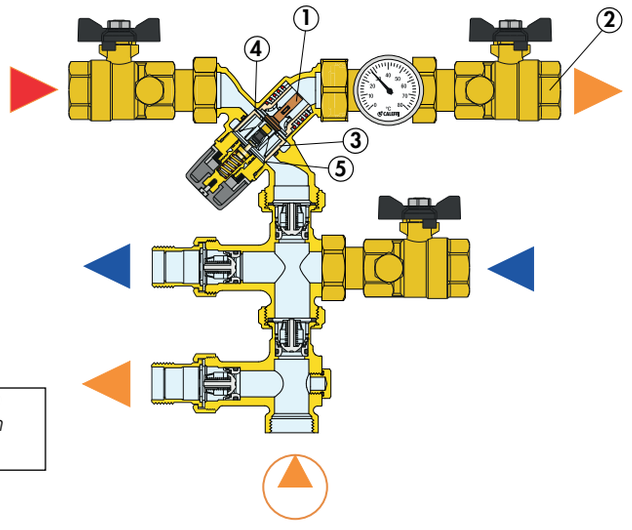
Complete temperature control unit
The control unit for domestic hot water temperature is equipped with a high performance thermostatic mixing valve with a thermal shut-off function. This makes it possible to maintain a flow temperature at the distribution point that is perfectly stable at the required value. The domestic hot water temperature control unit allows easy **connection between pipes serving the domestic hot water and storage** system, making it possible to minimise space requirements for installation. The unit is supplied with the **check valves that allow correct operation of the mixing valve in the presence of recirculation**. The group's modularity makes it extremely flexible, since it allows orientation of the various pipe connections in accordance with installation requirements. The shut-off valves with connection ports and temperature gauge on the mixed water outlet facilitate commissioning, checking and maintenance operations.

Hydraulic diagram

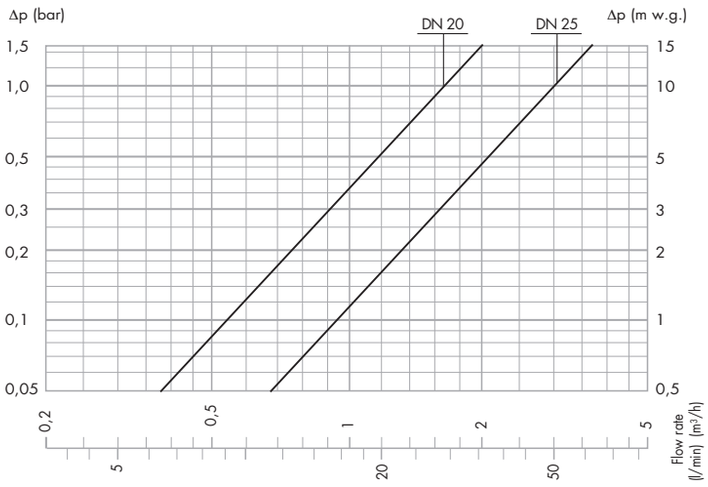




Interchangeable cold/recirculation connections



Hydraulic characteristics



Code	DN	Kv (m³/h)
52015.	20	1,7
52016.	25	3,0

*Δp = 1,5 bar	Minimum (m³/h)	Maximum* (m³/h)
DN 20	0,24	2,00
DN 25	0,36	3,60

Recommended flow rate values to ensure stable operation with an accuracy of ±2°C

Application

Thermostatic mixing valves 5201 series are used for applications at the point of distribution, to control the temperature of the domestic hot water distributed in the network.
To guarantee stable operation, the mixing valve must be supplied with a minimum flow rate of 4 l/min (DN 20) and 6 l/min (DN 25).

Selecting the mixing valve size

Given the design flow rate, taking into account simultaneous use of the domestic appliances, the mixing 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 mixing valve and the residual pressure to be guaranteed for user appliances.

Sizing software available at www.caleffi.com
Apple Store and Google play.

Installation

Before installing the mixing valve, the connecting pipes should be flushed to remove any impurities that could impair performance. We recommend always installing strainers of sufficient capacity at the inlet from the water main.
5201 series thermostatic mixing valves must be installed according to the diagrams shown in the instruction sheet or in this leaflet.
5201 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 by letter H (Hot) and a red mark
· cold water inlet, indicated by letter C (Cold) and a blue mark
· mixed water outlet, indicated by the word “MIX”.

Check valves

In systems with thermostatic mixing valves, check valves must be installed to prevent undesired backflow. 5201 series thermostatic mixing valves are supplied complete with check valves.

Commissioning

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

The unit is fitted with shut-off valves, pressure and temperature test ports for the pressure gauge and digital probe type temperature gauge, temperature gauge on the mixed water outlet.
This configuration makes for rapid and trouble-free commissioning procedures.

Temperature adjustment

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

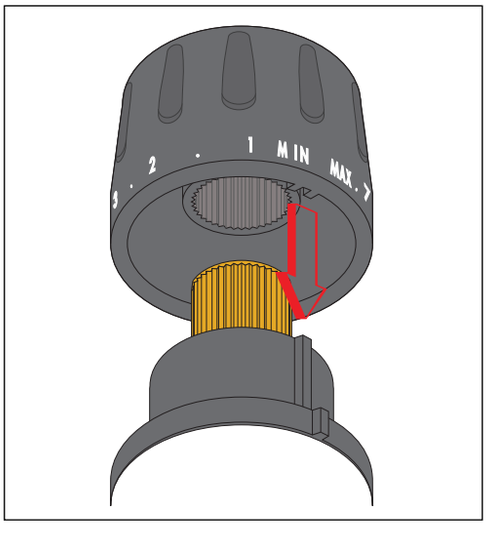
Pos.	Min	1	2	3	4	5	6	7	Max
DN 20 **T (°C)**	35	40	45	48	52	56	60	63	65
DN 25 **T (°C)**	35	38	41	45	50	53	56	60	65

con: T_{hot} = 70°C · T_{cold} = 15°C

p_{hot} = 3 bar p_{cold} = 3 bar

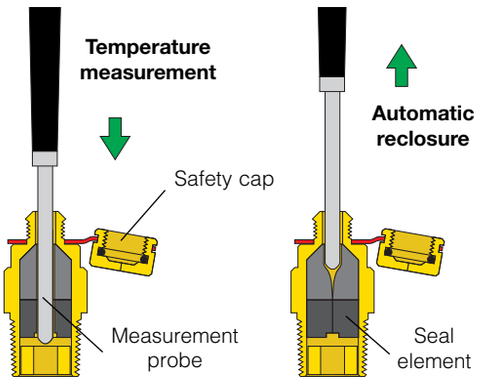
Locking the setting

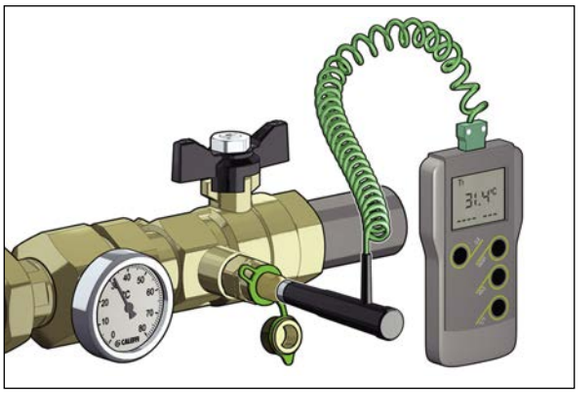
Turn the knob onto the required number, unscrew the upper screw, remove the knob and put it back on so that the internal reference couples with the protrusion on the knob holder nut.



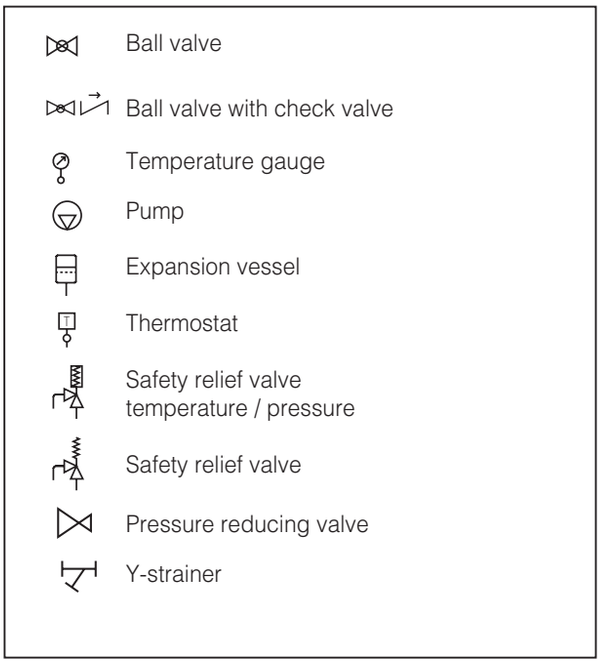
Quick-fit pressure test ports

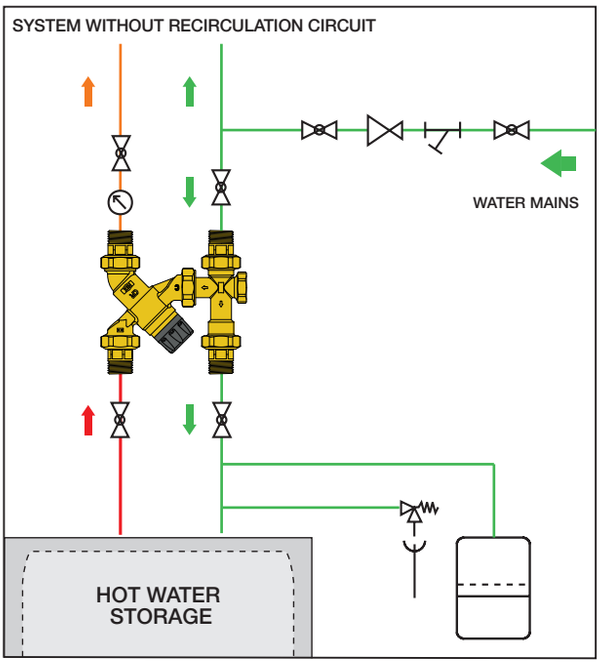
The shut-off valves of the complete temperature control unit are equipped with connections for quick-fit pressure and temperature test ports. With test ports of this type, measurement procedures can be performed quickly and accurately. On removing the measuring probe, the port closes automatically, preventing water leakage.

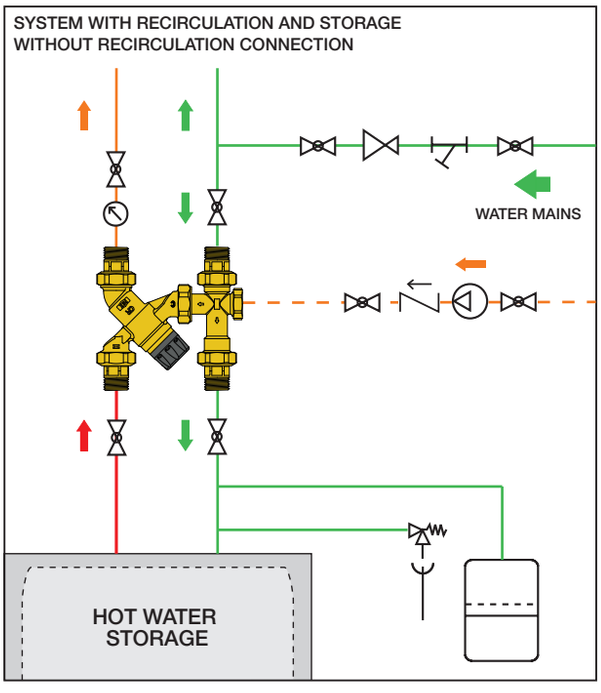


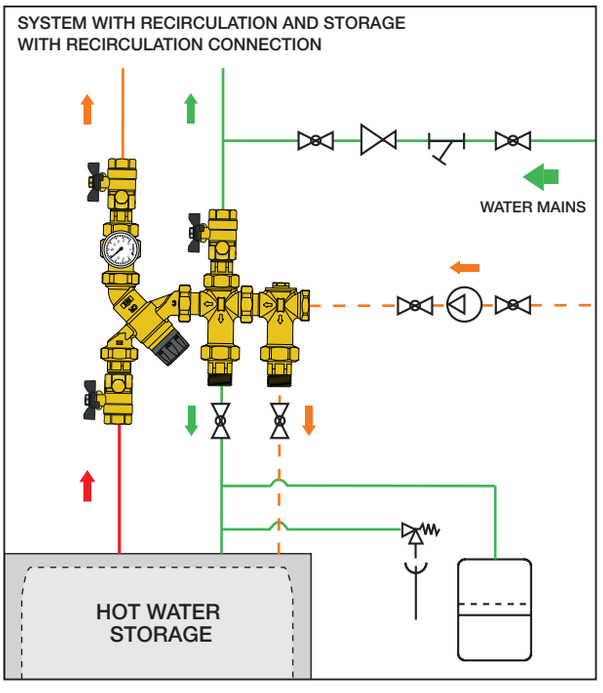


Application diagrams

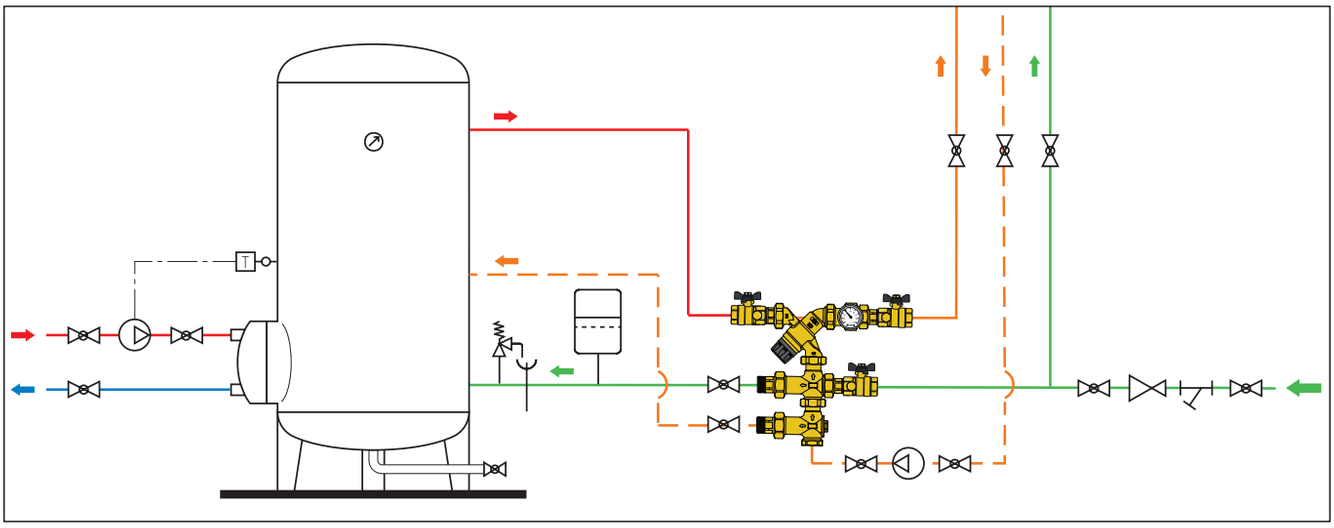








System with recirculation circuit. Storage with recirculation connection



SPECIFICATION SUMMARY

5201 series
Temperature control unit. Sizes DN 20 (DN 20 and DN 25). Connections 3/4" (3/4" and 1") M (ISO 228-1) with union. Dezincification resistant alloy body. PSU obturator. Stainless steel springs. EPDM seal elements. ABS control knob. Maximum inlet temperature 90°C. Temperature adjustment range from 35°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. Equipped with tamper-proof temperature setting lock.

Code 520005
Accessory kit for recirculation connection. Size DN 20. Connections 3/4" M with union x 3/4" F x 1" F (ISO 228-1) with captive nut. Brass body. Maximum inlet temperature 90°C. Maximum working pressure 10 bar.

Code 520155
Complete temperature control unit. Size DN 20. Connections 3/4" M with union x 3/4" F (ISO 228-1). Mixing valve body in dezincification resistant alloy complete with shut-off valves with connection ports and temperature gauge on the mixed water outlet. Brass connection fittings. PSU obturator. Stainless steel springs. EPDM seal elements. ABS control knob. Maximum inlet temperature 90°C. Temperature adjustment range from 35°C to 65°C. Accuracy ±2°C. Maximum working pressure (static) 10 bar. Maximum working pressure (dynamic) 5 bar. Temperature gauge scale 0–80°C. Maximum inlet pressure ratio (H/C or C/H) 2:1. Equipped with tamper-proof temperature setting lock.

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