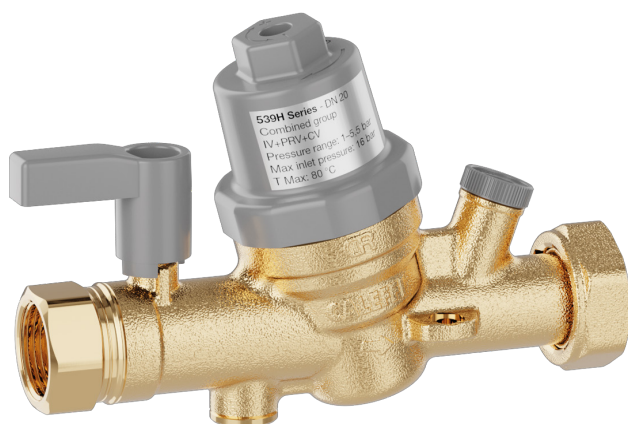


Combined group for pressure control in domestic water systems

539H series



Function

The combined group for pressure control in domestic water systems combines three different devices in a single component: a ball shut-off valve, a pressure reducing valve with filter and a EA type check valve. Installed on the pipe supplying hot or cold water to the users, it reduces the pressure of the water coming from the mains network, prevents the backflow of water into the mains system and allows users to be shut off during testing and maintenance procedures.

The patented design of the device offers shorter installation times, a more compact unit and greater reliability and flexibility; it also requires less space on the pipe. The group can be accessorised with insulation and a pressure gauge.

PATENT PENDING



Product range

Code 539050H Combined group for pressure control in domestic water systems size DN 20 (Rp 3/4" x G 1")

Technical specifications

Materials

Body: dezincification resistant alloy **CR** EN 12165 CW724R

Pressure reducing valve

Cover: PA6G30 (not UV resistant)
Control stem: stainless steel EN 10088-3 (AISI 303)
Spring: steel EN 10270-1
Cartridge: PPSG40
Internal components/moving parts: PSU
Diaphragm: EPDM
Seals: EPDM
Strainer: stainless steel EN 10088-2 (AISI 304)
Upstream test port plug: CW724R
Downstream test port plug: PA6G30

Check valve

Check valve: POM
Check valve spring: stainless steel EN 10088-3 (AISI 303)
Check valve seal: EPDM

Shut-off valve

Ball: dezincification resistant alloy **CR** EN 12164 CW724R
Ball control stem: dezincification resistant alloy **CR** EN 12164 CW724R
Ball seal seat: PTFE
Control lever: PA6G30
Control stem seals: EPDM

Insulation code CBN539050

Material: EPP
Density: 40 kg/m³
Working temperature range: -5–80 °C
Thermal conductivity (EN 12667): 0,037 W/(m·K) (at 10 °C)
Reaction to fire (DIN 4102): class B2

Performance

Medium: water
Maximum pressure upstream: 16 bar
Maximum working temperature: 80 °C

Pressure reducing valve

Downstream pressure setting range: 1–5,5 bar
Factory setting: 3 bar
Strainer mesh size: 0,51 mm
Pressure reducing valve certification: EN 1567
Acoustic group: II

Pressure gauge (optional)

Pressure gauge scale: 0–10 bar
Pressure gauge diameter: Ø 40 mm

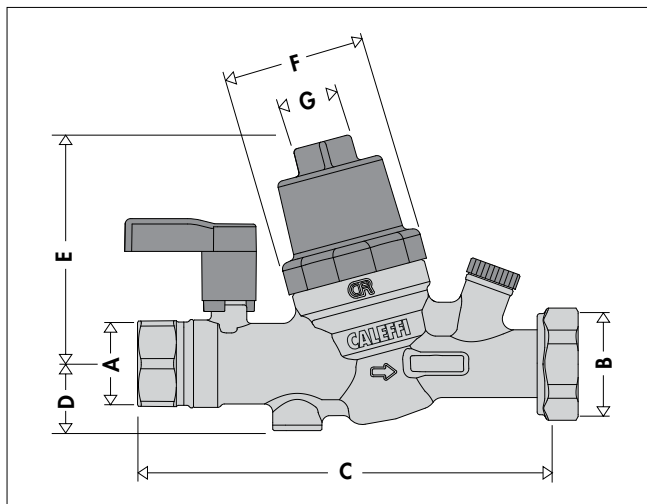
Check valve

Designation: family E, type A
Check valve minimum opening pressure (Δp): 0,5 kPa
Check valve certification (downstream of the reducing valve) in accordance with standard: EN 13959

Connections

Inlet: Rp 3/4" (EN 10226-1)
Outlet: G 1" (ISO 228-1) with nut
Upstream test port: G 1/4" (ISO 228-1)
Downstream test port: G 1/4" (ISO 228-1)

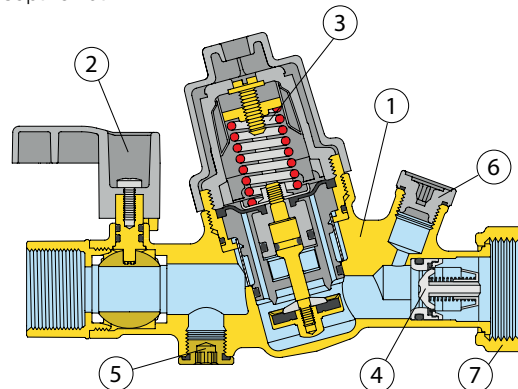
Dimensions



Code	DN	A	B	C	D	E	F	G	Mass (kg)
539050H	20	3/4"	1"	151,2	24,5	83,7	Ø 54	22	0,8

Characteristic components

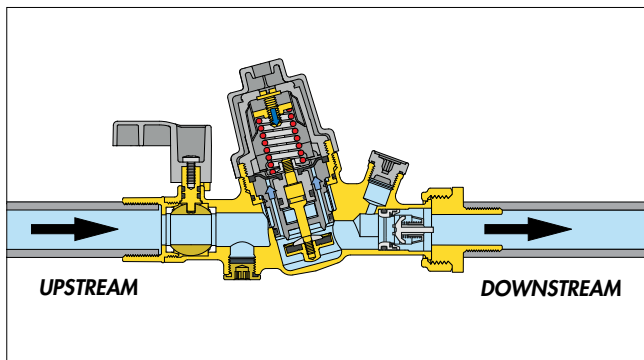
1. Compact, monoblock body
2. Shut-off valve
3. Pressure reducing valve cartridge with filter (EN 1567)
4. Check valve, EA type (EN 13959)
5. Upstream test port
6. Downstream test port
7. Captive nut



Operating principle

Pressure reducing valve operation is based on the balance between two opposing forces:

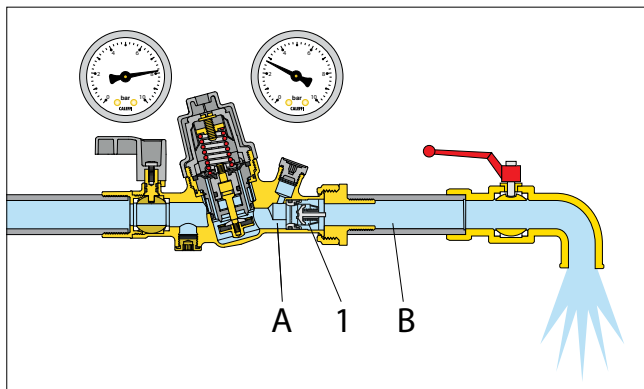
- The thrust of the spring towards the opening of the cross section;
- The thrust of the diaphragm towards the closure of the cross section.



Operation with water flow

When a draw-off outlet is opened, the force of the spring is stronger than that of the diaphragm; the obturator moves downwards, opening the channel so the water can flow through.

The greater the demand for water, the lower the pressure under the diaphragm, resulting in a greater flow of medium through the cross section.

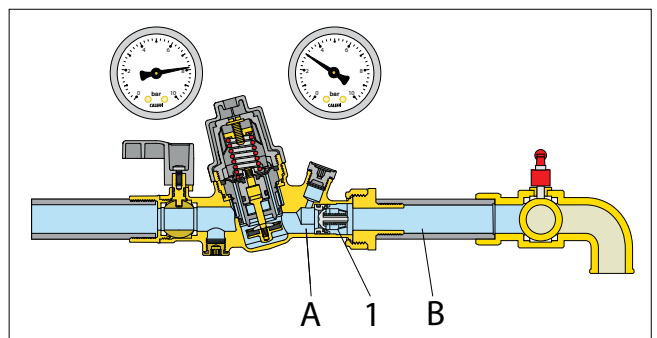


Correct flow conditions

When the conditions are right, check valve (1) opens automatically when the pressure in the upstream flow direction (A) is greater than the downstream value (B).

Operation without water flow

When the draw-off outlet is closed, the downstream pressure rises and pushes the diaphragm upwards. As a result, the obturator closes the cross section to the passage of water and maintains the pressure constant at the setting value. The slightest difference in favour of the force exercised by the diaphragm over that off the spring, causes the device to close.



No flow conditions

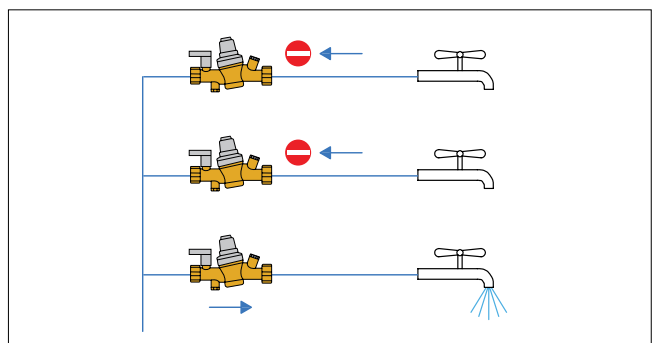
The check valve (1) closes in advance under the action of the force exerted by the spring when the downstream pressure (B) begins to equal the upstream value (A), after the flow has stopped.

Backflow

Potable water may become contaminated due to the backflow of medium from the pipes and systems.

Combined group 539H for pressure control is used to prevent reverse circulation, thanks to the check valve.

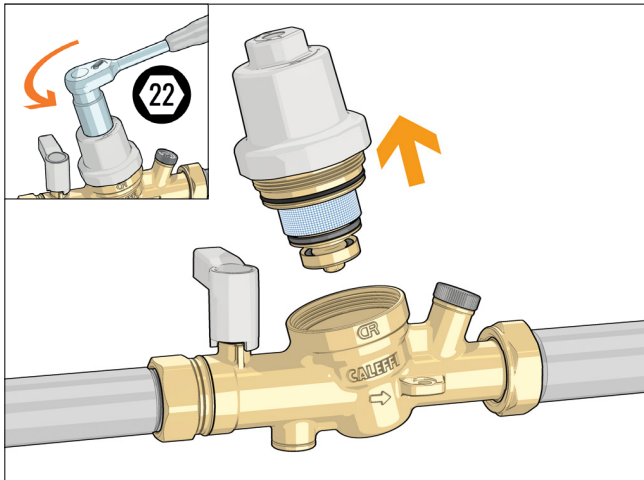
This phenomenon can arise in existing systems with multiple drawing points supplied by circuits with different pressure values and conditions.



Construction details

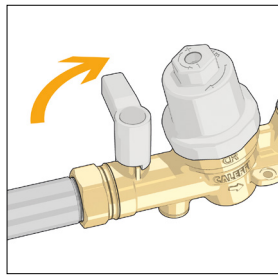
Removable self-contained cartridge

The cartridge containing the diaphragm, strainer, seat, obturator and compensating piston is a pre-assembled self-contained unit with a cover. It is easy to remove, simplifying inspection and maintenance procedures. The internal strainer, cleanable, is part of the cartridge and cannot be removed.



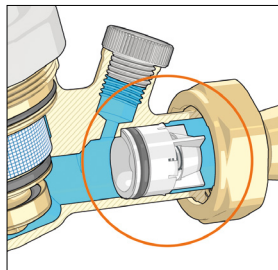
Shut-off valve

The ball shut-off valve allows regular checking of the combined group in accordance with EN standard 806-5. The extended lever allows control even if insulation has been fitted.



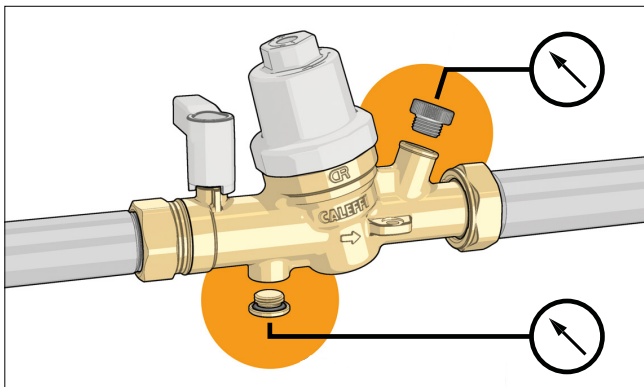
Downstream check valve

The inspectable and removable downstream check valve is an EA type (EN 13959). The check valve seal should be checked using the downstream test port.



Pressure test ports

The group has an upstream pressure test port which can be used for pressure control at the inlet. It is also fitted with a downstream pressure test port for installation of a pressure gauge or inspection of the check valve.

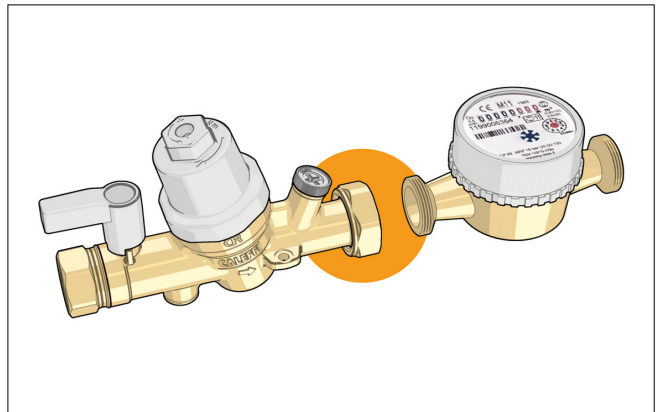


High temperatures

The materials used for the construction of the combined group for pressure control also allow installation on the hot water circuit, with temperatures of up to 80 °C.

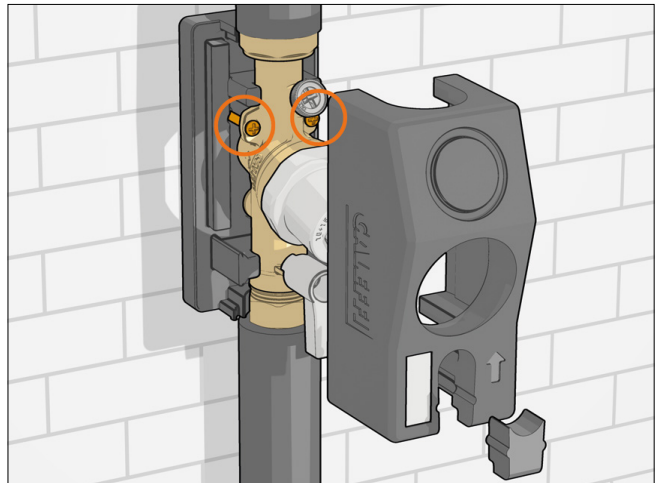
Component connection

The group is constructed to make installing a water meter and other downstream equipment easier.



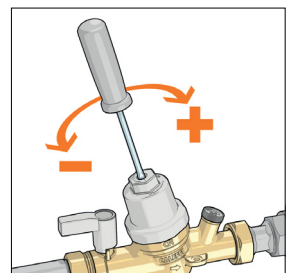
Wall bracketing

The group body has special slots for bracketing. The accessory insulation is supplied with the relevant screw holes.



Pressure setting

The device can be set by acting on the screw on top of the cover. Turn it clockwise to increase the pressure and anticlockwise to decrease it.



Dezincification resistant material with an extremely low lead content



CR

The combined group for pressure control is constructed using material with an extremely low lead content. This material is perfectly in line with the new regulatory provisions concerning contact with potable water. This is an innovative alloy with a very low lead content (< 0,1 %) and dezincification resistant properties.

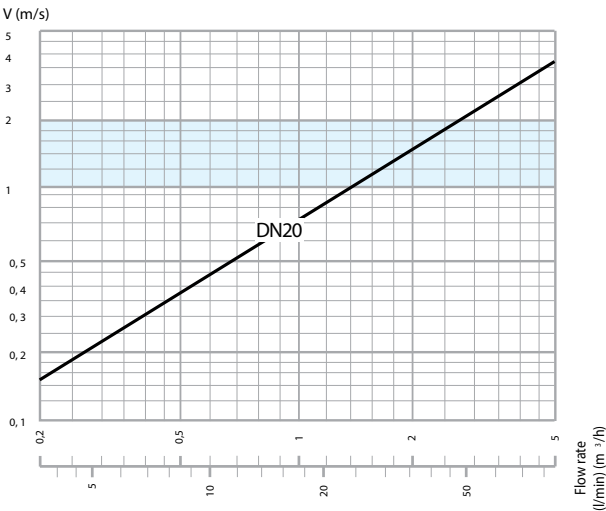
Certification

The pressure reducing valves are certified in accordance with EN 1567 standard, so that they can be used with hot water up to 80 °C. The anti-pollution check valves are also certified in accordance with EN 13959 standard.

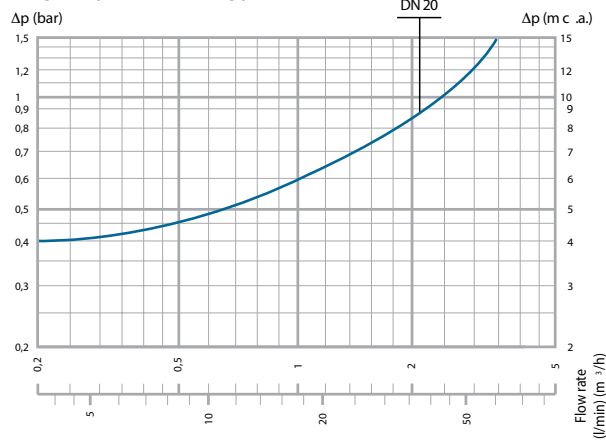
The groups comply with WRAS specifications in the United Kingdom, as well as KIWA UK and ACS specifications.

Hydraulic characteristics

Graph 1 (Water velocity)



Graph 2 (Pressure drop)



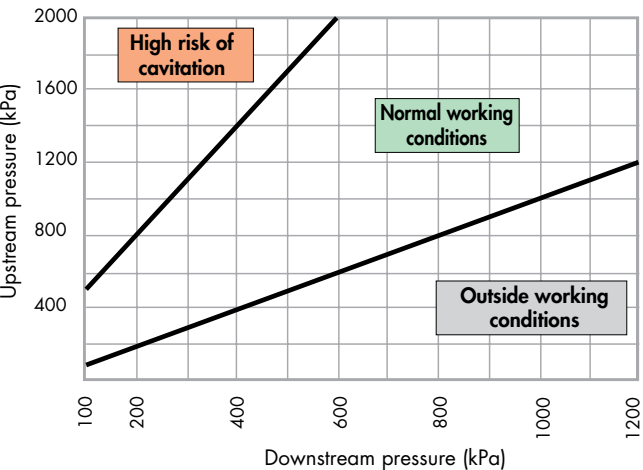
At the recommended velocity between 1-2 m/s (blue band), the pressure drop corresponding to the design flow rate is achieved.

Nominal flow rates

Water flow rates are shown for an average velocity of 2 m/s, in accordance with the requirements of EN 1567 standard.

Diameter	DN 20
Flow rate (m³/h)	2,27
Flow rate (l/min)	37,83

Cavitation diagram



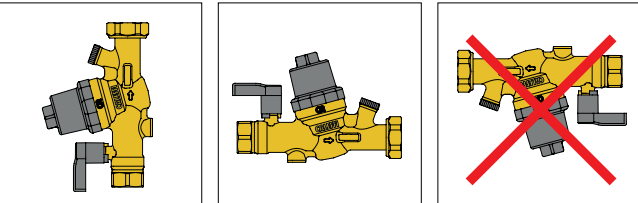
In order to minimise the risk of cavitation inside the reducing valve, which could cause malfunctioning with the risk of erosion in the region of the seal, vibration and noise, it is strongly recommended that you refer to the working conditions specified in the diagram.

Owing to multiple factors and variable conditions that have been tested, such as: system pressure, temperature, presence of air, flow rate and speed, which could affect the behaviour of the pressure reducing valve, it is advisable for the ratio between the upstream pressure and the downstream pressure to be kept ideally within a value of 2:1 and not in excess of 3:1 (for instance, upstream pressure 10 bar, downstream pressure 5 bar, pressure reduction ratio = $10/5 = 2:1$). In such conditions, the risk of cavitation is reduced to a minimum, nevertheless this does not completely exclude potential effects due to the other numerous factors present inside the system during operation.

If the pressure reduction ratio exceeds the limit specified, the design pressure of the system or the use of a first-stage pressure reducing valve should be considered (for instance, first-stage pressure reducing valve from 16 to 8 bar and then second stage from 8 to 4 bar).

Installation

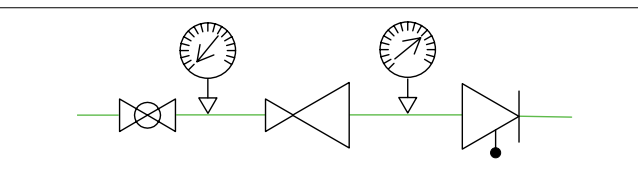
The group may be installed with either vertical or horizontal pipes. However, it must not be installed upside down.



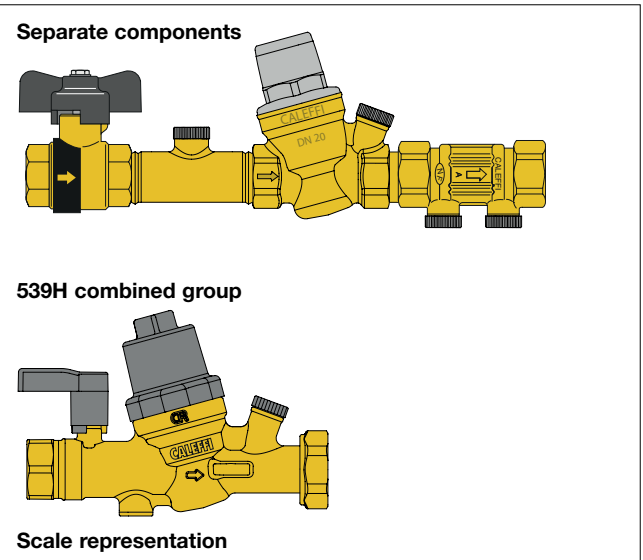
The control and testing components are in line so as to facilitate installation and maintenance of the group, for both vertical and horizontal applications.

This means there are no reading or maintenance issues, whether the group is connected on the right or left-hand side.

Functional diagram



The monoblock compact group avoids the use of separate components which need to be assembled during installation, thereby reducing the time required, the overall size and the risk of leaks.



Accessories for 539H combined group



CBN539050

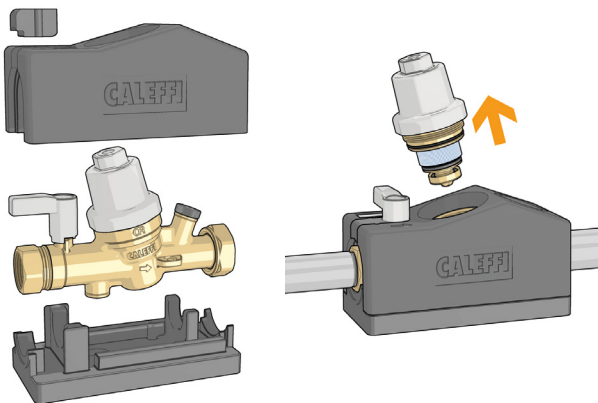
Insulation for 539H series combined group.

Code

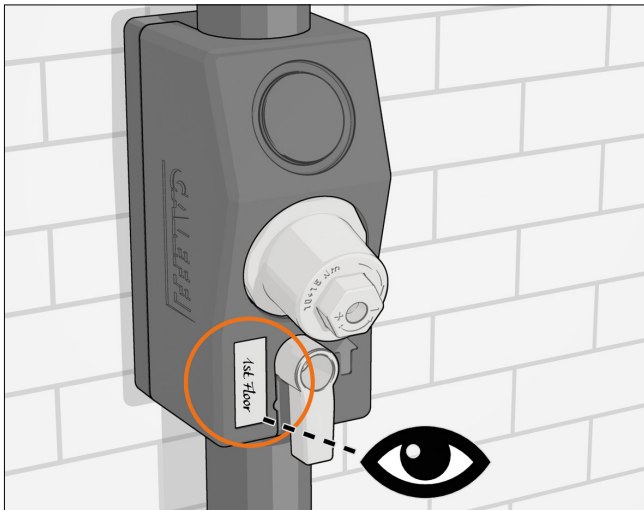
CBN539050

Insulation

The group can be accessorised with insulation sized to limit thermal losses. The insulation consists of a lower part, an upper part and an element to position underneath the lever. The latter allows the insulation to be applied without having to remove the lever. It is also designed for installation of the pressure gauge in the relevant slot. The cartridge can be taken out without the insulation needing to be removed.



The label on the insulation can be used to identify the user it serves.



557

1/4" central back connection.
Pressure gauge scale: 0–10 bar.
Ø 40 mm.
Accuracy class: UNI 2.5.

Code

557010



F0002665

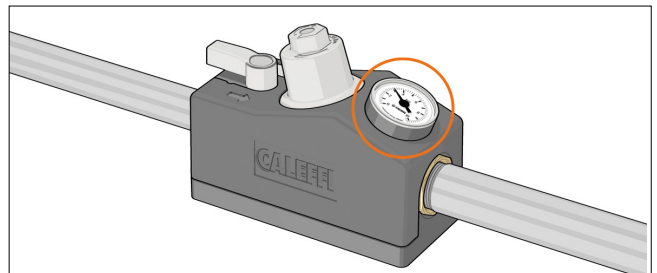
1/4" bottom connection.
Pressure gauge scale: 0–10 bar.
Ø 40 mm.
Accuracy class: UNI 2.5.

Code

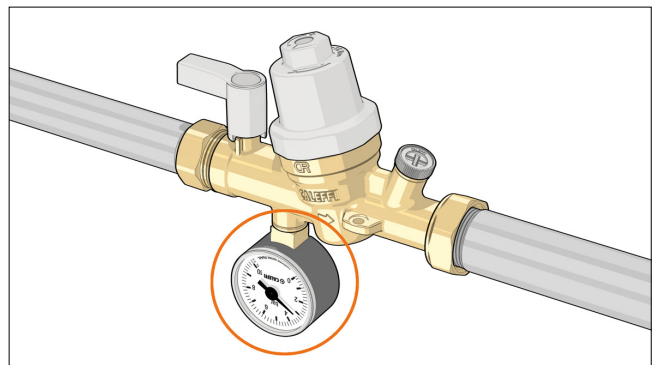
F0002665

Pressure gauge

Installation of the downstream pressure gauge means that the pressure at the reducing valve outlet can be checked. If insulation is applied, the 557010 pressure gauge with back connection can be installed.



Pressure gauge installation on the upstream test port allows pressure reading at the group inlet.



SPECIFICATION SUMMARY

Code 539050H

Combined group for pressure control. Size DN 20. Threaded connections Rp 3/4" (EN 10226-1) and G 1" (ISO 228-1) with nut. Dezincification resistant alloy body. Stainless steel stem. PA6G30 cover. Stainless steel strainer, mesh size 0,51 mm. EPDM diaphragm and sealing gaskets. Dezincification resistant alloy ball valve with extended lever in PA6G30. Check valve, EA type. Certified to EN 13959 standard. POM check valve. Stainless steel spring. Medium potable water. Maximum working temperature 80 °C. Maximum upstream pressure 16 bar. Downstream pressure setting range from 1 to 5,5 bar. Self-contained cartridge removable for maintenance purposes. Minimum opening pressure for check valve 0,5 kPa. Upstream test port and downstream test port. Test port connections G 1/4" (ISO 228-1).

Code CBN539050H

Insulation for 539H series combined group for pressure control in EPP. Average thickness 15 mm. Internal density 40 kg/m³. Thermal conductivity 0,037 W/(m·K) (at 10 °C). Working temperature range -5–80 °C. Resistance to fire DIN 4102 Class B2.

Combined group for pressure and temperature control in domestic water systems

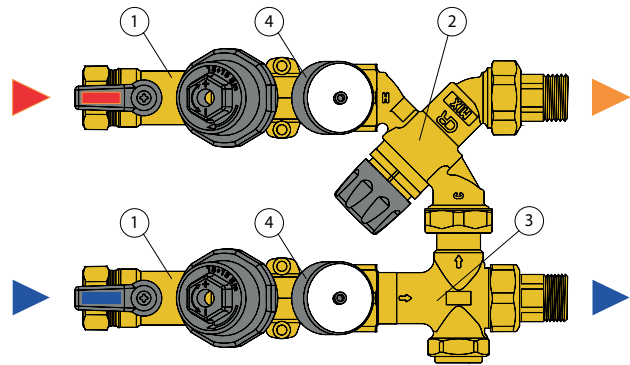


Function

It is essential to install various components capable of fulfilling all the required functions at the inlet of individual housing units, hotel rooms or hospital rooms, where it is necessary to control both the pressure and the temperature. In these applications, the 539H combined group can be paired with the 5200 series mixing valve using the special connection tee. Its function is to keep the pressure and temperature of the mixed water supplied to the user constant at the set value, in spite of variations in the hot and cold water supply conditions at the inlet, thereby making pipe connections easier.

Components

- 1. Combined group for pressure control in domestic water systems code 539050H
- 2. Mixing valve code 520050 (Tech. Broch. 01266)
Body: dezincification resistant alloy **CR** EN 1982 CC768S
Adjustment temperature range: 35–65 °C
Accuracy: ± 2 °C
Maximum working pressure (static): 10 bar
Maximum working pressure (dynamic): 5 bar
Maximum inlet temperature: 90 °C
Kv (m³/h): 1.7
Minimum flow rate for stable operation: 4 l/min (DN 20)
- 3. Connection tee code 520004
- 4. Pressure gauge code 557010



Connection tee for 5200 series thermostatic mixing valve



Function

The tee makes connecting cold and hot water pipes to the mixing valve easier while keeping them parallel within a small space. The check valves are already fitted in the most suitable positions for correct group operation.

Product range

Code 520004 connection tee for 5200 _____ size DN 20 (3/4")

Technical specifications

Materials

Body: dezincification resistant alloy **CR** EN 12164 CW724R
Check valve: PSU
Cap: dezincification resistant alloy **CR** EN 12164 CW724R

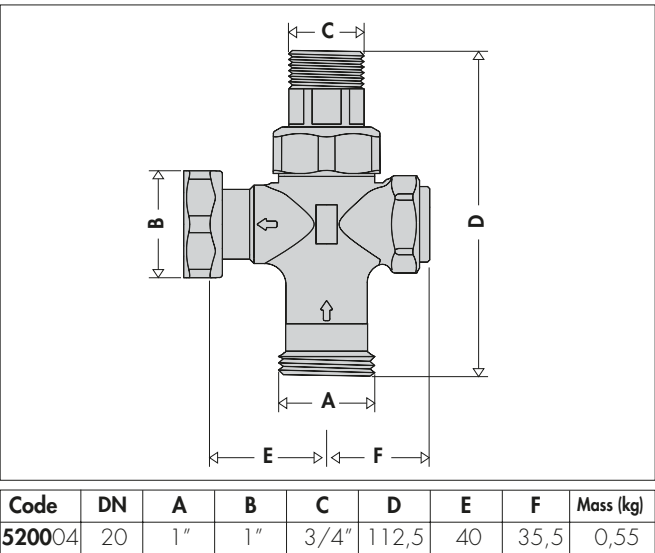
Performance

Medium: water
Maximum working pressure: 10 bar
Maximum working temperature: 90 °C

Connections

Inlet: G 1" (ISO 228-1)
Side: G 1" (ISO 228-1) with nut
Outlet: G 3/4" (ISO 228-1) with union

Dimensions

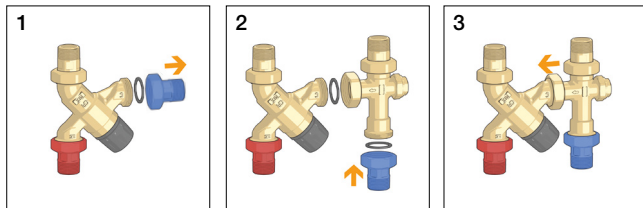


Installation of tee and mixing valve with the use of unions

Thermostatic mixing valve code 520050 has unions with built-in check valves.

The union positioned at the cold inlet of the mixing valve should be removed (1). The removed union should be positioned at the tee inlet (2) and finally the captive nut should be screwed onto the cold inlet of the mixing valve (3).

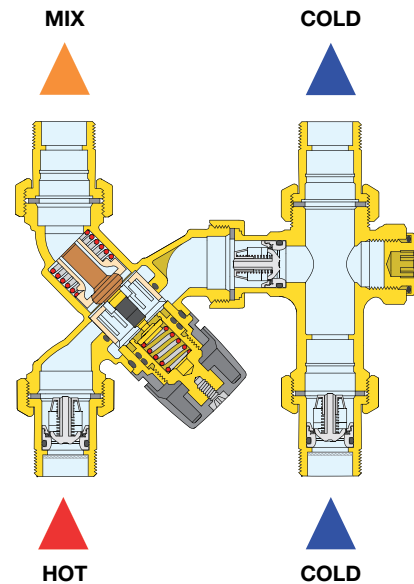
Sizes are minimised thanks to the design of the mixing valve and the tee, thereby guaranteeing correct positioning of the check valves for optimal group operation.



Installation of the combined group for pressure and temperature control

For full pressure and temperature control, thermostatic mixing valve code 520050, tee code 520004 and group 539H need to be installed. 539H groups are fitted with a check valve and can be directly connected to the mixing valve and the tee without the use of unions.

The 539H group shut-off valves and the upstream and downstream test ports make commissioning, checking and maintenance procedures easier.



Thermostatic mixing valve protecting the user

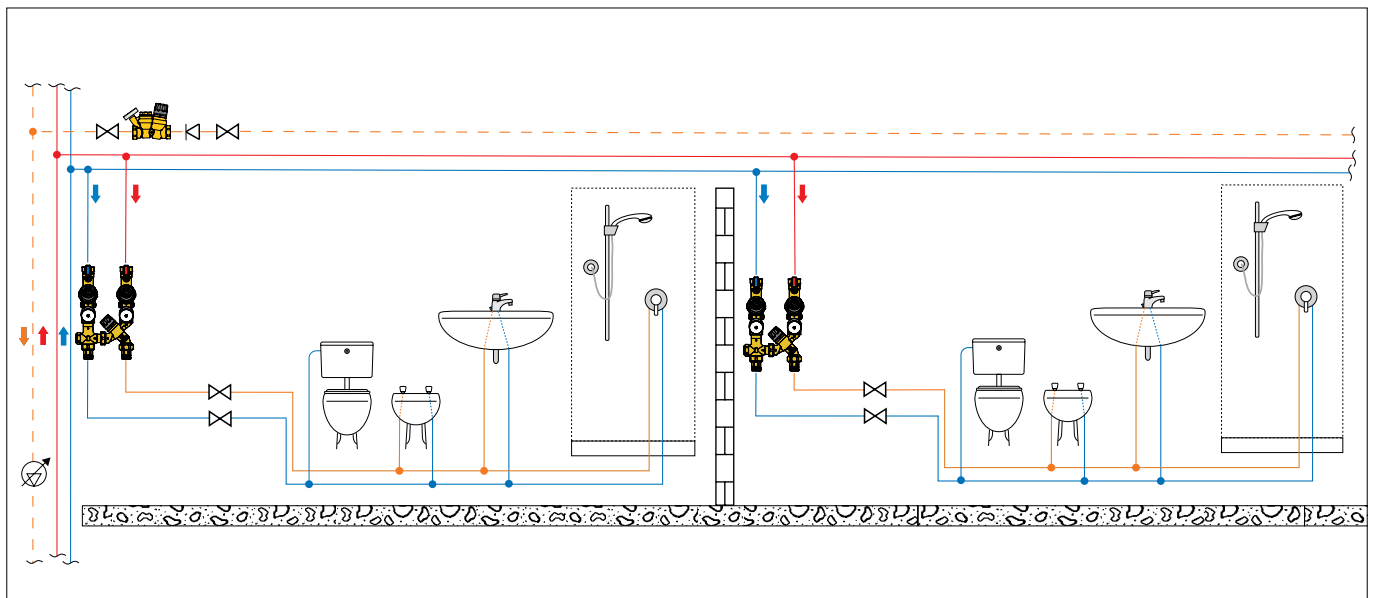
5200 series mixing valves ensure high thermal performance levels, as they are able to accurately adjust the flow temperature of the mixed water sent to users in spite of variations in the temperature or pressure at the inlet or in the drawn-off flow rate.

The mixing valve, thanks to its thermal shut-off function, is able to protect the user from the risk of dangerous burns and is beneficial in applications at the point of use. In the event of accidental cold water supply failure, the obturator shuts off the hot water passage, thus preventing the delivery of mixed water.

Certification

5200 series thermostatic mixing valves are certified by the Kiwa body as compliant with the requirements of EN 1111 and EN 1287.

Installation in individual bathrooms and branch-level recirculation



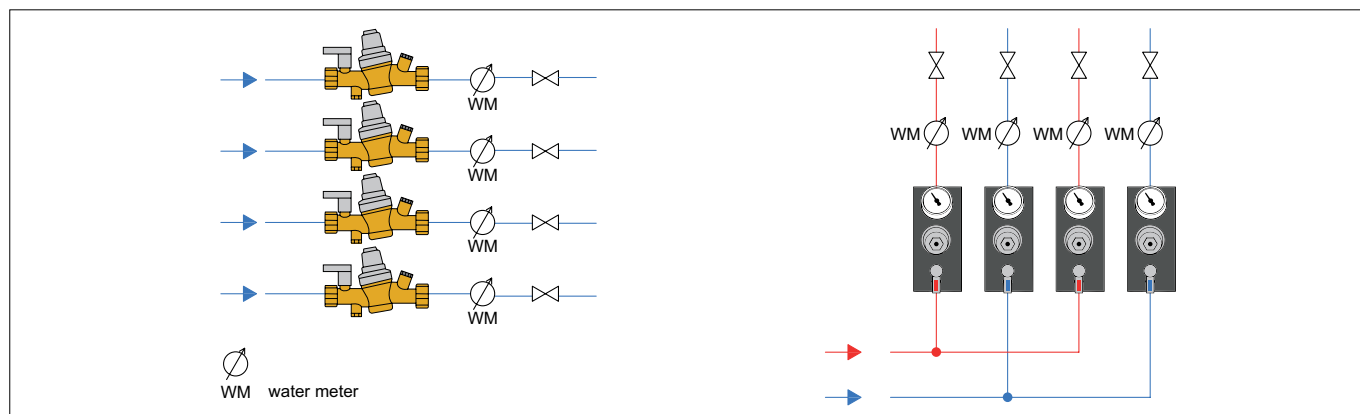
SPECIFICATION SUMMARY

Code 520004

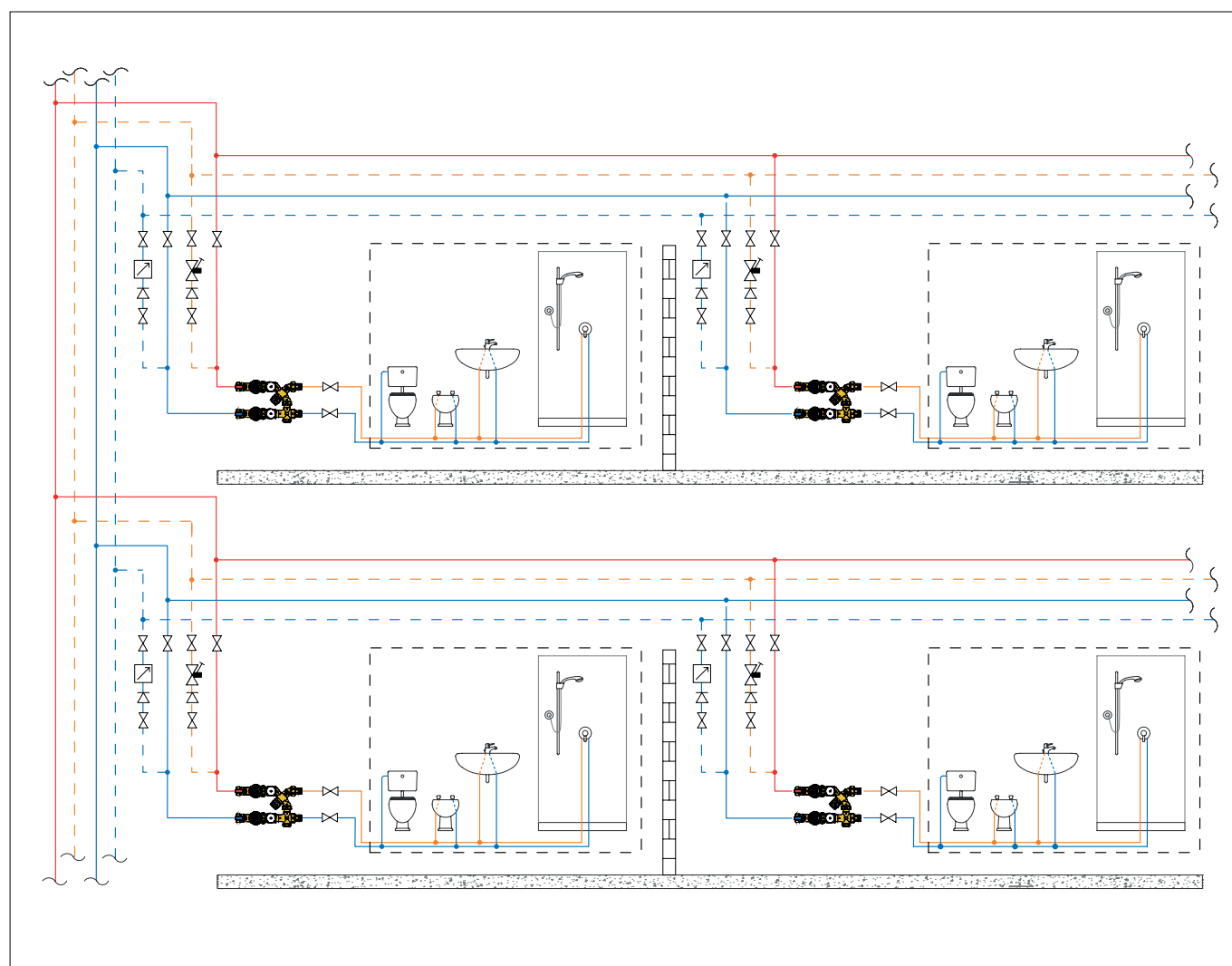
Connection tee for 5200 thermostatic mixing valve. Size DN 20. Connections: inlet G 1" (ISO 228-1), side G 1" (ISO 228-1) with nut, outlet G 3/4" (ISO 228-1) with union. Dezincification resistant alloy body. Maximum inlet temperature 90 °C. Maximum working pressure 10 bar.

Application diagrams

Installation with downstream water meter



Centralised system with peripheral pressure and temperature control (hot/cold recirculation circuit)



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