

Electronic mixer with programmable thermal disinfection

series 6000



cert. n° 0003
ISO 9001

01086/05 GB

Replaces 01086/03 GB



Function

The electronic mixer is used in centralised systems for the production of domestic hot water.

Its function is to guarantee and maintain the temperature of the mixed hot water supplied to the point of use when there are variations in the temperature and pressure conditions of the incoming hot and cold water or in the draw-off flow rate.

This particular series of electronic mixers is provided with a special regulator which runs an anti-Legionella thermal disinfection program.

The temperature levels and disinfection times can be adjusted to suit the type of system and the requirements of the users.

Patented.



Product range

Series 6000 Electronic mixer with programmable thermal disinfection with threaded connections _____ sizes 3/4" - 1" - 1 1/4" - 1 1/2" - 2"
Series 6000 Electronic mixer with programmable thermal disinfection with flanged connections _____ sizes DN 65 and DN 80

Technical specification

Valve body

Materials: - Body: brass EN 12165 CW617N, nickel plated
- Ball: brass EN 12165 CW617N, chrome plated
- Hydraulic seals: NBR

Max. working pressure (static): 10 bar
Max. inlet temperature: 100°C
Temperature gauge scale: 0 – 80°C
Hot and cold water connections: 3/4" – 2" F
Mixed water connections: 3/4" – 2" F with union tailpiece
Flanged connections: DN 65 and DN 80, PN 16 to be coupled with counterflanges EN 1092-1

Servomotor for threaded version

Electric supply: 230 V - 50/60 Hz directly from the regulator
Power consumption: (3/4" – 1 1/4") 4 W; (1 1/2" – 2") 10 W
Protective cover: self-extinguishing V0
Protection class: IP 54
Room temperature range: -10 – 55°C
Length of supply cable: 0,9 m

Servomotor for flanged version

Electric supply: 230 V - 50/60 Hz directly from the regulator
Power consumption: 10,5 W
Protective cover: self-extinguishing V0
Protection class: IP 65
Room temperature range: -10 – 55°C
Length of supply cable: 2 m

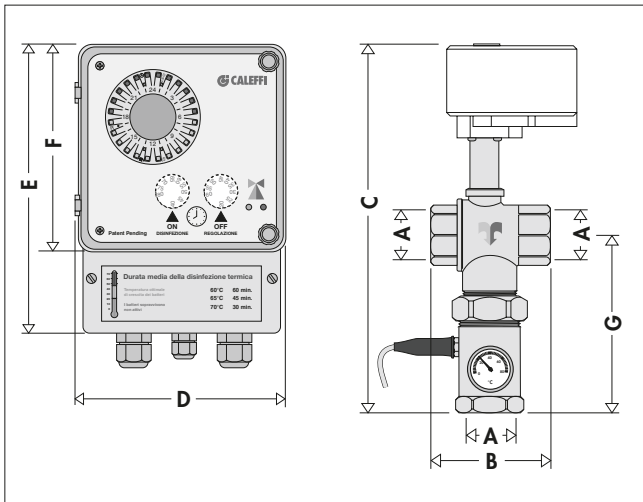
Electronic regulator

Electric supply: 230 V - 50/60 Hz
Regulating temperature range: 20 – 60°C
Disinfection temperature range: 40 – 80°C
Protection class: IP 54
Auxiliary microswitch contacts rating (it can be used during thermal disinfection): 16 A (cos φ = 1)
Back-up battery: 15 days duration in case of mains failure
Back-up battery recharge time: 72 h
Certification: CE

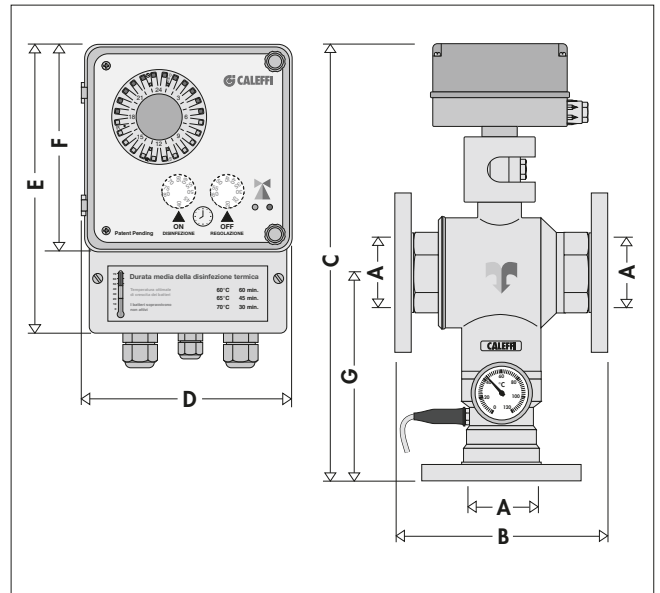
Mixer performance

Accuracy: ± 2°C
Max. working pressure (dynamic): 5 bar
Max. inlet pressures ratio (H/C or C/H) given G = 0,5 Kv: 2:1

Dimensions



Code	A	B	C	D	E	F	G	Weight (kg)
600050	3/4"	74	255	140	185	136	119	1,3
600060	1"	75	266	140	185	136	131	1,7
600070	1 1/4"	85	282	140	185	136	147	2,3
600080	1 1/2"	100	312	140	185	136	152	2,9
600090	2"	110	340	140	185	136	170	5,0



Code	A	B	C	D	E	F	G	Weight (kg)
600006	DN 65	235	600	140	185	136	275	28
600008	DN 80	235	600	140	185	136	275	30,4

Legionella vs distribution temperature

In systems producing domestic hot water with storage, in order to avoid the growth of Legionella dangerous bacteria, 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 causing this infection called Legionellosi will be totally eliminated.

However, this temperature is too high to be used directly by the user; at these levels, hot water can cause severe scalding. For this reason, it is necessary to reduce the temperature of the hot water distributed to a lower value compatible with use.

Moreover, not only the water storage, but also the distribution circuit requires a thermal "disinfection" operation at regular intervals. Otherwise, a rapid growth of bacteria could take place.

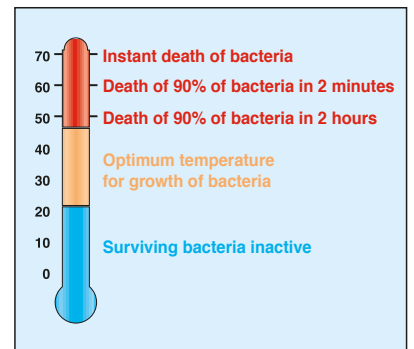
In view of the above, it is strongly recommended that an electronic mixer be installed, which can:

- reduce the temperature at the point of use to a value lower than that of storage;
- maintain the temperature of the mixed water constant when the incoming pressure and temperature conditions vary;
- permit programming of thermal "disinfection" at a higher temperature level than that of normal usage, at the necessary times and during the periods of least usage (at night).

Thermal disinfection

The diagram here on the side shows the behaviour of the bacteria *Legionella Pneumophila* when the temperature conditions of the water in which it is contained vary, in a laboratory sample population.

In order to ensure proper thermal disinfection, the value must not be below 60°C.



Reference documents

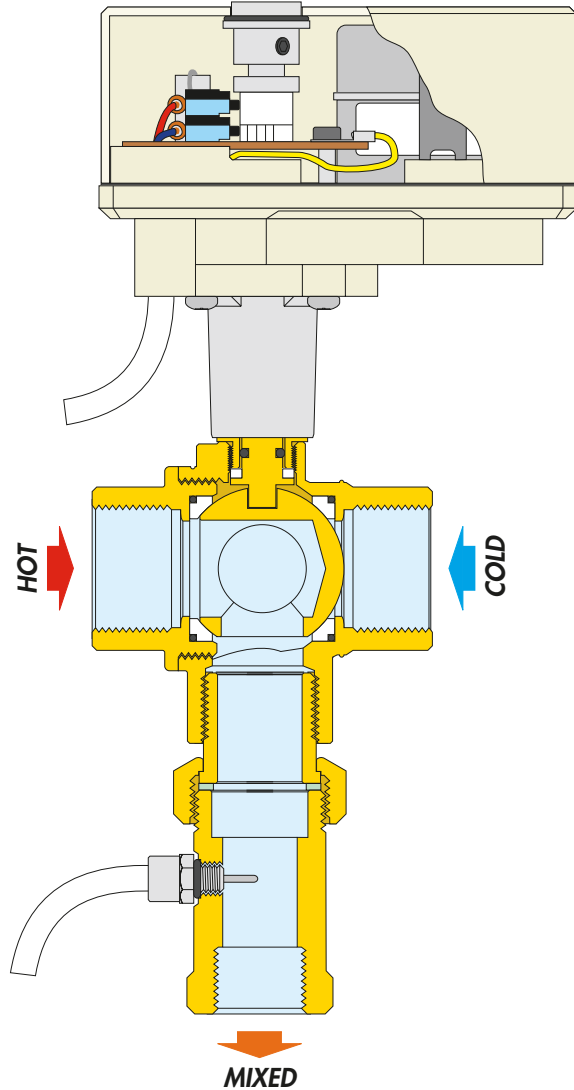
With regard to the prevention and control of Legionella, see the National Regulations and applicable Code of Practice.

Applications

The electronic mixer is typically used in centralised systems in hospitals, clinics, sports and shopping centres, hotels, campsites and schools. These public buildings are the places where it is most necessary to program a Legionella control, with optimum management of disinfection times.

Operating principle

The temperature sensor immersed in the mixed water outlet port sends a signal to the regulator, which controls the movement of the motorized valve. This adjusts the cold and hot water inlet supplies to maintain the outgoing mixed water temperature at the set value. Even when there are pressure drops due to the draw-off of hot water by other users, or variations in the incoming temperatures, the mixer automatically regulates the water flow rates to obtain the required temperature.



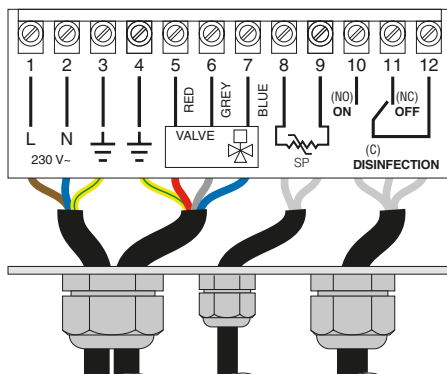
Constructional details

• Seat seals

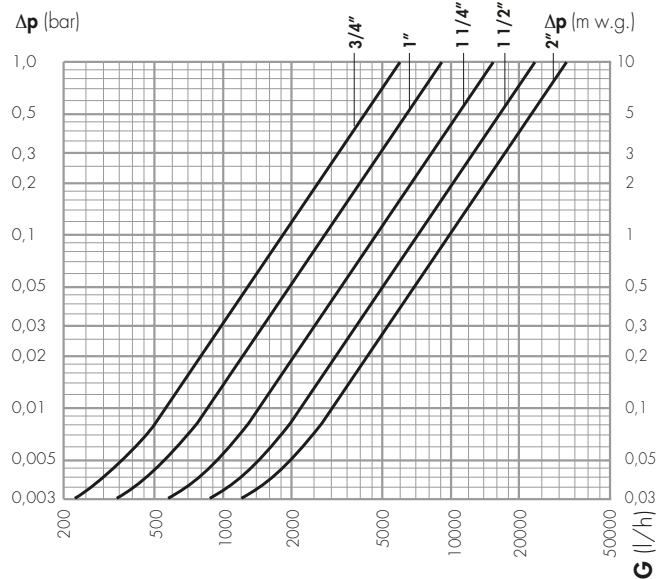
The seat seals consist of suitable rubber supports to prevent any jamming or clogging of the ball.

• Electric cabling

The electric cabling between regulator and valve is kept to the minimum required for the connection operations.



Hydraulic characteristics

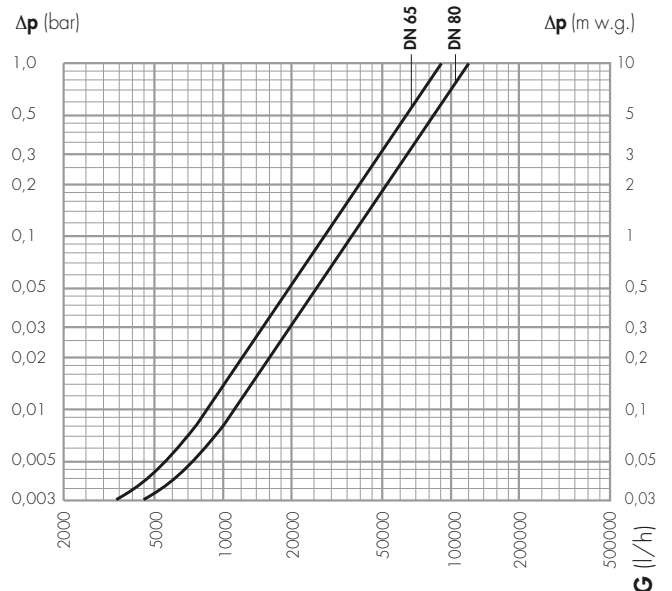


FLOW RATES recommended to ensure stable operation and accuracy of $\pm 2^\circ\text{C}$

	Kv (m ³ /h)
3/4"	5,2
1"	9,0
1 1/4"	14,5
1 1/2"	23,0
2"	32,0

	Minimum (m ³ /h)	Maximum*
3/4"	0,5	6,4
1"	0,7	11,0
1 1/4"	1,0	17,8
1 1/2"	1,5	28,0
2"	2,0	39,0

* $\Delta P = 1,5$ bar



FLOW RATES recommended to ensure stable operation and accuracy of $\pm 2^\circ\text{C}$

	Kv (m ³ /h)
DN 65	90,0
DN 80	120,0

	Minimum (m ³ /h)	Maximum*
DN 65	4,0	110,0
DN 80	5,0	146,0

* $\Delta P = 1,5$ bar

Installation

Before installing Caleffi mixers, the pipework must be flushed out to ensure that there are no circulating impurities to harm the system. It is always advisable to install filters of suitable capacity at water mains connection.

Caleffi electronic mixers must be installed in accordance with the installation diagrams given in the instruction sheet or in this leaflet, and in line with current regulations and Code of Practice.

Caleffi electronic mixers can be installed either vertically or horizontally, with the servomotor never upside down.

The body of the mixer is marked as follows:

- hot water inlet with a red arrow;
- cold water inlet with a blue arrow.

Check valves

In systems with mixers, check valves should be installed to prevent undesirable fluid backflow, as shown in the diagrams.

Commissioning

In view of the special purpose of the electronic mixer, it must be commissioned in accordance with current standards by qualified personnel using suitable temperature measuring equipment. Use of a digital thermometer is recommended for measurement of the mixed water temperature.

Thermal disinfection

The temperatures and corresponding disinfecting times must be selected according to the type of system and the relevant purpose. Taking into account the most updated world legislation, as an indication, the following criteria can be adopted:

- T = 70°C for 30 minutes
- T = 65°C for 45 minutes
- T = 60°C for 60 minutes

Thermal disinfection is generally carried out during the times when the system is least used, for example during the night; the reason for this is to minimise the possibility of scalding users.

In order to ensure that thermal disinfection has really taken place at the desired temperature and within the set time, it is advisable to adopt a suitable recording system, like the following example: a thermostat, a pulse counter and an hour counter.

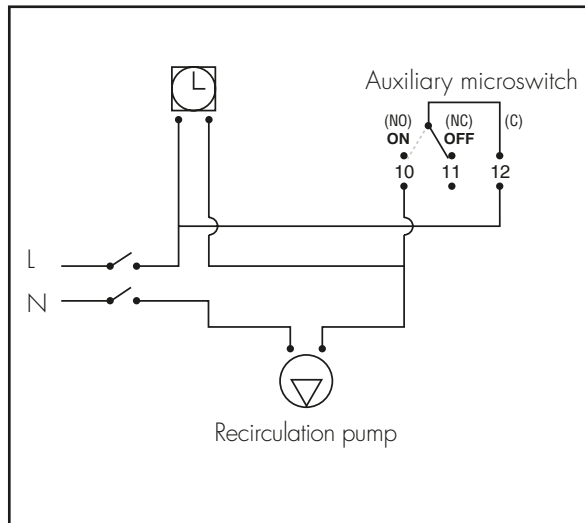
It is essential to reset the clock before programming the regulating and disinfecting times and temperatures.

The digital clock permits daily and weekly programming, with minimum intervals of 15'. In case of power supply failure, there is a back-up battery with a duration of 15 days.

Regulation temperature: select using the regulation OFF knob. Disinfection temperature: select using the disinfection ON knob.

Auxiliary microswitch

The following diagram shows the auxiliary microswitch electrical connection when the recirculation pump is equipped with a hour-counter.

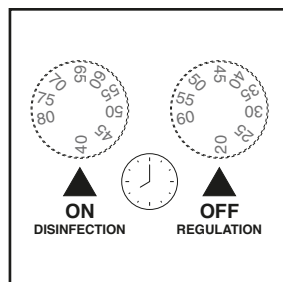
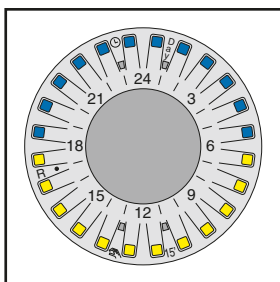


Maintenance

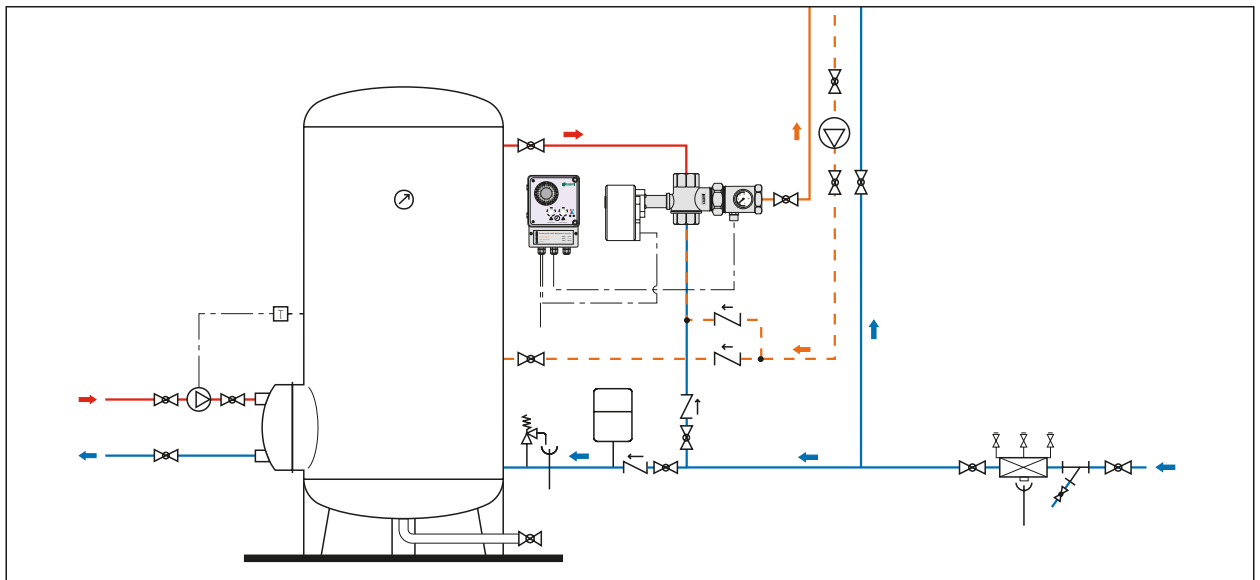
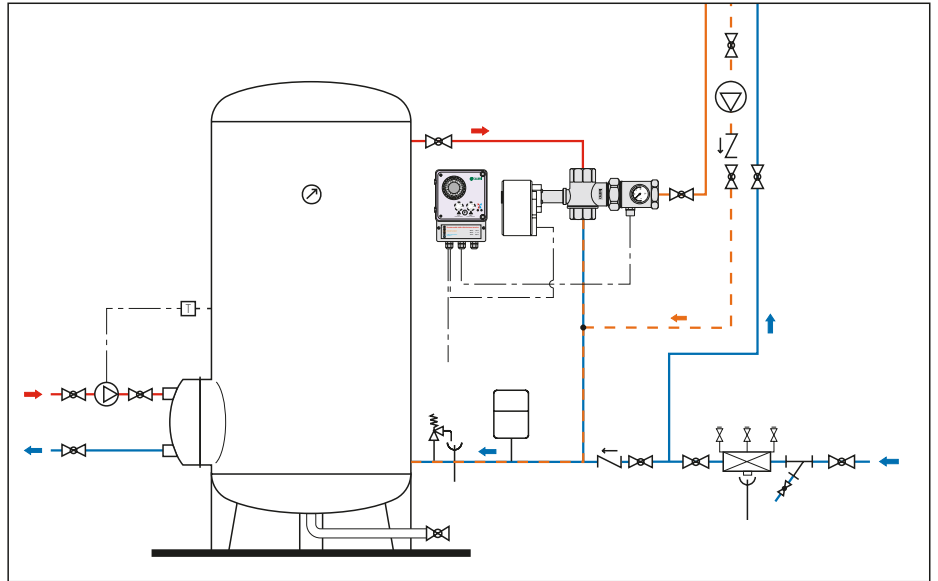
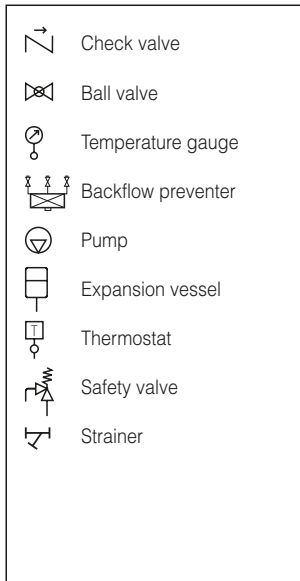
In service testing should be carried out regularly to monitor the correct operation of the mixer, as deterioration of performances may indicate the need to carry out maintenance work on the valve and/or system. If, during these tests, the mixed water temperature has changed significantly in relation to the previous tests, the details given in the installation and commissioning section should be checked and maintenance work carried out.

The following aspects should be checked periodically to ensure that the optimum levels of service of the valve are maintained. At least every 12 months or more frequently if required.

- 1) Check and clean the system filters.
- 2) Check that any non-return valves sited at the entry to the Caleffi valve are in perfect working order, without back-flow due to impurities.
- 3) The internal components of the valve can be cleaned of limescale by immersion in an appropriate descaling liquid. This operation is essential in the case of systems with seasonal use, such as in hotels, etc.
- 4) When all maintainable components have been checked, commissioning should be carried out again.



Application diagrams



SPECIFICATION SUMMARIES

Series 6000 threaded version

Electronic mixer with programmable thermal disinfection. Consisting of: **3-way valve**. 3/4" F (3/4" to 2") connections. Brass body EN 12165CW 617N nickel plated. Hydraulic seals in NBR. Maximum working pressure (static) 10 bar. Maximum working temperature 100°C. Temperature gauge with pocket, scale 0 – 80°C.

Servomotor. Electric supply 230 V. Protection class IP 54. Room temperature range: -10 – 55°C.

Electronic regulator. Electric supply 230 V. Regulating temperature range 20 – 60°C. Disinfection temperature range 40 – 80°C. Daily/weekly digital clock programmer. 3-contact auxiliary microswitch. Protection class: IP 54. Mixer accuracy $\pm 2^\circ\text{C}$. Maximum inlet pressures ratio (H/C or C/H) 2:1. CE certified.

Series 6000 flanged version

Electronic mixer with programmable thermal disinfection. Consisting of: **3-way valve**. DN 65 (or DN 80) flanged connections. PN 16. Brass body EN 12165 CW617N nickel plated. Hydraulic seals in NBR. Maximum working pressure (static) 10 bar. Maximum working temperature 100°C. Temperature gauge with pocket, scale 0 – 80°C.

Servomotor. Electric supply 230 V. Protection class IP 65. Room temperature range: -10 – 55°C.

Electric regulator. Electric supply 230 V. Regulating temperature range 20 – 60°C. Disinfection temperature range 40–80°C. Daily / weekly digital clock programmer. 3-contact auxiliary microswitch. Protection class: IP 54. Mixer accuracy $\pm 2^\circ\text{C}$. Maximum inlet pressures ratio (H/C or C/H) 2:1. CE certified.

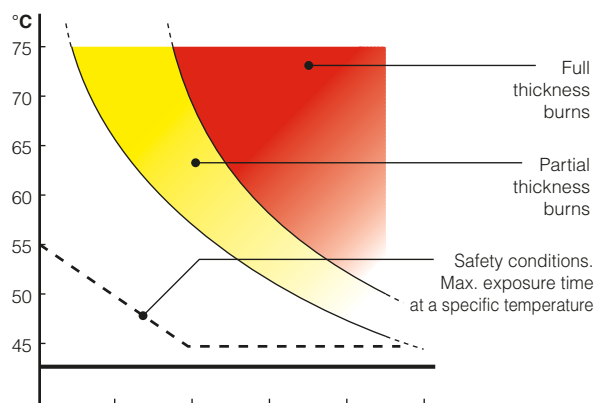


Safety in use

As shown on the diagram opposite, temperatures of more than 50°C can cause burning very quickly. For example, at 55°C partial burning will occur in approximately 30 seconds, while at 60°C partial burning will occur in approximately 5 seconds. The time may be reduced by 50 percent or more for children and elderly people.

Depending on the type of system and its purpose, together with the relevant risk assessment, various devices can be installed to safeguard users from scalds caused by hot tap water.

Temperature - Exposure time



Anti-scald device for domestic hot water use, code 600140



Function

The purpose of the device is to cut off the flow of water if its temperature reaches the set value. Designed for use in domestic hot water systems with electronic mixers with programmable thermal disinfection. Installed directly at the point of use outlet, it prevents the hot water from scalding the user during the hot disinfection period ($T > 50^{\circ}\text{C}$).



Technical specifications

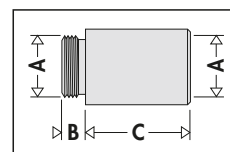
Materials: - Body brass EN 12164 CW614N, chrome plated
 - Springs: stainless steel
 Maximum working pressure (static): 10 bar
 Maximum working pressure (dynamic): 5 bar
 Temperatura di taratura: $48 \pm 1^{\circ}\text{C}$

Connections: $1/2''$ F in
 $1/2''$ M out

Hydraulic characteristics

$K_v = 0,8$ (m^3/h)

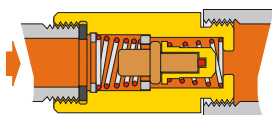
Dimensions



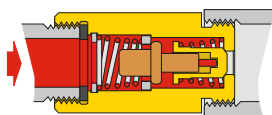
Code	A	B	C
600140	$1/2''$	8	38

Operation

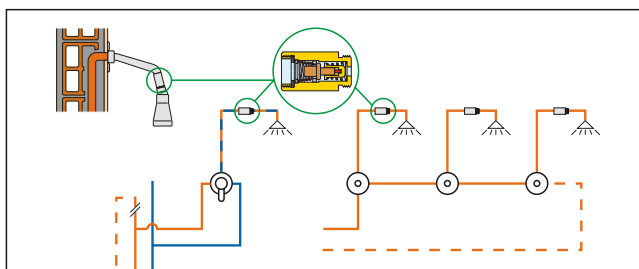
Open



Closed



Application diagram



SPECIFICATION SUMMARIES

Code 600140

Anti-scald device for domestic hot water use. $1/2''$ F inlet x $1/2''$ M outlet connections. Chrome plated brass body. Stainless steel springs. Maximum working pressure 10 bar. Set temperature $48^{\circ}\text{C} \pm 1^{\circ}\text{C}$.

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

