



# **BOSS™ 206 & 206TD**

## **Operating and Maintenance Instructions**



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**OVER  
100 YEARS  
OF QUALITY**

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### Introduction

The BOSS 206TD thermostatic regulator for domestic hot water re-circulation systems automatically maintains the specified water temperature.

### Function

The thermostatic regulator is intended to be installed in the return pipe of each re-circulation circuit, automatically maintaining the specified water temperature.

The regulator controls the flow rate in accordance with the inlet water temperature by means of a dedicated internal thermostatic cartridge.

When the water temperature approaches the set value, the obturator progressively closes and reduces the flow passage reducing the amount of water re-circulating.

The water supplied by the re-circulation pump is available to be distributed to other branches in the system, resulting in effective automatic thermal balancing.

The regulator is equipped with a thermal disinfection function, which is useful if the water temperature exceeds 55 to 60 °C.

### Product Range

- 20520023 1/2" Regulator with temp. gauge and disinfection cartridge
- 20520034 3/4" Regulator with temp. gauge and disinfection cartridge
- 20520045" Regulator with temp. gauge and disinfection cartridge
- 20520001 15mm / 1/2" BOSS™ 206 Regulator with probe pocket for temperature gauge
- 20520012 22mm / 3/4" BOSS™ 206 Regulator with probe pocket for temperature gauge
- 20520067 Insulation Jacket to fit 1/2" & 3/4" BOSS™ 206TD Balancing Valve
- 20520078 Insulation Jacket to fit 1" BOSS™ 206TD Balancing Valve

### Materials

Component	Material	Grade
Body	DZR	BS EN 12165 CW724R
Adjustable cartridge	PSU polymer	
Seals	Elastomer	EPDM
Adjustment knob	ABS polymer	
Springs	Stainless steel	BS EN 10270-3 AISI 302

### Technical Specification

Medium:	Potable water
Kv maximum:	1.8 m <sup>3</sup> /h
Kv disinfection:	1.0 m <sup>3</sup> /h
Kv min at 58°C (DN 15):	0.10 ± 20% m <sup>3</sup> /h
Kv min at 58°C (DN 20):	0.12 ± 20% m <sup>3</sup> /h
Kv (Dt = 5K):	0.45 m <sup>3</sup> /h
Max. working pressure:	16 bar
Max. differential pressure:	1 bar
Temperature adjustment range:	35 to 60 °C
Factory setting:	52 °C
Disinfection temperature:	70 °C
Closing temperature:	75 °C
Connections - female:	BS EN 10226-1

### Operating Principle

In domestic hot water distribution circuits, to achieve systems requirements for the prevention of Legionella growth, it is essential to ensure that all circuits are kept at the correct temperature.

The re-circulation network must be balanced, to avoid non-uniform temperature distribution.

The thermostatic regulator, installed on each branch of the re-circulation circuit, automatically maintains the set temperature.

The regulator modulates the water flow rate in accordance with the inlet temperature by means of the action of a dedicated internal thermostatic cartridge.

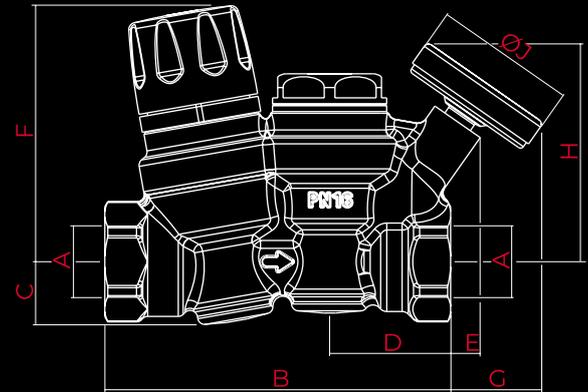
When the water temperature approaches the set value, the obturator progressively reduces the passage.

The water flow rate supplied by the re-circulation pump is thus distributed to the other network branches, resulting in effective automatic thermal balancing.

Regulators 20520023, 20520034 and 20520045 are already equipped with a thermal disinfection function, which is useful if the system temperature is to be increased to values over 55 to 60 °C.

This function can be completely automatic, activated by a dedicated second thermostatic cartridge that trips at 70 °C, or controlled with a control unit by means of a thermo-electric actuator available by special order please contact our BOSS Technical Support Team for more information.

### Dimensions



Code	A	B	C	D	E
20520001	15mm / 1/2"	100	18.5	35	9
20520012	22mm / 3/4"	100	18.5	35	9
20520023 with gauge	RP 1/2"	100	18.5	35	9
20520034 with gauge	RP 3/4"	100	18.5	35	9
20520045 with gauge	RP 1"	100	18.5	35	9

Code	F	G	H	J
20520001	74.5			
20520012	74.5			
20520023 with gauge	74.5	27	63.5	41
20520034 with gauge	74.5	27	63.5	41
20520045 with gauge	74.5	21.5	71	41

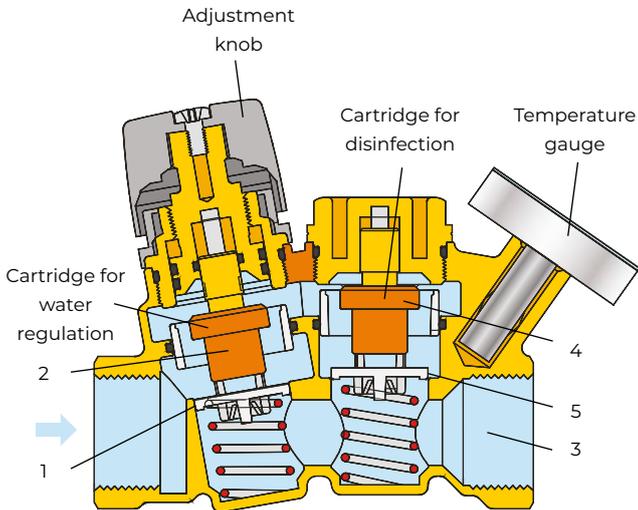
### Temperature Gauge - Code 20520100

Scale: 0 to 80 °C

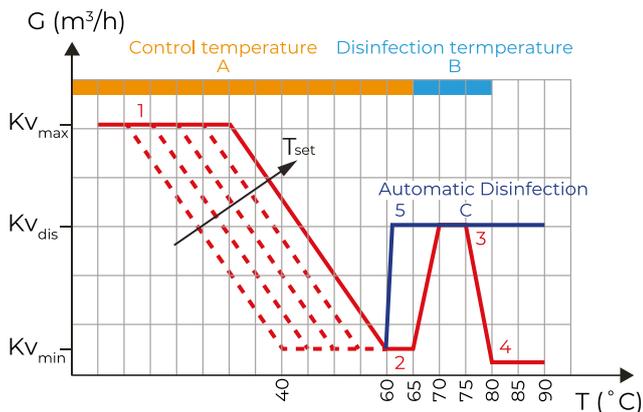
Diameter: Ø 40 mm

Stem diameter: Ø 9mm

### Construction - 20620023, 20520034 and 20520045 with cartridge for disinfection and temperature gauge



### Regulating Characteristics



The graph shows the variation of the  $K_v$  value depending on the device configuration (A, B, C) and on the inlet temperature of the domestic hot water.

#### Function A - Temperature control

$K_{v_{\max}}$  ( $\text{m}^3/\text{h}$ ) = 1.8

#### Function B - Thermostatic thermal disinfection

$K_{v_{\text{dis}}}$  ( $\text{m}^3/\text{h}$ ) = 1 (maximum flow rate for a disinfection process with a temperature of 70 °C)

$K_{v_{\min}}$  ( $\text{m}^3/\text{h}$ ) = 0.2 (minimum flow rate with the module of the main regulator closed)

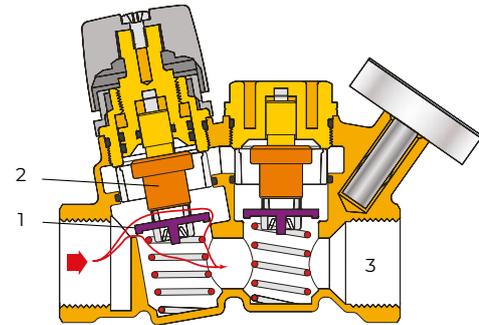
#### Function C - Controlled thermal disinfection

$K_{v_{\text{dis}}}$  ( $\text{m}^3/\text{h}$ ) = 1 (flow rate through the valve by means of a cartridge with thermo-electric actuator, with by-pass completely open)

### Operation

#### Function A - Temperature Control

On reaching the set temperature, the obturator (1), governed by the thermostatic sensor (2), modulates the closure of the hot water outlet (3), thereby aiding circulation towards the other connected circuits. If the temperature decreases, there is the opposite action and the passage reopens, so as to ensure that all the branches of the system reach the required temperature. The characteristic curve of the valve is shown in curve A.



1 Control temperature position open

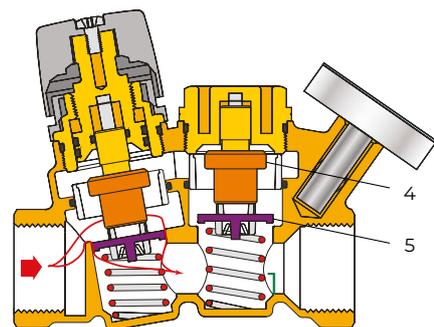
#### Function B - Thermostatic Thermal Disinfection

The characteristic curve of operation B is the same as curve A until a temperature higher than about 68 °C is reached.

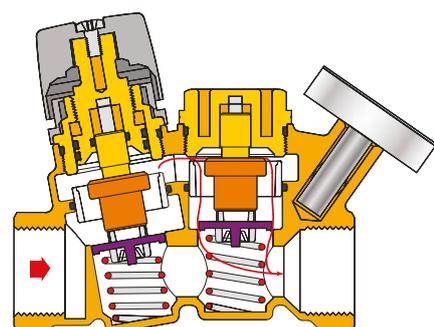
At this value the second thermostatic sensor (4) intervenes with the aim of controlling the disinfection process, allowing circulation independently of the action of the first thermostat.

This allows a passage of medium through a special by-pass (5), opening a passage up to the temperature of 70 °C.

If the temperature rises beyond this value, the flow through the by-pass circuit is reduced so as to allow thermal balancing to be performed even during the disinfection process. When it reaches about 75 °C, the regulator reduces the orifice so as not to circulate water at a high temperature, to avoid possible problems in the system. The characteristic curve of the valve is shown in curve A+B.



2 Minimum position open

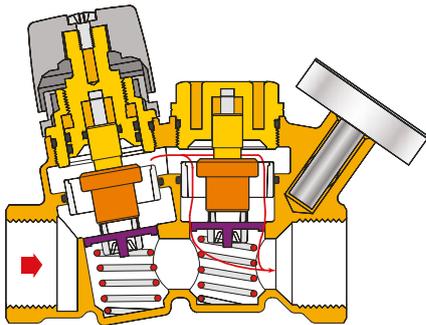


3 Disinfection flow path

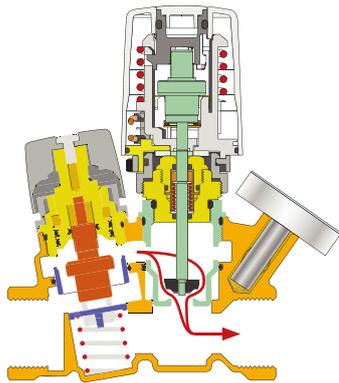
### Function C - Controlled Thermal Disinfection

The characteristic curve of operation C is the same as curve A until the temperature of intervention of the electronic disinfection system is reached.

At this value (which is controlled by a dedicated thermostat or electronic system), the thermo-electric actuator 656 series intervenes with the aim of controlling the disinfection process, allowing circulation independently of the action of the first thermostat, by means of a dedicated by-pass. In this case, the minimum head loss is produced during thermal disinfection against Legionella. The characteristic curve of the valve is shown in curve A+C.



4 Closed position during disinfection

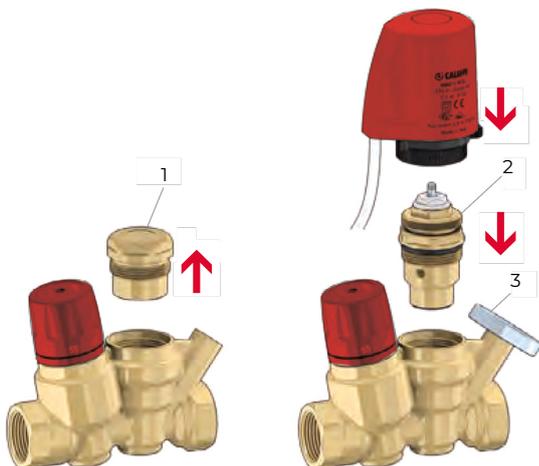


5 Electrical controlled disinfection

### Construction Details

#### DZR Alloy with very low lead contents

The material used to make the regulator 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.



### Fitting the Electric Actuator

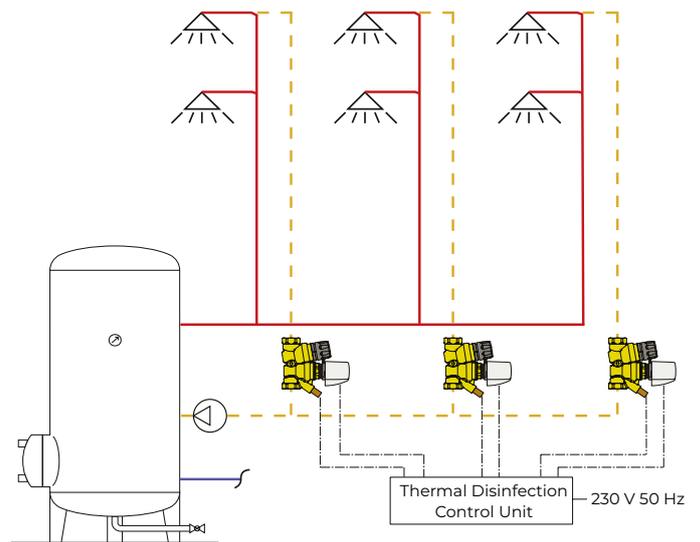
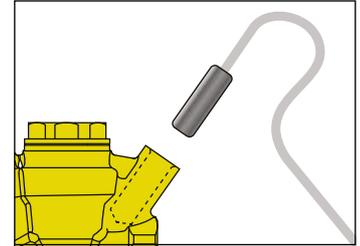
To transform into controlled mode it is sufficient to remove the plug (1) and screw on a replacement cartridge in its place (2). In this application, any 656 series thermo-electric actuator can be used.

The regulator can be equipped with a temperature gauge for measuring and controlling the temperature of the hot water in the circuit, code 20520100.

The temperature gauge pocket can also be used for inserting a special immersion probe (with  $\varnothing < 10$  mm) for remote control of the disinfection temperature by a dedicated control unit.

This system allows disinfection control in each circuit and optimization of the disinfection process.

In this case it is possible to measure and monitor the water temperature in each circuit, even from remote.



### Certification

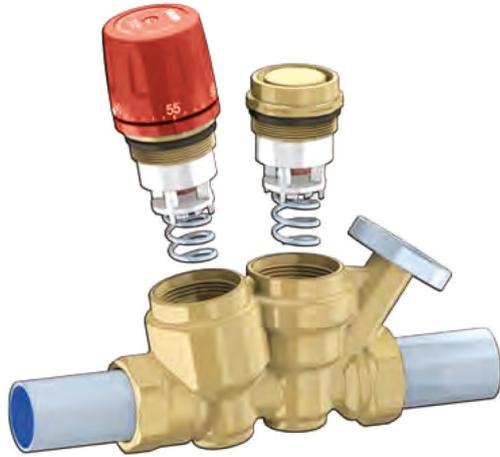
The thermostatic regulator complies with the performance requirements of product specification W554, applicable according to the provisions on system standards W551 for the prevention of Legionnaires' disease.

It is also certified by WRAS in the UK.

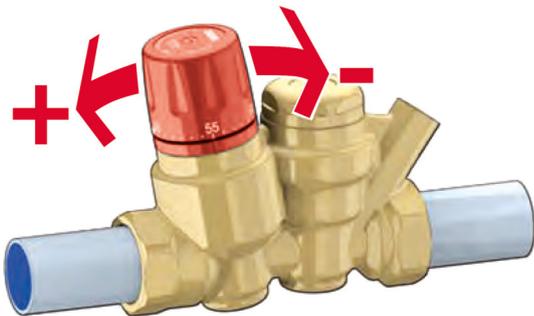
The thermostatic regulator is made from materials certified for contact with drinking water, for use in the distribution circuits of water for human consumption.

**Maintenance**

Both the adjustment cartridge and the disinfection control cartridge can be removed from the valve body for checking, cleaning or replacement.

**Temperature Adjustment**

The temperature is set at the desired value by turning the upper screw with the special knob.



The graduated scale shows the temperatures at which the indicator can be set.

It is recommended to set the valve temperature at a value about 5K greater than the water temperature at the valve inlet, taking into account the heat losses along the line, to limit the head required at the recirculation pump.

Take care to ensure the minimum flow rate at the mixing valves in the central heating system.

**Adjustment Locking**

After adjusting the temperature, the setting can be locked at the desired value using the control knob.

For this purpose, unscrew the locking screw at the top of the control knob, remove the knob and then put it back on so that the internal reference couples with the protrusion on the knob holder nut.

When locked, the indication of the temperature value on the knob is lost.

To restore it, completely unscrew the regulating headwork counter-clockwise. Reposition the knob on MAX value. Tighten the locking screw.

**Accessories****Insulation Shell - Product Code 20520067, 20520078****Technical Specification**

Material:	closed cell expanded PE-X
Thickness:	min 13mm - max 23mm
Density:	inner part 30 kg/m <sup>3</sup> outer part 80 kg/m <sup>3</sup>
Thermal conductivity (EN 12667):	- at 0°C: 0.0345 W/(m-K) - at 40°C: 0.0398 W/(m-K)

**Coefficient of resistance to water**

Vapour diffusion:	> 1.300
Working temperature range:	0 to 100 °C
Fire behaviour (UNI 9177):	class 1

**(available to special order)**

116002 240V electric actuator

116004 24V electric actuator

**Technical Specification**

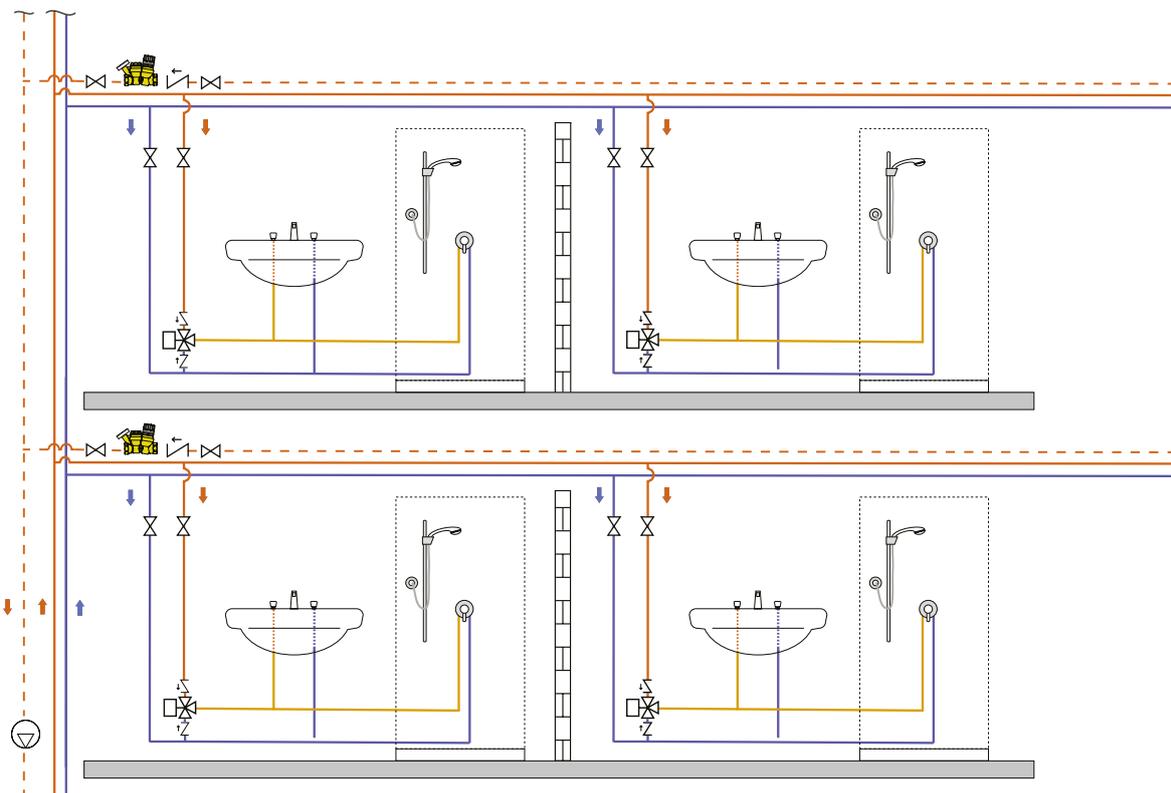
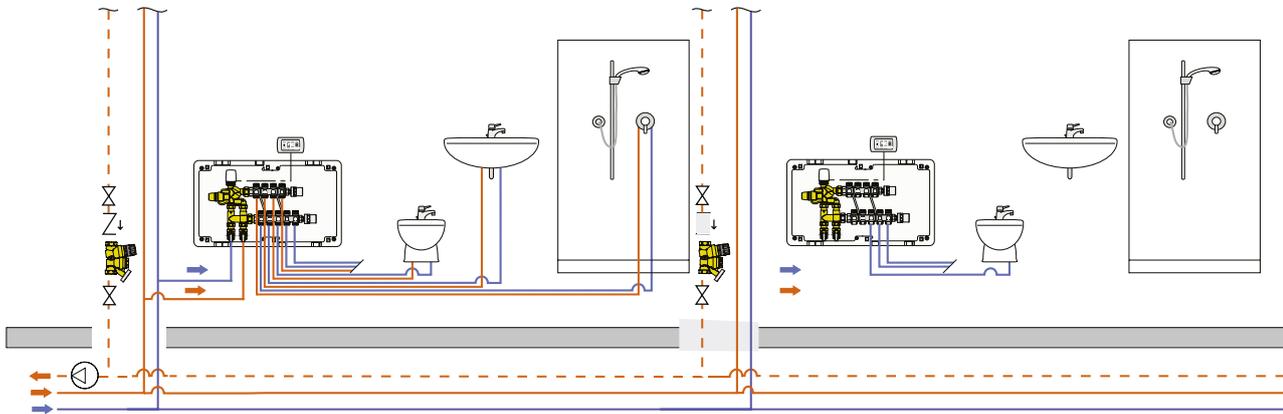
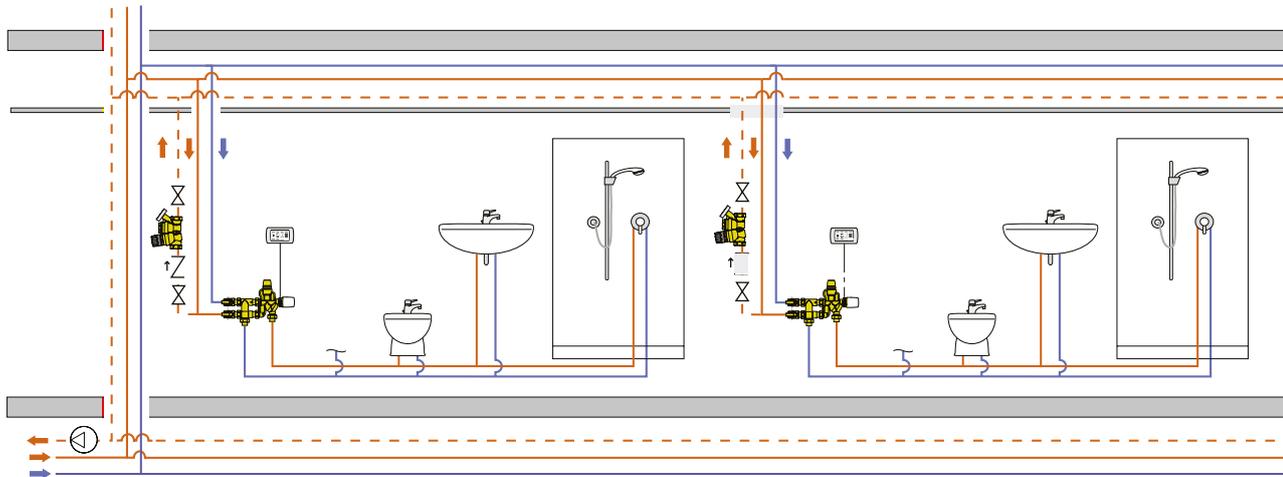
Normally closed ON/OFF:

Electric supply:	230 V ac - 24 V ac
Power consumption:	1.8 W
Insulation:	class II
Protection class:	IP 54
Ambient temperature range:	0 to 60 °C
Operating time:	150 to 200 second
Length of cable:	1 metre



**(available to special order)**

Application Diagrams





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