

Self-operated Temperature Regulators

Series 43

Temperature Regulator with Three-way Valve Type 43-3



Application

Temperature regulators for mixing and flow-diverting¹⁾ service in heating or cooling installations · Set points from 0 to 150 °C
Valves G ½ to G 1 female thread · DN 15 to DN 50 for connection of welding ends, threaded ends or flanges · PN 25
Suitable for liquids from 0 to 150 °C²⁾

Note!

Typetested temperature regulators (TR), safety temperature monitors (STM) and safety temperature limiters (SL) are available.



Special features

- Low-maintenance proportional regulators requiring no auxiliary energy
- Temperature sensor suitable for installation in any desired position and for operation at high excess temperatures, designed for operating pressures up to 40 bar
- Easy set point adjustment on a scale
- Three-way valve for mixing and flow-diverting service, flow across section AB independent from the valve plug position
- Version with double adapter Do3K for the attachment of additional control thermostats or manual adjuster (see Data Sheet T 2176 EN)
- Suitable for heat transfer media - water and oil.

Versions

The regulators consist of a three-way valve with a control thermostat containing a set point adjustment ring, a capillary tube and a temperature sensor which functions according to the adsorption principle.

Type 43-3 Temperature Regulator (Fig. 1) with an unbalanced Type 2433 K Three-way Valve · Female thread connection G ½ to G 1 · DN 15 to 50 for connection nuts with welding ends, threaded ends or flanges · Oil and water resistant Type 2430 K Control Thermostat.

Typetested safety devices

Register numbers are available on request.

Type 43-3 Temperature Regulator (TR) whose maximum operating pressure must not exceed the maximum differential pressure Δp specified in the Technical data. For sensors with thermowells, only SAMSON thermowells can be used.

Details about the selection and application of typetested devices can be found in the Information Sheet T 2181 EN.

Safety Temperature Monitors (STM) and **Safety Temperature Limiters (STL)** are also available. Further details can be found in Data Sheets T 2183 EN and T 2185 EN.



Fig. 1 · Type 43-3 Temperature Regulator
DN 25 with welding ends

Accessories

- Thermowell made of: Copper, PN 40, G ½
CrNiMo steel, PN 40, G ½
- Combinations available on request

Special versions

- ANSI version available on request
- 5 m capillary tube
- With distance piece for temperature ranging between -15 °C and +150 °C

¹⁾ Used as a flow-diverting valve, only with male thread connection for welding ends, threaded ends or flanges

²⁾ Special version with distance piece: -15 to +150 °C

Principle of operation (see Fig. 2)

The temperature of the medium produces a pressure in the sensor, which is proportional to the actual temperature measured. This pressure is transmitted through the capillary tube (6) to the positioning bellows (9), where it is converted into a positioning force. It acts on the valve plug (3) according to the set point adjusted.

The three-way valve is used only for mixing services with the female thread connection or for mixing or diverting services in the version with male thread connection in sizes DN 15 to 50.

When used as a **mixing valve**, the media to be mixed enter A and B ports. The combined stream flows off through AB. The flow from A or B to AB is determined by the free area between the seat (2) and the plug (3) and, as a result, depends on the position of the plug stem (4). When the temperature rises, port A opens and port B closes.

When used as a **flow-diverting valve**, the medium enters at AB and the diverted streams flow off at port A or port B. The flow from AB to A or B is determined by the position of the plug stem and the plugs. When the temperature rises, port A closes and port B opens.

Installation

Only the same kind of materials should be combined, for example, a thermowell made of stainless steel 1.4571 installed in a stainless steel heat exchanger.

• Valves

The valves must be installed in horizontal pipelines. The thermostat should preferably hang downwards. Other installation positions are possible for temperatures up to 110 °C. The medium must flow through the valve in the direction indicated by the arrow on the valve body. The flow direction at ports A, B and AB must correspond with the regulator arrangement specific to the installation (see Fig. 4).

• Capillary tube

The capillary tube must be laid in such a way that the ambient temperature does not exceed the permissible temperature limit, the temperature is kept as even as possible at ambient temperatures of approx. +20 °C and the tube cannot be damaged. The smallest permissible bending radius is 50 mm.

• Temperature sensor

The temperature sensor can be installed in any desired position. Its whole length must be immersed in the medium to be controlled. The sensor should be installed in a location where over-heating or considerable idle times cannot occur.

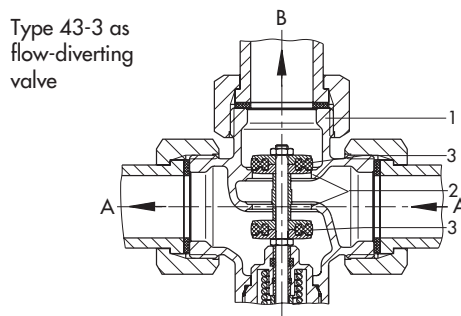
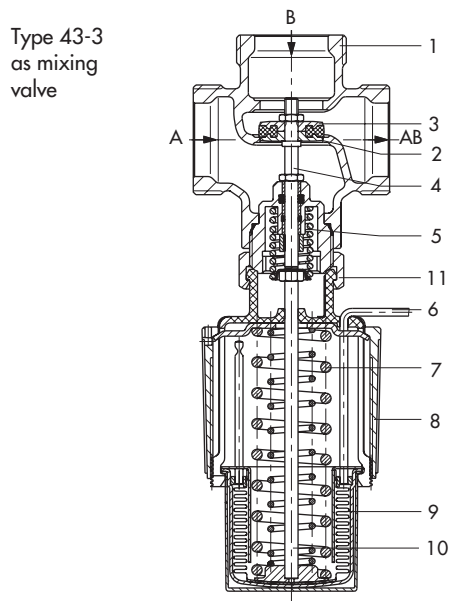


Fig. 2 · Type 43-3 Temperature Regulator
male thread connection for DN 15 to DN 50

- | | |
|-----------------------|-----------------------------|
| 1 Valve body | 7 Positioning spring(s) |
| 2 Seat | 8 Set point adjustment ring |
| 3 Plug (exchangeable) | 9 Positioning bellows |
| 4 Plug stem | 10 Pin of operating element |
| 5 Valve spring | 11 Coupling nut |
| 6 Capillary tube | |

Flow rate diagram for water

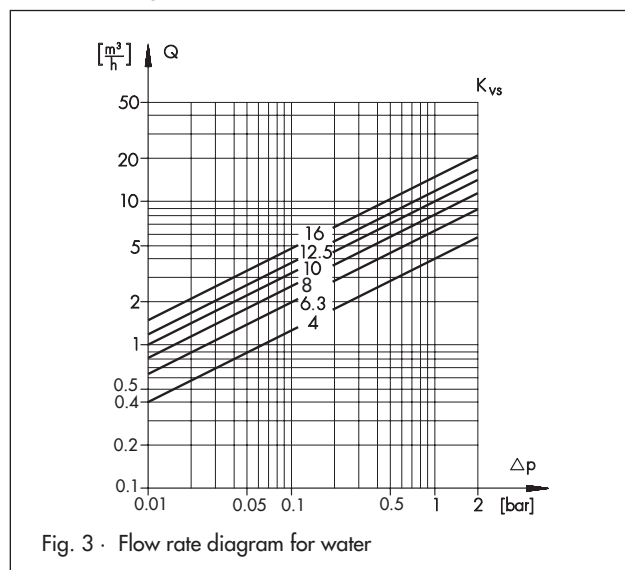


Fig. 3 · Flow rate diagram for water

Examples of arrangements for Type 43-3 Temperature Regulators

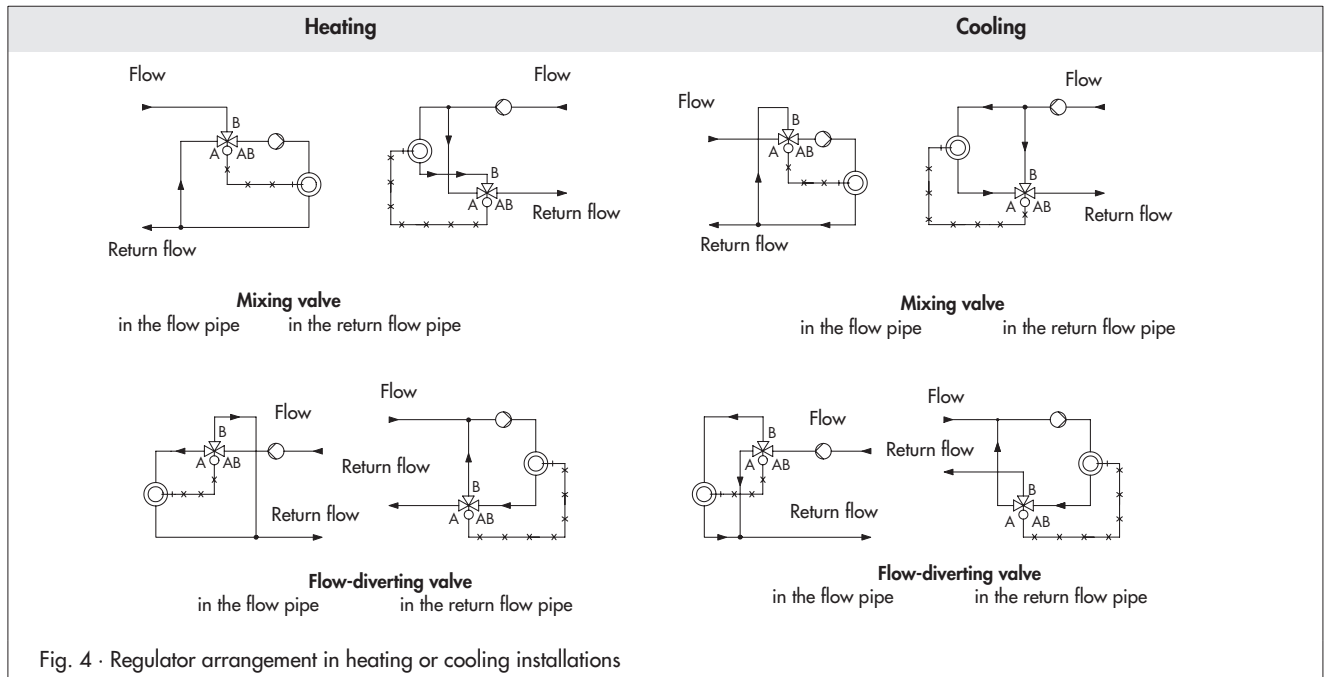


Fig. 4 · Regulator arrangement in heating or cooling installations

Table 1 · Technical data · All pressures in bar (gauge)

Type 2433 K Three-way Valve										
Connection	Female thread			Male thread						
Nominal size	G	1/2	3/4	1	-					
	DN	-			15	20	25	32	40	50
Medium	Water · Oil									
Operated as	Mixing valve			Mixing valve · Flow-diverting valve						
Kvs coefficient	4	6.3	8	4	6.3	8	10	12.5	16	
Nominal pressure	PN 25									
Max. perm. differential pressure	4.4	2.6	1.8	4.4	2.6	1.8	0.9	0.6		
Max. perm. temperature at valve	150 °C									
Type 2430 K Control Thermostat										
Set point range, continuously adjustable	0 to 35 °C, 25 to 70 °C, 40 to 100 °C, 50 to 120 °C or 70 to 150 °C									
Capillary tube	2 m (special version: 5 m)									
Max. permissible excess temperature at sensor	50 °C above adjusted set point									
Max. permissible ambient temperature	80 °C									
Permissible pressure at sensor/thermowell	PN 25/PN 40									
Max. permissible temperature range of medium	0 to +150 °C (-15 to +150 °C with distance piece)									

Table 2 · Materials · Material numbers according to DIN EN

Body	CC491K (Rg 5)	
Plug	Dezincification-resistant brass CW617N (CuZn40) with EPDM soft sealing	
Valve spring	Stainless steel 1.4310	
Temperature sensor	Capillary tube	Copper
	Thermowell	Nickel-plated copper or stainless steel 1.4571
Set point adjustment ring	Glass fiber reinforced PETP	

Table 3 · Dimensions in mm and weights

Nominal size	G	½	¾	1	–		
	DN	15	20	25	32	40	50
Pipe diameter Ø d		21.3	26.8	32.7	42	48	60
Connection size R		G ¾	G 1	G 1¼	G 1¾	G 2	G 2½
Width across flats SW		30	36	46	59	65	82
Length		65	70	75	100	110	130
Length L1		65	75	90			
Height H1			40		65	70	75
Weight ⁽¹⁾ , approx. kg		1.5	1.6	1.7	2.7	2.8	3.7
Connection nuts with welding ends, threaded ends or flanges							
Height H5			40		60		65
Connection nuts with welding ends							
Length L2		210	234	244	268	294	330
Height H2		112	122	124	144	157	165
Weight ⁽¹⁾ , approx. kg		2	2.3	2.5	3.9	4.2	5.5
Connection nuts with threaded ends (male thread)							
Male thread A		G ½	G ¾	G 1	G 1¼	G 1½	G 2
Length L3		129	144	159	180	196	228
Height H3		72	77	82	100	108	114
Weight ⁽¹⁾ , approx. kg		2	2.3	2.5	3.9	4.2	5.5
Connection nuts with flanges (PN 16/25)							
Length L3		130	150	160	180	200	230
Height H4		70	80	85	100	105	120
Weight ⁽¹⁾ , approx. kg		4.1	5.3	6.3	8.7	10.2	13

Dimensions

Type 43-3 (G ½ to G 1 connections)

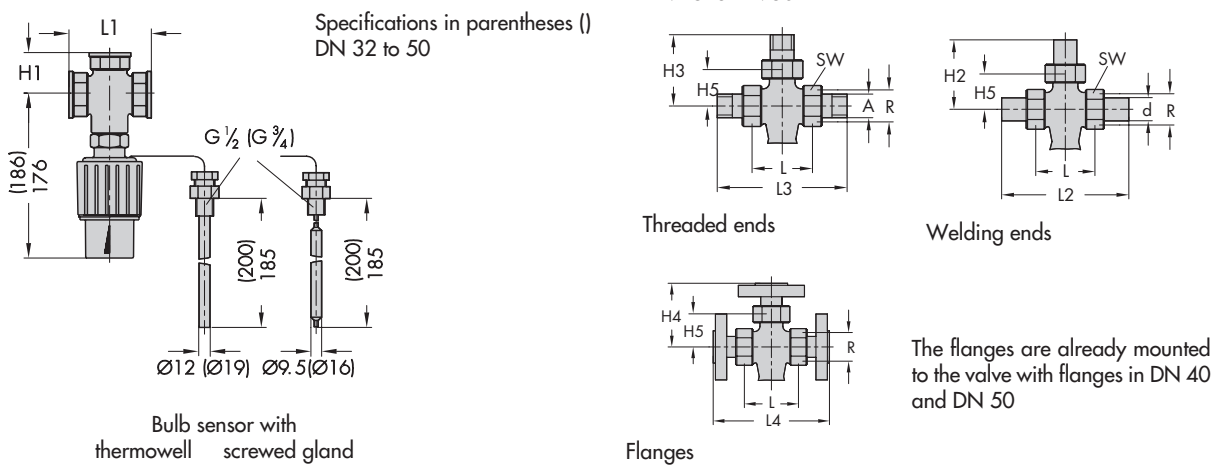


Fig. 5 · Dimensions

Ordering text

Temperature Regulator with three-way valve **Type 43-3**

Female thread ... G

Male thread for DN ... with connection nuts and welding ends, threaded ends or flanges

Used as mixing valve/flow-diverting valve

Set point range ... °C

Optionally, special version

Optionally, accessories

Specifications subject to change without notice.

