

# Self-operated Temperature Regulators Series 43

Temperature Regulators Type 43-5 · Type 43-7 · Valve closes as the temperature rises

Temperature Regulator Type 43-6 · Valve opens as the temperature rises



## Application

Temperature set points from 0 to 150 °C · Valves G ½ to G 1 · DN 15 to 50 · Nominal pressure PN 25 · Suitable for liquids and steam up to 200 °C and non-flammable gases up to 80 °C · For cooling and heating installations

## Note

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



## Special features

- Self-operated P regulators requiring little maintenance
- Temperature sensor suitable for installation in any position and for operation at high permissible ambient temperature (50 K above the adjusted set point), designed for operating pressures up to 40 bar
- Globe valves with a plug balanced by a bellows
- Compact design and a particularly low overall height
- Suitable for liquids, gases and steam

## Versions (Figs. 1 to 3)

The regulators consist of a globe valve and a control thermostat with set point adjuster, capillary tube and a temperature sensor which functions according to the adsorption principle.

Valve bodies made of red brass, spheroidal graphite iron or stainless steel.

Versions with double adapter or manual adjuster for attaching additional control thermostats (see Data Sheet T 2176 EN).

**Temperature regulators** with Type 2430 K Control Thermostat and valve with connection G ½, G ¾ or G 1 female thread.

**Type 43-5** · For heating installations · Type 2435 K Valve for PN 25 · Suitable for liquids and steam up to 200 °C

**Type 43-6** · For cooling installations · Type 2436 K Valve for PN 16 · Suitable for gases up to 80 °C and liquids up to 150 °C

**Temperature regulators** with Type 2430 K Control Thermostat and valve DN 15 to DN 50 with connection nuts and welding ends (special version with threaded ends, flanges or valve with flanged body)

**Type 43-6** · For cooling installations · Type 2436 K Valve for PN 25 · Nominal sizes DN 32, 40, 50 · Suitable for gases up to 80 °C and liquids up to 150 °C

**Type 43-7** · For heating installations · Type 2437 K Valve for PN 25 · Nominal sizes DN 15 to 50 · Suitable for liquids and steam up to 200 °C

## Typetested safety devices

Register numbers are available on request.

Type 43-5 and Type 43-7 Temperature Regulators (TR) whose maximum operating pressures must not exceed the maximum differential pressure  $\Delta p$  specified in the technical data. Only SAMSON thermowells may be used for sensors requiring thermowells.

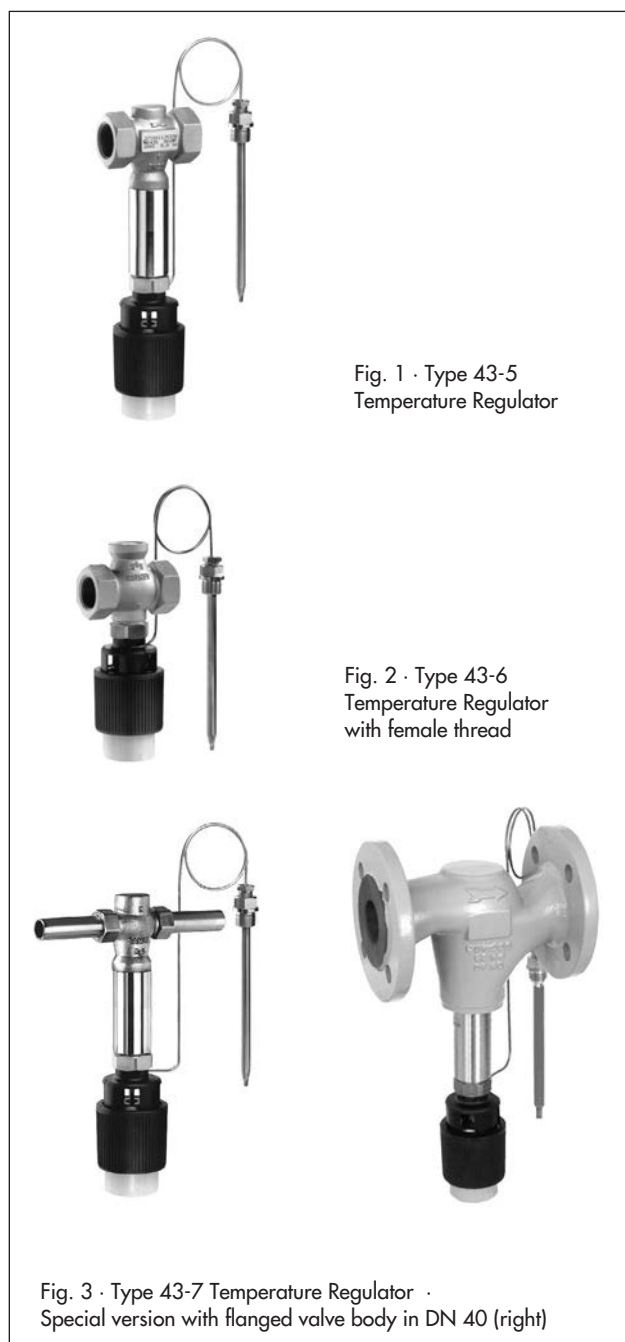


Fig. 1 · Type 43-5 Temperature Regulator

Fig. 2 · Type 43-6 Temperature Regulator with female thread

Fig. 3 · Type 43-7 Temperature Regulator · Special version with flanged valve body in DN 40 (right)

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.

### Special versions

- 5 m capillary tube
- Reduced  $K_{VS}$  value for DN 15 or G 1/2
- Oil-resistant internal parts for Type 43-6
- ANSI version on request (see Data Sheet T 2174 EN)
- Stainless steel body for Type 43-6
- Flanged body made of EN-JS1049 for Types 43-6/43-7

### Principle of operation (Fig. 4)

The temperature regulators work according to the adsorption principle.

The temperature of the medium produces a pressure in the measuring sensor which is proportional to the actual temperature measured. This pressure is transmitted through the capillary tube (11) to the operating element (9) where it is converted into a positioning force. This force acts via the pin of the operating element (10) on the plug stem (4) and the valve plug (3). The point of response of the valve spring (5) is changed by turning the set point adjuster (8).

The valves are pressure-balanced by the metal bellows (6). The balancing bellows compensates for any changes in pressure upstream of the valve since a hole in the valve plug (3) allows the upstream pressure also to act on the inside of the bellows.

The Type 43-5 and Type 43-7 Regulators are suitable for heating installations. The valves close as the temperature rises.

The Type 43-6 Regulator has a valve which opens as the temperature rises. This regulator is therefore suitable for cooling installations.

### Installation

#### • Valve

Install valves in horizontal pipelines. The direction of flow should correspond with the arrow on the valve body. The control thermostat must be installed suspended; other installation positions are also possible for Type 2436 K with temperatures up to 110 °C.

#### • Temperature sensor

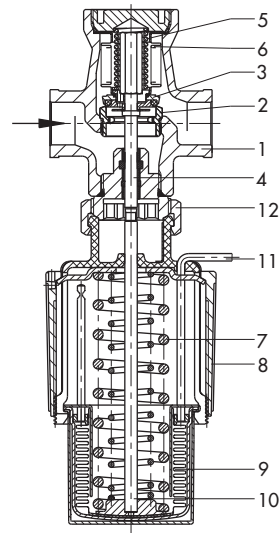
The temperature sensor can be installed in any position. However, the entire sensor must be immersed in the medium to be controlled. Choose a point of installation where overheating or noticeable idle times cannot occur.

Only the same sort of materials can be combined, e.g. a stainless steel heat exchanger with thermowells made of stainless steel 1.4571.

#### • Capillary tube

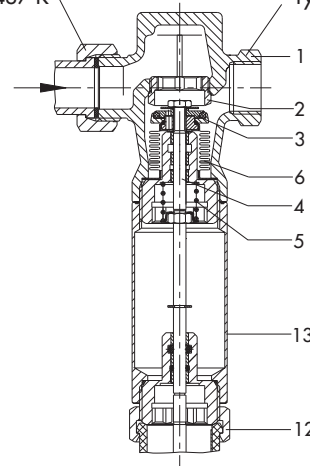
Run the capillary tube in such a way that the permissible ambient temperature range is not exceeded, temperature deviations cannot occur and the tube cannot be damaged. The smallest possible bending radius is 50 mm.

Type 2436 K Valve

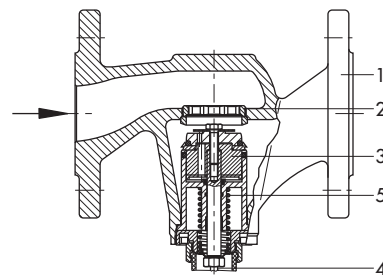


Type 43-6 Temperature Regulator, principle of operation

Type 2437 K      Type 2435 K



Type 43-5/-7, principle of operation (thermostat not shown)



Type 43-5/-7, valve with flanged body (thermostat not shown)

- |                       |                             |
|-----------------------|-----------------------------|
| 1 Valve body          | 8 Set point adjuster        |
| 2 Seat (exchangeable) | 9 Operating element         |
| 3 Plug                | 10 Pin of operating element |
| 4 Plug stem           | 11 Capillary tube           |
| 5 Valve spring        | 12 Coupling nut             |
| 6 Balancing bellows   | 13 Insulating pipe          |
| 7 Positioning springs |                             |

Fig. 4 · Type 43-5/-6/-7 Temperature Regulators

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

Temperature Regulator	Type	43-6	43-5	43-7
Valve	Type	2436 K	2435 K	2437 K
Thread size		G ½ to 1		–
Nominal size		DN 32 to 50	–	DN 15 to 50
Flanged valve body		DN 15 to 50	–	DN 15 to 50
Nominal pressure		PN 25		
Max. perm. differential pressure $\Delta p$		With stainless steel bellows: 16 bar <sup>2)</sup>		
Max. perm. temperature range of valve		0 to 150 °C <sup>1)</sup>	0 to 200 °C	
<b>Type 2430 K Control Thermostat</b>				
Set point range <sup>3)</sup>		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. perm. temperature at the sensor		50 K above the adjusted set point		
Max. perm. ambient temperature range		–20 to 80 °C		
Perm. pressure at sensor/at thermowell		PN 25/PN 40		

<sup>1)</sup> With intermediate insulating piece: –15 to 150 °C · <sup>2)</sup> Type 43-6, 43-7: max. 8 bar · <sup>3)</sup> Other set point ranges available on request

**Table 2 ·  $K_{VS}$  coefficients**

<b><math>K_{VS}</math> coefficients with ...</b>						
Thread size	G ½	G ¾	G 1	–		
Nominal size	DN 15 <sup>1), 2)</sup>	DN 20 <sup>1)</sup>	DN 25 <sup>1), 2)</sup>	DN 32 <sup>1)</sup>	DN 40 <sup>1)</sup>	DN 50 <sup>1)</sup>
$K_{VS}$ values	3.2	4	5	12.5	16	20
Special version	0.4 · 1.0 · 2.5 <sup>3)</sup>					

<sup>1)</sup> Flanged body made of spheroidal graphite iron for Type 43-6/-7 (special version)

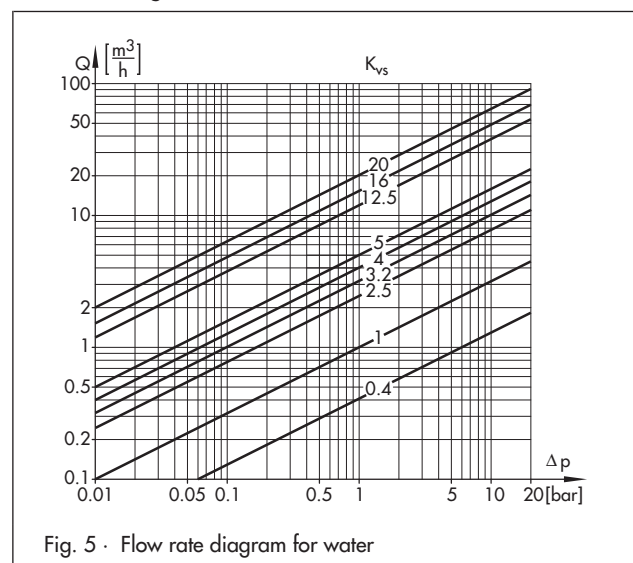
<sup>2)</sup> Flanged body made of stainless steel for Type 43-6 (special version) · <sup>3)</sup> On request

**Table 3 · Materials** · Material no. acc. to DIN EN

Body	CC491K/CC449K (Rg 5) · EN-JS1049 <sup>4)</sup>	Stainless steel 1.4408 <sup>5)</sup>
Seat	Stainless steel 1.4104 <sup>1)</sup>	
Plug	Type 43-6	Brass, free of dezincification, CW617N (CuZn40Pb) and 1.4104 with EPDM soft sealing <sup>2), 3)</sup>
	Type 43-5/-7	Brass, free of dezincification, CW617N (CuZn40Pb) and 1.4104 with EPDM soft sealing <sup>3)</sup>
Balancing bellows	Stainless steel 1.4571	
Valve spring	Stainless steel 1.4310	
Sensor	Capillary tube	Copper
	Thermowell	Copper or stainless steel 1.4571
Set point adjuster	PETP, glass fiber-reinforced	

<sup>1)</sup> For Type 43-6 G ½ to 1: 1.4305 · <sup>2)</sup> Special version for oils (ASTM I, II, III): FPM (FKM) soft sealing · <sup>3)</sup> For  $K_{VS} = 0.4$  and 1.0: 1.4305

<sup>4)</sup> Type 43-6/-7: Version with flanged body · <sup>5)</sup> Special version for Type 43-6: Flanged body DN 15 and 25 or with G ½ to G 1 female thread

**Flow rate diagram for water****Ordering text**

Temperature Regulator **Type 43-6**

G ... or

DN ... with connection nuts and welding ends/threaded ends/flanges or flanged valve body

With stainless steel bellows

Set point range ... °C

Optionally, accessories ... /special version ...

Temperature Regulator **Type 43-5/Type 43-7**

G ... or

for **Type 43-7** DN ... with connection nuts and welding ends/threaded ends/flanges or flanged valve body

With stainless steel bellows

Set point range ... °C

Optionally, accessories ... /special version ...

## Dimensions and weights

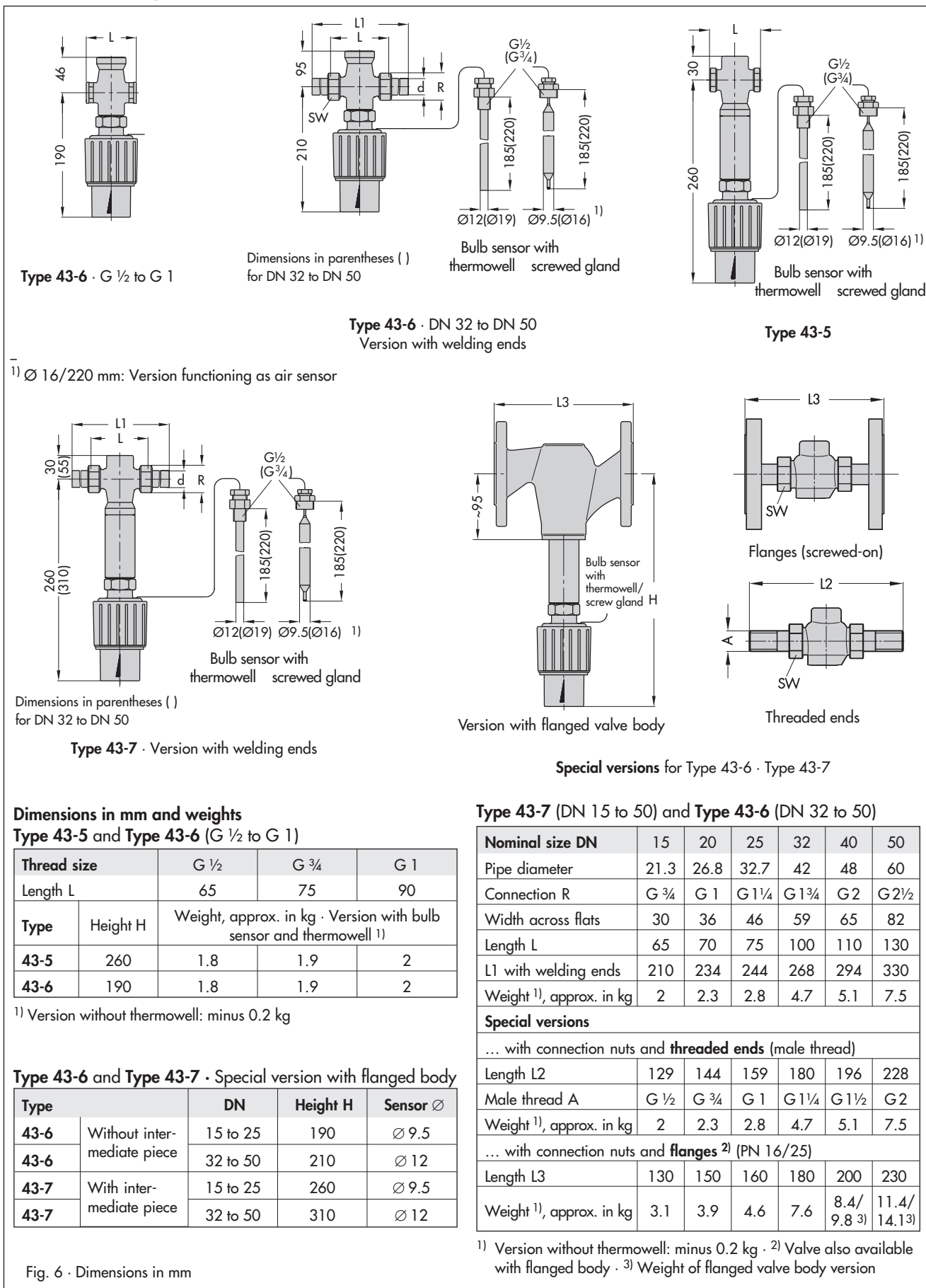


Fig. 6 · Dimensions in mm