Self-operated Temperature Regulators
Series 43

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

Type 43-6 · Valve opens when the temperature rises

ANSI version

Application

Set points from **30** to **300 °F** (0 to 150 °C) · Valves ½ to **1 NPT** **NPS** ½ to **2** · Pressure rating **Class 250** · For gases up to **175 °F** (80 °C), liquids and vapors up to **390 °F** (200 °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 any installation position and permissible excess temperature of 120 °F (50 °C) above the set point adjusted, designed for operating pressures up to 580 psig (40 bar)
- Globe valves with a plug balanced by a bellows
- Compact design and a particularly low overall height
- Suitable for liquids, gases and vapors

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.

The valve body is made either of red brass or stainless steel (Type 43-6 in special version).

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

Type 43-5 · For heating installations · Type 2435 K Valve for Class 250 · For liquids and steam up to 390 °F (200 °C)

Type 43-6 · For cooling installations · Type 2436 K Valve for Class 250 · For gases up to 175 °F (80 °C) and liquids up to 300 °F (150 °C)

Temperature regulators with Type 2430 K Control Thermostat and valve in **NPS** ½ to **2** with connection nuts and welding ends (special version with threaded ends).

Type 43-6 · For cooling installations · Type 2436 K Valve for Class 250 · Sizes NPS 1¼ to 2 · For gases up to 175 °F (80 °C) and liquids up to 300 °F (150 °C)

Type 43-7 · For heating installations · Type 2437 K Valve for Class 250 · Sizes NPS ½ to 2 · For liquids and vapors up to 390 °F (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 Δp 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 with welding ends

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.

Refer to Information Sheet T 2181 EN for details on selection and application of the typetested devices.

Accessories and combinations

- Thermowell made of: Copper, Class 300
  CrNiMo steel, Class 300
- Type 43-5/-6/-7: Double adapter Do3 K or manual adjuster (see Data Sheet T 2176 EN)

Special versions

- 16.4 feet (5 meter) capillary tube
- Oil-resistant internal parts for Type 43-6
- Stainless steel body for Type 43-6

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 when the temperature rises.

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

Installation

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

- **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 230 °F (110 °C).

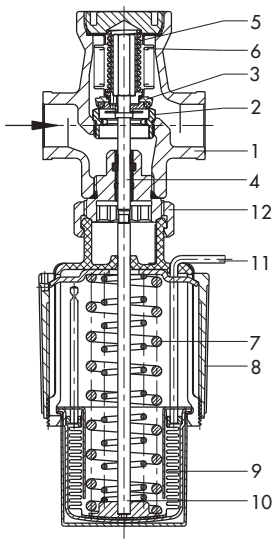
- **Temperature sensor**

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.

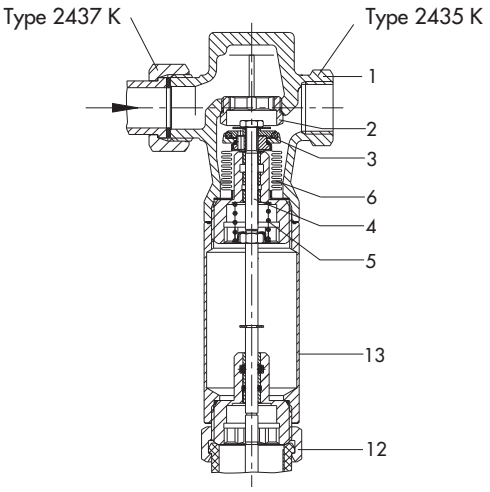
- **Capillary tube**

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 2" (50 mm).

Type 2436 K Valve



Type 43-6 Temperature Regulator, principle of operation



Type 43-5/-7, principle of operation (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 spring(s)		

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

Table 1 · **Technical data** · All pressures as gauge pressure

Temperature Regulator	**Type**	**43-6**	**43-5**	**43-7**
Valve	Type	2436 K	2435 K	2437 K
Thread size		½ to 1 NPT		–
Valve size		NPS 1¼ to 2	–	NPS ½ to 2
Pressure rating		Class 250		
Max. perm. differential pressure Δp		Version with stainless steel bellows: 200 psi [1] (14 bar)		
Max. perm. temperature range		300 °F (150 °C)	390 °F (200 °C)	

[1] Type 43-6, 43-7 and NPS 1¼ to 2: max. 115 psi (8 bar)

C_V (K_{VS}) coefficients with ...							
Thread size	**NPT**	½ NPT	¾ NPT	1 NPT	–		
Valve size	**NPS**	NPS ½	NPS ¾	NPS 1	NPS 1¼	NPS 1½	NPS 2
C_V coefficient		3.7	5	6	15	20	23
K_{VS} coefficient		3.2	4	5	12.5	16	20

Type 2430 K Control Thermostat	
Set point range [2], continuously adjustable	30 to 95 °F, 75 to 160 °F, 105 to 210 °F, 125 to 250 °F or 160 to 300 °F
	0 to 35 °C, 25 to 70 °C, 40 to 100 °C, 50 to 120 °C or 70 to 150 °C
Capillary tube	6.5 ft (2 m), special version 16.4 ft (5 m)
Perm. temperature at the sensor	120 °F (50 °C) above the adjusted set point
Max. perm. ambient temperature range	–5 to +175 °F (–20 to 80 °C)
Perm. pressure at sensor/at thermowell	Class 300

[2] Further set point ranges on request

Table 2 · **Materials** · Material no. acc. to ASTM and DIN EN

Body		C 83600	Stainless steel [2]
Seat		Stainless steel 1.4104 [3]	1.4408
Plug	Type 43-6	Brass, free of dezincification, and 1.4104 with EPDM soft sealing [1]	1.4408
	Type 43-5/-7	Brass, free of dezincification, and 1.4104 with PTFE soft sealing	–
Balancing bellows		Stainless steel 1.4571	1.4571
Valve spring		Stainless steel 1.4310	1.4310
Sensor	Capillary tube	Copper	
	Thermowell	Copper or stainless steel 1.4571	
Set point adjuster		PETP, glass fiber-reinforced	

[1] Special version for oils (ASTM I, II, III): FPM (FKM) soft sealing
[2] Special version for Type 43-6
[3] For Type 43-6, ½ to 1 NPT: 1.4305

Table 3 · Dimensions in inch (mm) and weights in lb (kg)
Type 43-5 and **Type 43-6** (½ to 1 NPT)

Thread size			½ NPT	¾ NPT	1 NPT
			G ½	G ¾	G 1
Length L		inch	2.56	2.95	3.54
		mm	65	75	90
Type	Height H		Weight, approx. in lb (kg)		
	in	mm	Version with bulb sensor and thermowell [1]		
43-5	10.24	260	4 (1.8)	4.2 (1.9)	4.4 (2.0)

Type 43-7 (NPS ½ to 2 · DN 15 to 50)
Type 43-6 (NPS 1¼ to 2 · DN 32 to 50)

Nominal size	NPS	½	¾	1	1¼	1½	2
	DN	15	20	25	32	40	50
Pipe diameter d	in	0.84	1.05	1.29	1.66	1.90	2.38
	mm	21.3	26.8	32.7	42	48	60
Thread size R	G	¾	1	1¼	1¾	2	2½
Width across flats	in	1.18	1.42	1.81	2.32	2.56	3.65
	mm	30	36	46	59	65	82
Length L	in	2.56	2.76	2.95	3.94	4.33	5.12
	mm	65	70	75	100	110	130
L1 with welding ends	in	8.27	9.22	9.61	10.55	11.57	13.0
	mm	210	234	244	268	294	330
Weight [1], approx.	lb	4.4	5.1	6.2	10.4	11.2	16.5
	kg	2.0	2.3	2.8	4.7	5.1	7.5
Special versions							
… with connection nuts and **threaded ends** (male thread)							
Length L2	in	5.1	5.67	6.26	7.1	7.72	8.98
	mm	129	144	159	180	196	228
Male thread A	NPT	½	¾	1	1¼	1½	2
Weight [1], approx.	lb	4.4	5.1	6.2	10.4	11.2	16.5
	kg	2.0	2.3	2.8	4.7	5.1	7.5

[1] Version with screw gland and thermowell
without thermowell: minus 0.44 lb (0.2 kg)

Ordering text

Temperature Regulator **Type 43-6**

… NPT or NPS … with connection nuts and welding ends/threaded ends

With stainless steel bellows

Set point range ... °F (° C)

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

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

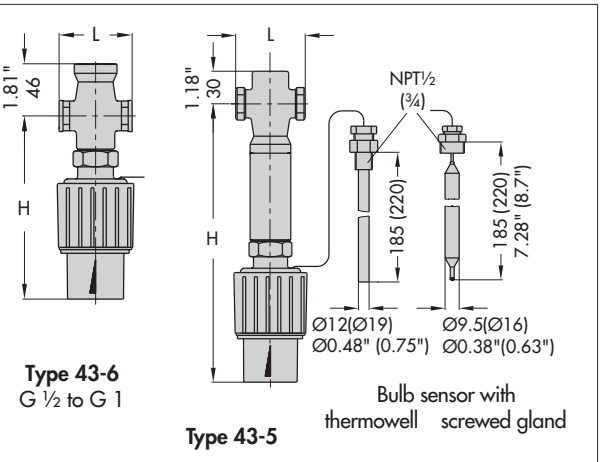
… NPT or
for **Type 43-7** NPS … with connection nuts and welding ends/threaded ends

With stainless steel bellows

Set point range ... °F (° C)

Optionally, accessories ... /special version …

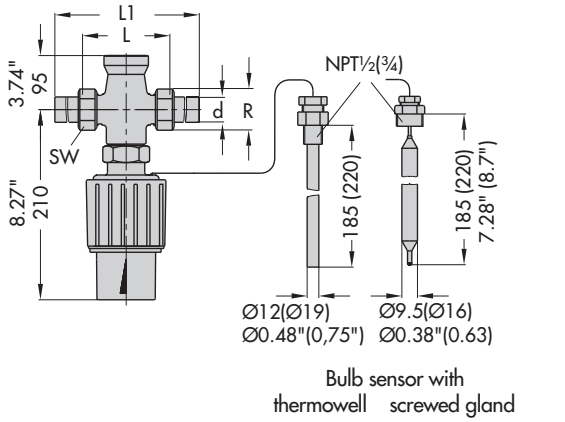
Specifications subject to change without notice.



Type 43-6
G ½ to G 1

Bulb sensor with thermowell screwed gland

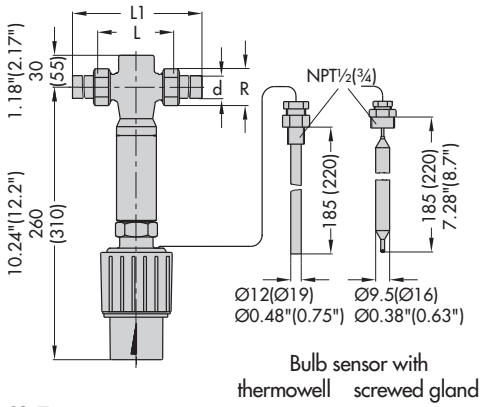
Type 43-5



Bulb sensor with thermowell screwed gland

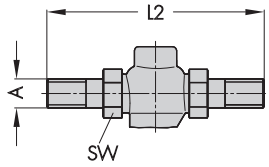
Type 43-6 · NPS 1¼ to 2 (DN 32 to 50)
Version with welding ends

Dimensions in parentheses ( )
NPS 1¼ to 2 · DN 32 to DN 50



Bulb sensor with thermowell screwed gland

Type 43-7
Version with welding ends



Threaded ends

Fig. 5 · Dimensions

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