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** · Valves **½** to **1 NPT** · **NPS ½ to 2**
Pressure rating Class 250 · Suitable for gases up to **175 °F**, for liquids and steam up to **390 °F** · Designed for heating and cooling installations

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

Special features
- Low-maintenance P-regulators requiring no auxiliary energy
- Temperature sensors suitable for installation in any desired position and for operation at high permissible excess temperatures of up to 120 °F (50 °C) above the adjusted set point value, designed for operating pressures up to 580 psig (40 bar)
- Globe valves with plug balanced by a metal 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 valve and a control thermostat with a set point adjuster, a capillary tube and a temperature sensor which functions according to the adsorption principle.

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

Type 43-5 · For heating installations · Type 2435 K Valve for Class 250 (PN 25) · For liquids and steam up to 390 °F (200 °C)

Type 43-6 · For cooling installations · Type 2436 K Valve for Class 250 (PN 25) · 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 a valve in **NPS ½** to **2** (DN 15 to 50) with connection nuts and welding ends (special version with threaded ends).

Type 43-6 · For cooling installations · Type 2436 K Valve for Class 250 (PN 25) · Nominal sizes NPS 1¼ to 2 (DN 32 to 50) · 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 (PN 25) · Nominal sizes NPS ½ to 2 (DN 15 to 50) For liquids and steam up to 390 °F (200 °C)

Typetested safety devices
Register numbers are available on request.

The maximum operating pressure of the Type 43-5 and Type 43-7 Temperature Regulators must not exceed the maximum differential pressure Δp specified in the "Technical data". Only SAMSON thermowells can be used for sensors with thermowells.

Safety Temperature Monitors (STM) and **Safety Temperature Limiters (STL)** are also available. Refer to Data Sheets T 2183 EN and T 2185 EN.

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

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

Accessories and combinations

– Thermowell made of: Copper, Class 300 (PN 40)
CrNiMo steel, Class 300 (PN 40)
– Types 43-5/6/7: Double adapter Do3 K or manual adjuster (see Data Sheet T 2176 EN)

Special versions

– 16.4 ft (5 m) long capillary tube
– Oil-resistant internal parts for Type 43-6

Principle of operation (Figs. 4 and 5)

The temperature regulators function according to the adsorption principle. 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 (11) to the operating element (9), where it is converted into a positioning force. This force acts on the pin (10) which moves the plug stem (4) and the valve plug (3). By turning the set point adjustment ring (8), the point of response of the regulator is changed by the spring (5).

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

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

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

Installation

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

• Valve

The valves must be installed in horizontal pipelines. The medium must flow through the valve in the direction indicated by the arrow on the valve body. The control thermostat must hang downwards. For Type 2436 K other installation positions are possible for temperatures lower than 230 °F (110 °C).

• Temperature sensor

The temperature sensor may 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 overheating or appreciable idle times cannot occur.

Type 2436 K Valve

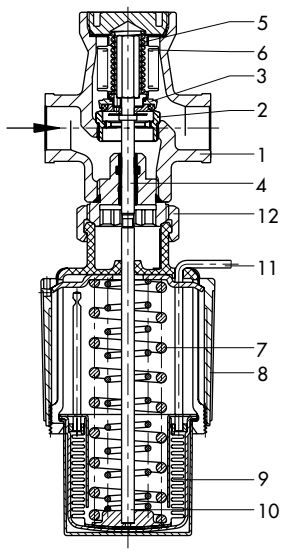


Fig. 4 · Type 43-6 Temperature Regulator

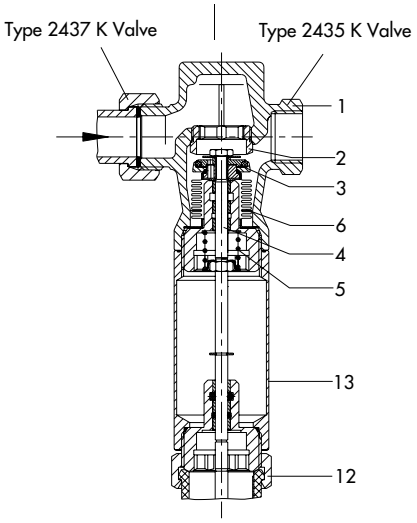


Fig. 5 · Type 43-5/Type 43-7 Temperature Regulator, functional diagram (thermostat not shown)

1	Valve body	8	Set point adjustment ring
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 (connecting valve and thermostat)
6	Balancing bellows	13	Insulating pipe
7	Positioning spring(s)		

• Capillary tube

The capillary tube must be run in such a way that the ambient temperature does not exceed the permissible range, this ambient temperature is kept as even as possible and the tube cannot be damaged. The smallest permissible bending radius is 2″ (50 mm).

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

Temperature Regulator Type	**43-6**	**43-5**	**43-7**
Valve Type	**2436 K**	**2435 K**	**2437 K**
Connection	½ to 1 NPT		–
Nominal size	NPS 1¼ to 2 (32 to 50)	–	NPS ½ to 2 (15 to 50)
Nominal pressure	Class 250 (PN 25)		
Max. permissible temperature	300 °F (150 °C)	390 °F (200 °C)	
Max. perm. differential pressure	Version with stainless steel bellows: 200 psi[1] (16 bar)		

[1] For Types 43-6, 43-7 and NPS 1¼ to 2 (DN 32 to 50): max. 115 psi (8 bar)

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

Type 2430 K Control Thermostat	
Set point ranges[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 adjusted set point
Max. permissible ambient temperature range	– 5 to + 175 °F (– 20 to + 80 °C)
Perm. pressure at sensor/at thermowell	Class 300 (PN 40)

[2] Other set point ranges available on request

Table 2 · **Materials** (Material number acc. to DIN EN)

Body		C 83600 (G-CuSn5ZnPb)
Seat		Stainless steel 1.4104
Plug	Type 43-6	CuZn40Pb and 1.4104 with EPDM soft sealing[1]
	Type 43-5/-7	CuZn40Pb and 1.4104 with PTFE soft sealing
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 adjustment ring		Glass fibre-reinforced PETP

[1] Special version for oils (ASTM I, II, III): FPM (FKM) soft sealing

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

Connection	**NPT**	½	¾	1
Length L	inch	2.56	2.95	3.54
	mm	65	75	90

Type	Height H		Weight, approx. in lb (kg) Version with bulb sensor and thermowell[1)]		
	in	mm			
43-5	10.24	260	4 (1.8)	4.2 (1.9)	4.4 (2)
43-6	7.48	190	4 (1.8)	4.2 (1.9)	4.4 (2)

[1)] Version without thermowell; minus 0.44 lb (0.2 kg)

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 ∅ d	in	0.84	1.05	1.29	1.66	1.90	2.38
	mm	21.3	26.8	32.7	42	48	60
Connection R	G	¾	1	1¼	1¾	2	2½
Width across flats SW	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	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	2.3	2.8	4.7	5.1	7.5

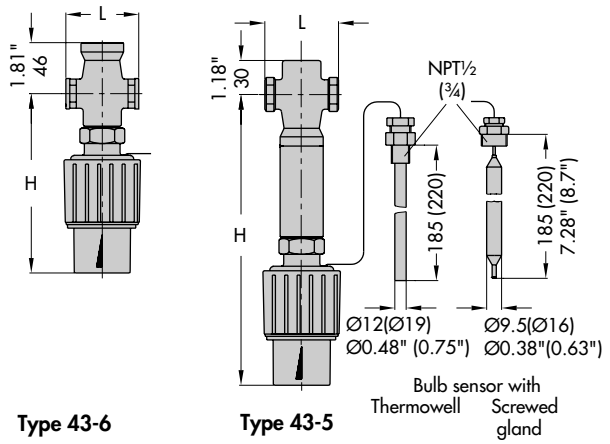
[1)] Version with bulb sensor and thermowell.
Without thermowell: minus 0.44 lb (0.2 kg)

Ordering text

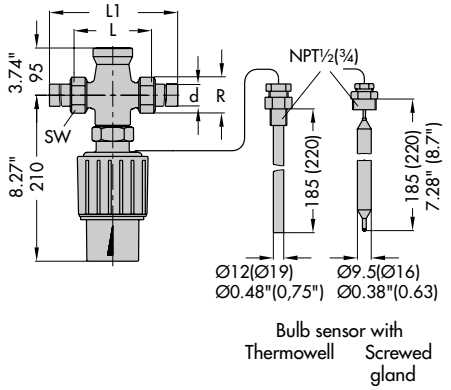
Temperature Regulator **Type 43-6**
... NPT or
NPS ... with connection nuts and welding ends/threaded ends
With stainless steel bellows
Set point range ... °F (°C)
Optionally, accessories ... /special version ...

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.

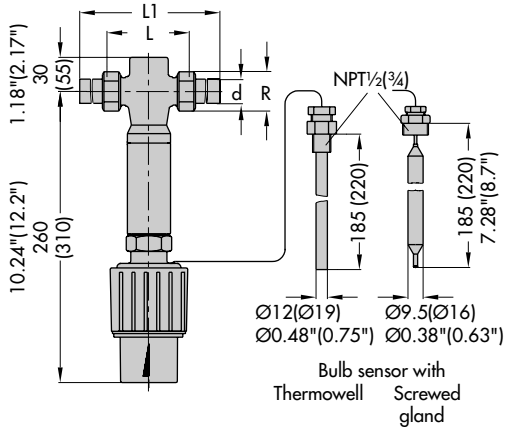


Type 43-6 **Type 43-5**
½ NPT to 1 NPT

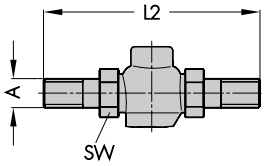


Type 43-6 NPS 1¼ to 2 (DN 32 to DN 50)
Version with connection nuts and welding ends

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



Type 43-7
Version with connection nuts and welding ends



Version with connection nuts and threaded ends

Fig. 6 · Dimensions

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