

## T 2174 EN

### Type 43-6 Temperature Regulator

Series 43 Self-operated Temperature Regulators · ANSI version



#### Application

Set points from **30 to 300 °F** (0 to 150 °C) with valves **½ NPT to 1 NPT** as well as **NPS ½ and 1** · Pressure rating **Class 150/300**  
Suitable for gases up to **175 °F** (80 °C), liquids up to **300 °F** (150 °C) · For cooling applications

The valve **opens** when the temperature rises.

#### 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 of 120 °F (50 °C) above the set point, designed for operating pressures up to 580 psi (40 bar)
- Spring-loaded, single-seated valve without pressure balancing or plug balanced by a bellows
- Compact design with particularly low overall height
- Valve body made of stainless steel

#### Version (Fig. 1)

The regulator consists of a valve and a control thermostat with set point adjuster, capillary tube and temperature sensor operating according to the adsorption principle.

Temperature regulators with Type 2430 Control Thermostat and Type 2436 Valve

- Body made of stainless steel (A351 CF8M) with screwed ends (½ NPT, ¾ NPT and 1 NPT female thread), Class 300
- Flanged valve body made of stainless steel (A351 CF8M) NPS ½ and 1, Class 150

#### Additionally, the following are available:

- Safety temperature monitors (STM) and safety temperature limiters (STL). For more details refer to Data Sheets  
▶ T 2183 and ▶ T 2185.
- Further details on the selection application of typetested equipment can be found in Information Sheet ▶ T 2181.
- Accessories and combinations
  - Thermowell: copper, Class 300  
CrNiMo steel, Class 300
  - Double adapter Do3 or manual adjuster  
Data Sheet ▶ T 2176



**Fig. 1:** Type 43-6 Temperature Regulator · Body with screwed ends

#### Special versions

- 16.4 ft (5 m) or 32.8 ft (10 m) capillary tube length
- Oil-resistant internal valve parts

**Principle of operation** (see Fig. 2)

The temperature regulators work according to the adsorption principle. The temperature of the measured medium creates a pressure in the sensor which is proportional to the measured temperature. This pressure is transferred through the capillary tube (12) to the operating element (10) and converted into a positioning force. This force causes the pin of the operating element (11) to move the plug stem (4) with the valve plug (3). By turning the set point adjuster (9), the point of response is changed over the valve spring (5).

The valves are balanced by a metal bellows (6). The balancing bellows counterbalances any changes in pressure upstream of the valve since the upstream pressure also acts on the inside of the bellows through a hole in the valve plug (3).

The Type 43-6 Regulator has a valve which opens as the temperature rises. This regulator is therefore suitable for plants to be cooled.

**Installation**

Only the combination of the same kind of materials is permitted, e.g. a stainless steel heat exchanger with thermowells made of stainless steel 1.4571.

• Valve

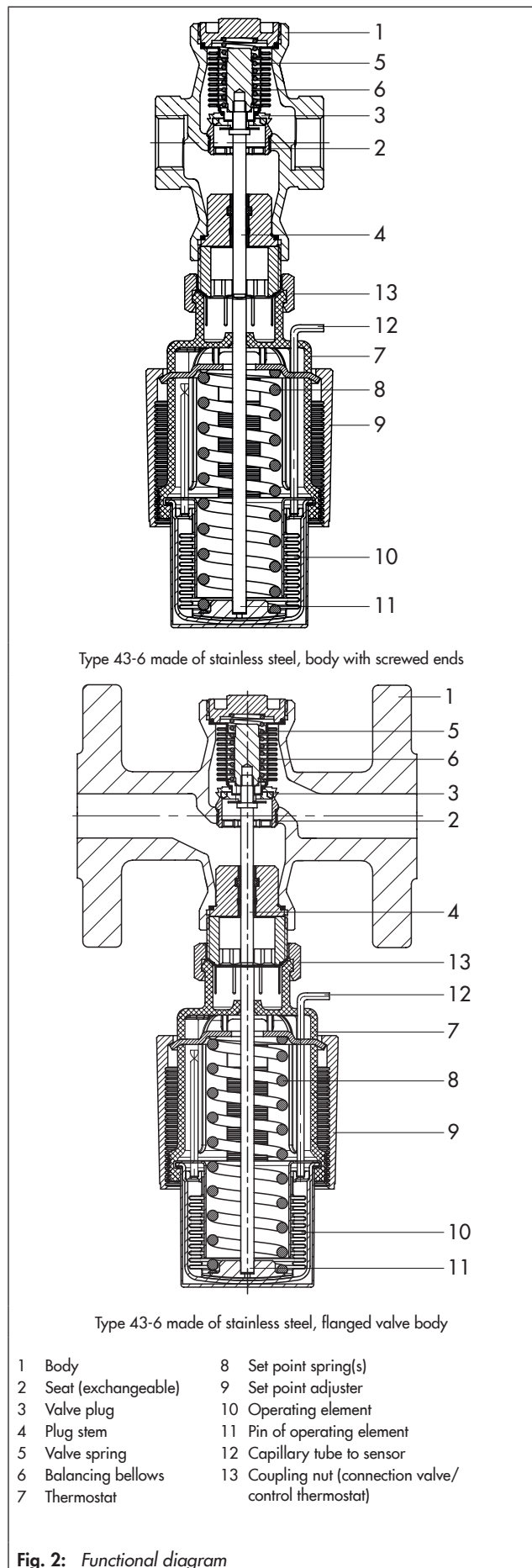
Install the valves in horizontal pipelines. The direction of flow must match the direction indicated by the arrow on the body. The control thermostat must be suspended to hang downward for temperatures higher than 230 °F (110 °C). Other mounting positions are possible for temperatures lower than 230 °F (110 °C).

• Temperature sensor

The temperature sensor can be installed in any position as required. However, make sure its entire length is immersed in the process medium to be controlled. It must be installed in a location where overheating or considerable idling times cannot occur.


• Capillary tube

The capillary tube must be run in such a way that the ambient temperature range cannot be exceeded, any deviations in temperature cannot occur and that the tube cannot be damaged. The smallest permissible bending radius is 2" (50 mm).



**Fig. 2:** Functional diagram

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

Valve		Type 43-6 Temperature Regulator
Type 2436 Valve	Female thread	½ NPT, ¾ NPT, 1 NPT
Connection	Flanges	NPS ½ and 1
Pressure rating		Class 300 (body with screwed ends) <sup>1)</sup>   Class 150 (flanged body)
Max. permissible temperature		300 °F (150 °C)
Max. perm. differential pressure Δp		230 psi (16 bar)
Leakage class according to IEC 60534-4		≤0.05 % of K <sub>VS</sub> coefficient
Compliance		 · ENEC
Type 2430 Control Thermostat		30 to 95 °F · 75 to 160 °F · 105 to 210 °F · 125 to 250 °F · 160 to 300 °F
Set point range <sup>2)</sup> (continuously adjustable)		0 to 35 °C · 25 to 70 °C · 40 to 100 °C · 50 to 120 °C · 70 to 150 °C
Capillary tube length <sup>3)</sup>		6.5 ft (2 m)
Perm. temperature at the sensor		120° F (50 °C) above the adjusted set point
Max. permissible ambient temperature		-5 to +175 °F (-20 to +80 °C)
Permissible pressure at sensor/thermowell		Class 300

<sup>1)</sup> Max. input pressure 275 psi (19 bar)

<sup>2)</sup> Further set point ranges on request

<sup>3)</sup> Others capillary tube lengths on request

**Table 2:** C<sub>V</sub> and K<sub>VS</sub> coefficients**Body with screwed ends and flanged body**

Connection	½ NPT · NPS ½	¾ NPT · –	1 NPT · NPS 1
C <sub>V</sub> coefficients	3.7	5.0	6.0
K <sub>VS</sub> coefficients	3.2	4.0	5.0

**Table 3:** Materials · Material numbers according to ASTM and DIN EN

Body		Stainless steel A351 CF8M (1.4408)
Seat		A479 316L (1.4404)
Plug		A479 316L (1.4404) with EPDM soft seal <sup>1)</sup>
Balancing bellows		A479 316Ti (1.4571)
Valve spring		A479 302 (1.4310)
Sensor	Capillary tube	Copper
	Thermowell	Copper or stainless steel 1.4571
Set point adjuster		PTFE, glass fiber reinforced

<sup>1)</sup> Special version for oils (ASTM I, II, III): FKM soft seal

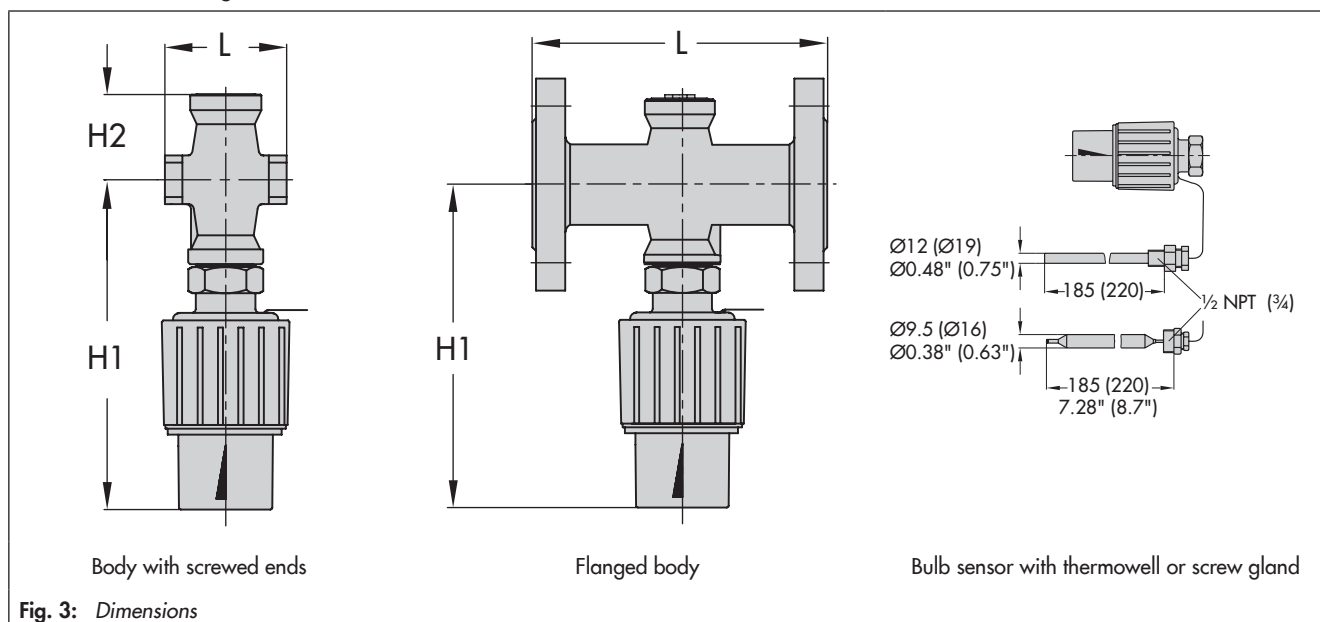
**Table 4: Dimensions and weights**

**Regulators with body with screwed ends or flanged body - A351 CF8M (1.4408)**

Connection size		½ NPT · G ½	¾ NPT · G ¾	1 NPT · G 1	NPS ½ · DN 15	NPS 1 · DN 25
Female thread	in	½	¾	1	–	–
	G	½	¾	1	–	–
Length L	in	2.6	3.0	3.5	7.2	–
	mm	65	75	90	184	–
Width across flats SW	in	1.3	1.3	1.8	–	–
	mm	34	34	46	–	–
Height H1	in	7.5			–	–
	mm	190			–	–
Height H2	in	1.8			–	–
	mm	46			–	–
D	in	2.7			–	–
	mm	68			–	–
Weight with bulb sensor and thermowell (approx.) <sup>1)</sup>	lb	4.0	4.2	4.4	7.5	10.4
	kg	1.8	1.9	2.0	3.4	4.7

<sup>1)</sup> Version without thermowell: minus 0.44 lb (0.2 kg)

**Dimensions of the regulators**



**Fig. 3: Dimensions**

**Ordering text**

**Type 43-6 Temperature Regulator**

Body material: stainless steel (A351 CF8M)

Version with screwed ends ... NPT female thread or flanged valve body NPS ...

Set point range ... °F (°C)

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