

Self-operated Temperature Regulators Series 43



Safety Temperature Monitors (STM) with Safety Thermostat Type 2403 K

Application

Safety temperature monitoring of the energy supplied to heat generators or heat exchangers by closing the valve.

For limit signals from 60 to 120 °C · With valves in sizes G ½ to G 1 or DN 15 to DN 50 · PN 16 or PN 25 · Max. 200 °C

Note

Devices typetested acc. to DIN EN 14597 are available for installations acc. to DIN 4747, DIN EN 12828, DIN EN 12953-6 and DIN 4753.

Refer to Information Sheet T 2181 EN for details on the use of the safety temperature monitors.



Safety temperature monitors with a valve and a Type 2403 K Safety Thermostat operate without auxiliary energy and are designed for Extended Safety acc. to DIN EN 14597. The valve is closed by a spring mechanism when the temperature reaches an adjusted limit value, when the capillary tube breaks or when leakage occurs in the sensor system. The thermostat is reset and the regulator put back into operation automatically as soon as the temperature has fallen below the limit value and the fault has been removed.

Versions

The Type 2403 K Safety Thermostat consists of a temperature sensor, limit value adjuster, capillary tube and operating element with spring mechanism.

Safety temperature monitors (Figs. 1 to 3)

Type 2431 K/2403 K · With Type 2431 K Globe Valve for G ½ to G 1 · PN 25 · Type 2403 K Thermostat · 150 °C

Type 2433 K/2403 K · With Type 2433 K Globe Valve for G ½ to G 1 or DN 15 to DN 50 · PN 25 · Type 2403 K Thermostat 200 °C

Type 2435 K/2403 K · With Type 2435 Globe Valve K for G ½ to G 1 · PN 25 · Type 2403 K Thermostat · 200 °C

Type 2432 K/2403 K · With Type 2432 K Globe Valve for DN 15 to DN 50 · PN 25 · Type 2403 K Thermostat · 150 °C

Type 2437 K/2403 K · With Type 2437 K Globe Valve for DN 15 to DN 50 · PN 25 · Type 2403 K Thermostat · 200 °C

Type 2436 K/2403 K · With Type 2436 K Globe Valve for G ½ to G 1 · PN 16 or for DN 15 to DN 50 · PN 25 · Type 2403 K Thermostat · Valve opens in case of emergency · 150 °C

Temperature regulators and safety temperature monitors (TR/STM) (Figs. 4 to 6) consist of one of the above mentioned instruments Type .../2403 K and a Type 2403 K Control Thermostat typetested acc. to DIN EN 14597, for example:

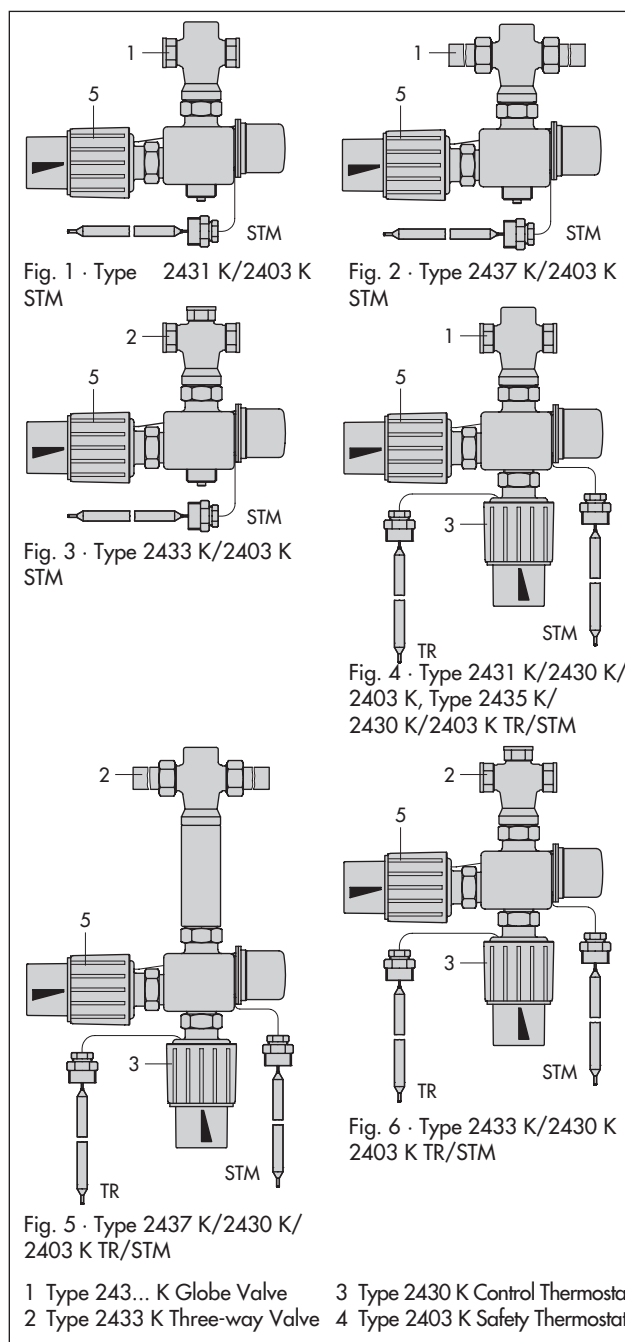
Type 2431 K/2430 K/2403 K · With Type 2431 K Valve for G ½ to G 1 · PN 25 · Type 2430 K Control Thermostat and Type 2403 K Safety Thermostat

Details and technical data of the valves and Type 2430 K Control Thermostats can be found in the Data Sheets:

T 2171 EN · Types 2431 K/2432 K Globe Valves

T 2172 EN · Types 2435 K, 2436 K and 2437 K Globe Valves

T 2173 EN · Type 2433 K Three-way Valve



Principle of operation (Fig. 7)

The safety temperature monitors work according to the vapor pressure principle.

The medium temperature produces a pressure in the sensor (9) that corresponds to the actual temperature measured. This pressure is transmitted through the capillary tube (8) to the metal bellows of the operating element (10) where it is converted into a positioning force. This force acts on the pin (11), moving the valve's plug stem (4) and plug (3). The position of the plug determines the flow rate of the heat transfer medium across the area released between the valve's plug and seat (2).

The spring mechanism is released by the pressure decrease in the system when the capillary tube breaks or when there is a leak in the sensor, closing the valve over the pin (11) of the operating element.

The Type 2403 K Safety Thermostat is available in two versions, which differ in the sensor's mounting position:

- Sensor horizontal or sensor tip points up
- Sensor horizontal or sensor tip points down

Register numbers of devices tested acc. to DIN EN 14597:

Type 2431 K, Type 2432 K, Type 2433 K, Type 2435 K and Type 2437 K Valves with

Type 2403 K Safety Thermostat } Available on request
Type 2430 K Control Thermostat }

Installation

- Valve

Install the valve in a horizontal pipeline with the operating element of the thermostat vertically suspended. Other mounting positions are possible for Types 2431 K, 2432 K and 2433 K Valves at temperatures up to 110 °C. For Type 2436 K up to 110 °C, the operating element must point up (upright).

Make sure the direction of flow through the valve matches the arrow on the body.

- Capillary tube

Install the capillary tube such that it is not exposed to large temperature fluctuations and cannot be damaged. Make sure the permissible ambient temperature range is not exceeded. The smallest permissible bending radius is 50 mm.

- Temperature sensor

Observe the mounting position of the temperature sensor!

Depending on the version, mount the sensor either horizontally or with the tip pointing up or horizontally with the tip pointing down. Some versions may also be installed at an angle.

Make sure the sensor's entire length is immersed in the process medium. Choose a place of installation where neither overheating nor considerable idle times occur.

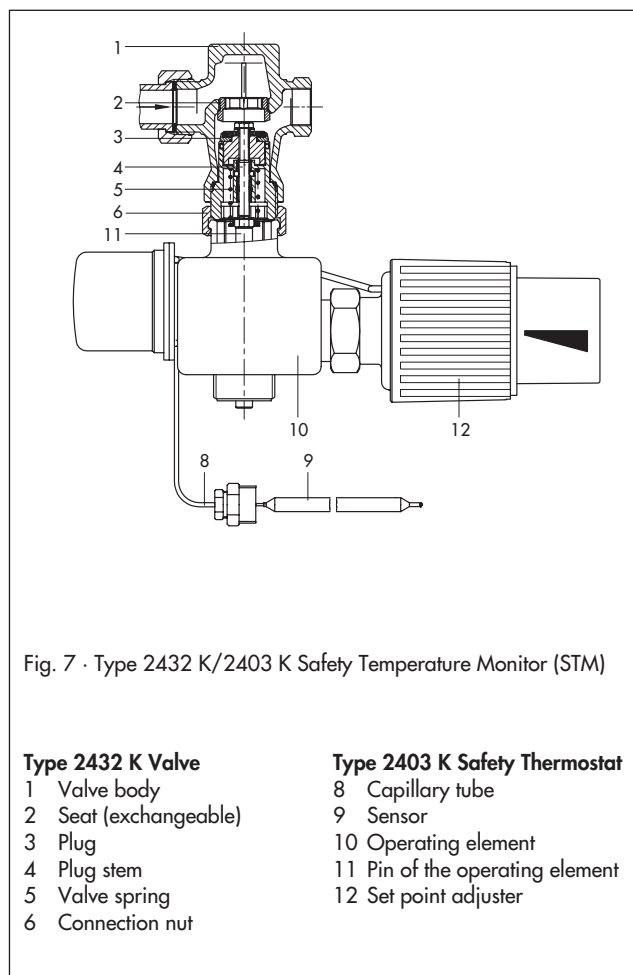


Fig. 7 · Type 2432 K/2403 K Safety Temperature Monitor (STM)

Type 2432 K Valve

- 1 Valve body
- 2 Seat (exchangeable)
- 3 Plug
- 4 Plug stem
- 5 Valve spring
- 6 Connection nut

Type 2403 K Safety Thermostat

- 8 Capillary tube
- 9 Sensor
- 10 Operating element
- 11 Pin of the operating element
- 12 Set point adjuster

Special version

- Reduced Kvs coefficient in DN 15 or G ½

Combinations

- Safety temperature monitor with Type 2430 K Control Thermostat
- Safety temperature monitor with differential pressure or flow regulation

Ordering text

Safety Temperature Monitor Type 243... K/2403 K

With Type 243... Valve, G ... or DN ... with welding ends/threaded ends/flanges (with Types 2432 and 2437 only)

For mixing/diverting service (with Type 2433 K only)
PN ...

With Type 2403 K Safety Thermostat

Limit value range ... °C

With sensor version

- Sensor horizontal or sensor tip points up
- Sensor horizontal or sensor tip points down

Optionally, accessories

Optionally, special version

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

Valve	Type	2431 K	2433 K	2435 K	2436 K ¹⁾		2432 K ¹⁾		2437 K ¹⁾		
Connection	G	½ to 1 · Female thread				–		–		–	
Nominal size	DN	–	15 to 50	–	–	32 to 50	15 to 25	32 to 50	15 to 25	32 to 50	
Nominal pressure	PN	25	25	25	16	25	25		25		
Max. permissible temperature	°C	150	150	200	150		150		200		
Max. perm. differential pressure	Δp	20	4.4 ²⁾	16	16	8	20	12	16	8	
Kvs coefficients with											
Connection	G	½	¾	1	–		–		–		
Nominal size	DN	15	20	25	32		40		50		
Kvs coefficients with Type 2433 K		4	6.3	8	10		12.5		16		
Kvs coefficients with Types 2435 K, 2436 K, 2437 K		3.2	4	5	10		12.5		16		
Special versions		0.4, 1.0, 2.5 ³⁾		–		–		–		–	
Kvs values with Types 2431 K, 2432 K		3.6	5.7	7.2	10		12.5		16		
Special versions		0.4, 1.0, 2.5		–		–		–		–	

Type 2403 K Safety Thermostat for STM	
Limit value adjustment range	60 to 75 °C, 75 to 100 °C, 100 to 120 °C
Permissible ambient temperature	Max. 50 °C
Permissible temperature at the sensor	25 K above the adjusted set point
Permissible pressure at the sensor	25 bar
Capillary tube length	5 m
Type 2430 K Thermostat for TR	
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
Permissible ambient temperature	0 to 50 °C
Permissible temperature at the sensor	25 K above the adjusted set point
Permissible pressure at the sensor	25 bar
Capillary tube length	2 m (special version: 5 m)

¹⁾ DN 15 to 50 also available with flanged body made of EN-JS1049 (GGG 40.3)

²⁾ Refer to Data Sheet T 2173 EN for values of other nominal sizes

³⁾ For Type 2436 K only

Table 2 · Materials · Material numbers according to DIN EN

Valve	Type	2431 K	2432 K ¹⁾	2435 K	2436 K ¹⁾	2437 K ¹⁾	2433 K
Body		Red brass CC491K ²⁾					
Seat		Stainless steel 1.4571					Integrated into the body
Plug		Stainless steel with brass ⁴⁾ and EPDM soft seal ³⁾					CW617N ⁴⁾ + EPDM soft seal
Valve spring		Stainless steel 1.4310					
Balancing bellows		–	–	Stainless steel 1.4571		–	
Type 2403 K Safety Thermostat for STM and Type 2430 K Thermostat for TR							
Connecting element Type 2403 K		PPO with brass connection nut					
Set point adjuster		Glass-fiber reinforced PETP					
Sensor		1.4571					
Capillary tube		Copper					

¹⁾ DN 15 to 50 also available with flanged body made of EN-JS1049 (GGG 40.3)

²⁾ Type 2436 K in G ½ to G 1: CW604N (brass)

³⁾ Special version for oils (ASTM I, II, III): FPM/FKM soft seal

⁴⁾ All brass materials resistant to dezincification

Table 3 · Dimensions in mm and weights in kg
Types 2431 K/2403 K · 2433 K/2403 K · 2435 K/2403 K
2436 K/2403 K

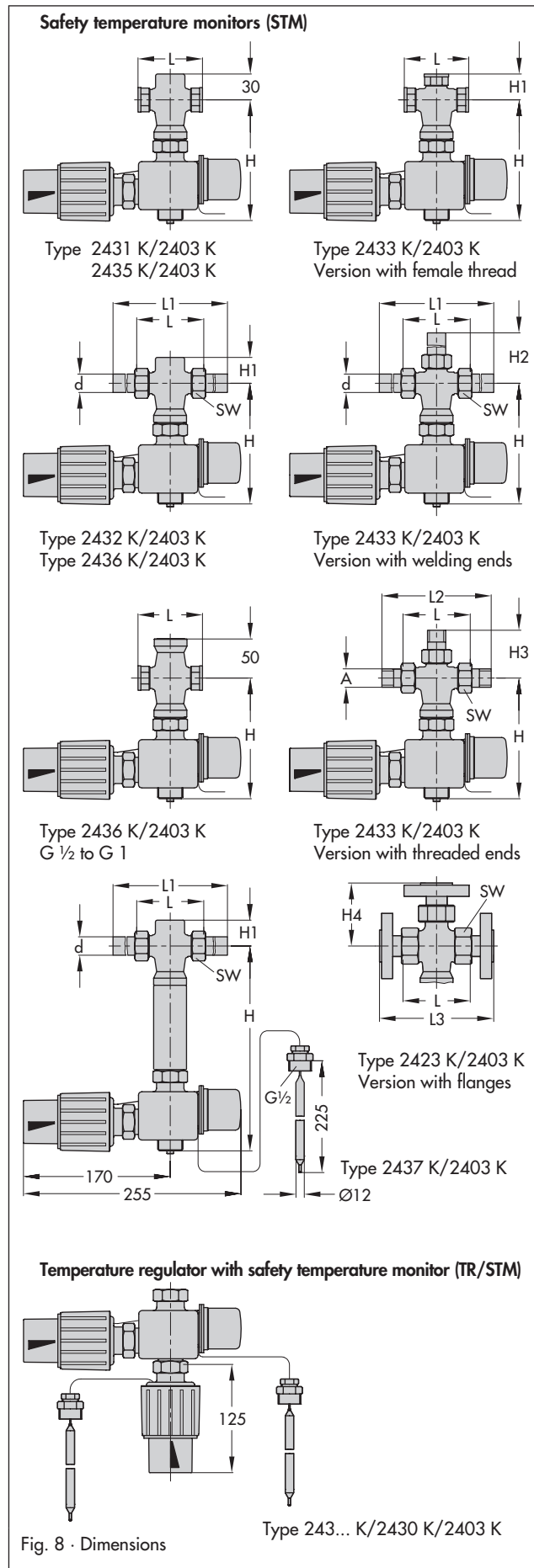
Connection	G	½	¾	1
Length	L	65	75	90
Type 2431 K/ 2403 K	Height H	140		
Type 2433 K/ 2403 K	Height H	140		
	Height H1	40		
Type 2435 K/ 2403 K	Height H	220		
Type 2436 K/ 2403 K	Height H	145		
	Height H1	46		
Type 2431 K/ 2403 K	Approx. weight	2.0	2.1	2.2
Type 2433 K/ 2403 K	Approx. weight	2.2	2.3	2.4
Type 2435 K/ 2403 K	Approx. weight	2.5	2.6	2.7
Type 2436 K/ 2403 K	Approx. weight	2.4	2.5	2.6

Types 2432 K/2403 K · 2433 K/2403 K · 2436 K/2403 K
2437 K/2403 K

Nominal size	DN	15	20	25	32	40	50
Pipe Ø	d	21.3	26.8	32.7	42	48	60
Width across flats	SW	30	36	46	59	65	82
Length	L	65	70	75	100	110	130
With welding ends	L1	210	234	244	268	294	330
With threaded ends	L2	129	144	159	180	196	228
With flanges	L3	130	150	160	180	200	230
Male thread	A	G ½	G ¾	G 1	G 1¼	G 1½	G 2
2432 K/ 2403 K	Height H	140			190		
	Height H1	30			55		
	Height H	135			145		
2433 K/ 2403 K	Height H2	112	122	124	144	157	165
	Height H3	72	77	82	100	108	114
	Height H4	72	80	82	105	110	115
2436 K/ 2403 K	Height H	-			160		
	Height H1	-			95		
2437 K/ 2403 K	Height H	220			270		
	Height H1	30			55		
Approx. weight in kg							
2432 K/ 2403 K	Welding ends	2.5	2.8	3.1	5.1	5.8	7.6
	Threaded ends	2.4	2.7	3.0	5.0	5.7	7.5
with	Flanges	3.9	4.8	5.6	8.3	9.8	11.6
2433 K/ 2403 K	Welding ends	2.9	3.2	3.4	4.8	5.1	6.4
	Threaded ends	2.9	3.2	3.4	4.8	5.1	6.4
with	Flanges	5.0	6.2	7.1	9.6	11	14
2436 K/ 2403 K	Welding ends				3.8	4.2	4.6
	Threaded ends				3.8	4.2	4.6
with	Flanges				7.0	8.2	9.6

Specifications subject to change without notice.

Dimensions



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