

Self-operated Temperature Regulators

Series 43

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



Application

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

For limit signals from **60 to 120 °C** · Valve sizes **G 1/2 to G 1**
· **DN 15 to DN 50** · **Nominal pressure PN 16 or PN 25** · **Max. 200 °C**

Note

Details about the application of safety temperature monitors can be found in the Information Sheet T 2181 EN. Typetested devices for installations according to DIN 4747, DIN EN 12828, DIN EN 12953-6, and DIN 4753 are available.



Safety Temperature Monitors (STM) with a **valve** and **Type 2403 K Safety Thermostat** operate without auxiliary energy and are designed for "Extended Safety" according to DIN 3440. The valve is closed by a spring mechanism when the temperature reaches the limit value adjusted, when the capillary tube ruptures or when there is a leak in the sensor system. It resets itself automatically when the fault has been removed and the temperature has fallen below the limit value.

Version

Type 2403 K Safety Thermostat consists of a temperature sensor, a limit value adjuster, a capillary tube and a connecting element.

Safety Temperature Monitors (STM) (Figs. 1 to 3)

Type 2431 K/2403 K · with Type 2431 K Globe Valve for G 1/2 to G 1 · PN 25 · Type 2403 K Thermostat · 150 °C

Type 2433 K/2403 K · with Type 2433 K Three-way Valve for G 1/2 to G 1 or DN 15 to DN 50 · PN 25 · Type 2403 K Thermostat · 150 °C

Type 2435 K/2403 K · with Type 2435 K Globe Valve for G 1/2 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 1/2 to G 1 with PN 16 or DN 15 to DN 50 with PN 25 · Type 2403 K Thermostat; the valve opens in case of emergency · 150 °C

Temperature Regulators and Safety Temperature Monitors (TR/STM) shown in Figs. 4 to 6, consist of a Type .../2403 K device listed above and a typetested Type 2430 K Control Thermostat, for example:

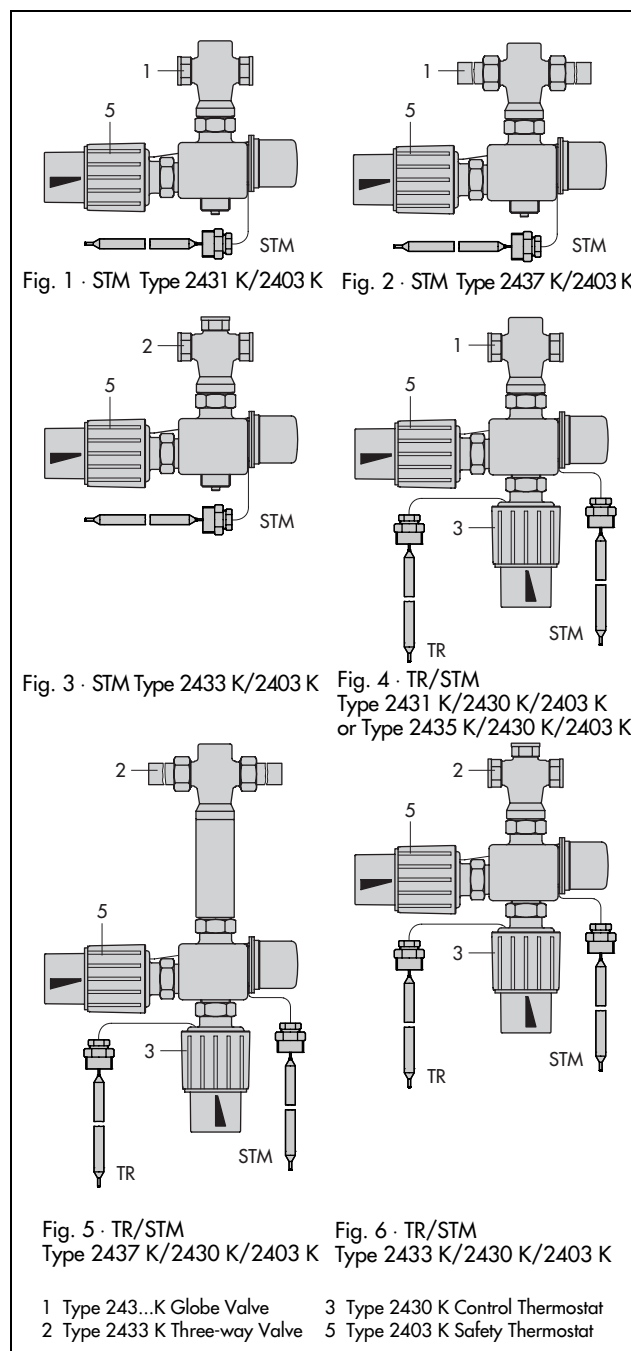
Type 2431 K/2430 K/2403 K · with Type 2431 K Valve for G 1/2 to G 1 · PN 25 · Type 2430 K Control Thermostat and Type 2403 K Safety Thermostat

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

Data Sheet T 2171 EN - Type 2431 K/Type 2432 K Globe Valves

Data Sheet T 2172 EN - Type 2433 K, Type 2436 K and Type 2437 K Globe Valves

Data Sheet T 2173 EN - Type 2433 K Three-way Valve



Principle of operation (Fig. 7)

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

The temperature of the medium produces a pressure in the sensor (9) proportional to the actual temperature measured. This pressure is transferred via the capillary tube (8) to the metal bellows of the operating element (10) where it is converted into a positioning force. It moves the pin (11) and the attached plug stem (4) and plug (3). The position of the valve plug determines the flow rate of the heating medium through the free area between the plug (3) and the valve seat (2).

When the capillary tube ruptures or when there is a leak in the sensor, the spring mechanism is released and the pin (11) closes the valve due to the pressure decrease in the system.

The Type 2403 K Safety Thermostat is available in two versions which differ in their sensor installation positions:

Version 1: Sensor horizontal or the sensor tip facing upwards.

Version 2: Sensor horizontal or the sensor tip facing downwards.

Register number of the devices typetested acc. to DIN 3440:

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

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

Installation

Valves

The valves must be installed in horizontal pipelines. The operating element must be suspended downwards—for Types 2431 K, 2432 K and 2433 K, other installation positions are also possible for temperatures up to 110 °C. For Type 2436 K: up to 110 °C, operating element must be installed in an upright position.

The medium must flow through the valve in the direction indicated by the arrow on the valve body.

Capillary tube

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

Temperature sensor

The installation position of the sensor must be carefully observed. Depending on the version, the sensor tip must either lie horizontally, face upwards or downwards. The sensor may be installed at an angle. Its whole length must be immersed in the medium to be controlled. The sensor should be installed in a location where overheating or considerable idle times cannot occur.

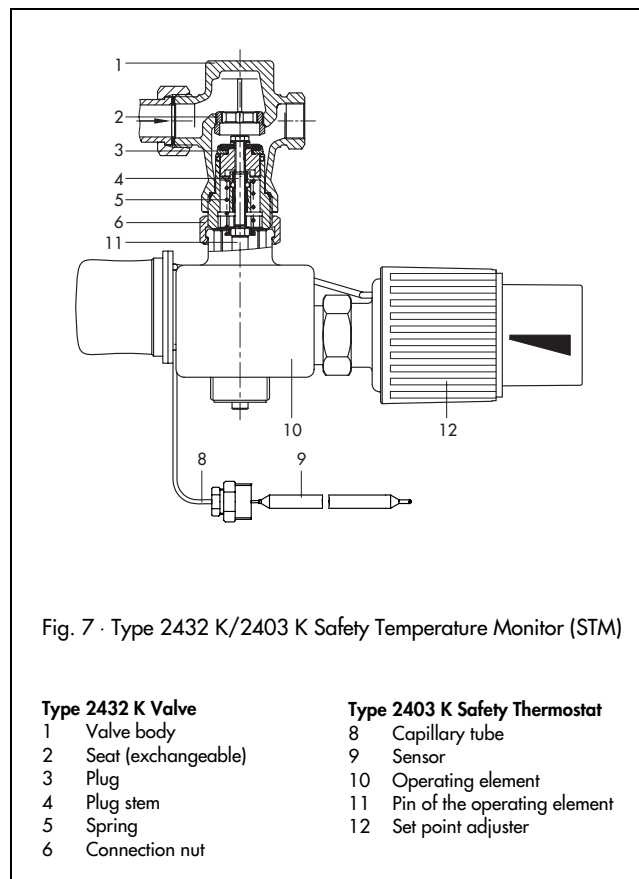


Fig. 7 · Type 2432 K/2403 K Safety Temperature Monitor (STM)

Special version

– Reduced K_{VS} value with DN 15 or G 1/2

Combinations

– STM with Type 2430 K Control Thermostat
– STM with differential pressure/flow control

Ordering text

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

with Valve Type 243..., G ... or DN ...

with weld-on fittings/threaded ends/flanges - only with Type 2432/37 -

For mixing/flow-diverting service - only with Type 2433 K - PN ...

with **Safety Thermostat Type 2403 K**, Limit value range ...°C optionally

Version 1: Sensor horizontal or the sensor tip facing upwards

Version 2: Sensor horizontal or sensor tip facing downwards

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

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	1/2 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
K_{vS} values with										
Connection	G	1/2	3/4	1	–	–	–	–	–	–
Nominal size	DN	15	20	25	32	40	50		50	
K _{vS} values with Type 2433 K		4	6.3	8	10	12.5	16		16	
K _{vS} values with Types 2435 K, 2436 K, 2437 K		3.2	4	5	10	12.5	16		16	
Special versions		0.4; 1.0; 2.5 ³⁾		–	–					
K _{vS} values with Types 2431 K, 2432 K		3.6	5.7	7.2	10	12.5	16		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
Perm. 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⁾ Valves in nominal sizes DN 15 to 50 also available with flanged bodies made of EN-JS1049 (GGG 40.3)

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

³⁾ Only for Type 2436 K

Table 2 · Materials · Material no. 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					
Valve plug		Stainless steel with brass ⁴⁾ and EPDM soft seal ³⁾					
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 coupling nut					
Set point adjuster		Glass-fiber reinforced PETP					
Sensor		1.4571					
Capillary tube		Copper					

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

²⁾ With Type 2436 K, G 1/2 to G 1: Brass CW604N

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

⁴⁾ All brass materials are free from dezincification

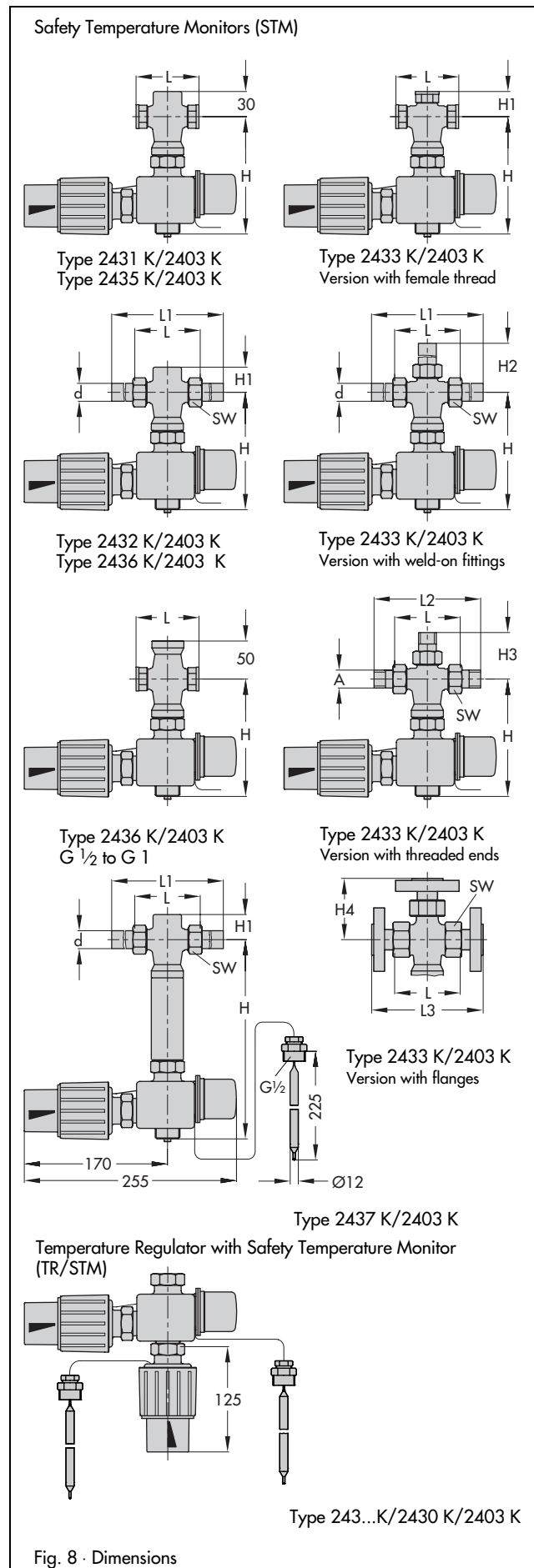
Table 3 · Dimensions in mm and weights
Types 2431 K/2403 K · 2433 K/2403 K · 2435 K/2403 K
2436 K/2403 K

Connections	G	1/2	3/4	1
Length	L	65	75	90
2431 K/2403 K	Height H	140		
Type	Height H	140		
2433 K/2403 K	Height H1	40		
2435 K/2403 K	Height H	220		
Type	Height H	145		
2436 K/2403 K	Height H1	46		
Type	Weight, approx. kg	2.0	2.1	2.2
Type	Weight, approx. kg	2.2	2.3	2.4
Type	Weight, approx. kg	2.5	2.6	2.7
Type	Weight, approx. kg	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
SW		30	36	46	59	65	82
Length	L	65	70	75	100	110	130
L1 with weld-on fittings		210	234	244	268	294	330
L2 with threaded ends		129	144	159	180	196	228
L3 with flanges		130	150	160	180	200	230
Male thread	A	G 1/2	G 3/4	G 1	G 1 1/4	G 1 1/2	G 2
2432 K/2403 K	Height H	140			190		
	Height H1	30			55		
	Height H	135			145		
Type 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		
Weight, approx. kg							
Type 2432 K/2403 K	Weld-on fittings	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
	Flanges	3.9	4.8	5.6	8.3	9.8	11.6
Type 2433 K/2403 K	Weld-on fittings	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
	Flanges	5.0	6.2	7.1	9.6	11	14
Type 2436 K/2403 K	Weld-on fittings				3.8	4.2	4.6
	Threaded ends				3.8	4.2	4.6
	Flanges				7.0	8.2	9.6

Dimensions



Specifications subject to change without notice.

