Self-operated Temperature Regulators Series 43

Safety Temperature Limiters (STL) with Safety Thermostat Type 2439 K

Application

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

For limit signals from **10** to **120 °C** · With valves in sizes **G** ½ to **G 1** or **DN 15** to **50** · **PN 16** or **25** · Max. **200 °C**

Note

Devices typetested acc. to DIN EN 14597 are available for installations acc. to DIN 4747-1, DIN EN 12828 and DIN 4753.

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

Safety temperature limiters with a valve and a Type 2439 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 and locked when the temperature reaches an adjusted limit value, when the capillary tube breaks or when leakage occurs in the sensor system. A screwdriver is required to reset the thermostat and put the regulator back into operation when the temperature has fallen below the limit value and the fault has been removed.

Versions (Figs. 1 to 4)

The **Type 2439 K Safety Thermostat** consists of a housing with spring mechanism and a thermostat with capillary tube, bulb sensor and a thermowell.

The device can optionally be equipped with an electric signal transmitter for remote transmission of fault states.

Safety temperature limiters with Type 2439 K Safety Thermostat (Figs. 1 and 2)

Type 2431 K/2439 K · With Type 2431 K Globe Valve for G ½ to G 1 · PN 25 · 150 °C

Type 2435 K/2439 K · With Type 2435 K Globe Valve for G ½ to G 1 · PN 25 · 200 °C

Type 2432 K/2439 K · With Type 2432 K Globe Valve for DN 15 to 50 · PN 25 · 150 °C

Type 2437 K/2439 K · With Type 2437 K Globe Valve for DN 15 to 50 · PN 25 · 200 °C

Type 2436 K/2439 K · Without DIN register number; valve opens in case of emergency · With Type 2436 K Globe Valve for G ½ to G 1, PN 16 or DN 32 to 50, PN 25 · 150 °C

Type 2433 K/2439 K · With Type 2433 Three-way Valve for G ½ to G 1 or DN 15 to 50 · PN 25 · 150 °C

Temperature regulators and safety temperature limiters (TR/STL) (Figs. 3 and 4) consist of one of the above mentioned instruments Type 243... K/2439 K and a typetested Type 2430 K Control Thermostat, for example:

Type 2431 K/2439 K/2430 K · With Type 2431 K Valve, Type 2439 K Safety Thermostat and Type 2430 K Control Thermostat

Safety temperature limiters (STL)

With valve with G ½ to G 1 female thread

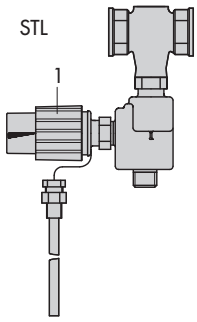


Fig. 1
Type 2431 K/2439 K
Type 2435 K/2439 K
Type 2436 K/2439 K

With DN 15 to DN 50 valve

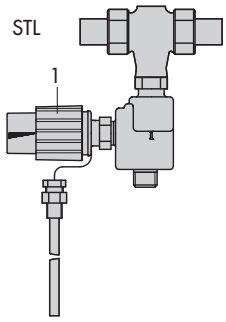


Fig. 2
Type 2432 K/2439 K
Type 2436 K/2439 K
Type 2437 K/2439 K

Temperature regulators and safety temperature limiters (TR/STL)

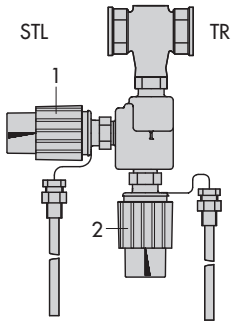


Fig. 3
Type 2431 K/2439 K/2430 K
Type 2435 K/2439 K/2430 K
Type 2436 K/2439 K/2430 K

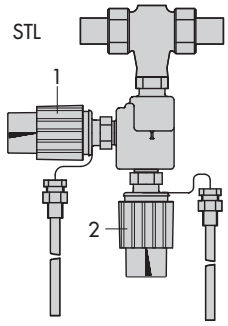


Fig. 4
Type 2432 K/2439 K/2430 K
Type 2436 K/2439 K/2430 K
Type 2437 K/2439 K/2430 K

1 Type 2439 K Safety Thermostat
2 Type 2430 K Control Thermostat

Details and technical data of the valve and the Type 2430 K Control Thermostat can be found in the Data Sheets:
T 2171 EN · With Types 2431 K and 2432 K Globe Valves
T 2172 EN · With Types 2435 K, 2436 K and 2437 K Globe Valves
T 2173 EN · With Type 2433 K Three-way Valve

Principle of operation (Fig. 5)

The safety temperature limiters have a temperature sensor that works according to the adsorption principle.

The medium temperature produces a pressure in the temperature sensor (11) that corresponds to the actual temperature measured. This pressure is transmitted through the capillary tube (12) to a positioning bellows where it is converted into a positioning force and compared to the force of a measuring spring. This spring force depends on the adjusted limit value (13). The spring mechanism is released when the actual temperature value exceeds the adjusted limit, when the capillary tube breaks or when there is a leak in the sensor. It moves the pin (10) of the spring mechanism and thus the attached plug stem (4), closing and locking the valve. A screwdriver is required to reset the thermostat and put the regulator back into operation when the temperature has fallen below the limit value and the fault has been removed.

Register numbers of devices tested acc. to DIN EN 14597

The register numbers of the Type 2431 K, Type 2432 K, Type 2433 K, Type 2435 K and Type 2437 K Valves with Type 2439 K Safety Thermostat or Type 2430 K Control Thermostat are available on request.

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, 2433 K and 2436 K Valves at temperatures up to 110 °C.
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**

The temperature sensor can be installed in any desired position. Its entire length must be immersed in the process medium. Choose a place of installation where neither overheating nor considerable idle times occur.

Only use the same kind of materials together, for example thermowells made of stainless steel 1.4571 can be installed in stainless steel heat exchangers.

Special installation regulations according to VdTÜV

Only use the Type .../2439 K Safety Temperature Limiter with a SAMSON thermowell.

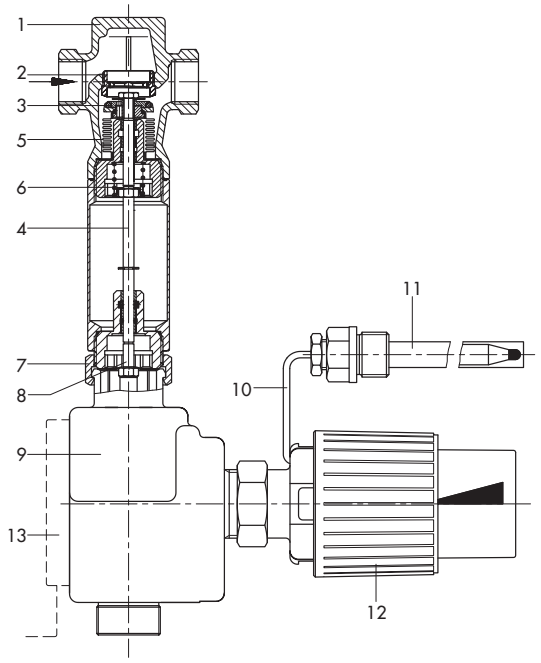


Fig. 5 · Type 2435 K/2439 K Safety Temperature Limiter (STL)

Type 2435 K Valve
1 Valve body
2 Seat (exchangeable)
3 Plug
4 Plug stem
5 Balancing bellows
6 Valve spring
7 Connection nut, valve/connecting element

Type 2439 K Safety Thermostat
8 Pin of the spring mechanism
9 Connecting element with spring mechanism
10 Capillary tube
11 Temperature sensor with thermowell
12 Limit value adjuster
13 Signal transmitter (optional)

Special versions

– Reduced K_{VS} coefficient in DN 15 or G ½
– 5 m capillary tube
– G ½ thermowell made of CrNiMo steel
– With electric signal transmitter

Combinations

– Safety temperature limiter with Type 2430 K Control Thermostat (TR/STL)
– Safety temperature limiter with differential pressure or flow regulation

Ordering text

Safety Temperature Limiter (STL) Type .../2439 K
With Type … Valve, G ..., DN …
With Type 2432 K or Type 2437 K with welding ends/threaded ends/flanges
PN ..., K_{VS} coefficient ...
With **Type 2439 K Safety Thermostat**
Limit value adjusted to/lead-sealed at ... °C
Optionally, special version
Optionally, 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]	
Thread size	G	G ½ to G 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		200	150		150		200	
Max. perm. differential pressure	Δp	20	4.4 [2]	16	16	8	20	12	16	8
K_{VS} coefficients with										
Thread size		G ½		G ¾	G 1		–		–	
Nominal size		DN 15		DN 20	DN 25		DN 32		DN 40	DN 50
K_{VS} coefficients with Type 2433 K		4		6.3	8		10		12.5	16
K_{VS} 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]		–						
K_{VS} with Types 2431 K, 2432 K		3.6		5.7	7.2		10		12.5	16
Special versions		0.4 · 1.0 · 2.5		–						

[1] DN 32 to 50 also with flanged body · [2] Refer to Data Sheet T 2173 EN for exact values of other nominal sizes · [3] For Type 2436 K only

Type 2439 K Safety Thermostat for STL	
Limit value adjustment range	10 to 95 °C or 20 to 120 °C [1]
Permissible ambient temperature	80 °C · 60 °C with electric signal transmitter
Permissible temperature at the sensor	20 K above the adjusted set point
Perm. pressure at sensor w. thermowell	40 bar
Switching cycles acc. to DIN EN 14597	500
Capillary tube length	2 m (special version: 5 m)
Electric signal transmitter	Permissible load 230 V~, 16 A at ohmic load
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	Max. 80 °C
Permissible temperature at the sensor	50 K above the adjusted set point
Permissible pressure at the sensor	40 bar
Capillary tube length	2 m (special version: 5 m)

[1] Higher limit values on request

Table 2 · **Materials** · Material numbers according to DIN EN

Valve	**Type**	**2431 K**	**2432 K**	**2435 K**	**2436 K**	**2437 K**	**2433 K**
Body		CC491K/CC499K (red brass, Rg 5) [1]					
Seat		Stainless steel 1.4571					Integrated into the body
Plug		Stainless steel 1.4305 [2] with brass [3] and EPDM soft seal					CuZn40 [3] + EPDM soft seal
Valve spring		Stainless steel 1.4310					
Balancing bellows		–	–	Stainless steel 1.4571			–
Type 2439 K Safety Thermostat for STL and **Type 2430 K Thermostat** for TR							
Connecting element Type 2439 K		Glass-fiber reinforced PETP					
Set point adjuster		Glass-fiber reinforced PETP					
Sensor		Copper					
Capillary tube		Copper					
Thermowell		Copper or stainless steel 1.4571					

[1] Types 2436 K, 2436 K and 3437 K in DN 32, 40 and 50: also with flanged body made of EN-JS1049 and Types 2432 K and 2436 K in DN 15 to 25: 1.4408

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

[3] All brass materials resistant to dezincification

Table 3 · Dimensions in mm and weights in kg

Types 2431 K/2439 K · 2433 K/2439 K · 2435 K/2439 K 2436 K/2439 K

Connection		G	½	¾	1
Length		L	65	75	90
2431 K/2439 K	Height H		170		
Type 2433 K/2439 K	Height H		165		
	Height H1		40		
2435 K/2439 K	Height H		255		
2436 K/2439 K	Height H		180		
Type 2431 K/2439 K	Approx. weight		1.9	2.0	2.1
Type 2433 K/2439 K	Approx. weight		2.1	2.2	2.3
Type 2435 K/2439 K	Approx. weight		2.4	2.5	2.6
Type 2436 K/2439 K	Approx. weight		2.3	2.4	2.5

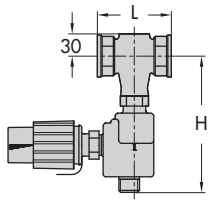
Types 2432 K/2439 K · 2433 K/2439 K · 2436 K/2439 K 2437 K/2439 K

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/2439 K	Height	H	175			225		
	Height	H1	30			55		
2433 K/2439 K	Height	H	171			181		
	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/2439 K	Height	H	–			195		
	Height	H1	–			95		
2437 K/2439 K	Height	H	255			305		
	Height	H1	30			55		
Approx. weight in kg								
2432 K/2439 K with	Welding ends		2.2	2.5	2.8	4.9	5.5	7.3
	Threaded ends		2.1	2.4	2.7	4.7	5.4	7.3
	Flanges		3.6	4.5	5.3	8.0	9.5	11.3
2433 K/2439 K with	Welding ends		2.8	3.1	3.3	4.6	4.9	6.2
	Threaded ends		2.8	3.1	3.3	4.6	4.9	6.2
	Flanges		4.9	6.1	7.1	9.4	10.9	13.7
2436 K/2439 K with	Welding ends					3.8	4.2	4.6
	Threaded ends					3.8	4.2	4.6
	Flanges					7.0	8.2	9.6
2437 K/2349 K with	Welding ends		2.4	2.7	3.0	5.2	5.9	7.8
	Threaded ends		2.3	2.6	2.9	5.5	5.9	7.8
	Flanges		3.8	4.7	5.5	8.2	9.7	11.7

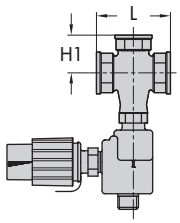
Specifications subject to change without notice.

Dimensions

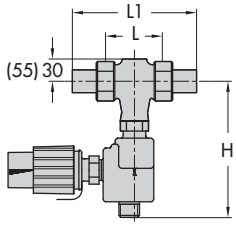
Safety temperature limiters (STL)



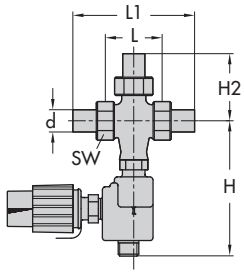
Type 2431 K/2439 K
2435 K/2439 K



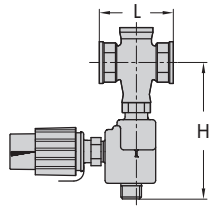
Type 2433 K/2439 K
Version with female thread



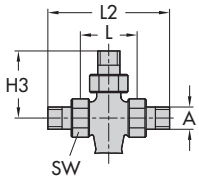
Type 2432 K/2439 K



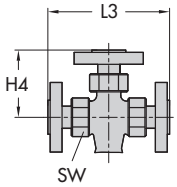
Type 2433 K/2439 K
Version with welding ends



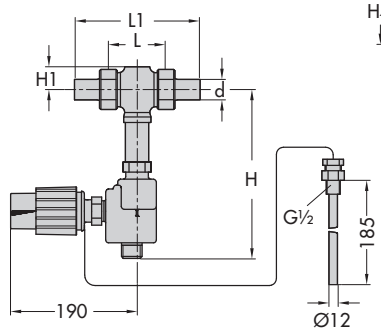
Type 2436 K/2439 K
G ½ to G 1



Type 2433 K/2439 K
Version with threaded ends

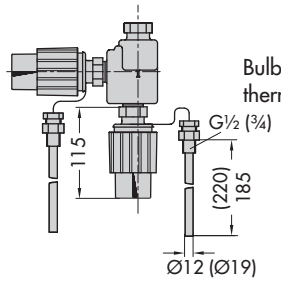


Type 2433 K/2439 K
Version with flanges



Type 2437 K/2439 K
Type 2436 K/2439 K (DN 32 to 50)
Version with welding ends

Temperature regulator with safety temperature limiter (TR/STL)



Dimensions in parentheses () for DN 32 to 50

Type .../2430 K/2439 K

Fig. 6 · Dimensions

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