DATA SHEET

T 2185 EN

Safety Temperature Limiters (STL) with Type 2439 Safety Thermostat

Series 43 Self-operated Temperature Regulators

Application

Safety temperature limitation of the energy supply for heat generators and heat exchangers by closing or locking a valve.

For limit signals from **10 to 120 °C** · Valves **G ½ to G 1 · DN 15 to 50** · Pressure rating **PN 16 or 25** · Max. **200 °C**

Safety temperature limiters (STL), consisting of a valve and Type 2439 Safety Thermostat, operate without auxiliary energy and are designed for extended safety according to DIN EN 14597.

The valve is closed and locked by a spring mechanism when the temperature reaches the adjusted temperature limit, when the capillary tube breaks or when leakage occurs in the sensor system. It can only be reset and put back into operation with a tool when the temperature has fallen below the limit and the fault has been remedied.

Versions (Fig. 1 to Fig. 2)

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

The device can also be delivered with an electric signal transmitter for remote transmission of a malfunction.

Type 2439 Safety Temperature Limiter (STL) (Fig. 1)

Type 2431/2439 · With Type 2431 Globe Valve for G ½ to 1 PN 25 · 150 °C · Material CC499K or 1.4408

Type 2435/2439 · With Type 2435 Globe Valve for G ½ to 1 PN 25 · 200 °C · Material CC499K

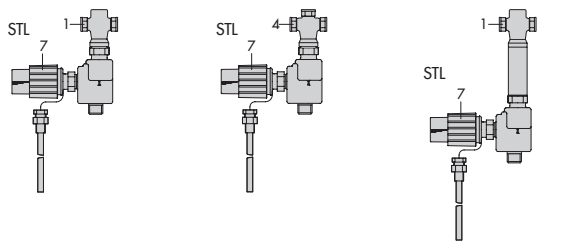
Type 2432/2439 · With Type 2432 Globe Valve for DN 15 to 50 · PN 25 · 150 °C · Material CC499K, EN-GJS-400-18-LT or 1.4408 [1)]

Type 2437/2439 · With Type 2437 Globe Valve for DN 15 to 50 · PN 25 · 200 °C · Material CC499K or EN-GJS-400-18-LT

1) DN 15 · DN 25
2) DN 15 to 50

Valves with Type 2439 Safety Temperature Limiter (STL)

G ½ to 1 female thread

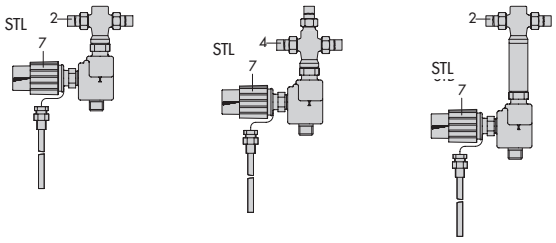


Type 2431 or Type 2436 Valve with Type 2439 STL

Type 2433 Valve with Type 2439 STL

Type 2435 Valve with Type 2439 STL

Male thread DN 15 to 50

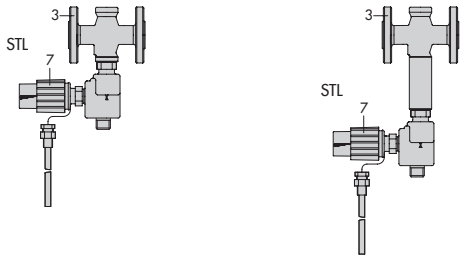


Type 2432 or Type 2436 Valve with Type 2439 STL

Type 2433 Valve with Type 2439 STL

Type 2437 or Type 2436 Valve with Type 2439 STL

Flanged valve body DN 15 to 50



Type 2432 or Type 2436 Valves (flanged) with Type 2439 STL

Type 2437 Valve (flanged) with Type 2439 STL

Fig. 1: *Type 2439 Safety Temperature Limiter (STL) with valves*

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Versions (Fig. 1 to Fig. 2)

Type 2436/2439 · Without DIN register number · Valve opens in case of emergency · With Type 2436 Globe Valve for G ½ to 1/DN 32 to 50 · PN 25 · 150 °C · Material CC499K, EN-GJS-400-18-LT [2] or 1.4408 [1]

Type 2433/2439 · With Type 2433 Three-way Valve for G ½ to 1 or DN 15 to 50 · PN 25 · 150 °C · Material CC499K

[1] DN 15 · DN 25
[2] DN 15 to 50

Note

Further details on the application of safety temperature limiters can be found in Information Sheet ▶ T 2181.

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

Temperature regulator with safety temperature limiter (TR/STL) (Fig. 2)

Temperature regulators and safety temperature limiters (TR/STL) consist of one of the listed devices Type 243…/2439 and a typetested Type 2430 Control Thermostat, for example:

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

Details and technical data of the valves and the Type 2430 Control Thermostat in Table 1.

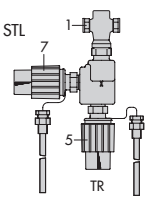
Table 1: *Overview of Series 43 Temperature Regulators*

Type … **Regulator**	With **valve**			Refer to **Data Sheet …**
	Type	Connection size	Pressure rating	
43-1	2431	G ½ to 1 [1] [3]	25	▶ T 2171
43-2	2432	DN 15 to 50 [1] [2]		
		DN 15 · 25 [4]		
43-3	2433 [1]	G ½ to 1		▶ T 2173
		DN 15 to 50		
43-5	2435 [1]	G ½ to 1		▶ T 2172
43-6	2436	G ½ to 1 [1] [3]		
		DN 32 to 50 [1]		
		DN 15 to 50 [2]		
		DN 15 · 25 [4]		
43-7	2437	DN 15 to 50 [1] [2]		
Double adapter/manual adjuster/intermediate insulating piece				▶ T 2176

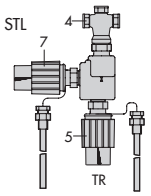
[1] Material CC499K
[2] Flanged valve body of EN-GJS-400-18-LT
[3] Material 1.4408
[4] Flanged valve body of 1.4408

Valves with Type 2439 Safety Temperature Limiter and Type 2430 Control Thermostat (TR/STL)

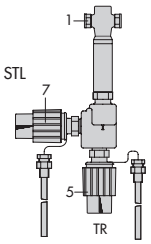
G ½ to 1 female thread



Type 2431/
Type 2439/Type 2430
or Type 2436/
Type 2439/Type 2430

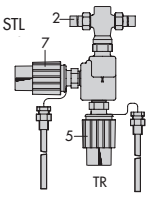


Type 2433/
Type 2439/Type 2430

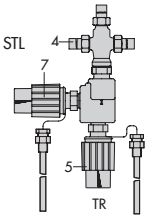


Type 2435/
Type 2439/Type 2430

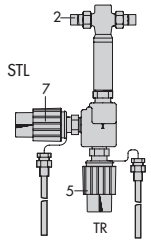
Male thread DN 15 to 50



Type 2432/
Type 2439/Type 2430
or Type 2436/
Type 2439/Type 2430

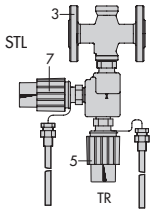


Type 2433/
Type 2439/Type 2430

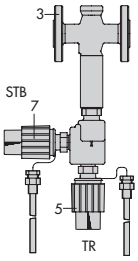


Type 2437/
Type 2439/Type 2430
or Type 2436/
Type 2439/Type 2430

Flanged valve body DN 15 to 50



Type 2432/Type 2439/Type 2430
or Type 2436/Type 2439/
Type 2430



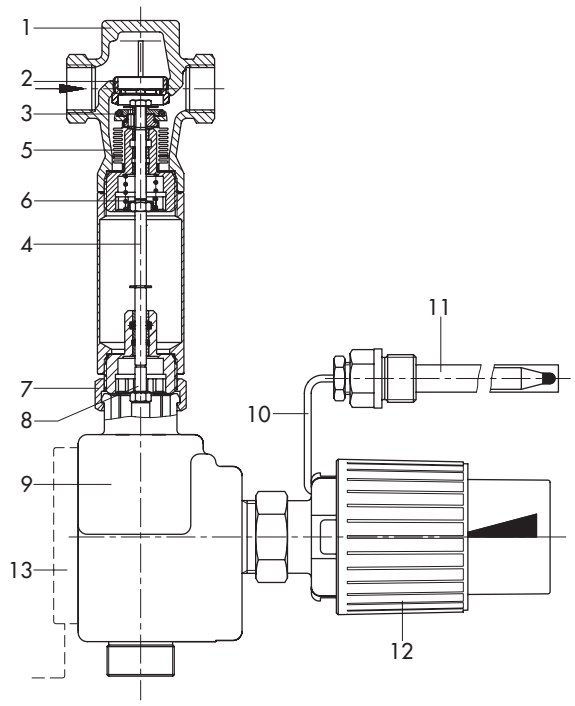
Type 2437/Type 2439/Type 2430

Fig. 2: *Type 2439 Safety Temperature Limiter (STL) with valves and Type 2430 Control Thermostat*

Legend for Fig. 1 and Fig. 2

1 Globe valves with female thread
2 Globe valve with male thread
3 Globe valve with flanged body
4 Three-way valve with female thread/male thread
5 Type 2430 Control Thermostat
6 Type 2403 Safety Temperature Monitor (STM)
7 Type 2439 Safety Temperature Limiter (STL)

Principle of operation



Type 2435 Valve		Type 2439 Safety Thermostat	
1	Valve body	8	Pin of operating element
2	Seat (exchangeable)	9	Connecting element with spring mechanism
3	Plug	10	Capillary tube
4	Plug stem	11	Temperature sensor with thermowell
5	Balancing bellows	12	Limit adjustment
6	Valve spring	13	Signal transmitter (optional)
7	Coupling nut Connecting element (valve)		

Fig. 3: *Type 2435/2439 Safety Temperature Limiter (STL)*

Principle of operation (Fig. 3)

The safety temperature limiters (STL) have a temperature sensor which operates according to the adsorption principle.

The temperature of the medium creates a pressure in the sensor (11) which is proportional to the measured temperature. This pressure is transferred to an operating bellows through a capillary tube (10) where it is converted into a positioning force and compared to the force of the set point spring. The spring force depends on the limit adjustment (12). When the temperature exceeds the adjusted limit, the capillary tube breaks or the sensor leaks, the spring mechanism in the connecting element (9) is released. It moves the pin (8) and the plug stem (4) attached to it, closing and locking the valve. The limiters can only be unlocked and put back into operation with a screwdriver after the temperature has fallen below the limit and the fault has been remedied.

Installation

– Valves

Install the safety temperature limiters in horizontal pipelines. The operating element must be suspended to hang downward. Other mounting positions are also possible for Types 2431, 2432, 2433 and 2436 at temperatures up to 110 °C. The direction of flow must match the arrow on the valve body.

– Capillary tube

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

– 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.

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.

Special installation regulations according to VdTÜV:

The Type …/2439 Safety Temperature Limiter (STL) must be used together with a SAMSON thermowell.

Register number of devices tested according to DIN EN 14597:

The register number of Types 2431, 2432, 2433, 2435 and 2437 Valves with Type 2439 Safety Thermostat or Type 2430 Control Thermostat is available on request.

Special version

- Reduced K_{VS} coefficient in DN 15 or G ½
- 5 m capillary tube
- Thermowell of CrNiMo steel, G ½
- With electric signal transmitter

Combinations

- Safety temperature limiter with Type 2430 Control Thermostat (TR/STL)
- Safety temperature limiter with differential pressure/flow rate regulation

Ordering text

Type … Safety Temperature Limiter/2439

With Type … Valve, G … or DN …, with welding ends, threaded ends or flanges (with Type 2432 and Type 2437)

PN …, K_{VS} …

With Type 2439 Safety Thermostat

Limit adjusted/lead-sealed to … °C

Optionally, special version or accessories ...

Table 2: *Technical data · All pressures in bar (gauge)*

Valve	Type	2431	2433	2435	2436		2432		2437	
Thread size (female thread)	G	½ to 1				–	–		–	
Valve size – Male thread	DN	–	15 to 50	–	–	32 to 50	15 to 25	32 to 50	15 to 25	32 to 50
Valve size – Flanged body	DN		–		15 to 25					
Pressure rating	PN	25 [1]								
Max. permissible temperature	°C	150		200	150				200	
Max. perm. differential pressure	Δp	20	4.4 [1]	16		8	20	12	16	8
K_{VS} coefficients for ...										
Connection size	G	½		¾	1		–			
Valve size	DN	15		20	25		32	40	50	
K_{VS} with Type 2431 – Standard version		3.6		5.7	7.2		12.5	16.0	20.0	
K_{VS} with Type 2431 – Special version		0.4 · 1.0 · 2.5					–			
K_{VS} with Type 2432 – Standard version		4.0		6.3	8.0		12.5	16.0	20.0	
K_{VS} with Type 2432 – Special version		0.4 · 1.0 · 2.5					–			
K_{VS} with Type 2433 – Standard version		4.0		6.3	8.0		10.0	12.5	16.0	
K_{VS} with Type 2433 – Special version		1.6		–						
K_{VS} with Types 2435, 2436, 2437 – Standard version		3.2		4.0	5.0		12.5	16.0	20.0	
K_{VS} with Types 2435, 2436, 2437 – Special version		0.4 · 1.0 · 2.5					–			

[1] Values of Type 2433 Valve for pressure rating depending on the valve size/max. permissible differential pressure (see Data Sheet ▶ T 2173)

Type 2439 Safety Thermostat (STL)		
Adjustment range of limit value	°C	10 to 95 · 20 to 120
Permissible ambient temperature		80 °C · With electric signal transmitter 60 °C
Perm. temperature at the sensor		20 K above the adjusted limit
Perm. pressure at sensor		With thermowell (40 bar)
Switching cycles according to DIN EN 14597		500
Capillary tube length		2 m · 5 m
Electric signal transmitter		Max. load 230 V~, 16 A with resistive load
Type 2430 Control Thermostat (TR)		
Set point range	°C	Continuously adjustable 0 to 35 · 25 to 70 · 40 to 100 · 50 to 120 · 70 to 150
Permissible ambient temperature		Max. 80 °C
Perm. temperature at the sensor		50 K above the adjusted set point
Perm. pressure at sensor		40 bar
Capillary tube length		2 m · 5 m · 10 m

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

Valve	Type	2431	2432	2437	2436	2435	2433
Body	Female thread	CC499K · 1.4408	–		CC499K · 1.4408	CC499K	CC499K
Body	Male thread	–	CC499K			–	
Body	Flange		EN-GJS-400-18-LT · 1.4408 [1]				–
Seat		Stainless steel 1.4571					Integrated in the body
Valve plug		Stainless steel 1.4305 [2] with brass [3] and EPDM soft seal					CuZn40 [3] with EPDM soft seal
Balancing bellows		–	Stainless steel 1.4571				–
Type 2439 Safety Thermostat (STL) and Type 2430 Control Thermostat (TR)							
Connecting element (Type 2439)		PTFE, glass fiber reinforced					
Set point adjuster		PTFE, glass fiber reinforced					
Sensor		Copper					
Capillary tube		Copper					
Thermowell		Copper or stainless steel 1.4571					

[1] DN 15 and 25 only

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

[3] All brass, resistant to dezincification

Dimensions

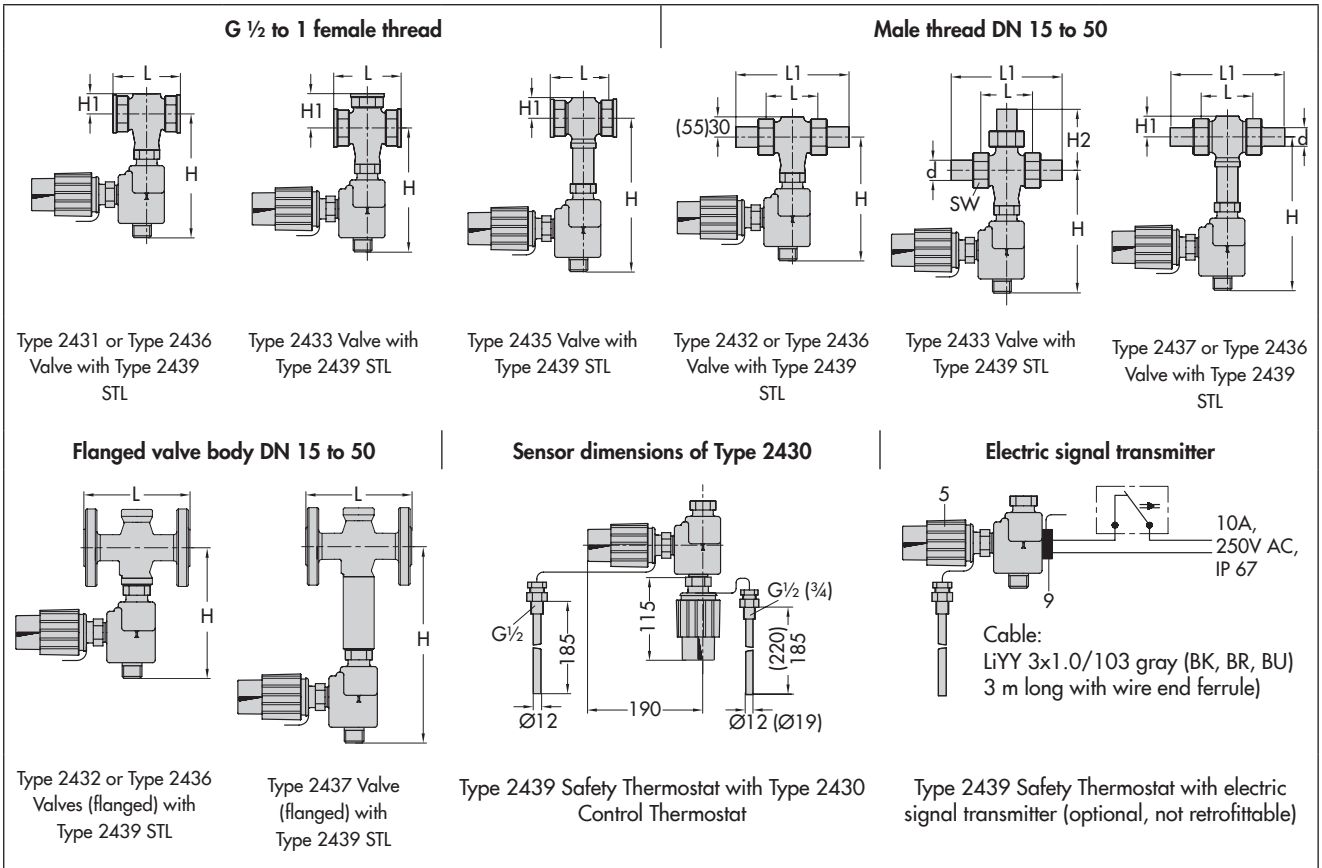


Fig. 4: *Dimensions*

Table 4: *Dimensions in mm and weights · Type 2431/2439 · Type 2433/2439 · Type 2435/2439 · Type 2436/2439 · Female thread*

Connection size		G ½	G ¾	G 1
Face-to-face dimensions	L	65	75	90
Type 2431/2439	Height H	170		
	Height H1	31 (47) [1]		
	Weight, approx. kg	1.9 (2.0) [1]	2.0 (2.1) [1]	2.1 (2.2) [1]
Type 2433/2439	Height H	165		
	Height H1	43		
	Weight, approx. kg	2.1	2.2	2.3
Type 2435/2439	Height H	255		
	Height H1	31		
	Weight, approx. kg	2.4	2.5	2.6
Type 2436/2439	Height H	180		
	Height H1	31 (47) [1]		
	Weight, approx. kg	2.3 (2.4) [1]	2.4 (2.5) [1]	2.5 (2.6) [1]

[1] Specifications in parentheses () apply material 1.4408

Table 5: *Dimensions in mm und weights · Type 2432/2439 · Type 2433/2439 · Type 2436/2439 · Type 2437/2439 · Male thread*

Connection size			**DN**	**15**	**20**	**25**	**32**	**40**	**50**
Length			L	65	70	75	100	110	130
Male thread			A	G ½	G ¾	G 1	G 1¼	G 1½	G 2
Pipe Ø d				21.3	26.8	32.7	42.0	48.0	60.0
AF				30	36	46	59	65	82
L1 with welding ends				210	234	244	268	294	330
L2 with threaded ends				129	144	159	180	196	228
Type 2432/ 2439	Height H			175			225		
	Height H1			30			55		
	Weight [1], approx. kg			2.2	2.5	2.8	4.9	5.5	7.3
Type 2433/ 2439	Height H			171			181		
	Height H2	Threaded ends		72	77	82	100	108	114
		Welding ends		112	122	124	144	157	165
	Weight [1], approx. kg			2.8	3.1	3.3	4.6	4.9	6.2
Type 2436/ 2439	Height H			–			195		
	Height H1						95		
	Weight [1], approx. kg						3.8	4.2	4.6
Type 2437/ 2439	Height H			255			305		
	Height H1			30			55		
	Weight [1], approx. kg			2.4	2.7	3.0	5.5	5.9	7.8

[1] Weight including threaded ends or welding ends

Table 6: *Dimensions in mm and weights · Type 2432/2439 · Type 2436/2439 · Type 2437/2439 · Flanged valve body*

Connection size			**DN**	**15**	**20**	**25**	**32**	**40**	**50**
Length			L	130	150	160	180	200	230
Type 2432/ 2439	Height H	EN-JS1049		170	175		270		
		1.4408			–	180	–		
	Weight [1], approx. kg			3.9	4.4	5.0	8.2	9.7	11.6
Type 2436/ 2439	Height H	EN-JS1049		170	175		270		
		1.4408			–	180	–		
	Weight [1], approx. kg			4.0	4.6	5.1	8.3	9.8	11.7
Type 2437/ 2439	Height H	EN-JS1049		250	255		350		
	Weight [1], approx. kg			4.0	4.7	5.1	8.3	10.0	11.3