

Self-operated Pressure Regulators



Pressure Limiters (PL) Type 243... K/2400 K Pressure Element Type 2400 K

Application

Limitation of the maximum pressure in heat generators or heat exchangers by closing and locking a valve. Additional limitation of the energy supply when equipped with a typetested control thermostat and/or safety thermostat.

For limit values from 1 to 10 bar · Valves G 1/2 to G 1 or DN 15 to DN 50 · Nominal pressure PN 25 · max. 200 °C

Conversion of valve sizing coefficients

$$C_V \text{ (in US gallons/min)} = 1.17 \cdot K_{VS} \text{ (in m}^3/\text{h)}$$

$$K_{VS} \text{ (in m}^3/\text{h)} = 0.86 \cdot C_V \text{ (in US gallons/min)}$$



Pressure Limiters (PL) with a control valve and Type 2400 K Pressure Element operate without auxiliary energy.

The spring mechanism of the pressure limiter closes and locks the valve when the pressure reaches the adjusted limit value. It can only be reset and put back into operation with a suitable tool when the fault has been removed and the pressure has fallen below the limit value.

Versions

Type 2400 K Pressure Element consists of a housing with a spring mechanism, a pressure measuring element with limit value adjustment, connecting tube and Type 1 NI Strainer (G 3/8, PN 25). An electric signal transmitter to produce a signal for fault indication, a typetested control thermostat and/or safety thermostat are available as options.

Pressure Limiters (PL) with Type 243...K Control Valve and Type 2400 K Pressure Element (Figs. 1 and 2).

Type 2431 K/2400 K · With Type 2431 K Globe Valve for G 1/2 to G 1 · PN 25 · 150 °C

Type 2432 K/2400 K · With Type 2432 K Globe Valve for DN 15 to DN 50 · PN 25 · 200 °C

Type 2433 K/2400 K · With Type 2433 K Three-way Valve for G 1/2 to G 1 · DN 15 to DN 50 · PN 25 · 150 °C

Type 2435 K/2400 K · With Type 2435 K Globe Valve for G 1/2 to G 1 · PN 25 · 200 °C

Type 2437 K/2400 K · With Type 2437 K Globe Valve for DN 15 to DN 50 · PN 25 · 200 °C

Combinations

- PL with Type 2430 K Control Thermostat (TR/PL)
- PL with Type 2403 Safety Thermostat (STM/PL)
- PL with Type 2439 K Safety Thermostat (STL/PL)
- PL with the differential pressure/flow control

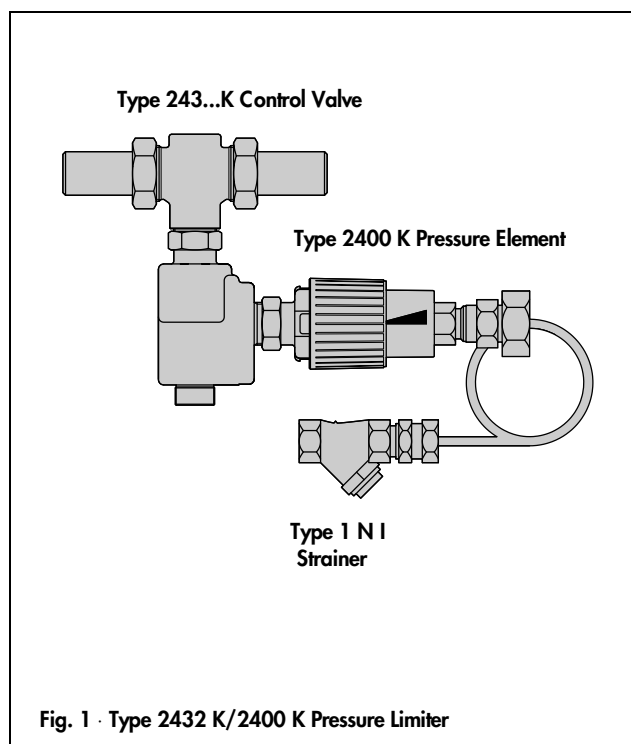


Fig. 1 · Type 2432 K/2400 K Pressure Limiter

Special version

- With electric signal transmitter
- Reduced K_{VS} value for DN 15 or G 1/2
- ANSI versions

Details and technical data about the control valves can be found in:

Data Sheet T 2171 E - Type 2431 K, Type 2432 K Globe Valves
Data Sheet T 2172 E - Type 2435 K, Type 2437 K Globe Valves
Data Sheet T 2173 E - Type 2433 K Three-way Valve

Details about the application of typetested temperature regulators can be found in Data Sheet T 2181 E.

Principle of operation (Fig. 3)

The medium passes through the strainer (14) and the connecting tube (13) to an operating bellows. It is converted into an positioning force and is compared with the force of a spring. This spring force is adjusted by the limit value adjustment (10). If the actual pressure exceeds the adjusted limit value, the spring mechanism in the connecting element (8) is released. It moves the pin (9) and the plug stem (4) attached to it, closing and locking the valve. It can only be reset and put back into operation with a special tool when the pressure falls below the limit value and the fault has been removed.

Electric supplementary equipment

Additionally the connecting element (8) can be equipped as an option with an electric signal transmitter (15) which produces a signal for fault indication.

Typetesting

Type 2400 K Pressure Element with the control valves specified is typetested by the German Technical Inspectorate (TÜV). The test mark is available on request.

Installation

The valve is only suitable for installation in horizontal pipes. The flow direction must correspond with the arrow on the body. The connection for the connecting element must hang downwards. Other installation positions are also possible with Types 2431 K and 2432 K Control Valves when the temperature of the medium is 110 °C and below. The ambient temperature may not exceed the permitted 80 °C.

The pressure measuring connection may be installed in any desired position.

The connecting tube must be run in such a way that it cannot be damaged.

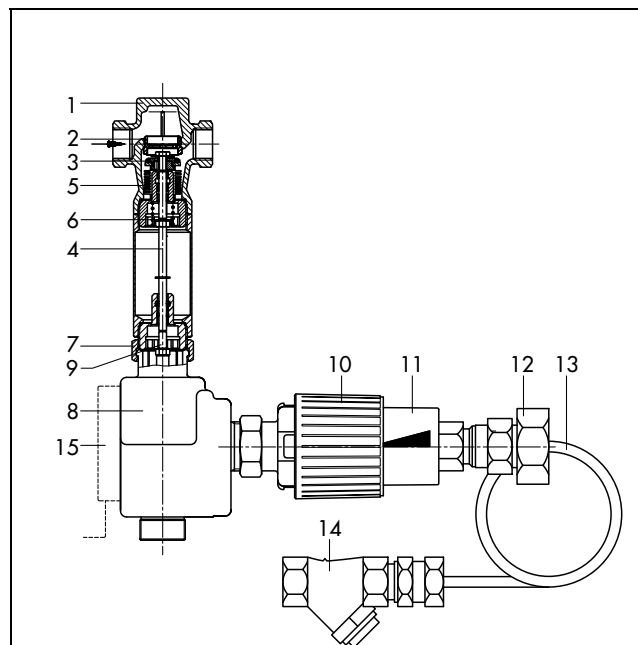


Fig. 2 · Type 2435 K/2400 K Pressure Limiter

Control valve		Pressure element	
1	Valve body	8	Connecting element with spring mechanism
2	Seat (exchangeable)	9	Spring mechanism pin
3	Plug	10	Limit value adjustment
4	Plug stem	11	Pressure element
5	Balancing bellows	12	Screw joint
6	Spring	13	Connecting tube
7	Connection between control valve and connecting element	14	Strainer
		15	Electric signal transmitter (optional)

Table 1 · Technical data

All pressures stated in bar (gauge)

Control Valve	Type	2433 K	2431 K	2435 K	2437 K		2432 K	
Connection		G 1/2 to G 1 (female thread)			–			
Nominal size	DN	15 to 50	–	–	15 to 25	32 to 50	15 to 25	32 to 50
Nominal pressure	PN	25						
Max. permissible temperature	°C	150		200			150	
Max. perm. differential pressure	Δp	4.4 ¹⁾	20	16		8	20	12
Pressure Element	Type	2400 K						
Adjustment range of the limit value		1 to 10 bar						
Response		≤ 0.1 bar						
Resetting		Release after pressure drop of 0.5 bar						
Permissible operating pressure		10 bar						
Permissible operating temperature		200 °C						
Permissible ambient temperature		–20 to +80 °C						
Electric signal transmitter		Permissible load: 230 V AC, 10 A with resistive load						
Connecting tube		Approx. 2 m						
Strainer		Type 1NI, G 3/8, PN 25 (see Data Sheet T 1010 E)						

¹⁾ For exact data for individual nominal sizes, see Data Sheet T 2173 E

Table 2 · Kvs values

Connection		G 1/2	G 3/4	G 1	–		
Nominal size	DN	15	20	25	32	40	50
Kvs-values	Type 2433 K	4	6.3	8	10	12.5	16
	Types 2435 K, 2437 K	3.2	4	5	10	12.5	16
	Special version	0.4 · 1.0		–			
	Types 2432 K, 2431 K	3.6	5.7	7.2	10	12.5	16
	Special version	0.4 · 1.0 · 2.5		–			

Table 3 · Materials (WN = Material Number according to DIN)

Control Valve	Type	2433 K	2431 K	2435 K	2437 K	2432 K
Valve body		Red casting brass G-CuSn 5 ZnPb				
Seat		Integrated in the valve body	Stainless steel WN 1.4571			
Valve plug		CuZn 40 with EPDM-soft sealing	Stainless steel with brass and soft sealing; with Kvs 0.4 and 1.0: WN 1.4305, metal-sealed			
Valve spring		Stainless steel WN 1.4310				
Balancing bellows		–	Stainless steel WN 1.4571		–	
Pressure Element	Type	2400 K				
Connecting element		Glass fibre reinforced PETP				
Bellows		CuSn 6 F 35				
Limit value adjustment		Glass fibre reinforced PETP				
Screw joint		Brass				
Connecting tube		Copper				
Strainer body		Brass CuZn 37 Pb				

Dimensions

Table 4 · Dimensions in mm and weights

Type 2431 K/2400 K, Type 2433 K/2400 K, Type 2435 K/2400 K

Connection	G	1/2	3/4	1
Length	L	65	75	90
Type 2431 K/2400 K	Height H	175		
Type 2433 K/2400 K	Height H	165		
	Height H1	40		
Type 2435 K/2400 K	Height H	255		
Type 2431 K/2400 K	Weight approx. kg	2.5	2.7	2.8
Type 2433 K/2400 K		2.1	2.2	2.3
Type 2435 K/2400 K		3	3.1	3.2

Type 2432 K/2400 K, Type 2433 K/2400 K, Type 2437 K/2400 K

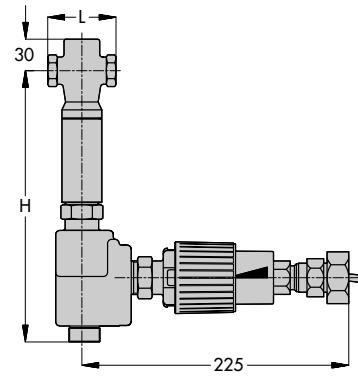
Nominal size	DN	15	20	25	32	40	50
Width across flats	SW	30	36	46	59	65	82
Length	L	65	70	75	100	110	130
L1 with weld-on fittings		210	234	244	268	294	330
Pipe diameter	d	21.3	26.8	32.7	42	48	60
L2 with threaded ends		129	144	159	180	196	228
Male thread		G1/2	G3/4	G1	G1 1/4	G1 1/2	G2
L3 with flanges		130	150	160	180	200	230
Type 2432 K/2400 K	Height H	175			225		
	Height H1	30			55		
Type 2433 K/2400 K	Height H	171			181		
	Height H2 ¹⁾	112	122	124	144	157	165
Type 2437 K/2400 K	Height H	255			305		
	Height H1	30			55		
Weight approx. kg							
Type 2432 K/2400 K with	Weld-on fittings	2.7	3.1	3.6	5.3	5.7	8.1
	Threaded ends	2.7	3.1	3.6	5.3	5.7	8.1
	Flanges	3.8	4.7	5.4	8.2	9	12
Type 2433 K/2400 K with	Weld-on fittings	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
Type 2437 K/2400 K with	Weld-on fittings	3.2	3.5	3.7	5.1	5.4	6.7
	Threaded ends	3.2	3.5	3.7	5.1	5.4	6.7
	Flanges	4.3	6.5	7.5	9.9	11.4	14.2

¹⁾ Connection nut with weld-on fittings

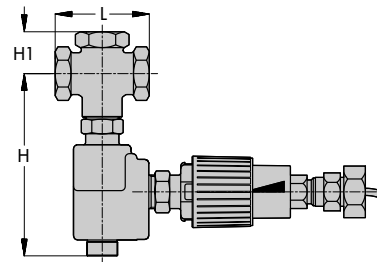
Ordering text

Pressure Limiter Type 243...K/2400 K
with Control Valve Type ..., PN ..., with female thread G ...
or
DN ..., for Types 2432 K and 2437 K with weld-on fittings /
threaded ends / flanges, if needed for mixing service with
Pressure Element Type 2400 K, optional limit value ad-
justed/lead sealed to ... bar, optional accessories .../special
version ...

Version with female thread

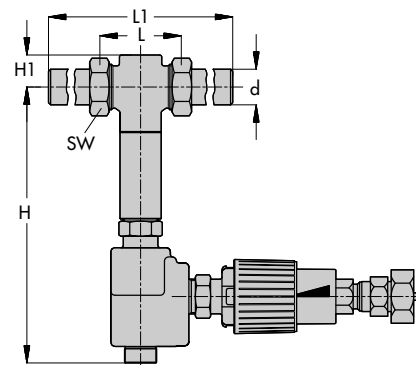


Type 2431 K/2400 K, Type 2435 K/2400 K

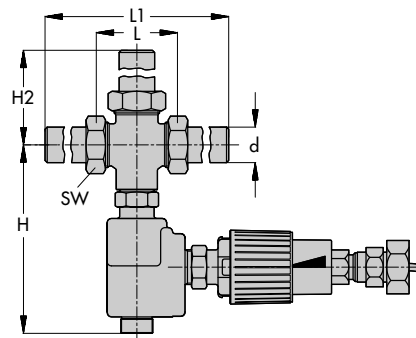


Type 2433 K/2400 K

Connection nuts with weld-on fittings

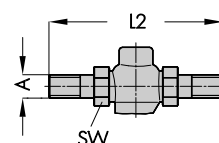


Type 2432 K/2400 K, Type 2437 K/2400 K



Type 2433 K/2400 K

Connection nuts with threaded ends



... with flanges

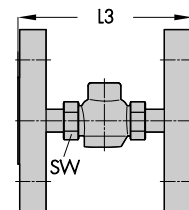


Fig. 3 · Dimensions



Specifications subject to change without notice.