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SAFETY VALVE WITH CLOSED BONNET

PV 25





PV 25

Spring loaded
proportional safety valve,
flanged, with closed bonnet

Description

The safety valve Series PV 25 is manufactured in pressure ranges, sizes and executions according to following tables. The tables contain the detail information about the dimensions, weight, range of set pressure and material of main parts too.

For PN16 and PN40, the valve's body is casted, the inlet nozzle is it's integrated part. The seat ring is tightly pressed into it. For PN63 and PN100, the casted body is provided with forged inlet nozzle with integrated seat. The flange's dimensions are according to ČSN EN 1092-1, respectively to ČSN EN 1092-2.

The flat disc is equipped with lifting bell, which is exposed to pressure of medium when the valve starts to open. The opening force is increased by this way, the result is quick opening of valve.

The spring, which causes the closing/sealing force, is designed for specific range of set pressures, the fine setting is made through adjusting screw.

The valve is equipped with lever, which serves for manual valve opening/test of function under the normal operating conditions of protected equipment.

Thanks to closed bonnet, the valve can be executed as gas-tight too.

Application

Spring loaded full lift safety valve PV 61 serves to automatically secure the pressure equipment (boiler, pressure vessel, reduction station, piping ...) against an increase in the medium pressure above the permissible limit.

The safety valve Series PV 25 is certified as Safety device for protection against excessive pressure according to ČSN EN ISO 4126-1 standard and fulfill the demands of directive 2014/68/EU (PED).

The valve's discharge capacity, based on the data given in this sheet ($A_{0,1}$, K_{dr}), is guaranteed, if the pressure drop in inlet pipeline doesn't exceed 3% of p_{set} and simultaneously the pressure drop in outlet pipeline doesn't exceed 15% of p_{set} .

In case of higher seat tightness demand, the disc with soft sealing (EPDM, NBR) is recommended. This execution is limited by max. temperature +120°C.

If the protected medium is liquid, the valve is, regarding the reliable function, offered either as the valve with limited lift (and reduced value of certified coefficient of discharge K_{dr} , see tables page 8) or as the full lift valve with soft seat and diaphragm (for PN16 and PN40 only).

The value of certified coefficient of discharge K_{dr} is higher, than in previous version, but this one is limited by size (DN 20x32 to 100x150), maximal temperature of medium +120°C and maximal value of set pressure p_{set} 10 barg.

Possible combinations (execution, seat material...) see relevant tables and type number specification.

Process media

The valve is determined for steam, air and other gases and liquids. Chemical composition of medium must be in accordance with material of valve's body and inner parts. Working temperature range is from +5°C to +450°C, if the temperature is higher than +350°C, the execution PV 250x xWx with cooling spacer (position 9) is recommended.

Installation instructions

- 1) the valve should be installed with spindle in vertical position
- 2) outlet line must be inclined, the drainage hole must be provided in the lowest point

Design and ordering

For the design (calculation) of the valve and its order, it is necessary to supply the following documents, either according to point 1) or 2).

- 1) opening pressure p_{set} , kind of medium, medium temperature, DN of the valve
- 2) opening pressure p_{set} , kind of medium, medium temperature, mass flow Q_{mR}

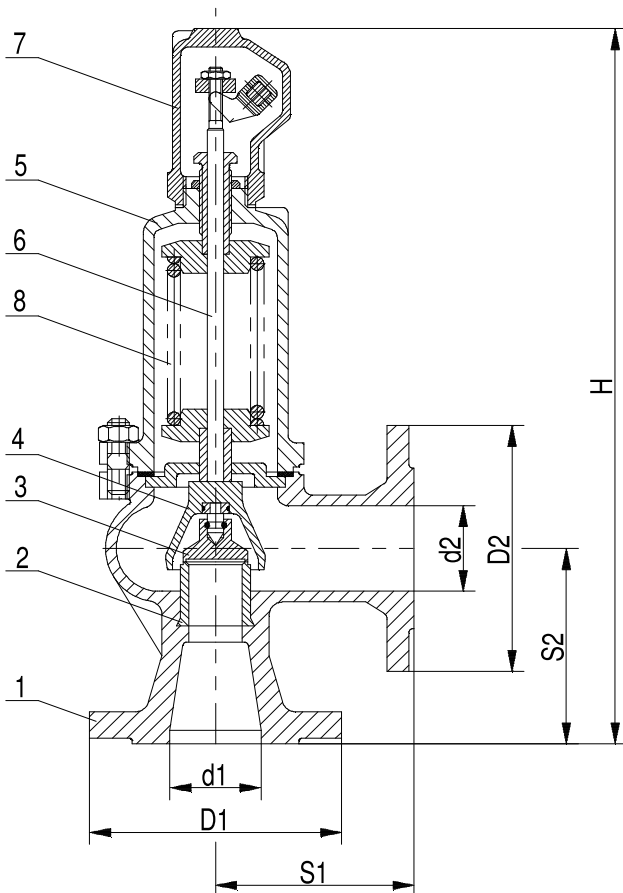
The full type number must be given when ordering the valve. Demands for other flanges than according to ČSN EN 1092-1, resp. ČSN EN 1092-2, for position sensor or supporting brackets with drilled fixing holes must be placed in order too. The counter flanges, gaskets and bolts/nuts can be provided on demand too.

Basic dimensions, weight and range of set pressure PV 2501 | PN 16 | DN 15 x 15 to 200 x 200

Size DN $d_1 \times d_2$	Seat		Input flange	Output flange	Centre to face		Installation height	Opening pressure (P_{set})			Weight (approx.)
	dia d_0 [mm]	area A_0 [mm ²]	PN16 D_1 [mm]	PN10 D_2 [mm]	S_1 [mm]	S_2 [mm]	H [mm]	min. ¹⁾ [barg]	min. ²⁾ [barg]	max. [barg]	m [kg]
15 x 15	12	113	95	95	90	90	330	0,45	1,00	16,00	6
20 x 20	12	113	105	105	95	95	335	0,45	1,00	16,00	6
25 x 25	16	201	115	115	100	100	350	0,45	1,00	16,00	8
32 x 32	20	314	140	140	105	105	390	0,45	1,00	16,00	10
40 x 40	25	491	150	150	115	115	420	0,45	1,00	16,00	12
50 x 50	32	804	165	165	125	125	485	0,45	1,00	16,00	20
65 x 65	40	1257	185	185	145	145	540	0,45	1,00	16,00	25
80 x 80	50	1964	200	200	155	155	655	0,45	1,00	16,00	36
100 x 100	63	3117	220	220	175	175	705	0,45	1,00	16,00	47
125 x 125	77	4657	250	250	200	200	810	0,45	1,00	16,00	74
150 x 150 ¹⁾	93	6793	285	285	225	225	850	0,45	---	16,00	100
200 x 200 ¹⁾	110	9503	340	340	250	250	980	0,45	---	16,00	140

¹⁾ for metal-metal seat only

²⁾ for soft seat only



Material of safety valve PV 2501 main parts

Part	Description	Material
1	Body	EN-GJL-250
2	Seat	X39CrMo17-1
3	Disc ¹⁾	X39CrMo17-1
3	Disc ²⁾	X6CrNiTi18-10+EPDM/NBR
4	Bell	EN-GJS-400-15
5	Bonnet	EN-GJS-400-15
6	Spindle	X20Cr13
7	Cap	EN-GJS-400-15
8	Spring	51CrV4

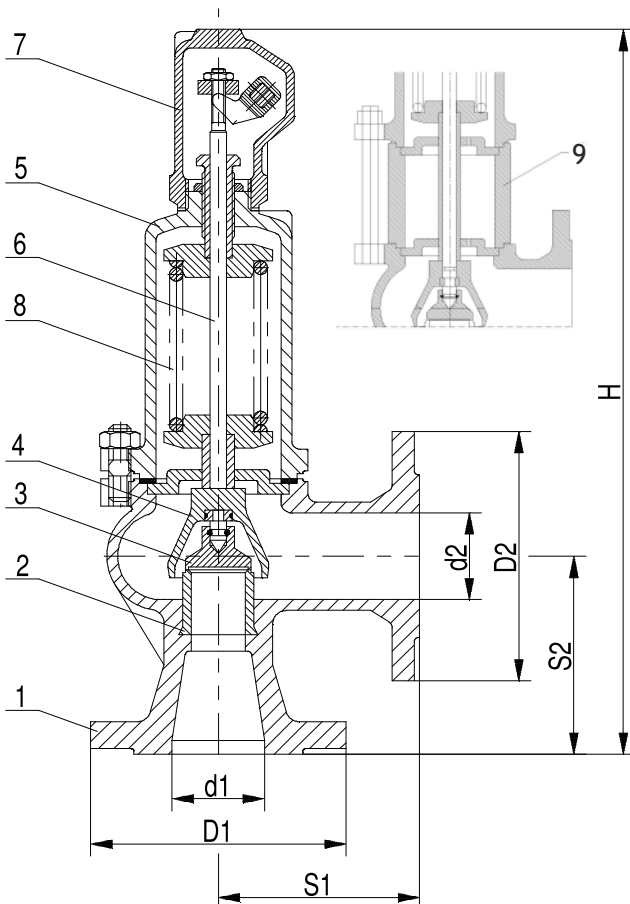
Basic dimensions, weight and range of set pressure PV 2502 | PN 40 | DN 20 x 20 to 200 x 200

Size DN $d_1 \times d_2$	Seat		Inlet flange PN 25/40		Outlet flange PN 10	Centre to face		Installation height		Opening pressure (p_{set})				Weight (approx.)	
	dia d_0 [mm]	area A_0 [mm ²]	D_1 [mm]	D_2 [mm]	S_1 [mm]	S_2 [mm]	wo cooling spacer H [mm]	with cooling spacer	min. ¹⁾ [barg]	min. ²⁾ [barg]	min. ⁴⁾ [barg]	max. [barg]	m [kg]	m ⁸⁾ [kg]	
20 x 20	12	113	---	105	105	95	95	335	---	0,45	1,00	0,20	40,00	7	---
25 x 25	16	201	---	115	115	100	100	350	410	0,45	1,00	0,20	40,00	9	10,7
32 x 32	20	314	---	140	140	105	105	390	460	0,45	1,00	0,20	40,00	12	13,8
40 x 40	25	491	---	150	150	115	115	420	495	0,45	1,00	0,20	40,00	14	16,3
50 x 50	32	804	---	165	165	125	125	485	575	0,45	1,00	0,20	40,00	22	25,6
65 x 65	40	1257	---	185	185	145	145	540	645	0,45	1,00	0,20	40,00	28	33
80 x 80	50	1964	---	200	200	155	155	655	765	0,45	1,00	0,20	40,00	40	46,2
100 x 100	63	3117	---	235	220	175	175	705	835	0,45	1,00	0,20	40,00	52	61,1
125 x 125	77	4657	---	270	250	200	200	810	955	0,45	1,00	---	40,00	80	94,4
150 x 150 ¹⁾	93	6793	---	300	285	225	225	850	---	0,45	---	---	25,00	110	---
200 x 200 ¹⁾	110	9503	360 ⁵⁾	---	340	250	250	980	---	0,45	---	---	16,00	150	---

¹⁾ for metal-metal seat only ²⁾ for soft seat only

³⁾ execution with cooling spacer on demand ⁴⁾ for stainless steel only

⁵⁾ pro size DN 200x200 the PN 25 flange only ⁸⁾ execution with cooling spacer



Material of safety valve PV 2502 main parts

Part	Description	Material
1	Body	GP240GH
2	Seat	X39CrMo17-1
3	Disc ¹⁾	X39CrMo17-1
3	Disc ²⁾	X6CrNiTi18-10+EPDM/NBR
4	Bell	EN-GJS-400-15
5	Bonnet	EN-GJS-400-15 / GP240GH
6	Spindle	X20Cr13
7	Cap	EN-GJS-400-15
8	Spring	51CrV4
9	Cooling spacer	C22

Material of safety valve PV 2502, stainless steel execution

Part	Description	Material
1	Body	GX5CrNi19-10
2	Seat	X6CrNiTi18-10
3	Disc ¹⁾	X6CrNiTi18-10
4	Bell	GX5CrNi19-10
5	Bonnet	GX5CrNi19-10
6	Spindle	X6CrNiTi18-10
7	Cap	GX5CrNi19-10
8	Spring	X10CrNi18-8

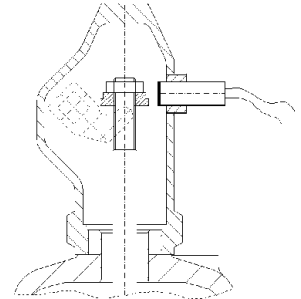
The stainless steel valve is manufactured in size range from DN 20 x 20 to DN 100 x 100 only. Regarding the fact, that the bonnet is closed and the valve is determined for corrosive service, only the gas-tight execution of valve is available.

Accessories

The valve can be provided with CLOSE position sensor (inductive switch) on demand. If not specified, the standard sensor has following parameters:

Working range (sensitivity):	3 mm (M8); 6 mm (M12) resp. 10 mm (M18)
Voltage:	20 ± 10 VDC
Protection:	IP67 (M8); IP68 (M12 and M18)
Temperature range:	from -25°C to +70°C
Length of connecting cable:	2000 mm

If the working condition (temperature) is over the above mentioned limits, the valve can be provided with sensor, suitable for range from -25°C to +230°C



Hodnoty zaručených výtokových součinitelů K_{dr}		
DN	Valve type PV 250x	
	K_{dr} for steam and gases	K_{dr} for liquids
	$\Delta p_{max} = 10\%$	$\Delta p_{max} = 10\%$
15 x 15 to 200 x 200	0,25	0,006

Note: Δp_{max} is maximal value of overpressure p_{set} necessary for full lift of valve

Series PV 250x valve's type number specification

		XX	XX	XXX	XXX	/	XXX	-	XXX	XX	/	X	-	XXX,X	/	X
1. Valve	spring loaded proportional safety valve with close bonnet	PV 25														
2. Nominal pressure	PN 16		01													
	PN 40		02													
3. Lift	full lift			S												
	full lift + extended seat			X												
4. Seat surface material	metal - metal			M												
¹⁾ up to 120°C	metal - metal + cooling spacer			W												
²⁾ up to 90°C	soft seat EPDM ¹⁾			E												
	soft seat NBR ²⁾			N												
5. Execution	standard			B												
	gas tight			G												
6. Size	DN - inlet					XXX										
	DN - outlet							XXX								
	seat dia [mm]								XXX							
7. Connection	flanged only											PP				
8. Body material	cast iron (EN-GJL-250), T _{max} 300°C													1		
	cast carbon steel (GP240GH), T _{max} 450°C													2		
	cast stainless steel (GX5CrNi19-10), T _{max} 300°C													3		
9. Set pressure	p _{set} [barg]														XXX,X	
10. Protected medium	gas															G
	steam															S
	liquid															L

Order example

PV 2502 SEG 080/080-050 PP/2-014,5/L i.e. spring loaded proportional safety valve with closed bonnet, nominal pressure PN 40, full lift, EPDM soft seat, gas-tight execution, size DN 80x80, seat dia 50 mm, flanged connection, body made from carbon steel (GP240GH), set pressure p_{set} = 14,5 barg, protected medium: liquid

Maximal permissible working pressures according to ČSN EN 12516-1, respective ČSN EN 1092-2 [bar]

Material	PN	Temperature [°C]														
		RT ¹⁾	50	100	120	150	180	200	250	300	350	375	400	425	450	
Cast iron EN-GJL 250 (EN-JL-1040)	10	10,0	10,0	10,0	10,0	9,0	8,4	8,0	7,0	6,0	---	---	---	---	---	
	16	16,0	16,0	16,0	16,0	14,4	13,4	12,8	11,2	9,6	---	---	---	---	---	
Cast carbon steel GP240GH (1.0619)	10	10,0	10,0	9,4	---	8,9	---	8,4	7,7	7,0	6,5	6,2	6,0	5,2	3,7	
	25	25,0	25,0	23,4	---	22,2	---	21,0	19,2	17,4	16,2	15,6	15,0	13,0	9,2	
	40	40,0	40,0	37,4	---	35,5	---	33,6	30,7	27,8	25,9	25,0	24,0	20,8	14,7	
Cast stainless steel GX5CrNi19-10 (1.4308)	10	10,0	10,0	9,2	---	8,1	---	7,00	6,6	6,2	---	---	---	---	---	
	40	40,0	40,0	37,0	---	32,5	---	28,0	26,3	24,6	---	---	---	---	---	

¹⁾ -10°C to 50°C



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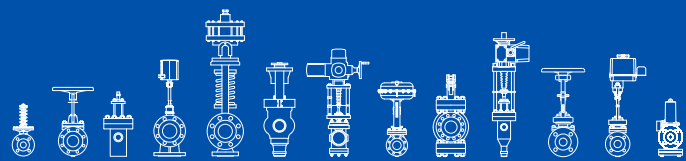
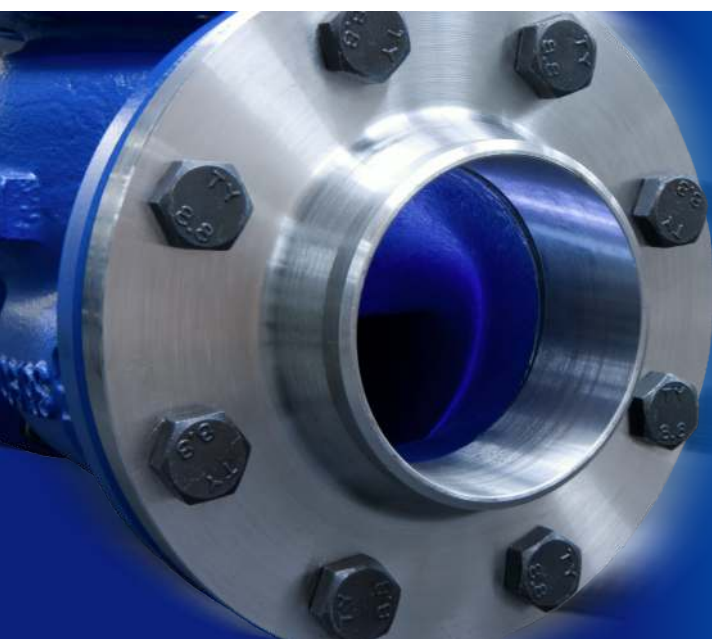
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