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ISO 45001

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02 - 07.8
05.21.GB

SAFETY VALVE
WITH CLOSED BONNET
PV 63

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PV 63

Spring loaded full lift safety valve flanged, with closed bonnet

Description

The safety valve Series PV 63 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 63 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 63 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, 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.

Iif 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 +400°C, if the temperature is higher than +350°C, the execution PV 630x 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
3) on demand, the valve's body can be manufactured with drainage hole

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).

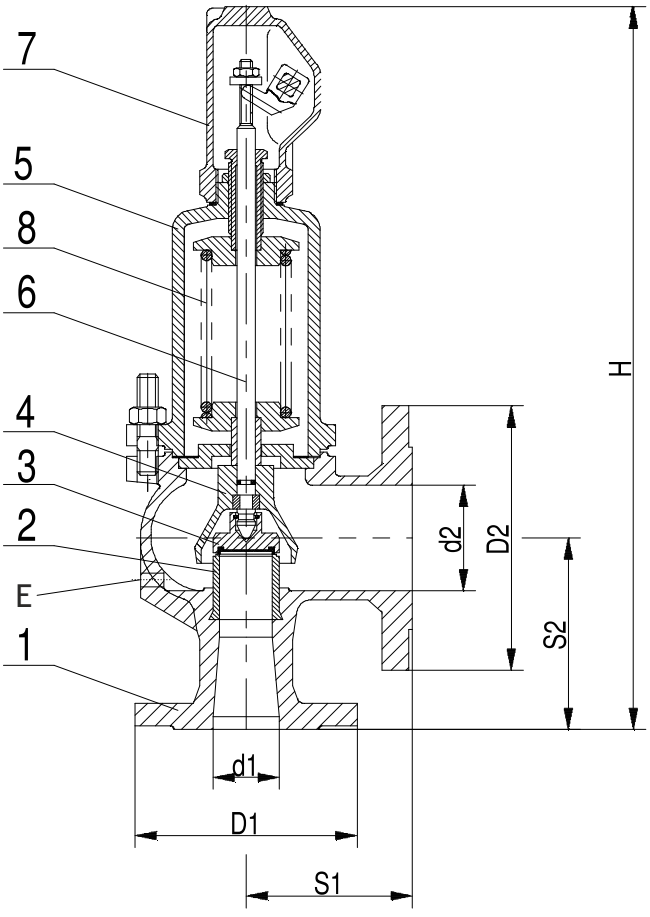
1) opening pressure p_{set}, kind of medium, medium temperature, DN of the valve
2) opening pressure p_{set}, kind of medium, medium temperature, mass flow Q_{mR}

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 6301 | PN 16 | DN 20 x 32 to 150 x 250

Size DN	Seat		Inlet flange	Output flange	Centre to face		Installation height	Drainage[6]	Set pressure (p_{set})				Weight (approx.)
	dia	area	PN16	PN10									
$d_1 \times d_2$	d_0 [mm]	A_0 [mm²]	D_1 [mm]	D_2 [mm]	S_1 [mm]	S_2 [mm]	H [mm]	E thread	min.[1] [barg]	min.[2] [barg]	max. [barg]	max.[9] [barg]	m [kg]
20 x 32	16	201	105	140	85	95	345	G¼	0,45	1,0	16,0	10,0	7,5
25 x 40	20	314	115	150	95	105	395	G¼	0,45	1,0	16,0	10,0	9
32 x 50	25	491	140	165	100	110	420	G¼	0,45	1,0	16,0	10,0	13
40 x 65	32	804	150	185	115	130	495	G¼	0,45	1,0	16,0	10,0	19
50 x 80	40	1257	165	200	125	145	550	G¼	0,45	1,0	16,0	10,0	25
65 x 100	50	1964	185	220	140	150	660	G⅜	0,45	1,0	16,0	10,0	37
80 x 125	63	3117	200	250	155	170	710	G⅜	0,45	1,0	16,0	10,0	52
100 x 150	77	4657	220	285	175	180	810	G⅜	0,45	1,0	16,0	10,0	77
125 x 200	93	6793	250	340	215	220	860	G½	0,45	---	12,5	---	90
150 x 250	110	9503	285	395	225	245	990	G½	0,45	---	10,0	---	140

[1] for metal - metal seat only
[2] for soft seat only
[6] delivered only after agreement with the customer
[9] for execution with diaphragm only



Material of safety valve PV 6301 main parts

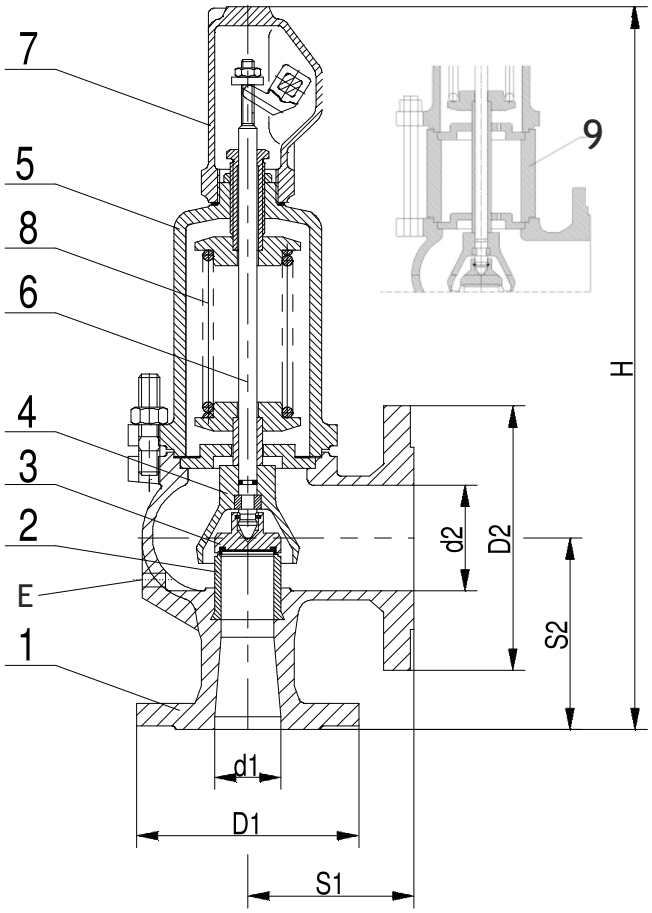
Part	Description	Material
1	Body	EN-GJL-250
2	Seat	X39CrMo17-1
3	Disc [1]	X39CrMo17-1
3	Disc [2]	X6CrNiTi18-10+EPDM/NBR
4	Bell	EN-GJS-400-15
5	Bonnet	EN-GJS-400-15
6	Spindle	X20Cr13
7	Cap	EN-GJS-400-15
8	Spring	51CrV4

Basic dimensions, weight and range of set pressure

PV 6302 | PN 40 | DN 20 x 32 to 150 x 250 | body material **GP240GH**
PV 6302 | PN 40 | DN 20 x 32 to 100 x 150 | body material **EN-GJS-400-18**

Size DN	Sedlo		Inlet flange	Outlet flange	Centre to face		Installation height		Drain-age [6]	Opening pressure (p_{set})					Weight (approx.)	
	dia	area	PN40	PN10			wo cooling spacer	with cooling spacer								
d_1 x d_2	d_0	A_0	D_1	D_2	S_1	S_2	H		E	min.[1]	min.[2]	min.[3]	max.	max.[9]	m	m[7]
	[mm]	[mm²]	[mm]	[mm]	[mm]	[mm]	[mm]		thread	[barg]	[barg]	[barg]	[barg]	[barg]	[kg]	
20 x 32	16	201	105	140	85	95	345	405	G¼	0,45	1,0	0,5	40,0	10,0	8	7,5
25 x 40	20	314	115	150	95	105	395	465	G¼	0,45	1,0	0,5	40,0	10,0	10	9
32 x 50	25	491	140	165	100	110	420	495	G¼	0,45	1,0	0,5	40,0	10,0	14	13
40 x 65	32	804	150	185	115	130	495	585	G¼	0,45	1,0	0,5	32,0	10,0	20	19
50 x 80	40	1257	165	200	125	145	550	655	G¼	0,45	1,0	0,5	32,0	10,0	27	25
65 x 100	50	1964	185	220	140	150	660	770	G⅜	0,45	1,0	0,5	32,0	10,0	39	37
80 x 125	63	3117	200	250	155	170	710	840	G⅜	0,45	1,0	0,5	25,0	10,0	55	52
100 x 150	77	4657	235/239[7]	285	175	180	810	955	G⅜	0,45	1,0	0,5	20,0	10,0	82	77
125 x 200[1]	93	6793	270	340	215	220	860	970	G½	0,45	---	---	12,5	---	100	---
150 x 250[1]	110	9503	300	395	225	245	990	[3]	G½	0,45	---	---	10,0	---	155	---

[1] for metal - metal seat only
[2] for soft seat only
[3] for stainless steel only
[5] execution with cooling spacer on demand
[6] delivered only after agreement with the customer
[7] body material EN-GJS-400-18
[9] for execution with diaphragm only
[10] weights of the valve wit cooling spacer in a separate table at the end of the catalog



Material of safety valve PV 6302 main parts

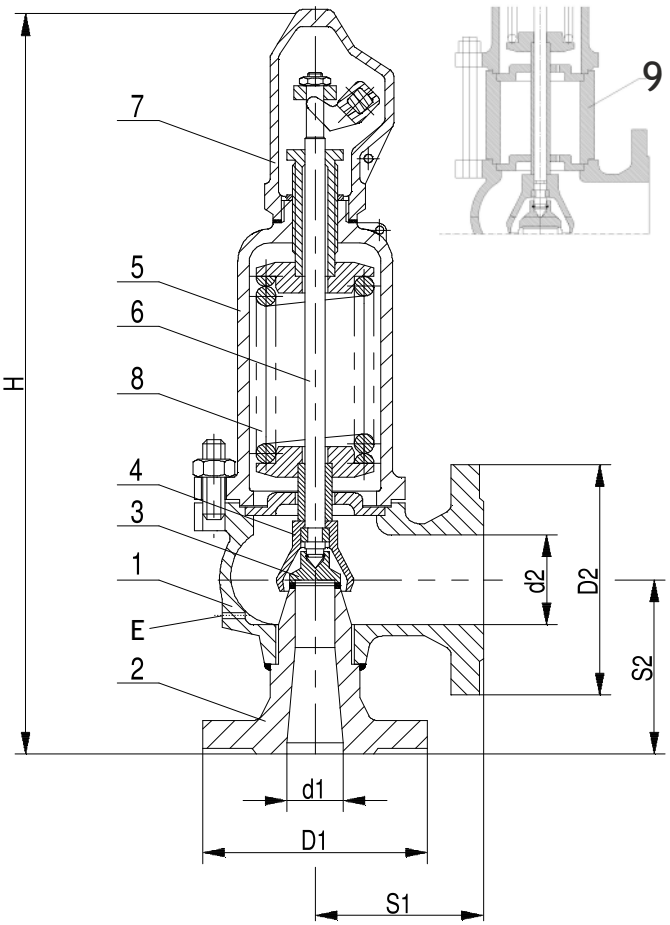
Part	Description	(GP240GH) Material
1	Body	GP240GH
2	Seat	X39CrMo17-1
3	Disc [1]	X39CrMo17-1
3	Disc [2]	X6CrNiTi18-10+EPDM/NBR
4	Bell	EN-GJS-400-15
5	Bonnet	EN-GJS-400-15 / GP240GH
6	Spindle	X20Cr13
7	Cap	EN-GJS-400-15
8	Spring	51CrV4
9	Cooling spacer [1]	C22

Part	Description	(EN-GJS-400-18) Material
1	Body	EN-GJS-400-18
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

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

Basic dimensions, weight and range of set pressure
PV 6303 | PN 63 | DN 20 x 32 to 400 x 500

Size DN [2]	Seat		Inlet flange		Outlet flange		Centre to face		Installation height		Drain -age [6]	Opening pressure (p_{set})		Weight (approx.) [10]
	dia	area	PN 25/40	PN 63	PN 10	PN 25/40			wo cooling spacer	with cooling spacer				
d_1 x d_2	d_0 [mm]	A_0 [mm²]	D_1 [mm]	D_1 [mm]	D_2 [mm]	D_2 [mm]	S_1 [mm]	S_2 [mm]	H [mm]		E závit	min. [barg]	max. [barg]	m [kg]
20 x 32	16	201	105 [8]	130	---	140	95	110	400	470	G¼	38	62	12
25 x 40	20	314	115 [8]	140	---	150	100	110	420	495	G¼	38	62	14
32 x 50	25	491	140 [8]	155	---	165	110	115	475	560	G¼	38	62	20
40 x 65	32	804	150 [8]	170	---	185	130	140	535	640	G¼	30	50	28
50 x 80	40	1257	165 [8]	180	---	200	145	150	650	760	G¼	30	50	40
65 x 100	50	1964	185 [8]	205	---	235	155	160	685	815	G⅜	30	50	50
80 x 125	63	3117	200 [8]	215	---	270	190	180	790	935	G⅜	23	40	80
100 x 150	77	4657	235 [8]	250	---	300	210	200	920	---[5]	G⅜	18	32	130
125 x 200 [1]	93	6793	270 [8]	295	340	360 / ---	215	220	960	---[5]	G½	12	25	150
150 x 250 [1]	110	9503	300	---	405 [4]	--- / ---	225	245	1020	---[5]	G½	9,5	16	180
200 x 300 [1]	155	18870	360 / ---	---	445	--- / ---	265	290	1210	---[5]	G¾	0,45	10	300
300 x 400 [1]	220	38010	485 / ---	---	565	--- / ---	335	370	1480	---[5]	G¾	0,3	7	470
400 x 500 [1]	280	61575	620 / ---	---	670	--- / ---	375	415	1650	---[5]	G¾	0,25	4,5	550



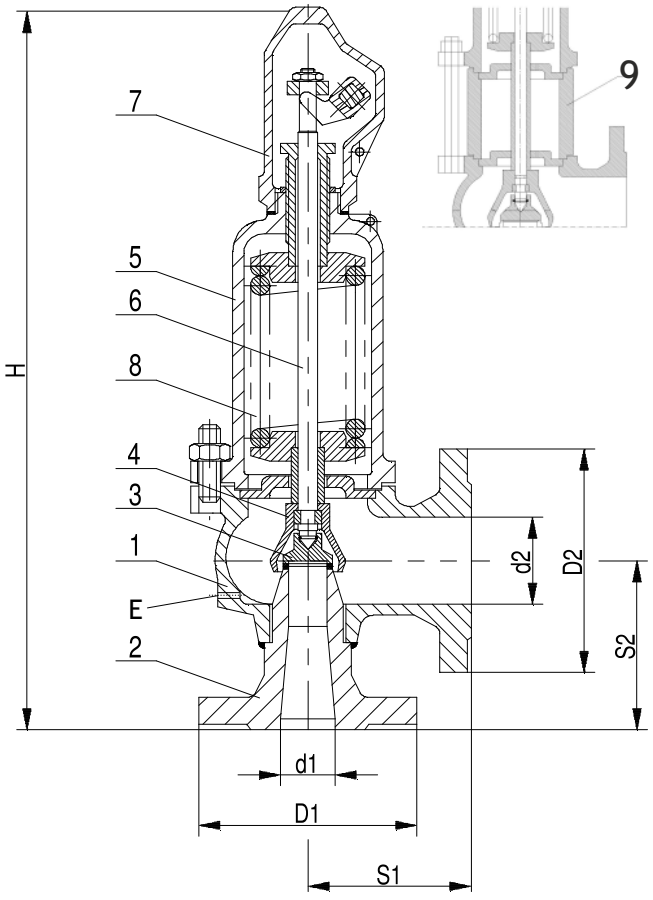
[1] for metal - metal seat only
[2] for soft seat only
[3] for stainless steel only
[5] execution with cooling spacer on demand
[6] delivered only after agreement with the customer
[8] if it is possible acc. to opening pressure
[10] weights of the valve wit cooling spacer in a separate table at the end of the catalog

Material of safety valve PV 6303 main parts

Part	Description	Material
1	Body	GP240GH
2	Inlet nozzle	13CrMo4-5, od DN125 GP240GH
3	Disc [1]	X39CrMo17-1, od DN200 GX5CrNi19-10
3	Disc [2]	X6CrNiTi18-10+EPDM/NBR
4	Bell	EN-GJS-400-15, od DN200 GP240GH
5	Bonnet	GP240GH
6	Spindle	X20Cr13
7	Cap	EN-GJS-400-15, od DN200 GP240GH
8	Spring	51CrV4
9	Cooling spacer [1]	C22

Basic dimensions, weight and range of set pressure
PV 6304 | PN 100 | DN 25 x 40 to 100 x 150

Size DN	Seat		Inlet flange	Outlet flange	Centre to face		Installation height		Drain -age[6]	Opening pressure (p_{set})		Weight (approx.)
	dia	area	PN63 | PN100	PN40			wo cooling spacer	with cooling spacer				
$d_1 \times d_2$	d_0 [mm]	A_0 [mm²]	D_1 [mm]	D_2 [mm]	S_1 [mm]	S_2 [mm]	H [mm]		E thread	min. [barg]	max. [barg]	m [kg]
25 x 40	16	201	140	150	100	120	430	505	G¼	60	95	15
32 x 50	20	314	155	165	110	125	485	570	G¼	60	95	20
40 x 65	25	491	170	185	130	140	535	640	G¼	48	95	28
50 x 80	32	804	195	200	145	150	650	760	G¼	48	95	40
65 x 100	40	1257	220	235	155	165	685	812	G⅜	48	95	50
80 x 125	50	1964	230	270	190	185	795	940	G⅜	38	78	80
100 x 150	63	3117	250	300	210	200	940	[5]	G⅜	30	62	130



[1] for metal - metal seat only
[2] for soft seat only
[5] execution with cooling spacer on demand
[6] delivered only after agreement with the customer
[10] weights of the valve wit cooling spacer in a separate table at the end of the catalog

Material of safety valve PV 6303 main parts

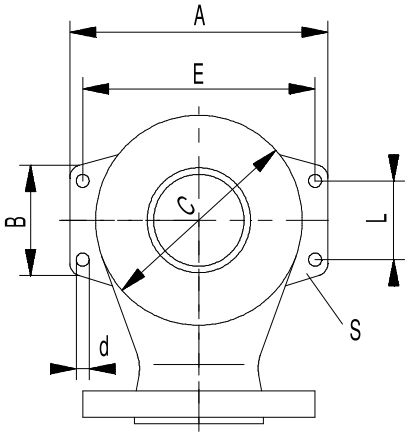
Part	Description	Material
1	Body	GP240GH
2	Inlet nozzle	13CrMo4-5
3	Disc [1]	X39CrMo17-1
3	Disc [2]	X6CrNiTi18-10+EPDM/NBR
4	Bell	EN-GJS-400-15
5	Bonnet	GP240GH
6	Spindle	X20Cr13
7	Cap	EN-GJS-400-15
8	Spring	51CrV4
9	Cooling spacer [1]	C22

Supporting brackets

The valve is provided with supporting brackets.
On demand, the fixing holes can be drilled into brackets according to following tables:

Dimensions of supporting brackets/fixing holes PV 6102 (PN40)

Size DN	A	B	C	L [mm]	E	d	S
40 x 65	180	84	134	65	155	14	10
50 x 80	210	93	160	70	180	14	12
65 x 100	245	94	196	70	215	14	12
80 x 125	300	100	240	90	270	18	15
100 x 150	320	160	280	130	285	18	15
125 x 200	365	120	300	90	330	18	15
150 x 250	415	150	360	120	380	18	15



Dimensions of supporting brackets/fixing holes PV 6103 (PN63)

Size DN	A	B	C	L [mm]	E	d	S
40 x 65	186	93	140	70	156	14	12
50 x 80	210	95	165	70	180	14	12
65 x 100	250	95	205	70	220	14	12
80 x 125	295	120	240	90	260	18	15
100 x 150	320	120	265	90	285	18	15
125 x 200	365	120	300	90	330	18	15
150 x 250	415	150	360	120	380	18	15
200 x 300	510	180	450	150	470	23	20
300 x 400	695	210	600	180	655	23	20
400 x 500	800	230	715	200	760	23	20

Dimensions of supporting brackets/fixing holes PV 6104 (PN100)

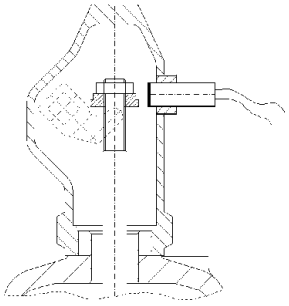
Size DN	A	B	C	L [mm]	E	d	S
40 x 65	186	93	140	70	156	14	12
50 x 80	210	95	165	70	180	14	12
65 x 100	250	95	205	70	220	14	12
80 x 125	295	120	240	90	260	18	15
100 x 150	320	120	265	90	285	18	15

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



Value of certified coefficient of discharge K_{dr}

DN	Valve type PV 630x Sxx K_{dr} for steam and gases		PV 630x Lxx K_{dr} for liquids		PV 630x Lxx K_{dr} for steam and gases
	Δp_{max} = 0,1 barg $p_{set} \leq$ 1 barg nebo Δp_{max} = 10% 1 < $p_{set} \leq$ 1,4 barg	Δp_{max} = 10% p_{set} > 1,4 barg	Δp_{max} = 10% $p_{set} \leq$ 6 barg	Δp_{max} = 10% p_{set} >6 barg	Δp_{max} = 10%
20 x 32 až 150 x 250	0,72	0,78	0,01	0,28	0,36
200 x 300	0,70	0,74	0,01	0,01	---
300 x 400	0,54	0,70			
400 x 500					

Value of certified coefficient of discharge K_{dr} for execution with diaphragm

DN	Valve type PV 630x SDx K_{dr} for steam and gases		K_{dr} for liquids
	Δp_{max} = 0,1 barg $p_{set} \leq$ 1 barg nebo Δp_{max} = 10% 1 < $p_{set} \leq$ 1,4 barg	Δp_{max} = 10% p_{set} > 1,4 barg	Δp_{max} = 10%
20 x 32 až 100 x 150	0,72	0,78	0,5

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

Weight of valves with cooling spacer

Size DN	Valve execution - weight[kg] 6302 (GP240GH)	6302 (EN-GJS-400-18)	6303 (GP240GH)	6304 (GP240GH)
20 x 32	9,7	9,2	13,8	---
25 x 40	11,8	10,8	16,3	17,3
32 x 50	16,3	15,3	23,6	23,6
40 x 65	23,6	22,6	33	33
50 x 80	32	30	46,2	46,2
65 x 100	45,2	43,2	59,1	59,1
80 x 125	64,1	61,1	94,4	94,4
100 x 150	96,4	91,4	--- [1]	--- [1]
125 x 200	112,1	---	---	---
150 x 250	--- [1]	---	---	---
200 x 300	---	---	---	---
300 x 400	---	---	---	---
400 x 500	---	---	---	---

[1] exectution with cooling spacer only after agreement with producer

Series PV 630x valve's type number specification

		XX XX	XX	XXX	XXX	/	XXX	-	XXX	XX	/	X	-	XXX,X	/	X
1. Valve	spring loaded full lift safety valve with closed bonnet	**PV 63**														
2. Nominal pressure	PN16		**01**													
	PN40		**02**													
	PN63		**03**													
	PN100		**04**													
3. Lift	full lift			**S**												
	regulated lift			**L**												
	full lift + extended seat			**X**												
	regulated lift + extended seat			**Y**												
4. Seat surface material	metal - metal			**M**												
	metal - metal + cooling spacer			**W**												
	soft seat EPDM [1]			**E**												
	soft seat NBR [1]			**N**												
	soft seat EPDM + diaphragm [1] [2]			**D**												
5. Execution	standard				**B**											
	gas-tight				**G**											
6. Size	DN - inlet					**XXX**										
	DN - outlet						**XXX**									
	seta dia (mm)								**XXX**							
7. Connection	flange only									**PP**						
8. Body material	cast iron (EN-GJL-250), T_{max} 300°C											**1**				
	cast carbon steel (GP240GH), T_{max} 400°C											**2**				
	cast stainless steel (GX5CrNi19-10), T_{max} 300°C											**3**				
	nodular cast iron (EN-GJS-400-18), T_{max} 350°C											**4**				
9. Set pressure	p_{set} [barg]													**XXX,X**		
10. Protected medium	gas															**G**
	steam															**S**
	liquid															**L**

[1] *up to 120°C DN 20x32 - 100x150*
[2] $p_{set} \leq 10$ *barg*

Příklad objednávky: **PV 6302 LMG 080/125-063 PP/3-010,5/L** i.e. spring loaded full lift safety valve with closed bonnet, nominal pressure PN 40, limited lift, metal/metal seat, gas-tight, size DN 80x125, seat dia 63 mm, flanged connection, body made from stainless steel (GX5CrNi19-10), set pressure pset = 10,5 barg, protected medium: liquid

Maximal permissible working pressures according to ČSN EN 12516-1 resp. 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	---	---	---	---	---
Nodulat cast iron EN-GJS-400-18 (EN-JS 1025)	10	10,0	10,0	10,0	10,0	9,7	---	9,2	8,7	8,0	7,0	---	---	---	---
	40	40,0	40,0	40,0	40,0	38,8	---	36,8	34,8	32,0	28,0	---	---	---	---
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
	63	63	63	59,0	---	55,9	---	52,9	48,4	43,8	40,8	39,3	37,8	32,7	23,2
	100	100	100	93,6	---	88,8	---	84,0	76,8	69,6	64,8	62,4	60,0	51,9	36,8
Alloy steel 13CrMo4-5 (1.7335)	40	40	40	40	---	40	---	40	40	40	37,3	35,9	34,1	32,7	31,5
	63	63	63	63	---	63	---	63	63	63	58,7	56,5	53,8	51,4	49,7
	100	100	100	100	---	100	---	100	100	100	93,1	89,8	85,3	81,6	78,9
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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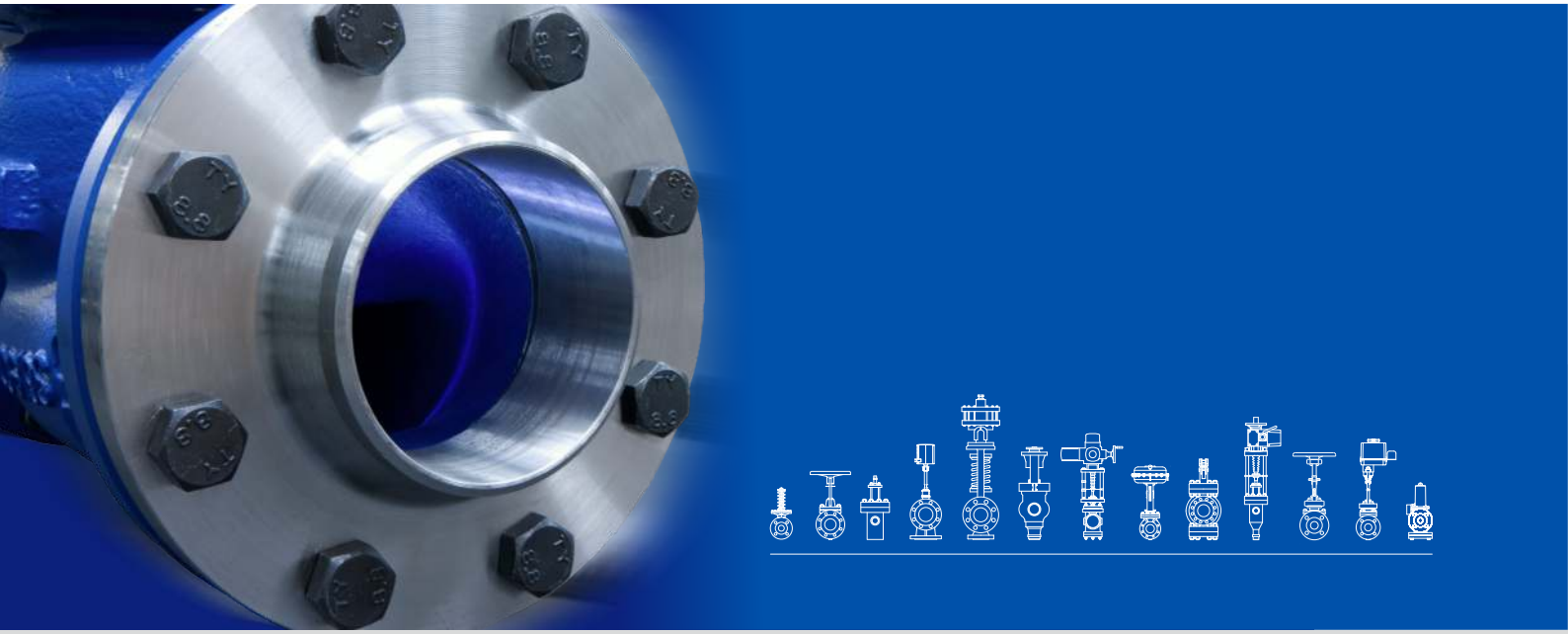

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