



Normal safety valve with spring loading. (AN)

Mod. 484 | ASME | SI

250



EP



AP



ES



CP

Operation

The valve works as an automatic pressure releasing regulator activated by the static pressure existing at the entrance to the valve and is characterized by its ability to open, at the first proportional to the pressure increase, and after instantly and totally.

Specifications

Size

- 1" x 1" to 8" x 8"

Temperature range

- -29 °C to +450 °C

Applications

- Gas, steam and liquids

Materials

- Cast steel
- Stainless steel

Maximum pressure

- Up to 40 bar

Regulation

- PED 2014/68/EU
- ASME B16.34
- ASME B16.5
- ASME II
- ASME VIII Div.1
- UNE-EN ISO 4126-1
- UNE-EN 12516-2

Certification



N°. PIECE	PIECE	MATERIAL														
		CAST STEEL								STAINLESS STEEL						
1	Body	Cast steel (SA 216-WCB)								Stainless steel (SA 351-CF8M)						
2	Closed bell	Cast steel (SA 536 65-45-12)								Stainless steel (SA 351-CF8M)						
3	Open bell	Cast steel (SA 216-WCB)								Stainless steel (SA 351-CF8M)						
4	Hood	Cast steel (SA 536 65-45-12)								Stainless steel (SA 351-CF8M)						
5	Elevator	Stainless steel (SA 536 65-45-12) (1)								Stainless steel (SA 351-CF8M) (5)						
6	Cam	Stainless steel (AISI 304) (4)								Stainless steel (AISI 304)						
7	Lever	Stainless steel (SA 536 65-45-12)								Stainless steel (SA 536 65-45-12)						
8	Seating	Stainless steel (AISI 420)								Stainless steel (AISI 630)						
9	Plug	Stainless steel (AISI 420)								Stainless steel (AISI 630)						
10	Lead	Stainless steel (AISI 420)								Stainless steel (AISI 316)						
11	Spring press	Cast steel (AISI 1045)								Stainless steel (AISI 303)						
12	Separator	Stainless steel (AISI 420)								Stainless steel (AISI 316)						
13	Rod	Stainless steel (AISI 420)								Stainless steel (AISI 316)						
14	Lever shaft	Cast steel (AISI 1045)								Stainless steel (AISI 303)						
15	Gudgeon	Cast steel (AISI 1070)								Stainless steel (AISI 301 / SA 313-302)						
16	Ring	Stainless steel (AISI 420)								Stainless steel (AISI 316)						
17	Safety ring	Stainless steel (AISI 301 / SA 313-302)								Stainless steel (AISI 301 / SA 313-302)						
18	Spring	Chrome vanadium steel (AISI 6150 / SA 304) (2)								Stainless steel (AISI 301 / SA 313-302) (3)						
19	Gland	Cast steel (AISI 1045)								Stainless steel (AISI 303)						
20	Hollow screw	Stainless steel (AISI 303)								Stainless steel (AISI 303)						
21	Hollow screw nut	Stainless steel (AISI 303)								Stainless steel (AISI 303)						
22	Buffer nut	Stainless steel (AISI 303)								Stainless steel (AISI 303)						
23	Rod check nut	Cast steel (AISI 1015)								Stainless steel (AISI 316)						
24	Nut	Cast steel (AISI 1015)								Stainless steel (AISI 316)						
25	Washer	Cast steel (AISI 1015)								Stainless steel (AISI 316)						
26	Stud	Cast steel (AISI 1035)								Stainless steel (AISI 316)						
27	Screw	Cast steel (AISI 1045)								Stainless steel (AISI 316)						
28	Cap	Cast steel (AISI 1035)								Stainless steel (AISI 316)						
29	Coupling	Graphite								PTFE (Teflon)						
30	Coupling	PTFE (Teflon)								PTFE (Teflon)						
31	Seal	Graphite								PTFE (Teflon)						
NPS1 x NPS2		1" x 1" to 8" x 8"														
CLASS [lbs]		150														
OPERATING CONDITIONS	PS [psi]	16	14	12	10	8	7	5	16	15	14	12	10,2	8	7	
	MAX. TEMP. [°C]	150	200	250	300	350	400	450	100	150	200	250	300	350	400	
	MIN. TEMP. [°C]	-29								-29						
CLASS [lbs]		300														
OPERATING CONDITIONS	PS [psi]	40		38		35		23		40	39	36	33	31,6	30	29
	MAX. TEMP. [°C]	300		350		400		450		130	150	200	250	300	350	400
	MIN. TEMP. [°C]	-29								-29						

(1) 1" x 1" in stainless steel (SA 351-CF8M).

(2) Spring steel (EN-10270-1-SH) for spring wire $\varnothing \leq 10$ mm. Max. temperature EP, ES and CP 250 °C / AP 400 °C.

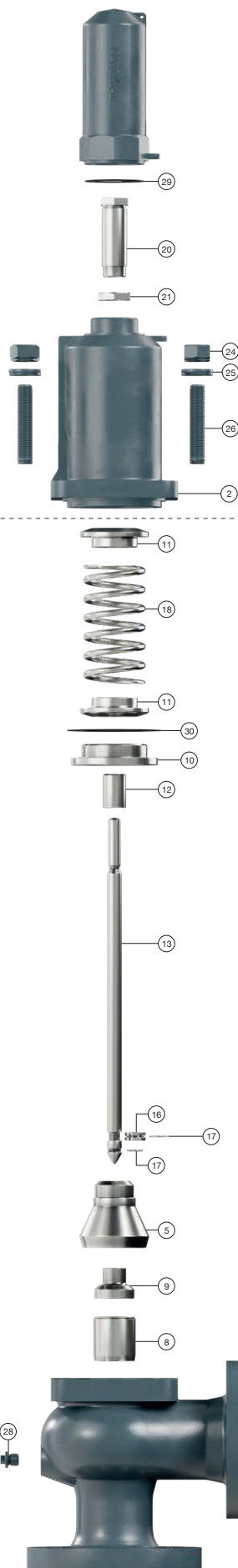
(3) Chrome-vanadium steel (EN-1.8159) for spring wire $\varnothing > 10$ mm.

(4) 1" x 1" in stainless steel (EN-1.4301).

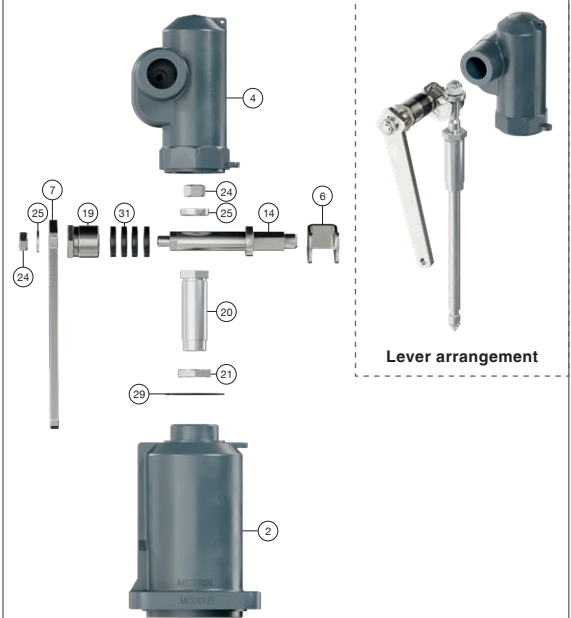
(5) 1 1/4" x 1 1/4" to 2 1/2" x 2 1/2" in stainless steel (EN-1.4401).



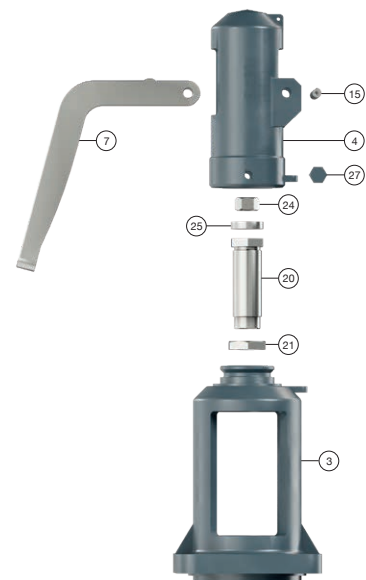
ES Isometric view



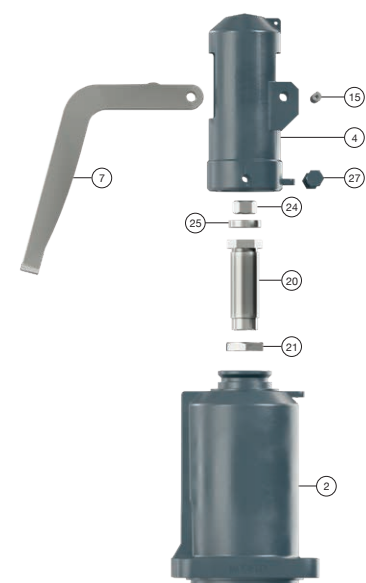
ES Exploded view



EP Hood exploded view



AP Hood exploded view



CP Hood exploded view



Lever arrangement

[illegible]

PRESSURES AND SPRING REGULATION RANGES												
NPS1 x NPS2			1" x 1"	1 1/4" x 1 1/4"	1 1/2" x 1 1/2"	2" x 2"	2 1/2" x 2 1/2"	3" x 3"	4" x 4"	5" x 5"	6" x 6"	8" x 8"
API ORIFICE			D-E	F	G	H	J	L	N	P	P	Q
REGULATION PRESSURE [bar]	MAXIMUM (LIQUIDS AND GASES)	150 lbs	20	20	20	20	20	20	20	20	10	8
		300 lbs	40	40	40	32	32	32	26	20	10	8
	MAXIMUM (SATURATED STEAM)	150 lbs	20	20	20	20	20	20	20	18	10	8
		300 lbs	32	32	30	24	22	24	20	18	10	8
	MINIMUM	STEAM AND GASES	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50	0,50
LIQUIDS		0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20	0,20
SPRING REGULATION RANGES [bar]	0,20 to 0,68	CODE	56210	56226	56242	56258	56273	56288	56303	56317	56500	56511
			56390	56406	56422	56438	56453	56468	56483	56497		
	0,66 to 1,00	CODE	56211	56227	56243	56259	56274	56289	56304	56318	56501	56512
			56391	56407	56423	56439	56454	56469	56484			
	0,95 to 1,40	CODE	56212	56228	56244	56260	56275	56290	56305	56319	56502	56513
			56392	56408	56424	56440	56455	56470	56485			
	1,30 to 1,90	CODE	56213	56229	56245	56261	56276	56291	56306	56320	56503	56514
			56393	56409	56425	56441	56456	56471	56486			
	1,80 to 2,60	CODE	56214	56230	56246	56262	56277	56292	56307	56321	56504	56515
			56394	56410	56426	56442	56457	56472				
	2,50 to 3,60	CODE	56215	56231	56247	56263	56278	56293	56308	56322	56505	56516
			56395	56411	56427	56443	56458	56473				
	3,50 to 5,00	CODE	56216	56232	56248	56264	56279	56294	56309	56323	56506	56517
			56396	56412	56428	56444	56459					
	4,80 to 6,30	CODE	56217	56233	56249	56265	56280	56295	56310	56324	56507	56518
			56397	56413	56429	56445	56460					
6,00 to 8,00	CODE	56218	56234	56250	56266	56281	56296	56311	56325	56508	56519	
		56398	56414	56430	56446	56461						
7,50 to 10,00	CODE	56219	56235	56251	56267	56282	56297	56312	56326	56509	56520	
		56399	56415	56431	56447	56462						
9,50 to 12,50	CODE	56220	56236	56252	56268	56283	56298	56313	56327	56510		
		56400	56416	56432	56448							
12,00 to 16,00	CODE	56221	56237	56253	56269	56284	56299	56314	56328			
		56401	56417	56433	56449							
15,00 to 20,00	CODE	56222	56238	56254	56270	56285	56300	56315	56329			
		56402	56418	56434								
18,00 to 25,00	CODE	56223	56239	56255	56271	56286	56301	56316				
		56403	56419	56435								
23,00 to 32,00	CODE	56224	56240	56256	56272	56287	56302					
		56404	56420	56436								
30,00 to 40,00	CODE	56225	56241	56257								
		56405	56421	56437								

— Spring steel (EN-10270-1-SH). Maximum temperature for models EP, ES and CP 250 °C / AP 400 °C.

— Stainless steel (EN-1.4310).

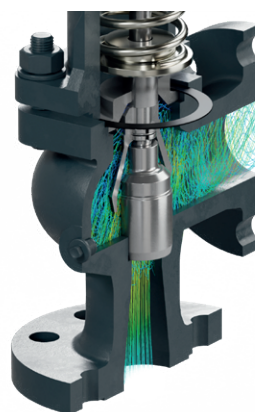
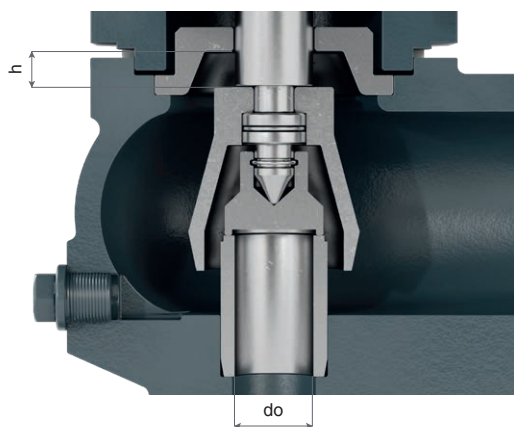
— Chrome-vanadium steel (EN-1.8159).

RECOMMENDED RANGES OF APPLICATION					
MODEL		EP	AP(1)	ES	CP(1)
FLUID	SATURATED STEAM	*	*		*
	GASES	*		*	
	LIQUIDS	*		*	
PERMISSIBLE BACK PRESSURE IN % OF SET PRESSURE	INTERNAL OR GENERATED	SATURATED STEAM GASES	15		
		LIQUIDS	—		
	EXTERNAL VARIABLE (1)	SATURATED STEAM	—		
		LIQUIDS	—		
	EXTERNAL CONSTANT (1) (2) (3)	SATURATED STEAM GASES	50		
		LIQUIDS	90		

- (1) If external backpressure exists, the AP and CP model cannot be used.
(2) With external constant backpressure, the spring is adjusted deducting the backpressure from the set pressure.
(3) If the set pressure < 3 bar we must consider the total atmospheric pressure (1 bar) as external constant backpressure being freely released.

OPENING, OVERPRESSURE AND RESET PRESSURES			
FLUID	OPENING PRESSURE	OVERPRESSURE	RESET PRESSURE
SATURATED STEAM AND GASES	The higher of $\pm 3\%$ or $\pm 0,1$ bar	The higher of $\pm 10\%$ o $0,1$ bar	The higher of $\pm 15\%$ o $0,3$ bar
LIQUIDS	The higher of $\pm 3\%$ o $\pm 0,1$ bar	The higher of $\pm 10\%$ o $0,1$ bar	The higher of $\pm 20\%$ o $0,6$ bar

DISCHARGE COEFFICIENTS										
NPS1 x NPS2	1" x 1"	1 1/4" x 1 1/4"	1 1/2" x 1 1/2"	2" x 2"	2 1/2" x 2 1/2"	3" x 3"	4" x 4"	5" x 5"	6" x 6"	8" x 8"
API ORIFICE	D - E	F	G	H	J	L	N	P	P	Q
do [mm]	16	20	25	32	40	50	63	77	93	110
h [mm]	2,0	2,0	2,5	3,5	5,3	5,0	6,5	8,0	9,5	11,0
h/do [mm]	0,13	0,10	0,10	0,11	0,13	0,10	0,10	0,10	0,10	0,10
STEAM AND GASES [Kdr]	0,30									
LIQUIDS [Kdr]	0,30									



Fluid dynamics

DISCHARGE CAPACITIES																														
NPS1 x NPS2	1" x 1"			1 1/4" x 1 1/4"			1 1/2" x 1 1/2"			2" x 2"			2 1/2" x 2 1/2"			3" x 3"			4" x 4"			5" x 5"			6" x 6"			8" x 8"		
API ORIFICE	D-E			F			G			H			J			L			N			P			P			Q		
d0 [mm]	16			20			25			33			41			51			64			78			94			112		
AO= $\frac{\pi \cdot d_0^2}{4}$ [mm²]	204			319			499			817			1277			1995			3167			4732			6902			9655		
p [bar]	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III			
1,0	52	76	2690	82	118	4203	128	185	6568	209	303	10761	327	473	16814	510	740	26272	810	1174	41709	1210	1754	62306	1766	2559	90890	2470	3580	127156
1,5	66	96	3295	103	149	5148	161	233	8044	264	382	13179	412	597	20593	644	933	32176	1023	1482	51082	1528	2213	76308	2228	3229	111316	3118	4517	155731
2,0	80	115	3805	124	180	5945	194	282	9288	319	462	15218	498	721	23778	778	1127	37154	1235	1789	58985	1845	2673	88113	2691	3899	128536	3765	5455	179823
2,5	93	135	4254	146	211	6646	228	330	10385	373	541	17014	584	845	26585	912	1321	41539	1448	2097	65947	2163	3132	98514	3155	4569	143708	4413	6392	201048
3,0	107	155	4660	167	242	7281	261	379	11376	428	620	18638	669	969	29122	1046	1514	45504	1660	2404	72242	2480	3591	107916	3618	5239	157424	5062	7329	220237
3,5	121	175	5033	189	273	7864	295	427	12287	483	700	20132	755	1093	31456	1180	1708	49150	1873	2712	78030	2798	4051	116563	4082	5909	170038	5710	8267	237884
4,0	135	195	5380	210	304	8407	328	475	13136	538	779	21522	841	1217	33628	1314	1902	52543	2086	3019	83417	3116	4510	124611	4545	6579	181778	6359	9204	254308
4,5	148	215	5707	232	335	8917	362	524	13933	593	858	22827	927	1341	35667	1448	2095	55730	2299	3327	88477	3434	4969	132170	5009	7249	192805	7008	10142	269735
5,0	162	234	6015	253	366	9399	396	572	14686	648	938	24062	1013	1465	37597	1582	2289	58745	2512	3634	93263	3752	5429	139319	5473	7919	203234	7657	11079	284325
5,5	176	254	6309	275	397	9858	429	621	15403	703	1017	25236	1098	1589	39432	1716	2483	61612	2725	3942	97815	4070	5888	146119	5938	8589	213153	8307	12017	298203
6,0	190	274	6590	296	428	10296	463	669	16088	758	1096	26359	1184	1713	41185	1851	2676	64352	2938	4249	102165	4389	6347	152617	6402	9259	222632	8957	12954	311463
6,5	203	294	6859	318	459	10717	496	718	16745	813	1176	27435	1270	1837	42867	1985	2870	66979	3151	4557	106337	4708	6807	158849	6867	9929	231722	9607	13891	324181
7,0	217	314	7118	339	490	11121	530	766	17377	868	1255	28470	1356	1961	44485	2119	3064	69508	3365	4864	110351	5026	7266	164845	7332	10600	240470	10258	14829	336418
7,5	231	334	7367	361	521	11512	563	814	17987	923	1334	29470	1442	2085	46046	2254	3257	71948	3578	5172	114224	5345	7725	170631	7797	11270	248910	10909	15766	348226
8,0	245	353	7609	382	552	11889	597	863	18577	978	1414	30436	1529	2209	47557	2388	3451	74307	3792	5479	117970	5664	8185	176227	8263	11940	257073	11560	16704	359646
9,0	272	393	8071	425	614	12610	664	960	19704	1089	1572	32282	1701	2457	50441	2658	3839	78815	4219	6094	125126	6303	9103	186917	9194	13280	272667	12863	18578	381462
10,0	300	433	8507	468	676	13292	732	1056	20769	1199	1731	34029	1873	2705	53170	2927	4226	83078	4647	6709	131894	6942	10022	197027	10126	14620	287416	14167	20453	402097
11,0	327	472	8922	511	738	13941	799	1153	21783	1309	1890	35690	2046	2952	55765	3197	4613	87133	5075	7324	138332	7581	10941	206644	11059	15960	301445	15472	22328	421723
12,0	355	512	9319	555	800	14561	867	1250	22752	1420	2048	37277	2219	3200	58245	3467	5001	91007	5504	7939	144483	8222	11859	215833	11993	17300	314849	16779	24203	440475
13,0	383	552	9700	598	862	15156	934	1347	23681	1531	2207	38799	2392	3448	60623	3737	5388	94723	5933	8554	150383	8862	12778	224646	12928	18640	327705	18087	26078	458461
14,0	410	591	10066	641	924	15728	1002	1444	24575	1641	2366	40263	2565	3696	62911	4007	5775	98299	6362	9169	156060	9504	13697	233126	13864	19980	340075			
15,0	438	631	10419	684	986	16280	1070	1541	25437	1752	2524	41676	2738	3944	65119	4278	6163	101749	6792	9784	161537	10146	14615	241308	14800	21321	352011			
16,0	466	671	10761	728	1048	16814	1137	1638	26272	1863	2683	43043	2911	4192	67255	4549	6550	105086	7222	10399	166835	10788	15534	249222						
17,0	494	710	11092	771	1110	17331	1205	1734	27080	1974	2842	44368	3085	4440	69325	4820	6937	108320	7653	11014	171969	11432	16453	256892						
18,0	521	750	11414	815	1172	17834	1273	1831	27865	2086	3000	45654	3259	4688	71335	5092	7325	111461	8084	11629	176955	12076	17372	264340						
20,0	577	829	12031	902	1296	18798	1409	2025	29372	2308	3318	48124	3607	5184	75193	5635	8100	117490	8947	12859	186527	13365	19209	278639						
22,0	633	909	12618	989	1420	19716	1545	2219	30806	2531	3635	50473	3955	5680	78864	6180	8874	123224	9812	14089	195631		21046	292239						
24,0	689	988	13179	1076	1544	20593	1682	2412	32176	2755	3952	52717	4305	6175	82370	6726	9649	128704		15319	204330									
25,0	717	1028	13451	1120	1606	21017	1750	2509	32839	2867	4111	53804		6423	84069	7000	10036	131358		15934	208543									
26,0	745	1067	13717	1164	1668	21433	1818	2606	33490		4270	54870		6671	85734		10424	133959		16549	212673									
28,0	801	1147	14235	1251	1792	22243	1955	2800	34754		4587	56941		7167	88970		11198	139016												
30,0	857	1226	14735	1339	1916	23023	2093	2993	35974		4904	58939		7663	92093		11973	143895												
32,0	914	1305	15218	1427	2040	23778		3187	37154		5222	60872		8159	95113		12748	148614												
34,0		1385	15686		2164	24510		3381	38297																					
36,0		1464	16141		2288	25221		3574	39407																					
38,0		1543	16584		2412	25912		3768	40487																					
40,0		1623	17014		2535	26585		3962	41539																					

I - Saturated steam [kg/h].

II - Air to 0 °C and 1.013 bar in [Nm³/h].

III - Water to 20 °C [l/h].

For other, not so dense liquids, other than water at 20 °C apply:

$$V_L = \sqrt{\frac{\rho_A}{\rho_L}} \cdot V_A \text{ ó } V_A = V_L \cdot \sqrt{\frac{\rho_L}{\rho_A}}$$

V_A = Water flow according to table.
V_L = Liquid flow.
ρ_A = Water density at a 20 °C.
(ρ_A = 998 kg/m³)
ρ_L = Liquid density.

ATTENTION: Flow rates according to ASME VIII Div.1/API 520 with 10% overpressure.

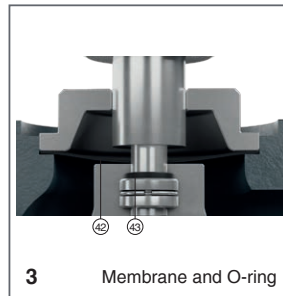
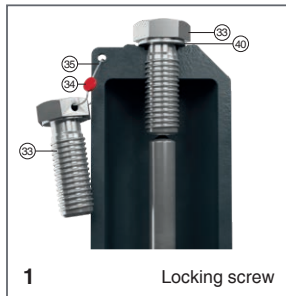
Depending on demand

- 1.- Blocking screw which facilitates hydrostatic testing of the container which to be protected.
- 2.- Fluorelastomer (Vitón) seals, Silicone's rubber, PTFE (Teflón) etc., achieving leakage levels less than: $0,3 \times 10^{-3} \frac{\text{Pa cm}^3}{\text{seg.}}$

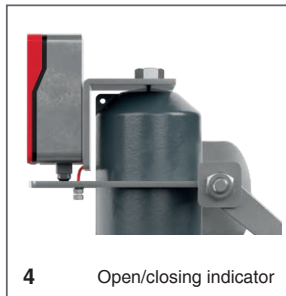
The ranges of application allow certain flexibility although we recommend limiting them to:

SEALS		TEMPERATURE RANGE OF THE SEALS [°C]	
		MINIMUM	MAXIMUM
SILICONE'S RUBBER	S	-60	200
FLUORELASTOMER (Vitón)	V	-20	200
PTFE (Teflon)	T	-200	260

- 3.- Fluorelastomer (Vitón) membrane and O-ring isolating the rotating or sliding parts from the working fluid.
- 4.- Electrical contact indicating open/closed.
- 5.- Balance bellows to:
 - Protect the spring from atmospheric influences.
 - Ensure outside of valve body is totally tightness.
 - Level out external or self-generated back pressure.
- 6.- Possibility of manufacture in other types of material, for special operating conditions (high temperatures, fluids, etc.).
- 7.- Totally free of oil and grease, to work with oxygen, avoiding possible fire risks (UV-Oxygen VBG 62).
- 8.- Special springs for critical temperatures.



33	Screw
34	Seal
35	Sealing whire
36	Shutter
37	Sealing disc
38	Washer
39	Nut
40	Joint
41	Membrane
42	O-ring



Specifications

- 90° angular flow.
- Activated by direct action helicoid spring.
- Simplicity of construction ensuring minimum maintenance.
- Materials carefully selected for their resistance to corrosion. With the exception of washers and couplings, the valves are free of non-ferric materials.
- Internal body designed to offer favourable flow profile.
- Sealing surfaces treated and balanced, making them extremely tightness, even exceeding EN 12266-1 requirements.
- Great discharge capacity. For liquids typically used with openings similar to proportional safety valves.
- Equipped with draining screws for removing condensation.
- Auto-centering plug.
- Threaded shaft with lever positioner facilitating immediate manual action.
- Elevator, independent of the seal, designed facilitate sudden opening when the steam expands and, with any fluid, guarantees absolute opening and closing precision.
- All the valves are supplied sealed at the set pressure requested, simulating operational conditions, and are vigorously tested.
- All components are numbered, registered and checked. If requested in advance, material, casting, test and efficiency certificates will be enclosed with the valve, and the instruction manual, in accordance with P.E.D. 2014/68/EU.