



Full lift safety valve with spring loading. (AIT)

Mod. 586 | ASME | SI



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 2" to 16" x 20"

Temperature range

- -60 °C to +420 °C

Applications

- Gas, Steam and Liquids

Materials

- Carbon steel
- Stainless steel

Maximum pressure

- Up to 62 bar

Regulation

- PED 2014/68/EU
- UNE-EN ISO 4126-1
- ASME B16.34
- ASME B16.5
- API 526

Certification



N°. PIECE	PIECE	MATERIAL	
		CARBON STEEL	STAINLESS STEEL
1	Body	Carbon steel (ASTM-A 216 WCB)	Stainless steel (ASTM A351 CF8M)
2	Closed bell	Carbon steel (ASTM-A 216 WCB)	Stainless steel (ASTM A351 CF8M)
3	Open bell	Carbon steel (ASTM-A 216 WCB)	Stainless steel (ASTM A351 CF8M)
4	Hood	Nodular iron (ASTM-A 536 65-45-12)	Stainless steel (ASTM A351 CF8M)
5	Elevator	Nodular iron (ASTM-A 536 65-45-12) (1)	Stainless steel (ASTM A351 CF8M) (2)
6	Lever	Carbon steel (ASTM-A 570 36)	Stainless steel (AISI-304)
7	Plug	Carbon steel (ASTM-A 570 36)	Carbon steel (ASTM-A 570 36)
9	Lead	Stainless steel (AISI-420F)	Stainless steel (AISI-360)
10	Cam	Stainless steel (AISI-420F) (3)	Stainless steel (AISI-316) (4)
11	Spring press	Carbon steel (AISI-1045)	Stainless steel (AISI-303)
12	Separator	Stainless steel (AISI-420F)	Stainless steel (AISI-316)
13	Rod	Stainless steel (AISI-420F)	Stainless steel (AISI-316)
14	Lever shaft	Carbon steel (AISI-1045)	Stainless steel (AISI-303)
15	Gudgeon	Carbon steel (AISI-1070)	Stainless steel (AISI-301)
16	Ring	Stainless steel (AISI-420F)	Stainless steel (AISI-316)
17	Safety ring	Stainless steel (AISI-301)	Stainless steel (AISI-301)
18	Spring	Chrome vanadium steel (AISI 6150) (5)	Stainless steel (AISI-301) (6)
19	Gland	Carbon 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	Carbon steel (AISI-1015)	Stainless steel (AISI-316)
24	Nut	Carbon steel (AISI-1015)	Stainless steel (AISI-316)
25	Washer	Carbon steel (AISI-1015)	Stainless steel (AISI-316)
26	Stud	Carbon steel (AISI-1035)	Stainless steel (AISI-316)
27	Screw	Carbon steel (AISI-1045)	Stainless steel (AISI-316)
28	Cap	Carbon steel (AISI-1035)	Stainless steel (AISI-316)
29	Coupling	Graphite	PTFE (Teflon)
30	Coupling	PTFE (Teflon)	PTFE (Teflon)
31	Seal	Graphite	PTFE (Teflon)
32	Seating	Carbon steel (ASTM-A 105) (7)	Stainless steel (AISI-316TI) (8)
33	Seal	Plastic	Plastic
34	Sealing wire	Sealing wire	Sealing wire
35	Characteristic plate	Stainless steel (AISI-304)	Stainless steel (AISI-304)
NPS1 x NPS2		1" x 2" to 16" x 20"	
CLASS [lbs]		600 x 150	
OPERATING CONDITIONS	PRESSURE [bar]	62	62
	MAXIMUM TEMPERATURE [°C]	420	400
	MINIMUM TEMPERATURE [°C]	-10	-60

(1) 1" x 2" in Stainless steel (ASTM A351 CF8M).

(2) 1 1/2" x 3" to 4" x 6" (L) in Stainless steel (AISI 316).

(3) From 6" x 8" to 16" x 20" in Stainless steel (DIN-1.4027).

(4) From 6" x 8" to 16" x 20" in Stainless steel (ASTM A351 CF8M).

(5) 1" x 2" from 30 to 40 and 38 to 50 bar in Spring steel (ASTM-A 225),

1 1/2" x 2" from 30 to 40 bar in Spring steel (ASTM-A 225). Maximum temperature EP, ES and CP 250 °C / AP 400 °C. Above 400 °C possibility of manufacturing the spring in another material if specified by the customer.

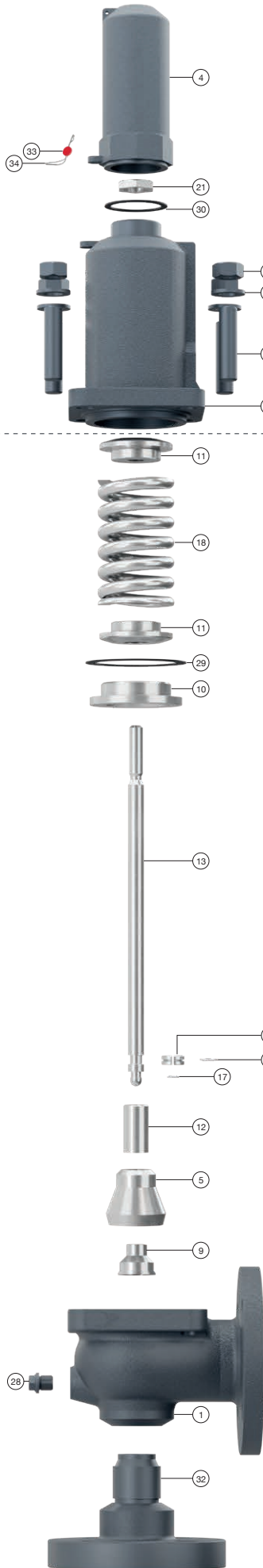
(6) 1" x 2" from 30 to 40, 38 to 50 and 48 to 62 bar in Stainless steel EN-1.4310 (AISI 301), 1 1/2" x 2" from 30 to 40, 38 to 50 and 48 to 62 bar in Stainless steel EN-1.4310 (AISI 301).

(7) From 4" x 6" (P) to 16" x 20" in Carbon steel EN-1.0619 (ASTM-A 216 WCB)

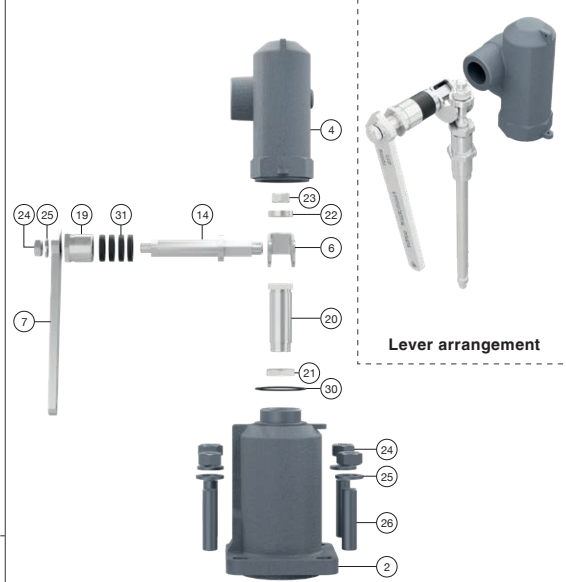
(8) From 4" x 6" (P) to 16" x 20" in Stainless steel EN-1.4408 (ASTM A351 CF8M)



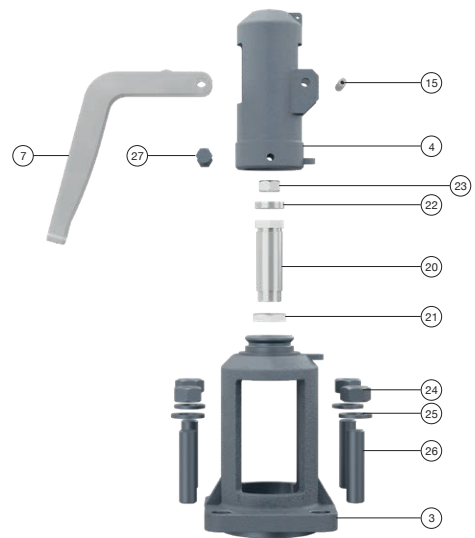
ES Isometric view



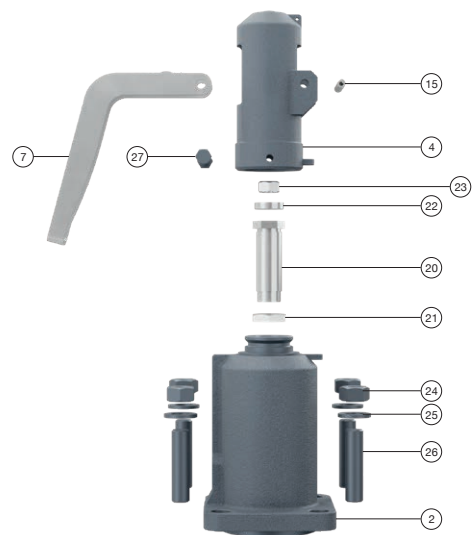
ES Exploded view



EP Hood exploded view



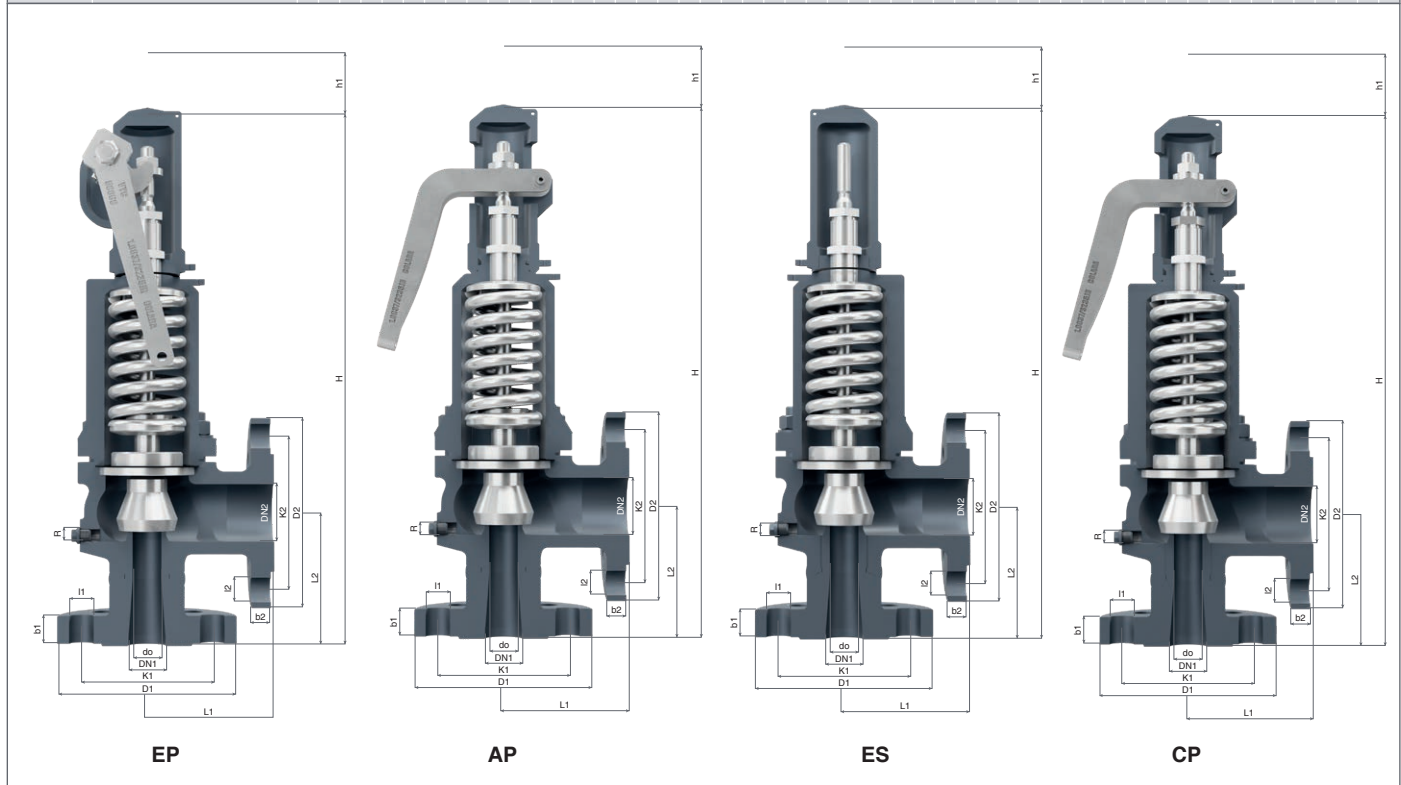
AP Hood exploded view



CP Hood exploded view

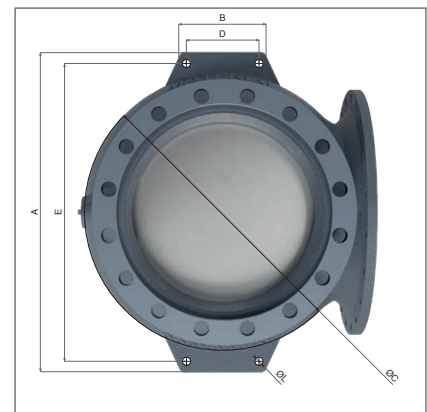
Lever arrangement

DIMENSIONS															
NPS1 x NPS2		1" x 2"	1 1/2" x 2"	1 1/2" x 3"	2" x 3"	3" x 4"	4" x 6"	4" x 6"	4" x 6"	6" x 8"	8" x 10"	10" x 14"	12" x 16"	16" x 20"	
API ORIFICE LETTER		D-E	F	G	H	K	L	N	P	Q	T	V	W	X	
do [mm]		16	20	25	32	40	50	63	93	110	155	180	220	280	
Ao: $\frac{\pi \cdot do^2}{4}$ [mm²]		201	314	491	804	1257	1963	3117	6793	9503	18869	25447	38013	61575	
H [mm]		400	433	503	564	694	740	835	702	1158	1282	1430	1600	1935	
h1 [mm]		150	150	175	175	225	225	225	300	385	400	420	552	590	
L1 [mm]		114	152	152	162	181	203	222	254	241	279	300	335	375	
L2 [mm]		105	124	124	154	184	179	197	225	240	276	340	370	415	
R		1/4"	1/4"	1/4"	1/4"	3/8"	3/8"	3/8"	1/2"	1/2"	1/2"	3/4"	3/4"	3/4"	
		Female Threads Gas Whitworth Cylindrical ISO 228/1 (DIN-259)													
INLET FLANGE (1)	Class 600 lbs ASME/ANSI B16.5	D1 [mm]	125	155	155	165	210	275	275	275	355	380	445	520	650
		k1 [mm]	88,9	114,3	114,3	114,3	168,3	215,9	215,9	215,9	292,1	330,2	387,4	450,8	571,5
		l1 [mm]	19,1	22,2	22,2	19,1	22,2	25,4	25,4	25,4	28,6	25,4	28,6	31,8	34,9
		b1 [mm]	17,5	22,3	22,3	25,4	31,8	38,1	31,8	44,5	47,7	39,7	46,1	49,3	55,6
		SCREWS N°	4	4	4	8	8	8	8	8	12	12	16	16	20
OUTLET FLANGE	Class 150 lbs ASME/ANSI B16.5	D2 [mm]	150	150	190	190	230	280	280	280	345	405	535	595	700
		k2 [mm]	120,7	120,7	152,4	152,4	152,4	241,3	241,3	241,3	298,5	362	476,3	539,8	635
		l2 [mm]	19,1	19,1	19,1	19,1	19,1	22,2	22,2	22,2	22,2	25,4	28,6	28,6	31,8
		b2 [mm]	17,5	17,5	22,3	22,3	22,3	23,9	23,9	23,9	27	28,9	33,4	35	41,3
		SCREWS N°	4	4	4	4	8	8	8	8	8	12	12	16	20
MODEL		EP	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D
WEIGHT [kg]	CARBON STEEL	9,3	9,9	9,9	9,9	9,9	9,9	9,9	9,9	9,9	9,9	9,9	9,9	9,9	9,9
	STAINLESS STEEL	9,9	10,4	10,4	10,4	10,4	10,4	10,4	10,4	10,4	10,4	10,4	10,4	10,4	10,4
CODE	CARBON STEEL 2002-586.	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D	0104D
	STAINLESS STEEL 2002-586.	0102D	0102D	0102D	0102D	0102D	0102D	0102D	0102D	0102D	0102D	0102D	0102D	0102D	0102D



(1) From 8" x 10" to 16" x 20" class 300 lbs

SUPPORT BRACKETS								
NPS1 x NPS2	A [mm]	B [mm]	ØC [mm]	D [mm]	E [mm]	ØL [mm]	THICKNESS [mm]	SCREWS N°
2" x 3"	210	98	166	70	180	14	14	4 x M12
3" x 4"	250	100	200	70	220	14	14	4 x M12
4" x 6"	344	129	292	90	309	18	20	4 x M16
6" x 8"	440	184	370	120	400	18	20	4 x M16
8" x 10"	440	184	370	120	400	18	20	4 x M16
10" x 14"	664	195	581	160	624	23	20	4 x M20
12" x 16"	710	215	616	180	655	23	23	4 x M20
16" x 20"	880	238	760	200	820	23	23	4 x M20



Brackets shall only be drilled to the customer's specification.

PRESSURES AND SPRING REGULATION RANGES															
NPS1 x NPS2			1" x 2"	1 1/2" x 2"	1 1/2" x 3"	2" x 3"	3" x 4"	4" x 6"	4" x 6"	4" x 6"	6" x 8"	8" x 10"	10" x 14"	12" x 16"	16" x 20"
API ORIFICE LETTER			D - E	F	G	H	K	L	N	P	Q	T	V	W	X
REGULATION PRESSURE [barg]	MAXIMUM (LIQUIDS AND GAS)	600#	62	62	62	62	62	62	50	25	20	10	8	7	6
	MAXIMUM (SATURATED STEAM)	600#	62	62	62	62	62	62	50	25	20	10	8	7	6
	STEAM AND GAS		30	30	30	23	23	23	18	12	9,5	7,5	0,5	0,5	0,5
	MINIMUM LIQUIDS		38	38	38	30	30	30	23	12	9,5	7,5	0,2	0,2	0,2
SPRING REGULATION RANGES [barg]	0,20 to 0,68	CODE											56627	56579	56588
	0,66 to 1,00	CODE											56628	56580	56589
	0,95 to 1,40	CODE											56629	56581	56590
	1,30 to 1,90	CODE											56630	56582	56591
	1,80 to 2,60	CODE											56631	56583	56592
	2,50 to 3,60	CODE											56632	56584	56593
	3,50 to 5,00	CODE											56633	56585	56594
	4,80 to 6,30	CODE											56577	56586	56595
	6,00 to 8,00	CODE											56578	56587	
	7,50 to 10,00	CODE										56569			
	9,50 to 12,50	CODE									56566				
	12,00 to 16,00	CODE								56563	56567				
	15,00 to 20,00	CODE								56564	56568				
	18,00 to 25,00	CODE							56576	56565					
	23,00 to 32,00	CODE				56573	56574	56575	56557						
	30,00 to 40,00	CODE	56570	56571	56572	56548	56551	56554	56558						
	38,00 to 50,00	CODE	56542	56544	56546	56549	56552	56555	56559						
	48,00 to 62,00	CODE	56543	56545	56547	56550	56553	56556							

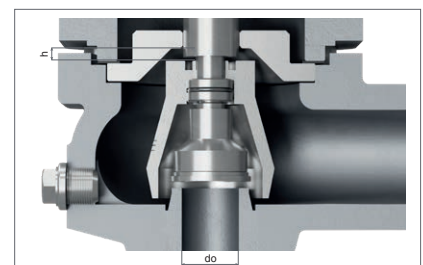
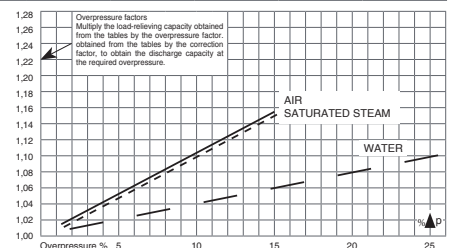
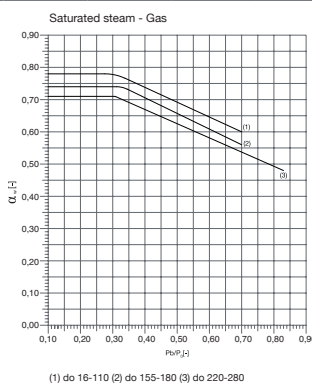
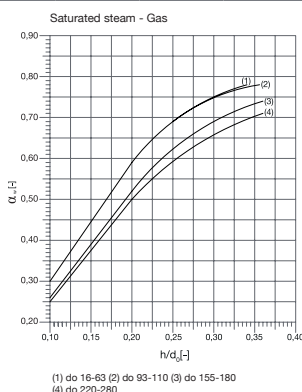
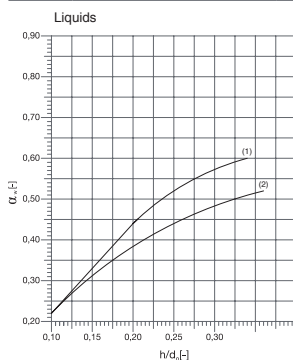
— Spring steel (EN-10270-1-SH). — Stainless steel (AISI 301 / SA 313-302). — Chrome vanadium steel (AISI 6150 / SA 304).

RECOMMENDED RANGES OF APPLICATION					
MODELO		EP	AP(1)	ES	CP(1)
FLUID	SATURATED STEAM	*	*		*
	GAS	*		*	
	LIQUIDS	*		*	
	INTERNAL OR GENERATED				
PERMISSIBLE BACK PRESSURE IN % OF SET PRESSURE	INTERNAL OR GENERATED			15	
	EXTERNAL VARIABLE (1)			5	
	EXTERNAL CONSTANT (1) (2) (3)			50	
	EXTERNAL CONSTANT (1) (2) (3)			90	
% OVERPRESSURE	SATURATED STEAM			10	
	LIQUIDS			25	

OPEN AND CLOSED PRESSURES IN % OF SET PRESSURE			
FLUID	PRESSURE [bar]	OPENING PRESSURE	CLOSING PRESSURE
SATURATED STEAM	< 3	+ 10 %	- 0,3 bar
GAS	≥ 3	+ 10 %	- 10 %
LIQUIDS	< 3	+ 10 %	- 0,6 bar
	≥ 3	+ 10 %	- 20 %

(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. If $p_b > 0,25$ po we must limit plug speed with the consequent reduction of the Kdr coefficient of discharge. With the new reduced coefficient we determine the do, in order to remove the necessary volume. p_b = Backpressure permitted [bar] absolute. p_o = Set pressure [bar] absolute. Kdr = Coefficient of discharge.

DISCHARGE COEFFICIENTS														
NPS1 x NPS2		1" x 2"	1 1/2" x 2"	1 1/2" x 3"	2" x 3"	3" x 4"	4" x 6"	4" x 6"	4" x 6"	6" x 8"	8" x 10"	10" x 14"	12" x 16"	16" x 20"
do [mm]		16	20	25	32	40	50	63	93	110	155	180	220	280
h [mm]		7,00	9,00	12,00	12,00	18,00	18,00	20,00	34,40	36,80	56,15	64,80	79,20	100,80
h1 [mm]		2,60	3,20	4,00	5,20	6,50	8,00	10,00	16,74	19,80	27,90	32,4	39,6	50,4
h/do [mm]		0,44	0,45	0,48	0,38	0,45	0,36	0,32	0,37	0,33	0,36	0,36	0,36	0,36
h1/do (1) [mm]		0,16	0,16	0,16	0,16	0,16	0,16	0,16	0,18	0,18	0,18	0,18	0,18	0,18
DISCHARGE COEFFICIENTS [kdr]	SATURATED STEAM GAS	0,78										0,74		0,71
	LIQUIDS	0,60								0,52			-	
	LIQUIDS WITH STROKE LIMITATOR (1)	0,36										-		



DISCHARGE CAPACITIES																						
NPS1 x NPS2	1" x 2"			1 1/2" x 2"			1 1/2" x 3"			2" x 3"			3" x 4"			4" x 6"			4" x 6"			
d0 [mm]	16			20			25			32			40			50			63			
A0= $\frac{\pi \cdot d_0^2}{4}$ [mm²]	201			314			491			804			1257			1964			3117			
p [barg]	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	
0,2																						
0,5																						
1,0																						
1,5																						
2,0																						
2,5																						
3,0																						
3,5																						
4,0																						
4,5																						
5,0																						
5,5																						
6,0																						
6,5																						
7,0																						
7,5																						
8,0																						
9,0																						
10,0																						
11,0																						
12,0																						
13,0																						
14,0																						
15,0																						
16,0																						
17,0																						
18,0																			26551			
20,0																			29360			
22,0										8299			12968			20262			32168	42872	468062	
23,0										8662			13534			21147			33572	44744	478582	
24,0										9024			14100			22031			34976	46615	488875	
26,0										9748			15232			23800			37785	50358	508837	
28,0										10473			16364			25569			40593	54101	528045	
30,0	2799			4374			6834			11198	14924	141017	17496	23318	220339	27338	36435	344280	43401	57844	546579	
32,0	2981			4657			7277			11922	15889	145642	18628	24827	227565	29107	38792	355571	46210	61586	564504	
34,0	3162			4940			7719			12647	16855	150124	19760	26336	234569	30876	41150	366514	49018	65329	581878	
36,0	3343			5223			8161			13371	17821	154476	20892	27845	241369	32644	43507	377140	51826	69072	598747	
38,0	3524	4697	39677	5506	7338	61996	8603	11466	96869	14096	18786	158709	22025	29353	247984	34413	45865	387474	54635	72815	615154	
40,0	3705	4938	40708	5789	7716	63606	9046	12056	99385	14820	19752	162833	23157	30862	254426	36182	48222	397540	57443	76558	631135	
42,0	3886	5179	41713	6072	8093	65177	9488	12645	101839	15545	20718	166854	24289	32371	260709	37951	50580	407358	60251	80301	646721	
44,0	4067	5421	42695	6355	8470	66711	9930	13234	104236	16269	21683	170780	25421	33880	266844	39720	52937	416944	63060	84043	661940	
46,0	4248	5662	43655	6638	8847	68210	10372	13824	106579	16994	22649	174618	26553	35389	272841	41489	55295	426314	65868	87786	676817	
48,0	4430	5904	44594	6921	9224	69677	10814	14413	108871	17718	23614	178374	27685	36898	278709	43258	57652	435484	68676	91529	691374	
50,0	4611	6145	45513	7204	9602	71114	11257	15003	111116	18443	24580	182052	28817	38406	284457	45027	60010	444464	71485	95272	705630	
52,0	4792	6386	46414	7487	9979	72523	11699	15592	113316	19168	25546	185658	29949	39915	290090	46796	62368	453266				
54,0	4973	6628	47299	7770	10356	73904	12141	16181	115475	19892	26511	189194	31081	41424	295616	48565	64725	461900				
56,0	5154	6869	48167	8053	10733	75260	12583	16771	117594	20617	27477	192666	32214	42933	301041	50334	67083	470376				
58,0	5335	7111	49019	8336	11110	76592	13026	17360	119675	21341	28443	196076	33346	44442	306369	52103	69440	478702				
60,0	5516	7352	49857	8619	11488	77902	13468	17949	121721	22066	29408	199428	34478	45951	311607	53871	71798	486885				
62,0	5698	7593	50681	8902	11865	79189	13910	18539	123733	22790	30374	202725	35610	47459	316758	55640	74155	494934				

I - Saturated steam [kg/h].

II - Air to 0 °C and 1.013 bar [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.

DISCHARGE CAPACITIES																		
NPS1 x NPS2	4" x 6"			6" x 8"			8" x 10"			10" x 14"			12" x 16"			16" x 20"		
d0 [mm]	93			110			155			180			220			280		
$A_0 = \frac{\pi \cdot d_0^2}{4}$ [mm²]	6793			9503			18870			25450			38010			61575		
p [barg]	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
0,2										12061	18446	425737	17287	26438	635978	28002	42826	1030180
0,5										15323	22399	563198	21963	32104	841320	35576	52003	1362800
1,0										20761	28987	737399	29756	41546	1101547	48200	67297	1784323
1,5										26198	34916	864677	37549	50044	1291678	60823	81063	2092305
2,0										31636	42163	998443	45342	60430	1491501	73447	97887	2415985
2,5										37073	49409	1116293	53135	70817	1667549	86071	114711	2701154
3,0										42510	56656	1222838	60929	81203	1826708	98694	131536	2958966
3,5										47948	63903	1320816	68722	91590	1973071	111318	148360	3196048
4,0										53385	71149	1412012	76515	101976	2109301	123942	165184	3416719
4,5										58822	78396	1497664	84308	112363	2237252	136565	182009	3623978
5,0										64260	85643	1578677	92101	122749	2358270	149189	198833	3820008
5,5										69697	92890	1655730	99895	133136	2473375	161813	215658	4006458
6,0										75135	100136	1729354	107688	143522	2583356	174436	232482	4184609
6,5										80572	107383	1799969	115481	153908	2688842			
7,0										86009	114630	1867916	123274	164295	2790343			
7,5							67809	90373	1433697	91447	121876	1933476	131067	174681	2888280			
8,0							71841	95746	1480716	96884	129123	1996886	138861	185068	2983002			
9,0				42419	56534	790988	79904	106493	1570536									
10,0				46699	62239	833774	87968	117240	1655490									
11,0				50980	67944	874470												
12,0	39500	52644	652860	55261	73649	913354												
13,0	42560	56722	679518	59542	79355	950649												
14,0	45620	60800	705169	63822	85060	986535												
15,0	48680	64878	729919	68103	90765	1021161												
16,0	51740	68956	753857	72384	96470	1054651												
17,0	54799	73034	777058	76665	102176	1087109												
18,0	57859	77113	799586	80945	107881	1118626												
20,0	63979	85269	842838	89507	119291	1179135												
22,0	70099	93425	883976															
24,0	73159	97503	903843															
25,0	76218	101581	923283															
26,0																		
28,0																		
30,0																		
32,0																		
34,0																		
36,0																		
38,0																		
40,0																		
42,0																		
44,0																		
46,0																		
48,0																		
50,0																		
52,0																		
54,0																		
56,0																		
58,0																		
60,0																		
62,0																		

I - Saturated steam [kg/h].

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

III - Water to 20 °C [l/h].

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

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

V_A = Water flow according to table.

V_L = Liquid flow.

ρ_A = Water density at a 20 °C.

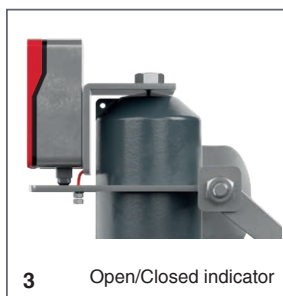
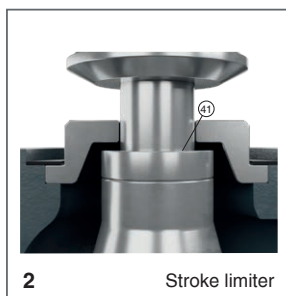
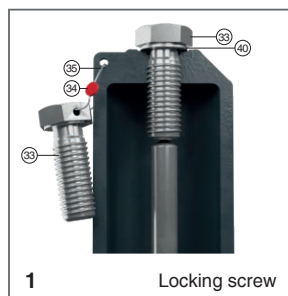
(ρ_A = 998 kg/m³)

ρ_L = Liquid density.

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

Depending on demand

- 1.- Locking screw that facilitates the hydrostatic test of the container to be protected.
- 2.- Stroke limiter to reduce the coefficient of discharge
- 3.- Opening/closing indicator electrical contact.
- 4.- Balancing bellows to:
 - Protect the spring against environmental influences.
 - Ensure the valve body is completely sealed to the outside.
 - To level out the back pressure generated by others or by the valve itself.



33	Screw
34	Seal
35	Sealing wire
40	Joint
50	Limiter

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.