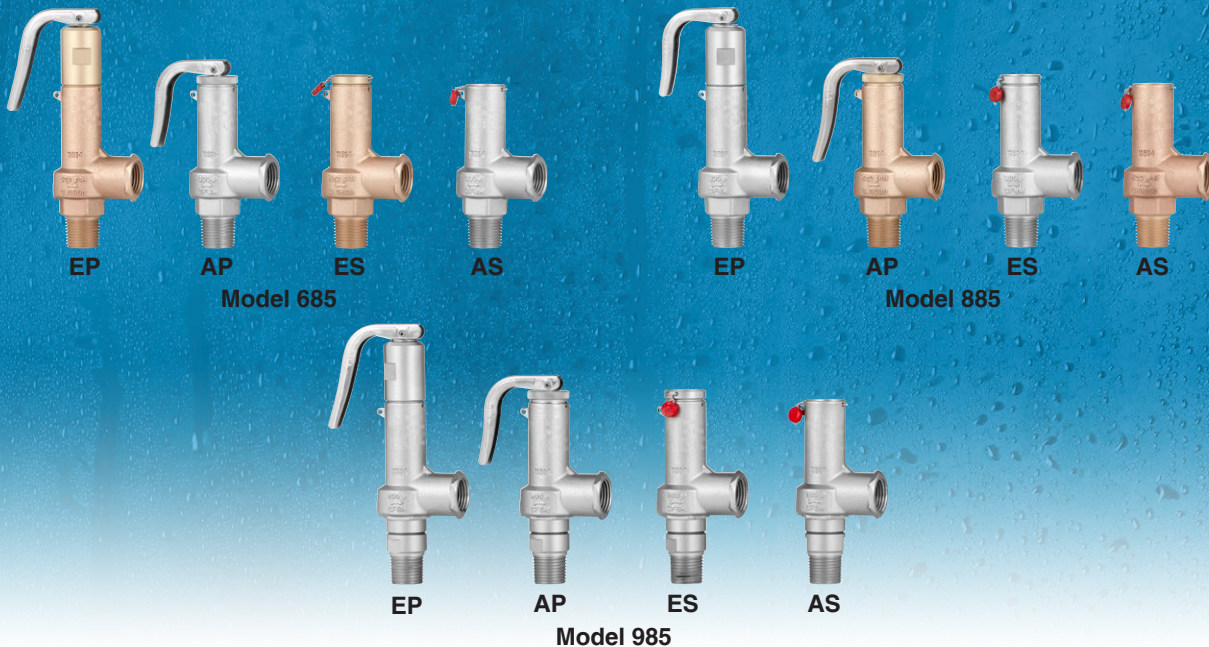


Full lift safety valve with spring loading. (AIT)



ASME
SI Units

Model 685 Model 885 Model 985



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 instantly and totally.

Design in accordance with "ASME code section VIII". Materials according ASME code section II and ASTM.

Connections according ASME B1.20.1 standard..

In accordance with the requirements of the pressure equipment directive 2014/68/EU.

EC valve verification certified by: TÜV Internacional Grupo TÜV Rheinland, S.L. EC 0035. Type (Module D) EC examination report nº

33530455 certified by: TÜV Internacional Grupo TÜV Rheinland, S.L. In compliance with the ATEX 2014/34/EU directive

"Protective equipment and systems for use in potentially explosive atmospheres".

Other authorisations: ISCIR, ITI, NASTHOL,EAC,...etc.

Specifications

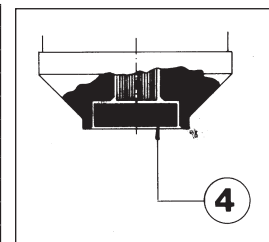
- 90° angular flow.
- Activated by direct action helicoid spring.
- Simplicity of construction ensuring minimum maintenance.
- Materials carefully selected for their resistance to corrosion.
- Internal body designed to offer favourable flow profile.
- Sealing surfaces balanced and making them extremely tightness, even exceeding API-527 requirements.
- Great discharge capacity. For liquids typically used with openings similar to proportional safety valves.
- Auto-centering plug.
- Totally precise open and close.
- 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.

IMPORTANT

1.- Fluorelastomer (Vitón) seals, Silicone's rubber, PTFE (Teflón) o Perfluorelastomer (FFKM).

Achieving leakage levels less than: $0,3 \times 10^{-3} \frac{\text{Pa cm}^3}{\text{seg.}}$

		RANGE OF APPLICATION FOR THE SEALS							
		SET PRESSURE IN bar							
FLUID		0,20	1,80	4,80	20,00	30,00	36,01	45,00	144,00
Saturated steam		S		V		K	T		
Liquids and gases			S		V	K		T	
SEALS		TEMPERATURE IN °C							
		MINIMUM			MAXIMUM				
Silicone's rubber	S	-50			200				
Fluorelastomer (Vitón)	V	-20			220				
PTFE (Teflón)	T	-196			260				
Perfluorelastomer (FFKM)	K	-10			250				



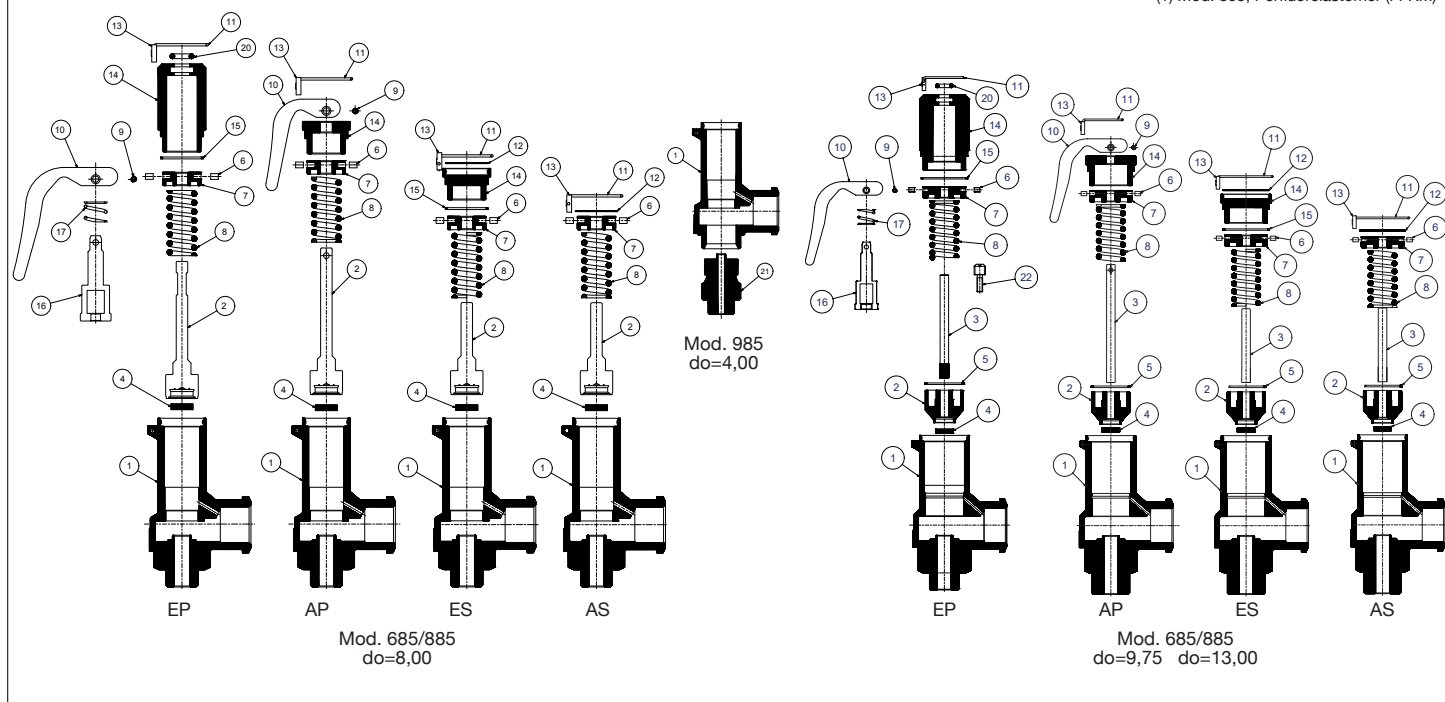
Depending on demand:

1. Buna-nitrils seals, Butyl, Natural rubber, E.P.D.M., Chlorosulphonate polyethylene (Hypalon), Neoprene, etc.
2. Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).

N.° PIECE	PIECE	MATERIAL	
		BRONZE	STAINLESS STEEL
1	Body	Bronze (EN-CC491K)	S. steel (EN-1.4408)
2	Plug	Brass (EN-CW617N)	S. steel (EN-1.4401)
3	Shaft	S. steel (EN-1.4305)	S. steel (EN-1.4305)
4	Seal	Silicone's rubber	Silicone's rubber
		Fluorelastomer (Viton)	Fluorelastomer (Viton)
		PTFE (Teflon)	PTFE (Teflon)
		Perfluorelastomer (FFKM)	Perfluorelastomer (FFKM)
5	Limiter ring	S. steel (EN-1.4310)	S. steel (EN-1.4310)
6	End-stop	PTFE (Teflon)	PTFE (Teflon)
7	Spring press	Brass (EN-CW617N)	S. steel (EN-1.4305)
8	Spring	S. steel (EN-1.4310)	S. steel (EN-1.4310)
9	Clip	S. steel (EN-1.4310)	S. steel (EN-1.4310)
10	Lever	S. steel (EN-1.4301)	S. steel (EN-1.4301)
11	Sealing wire	Sealing wire	Sealing wire
12	Characteristic plate	Aluminium	Aluminium
13	Seal	Plastic	Plastic
14	Cap	Brass (EN-CW617N)	S. steel (EN-1.4305)
15	Hood coupling	PTFE (Teflón)	PTFE (Teflón)
16	Piston	Latón (EN-CW617N)	S. steel (EN-1.4305)
17	Piston Spring	S. steel (EN-1.4310)	S. steel (EN-1.4310)
18	Inlet clamp	-	S. steel (EN-1.4404)
19	Outlet clamp	-	S. steel (EN-1.4404)
20	O-ring	Fluorelastomer (Viton) (1)	Fluorelastomer (Viton) (1)
21	Seat	-	S. steel (EN-1.4401)
22	Screw cap	S. steel (EN-1.4305)	S. steel (EN-1.4305)

MODEL		MNPT ₁ xFNPT ₂	3/8"x1/2" a 1"x1"	
			PMS 36 bar	40
685	OPERATING CONDITIONS	PN	PMS 36 bar	40
		PRESSURE IN bar	36	36
		MAX. TEMPERATURE IN °C	200	250
		MIN. TEMPERATURE IN °C	-60	-60
		MNPT ₁ xFNPT ₂	3/8"x1/2" a 1"x1"	
885	OPERATING CONDITIONS	PN	PMS 36 bar	40
		PRESSURE IN bar	36	36
		MAX. TEMPERATURE IN °C	200	250
		MIN. TEMPERATURE IN °C	-196	-196
		MNPT ₁ xFNPT ₂	3/8"x1/2" a 1/2"x1/2"	
985	OPERATING CONDITIONS	PN		160
		PRESSURE IN bar	-	144
		MAX. TEMPERATURE IN °C	-	250
		MIN. TEMPERATURE IN °C	-	-60
		MNPT ₁ xFNPT ₂	3/8"x1/2" a 1/2"x1/2"	

(1) Mod. 895; Perfluorelastomer (FFKM)



Full lift safety valve with spring loading (AIT) version EP.

1. Disassembly and assembly

1.1 Disassembly

To replace the spring (8) or clean any of the internal components of the valve, proceed in the following manner:

- A - Cut the seal thread (11) with pliers.
- B - Withdraw the fastener (9), using a punching tool, until the lever (10) comes free.
- C - Unscrew and extract the hood (14).
- D - Unscrew the piston (16) from the rod (3) and then the screw cap (22).
- E - Holding the rod (3), unscrew the spring press (7) until you note a releasing of the spring (8).
- F - Extract the spring (8).

1.2 Assembly

- A - Enter the spring (8) through the upper part of the rod (3).
- B - Screw the spring press (7) holding the rod (3) and the screw cap (22).
- C - Adjust the set pressure with the spring press (7).
- D - Screw the piston (16) to the rod (3).
- E - Screw the hood (14).
- F - Place the lever (10) and fix it with the fastener (9).

2. Adjusting the firing pressure

- A - Proceed according to points 1.1.A, 1.1.B, 1.1.C, 1.1.D, 1.1.E.
- B - Proceed according to points 1.2.C, 1.2.D, 1.1.E, 1.1.F.

Full lift safety valve with spring loading (AIT) version AP.

1. Disassembly and assembly

1.1 Disassembly

To replace the spring (8) or clean any of the internal components of the valve, proceed in the following manner:

- A - Cut the seal thread (11) with pliers.
- B - Withdraw the clip (9), using a punching tool, until the lever (10) comes free.
- C - Unscrew and extract the hood (14).
- D - Holding the rod (3), unscrew the spring press (7) until you note a releasing of the spring (8).
- E - Extract the spring (8).

1.2 Assembly

- A - Enter the spring (8) through the upper part of the rod (3).
- B - Screw the spring press (7) holding the rod (3).
- C - Adjust the set pressure with the spring press (7).
- D - Screw the hood (14).
- E - Place the lever (10) and fix it with the fastener (9).

2. Adjusting the firing pressure

- A - Proceed according to points 1.1.A, 1.1.B, 1.1.C, 1.1.D.
- B - Proceed according to points 1.2.C, 1.2.D, 1.1.E.

Full lift safety valve with spring loading (AIT) version ES.

1. Disassembly and assembly

1.1 Disassembly

To replace the spring (8) or clean any of the internal components of the valve, proceed in the following manner:

- A - Cut the seal thread (11) with pliers and extract the characteristic plate (12).
- B - Unscrew and extract the hood (14).
- C - Holding the rod (3), unscrew the spring press (7) until you note a releasing of the spring (8).
- D - Extract the spring (8).

1.2 Assembly

- A - Enter the spring (8) through the upper part of the rod (3).
- B - Screw the spring press (7) holding the rod (3).
- C - Adjust the set pressure with the spring press (7).
- D - Screw the hood (14).

2. Adjusting the firing pressure

- A - Proceed according to points 1.1.A, 1.1.B, 1.1.C.
- B - Proceed according to points 1.2.C, 1.2.D..

Full lift safety valve with spring loading (AIT) version AS.

1. Disassembly and assembly

1.1 Disassembly

To replace the spring (8) or clean any of the internal components of the valve, proceed in the following manner:

- A - Cut the seal thread (11) with pliers and extract the characteristic plate (12).
- B - Holding the rod (3), unscrew the spring press (7) until you note a releasing of the spring (8).
- C - Extract the spring (8).

1.2 Assembly

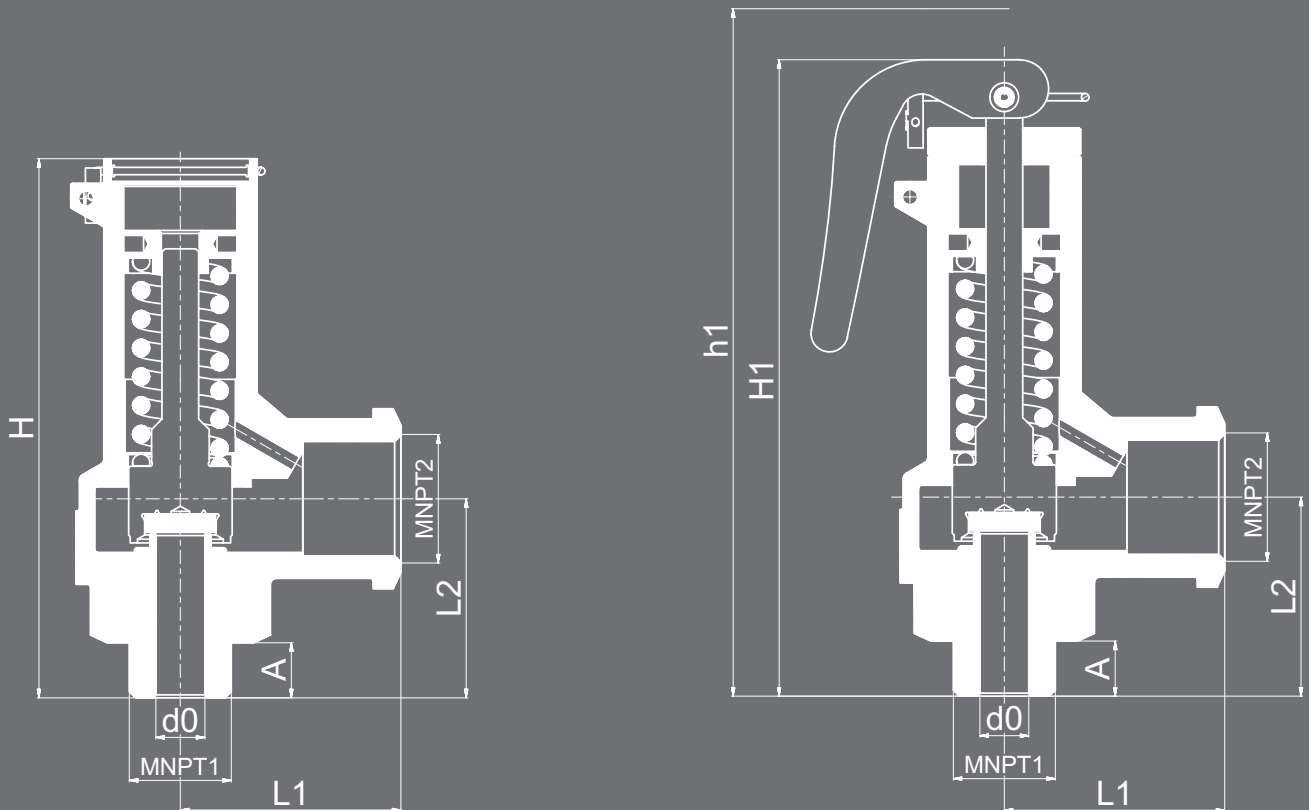
- A - Enter the spring (8) through the upper part of the rod (3).
- B - Screw the spring press (7) holding the rod (3).
- C - Adjust the set pressure with the spring press (7).

2. Adjusting the firing pressure

- A - Proceed according to points 1.1.A, 1.1.B.
- B - Proceed according to points 1.2.C.

MODELO 685/885/985

MNPT ₁ xFNPT ₂		3/8"x1/2"				1/2"x 1/2"				1/2"x 3/4"		
CONNECTIONS		Male thread x Female thread NPT ASME B1.20.1										
d ₀	685/885	8,00								9,75		
	985	4,00										
$A_0 = \frac{\pi \cdot d_0^2}{4}$	685/885	50,26								74,66		
	985	12,57										
H	685/885	-	88	-	-	-	91	-	-	-	109	
	985	-	99	-	-	-	102	-	-	-		
H ¹	685/885	102	-	136	93	105	-	139	96	127	-	
	985	113	-	147	-	116	-	150	107			
h ¹	685/885	119	-	148	109	122	-	151	112	142	-	
	985	130	-	159	120	133	-	162	123			
A	685/885/985	9				12				12		
L ₁	685/885/985	36								44		
L ₂	685/885	32,50				35,50				45,50		
	985	43,50				46,50						
WEIGHT IN Kgs.		EP	AP	ES	AS	EP	AP	ES	AS	EP	AP	
685/885/985	BRONZE	0,47	0,38	0,36	0,34	0,47	0,38	0,36	0,34	0,97	0,74	
	S. STEEL.	0,45	0,36	0,34	0,32	0,45	0,36	0,34	0,32	0,95	0,72	
CODE	685	BRONZE 2002-685.	83810	838110	838120	838130	80210	802110	802120	802130	80211	802111
		S. STEEL. 2002-685.	83820	838210	838220	838230	80220	802210	802220	802230	80221	802211
	885	BRONZE 2002-885.	83810	838110	838120	838130	80210	802110	802120	802130	80211	802111
		S. STEEL. 2002-885.	83820	838210	838220	838230	80220	802210	802220	802230	80221	802211
985	S. STEEL. 2002-985.	03820	03821	03822	03823	0022	00221	00222	00223			



MODEL 685/885/985

1/2"x 3/4"

3/4"x3/4"

3/4"x1"

1"x1"

Male thread x Female thread NPT ASME B1.20.1

9,75

13,00

74,66

132,73

- - - 112 - - - 138 - - - 141 - -

164 116 130 - 167 119 159 - 196 147 162 - 199 150

178 134 145 - 181 137 174 - 210 165 147 - 213 168

12

15

15

18

44

60

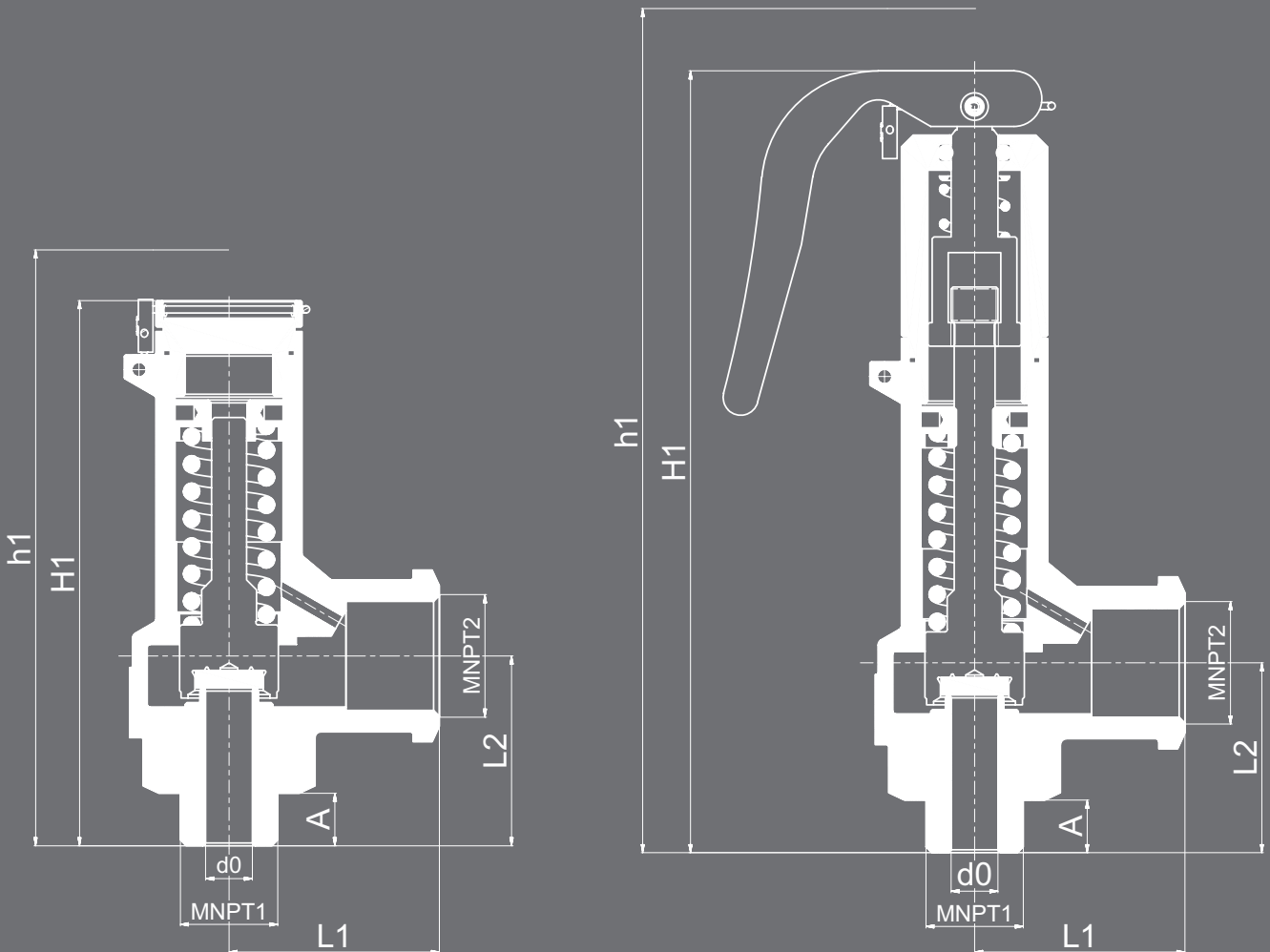
45,50

48,50

58,50

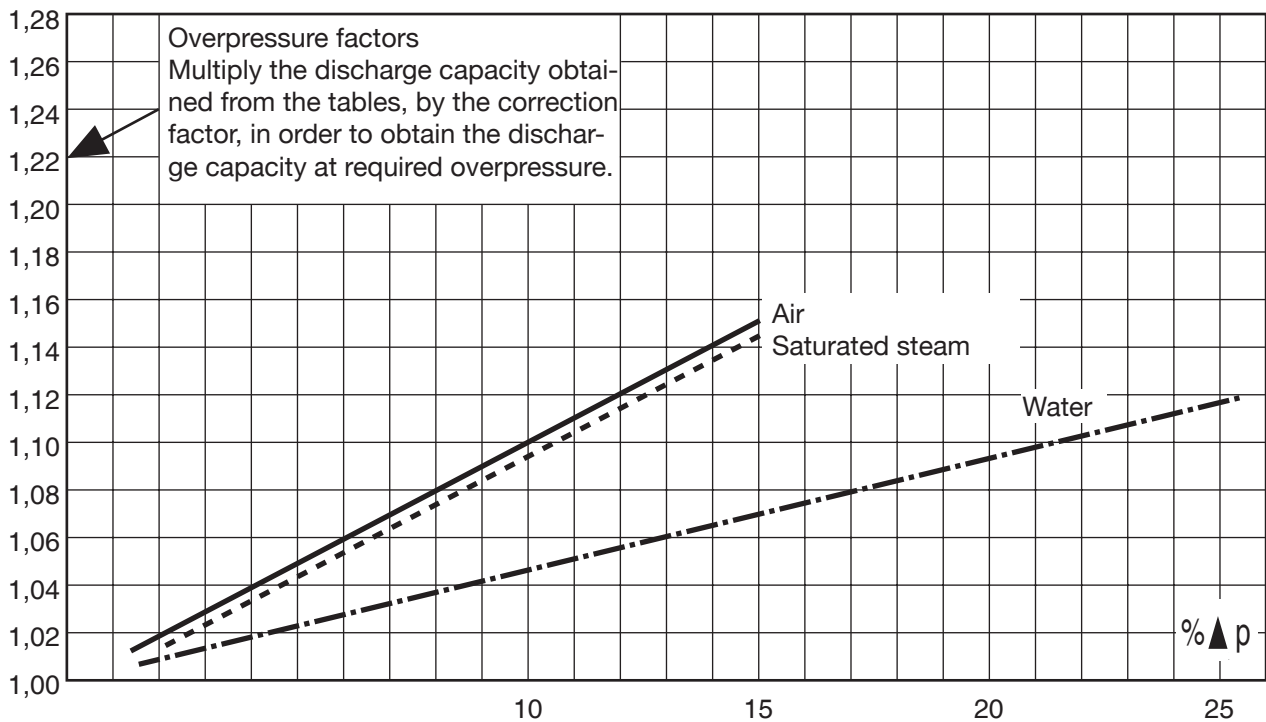
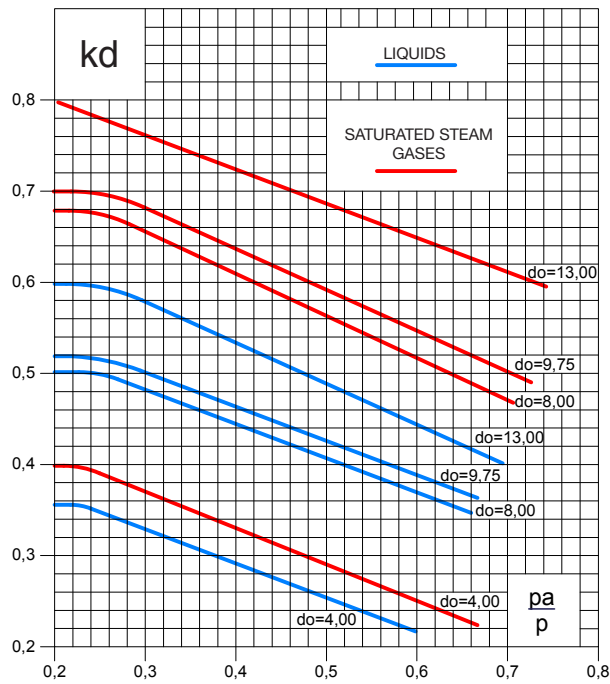
61,50

ES	AS	EP	AP	ES	AS	EP	AP	ES	AS	EP	AP	ES	AS
0,72	0,70	0,97	0,74	0,72	0,70	1,67	1,35	1,33	1,31	1,67	1,35	1,33	1,31
0,70	0,68	0,95	0,72	0,70	0,68	1,65	1,33	1,31	1,29	1,65	1,33	1,31	1,29
802121	802131	83410	834110	834120	834130	83411	834111	834121	834131	81010	810110	810120	810130
802221	802231	83420	834210	834220	834230	83421	834211	834221	834231	81020	810210	810220	810230
802121	802131	83410	834110	834120	834130	83411	834111	834121	834131	81010	810110	810120	810130
802221	802231	83420	834210	834220	834230	83421	834211	834221	834231	81020	810210	810220	810230



SET PRESSURES AND REGULATING RANGES									
MODEL			685/885/985						
ENTRY CONNECTION	685/885/985	MNPT ₁	3/8	1/2"	1/2"	3/4"	3/4"	1"	
EXIT CONNECTION	685/885/985	FNPT ₂	1/2"		3/4"		1"		
d ₀	685/885		8,00		9,75		13,00		
	985		4,00						
SET PRESSURE IN bar	MAXIMA	685/885	PMS. 36 bar	36	36	36	36		
		685	PN-40	36	36	36			
		985	PN-160	144					
	MINIMA	685/885	PMS. 36 bar	0,2	0,2	0,2		0,2	
		685	PN-40	0,2	0,2	0,2			
		985	PN-160	36,1					
SPRING REGULATING RANGE IN bar	685/885	985							
	0,20 a 0,70		CODE	56160	56169	56178			
	0,60 a 1,60		CODE	56161	56170	56179			
	1,50 a 3,50		CODE	56162	56171	56180			
	3,40 a 5,50		CODE	56163	56172	56181			
	5,40 a 10,00	36,10 a 40,00	CODE	56164-56334	56173	56182			
	9,80 a 15,00	39,00 a 60,00	CODE	56165-56335	56174	56183			
	14,50 a 20,00	58,00 a 80,00	CODE	56166-56336	56175	56184			
	19,00 a 25,00	76,00 a 100,00	CODE	56167-56337	56176	56185			
	24,00 a 36,00	96,00 a 144,00	CODE	56168-56338	56177	56186			

RECOMMENDED RANGES OF APPLICATION						
MODEL		695/895/995/694				
		AP	AS	EP	ES	
FLUID	SATURATED STEAM		*	*	*	*
	GASES	INERT	*	*	*	*
		NON INERT			*	*
LIQUIDS				*	*	
OPENING PRESSURE IN % OF THE SET PRESSURE			+10%			
CLOSURE PRESSURE IN % OF THE SET PRESSURE			-10%			



DISCHARGE CAPACITY										
MODEL	685-885								985	
ENTRY CONNECTION	MNPT1	3/8"	1/2"	1/2"	3/4"	3/4"	1"	3/8"	1/2"	
EXIT CONNECTION	FNPT2	1/2"		3/4"		1"		1/2"		
do		8,00		9,75		13,00		4,00		
$A_0 = \frac{\pi \cdot d_0^2}{4}$		50,26		74,66		132,73		12,57		
p [bar]	For other, not so dense liquids, other than water at 20°C apply:									
	$V_L = \sqrt{\frac{\rho A}{\rho L}} \cdot V_A \quad V_A = V_L \cdot \sqrt{\frac{\rho A}{\rho L}}$									
	I- Saturated steam in kg/h. II- Air at 0°C and 1,013 bar in [Nm ³ /h]. III- Water at 20°C in l/h.									
	V _A = Water flow according to table. V _L = Liquid flow. ρA = Water density at a 20° C. (ρA = 998 kg/m ³) ρL = Liquid density.									
	SET PRESSURE IN bar	I	II	III	I	II	III	I	II	III
	0,5	31	41	1091	46	61	1621	94	125	2881
	1,0	39	53	1428	60	79	2122	121	162	3772
	1,5	48	65	1700	73	97	2526	149	198	4490
	2,0	57	77	1934	87	115	2873	176	235	5108
	2,5	67	90	2162	101	135	3212	206	275	5711
	3,0	77	103	2369	116	155	3519	237	316	6256
	3,5	87	116	2559	131	175	3801	267	356	6757
	4,0	97	129	2735	146	195	4063	297	397	7223
4,5	107	142	2901	161	215	4310	328	437	7662	
5,0	117	156	3058	176	235	4543	358	478	8076	
6,0	136	182	3350	206	274	4976	418	558	8847	
7,0	156	208	3618	235	314	5375	479	639	9556	
8,0	176	235	3868	265	354	5746	539	720	10215	
9,0	196	261	4103	295	393	6095	600	801	10835	
10,0	215	287	4325	325	433	6424	661	882	11421	
12,0	255	340	4738	384	513	7038	782	1043	12511	
14,0	294	393	5117	444	592	7601	903	1205	13514	
16,0	334	445	5470	503	671	8126	1024	1366	14447	
18,0	373	498	5802	563	751	8619	1145	1528	15323	
20,0	413	551	6116	622	830	9085	1266	1690	16152	
22,0	452	603	6415	682	910	9529	1387	1851	16940	
24,0	492	656	6700	741	989	9953	1508	2013	17694	
26,0	531	709	6973	801	1068	10359	1629	2175	18416	
28,0	571	761	7237	860	1148	10750	1751	2336	19111	
30,0	610	814	7491	920	1227	11127	1872	2498	19782	
32,0	650	867	7736	979	1307	11492	1993	2659	20431	
34,0	689	919	7974	1039	1386	11846	2114	2821	21060	
36,0	728	972	8206	1098	1465	12189	2235	2983	21670	
38,0										
40,0										
42,0										
44,0										
46,0										
48,0										
50,0										
52,0										
54,0										
56,0										
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105,0										
110,0										
115,0										
120,0										
125,0										
130,0										
135,0										
140,0										
145,0										

COEFFICIENT OF DISCHARGE										
MODEL		685/885/985								
ENTRY CONNECTION	R ₁	3/8"	1/2"	1/2"	3/4"	3/4"	1"			
EXIT CONNECTION	R ₂	1/2"		3/4"		1"				
d ₀	685/885	8,00		9,75		13,00				
	985	4,00								
h	685/885		2,50		4,00		5,50			
	985		0,31		0,41		0,42			
h/d ₀	685/885		0,31		0,41		0,42			
	985		0,62							
COEFFICIENT OF DISCHARGE kd (1)	685/885	SATURATED STEAM GASES		0,68		0,69		0,79		
	985			0,40						
	685/885	LIQUIDS		0,51		0,52		0,60		
	985			0,35						
113	151	1446								
119	158	1483								
124	166	1520								
130	174	1556								
136	182	1591								
142	189	1625								
148	197	1658								
154	205	1691								
159	213	1724								
165	220	1755								
171	228	1786								
177	236	1553								
183	244	1847								
188	251	1876								
194	259	1905								
200	267	1934								
206	275	1962								
212	282	1990								
217	290	2018								
223	298	2045								
229	306	2071								
235	313	2098								
241	321	2124								
246	329	2150								
252	336	2175								
258	344	2200								
264	352	2220								
270	360	2250								
275	367	2274								
281	375	2298								
287	383	2322								
293	391	2345								
307	410	2403								
322	429	2460								
336	449	2515								
351	468	2569								
365	437	2622								
380	507	2674								
394	526	2725								
409	546	2775								
423	565	2824								

(1) For set pressures less than 3 bar see graph of discharge coefficient.										
pa = Backpressure permitted [bar] absolute. p = Set pressure [bar] absolute. kd = Coefficient of discharge.										

Calculus according to ASME section VIII Div.1