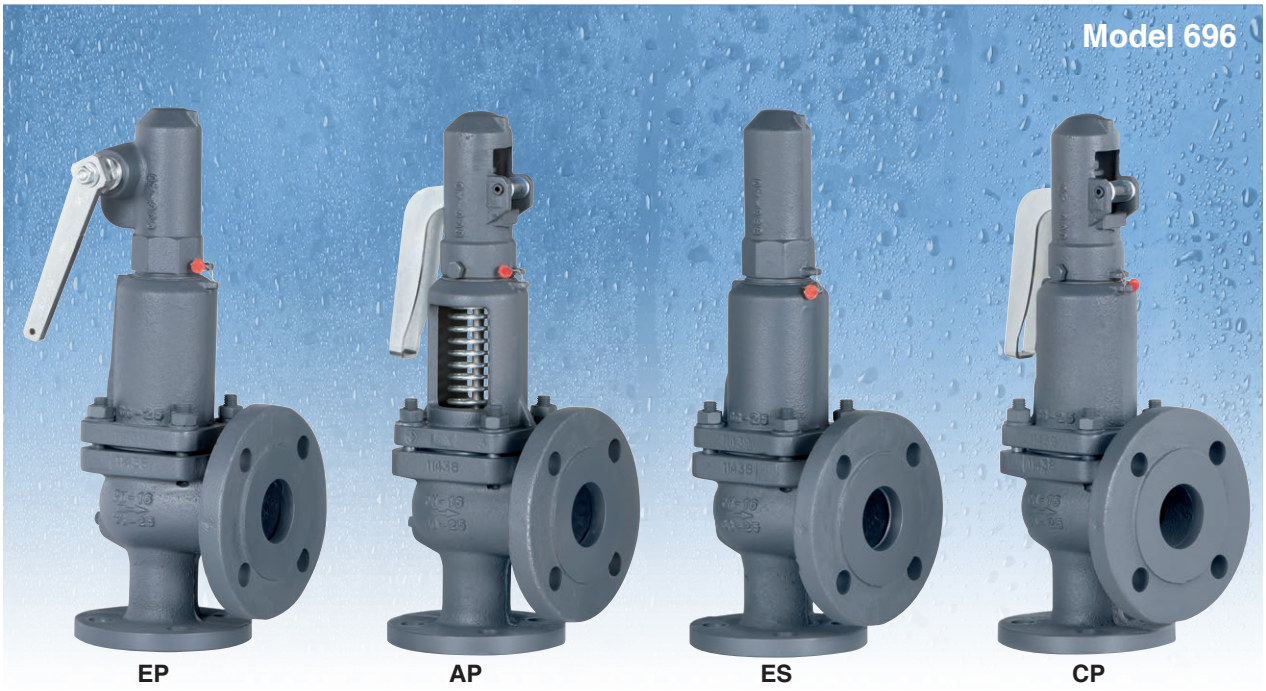
Full lift safety valve with spring loading. (AIT)

EN



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 “International Standard ISO 4126-1:2004 Safety Valves”.
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 direc ed 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 requeriments.
— 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.

IMPORTANT

Depending on demand:

1. Blocking screw which facilitates hydrostatic testing of the container which to beprotected.
2. Rapid limiter to reduce the coefficient of discharge
3. Fluorelastomer (Vitón) seals, Silicone's rubber, PTFE (Teflón)... etc.,achieving leakage levels less than

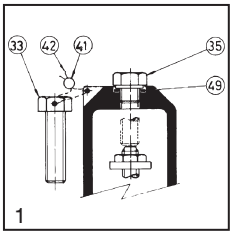
$$0{,}3\text{x}10^{-3}\frac{\text{Pa cm}^3}{\text{seg.}}$$

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

RANGE OF APPLICATION FOR THE SEALS					
FLUID		SET PRESSURE IN bar			
		0,2 / 1,8 / 4,0 / 4,8 / 7,0 / 30,0 / 62,0			
Satured		S	V	T	
Liquids and gases		S		V	T
SEALS		TEMPERATURE IN °C			
		ACCORDING TO MANUFACTURERS		RECOMMENDED BY VYC	
		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
Silicone's rubber	S	-60	+200	-50	+115
Fluorelastomer (Vitón)	V	-40	+250	-30	+150
PTFE (Teflón)	T	-265	+260	-80	+230 (1)

(1) For temperatures exceeding 230°C apply metallic seal only

4. Flourelastomer (Vitón) membrane and O-ring isolating the rotating or sliding parts from the working fluid.
5. Electrical contact indicating open/closed.
6. 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.
7. Possibility of manufacture in other types of material, for special operating conditions (high temperatures, fluids, etc.).
8. Totally free of oil and grease, to work with oxygen, avoiding possible fire risks (UV-Oxygen-VBG 62).
9. Special springs for critical temperatures.



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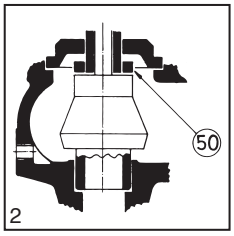

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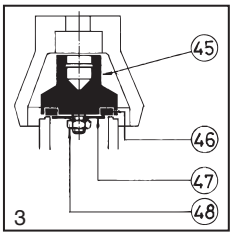

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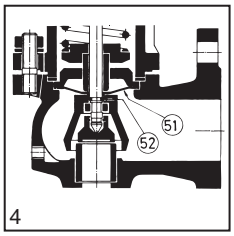

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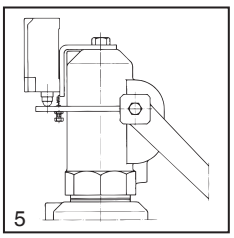
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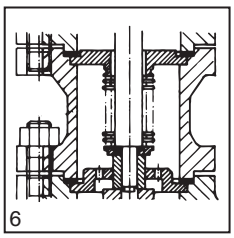
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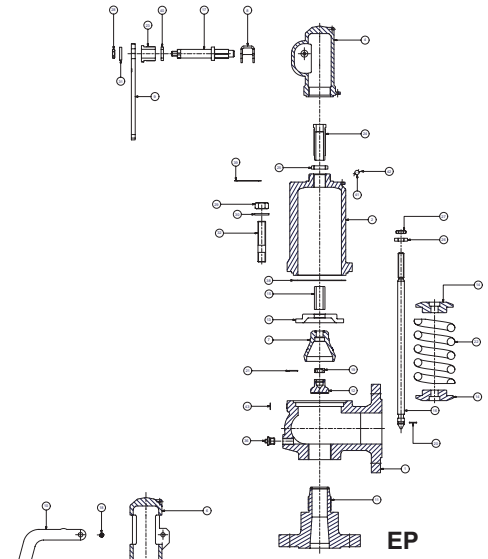
N.º PIECE	PIECE	MATERIAL	
		ACERO AL CARBONO	ACERO INOXIDABLE
1	Body	Cast steel (EN-1.0619+N)	Stainless steel. (EN-1.4408)
2	Closed bell	Cast steel (EN-1.0619+N)	Stainless steel. (EN-1.4408)
3	Open bell	Cast steel (EN-1.0619+N)	Stainless steel. (EN-1.4408)
4, 5, 6	Hood	Nodular iron (EN-JS1030)	Stainless steel. (EN-1.4408)
7	Elevator	Nodular iron (EN-JS1030) (1)	Stainless steel. (EN-1.4408) (2)
8	Cam	Cast steel (EN-1.0037)	Stainless steel. (EN-1.4301)
9, 10	Lever	Nodular iron (EN-JS1030)	Nodular iron (EN-JS1030)
11	Seating	Cast steel (EN-1.0460)	Stainless steel. (EN-1.4408)
12	Plug	Stainless steel (EN-1.4028)	Stainless steel. (EN-1.4542)
13	Lead	Stainless steel (EN-1.4028) (3)	Stainless steel. (EN-1.4401) (4)
14	Spring press	Cast steel (EN-1.1191)	Stainless steel. (EN-1.4305)
15	Separator	Stainless steel (EN-1.4028)	Stainless steel. (EN-1.4401)
16	Rod	Stainless steel (EN-1.4028)	Stainless steel. (EN-1.4401)
17	Lever shaft	Cast steel (EN-1.1191)	Stainless steel. (EN-1.4305)
18	Gudgeon	Cast steel (EN-1.1231)	Stainless steel. (EN-1.4310)
19	Ring	Stainless steel (EN-1.4028)	Stainless steel. (EN-1.4401)
20, 21	Safety ring	Stainless steel (EN-1.4310)	Stainless steel. (EN-1.4310)
22	Spring	Vanadium chrome steel (EN-1.8159) (5)	Stainless steel. (EN-1.4310) (6)
23	Gland	Cast steel (EN-1.1191)	Stainless steel. (EN-1.4305)
24	Hollow screw	Stainless steel (EN-1.4305)	Stainless steel. (EN-1.4305)
25	Hollow screw nut	Stainless steel (EN-1.4305)	Stainless steel. (EN-1.4305)
26	Buffer nut	Stainless steel (EN-1.4305)	Stainless steel. (EN-1.4305)
27	Rod check nut	Cast steel (EN-1.1141)	Stainless steel. (EN-1.4401)
28, 29, 48	Nut	Cast steel (EN-1.1141)	Stainless steel. (EN-1.4401)
30, 31	Washer	Cast steel (EN-1.1141)	Stainless steel (EN-1.4401)
32	Stud	Cast steel (EN-1.1181)	Stainless steel. (EN-1.4401)
33, 34, 35	Screw	Cast steel (EN-1.1191)	Stainless steel. (EN-1.4401)
36	Cap	Cast steel (EN-1.1181)	Stainless steel. (EN-1.4401)
38	Coupling	Graphite	PTFE (Teflon)
39	Coupling	PTFE (Teflon)	PTFE (Teflon)
40	Seal	Graphite	PTFE (Teflon)
41	Seal	Plastic	Plastic
42	Sealing wire	Sealing wire	Sealing wire
43	Characteristic plate	Stainless steel. (EN-1.4301)	Stainless steel. (EN-1.4301)
45	Plug	Stainless steel (EN-1.4401)	Stainless steel (EN-1.4401)
46	Sealing disk	PTFE (Teflon)	PTFE (Teflon)
		Silicone's rubber	Silicone's rubber
		Fluorelastomer (Vitón)	Fluorelastomer (Vitón)
47	Washer	Stainless steel (EN-1.4401)	Stainless steel. (EN-1.4401)
49	Coupling	Copper	Copper
50	Limiter	Stainless steel (EN-1.4028)	Stainless steel (EN-1.4401)
51	Membrane	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)
52	O-ring	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)
DN1x DN2		25x40 to 300x400	
PN		160	
OPERATING CONDITIONS	PRESSURE IN bar	95	95
	MAX. TEMP. IN °C	450 ºC	400 ºC
	MIN. TEMP. IN °C	-10	-60

(1) DN-25x40 in stainless steel (1.4408).
(2) DN-32x50 a DN-65x100 in stainless steel (1.4401).
(3) From DN-150x250 to DN-300x400 in stainless steel (DIN-1.4027).
(4) From DN-150x250 to DN-300x400 in stainless steel (1.4408).
(5) Vanadium-chrome (1.8159) to 400ºC. EP, ES and CP over 400ºC, especial spring.
(6) DN-25x40 from 60,00 a 78,00 and from 75,00 to 95,00 bar in Staimless steel (1.4310). Rest of them in Vanadium-chrome (1.8159)



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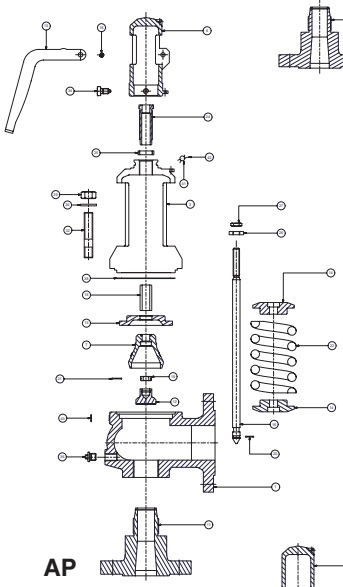
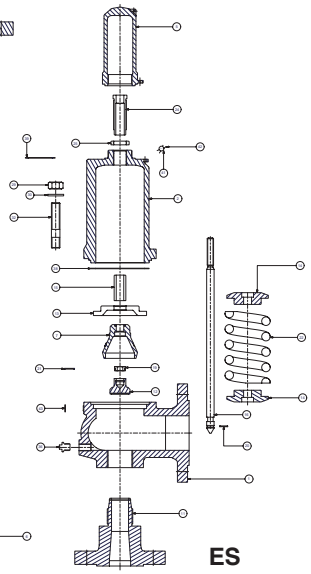
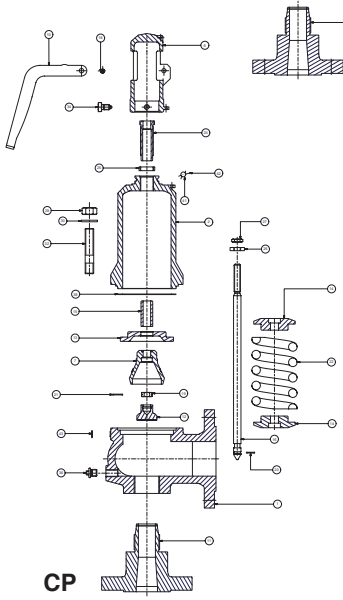


AP



ES



CP

FULL LIFT SAFETY VALVE WITH SPRING LOADING (AIT) MODEL 596 - AP AND CP.

1. Disassembly and assembly.

1.1 Disassembly.

To replace the spring (22) or clean any of the internal components of the valve, proceed in the following manner:

A - Withdraw the clip (18), using a punching tool, until the lever (10) comes free.

B - Loosen the screws (34) and take the cap (6) off.

C - Holding the spindle (16) steady, loosen the hollow screw nut (25) and the holow screw (24) until you note a realasing of the spring (22).

D - Mark on the spindle (16) the position of the spindle lock-nut (27) and the adjusting nut (26). Loosen them and remove them.

E - Unscrew the nuts (29) and remove them, together with the studs (32) and their washers (30).

F - Lift the cover (3) or (2) and you will have access to all of the components.

1.2 Assembly.

A - Place the safety-ring (20) on the spindle (16) and press it against the gasket (12).

B - In the spindle channel (16) connect the ring (19) and fix it to the security-ring (21). IIntroduce the elevator (7) into the upper part of the spindle (16) and press this against the previously described pieces.

C - Enter the guide (13), the separator (15), the spring-press (14), the spring (22), the spring-press (14) through the upper part of the spindle (16) and press this against the previously descrobed pieces.

D - Replace the assembly (38) and the cover (3) or (2).

E - Place the washers (30) on the studs (32) and make up the nuts (29) diagonally, checking the correct alignment of the cover (3) or (2).

F - Adjust the firing pressure with the hollow screw (24) and fix the adjustment position with the hollow screw nut (25).

G - Turn the spindle lock-nut (27) and the adjusting nut (26) to the position mrked (see 1.1.D) and make up against each other.

H - Introduce the cap (6) and tighten the screws (34).

I - Place the lever (10) and fix it with the fastener (18).

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.F, 1.2.H, 1.2.I.

FULL LIFT SAFETY VALVE WITH SPRING LOADING (AIT) MODEL 596 - EP.

1. Disassembly and assembly.

1.1 Disassembly.

To replace the spring (22), or clean any of the internal components of the valve, proceed in the following manner:

A - Move the lever (9) in direction C as far as the constructive catcher.

B - Unscrew the cap (4) and remove.

C - Holding the spindle (16) steady, loosen the hollow screw nut (25) and the hollow screw (24) until you note a realeasing of the spring (22).

D - Mark on the spindle (16) the position of the spindle lock-nut (27) and the adjusting nut (26). Loosen them and remove them.

E - Unscrew the nuts (29) and remove them, together with the studs (32) and their washers (30).

F - Lift the cover (2) and you will have access to all of the components.

1.2 Assembly.

A - Place the safety-ring (20) on the spindle (16) and press it against the gasket (12).

B - In the spindle channel (16) connect the ring (19) and fix it to the security-ring (21). Introduce the elevator (7) into the upper part of the spindle (16) and press this against the previously described pieces.

C - Enter the guide (13), the separator (15), the spring-press (14), the spring (22), the spring-press (14) through the upper part of the spindle (16) in a correlative manner.

D - Replace the assembly (38) and the cover (2).

E - Place the washers (30) on the studs (32) and make up the nuts (29) diagonally, checking the correct alignment of the cover (2).

F - Adjust the firing pressure with the hollow screw (24) and fix the adjustment position with the hollow screw nut (25).

G - Turn the spindle lock-nut (27) and the adjusting nut (26) to the position marked (see 1.1.D) and make up against each other.

H - Change the coupling (39) and lightly tighten the cap (4). Move the lever (9) towards position A as far as the constructive catcher. Definitively tighten the cap (4).

2. Adjustig the firing pressure.

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

B - Proceed according to points 1.2.F, 1.2.H.

FULL LIFT SAFETY VALVE WITH SPRING LOADING (AIT) MODEL 596 - ES.

1. Disassembly and assembly.

1.1 Disassembly.

To replace the spring (22), or clean any of the internal components of the valve, proceded in the following manner:

A - Unscrew the cap (5) and remove.

B - Holding the spindle (16) steady, loosen the hollow screw nut (25) and the hollow screw (24) until you note a realeasing of the spring (22).

C -Unscrew the nuts (29) and remove them, together with the studs (32) and their washers (30).

F- Lift the cover (2) and you will have access to all of the components.

1.2 Assembly.

A - Place the safety-ring (20) on the spindle (16) and press it against the gasket (12).

B - In the spindle channel (16) connect the ring (19) and fix it to the security-ring (21).

Introduce the elevator (7) into the upper part of the spindle (16) and press this against the previously described pieces.

C - Enter the guide (13), the separator (15), the spring-press (14), the spring (22), the spring-press (14) through the upper part of the spindle (16) in a correlative manner.

D - Replace the washers (38) and the cover (2).

E - Place the washers (30) on the studs (32) and make up the nuts (29) diagonally, checking the correct alignment of the cover (2).

F - Adjust the firing pressure with the hollow screw (24) and fix the adjustment position with the hollow screw nut (25).

G - Change the coupling (39) and tighten the cap (5).

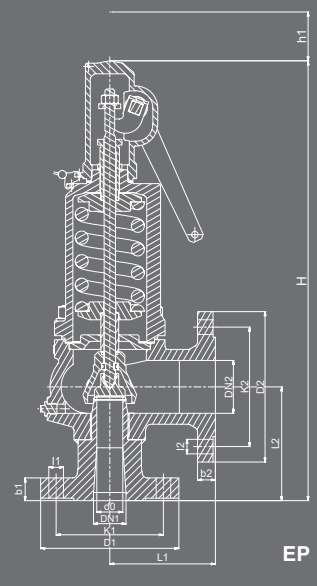
2. Adjusting the firing pressure.

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

B - Proceed according to points 1.2.F, 1.2.G.B - Proceder conforme al punto 1.2.F, 1.2.G.

DN1x DN2			25x40	32x50	40x65	50x80	65x100	80x125	
do			16	20	25	32	40	50	
Ao			201	314	491	804	1257	1964	
H			420	480	540	650	685	800	
h1			150	175	175	225	225	225	
L1			100	110	130	145	155	190	
L2			120	125	140	150	165	185	
R			¼”	¼”	¼”	¼”	3/8”	3/8”	
			Whitworth gas-tight cylindrical f						
INTAKE FLANGE	PN-160 EN 1092-1 (1) (2) (3) (4)	D1	140	155	170	195	220	230	
		K1	100	110	125	145	170	180	
		I1	18	22	22	26	26	26	
		b1	24	26	28	30	34	36	
		DRILLS Nº	4	4	4	4	8	8	
ESCAPE FLANGE	PN-40 EN 1092-1 (1) (2)	D2	150	165	185	200	235	270	
		K2	110	125	145	160	190	220	
		I2	18	18	18	18	22	26	
		b2	18	20	22	24	24	26	
		DRILLS Nº	4	4	8	8	8	8	

MODEL		EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP	
WEIGHT IN kgs.	CAST STEEL STAINLESS STEEL	12,00	11,40	11,60	11,80	14,00	13,40	13,60	13,80	19,00	18,40	18,60	18,80	28,00	27,40	27,60	27,80	40,00	39,40	39,60	39,80	50,00	49,40	49,60	49,80	
CODE	CAST STEEL 2002-596.	0104	01041	01042	01043	0144	01441	01442	01443	0124	01241	01242	01243	0204	02041	02042	02043	0224	02241	02242	02243	0304	03041	03042	03043	
	STAINLESS STEEL 2002-596.	0102	01021	01022	01023	0142	01421	01422	01423	0122	01221	01222	01223	0202	02021	02022	02023	0222	02221	02222	02223	0302	03021	03022	03023	



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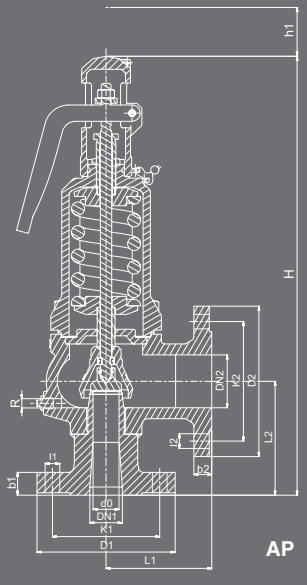

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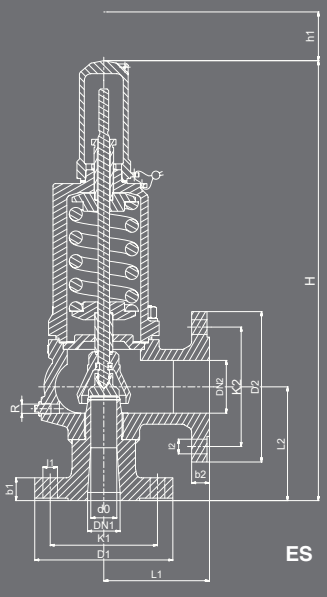
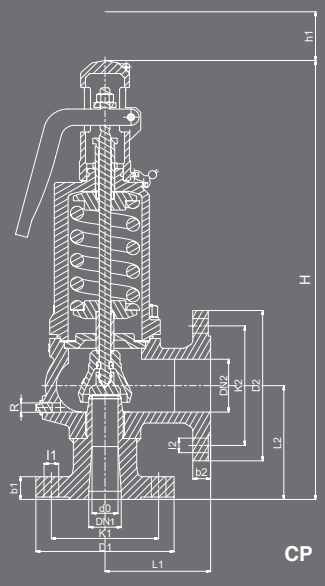


ES



CP

	100x150				125x200				150x250				200x300				250x350				300x400			
	63				77				93				110				155				180			
	3117				4657				6793				9503				18870				25450			
	840				980				1180				1300				1400				1575			
	225				305				400				400				425				520			
	210				215				225				265				300				335			
	200				220				245				290				340				370			
	3/8"				½"				½"				½"				¾"				¾"			
emale thread ISO 228/1 (DIN-259)																								
	265				315				345				375				425				485			
	210				250				280				320				370				430			
	30				33				33				30				30				30			
	40				40				36				34				32				34			
	8				8				8				12				12				16			
	300				360				395				445				505				565			
	250				310				350				400				460				515			
	26				26				22				22				22				26			
	28				30				26				26				26				26			
	8				12				12				12				16				16			
	EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP
	80,00	79,40	79,60	79,80	126,00	125,40	125,60	125,80	135,00	134,40	134,60	134,80	170,00	169,40	169,60	169,80	270,00	269,40	269,60	269,80	370,00	369,40	369,60	369,80
	0404	04041	04042	04043	0504	05041	05042	05043	0604	06041	06042	06043	0804	08041	08042	08043	0004	00041	00042	00043	0024	00241	00242	00243
	0402	04021	04022	04023	0502	05021	05022	05023	0602	06021	06022	06023	0802	08021	08022	08023	0002	00021	00022	00023	0022	00221	00222	00223

Escape flange
(1) DN-125x200 PN-25
(2) From DN-150x200 to DN-300x400 PN-10

Intake flange
(1) DN-32x50 y DN-125x200 PN-100
(2) DN-150x250 PN-63
(3) DN-200x300 PN-40
(4) From DN-250x350 to DN-300x400 PN-25

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 GASES	5			
		LIQUIDS	—			
	EXTERNAL CONSTANT (1) (2) (3)	SATURATED STEAM GASES	50			
		LIQUIDS	90			
% OVERPRESSURE		SATURATED STEAM GASES	10			
		LIQUIDS	25			

PRESIONES DE APERTURA Y CIERRE EN % DE LA PRESION DE DISPARO			
FLUID	PRESSURE IN bar	OPENING PRESSURE	CLOSING PRESSURE
SATURATED STEAM GASES	<3	+5%	- 0,3 bar
	≥3	+5%	- 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 pa > 0,25p, we must limit plug speed with the consequent reduction of the ad coefficient of discharge.
With the new reduced coefficient we determine the d0, in order to remove the necessary volume.

pa = Backpressure permitted [bar] absolute
p = Set pressure [bar] absolute.
kd = Coefficient of discharge.

DISCHARGE CAPACITY

DN1 x DN2	25x40			32x50			40x65			50x80		
do	16			20			25			32		
$Ao=\frac{\pi \cdot do^2}{4}$	201			314			491			804		
p [bar]	I - Saturated steam in Kg/h..											
	II - Air at 0°C and 1,013 bar in [Nm3/h].			$V_L=\sqrt{\frac{Q_A}{Q_L}}.V_A$ ó $V_A=V_L.\sqrt{\frac{Q_L}{Q_A}}$								
	III - Water at 20°C in l/h..											
	V_A = Water flow according to table. V_L = Liquid flow. V_A = Water density at a 20°C. (V_A=998 Kg/m3). V_L = Liquid density.											
SET PRESSURES IN bar	I	II	III	I	II	III	I	II	III	I	II	III
0,2	99	112	1848	154	174	2887	241	272	4514	394	446	7391
0,5	122	139	2983	191	218	4660	299	341	7287	490	558	11933
1,0	162	194	4248	252	303	6636	395	473	10376	646	775	16990
1,5	201	242	5214	313	378	8145	490	591	12736	802	968	20855
2,0	239	290	6027	374	454	9416	584	710	14723	957	1162	24109
2,5	278	339	6743	434	529	10534	678	828	16472	1110	1355	26972
3,0	316	387	7390	494	605	11544	772	946	18052	1264	1549	29560
3,5	354	436	7985	553	681	12473	865	1064	19505	1416	1743	31938
4,0	392	484	8538	613	756	13338	958	1183	20856	1568	1936	34151
4,5	430	533	9057	672	832	14149	1050	1301	22125	1720	2130	36230
5,0	468	581	9549	731	908	14917	1143	1419	23326	1871	2324	38195
5,5	524	629	10016	818	983	15647	1279	1537	24467	2094	2517	40064
6,0	579	678	10463	904	1059	16344	1413	1656	25558	2315	2711	41850
6,5	633	726	10891	989	1134	17013	1547	1774	26604	2533	2905	43563
7,0	687	775	11303	1074	1210	17657	1679	1892	27610	2750	3098	45210
7,5	741	823	11700	1158	1286	18278	1811	2010	28581	2965	3292	46800
8,0	826	871	12084	1290	1361	18878	2018	2129	29520	3304	3486	48338
9,0	932	968	12819	1457	1513	20025	2278	2365	31313	3730	3873	51274
10,0	1039	1065	13513	1623	1664	21110	2537	2602	33009	4155	4260	54052
11,0	1145	1162	14173	1788	1815	22142	2796	2838	34623	4579	4647	56694
12,0	1251	1259	14804	1954	1966	23127	3056	3075	36164	5004	5035	59218
13,0	1357	1355	15410	2120	2118	24073	3315	3311	37642	5429	5422	61638
14,0	1464	1452	15992	2286	2269	24982	3575	3548	39065	5854	5809	63967
15,0	1570	1549	16554	2453	2420	25860	3835	3784	40437	6280	6196	66215
16,0	1677	1646	17097	2620	2571	26709	4096	4021	41764	6708	6584	68388
17,0	1784	1743	17624	2787	2723	27531	4358	4257	43051	7136	6971	70494
18,0	1891	1840	18135	2955	2874	28330	4620	4494	44300	7566	7358	72540
20,0	2048	2033	19117	3200	3176	29864	5004	4967	46698	8194	8133	76466
22,0	2205	2227	20050	3445	3479	31322	5387	5440	48979	8821	8907	80201
24,0	2299	2420	20942	3592	3781	32716	5616	5913	51158	9197	9682	83769
25,0	2345	2517	21374	3663	3933	33391	5728	6149	52213	9379	10069	85498
26,0	2389	2614	21798	3733	4084	34053	5837	6386	53248	9557	10457	87192
28,0	2476	2808	22621	3868	4386	35339	6049	6859	55259	9905	11231	90485
30,0	2560	3001	23416	4000	4689	36580	6254	7332	57199	10241	12006	93662
32,0	2642	3195	24184	4127	4991	37780	6453	7805	59076	10566	12780	96735
34,0	2720	3389	24928	4250	5294	38943	6645	8278	60895	10882	13555	99714
36,0	2797	3582	25651	4370	5596	40072	6833	8751	62661	11188	14329	102606
38,0	2872	3776	26355	4486	5899	41171	7015	9224	64379	11487	15104	105418
40,0	2944	3970	27039	4600	6201	42241	7192	9697	66052	11778	15878	108158
42,0	3015	4163	27707	4711	6504	43284	7366	10170	67683	12061	16653	110830
44,0	3085	4357	28360	4819	6806	44303	7535	10643	69277	12339	17428	113439
46,0	3152	4551	28997	4925	7109	45299	7701	11116	70834	12610	18202	115989
48,0	3219	4744	29621	5028	7411	46274	7863	11589	72358	12875	18977	118484
50,0	3284	4938	30232	5130	7714	47228	8022	12062	73850	13136	19751	120928
52,0	3348	5131	30831	5230	8016	48164	8178	12535	75313	13391	20526	123324
54,0	3410	5325	31418	5327	8319	49081	8330	13008	76748	13641	21300	125673
56,0	3472	5519	31995	5423	8621	49982	8481	13481	78157	13887	22075	127980
58,0	3532	5712	32562	5518	8924	50867	8628	13954	79541	14128	22850	130246
60,0	3591	5906	33118	5610	9226	51737	8773	14427	80901	14366	23624	132473
62,0	3650	6100	33666	5702	9529	52592	8916	14900	82238	14599	24399	134663
64,0	3707	6293	34205	5792	9831	53434	9056	15373	83555	14829	25173	136819
66,0	3764	6487	34735	5880	10134	54263	9194	15846	84850	15056	25948	138940
68,0	3820	6681	35258	5967	10436	55079	9331	16319	86127	15279	26722	141030
70,0	3875	6874	35772	6053	10739	55883	9465	16792	87384	15499	27497	143090
72,0	3929	7068	36280	6138	11041	56676	9597	17265	88624	15715	28271	145120
74,0	3982	7261	36780	6221	11344	57458	9728	17738	89847	15929	29046	147122
76,0	4035	7455	37274	6303	11646	58229	9857	18211	91053	16140	29821	149097
78,0	4087	7649	37762	6385	11949	58991	9984	18684	92244	16348	30595	151046
80,0	4139	7842	38243	6465	12251	59742	10110	19157	93419	16554	31370	152971
82,0	4189	8036	38718	6544	12554	60485	10234	19630	94580	16757	32144	154872
84,0	4239	8230	39187	6623	12856	61218	10356	20103	95726	16958	32919	156749
86,0	4289	8423	39651	6700	13159	61943	10477	20576	96859	17156	33693	158605
88,0	4338	8617	40110	6777	13461	62659	10597	21049	97979	17352	34468	160439
90,0	4387	8811	40563	6853	13764	63367	10715	21522	99087	17546	35242	162252
92,0	4434	9004	41011	6928	14066	64067	10833	21995	100182	17738	36017	164045
94,0	4482	9198	41455	7002	14369	64760	10948	22468	101265	17928	36792	165819
95,0	4505	9295	41675	7038	14520	65104	11006	22705	101802	18022	37179	166698

DISCHARGE CAPACITY

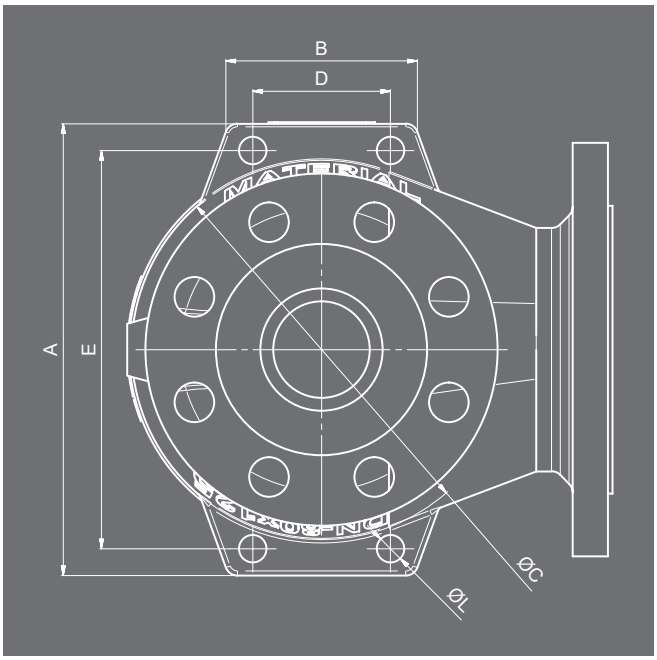
DN1 x DN2	65x100			80x125			100x150			125x200		
do	40			50			63			77		
$Ao=\frac{\pi \cdot do^2}{4}$	1257			1964			3117			4657		
p [bar]	I - Saturated steam in Kg/h.. II - Air at 0°C and 1,013 bar in [Nm3/h]. III - Water at 20°C in l/h..			$V_L=\sqrt{\frac{Q_A}{Q_L}}.V_A$ ó $V_A=V_L.\sqrt{\frac{Q_L}{Q_A}}$			V_A = Water flow according to table. V_L = Liquid flow. V_A = Water density at a 20°C. (V_A=998 Kg/m3). V_L = Liquid density.					
SET PRESSURE IN bar	I	II	III	I	II	III	I	II	III	I	II	III
0,2	616	698	11556	963	1090	18056	1528	1730	28656	2284	2584	42813
0,5	765	872	18657	1196	1362	29150	1898	2162	46263	2836	3230	69120
1,0	1011	1211	26563	1579	1892	41504	2506	3003	65869	3745	4486	98413
1,5	1254	1514	32606	1959	2365	50945	3110	3754	80854	4646	5608	120801
2,0	1496	1816	37692	2337	2838	58892	3709	4504	93466	5541	6730	139644
2,5	1736	2119	42169	2713	3311	65887	4305	5255	104568	6432	7851	156231
3,0	1976	2422	46215	3087	3784	72208	4899	6006	114599	7319	8973	171218
3,5	2214	2725	49933	3460	4257	78018	5491	6756	123820	8203	10095	184995
4,0	2452	3027	53394	3831	4730	83425	6080	7507	132401	9084	11216	197815
4,5	2689	3330	56643	4202	5203	88502	6669	8258	140458	9963	12338	209853
5,0	2926	3633	59716	4572	5676	93303	7255	9009	148078	10840	13459	221238
5,5	3274	3936	62638	5116	6149	97869	8119	9759	155324	12131	14581	232064
6,0	3619	4238	65430	5654	6622	102231	8973	10510	162247	13406	15703	242407
6,5	3960	4541	68107	6187	7095	106414	9819	11261	168886	14671	16824	252327
7,0	4299	4844	70683	6717	7568	110439	10660	12011	175274	15927	17946	261871
7,5	4636	5147	73169	7244	8041	114323	11497	12762	181438	17177	19068	271080
8,0	5166	5449	75573	8071	8514	118078	12810	13513	187398	19139	20189	279985
9,0	5831	6055	80164	9111	9460	125253	14460	15014	198784	21604	22432	296997
10,0	6496	6660	84507	10149	10406	132038	16107	16516	209553	24065	24676	313085
11,0	7159	7266	88637	11186	11352	138491	17753	18017	219794	26524	26919	328386
12,0	7823	7871	92583	12223	12299	144656	19399	19519	229579	28983	29162	343005
13,0	8487	8477	96367	13261	13245	150569	21046	21020	238963	31444	31405	357026
14,0	9153	9082	100009	14300	14191	156259	22696	22521	247993	33909	33649	370517
15,0	9819	9688	103522	15342	15137	161748	24348	24023	256705	36378	35892	383534
16,0	10487	10293	106920	16385	16083	167057	26005	25524	265131	38853	38135	396123
17,0	11157	10899	110213	17432	17029	172203	27665	27026	273298	41334	40378	408324
18,0	11828	11504	113411	18481	17975	177199	29331	28527	281227	43822	42621	420171
20,0	12811	12715	119550	20016	19867	186791	31767	31530	296450	47462	47108	442916
22,0	13791	13926	125389	21548	21759	195914	34198	34533	310929	51095	51594	464548
24,0	14378	15137	130968	22466	23651	204631	35654	37536	324763	53270	56081	485217
25,0	14663	15743	133670	22910	24597	208853	36360	39037	331463	54325	58324	495228
26,0	14943	16348	136319	23347	25543	212991	37053	40539	338031	55360	60567	505040
28,0	15486	17559	141467	24196	27435	221035	38401	43542	350798	57374	65054	524115
30,0	16011	18770	146435	25017	29327	228797	39703	46544	363116	59319	69540	542519
32,0	16520	19981	151239	25811	31219	236304	40964	49547	375030	61203	74027	560319
34,0	17013	21192	155896	26582	33111	243579	42187	52550	386577	63030	78513	577571
36,0	17492	22403	160417	27331	35004	250644	43375	55553	397788	64806	83000	594322
38,0	17959	23614	164814	28060	36896	257514	44532	58556	408693	66534	87486	610613
40,0	18413	24825	169098	28770	38788	264207	45660	61559	419313	68219	91973	626482
42,0	18857	26036	173275	29463	40680	270733	46760	64562	429672	69863	96459	641958
44,0	19291	27247	177354	30141	42572	277106	47835	67564	439786	71469	100946	657069
46,0	19715	28458	181341	30803	44464	283336	48887	70567	449673	73040	105432	671841
48,0	20130	29669	185242	31452	46356	289432	49916	73570	459348	74578	109919	686295
50,0	20537	30880	189063	32087	48248	295402	50925	76573	468822	76085	114405	700451
52,0	20935	32091	192808	32710	50140	301253	51914	79576	478109	77562	118891	714326
54,0	21327	33302	196482	33322	52032	306993	52884	82579	487219	79012	123378	727937
56,0	21711	34513	200088	33922	53924	312628	53837	85582	496162	80436	127864	741298
58,0	22089	35724	203631	34512	55816	318163	54773	88584	504946	81835	132351	754422
60,0	22460	36935	207113	35092	57709	323603	55694	91587	513580	83210	136837	767322
62,0	22825	38146	210537	35663	59601	328954	56600	94590	522072	84563	141324	780009
64,0	23185	39357	213907	36225	61493	334218	57491	97593	530427	85895	145810	792493
66,0	23539	40568	217224	36778	63385	339402	58369	100596	538653	87207	150297	804783
68,0	23887	41779	220491	37323	65277	344507	59234	103599	546755	88499	154783	816888
70,0	24231	42989	223711	37860	67169	349537	60086	106602	554739	89772	159270	828816
72,0	24570	44200	226885	38389	69061	354496	60926	109604	562609	91028	163756	840575
74,0	24904	45411	230015	38912	70953	359387	61755	112607	570371	92266	168243	852172
76,0	25234	46622	233103	39427	72845	364212	62573	115610	578029	93488	172729	863613
78,0	25560	47833	236151	39936	74737	368974	63381	118613	585587	94695	177216	874904
80,0	25881	49044	239160	40438	76629	373675	64178	121616	593048	95886	181702	886052
82,0	26199	50255	242131	40934	78521	378318	64965	124619	600416	97063	186189	897061
84,0	26513	51466	245067	41424	80414	382905	65743	127622	607696	98225	190675	907937
86,0	26823	52677	247968	41909	82306	387437	66512	130625	614889	99374	195162	918684
88,0	27129	53888	250835	42388	84198	391917	67273	133627	621999	100510	199648	929306
90,0	27432	55099	253670	42862	86090	396346	68024	136630	629028	101633	204134	939809
92,0	27732	56310	256473	43330	87982	400727	68768	139633	635980	102743	208621	950195
94,0	28029	57521	259246	43793	89874	405059	69503	142636	642857	103842	213107	960469
95,0	28176	58127	260622	44023	90820	407209	69868	144137	646267	104387	215351	965565

DISCHARGE CAPACITY

DN1 x DN2	150x250			200x300			250x350			300x400		
do	93			110			155			180		
$Ao=\frac{\pi \cdot do^2}{4}$	6793			9503			18870			25450		
p [bar]	I - Saturated steam in Kg/h..			$V_L=\sqrt{\frac{Q_A}{Q_L}}.V_A$ ó $V_A=V_L.\sqrt{\frac{Q_L}{Q_A}}$			V_A = Water flow according to table. V_L = Liquid flow. V_A = Water density at a 20°C. (V_A=998 Kg/m3). V_L = Liquid density.					
	II - Air at 0°C and 1,013 bar in [Nm3/h].											
	III - Water at 20°C in l/h..											
SET PRESSURE IN bar	I	II	III	I	II	III	I	II	III	I	II	III
0,2	3331	3769	54124	4660	5273	75716	8778	9934	150348	11840	13398	202775
0,5	4137	4712	87380	5787	6592	122239	10901	12418	242729	14703	16748	327368
1,0	5462	6544	124412	7641	9155	174045	14395	17247	345598	19414	23261	466109
1,5	6777	8180	152713	9480	11444	213637	17859	21558	424216	24087	29076	572141
2,0	8083	9816	176534	11308	13733	246961	21302	25870	490388	28730	34891	661387
2,5	9382	11452	197503	13125	16021	276295	24726	30182	548636	33349	40706	739946
3,0	10676	13089	216450	14936	18310	302800	28137	34494	601267	37948	46521	810930
3,5	11966	14725	233867	16739	20599	327165	31534	38805	649648	42531	52337	876182
4,0	13251	16361	250073	18537	22888	349837	34922	43117	694668	47099	58152	936900
4,5	14533	17997	265292	20331	25176	371127	38300	47429	736943	51656	63967	993916
5,0	15812	19633	279683	22120	27465	391260	41671	51740	776921	56202	69782	1047834
5,5	17695	21269	293370	24754	29754	410407	46633	56052	814940	62894	75597	1099111
6,0	19556	22905	306445	27357	32043	428699	51537	60364	851263	69508	81413	1148099
6,5	21400	24541	318986	29937	34331	446242	56398	64675	886098	76063	87228	1195081
7,0	23232	26177	331051	32501	36620	463121	61226	68987	919614	82576	93043	1240285
7,5	25055	27813	342692	35051	38909	479406	66031	73299	951951	89056	98858	1283898
8,0	27917	29449	353951	39054	41198	495156	73572	77610	983225	99227	104673	1326077
9,0	31513	32721	375456	44085	45775	525240	83050	86234	1042964	112010	116304	1406647
10,0	35103	35993	395795	49106	50353	553693	92510	94857	1099462	124768	127934	1482846
11,0	38689	39266	415138	54124	54930	580753	101962	103481	1153195	137517	139564	1555315
12,0	42277	42538	433619	59142	59508	606607	111416	112104	1204533	150267	151195	1624556
13,0	45867	45810	451344	64165	64085	631404	120877	120727	1253771	163027	162825	1690963
14,0	49462	49082	468399	69194	68663	655262	130351	129351	1301147	175805	174456	1754859
15,0	53063	52354	484854	74232	73240	678282	139843	137974	1346858	188607	186086	1816509
16,0	56673	55626	500769	79282	77818	700546	149356	146598	1391067	201437	197716	1876134
17,0	60292	58898	516194	84345	82395	722124	158893	155221	1433914	214300	209347	1933922
18,0	63921	62170	531171	89422	86973	743076	168458	163844	1475517	227200	220977	1990033
20,0	69231	68715	559924	96850	96128	783300	182451	181091	1555389	246073	244238	2097756
22,0	74530	75259	587271	104263	105283	821556	196417	198338	1631355	264908	267499	2200211
24,0	77703	81803	613399	108702	114438	858109	204779	215585	1703937	276186	290759	2298103
25,0	79242	85075	626055	110855	119015	875814	208834	224208	1739093	281655	302390	2345518
26,0	80751	88347	638460	112966	123593	893167	212813	232831	1773552	287021	314020	2391993
28,0	83689	94892	662573	117076	132748	926900	220554	250078	1840535	297461	337281	2482333
30,0	86526	101436	685839	121045	141903	959448	228032	267325	1905165	307547	360541	2569500
32,0	89274	107980	708342	124889	151058	990927	235273	284572	1967673	317313	383802	2653804
34,0	91939	114524	730151	128618	160213	1021437	242298	301818	2028256	326787	407063	2735512
36,0	94530	121069	751327	132242	169368	1051061	249124	319065	2087081	335994	430324	2814849
38,0	97051	127613	771923	135769	178523	1079873	255769	336312	2144292	344956	453584	2892011
40,0	99508	134157	791983	139206	187678	1107936	262245	353559	2200017	353690	476845	2967166
42,0	101907	140702	811547	142561	196833	1135306	268565	370805	2254364	362214	500106	3040465
44,0	104250	147246	830651	145839	205988	1162031	274740	388052	2307432	370542	523367	3112037
46,0	106541	153790	849325	149045	215143	1188155	280779	405299	2359306	378687	546627	3182000
48,0	108784	160334	867598	152183	224298	1213717	286691	422546	2410064	386660	569888	3250458
50,0	110982	166879	885493	155257	233453	1238752	292483	439793	2459775	394472	593149	3317503
52,0	113137	173423	903034	158272	242608	1263290	298163	457039	2508501	402132	616410	3383220
54,0	115252	179967	920240	161231	251763	1287361	303736	474286	2556298	409650	639670	3447684
56,0	117329	186511	937131	164136	260918	1310990	309209	491533	2603218	417031	662931	3510965
58,0	119370	193056	953723	166991	270073	1334201	314587	508780	2649307	424285	686192	3573125
60,0	121376	199600	970030	169798	279228	1357014	319875	526026	2694608	431416	709453	3634222
62,0	123350	206144	986069	172559	288383	1379451	325077	543273	2739160	438431	732713	3694309
64,0	125292	212688	1001850	175277	297538	1401528	330196	560520	2782999	445336	755974	3753435
66,0	127205	219233	1017387	177953	306693	1423263	335238	577767	2826157	452135	779235	3811643
68,0	129090	225777	1032690	180589	315848	1444671	340204	595013	2868667	458834	802496	3868976
70,0	130947	232321	1047769	183188	325003	1465766	345100	612260	2910555	465436	825756	3925471
72,0	132779	238865	1062635	185750	334158	1486562	349926	629507	2951850	471946	849017	3981165
74,0	134586	245410	1077295	188277	343313	1507071	354688	646754	2992574	478368	872278	4036090
76,0	136368	251954	1091759	190771	352468	1527305	359386	664000	3032752	484704	895539	4090278
78,0	138128	258498	1106033	193233	361623	1547274	364023	681247	3072404	490958	918799	4143757
80,0	139865	265042	1120126	195663	370778	1566989	368602	698494	3111551	497134	942060	4196555
82,0	141582	271587	1134043	198064	379933	1586458	373125	715741	3150212	503234	965321	4248696
84,0	143277	278131	1147792	200436	389088	1605692	377594	732988	3188404	509261	988582	4300206
86,0	144953	284675	1161378	202781	398243	1624698	382010	750234	3226144	515218	1011842	4351105
88,0	146610	291219	1174806	205098	407398	1643484	386376	767481	3263447	521106	1035103	4401417
90,0	148248	297764	1188083	207390	416553	1662058	390693	784728	3300329	526929	1058364	4451159
92,0	149868	304308	1201214	209657	425709	1680426	394963	801975	3336803	532688	1081624	4500352
94,0	151471	310852	1214202	211899	434864	1698596	399188	819221	3372883	538385	1104885	4549013
95,0	152266	314124	1220644	213011	439441	1707608	401283	827845	3390779	541211	1116516	4573149

SET PRESSURES AND REGULATING RANGES														
DN1x DN2			25x40	32x50	40x65	50x80	65x100	80x125	100x150	125x200	150x250	200x300	250x350	300x400
SET PRESSURES IN bar	MAXIMUM (LIQUIDS AND GASES)	PN-160	95	95	95	95	95	78	62	40	32	16	12	10
	MAXIMUM (SATURATED STEAM)	PN-160	95	95	95	95	95	78	62	40	32	16	12	10
	MINIMUM	STEAM AND GASES	38	38	30	30	30	23	18	12	9,5	7,5	7,5	7,5
		LIQUIDS	38	38	30	30	30	23	18	12	9,5	7,5	7,5	7,5
SPRING REGULATING RANGE IN bar	7,50 to 10,00	CODE	-	-	-	-	-	-	-	-	-	-	56617	56619
	9,50 to 12,50	CODE	-	-	-	-	-	-	-	-	-	56614	56618	-
	12,00 to 16,00	CODE	-	-	-	-	-	-	-	-	-	56615	-	-
	15,00 to 20,00	CODE	-	-	-	-	-	-	-	-	-	56616	-	-
	18,00 to 25,00	CODE	-	-	-	-	-	-	-	-	56612	-	-	-
	23,00 to 32,00	CODE	-	-	-	-	-	-	-	56610	56613	-	-	-
	30,00 to 40,00	CODE	-	-	-	-	-	-	-	56611	-	-	-	-
	38,00 to 50,00	CODE	-	-	-	-	-	-	56608	-	-	-	-	-
	48,00 to 62,00	CODE	-	-	-	-	-	56606	56609	-	-	-	-	-
	60,00 to 78,00	CODE	56596 56624	56598	56600	56602	56604	56607	-	-	-	-	-	-
	48,00 to 62,00	CODE	56597 56625	56599	56601	56603	56605	-	-	-	-	-	-	-

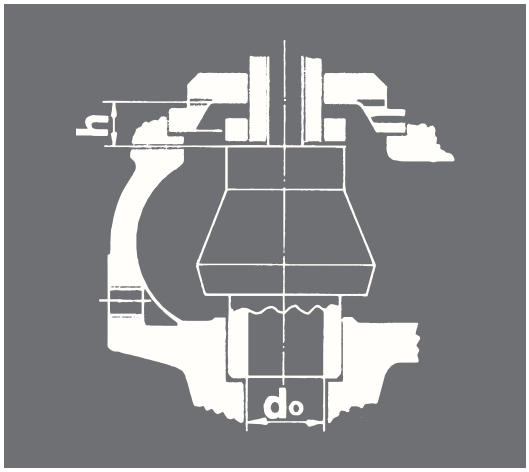
- Spring steel EN-10270-1-SH
- Vanadium-chrome steel EN-1.8159
- Stainless steel EN-1.4310

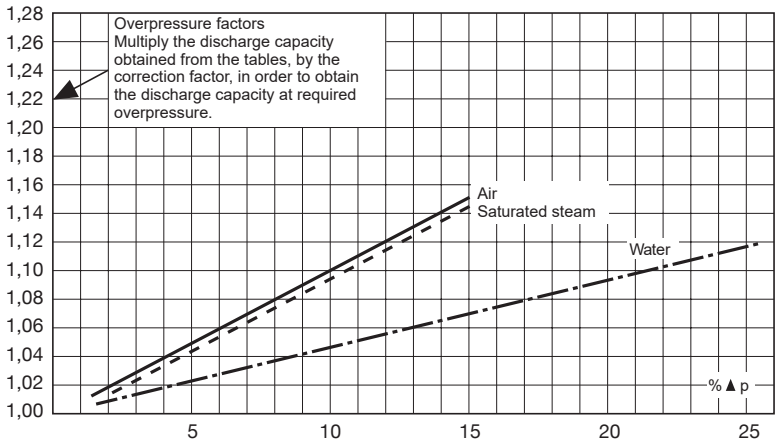


SUPPORT BRACKETS DIMENSIONS								
DN1xDN2	A	B	C	D	E	L	THICKNESS	DRILLS Nº
40x65	186	96	147	70	156	14	13,5	4xM12
50x80	210	98	166	70	180	14	14	4xM12
65x100	250	100	200	70	220	14	14	4xM12
80x125	295	125	248	90	260	18	16	4xM16
100x150	344	129	292	90	309	18	17	4xM16
125x200	374	129	309	90	339	18	17	4xM16
150x250	440	184	370	120	400	18	20	4xM16
200x300	530	188	459	130	494	23	20	4xM20
250x350	664	195	581	160	624	23	20	4xM20
300x400	710	215	616	180	655	23	23	4xM20
400x500	880	238	760	200	820	23	23	4xM20

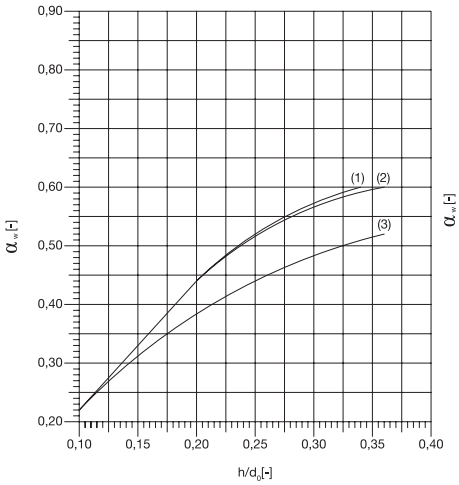
Support brackets will only be drilled if specified by the customer

COEFFICIENT OF DISCHARGE												
DN1x DN2		25x40	32x50	40x65	50x80	65x100	80x125	100x150	125x200	150x250	200x300	250x350	300x400
do		16	20	25	32	40	50	63	77	93	110	155	180
h		7	9	12	12	18	18	20	29	34,4	36,8	56,15	64,8
h1		2,6	3,2	4	5,2	6,5	8	10	12,5	16,74	19,8	27,9	32,4
h/do		0,44	0,45	0,48	0,38	0,45	0,36	0,32	0,38	0,37	0,33	0,36	0,36
h1/do (1)		0,16	0,16	0,16	0,16	0,16	0,16	0,16	0,16	0,18	0,18	0,18	0,18
COEFFICIENT OF DISCHARGE kd	SATURATED STEAM GASES	0,78										0,74	
	LIQUIDS	0,60										0,52	
	LIQUIDS WITH RAPID LIMITER(1)	0,36											



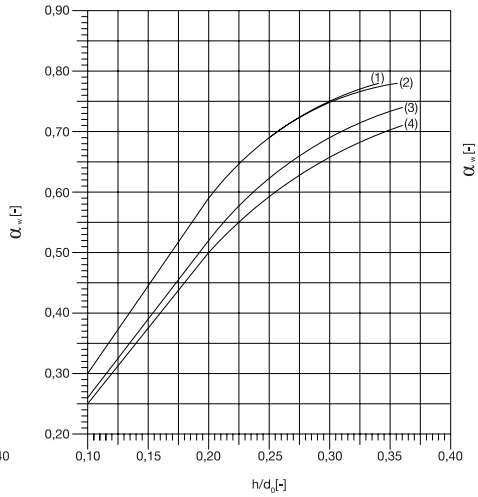


Liquids



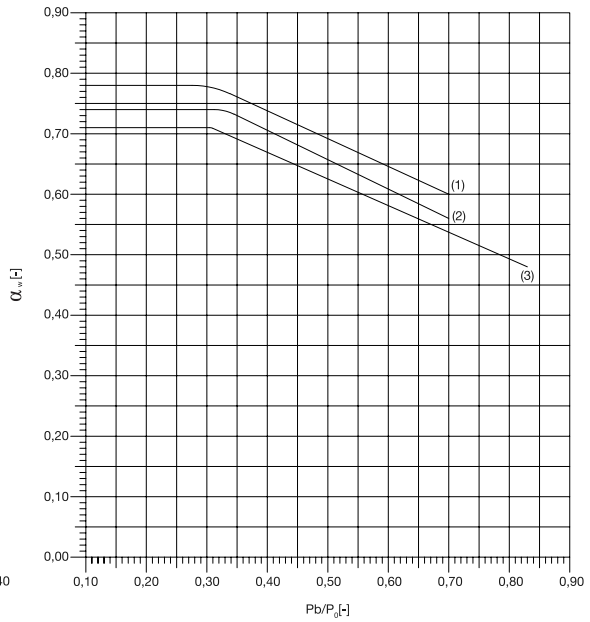
(1) d_0 16-63
(2) d_0 77
(3) d_0 93-155

Saturated steam
Gases



(1) d_0 16-77
(2) d_0 93-110
(3) d_0 155-180
(4) d_0 220-280

Saturated steam
Gases



(1) d_0 16-110
(2) d_0 155-180
(3) d_0 220-280

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