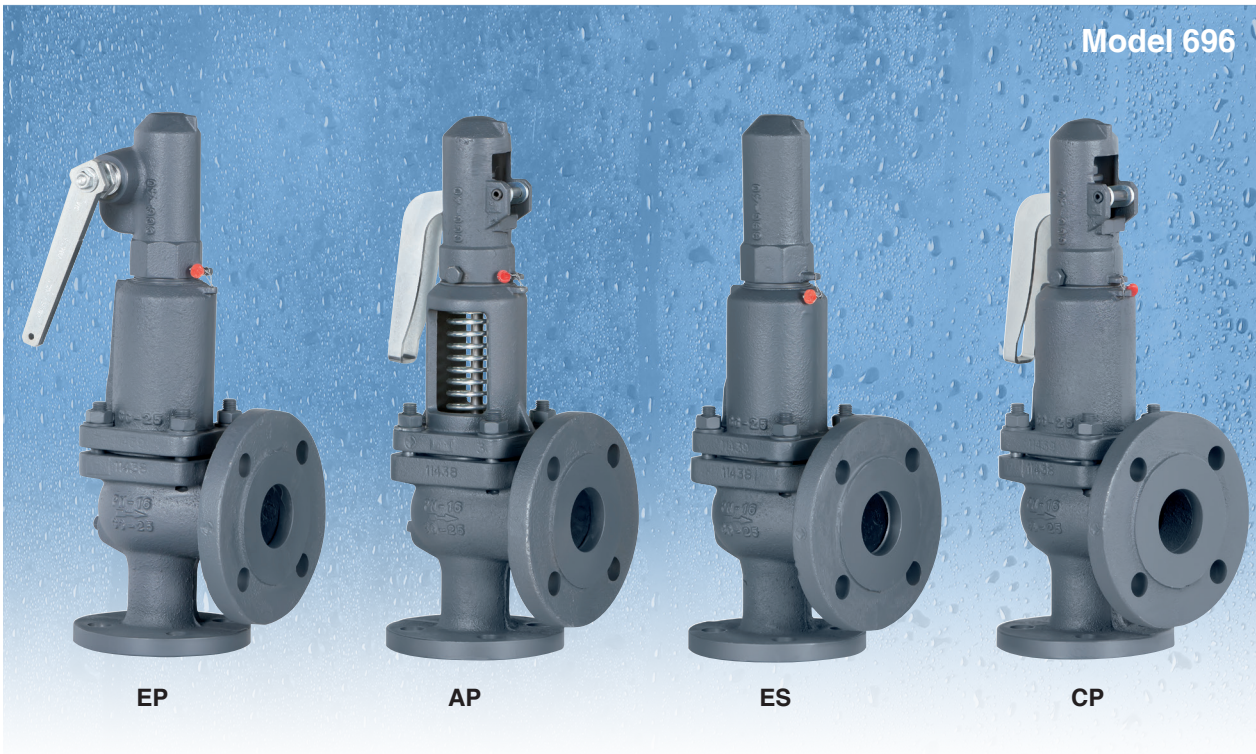


# Full lift safety valve with spring loading. (AIT)



EN

Model 696



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 Rheinland Industrie Service GmbH, Notified Body for Pressure Equipment ID-No. 0035.

Type (Module B) EC examination report n° 33530455 certified by: TÜV Rheinland Ibérica ICT, S.A.

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 pressure 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.

**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

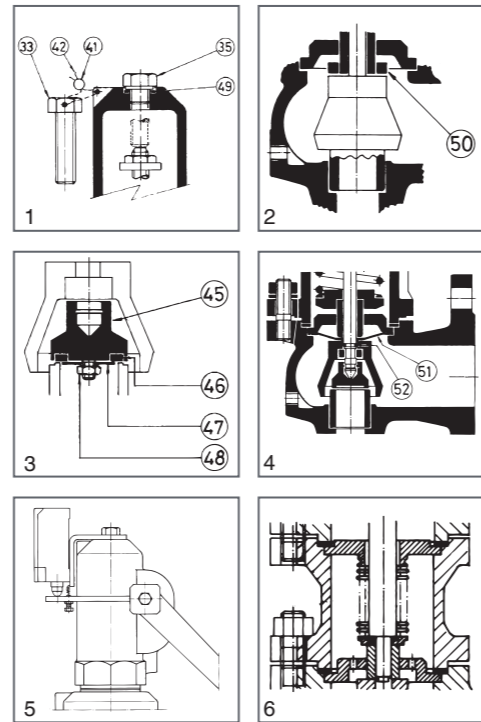
$$0,3 \times 10^{-3} \frac{\text{Pa cm}^3}{\text{seg.}}$$

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	7,0	
Saturated Liquids and gases	S	V	T	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)

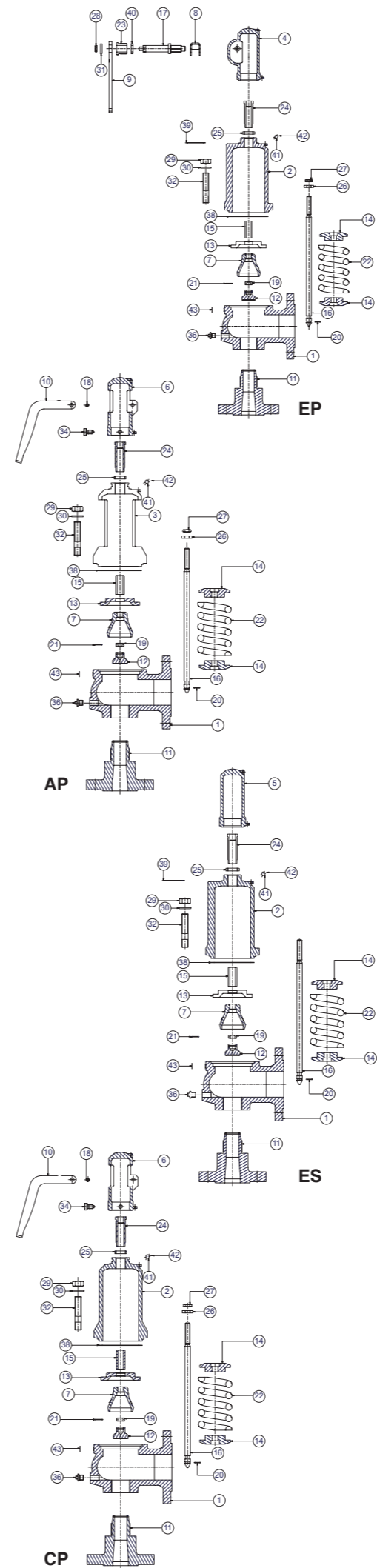
(1) For temperatures exceeding 230°C apply metallic seal only

4. Fluorelastomer (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.



N.º PIECE	PIECE	MATERIAL	
		CAST STEEL	STAINLESS STEEL
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-5.3106)	Stainless steel (EN-1.4408)
7	Elevator	Nodular iron (EN-5.3106) (1)	Stainless steel (EN-1.4408)(2)
8	Cam	Carbon steel (EN-1.0037)	Stainless steel (EN-1.4301)
9, 10	Lever	Carbon steel (EN-1.0037)	Carbon steel (EN-1.0037)
11	Seating	Carbon steel (EN-1.0460) (7)	Stainless steel (EN-1.4571) (8)
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	Carbon 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	Carbon steel (EN-1.1191)	Stainless steel (EN-1.4305)
18	Gudgeon	Carbon 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) (2)	Stainless steel (EN-1.4310) (6)
23	Gland	Carbon 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	Carbon steel (EN-1.1141)	Stainless steel (EN-1.4401)
28, 29, 48	Nut	Carbon steel (EN-1.1141)	Stainless steel (EN-1.4401)
30, 31	Washer	Carbon steel (EN-1.1141)	Stainless steel (EN-1.4401)
32	Stud	Carbon steel (EN-1.1181)	Stainless steel (EN-1.4401)
33, 34, 35	Screw	Carbon steel (EN-1.1191)	Stainless steel (EN-1.4401)
36	Cap	Carbon 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	25x32 to 300x400	
	PN	160	95
OPERATING CONDITIONS	PRESSURE IN bar	95	95
	MAX. TEMP. IN °C	450°C	400°C
	MIN. TEMP. IN °C	-10	-60

(1) DN-25x40 in stainless steel (1.4408).  
 (2) DN-32x50 a DN-80x125 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) DN-25x32 from 30 to 40 and 38 to 50 bar in Spring steel (EN-10270-1-SH), DN-25x40 from 30 to 40 bar in Spring steel (EN 10270-1 SH).Max temp. EP, ES and CP 250°C / AP 400°C. Over 400°C possibility of manufacturing the spring in another material if specified by the customer  
 (6) DN-25x40 from 60 to 78 , and from 75 to 95 bar in Stainless Steel (EN.1.4310).  
 (7) From DN-150x250 to DN-300x400 in Carbon steel (1.0619)  
 (8) From DN-150x250 to DN-300x400 in Stainless steel (1.4408)



**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 releasing 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. Definitely tighten the cap (4).

**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.

**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 hollow screw (24) until you note a releasing 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). 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) and press this against the previously described 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 marked (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 - ES.**

**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 - 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 releasing 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.

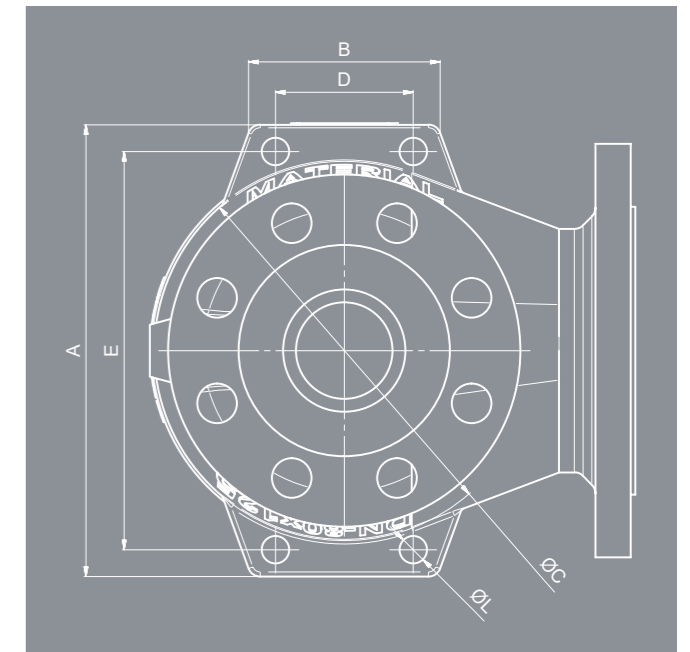




DISCHARGE CAPACITY												
DN1 x DN2	150x250			200x300			250x350			300x400		
do	93			110			155			180		
$A_o = \frac{\pi \cdot do^2}{4}$	6793			9503			18870			25450		
p [bar]	I - Saturated steam in Kg/h..											
	II - Air at 0°C and 1,013 bar in [Nm3/h].											
	III - Water at 20°C in l/h..											
	$V_L = \sqrt{\frac{Q_A}{Q_L}} \cdot V_A$			$V_A = V_L \cdot \sqrt{\frac{Q_L}{Q_A}}$								
	$V_A$ = Water flow according to table. $V_L$ = Liquid flow. $V_A$ = Water density at a 20°C. $(V_A = 998 \text{ Kg/m}^3)$ . $V_L$ = Liquid density.											
SET PRESSURE IN bar	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							61226	68987	919614	82576	93043	1240285
7,5							66031	73299	951951	89056	98858	1283898
8,0							73572	77610	983225	99227	104673	1326077
9,0				44085	45775	525240	83050	86234	1042964	112010	116304	1406647
10,0				49106	50353	553693	92510	94857	1099462	124768	127934	1482846
11,0				54124	54930	580753	101962	103481	1153195			
12,0				59142	59508	606607	111416	112104	1204533			
13,0				64165	64085	631404						
14,0				69194	68663	655262						
15,0				74232	73240	678282						
16,0				79282	77818	700546						
17,0				84345	82395	722124						
18,0	63921	62170	531171	89422	86973	743076						
20,0	69231	68715	559924	96850	96128	783300						
22,0	74530	75259	587271									
24,0	77703	81803	613399									
25,0	79242	85075	626055									
26,0	80751	88347	638460									
28,0	83689	94892	662573									
30,0	86526	101436	685839									
32,0	89274	107980	708342									
34,0												
36,0												
38,0												
40,0												
42,0												
44,0												
46,0												
48,0												
50,0												
52,0												
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86,0												
88,0												
90,0												
92,0												
94,0												
95,0												

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	20	12	10
	MAXIMUM (SATURATED STEAM)	PN-160	95	80	95	95	95	78	62	40	32	20	12	10
	MINIMUM	STEAM AND GASES	60	60	60	60	60	48	38	23	18	9,5	7,5	7,5
SPRING REGULATING RANGE IN bar		LIQUIDS	60	60	60	60	60	48	38	23	18	9,5	7,5	7,5
	7,50 to 10,00	CODE	-	-	-	-	-	-	-	-	-	-	56617	56634
	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	-	-	-	-	-	-
75,00 to 95,00	CODE	56597 56625	56599	56601	56603	56605	-	-	-	-	-	-	-	

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

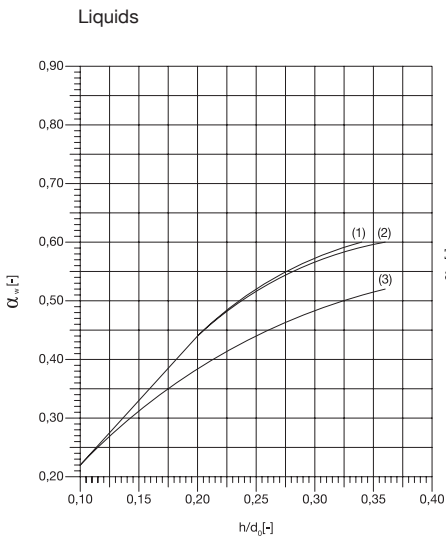
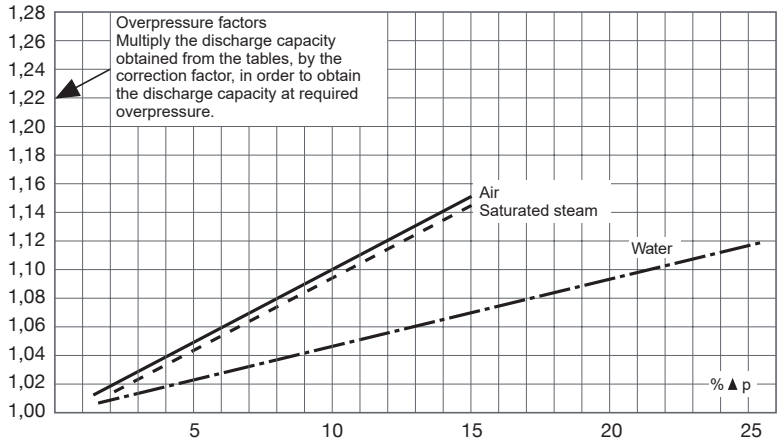
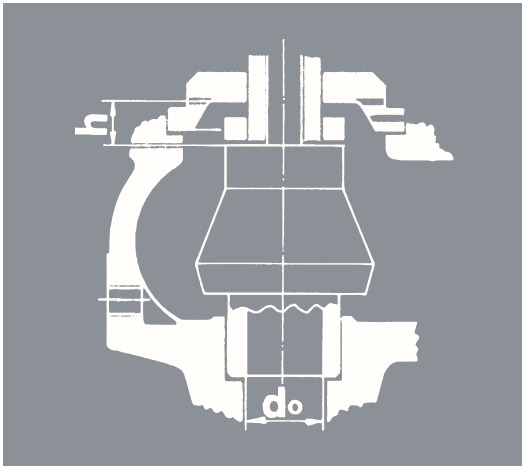


SUPPORT BRACKETS DIMENSIONS								
DN1xDN2	A	B	C	D	E	L	THICKNESS	DRILLS N°
40x65	186	96	147	70	156	14	13,5	4xM12
50x80	210	98	166	70	180	14	14	4xM12
65x100	250	100	200	70	220	14	14	4xM12
80x125	295	125	248	90	260	18	16	4xM16
100x150	344	129	292	90	309	18	17	4xM16
125x200	374	129	309	90	339	18	17	4xM16
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

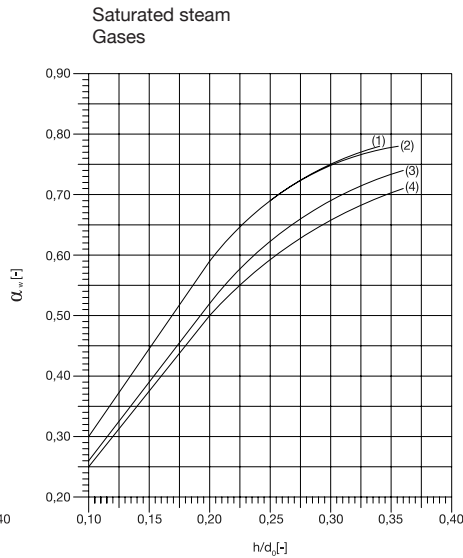
Support brackets will only be drilled if specified by the customer

COEFFICIENT OF DISCHARGE

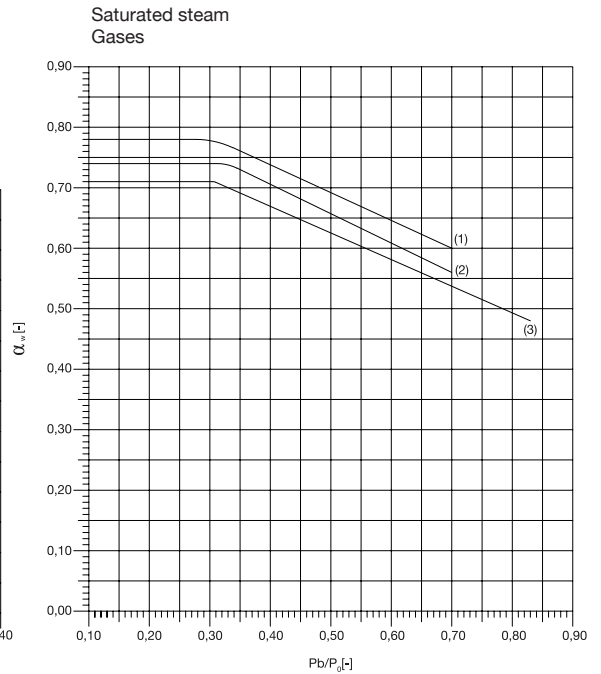
DN1x DN2	25x40	32x50	40x65	50x80	65x100	80x125	100x150	125x200	150x250	200x300	250x350	300x400	
do	16	20	25	32	40	50	63	77	93	110	155	180	
h	7,00	9,00	12,00	12,00	18,00	18,00	20,00	29,00	34,40	36,80	56,15	64,80	
h1	2,60	3,20	4,00	5,20	6,50	8,00	10,00	12,50	16,74	19,80	27,90	32,40	
h/do	0,44	0,45	0,48	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	



- (1) d<sub>0</sub> 16-63
- (2) d<sub>0</sub> 77
- (3) d<sub>0</sub> 93-155



- (1) d<sub>0</sub> 16-77
- (2) d<sub>0</sub> 93-110
- (3) d<sub>0</sub> 155-180
- (4) d<sub>0</sub> 220-280



- (1) d<sub>0</sub> 16-110
- (2) d<sub>0</sub> 155-180
- (3) d<sub>0</sub> 220-280