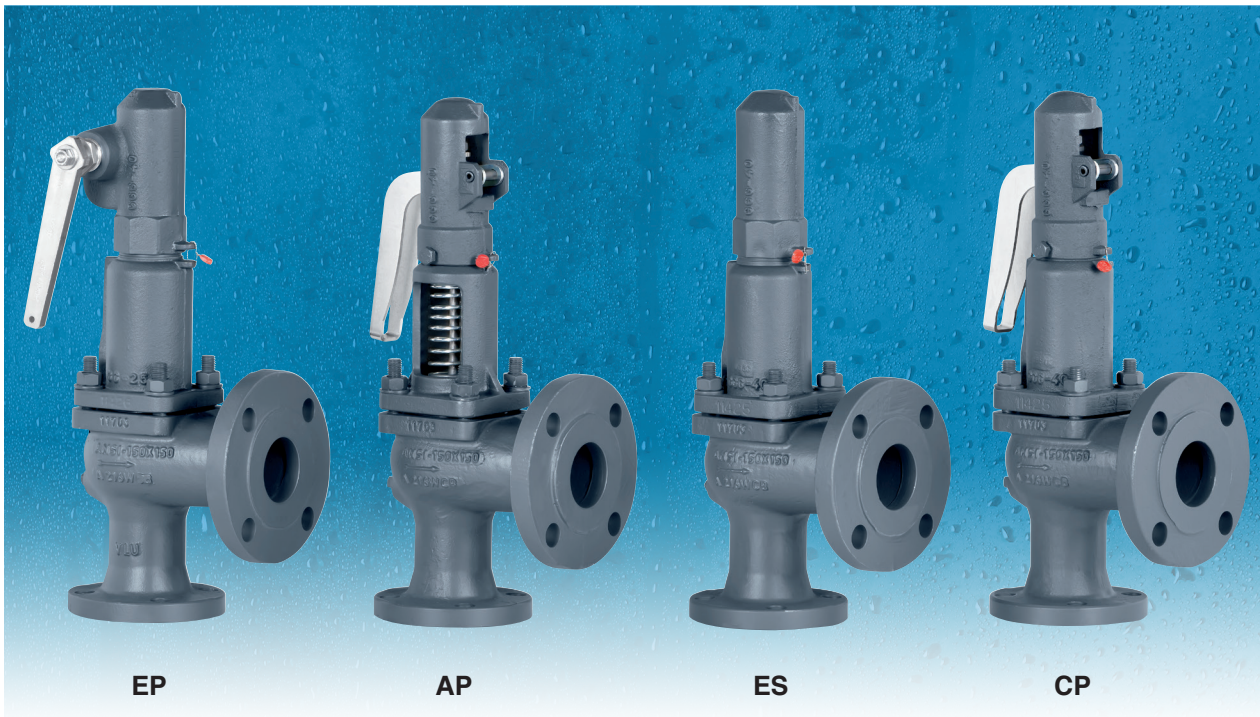# Full lift safety valve with spring loading.(AIT)

Model 486

VYC

ASME SI Units

EP   AP   ES   CP

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/ANSI B16.5-2009 standard. Center to face dimensions according API-526.
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 nº DEP-B-prod.001072-22 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 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 API-527 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 be protected.
2.- Rapid limiter to reduce the coefficient of discharge.
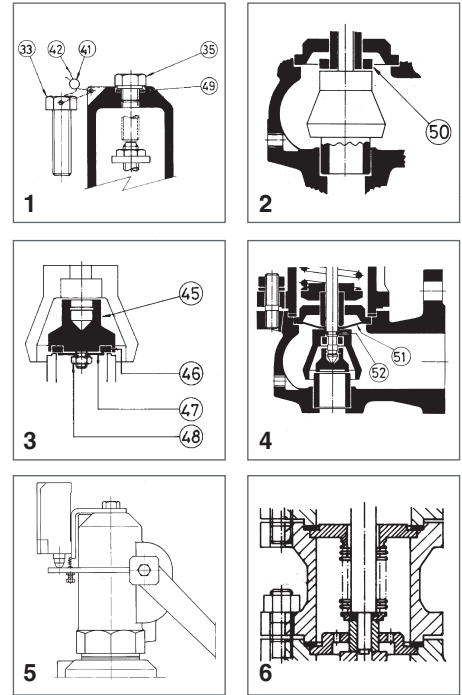3.- Fluorelastomer (Vitón) seals, Silicone's rubber, PTFE (Teflón)... etc., achieving leakage levels less than

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

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

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

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

4.- Flourelastomer (Viton) 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°. PIECE	PIECE	MATERIAL	
		CAST STEEL	STAINLESS STEEL
1	Body	Cast steel (ASTM A216 - WCB)	Stainless steel (ASTM A 351 - CF8M)
2	Closed bell	Nodular iron (ASTM A536 65 - 45 -12)	Stainless steel (ASTM A 351 - CF8M)
3	Open bell	Cast steel (ASTM A 216 - WCB)	Stainless steel (ASTM A 351 - CF8M)
4, 5, 6	Hood	Nodular iron (ASTM A 536 65 - 45 -12)	Stainless steel (ASTM A 351 - CF8M)
7	Elevator	Nodular iron (ASTM A 536 65 - 45 -12) (1)	Stainless steel (ASTM A 351 - CF8M) (7)
8	Cam	Carbon steel (ASTM A 570 - 36) (6)	Stainless steel (AISI 304)
9, 10	Lever	Carbon steel (ASTM A 570 - 36)	Carbon steel (ASTM A 570 - 36)
11	Seating	Stainless steel (AISI 420)	Stainless steel (AISI 630)
12	Plug	Stainless steel (AISI 420)	Stainless steel (AISI 630)
13	Lead	Stainless steel (AISI 420) (4)	Stainless steel (AISI 316) (5)
14	Spring press	Carbon steel (AISI 1045)	Stainless steel (AISI 303)
15	Separator	Stainless steel (AISI 420)	Stainless steel (AISI 316)
16	Rod	Stainless steel (AISI 420)	Stainless steel (AISI 316)
17	Lever shaft	Carbon steel (AISI 1045)	Stainless steel (AISI 303)
18	Gudgeon	Carbon steel (AISI 1070)	Stainless steel (AISI 301)
19	Ring	Stainless steel (AISI 420)	Stainless steel (AISI 316)
20, 21	Safety ring	Stainless steel (AISI 301)	Stainless steel (AISI 301)
22	Spring	Vanadium chrome steel (AISI 6150) (2)	Stainless steel (AISI 301) (3)
23	Gland	Carbon steel (AISI 1045)	Stainless steel (AISI 303)
24	Hollow screw	Stainless steel (AISI 303)	Stainless steel (AISI 303)
25	Hollow screw nut	Stainless steel (AISI 303)	Stainless steel (AISI 303)
26	Buffer nut	Stainless steel (AISI 303)	Stainless steel (AISI 303)
27	Rod check nut	Carbon steel (AISI 1015)	Stainless steel (AISI 316)
28, 29, 48	Nut	Carbon steel (AISI 1015)	Stainless steel (AISI 316)
30, 31	Washer	Carbon steel (AISI 1015)	Stainless steel (AISI 316)
32	Stud	Carbon steel (AISI 1035)	Stainless steel (AISI 316)
33, 34, 35	Screw	Carbon steel (AISI 1045)	Stainless steel (AISI 316)
36	Cap	Carbon steel (AISI 1035)	Stainless steel (AISI 316)
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 (AISI 304)	Stainless steel (AISI 304)
45	Plug	Stainless steel (AISI 316)	Stainless steel (AISI 316)
46	Sealing disk	PTFE (Teflon)	PTFE (Teflon)
		Silicone's rubber	Silicone's rubber
		Fluorelastomer (Viton)	Fluorelastomer (Viton)
47	Washer	Stainless steel (AISI 316)	Stainless steel (AISI 316)
49	Coupling	Copper	PTFE (Teflon)
50	Limiter	Stainless steel (AISI 420)	Stainless steel (AISI 316)
51	Membrane	Fluorelastomer (Viton)	Fluorelastomer (Viton)
52	O-ring	Fluorelastomer (Viton)	Fluorelastomer (Viton)

NPS₁ x NPS₂		1"x2" to 8"x10"										
Class		150 lbs							150 lbs			
OPERATING CONDITIONS	PRESSURE [bar]	16,90	13,80	12,10	10,20	8,40	6,50	4,60	15,64	13,70	10,20	4,60
	MAX. TEMP. [°C]	120	200	250	300	350	400	426	120	200	300	400
	MIN. TEMP. [°C]	-29							-29			
Class		300 lbs							300 lbs			
OPERATING CONDITIONS	PRESSURE [bar]	40	40	40	39,80	37,60	34,70	23	40	35,70	31,60	28,80
	MAX. TEMP. [°C]	120	200	250	300	350	400	426	120	200	300	400
	MIN. TEMP. [°C]	-29							-29			

(1) 1"x2" in stainless steel (ASTM A351 CF8M).
(2) Spring steel (ASTM A228) for wire spring Ø < 10 mm. Maximum temperature EP, ES and CP 250 °C / AP 400 °C.
(3) Vanadium chrome steel (AISI 6150) for wire spring Ø > 10 mm.
(4) 8" x 10" in Stainless steel (ASTM A743 CA40F).
(5) 8" x 10" in Stainless steel (ASTM A351 CF8M).
(6) 1"x2" in Stainless steel (AISI 304).
(7) 11/2"x2" to 4"x6" L in Stainless steel (AISI 316) .

Full lift safety valve with spring loading (AIT) model 486 - 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 486 - 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 486 - 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).
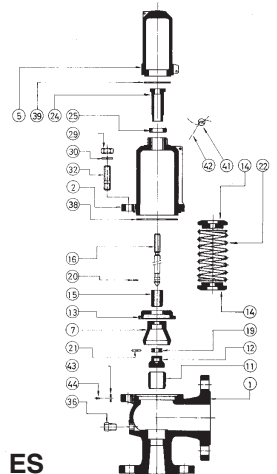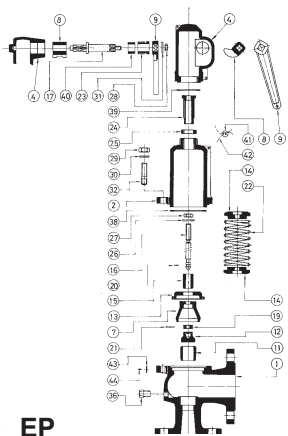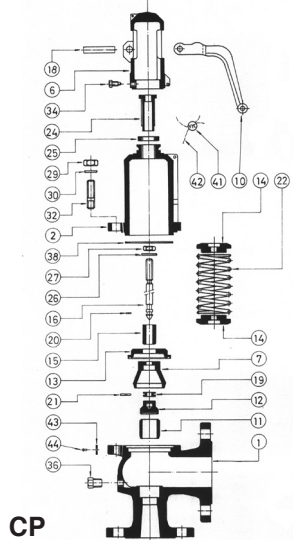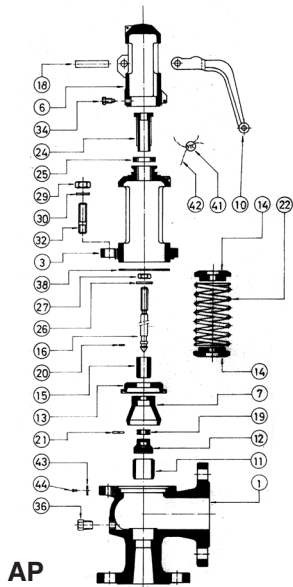
F - Adjust the firing pressure with the hollow screw (24) and fix the adjustment position with the hollow screw nut (25).

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

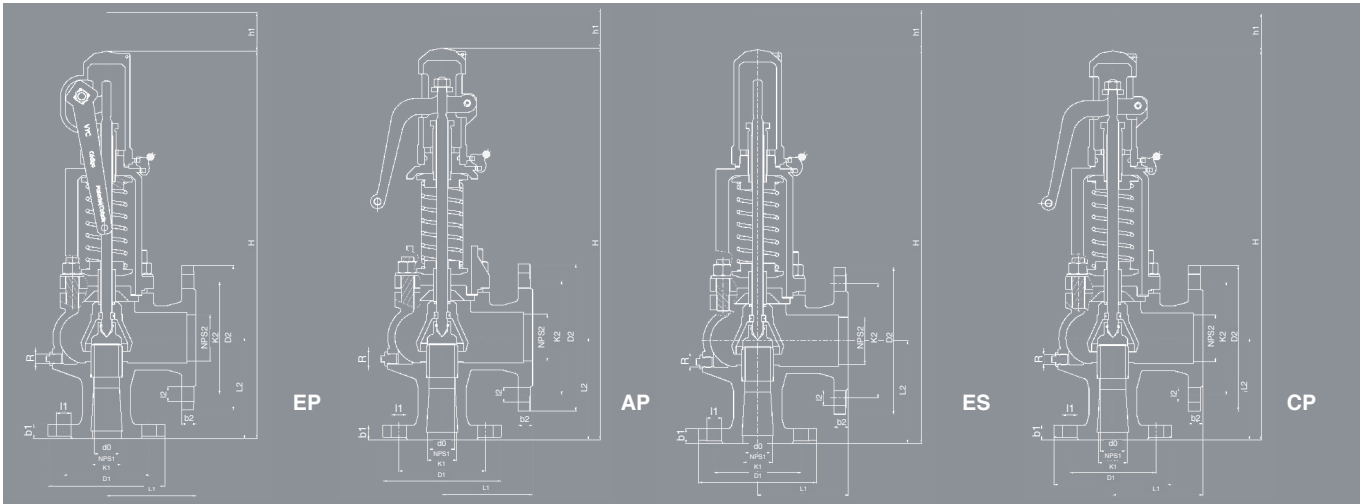2. Adjusting the firing pressure.

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

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

NPS$_1$ x NPS$_2$	1"x 2"	1 1/2" x 2"	1 1/2"x2 1/2"	1 1/2"x3"(2"x3")*	2"x3"(3"x4")*	3"x4"(4"x6")*	4" x 6"	4" x 6"	6" x 8"	8" x 10"
API Orifice Letter	D - E	F	G	H	J	L	N	P	Q	T
do	16	20	25	32	40	50	63	77	110	155
$Ao = \frac{\pi \cdot do^2}{4}$	201	314	491	804	1257	1964	3117	4657	9503	18870
H	367	412	436	498	545	665	745	810	1070	1200
h_1	112	129	129	148	148	191	191	191	247	331
L_1	114	121 (152)*	121 (152)*	124	124 (181)*	165 (181)*	209,5	229 (254)*	241	279
L_2	105	124	124	130	136,5 (184)*	155,5 (179)*	197	181 (225)*	240	276
R	1/4"	1/4"	1/4"	1/4"	1/4"	3/8"	3/8"	3/8"	3/8"	3/8"
	Whitworth gas-tight cylindrical female thread ISO 228/ 1 (DIN-259)									

INTAKE FLANGE

Class 150 lbs ASME/ANSI B16.5

D_1	110	125	125	125	150	190	230	230	280	345
K_1	79,2	98,6	98,6	98,6	120,7	152,4	190,5	190,5	241,3	298,5
I_1	15,9	15,9	15,9	15,9	19,1	19,1	19,1	19,1	22,2	22,2
b_1	14,7	17,9	17,9	17,9	19,5	24,3	24,3	24,3	25,9	29
DRILLS N.°	4	4	4	4	4	4	8	8	8	8

Class 300 lbs ASME/ANSI B16.5

D_1	125	155	155	165	210	255	255	255	320	380
K_1	88,9	114,3	114,3	127	168,3	200	200	200	269,9	330,2
I_1	19,1	22,2	22,2	19,1	22,2	22,2	22,2	22,2	22,2	25,4
b_1	17,9	21,1	21,1	22,7	29	32,2	32,2	32,2	37	41,7
DRILLS N.°	4	4	4	8	8	8	8	8	12	12

ESCAPE FLANGE

Class 150 lbs ASME/ANSI B16.5

D_2	150	150	180	190	190 (230)*	230 (280)*	280	280	345	405
K_2	120,7	120,7	139,7	152,4	152,4 (190,5)*	190,5 (241,3)*	241,3	241,3	298,5	362
I_2	19,1	19,1	19,1	19,1	19,1 (19,1)*	19,1 (22,2)*	22,2	22,2	22,2	25,4
b_2	19,5	19,5	22,7	24,3	24,3 (24,3)*	24,3 (25,9)*	25,9	25,9	29	30,6
DRILLS N.°	4	4	4	4	4 (8)	8 (8)	8	8	8	12

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	EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP	EP	AP	ES	CP
WEIGHT [Kg] CAST STEEL STAINLESS STEEL	8,50	7,86	8,07	8,27	10,60	9,80	10,07	10,33	14,87	13,75	14,12	14,38	21,27	19,67	20,20	20,63	28,68	26,52	27,24	27,67	41,48	38,36	39,40	40,00	58,48	54,09	55,55	56,15	87,15	80,61	82,79	83,39	152,10	144,48	149,30	180,65	250,88	235,94	243,61	246,75

CODE

CAST STEEL 2002-486.

| 150 lb | 5104D | 51041D | 51042D | 51043D | 5124F | 51241F | 51242F | 51243F | 5124G | 51241G | 51242G | 51243G | 5124H | 51241H | 51242H | 51243H | 5204J | 52041J | 52042J | 52043J | 5304L | 53041L | 53042L | 53043L | 5404N | 54041N | 54042N | 54043N | 5404P | 54041P | 54042P | 54043P | 5604Q | 56041Q | 56042Q | 56043Q | 5804T | 58041T | 58042T | 58043T |
| 300 lb | 8104D | 81041D | 81042D | 81043D | 8124F | 81241F | 81242F | 81243F | 8124G | 81221G | 81242G | 81223G | 8204H | 82041H | 82042H | 82043H | 8304J | 83041J | 83042J | 83043J | 8404L | 84041L | 84042L | 84043L | 8404N | 84041N | 84042N | 84043N | 8404P | 84041P | 84042P | 84043P | 8604Q | 86041Q | 86042Q | 86043Q | 8804T | 88041T | 88042T | 88043T |

STAINLESS STEEL 2002-486.

| 150 lb | 5102D | 51021D | 51022D | 51023D | 5122F | 51221F | 51222F | 51223F | 5122G | 51221G | 51222G | 51223G | 5122H | 51221H | 51222H | 51223H | 5202J | 52021J | 52022J | 52023J | 5302L | 53021L | 53022L | 53023L | 5402N | 54021N | 54022N | 54023N | 5402P | 54021P | 54022P | 54023P | 5602Q | 56021Q | 56022Q | 56023Q | 5802T | 58021T | 58022T | 58023T |
| 300 lb | 8102D | 81021D | 81022D | 81023D | 8122F | 81221F | 81222F | 81223F | 8122G | 81221G | 81222G | 81223G | 8202H | 82021H | 82022H | 82023H | 8302J | 83021J | 83022J | 83023J | 8402L | 84021L | 84022L | 84023L | 8402N | 84021N | 84022N | 84023N | 8402P | 84021P | 84022P | 84023P | 8602Q | 86021Q | 86022Q | 86023Q | 8802T | 88021T | 88022T | 88023T |

Center to face dimensions according to API-526.
*Dimensions corresponding to 300x150 lbs.

EP   AP   ES   CP

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		

OPEN AND CLOSED PRESSURES IN % OF SET PRESSURE			
FLUID	PRESSURE [bar]	OPENING PRESSURE	CLOSING PRESSURE
SATURATED STEAM	< 3	+ 5 %	- 0,3 bar
GASES	≥ 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 αd 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.
αd = Coefficient of discharge.

SET PRESSURES AND REGULATING RANGES											
NPS$_1$ x NPS$_2$		1"x 2"	1 1/2"x 2"	1 1/2"x 2 1/2"	1 1/2"x 3" (2"x3")	2"x 3" (3"x4")	3"x 4" (4"x6")	4"x 6"	4"x 6"	6"x 8"	8"x10"
API Orifice Letter		D-E	F	G	H	J	L	N	P	Q	T
SET PRESSURES [bar] MAXIMUM (LIQUIDS AND GASES)	150 lbs	19,6	19,6	19,6	19,6	19,6	19,6	19,6	19,6	10	8
	300 lbs	40	40	40	32	32	32	25	20	10	8
MAXIMUM (SATURATED STEAM)	150 lbs	10,2	10,2	10,2	10,2	10,2	10,2	10,2	10,2	10	8
	300 lbs	32	32	30	24	22	24	20	18	10	8
MINIMUM	STEAM AND GASES	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5	0,5
	LIQUIDS	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2	0,2
SPRING REGULATING RANGE [bar] 0,20 to 0,68	CODE	56210 56390	56226 56406	56242 56422	56258 56438	56273 56453	56288 56468	56303 56483	56317 56497	56511	56521
0,66 to 1,00	CODE	56211 56391	56227 56407	56243 56423	56259 56439	56274 56454	56289 56469	56304 56484	56318	56512	56522
0,95 to 1,40	CODE	56212 56392	56228 56408	56244 56424	56260 56440	56275 56455	56290 56470	56305 56485	56319	56513	56523
1,30 to 1,90	CODE	56213 56393	56229 56409	56245 56425	56261 56441	56276 56456	56291 56471	56306 56486	56320	56514	56524
1,80 to 2,60	CODE	56214 56394	56230 56410	56246 56426	56262 56442	56277 56457	56292 56472	56307	56321	56515	56525
2,50 to 3,60	CODE	56215 56395	56231 56411	56247 56427	56263 56443	56278 56458	56293 56473	56308	56322	56516	56526
3,50 to 5,00	CODE	56216 56396	56232 56412	56248 56428	56264 56444	56279 56459	56294	56309	56323	56517	56527
4,80 to 6,30	CODE	56217 56397	56233 56413	56249 56429	56265 56445	56280 56460	56295	56310	56324	56518	56528
6,00 to 8,00	CODE	56218 56398	56234 56414	56250 56430	56266 56446	56281 56461	56296	56311	56325	56519	56529
7,50 to 10,00	CODE	56219 56399	56235 56415	56251 56431	56267 56447	56282 56462	56297	56312	56326	56520	
9,50 to 12,50	CODE	56220 56400	56236 56416	56252 56432	56268 56448	56283	56298	56313	56327		
12,00 to 16,00	CODE	56221 56401	56237 56417	56253 56433	56269 56449	56284	56299	56314	56328		
15,00 to 20,00	CODE	56222 56402	56238 56418	56254 56434	56270	56285	56300	56315	56329		
18,00 to 25,00	CODE	56223 56403	56239 56419	56255 56435	56271	56286	56301	56316			
23,00 to 32,00	CODE	56224 56404	56240 56420	56256 56436	56272	56287	56302				
30,00 to 40,00	CODE	56225 56405	56241 56421	56257 56437							

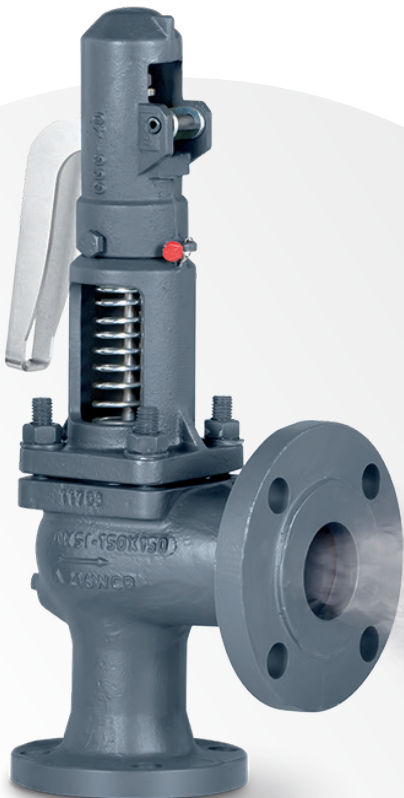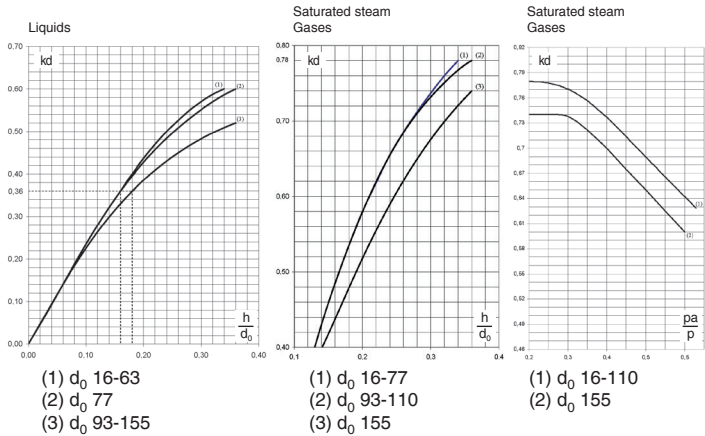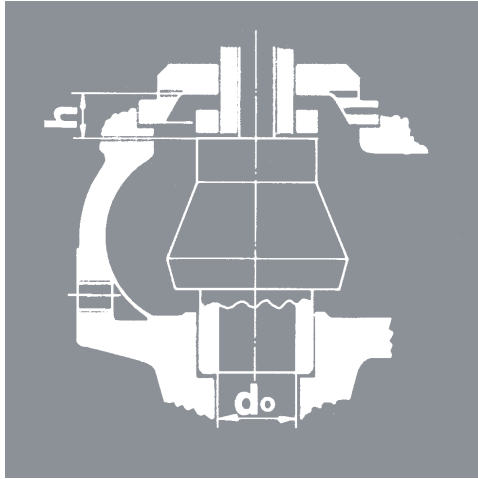Spring steel (ASTM A228). Maximum temperature for EP, ES and CP 250 °C / AP 400 °C.

Vanadium-chrome steel (AISI 6150).

Stainless steel (AISI 301).

ASME code only applies to setted safety valves at 1,00 bar or above.

COEFFICIENT OF DISCHARGE

NPS₁ x NPS₂	1"x 2"	1 1/2" x 2"	1 1/2" x 2 1/2"	1 1/2" 3"(2"x3")	2"x 3" (3"x4")	3"x 4" (4"x6")	4"x 6"	4"x 6"	6"x 8"	8"x10"
API Orifice Letter	D-E	F	G	H	J	L	N	P	Q	T
do	16	20	25	32	40	50	63	77	110	155
h	7,00	9,00	12,00	12,00	18,00	18,00	20,00	29,00	36,80	56,15
h1	2,60	3,20	04,00	05,20	06,50	08,00	10,00	12,50	19,80	27,90
h/do	0,44	0,45	00,48	00,38	00,45	00,36	00,32	0,38	0,33	0,36
h1/do (1)	0,16	0,16	00,16	00,16	00,16	00,16	00,16	0,16	0,18	0,18
COEFFICIENT OF DISCHARGE [kd] — SATURATED STEAM GASES	0,78								0,74	
COEFFICIENT OF DISCHARGE [kd] — LIQUIDS	0,60								0,52	
COEFFICIENT OF DISCHARGE [kd] — LIQUIDS WITH RAPID LIMITER (1)	0,36									

Liquids

(1) d₀ 16-63
(2) d₀ 77
(3) d₀ 93-155

Saturated steam Gases

(1) d₀ 16-77
(2) d₀ 93-110
(3) d₀ 155

Saturated steam Gases

(1) d₀ 16-110
(2) d₀ 155

NPS₁ x NPS₂	1"x 2"			1 1/2" x 2"			1 1/2" x 2 1/2"		
API Orifice Letter	D-E			F			G		
do	16			20			25		
$A_0 = \dfrac{\pi \cdot do^2}{4}$	201			314			491		
p [bar] — SET PRESSURE [bar]	I - Saturated steam [kg/h]. II - Air at 0 °C and 1,013 bar in [Nm3/h]. III - Water at 20 °C [l/h].								
	I	II	III	I	II	III	I	II	III
1,0	181	242	6721	274	365	10165	442	590	16417
1,5	222	297	7999	336	449	12098	543	724	19540
2,0	263	351	9100	398	532	13763	643	859	22229
2,5	309	412	10174	467	623	15387	754	1006	24853
3,0	354	472	11145	535	714	16856	865	1154	27225
3,5	399	533	12038	604	806	18207	975	1301	29406
4,0	444	593	12869	672	897	19464	1086	1449	31436
4,5	490	654	13650	741	988	20644	1196	1596	33343
5,0	535	714	14388	809	1080	21761	1307	1744	35147
6,0	626	835	15761	946	1263	23838	1528	2039	38502
7,0	716	956	17024	1083	1445	25748	1749	2334	41586
8,0	807	1076	18200	1220	1628	27526	1970	2630	44458
9,0	897	1197	19304	1357	1811	29196	2192	2925	47155
10,0	988	1318	20348	1494	1994	30775	2413	3220	49705
12,0	1169	1560	22290	1768	2359	33712	2855	3810	54449
14,0	1350	1801	24076	2042	2724	36413	3297	4400	58812
16,0	1531	2043	25738	2315	3090	38927	3740	4991	62873
18,0	1712	2285	27299	2589	3455	41289	4182	5581	66687
20,0	1893	2526	28776	2863	3821	43522	4624	6171	70294
22,0	2074	2768	30181	3137	4186	45646	5067	6762	73725
24,0	2255	3010	31523	3411	4552	47676	5509	7352	77003
26,0	2436	3251	32810	3685	4917	49623	5952	7942	80147
28,0	2617	3493	34048	3959	5283	51496	6394	8533	83173
30,0	2799	3735	35243	4233	5648	53303	6836	9123	86092
32,0	2980	3976	36399	4506	6014	55052		9713	88916
34,0		4218	37519		6379	56746		10303	91652
36,0		4460	36607		6745	58391		10894	94309
38,0		4701	39665		7110	59991		11484	96893
40,0		4943	40696		7476	61550		12074	99411

Calculated discharge capacities at set pressure +10% overpressure.

Discharge capacities at 2 bar and below are calculated at set pressure + 0,2 bar of overpressure.

DISCHARGE CAPACITY

1 1/2" x 3" (2"x3")		2" x 3" (3"x4")		3" x 4" (4"x6")		4" x 6"		4" x 6"		6" x 8"		8" x 10"	
H		J		L		N		P		Q		T	
32		40		50		63		77		110		155	
804		1257		1964		3117		4657		9503		18870	

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

$$V_L = \sqrt{\frac{\varrho_A}{\varrho_L}} \cdot V_A \quad \text{Ó} \quad V_A = V_L \cdot \sqrt{\frac{\varrho_L}{\varrho_A}}$$

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

I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
724	967	26883	1132	1511	42029	1769	2361	65668	2808	3747	104220	4195	5599	155712	8561	11425	275377	16128	21523	546814
889	1186	31997	1390	1855	50025	2171	2898	78161	3446	4599	124047	5149	6871	185334	10507	14021	327765	19794	26414	650839
1054	1406	36399	1647	2198	56908	2574	3434	88916	4085	5451	141115	6103	8144	210835	12453	16618	372863	23459	31306	740390
1235	1648	40696	1930	2576	63625	3016	4025	99411	4787	6388	157771	7151	9543	235721	14593	19474	416873	27941	36687	827781
1416	1889	44580	2213	2954	69697	3458	4615	108899	5489	7324	172830	8200	10943	258219	16733	22330	456662	31523	42067	906788
1597	2131	48152	2496	3332	75282	3901	5205	117624	6191	8261	186678	9249	12343	278908	18874	25187	493251	35555	47448	979443
1778	2373	51476	2780	3709	80480	4343	5796	125746	6893	9198	199567	10298	13743	298166	21014	28043	527308	39587	52829	1047069
1959	2614	54599	3063	4087	85362	4785	6386	133373	7595	10135	211672	11347	15142	316252	23154	30899	559294	43619	58210	1110584
2140	2856	57552	3346	4465	89979	5228	6976	140588	8297	11072	223122	12396	16542	333359	25295	33755	589548	47651	63590	1170659
2502	3339	63045	3912	5221	98567	6112	8157	154006	9701	12946	244418	14494	19341	365177	29575	39468	645817	55716	74352	1282392
2864	3822	68097	4478	5976	106465	6997	9337	166346	11105	14819	264002	16591	22141	394436	33856	45180	697562	63780	85113	1385142
3227	4306	72798	5044	6732	113816	7882	10518	177831	12509	16693	282230	18689	24940	421670	38136	50893	745726	71844	95875	1480779
3589	4789	77214	5611	7487	120720	8766	11699	188618	13913	18567	299350	20787	27740	447248	42417	56605	790961			
3951	5272	81391	6177	8243	127250	9651	12879	198821	15317	20440	315543	22884	30539	471441	46698	62318	833747			
4675	6239	89160	7309	9754	139395	11420	15240	217798	18125	24188	345660	27080	36138	516438						
5400	7206	96303	8442	11265	150564	13190	17602	235248	20933	27935	373355	31275	41737	557817						
6124	8172	102953	9574	12777	160959	14959	19963	251491	23741	31682	399133	35471	47336	596331						
6848	9139	109198	10707	14288	170723	16729	22324	266747	26549	35430	423345	39666	52934	632505						
7572	10105	115105	11839	15799	179958	18498	24685	281176	29357	39177	446245		58533	666718						
8297	11072	120723	12971	17310	188742	20267	27046	294900		42925	468025									
9021	12039	126091		18822	197134	22037	29408	308013		46672	488837									
	13005	131239		20333	205184		31769	320590		50419	508797									
	13972	136193		21844	212929		34130	332692												
	14938	140974		23355	220403		36491	344368												
	15905	145597		24866	227631		38852	355662												

Calculus according to ASME code section VIII Div.1

FACT LIST FOR **SAFETY VALVE CALCULS** Calculus according to ASME code section VIII Div.1	Customer: Theme: Leaf: Of:

1	Consultation / Bid / Order				
2	Position N°.				
3	N°. of units				
4	Regulation				
5	SERVICE CONDITIONS	Fluid				
6		Calculation temperature °C				
7		State at moment of dischar. l = liquid, s = steam, g = gas	l ☐ s ☐ g ☐	l ☐ s ☐ g ☐	l ☐ s ☐ g ☐
8		Molecular mass kg/kmol				
9		Adiabatic exponent æ Compressibility coe. Z				
10		Density at moment of discharge kg/m³				
11		Coefficients ψ max χ				
12		Viscosity cSt cPs				
13		Working pressure abs. bar				
14		Set pressure abs. bar				
15		External back pressure abs. constant variable bar				
16		Rated pressure abs. bar				
17		Discharge Required: kg/h, Nm³/h, l/h				
18		capacity Possible: 1) Kg/h, Nm³/h, l/h				
19	VALVE CONSTRUCTION	Opening: Full lift / Normal / Progressive				
20		Manufacturer type				
21		Materials Body				
22		Seat				
23		Plug				
24		Spring				
25		Joint				
26		Manual discharge action yes / no				
27		Cover Closed / Open				
28		Bellows yes / no				
29		Body with drainage yes / no				
30		Diameter of narrowest flow d_0 mm				
31		Section of narrowest Necessary A_0 mm²				
32		flow A_0 Chosen A_0 mm²				
33		Allowed discharge coefficient αd				
34	CONNECTIONS	Input / Output NPS Flange mm				
35		Thread inch				
36		Welding (soldering) ends				
37		Class				
38		Shape of joint surfaces (ASME/ANSI B16.5-2009)				
39	OBSERVA-TIONS	Unit weight approx. Kg				
40						
41						
42						
43	ACCEP-TANCE	Certificate according to EN-10204 2.2				
44		Certificate according to EN-10204 3.2				
45						

Date:

Department:

Name: