

The valve works as an automatic pressure releasing regulator activated by the static pressure existing at the entrance to the valve and is characterized by its ability to open, at the first proportional to the pressure increase, and after instantly and totally.

Desing in line with the "AD-MERKBLATT A2 Specifications sheet" and "Technical safety instructions for TRD-421 steam boilers".  
In accordance with UNE 9-100-86 "Safety valve" (Steam boilers).

Complies with the requirements of "Regulation for pressurised equipment ITC-MIE-AP..." (Safety valve).

Component test stamp: TÜV Rheinland (German technical supervision authority).

Licence N°:

#### Specifications

- Model AP open cap with lever.
- Model ES closed cap without lever.
- 90° angular flow.
- Activated by direct action helicoid spring.
- Simplicity of construction ensuring minimum maintenance.
- Materials carefully selected for their resistance to corrosion.
- Internal body designed to offer favourable flow profile.
- Seat and sealing disk balanced, making them extremely tightness, even exceeding DIN-3230 requeriments. Page 3.
- Great discharge capacity.
- Deflector nut designed to make easier the steam expansion, a sudden opening and to measure the blowdown of any fluid.
- Guarantees absolute opening and closing precision.
- Equipped with draining screws for removing condensation.
- Orientation of the lever by rotation.
- 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.

**IMPORTANT**

1.- Silicone's rubber, Fluorelastomer (Vitón) seals, PTFE (Teflón)... etc., achieving leakage levels less than:

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

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

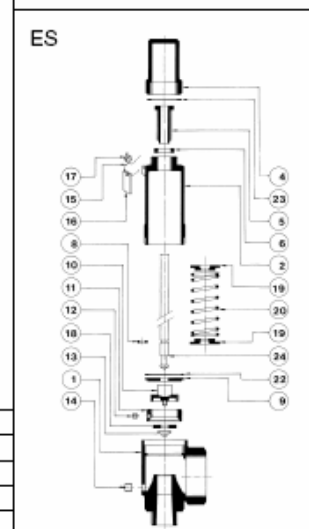
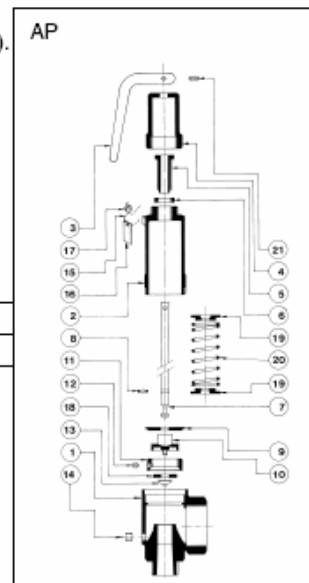
RANGE OF APPLICATIONS OF THE SEALS						
FLUID		SET PRESSURE IN bar				
		0,2	1,5	3,5	4,0	8,0
Saturated steam		S	V			T
Liquids and gases		S		V		T
SEALS		TEMPERATURE IN °C				
		ACCORDING TO MANUFACTURERS		RECOMMENDED BY VYC		
		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM	
Silicone's rubber	S	-60	+200	-50	+115	
Fluorelastomer (Vitón)	V	-40	+250	-90	+150	
PTFE (Teflón)	T	-265	+260	-80	+290 (1)	

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

Depending on demand:

- Buna-nitrils seals, Butyl, Natural rubber, E.P.D.M., Chlorosulphonate polyethylene (Hypalon), Neoprene, etc.
- Seal metal by metal.
- Electrical contact indicating open/closed.
- Other connections.
- Possibility of manufacture in other types of material, for special operating conditions (high temperatures, fluids, etc.).
- Totally free of oil and grease, to work with oxygen, avoiding possible fire risks (UV-Oxygen-VBG62).

Nº PIECE	PIECE	MATERIAL
		BRONZE
1	Body	Bronze (DIN-2.1096.01 G-Cu Sn 5 Zn Pb)
2	Bell	Bronze (DIN-2.1096.01 G-Cu Sn 5 Zn Pb)
3	Lever	Stainless steel (DIN-1.4301)(AISI-304)
4	Cap	Brass (DIN-1.7660 Cu Zn 40 Pb2)
5	Hollow screw	Brass (DIN-1.7660 Cu Zn 40 Pb2)
6	Hollow screw nut	Brass (DIN-1.7660 Cu Zn 40 Pb2)
7, 24	Rod	Stainless steel (DIN-1.4401) (AISI-316)
8	Ring	Stainless steel (DIN-1.4300) (AISI-302) (1)
9	Lead	Brass (DIN-1.7660 Cu Zn 40 Pb2)
10	Plug	Brass (DIN-1.7660 Cu Zn 40 Pb2)
11	Deflector	Brass (DIN-1.7660 Cu Zn 40 Pb2)
12	Stud	Stainless steel (DIN-1.4401) (AISI-316)
13	Sealing nut	Brass (DIN-1.7660 Cu Zn 40 Pb2)
14	Cap	Brass (DIN-1.7660 Cu Zn 40 Pb2)
15	Sealing wire	Sealing wire
16	Characteristic plate	Aluminium
17	Seal	Lead
18	Sealing disk	PTFE (Teflón) Silicone's rubber Fluorelastomer (Vitón)
19	Spring press	Brass (DIN-1.7660 Cu Zn 40 Pb2)
20	Spring	Stainless steel (DIN-1.4300) (AISI-302)
21	Clip	Stainless steel (DIN-1.4310) (AISI-301)
22	Joint	Klingerit cardboard
23	Washer	Copper
R1 x R2		1/2" x 1" and 3/4" x 1 1/4"
PN		PMS . 25 bar
OPERATING CONDITIONS	PRESSION IN bar	25
	MAX. TEMP. IN °C	225
	MIN. TEMP. IN °C	-60



(1) R. 1/2" x 1" in Phosphorous bronze (Cu Sn 6).

## DISASSEMBLY AND ASSEMBLY

### 1 – Disassembly

To replace the spring (20), or clean any of the internal components of the valve, proceed in the following manner:

- A – Withdraw the clip (21), using a punching tool, and lift the lever (3).
- B – Unscrew the cap (4) and remove.
- C – Holding the rod (7) (24) steady, loosen the hollow screw nut (6), until the constructive limit, and the hollow screw (5) until you note a releasing of the spring (20).
- D – Unscrew the bell (2) holding the rod (7) (24) and the body (1) steady.
- E – Lift the bell (2) and you will have access to all the components.

### 2 – Assembly

- A – Enter the bell (2) and the joint (22) through the upper part the rod (7) (24).
- B – Turn the bell (2) holding the rod (7) (24) and the body (1) steady.
- C – Replace the hollow screw (5) with the hollow screw nut (6).
- D – Adjust the set pressure with the hollow screw (5) and fix the adjustment position with the hollow screw nut (6).
- E – Change the washer (23) and lightly tighten the cap (4).
- F – Place the lever (3) and fix it with the clip (21).

## ADJUSTING THE SET PRESSURE

- A – Proceed according to DISASSEMBLY A, B, C.
- B – Proceed according to ASSEMBLY D, E, F.

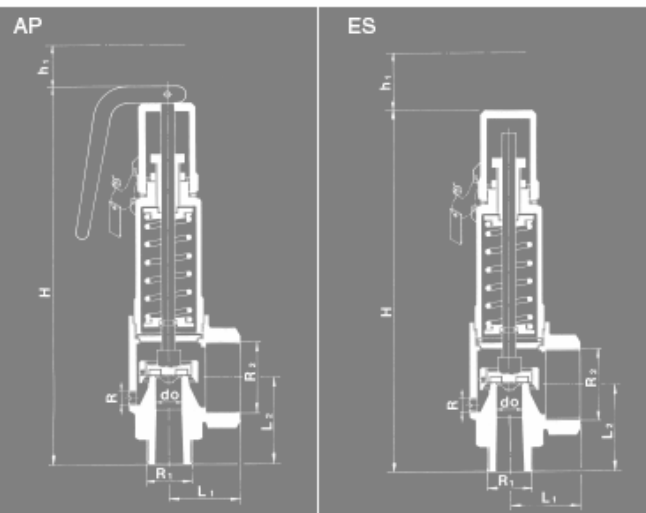
## ADJUSTEMENT OF THE BLOWDOWN

- A – Slack the stud (12).
- B – Twist or untwist the deflector (11) according the difference in the wished locking pressure (blowdown).
- C – Fix the deflector position screwing the stud (12).

## WARNING

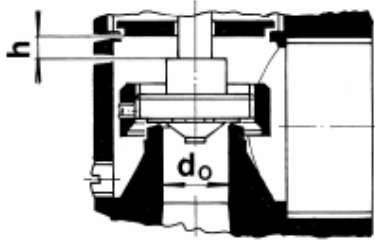
In case to do the change of the sealing disc (18) make sure that the surface of this as well as the one of the seat into the body (1) the correctly rectified and free of impurities.

R1 x R2	1/2" x 1"		3/4" x 1 1/4"	
CONNECTIONS	Whitworth cylindrical Male x Female thread ISO 228/1 1978 (DIN-259)			
MODEL	AP	ES	AP	ES
d <sub>0</sub>	15		15	
$A_0 = \frac{\pi \cdot d_0^2}{4}$	176,7		176,7	
H	161	150	212	199
h'	50	39	60	46
L <sub>1</sub>	34	34	41	41
L <sub>2</sub>	41	41	49	49
R	1/8"			
	Whitworth cylindrical Female thread ISO 228/1 1978 (DIN-259)			
WEIGHT IN Kgs.	0,71	0,64	1,50	1,43
CODE 2002-295.	60211	60212	63411	63412



SET PRESSURES AND REGULATING RANGES				
R1 x R2		1/2" x 1"	3/4" x 1 1/4"	
SET PRESSURES N bar	MAXIMUM (LIQUIDS AND GASES)	25	25	
	MAXIMUM (SATURATED STEAM)	25	25	
	MINIMUM	STEAM AND GASES	0,5	0,5
		LIQUIDS (1)	0,2	0,2
SPRING REGULATING RANGE N bar	0,20 to 0,70	CODE	56341	56348
	0,50 to 1,60	CODE	56342	56349
	1,40 to 3,50	CODE	56343	56350
	3,00 to 5,50	CODE	56344	56351
	5,00 to 10,00	CODE	56345	56352
	9,00 to 15,00	CODE	56346	56353
	14,00 to 20,00	CODE		56354
	19,00 to 25,00	CODE	56347	56355

(1) For set pressures less than 0,5 bar previous consult with our technical department.



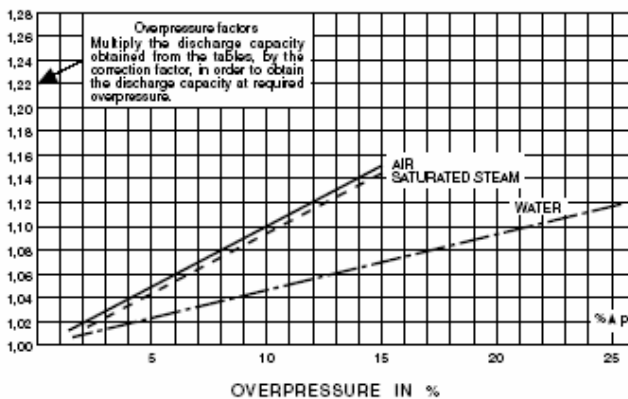
RECOMMENDED RANGES OF APPLICATION				
		MODEL	AP	ES
FLUID	SATURATED STEAM		*	
	GASES		* (1)	*
	LIQUIDS		* (1)	*

(1) With noxious or expensive fluids apply only ES model.  
 If external overpressure exists, the AP model cannot be used.  
 With external constant overpressure, the spring is adjusted deducting the overpressure from the set pressure.

COEFFICIENT OF DISCHARGE FOR SATURATED STEAM AND GASES				
R1 x R2		1/2" x 1"	3/4" x 1 1/4"	
d0		15	15	
h		2,20	3,75	
h/d0		0,14	0,25	
COEFFICIENT OF DISCHARGE $C_{d0}$	SET PRESSURE IN bar	0,50 to 1,00	0,29	0,55
		1,00 to 25,00	0,35	0,62

DISCHARGE CAPACITY		
R1 x R2	1/2" x 1"	3/4" x 1 1/4"
d0	15	15
$A_0 = \frac{\pi \cdot d_0^2}{4}$	176,7	176,7
P [bar]	For other, not so dense liquids, other than water at 20°C apply: $V_L = \sqrt{\frac{\rho_L}{\rho}} \cdot V_A \quad \text{or} \quad V_L = V_A \cdot \sqrt{\frac{\rho_L}{\rho}}$ I - Saturated steam in Kg/h. II - Air at 0°C and 1,013 bar in [Nm <sup>3</sup> /h]. III - Water at 20°C in l/h. V <sub>A</sub> = Water flow according to table. V <sub>L</sub> = Liquid flow. ρ <sub>L</sub> = Water density at a 20°C. (ρ <sub>L</sub> = 998 Kg/m <sup>3</sup> ). ρ = Liquid density.	

P<sub>a</sub> = Overpressure permitted [bar] absolute.  
 P = Set pressure [bar] absolute.



SET PRESSURE IN bar	I	II	III	I	II	III
0,5	40	50	1790	76	92	3435
1,0	54	68	2517	102	128	4858
1,5	74	101	3082	137	160	5959
2,0	98	122	3560	175	220	6877
2,5	113	143	3990	202	255	7588
3,0	128	162	4360	229	290	8299
3,5	144	183	4709	257	328	9010
4,0	160	204	5034	285	360	9720
4,5	176	231	5339	323	395	10306
5,0	192	258	5628	361	430	10870
6,0	225	286	6165	400	510	11908
7,0	255	327	6659	452	580	12859
8,0	285	368	7119	505	650	13745
9,0	315	409	7551	560	723	14576
10,0	346	450	7959	615	800	15370
12,0	407	530	8719	720	940	16828
14,0	468	612	9417	880	1090	18185
16,0	525	694	10068	935	1230	19440
18,0	588	775	10678	1045	1380	20610
20,0	647	857	11256	1150	1520	21725
22,0	709	940	11805	1260	1665	22786
24,0	770	1020	12330	1370	1810	23799
25,0	810	1060	12535	1470	1881	24200

Calculus according "AD-Merkblatt A2".