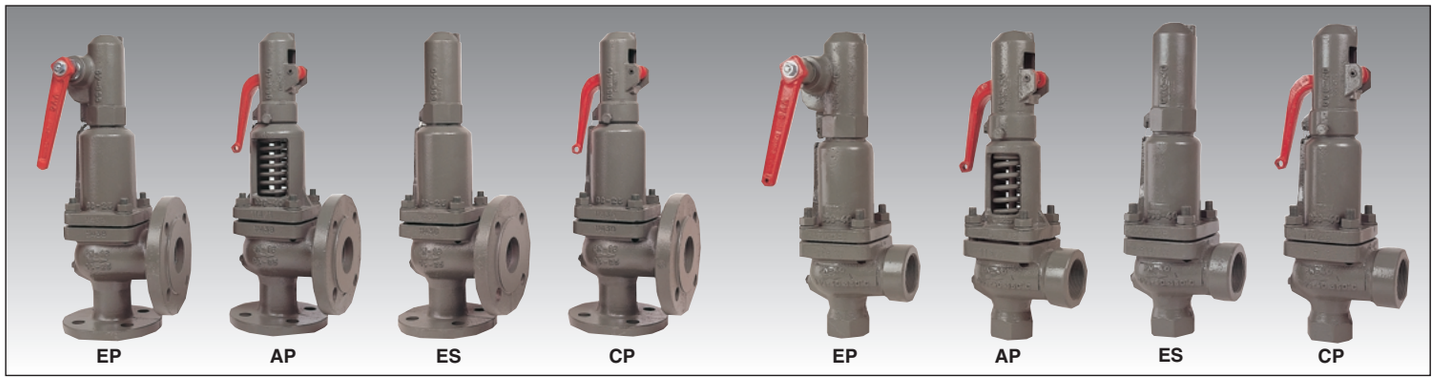
Fabrication program

Safety

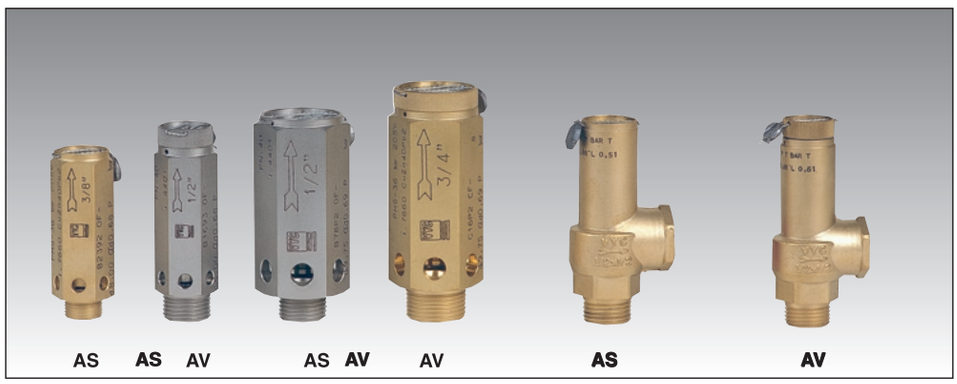
Full lift safety valve with spring loading. (AIT)

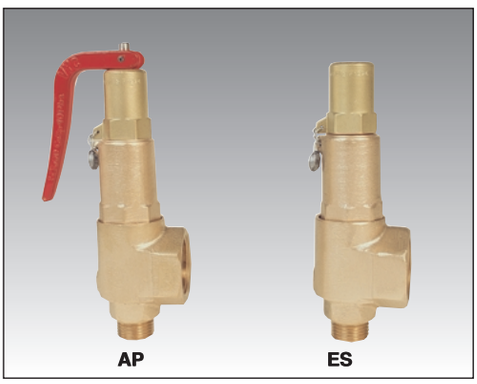


Mod. 496
Connection: Flange x Flange
DN_1 x DN_2: 20x32 to 100x150
Material: Cast iron. PN-16
Nodular iron. PN-40. 350°C
Cast steel. PN-40
Stainless steel. PN-40
Seal: Metal

Mod. 495
Connection: Female thread x Female thread
R_1 x R_2: 3/4"x1 1/4" and 1"x1 1/2"
Material: Cast iron. PN-16
Nodular iron. PN-40. 350°C
Cast steel. PN-40
Stainless steel. PN-40
Seal: Metal

Normal safety valve with spring loading. (AN)



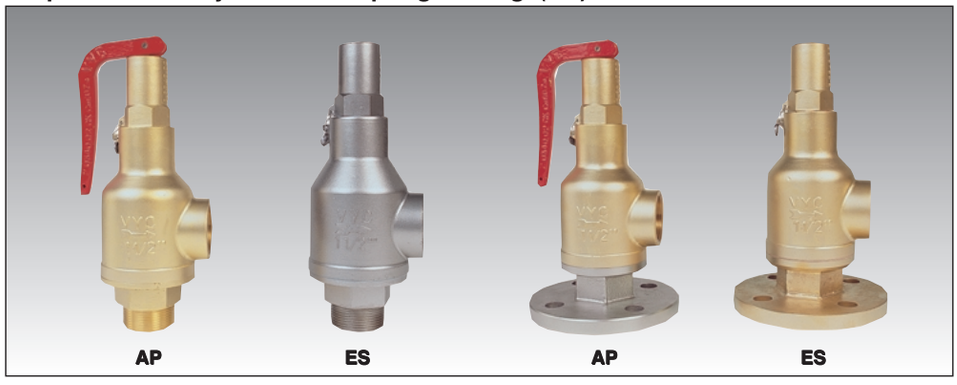


Mod. 595
Connection: Male thread x Free discharge
R_1 x 6ØB: 3/8"x6ØB to 1"x6ØB
Material: Brass. PMS. 36 bar
Stainless steel. PN-40
Seal: PTFE (Teflón)
Fluorelastomer (Vitón)

Mod. 695
Connection: Male thread x Female thread
R_1 x R_2: 3/8"x1/2" and 1/2"x1/2"
Material: Brass. PMS. 36 bar
Seal: PTFE (Teflón)
Fluorelastomer (Vitón)

Mod. 295
Connection: Male thread x Female thread
R_1 x R_2: 1/2"x1" and 3/4"x1 1/4"
Material: Bronze. PMS. 25 bar
Seal: PTFE (Teflón)
Silicone's rubber
Fluorelastomer (Vitón)

Proportional safety valve with spring loading. (AP)



Vacuum breaker safety valve

Mod. 095
Connection: Male thread x Female thread
R_1 x R_2: 1/4"x1/4" to 4"x4"
Material: Bronze/Brass. PN-16
Mixed (Bronze/Brass- Stainless steel). PN-25
Stainless steel. PN-25
Seal: PTFE (Teflón)
Silicone's rubber
Fluorelastomer (Vitón)

Mod. 096
Connection: Flange x Female thread
DN_1 x R_2: 8x1/4" to 100x4"
Material: Bronze/Brass. PN-16
Mixed(Bronze/Brass- Stainless steel). PN-25
Stainless steel. PN-25
Seal: PTFE (Teflón)
Silicone's rubber
Fluorelastomer (Vitón)

Mod. 795
Connection: Male thread x Free intake
R x 6ØB: 3/8"x6ØB to 1"x6ØB
Material: Stainless steel. PN-16
Brass. PN-16
Seal: Silicone's rubber
Fluorelastomer (Vitón)

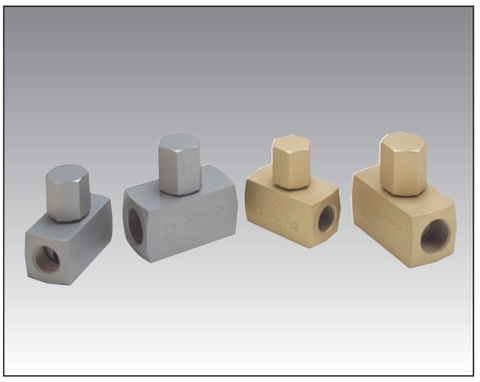
Check

Disc check valve

Mod. 170
Connection: For placing between flanges
DN: 15 to 100
Material: Bronze. PN-16
Carbon steel. PN-40
Stainless steel. PN-40
Seal: Metal

Mod. 172
Connection: For placing between flanges
DN: 125 to 200
Material: Bronze. PN-16
Cast steel. PN-40
Stainless steel. PN-40
Seal: Metal

Piston check valve



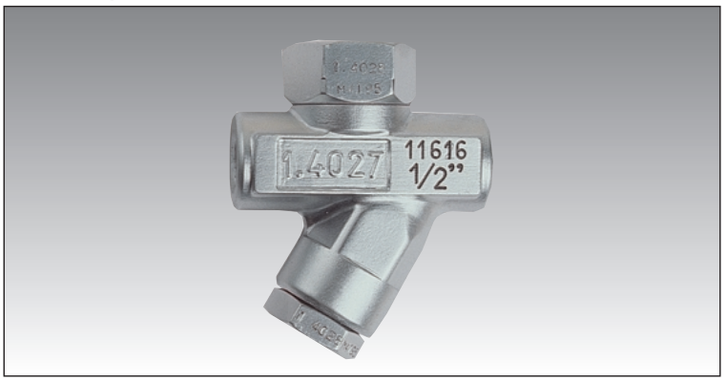
Mod. 179
Connection: Female thread GAS
Female thread NPT
Socket welding ends SW
R: 1/4" to 2"
Material: Brass. PN-200
Carbon steel. PN-250
Stainless steel. PN-250
Seal: Metal

Steam traps

Thermodynamic steam trap without strainer

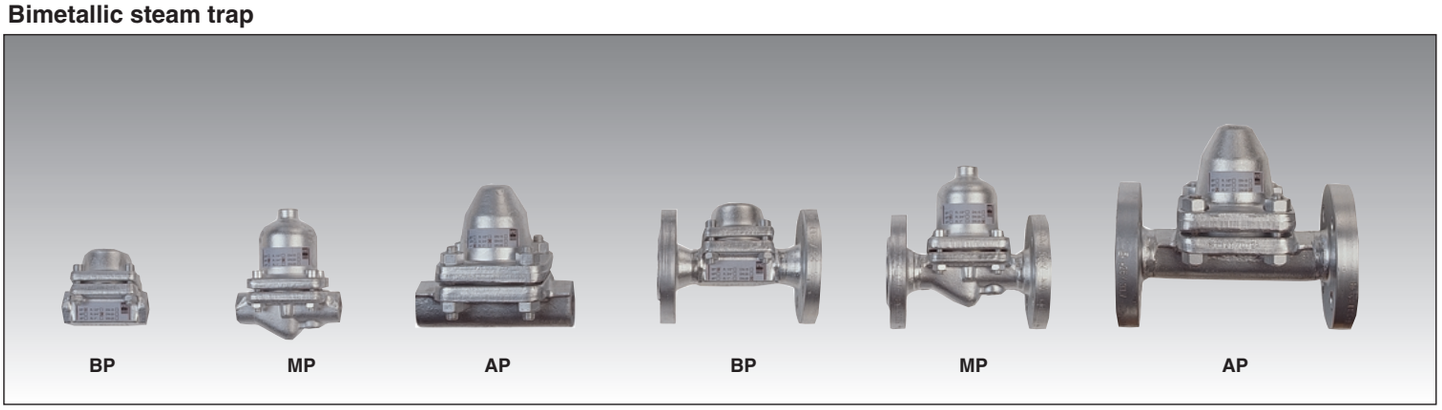
Mod. 041
Connection: Female thread GAS
Female thread NPT
Socket welding ends SW
R: 1/2" to 1"
Material: Stainless steel. PMA. 63 bar
Seal: Metal

Thermodynamic steam trap with strainer



Mod. 043
Connection: Female thread GAS
Female thread NPT
Socket welding ends SW
R: 1/2" to 1"
Material: Stainless steel. PMA. 63 bar
Seal: Metal

Bimetallic steam trap

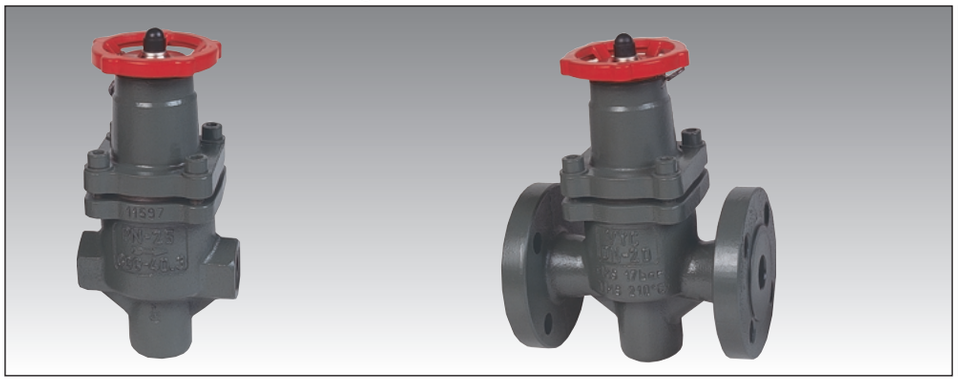


Mod. 143
Connection: Female thread
R: BP 1/2" and 3/4"
MP 1/2" and 3/4"
AP 1/2" to 1"
Material: Carbon steel. BP. PN-40
Carbon steel. MP. PN-40
Carbon steel. AP. PN-100
Seal: Metal

Mod. 144
Connection: Flange
DN: BP 15 to 25
MP 15 to 25
AP 15 and 25
Material: Carbon steel. BP. PN-40
Carbon steel. MP. PN-40
Carbon steel. AP. PN-100
Seal: Metal

Reducing

Direct action pressure reducing valve



Mod. 513
Connection: Female thread
R: 1/2" to 1"
Material: Nodular iron. PN-25
Cast steel. PN-40
Stainless steel. PN-40
Seal: Metal

Mod. 514
Connection: Flange
DN: 15 to 25
Material: Nodular iron. PN-25
Cast steel. PN-40
Stainless steel. PN-40
Seal: Metal

Mixing

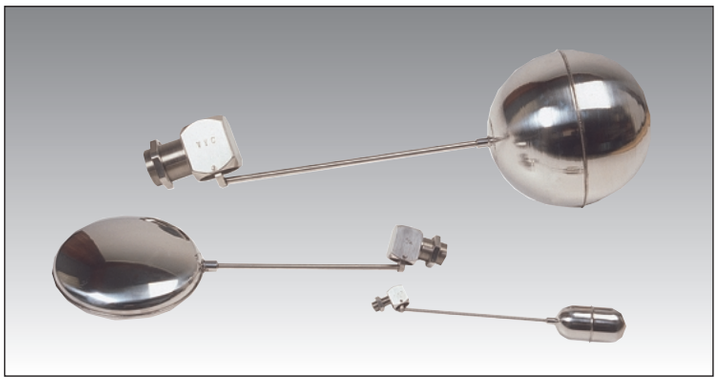
Steam-water mixing valve

Mod. 253
Connection: Female thread
R: 1/2", 3/4", 1" and 1 1/2"
Material: Bronze. PN-16
Seal: PTFE (Teflón)

Watergun. PI-1
Connection: Female thread
R: 1/2"
Material: Bronze (Covered with synthetic Rubber)
Seal: Fluorelastomer (Vitón)

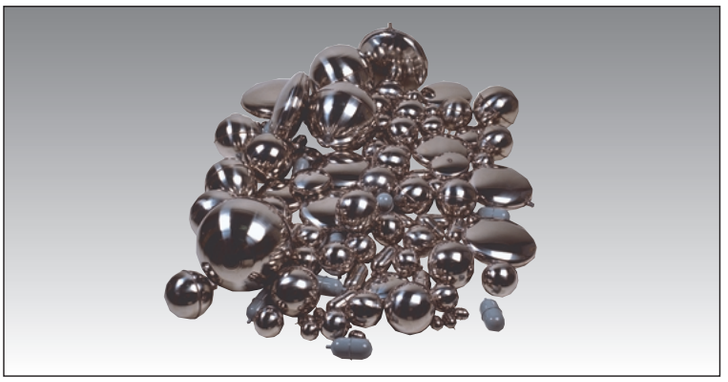
Float - Buoys

Float valve



Mod. 151
Connection: Male thread
R: 3/8" to 2 1/2"
Material: Stainless steel. PN-16
Seal: Silicone's rubber

Buoys

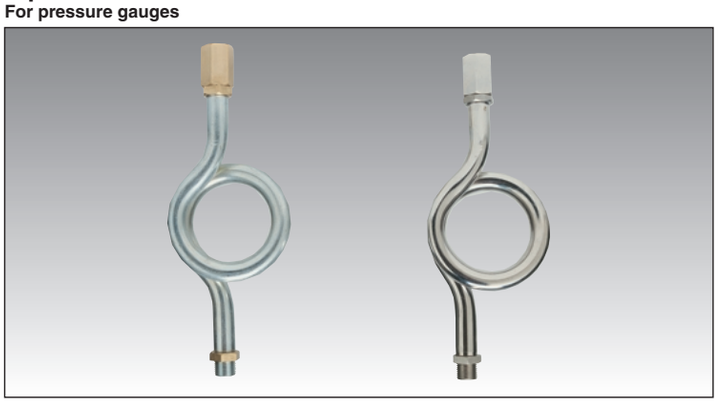


Mod. 152

Material:	Stainless steel	**Spherical:**	
Flat:		Ø60.	Dovel Ø 4,5 mm.
Ø150x60.	Female thread. M10	Ø60.	Female thread. M4
Ø150x60.	Sliding(Ø8 mm. internal)	Ø90.	Female thread. M10
Ø200x80 and Ø250x95.	Female threads. M10	Ø105.	Sliding (Ø18 mm. internal)
Ø300x115 and Ø350x130.	Female threads. M12	Ø110 and Ø150.	Female threads. M10
Cylindrical:		Ø200 and Ø300.	Female threads. M12
Ø40x50.	Male thread. M4		
Ø40x50.	Sliding (Ø4 mm. internal)		
Ø60x120.	Female thread. M6. (With or without Epoxi coating)		
Ø60x120.	Sliding (Ø6 mm. internal). (With or without Epoxi coating)		

Instrumentation

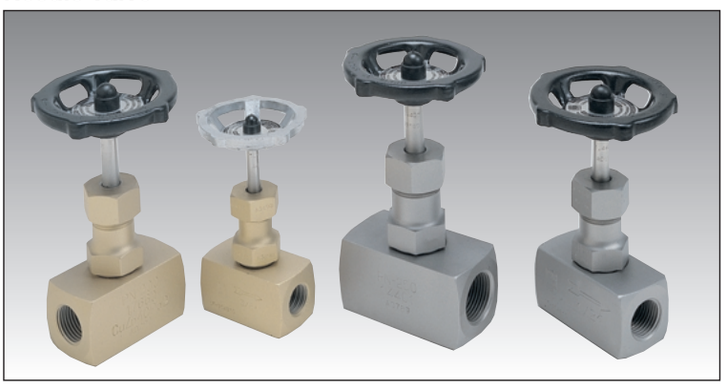
Siphon tube
For pressure gauges



Mod. 011
Connection: Male thread
R: 1/4" to 1/2"
Material: Carbon steel. PN-32
Stainless steel. PN-40

Sleeve and nuts
Connection: Female thread
R: 1/4" to 1/2"
Material: Brass
Stainless steel

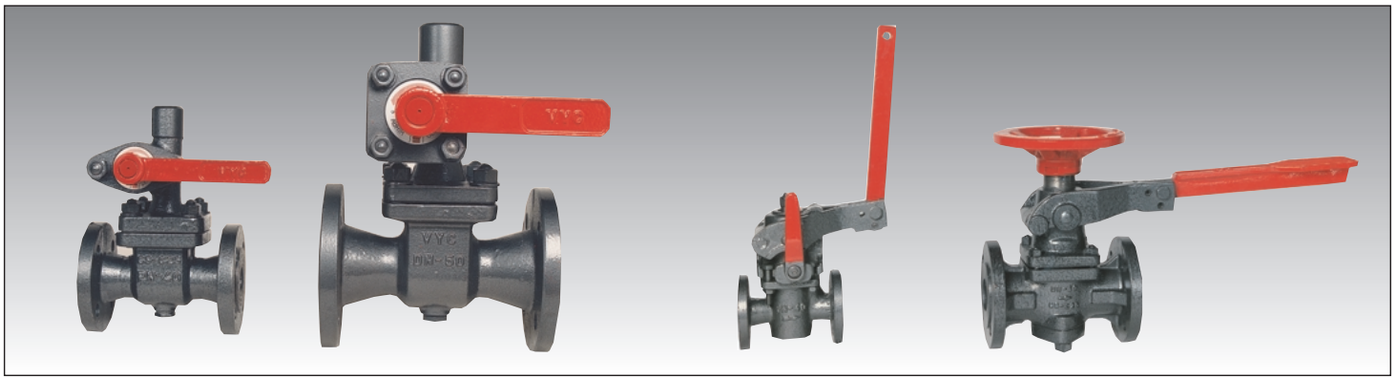
Needle valve



Mod. 147
Connection: Female thread GAS
Female thread NPT
Socket welding ends SW
R: 1/4" to 2"
Material: Brass. PN-200
Carbon steel. PN-250
Stainless steel. PN-250
Seal: Metal

Bleeding for steam boilers

Blowdown valve for bleeding dirt and sludge
For steam boilers



Mod. 460
Connection: Flange
DN: 25 to 50
Material: Cast steel. PN-40
Seal: Metal

Mod. 260
Connection: Flange
DN: 20 to 50
Material: Cast steel. PN-40
Seal: Metal

Blowdown valve for automatic bleeding dirt and sludge
For steam boilers

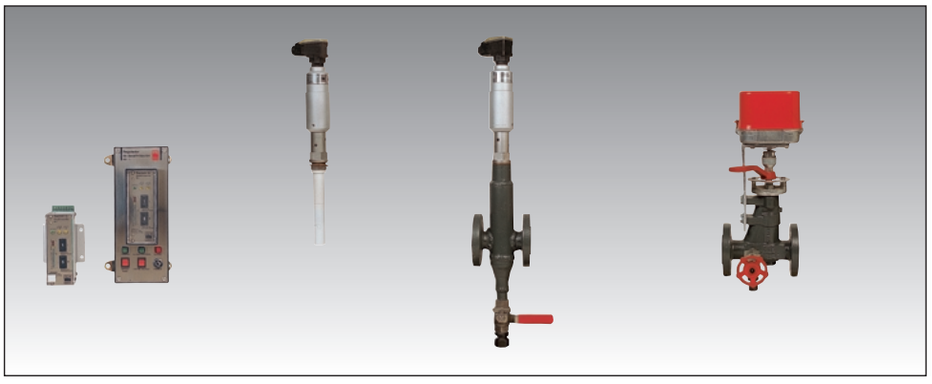
Mod. 260-A
Connection: Flange
DN: 20 to 50
Material: Cast steel. PN-40
Seal: Metal

Programmable control for automatic bleeding of dirt and sludge. MP-1
Connection: Air inlet 1/8"
Control and discharge tube Ø6/4 mm.
Voltage: 220 V.A.C. ± 10% 50/60 Hz.

Continuous desalting valve
For steam boilers

Mod. 560
Connection: Flange
DN: 20
Material: Cast steel. PN-40
Seal: Metal

Automatic continuous desalting valve
For steam boilers



Mod. 560-A
Connection: Flange
DN: 20
Material: Cast steel. PN-40
Seal: Metal
Servomotor voltage: 220 V.A.C. ± 10% 50/60 Hz.

Desalting controlle
With assembly cupboard. ARD-1
Without assembly cupboard. RD-1
Voltage: 220 V.A.C. ± 10% 50/60 Hz.

Conductivity electrode. EC-1
Connection: Male thread
R: 1"
Material: PTFE (Teflón) -
Stainless steel. PMS. 32 bar

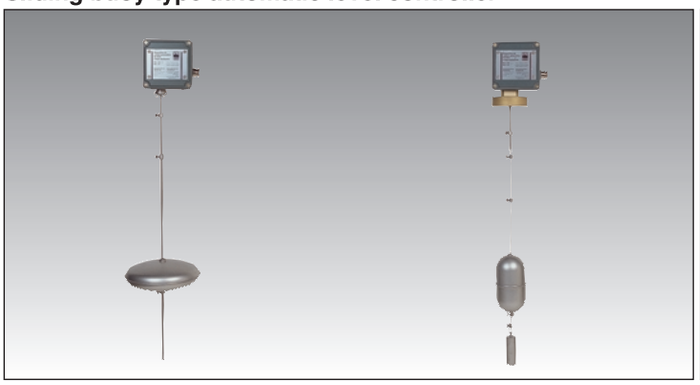
Electrode connection collector
Connection: Flange
DN: 20
Material: Carbon steel. PN-40
Blowoff valve: Mod. 999 1/2" with simple joint plug

Samples water-cooled
For steam boilers

Mod. 560 DRM-1
Connection: Sampling circuit: Tube Ø6/8 mm.
Refrigeration circuit: Female thread 1/2"
Material: Stainless steel.
Sampling circuit. PMS. 140 bar
Refrigeration circuit. PMS. 10 bar

Automatic level controller

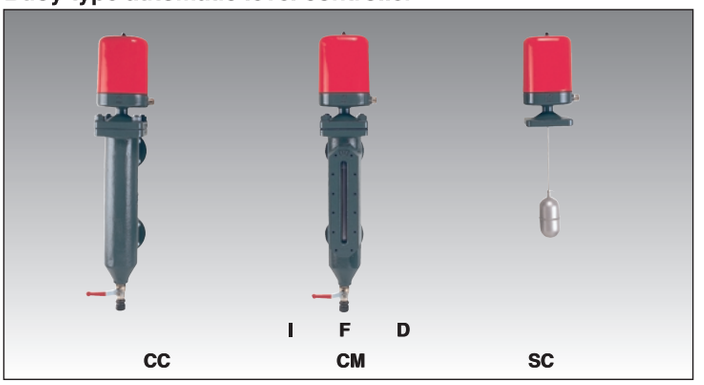
Sliding buoy type automatic level controller



Mod. 290
Connection: Bracket with 2 screws M.8 x ...
Material: Stainless steel
Standard level fluctuation: 495 mm.
Buoy: Ø150x60 sliding
Maximum n°. of switches: 1

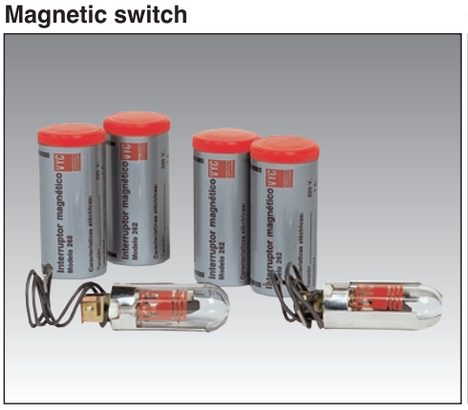
Mod. 291
Connection: Female thread
R: 2 1/2"
Material: Stainless steel - Brass. PMS. 19 bar
Standard level fluctuation: 3.000 mm.
Maximum level fluctuation: 30.000 mm.
Buoy: Ø60x120 sliding
Maximum n°. of switches: 1

Buoy type automatic level controller



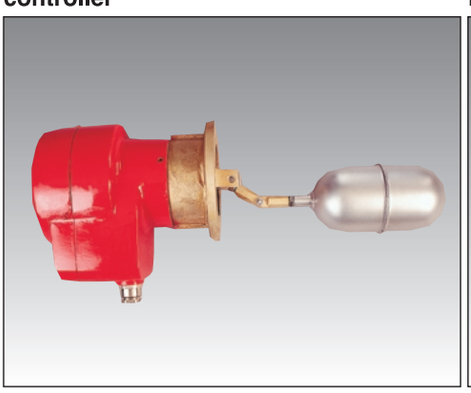
Mod. 076
Connection: Flange
DN: 25
Connection (SC): Flange with 4 screws M.16x40
Material: Cast iron. PN-16
Stainless steel. PN-16. (SC)
Maximum level fluctuation: 120 mm.
Buoy: Ø60x120
Maximum n°. of switches: 10
Distance between centres of flanges: 190 or 250 mm.
Viewer(CM): F = Front
D = Right
I = Left
Blowoff valve: Mod. 999 1/2" with simple joint plug

Magnetic switch



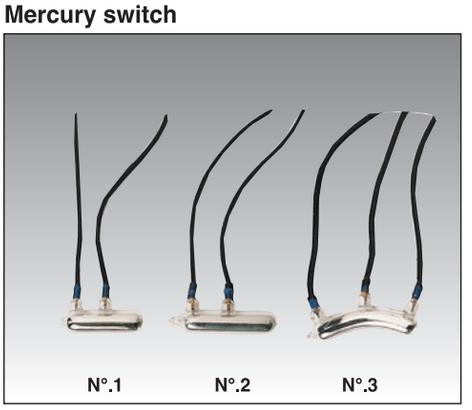
Mod. 262
Connection: M.4
Voltage: 220 V.A.C.
To be meant for Mod. 290, 291 and 076

Buoy type automatic level controller



Mod. 240
Connection: Lateral flange Ø110 mm.
Material: Bronze. PMS.25 bar. 220°C
Stainless steel. PN-25
Maximum level fluctuation: 125 mm.
Buoy: Ø60x120
Maximum n°. of switches: 3

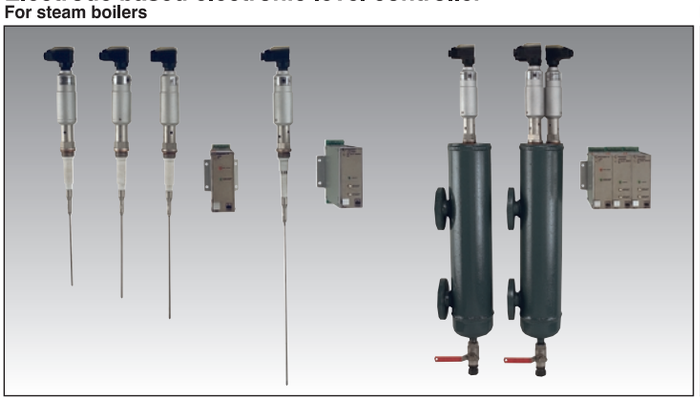
Mercury switch



Mod. 248
Connection: With dog clamp
N°. 1 Type R: 2 contacts. 6A.
N°. 2 Type R: 2 contacts. 10A.
N°. 3 Type I: 3 contacts. 10A.
To be meant for Mod. 240

Electrode based electronic level controller

For steam boilers



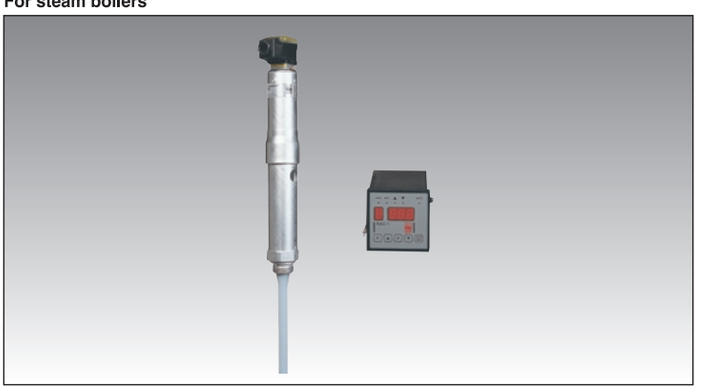
Mod. 176
Level controller. RN-1
Minimum level safety controller. RS-1
Voltage: 220 V.A.C. ± 10% 50/60 Hz.

Level electrode. EN-1
Minimum level safety electrode. ES-1
Connection: Male thread
R: 1"
Material: PTFE (Teflón)- Stainless steel. PMS. 32 bar
Measuring standard length: 700 mm.

Electrode connection collector
Connection: Flange
DN: 25
Material: Carbon steel. PN-40
Maximum n°. of electrodes: 1 or 3
Distance between centres of flanges: 190 or 250 mm.
Blowoff valve: Mod. 999 1/2" with simple joint plug

Modulating electrode based electronic level controller

For steam boilers



Mod. 276
Modulating level controller. RAC-1
Voltage: 220 V.A.C. ± 10% 50/60 Hz.

Modulating level electrode. EAC-1
Connection: Male thread
R: 1"
Material: PTFE (Teflón) - Stainless steel. PMS. 32 bar
Measuring standard length: 300 to 1.500 mm.

Electrode connection collector
Connection: Flange
DN: 25
Material: Carbon steel. PN-40
Maximum n°. of electrodes: 1 or 3
Distance between centres of flanges: 190 or 250 mm.
Blowoff valve: Mod. 999 1/2" with simple joint plug

Level indicators

Round-dowel level indicator

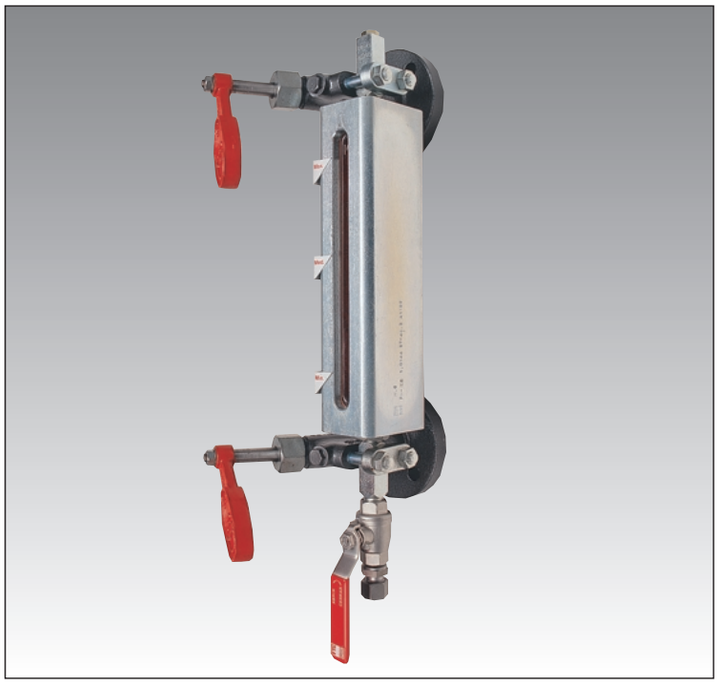
Level gauges
Mod. 666

Connection:	Flange
DN:	20 and 25
Material:	Cast iron. PN-16 Nodular iron. PN-40. 350°C Cast steel. PN-40 Stainless steel. PN-40
Seal:	Metal
Blowoff valve:	Mod. 999 3/8" with simple joint plug and/or sleeve

Level indicator box
Mod. 166-ER

Connection:	Round-dowel Ø 20 mm.
Box n°.:	O to X
Material:	Carbon steel. PN-16. PN-40 Stainless steel. PN-40

Square-dowel level indicator



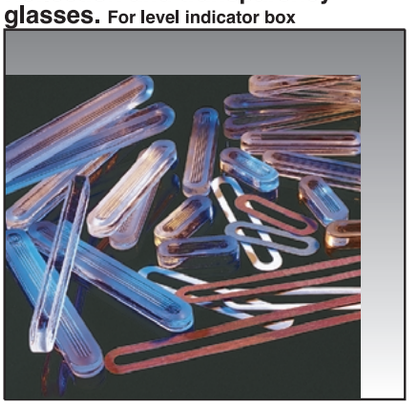
Level gauges
Mod. 466

Connection:	Flange
DN:	20 and 25
Material:	Cast iron. PN-16 Nodular iron. PN-40. 350°C Cast steel. PN-40 Stainless steel. PN-40
Seal:	Metal

Level indicator box
Mod. 166-EC

Connection:	Square-dowel⍁ 18 mm.
Box n°.:	O to X
Material:	Carbon steel. PN-16. PN-40 Stainless steel. PN-40
Blowoff valve:	Mod. 999 3/8" with simple joint plug

Reflection and transparency glasses. For level indicator box



Mod. 066

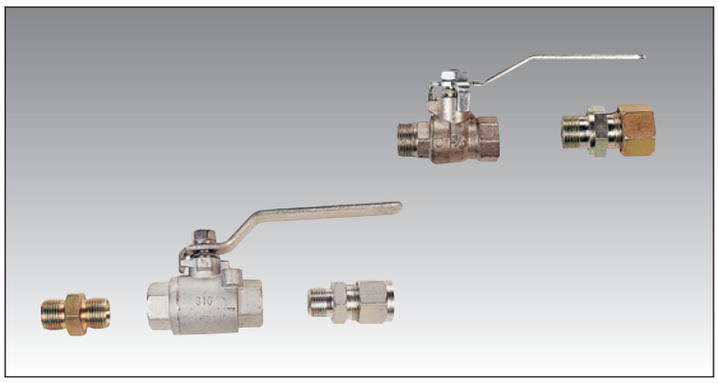
Type:	Reflection:	A 5 prisms 0 to IX B 5 prisms 0 to IX H 5 prisms 0 to IX
	Transparency:	A V to IX B V to IX H V to IX
Material:		Boron-Silicate
Joints:		Red Klingerit cardboard type Oilit Klingerit cardboard type PTFE (Teflón)

Mica Shield
For level indicators

Mod. 066 - PM

Type:	A I to X B/H I to X
Material:	Natural muscovite mica

Blowoff valve



Mod. 999

Connection:	Female thread
R:	3/8" and1/2"
Material:	Brass. PN-25
Seal:	PTFE (Teflón) - Metal
Connection:	Male thread x Female thread
R:	3/8" and 1/2"
Material:	Stainless steel. PMS.56 bar
Seal:	PTFE (Teflón) - Metal

Simple joint plug

Connection:	Male thread x Tube Ø 12/10
R:	and Ø 15/13 mm.
Material:	3/8" and 1/2" Carbon steel Stainless steel

Sleeve

Connection:	
R:	Male thread
Material:	3/8" and 1/2"

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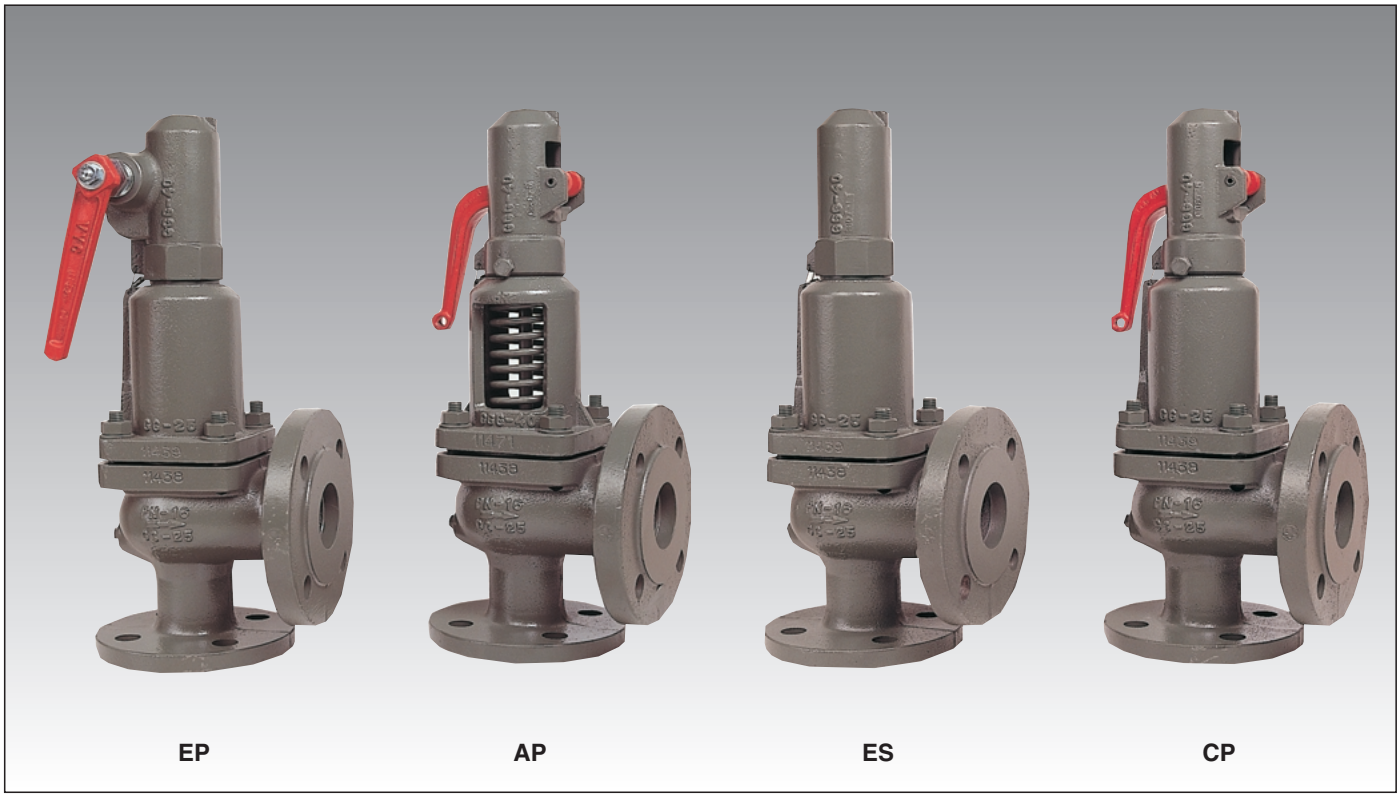
TRANSVERSAL, 179 - 08225 TERRASSA (BARCELONA) SPAIN
e-mail: info@vycindustrial.com
http: //www.vycindustrial.com

Full lift safety valve with spring loading. (AIT)

Model 496



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 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 valves" (Steam boilers).

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

Licence N.°: PENDING ALLOCATION

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 DIN-3230 requeriments. Page 3.
— 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.

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 IN bar			
		0,2 — 1,8 — 4,0 — 4,8 — 7,0 — 30,0 — 40,0			
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	-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.

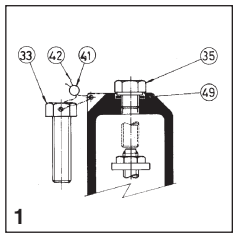
6.- Balance bellows to:

- 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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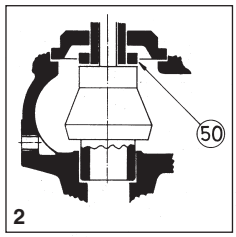

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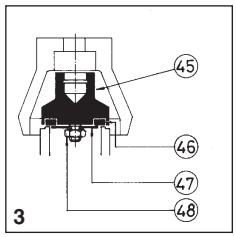

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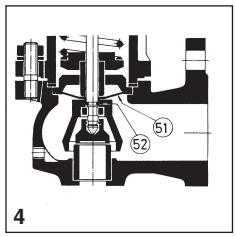

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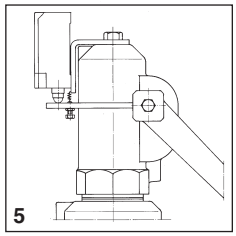
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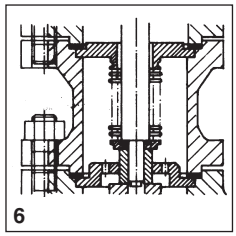
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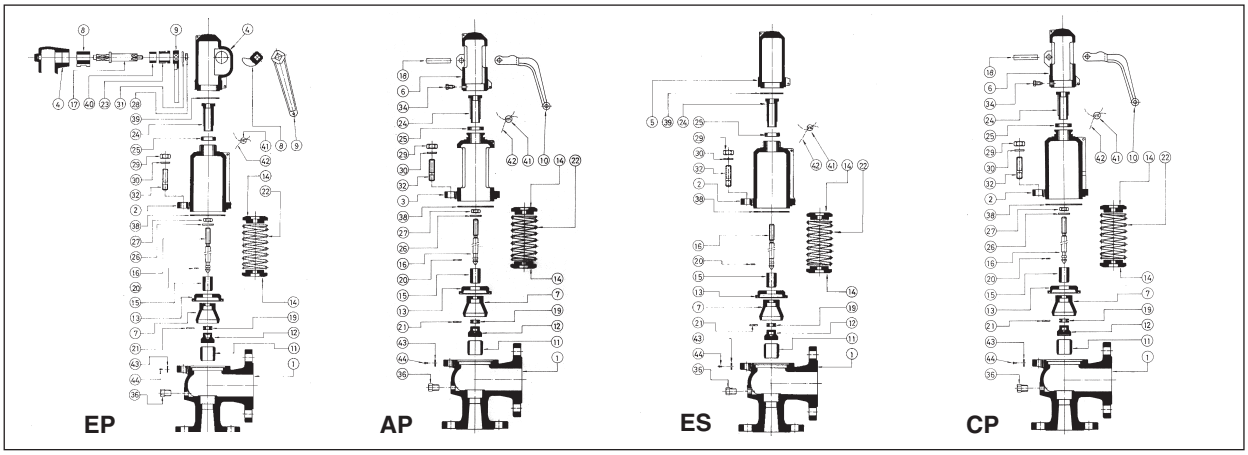


N°. PIECE	PIECE	MATERIAL			
		CAST IRON	NODULAR IRON	CAST STEEL	STAINLESS STEEL
1	Body	Cast iron (DIN-0.6025 GG-25)	Nodular iron (DIN-0.7040 GGG-40)	Cast steel (DIN-1.0619.01 GS-C 25N)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
2	Closed bell	Cast iron (DIN-0.6025 GG-25)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
3	Open bell	Cast iron (DIN-0.6025 GG-25)	Nodular iron (DIN-0.7040 GGG-40)	Cast steel (DIN-1.0619.01 GS-C 25N)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
4, 5, 6	Hood	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
7	Elevator	Nodular iron (DIN-0.7040 GGG-40) (1)	Nodular iron (DIN-0.7040 GGG-40) (1)	Nodular iron (DIN-0.7040 GGG-40) (1)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
8	Cam	Nodular iron (DIN-0.7040 GGG-40) (1)	Nodular iron (DIN-0.7040 GGG-40) (1)	Nodular iron (DIN-0.7040 GGG-40) (1)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
9, 10	Lever	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)
11	Seating	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4542) (AISI-630) (17-4PH)
12	Plug	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4542) (AISI-630) (17-4PH)
13	Lead	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
14	Spring press	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Stainless steel (DIN-1.4305) (AISI-303)
15	Separator	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
16	Rod	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
17	Lever shaft	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Stainless steel (DIN-1.4305) (AISI-303)
18	Gudgeon	Carbon steel (DIN-1.1231 Ck-67)	Carbon steel (DIN-1.1231 Ck-67)	Carbon steel (DIN-1.1231 Ck-67)	Stainless steel (DIN-1.4310) (AISI-301)
19	Ring	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
20, 21	Safety ring	Stainless steel (DIN-1.4300) (AISI-302)	Stainless steel (DIN-1.4300) (AISI-302)	Stainless steel (DIN-1.4300) (AISI-302)	Stainless steel (DIN-1.4300) (AISI-302)
22	Spring	Vanadium-chrome steel (DIN-1.8159 50CrV4) (2)	Vanadium chrome steel (DIN-1.8159 50CrV4) (2)	Vanadium chrome steel (DIN-1.8159 50CrV4) (2)	Stainless steel (DIN-1.4300) (AISI-302) (3)
23	Gland	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Stainless steel (DIN-1.4305) (AISI-303)
24	Hollow screw	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)
25	Hollow screw nut	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)
26	Buffer nut	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)
27	Rod check nut	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Stainless steel (DIN-1.4401) (AISI-316)
28, 29, 48	Nut	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Stainless steel (DIN-1.4401) (AISI-316)
30, 31	Washer	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Stainless steel (DIN-1.4401) (AISI-316)
32	Stud	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	Stainless steel (DIN-1.4401) (AISI-316)
33, 34, 35	Screw	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Stainless steel (DIN-1.4401) (AISI-316)
36	Cap	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	Stainless steel (DIN-1.4401) (AISI-316)
38	Coupling	Klingerit cardboard	Klingerit cardboard	Klingerit cardboard	PTFE (Teflón)
39, 49	Coupling	Copper	Copper	Copper	PTFE (Teflón)
40	Seal	Graphite	Graphite	Graphite	PTFE (Teflón)
41	Seal	Lead	Lead	Lead	Lead
42	Sealing wire	Sealing wire	Sealing wire	Sealing wire	Sealing wire
43	Characteristic plate	Aluminium	Aluminium	Aluminium	Aluminium
44	Rivets	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)
45	Plug	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)
46	Sealing disk	PTFE (Teflón)	PTFE (Teflón)	PTFE (Teflón)	PTFE (Teflón)
		Silicone's rubber	Silicone's rubber	Silicone's rubber	Silicone's rubber
		Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)
47	Washer	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)
50	Limiter	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
51	Membrane	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)
52	O-ring	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)

DN_1 x DN_2		20 x 32 to 100 x 150																			
PN		16				40					40							40			
OPERATING CONDITIONS	PRESSURE IN bar	16	13	13	13	40	35	32	28	24	40	35	32	28	24	21	20	40	34	32	29
	MAX. TEMP. IN °C	120	200	250	300	120	200	250	300	350	120	200	250	300	350	400	450	120	200	300	400
	MIN. TEMP. IN °C	-10				-10					-10							-60			

(1) DN-20 x 32 in stainless steel (DIN-1.4408) (ASTM A351 CF8M).

(2) Spring steel (DIN-1.0600 GRADE-B) for wire spring Ø < 8 mm. Maximum temperature 250°C.
(3) Vanadium chrome steel (DIN-1.8159 50CrV4) for wire spring Ø > 10 mm.

Full lift safety valve with spring loading (AIT) model 496 - 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 496 - 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 496 - 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).

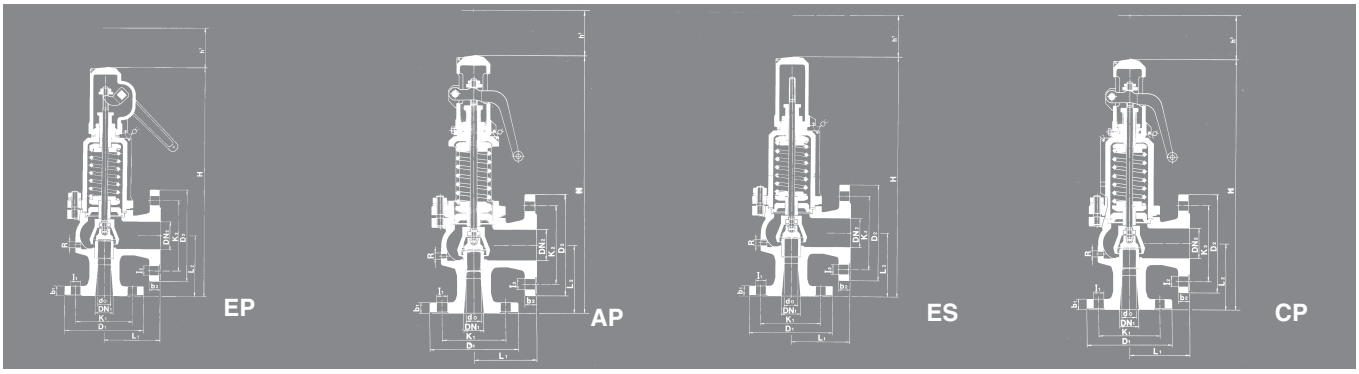
2. Adjusting the firing pressure.

A - Proceed according to points 1.1.A, 1.1.B.
B - Proceed according to points 1.2.F, 1.2.G.

DN_1 x DN_2			20 x 32	25 x 40	32 x 50	40 x 65	50 x 80	65 x 100	80 x 125	100 x 150
do			16	20	25	32	40	50	63	77
Ao = $\frac{\pi \cdot do^2}{4}$			201	314	491	804	1257	1964	3117	4657
H			350	395	415	500	555	660	710	810
h^1			112	129	129	148	148	191	191	191
L_1			85	95	100	115	125	140	155	175
L_2			95	105	110	130	145	150	170	180
R			1/4"	1/4"	1/4"	1/4"	1/4"	3/8"	3/8"	3/8"
			Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259)							
INTAKE FLANGE	PN-10/16 DIN-2532/2533	D_1	105	115	140	150	165	185	200	220
		K_1	75	85	100	110	125	145	160	180
		I_1	14	14	18	18	18	18	18	18
		b_1	16	16	18	18	20	20	22	24
		DRILLS N.°	4	4	4	4	4	4	8	8
	DIN-28607 DIN-2544/2545	D_1	105	115	140	150	165	185	200	235
		K_1	75	85	100	110	125	145	160	190
		I_1	14	14	18	18	18	18	18	22
	PN-25/40	b_1	18	18	18	18(20)•	20	22	24	24
		DRILLS N.°	4	4	4	4	4	8	8	8
ESCAPE FLANGE	DIN-2532/2533 DIN-28605 DIN-2544/2545	D_2	140	150	165	185	200	220	250	285
		K_2	100	110	125	145	160	180	210	240
		I_2	18	18	18	18	18	18	18	22
	PN-10/16	b_2	18	18	20	20(18)*	22(20)•*	24(20)•*	26(22)•*	26(22)•*
		DRILLS N.°	4	4	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	EP	AP	ES	CP	EP	AP	ES	CP
WEIGHT IN Kgs.	CAST IRON	8,00	7,40	7,60	7,80	9,60	8,88	9,12	9,38	13,87	12,82	13,17	13,43	20,27	18,74	19,25	19,68	26,68	24,67	25,34	25,77	39,48	36,52	37,50	38,10	55,48	51,32	52,70	53,30	82,15	75,98	78,04	78,64
	NODULAR IRON	8,73	8,07	8,29	8,49	10,47	9,68	9,94	10,20	15,13	13,99	14,37	14,63	22,11	20,45	21,00	21,43	29,11	26,92	27,65	28,08	43,08	39,84	40,92	41,52	60,54	55,99	57,51	58,11	89,64	82,91	85,15	85,75
	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
CODE	CAST IRON 2002-496.	5346	53461	53462	53463	5106	51061	51062	51063	5146	51461	51462	51463	5126	51261	51262	51263	5206	52061	52062	52063	5226	52261	52262	52263	5306	53061	53062	53063	5406	54061	54062	54063
	NODULAR IRON 2002-496.	8346	83461	83462	83463	8106	81061	81062	81063	8146	81461	81462	81463	8126	81261	81262	81263	8206	82061	82062	82063	8226	82261	82262	82263	8306	83061	83062	83063	8406	84061	84062	84063
	CAST STEEL 2002-496.	8344	83441	83442	83443	8104	81041	81042	81043	8144	81441	81442	81443	8124	81241	81242	81243	8204	82041	82042	82043	8224	82241	82242	82243	8304	83041	83042	83043	8404	84041	84042	84043
	STAINLESS STEEL 2002-496.	8342	83421	83422	83423	8102	81021	81022	81023	8142	81421	81422	81423	8122	81221	81222	81223	8202	82021	82022	82023	8222	82221	82222	82223	8302	83021	83022	83023	8402	84021	84022	84023

* Cast steel (GS-C 25N) and Stainless steel (1.4408).
• Nodular iron (GGG-40).



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 IN 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 overpressure exists, the AP and CP model cannot be used.

(2) With external constant overpressure, the spring is adjusted deducting the overpressure from the set pressure.

(3) If the set pressure < 3 bar we must consider the total atmospheric pressure (1 bar) as external constant overpressure 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 d_0 , in order to remove the necessary volume.

pa = Overpressure permitted [bar] absolute.
p = Set pressure [bar] absolute.
αd = Coefficient of discharge.

SET PRESSURES AND REGULATING RANGES

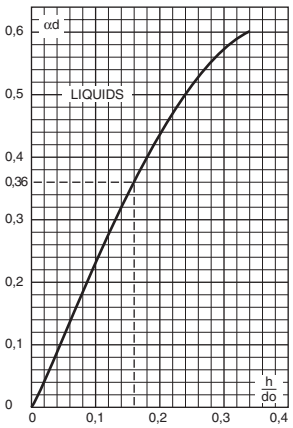
DN_1 x DN_2			20 x 32	25 x 40	32 x 50	40 x 65	50 x 80	65 x 100	80 x 125	100 x 150
SET PRESSURES IN bar	**MAXIMUM** (LIQUIDS AND GASES)	PN-16	16	16	16	16	16	16	16	16
		PN-40	40	40	40	32	32	32	25	20
	MAXIMUM (SATURATED STEAM)	PN-16	13	13	13	13	13	13	13	13
		PN-40	32	32	30	24	22	24	20	18
	MINIMUM	STEAM AND GASES	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
SPRING REGULATING RANGE IN bar	0,20 a 0,68	CODE	56210 56390	56226 56406	56242 56422	56258 56438	56273 56453	56288 56468	56303 56483	56317 56497
	0,66 a 1,00	CODE	56211 56391	56227 56407	56243 56423	56259 56439	56274 56454	56289 56469	56304 56484	56318
	0,95 a 1,40	CODE	56212 56392	56228 56408	56244 56424	56260 56440	56275 56455	56290 56470	56305 56485	56319
	1,30 a 1,90	CODE	56213 56393	56229 56409	56245 56425	56261 56441	56276 56456	56291 56471	56306 56486	56320
	1,80 a 2,60	CODE	56214 56394	56230 56410	56246 56426	56262 56442	56277 56457	56292 56472	56307	56321
	2,50 a 3,60	CODE	56215 56395	56231 56411	56247 56427	56263 56443	56278 56458	56293 56473	56308	56322
	3,50 a 5,00	CODE	56216 56396	56232 56412	56248 56428	56264 56444	56279 56459	56294	56309	56323
	4,80 a 6,30	CODE	56217 56397	56233 56413	56249 56429	56265 56445	56280 56460	56295	56310	56324
	6,00 a 8,00	CODE	56218 56398	56234 56414	56250 56430	56266 56446	56281 56461	56296	56311	56325
	7,50 a 10,00	CODE	56219 56399	56235 56415	56251 56431	56267 56447	56282 56462	56297	56312	56326
	9,50 a 12,50	CODE	56220 56400	56236 56416	56252 56432	56268 56448	56283	56298	56313	56327
	12,00 a 16,00	CODE	56221 56401	56237 56417	56253 56433	56269 56449	56284	56299	56314	56328
	15,00 a 20,00	CODE	56222 56402	56238 56418	56254 56434	56270	56285	56300	56315	56329
	18,00 a 25,00	CODE	56223 56403	56239 56419	56255 56435	56271	56286	56301	56316	
	23,00 a 32,00	CODE	56224 56404	56240 56420	56256 56436	56272	56287	56302		
	30,00 a 40,00	CODE	56225 56405	56241 56421	56257 56437					

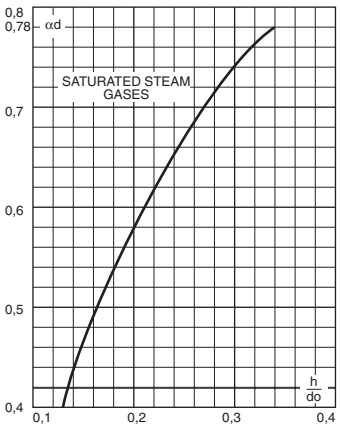
Spring steel (DIN-1.0600 GRADE-B). Maximum temperature for EP, ES and CP models 250°C.

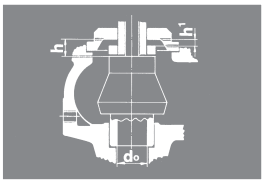
Vanadium-chrome steel (DIN-1.8159 50 CrV4).

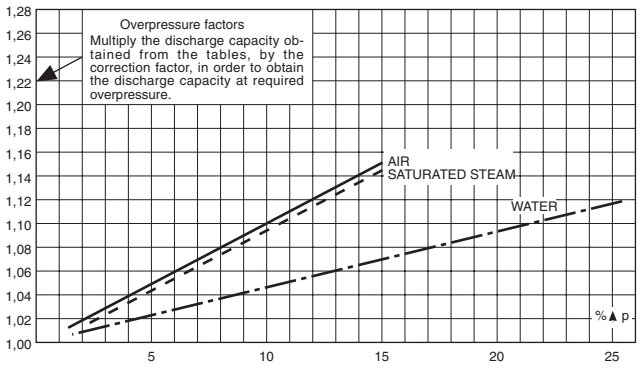
Stainless steel (DIN-1.4300) (AISI-302).

COEFFICIENT OF DISCHARGE									
DN_1 x DN_2		20 x 32	25 x 40	32 x 50	40 x 65	50 x 80	65 x 100	80 x 125	100 x 150
do		16	20	25	32	40	50	63	77
h		7,00	9,00	12,00	12,00	18,00	18,00	20,00	29,00
h^1		2,60	3,20	4,00	5,20	6,50	8,00	10,00	12,50
h/do		0,44	0,45	0,48	0,38	0,45	0,36	0,32	0,38
h^1/do (1)		0,16	0,16	0,16	0,16	0,16	0,16	0,16	0,16
COEFFICIENT OF DISCHARGE αd	SATURATED STEAM GASES	0,78							
	LIQUIDS	0,60							
	LIQUIDS WITH RAPID LIMITER (1)	0,36							

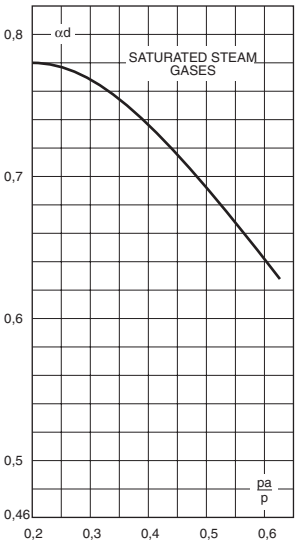








OVERPRESSURE IN %



DISCHARGE CAPACITY

$DN_1 \times DN_2$	20 x 32			25 x 40			32 x 50			40 x 65			50 x 80			65 x 100			80 x 125			100 x 150		
do	16			20			25			32			40			50			63			77		
$Ao=\frac{\pi \cdot do^2}{4}$	201			314			491			804			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.																							
SET PRESSURE IN bar	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
0,5	101	121	4310	157	200	6734	246	294	10530	402	482	17243	629	738	26958	982	1168	42120	1559	1845	66848	2330	2773	99876
1,0	151	182	6096	236	285	9523	369	435	14892	604	724	24385	945	1134	38125	1476	1771	59568	2343	2811	94538	3500	4200	141246
1,5	200	244	7466	312	380	11664	488	590	18239	799	960	29866	1249	1498	46693	1952	2342	72955	3097	3716	115785	4628	5431	172990
2,0	246	300	8621	385	469	13468	602	728	21060	986	1191	34486	1541	1863	53916	2408	2913	84241	3821	4622	133697	5709	6907	199752
2,5	290	356	9639	453	569	15058	708	857	23546	1160	1415	38556	1813	2194	60280	2833	3429	94185	4496	5444	149478	6717	8134	223329
3,0	334	414	10559	522	648	16495	817	1017	25793	1337	1664	42236	2090	2605	66034	3266	4070	103174	5184	6376	163746	7745	9526	244645
3,5	375	466	11405	585	730	17817	916	1145	27860	1499	1872	45620	2343	2931	71325	3661	4579	111441	5811	7260	176865	8682	10820	264247
4,0	415	518	12192	648	811	19047	1014	1272	29784	1660	2080	48770	2596	3256	76249	4056	5088	119136	6437	8066	189077	9617	12023	282492
4,5	455	570	12932	711	892	20202	1112	1399	31590	1821	2288	51729	2847	3582	80874	4449	5596	126362	7060	8873	200547	10548	13225	299628
5,0	496	622	13632	774	973	21295	1210	1526	33299	1982	2496	54527	3099	3908	85249	4842	6105	133198	7684	9680	211394	11481	14427	315835
6,0	576	725	14933	899	1135	23328	1406	1780	36477	2303	2913	59731	3600	4559	93386	5625	7123	145911	8928	11293	231571	13339	16832	345980
7,0	656	829	16129	1024	1298	25197	1602	2035	39400	2623	3329	64517	4100	5210	100868	6406	8140	157602	10167	12907	250125	15190	19236	373701
8,0	736	933	17243	1149	1460	26936	1797	2289	42121	2942	3745	68972	4600	5862	107833	7187	9158	168483	11406	14520	267395	17041	21641	399504
9,0	815	1036	18288	1273	1622	28570	1991	2544	44676	3261	4161	73156	5098	6513	114374	7965	10176	178704	12641	16133	283615	18887	24045	423738
10,0	894	1140	19278	1397	1784	30116	2185	2798	47092	3578	4577	77113	5594	7164	120561	8740	11193	188370	13871	17747	298957	20724	26450	446659
12,0	1053	1347	21118	1645	2109	32990	2572	3307	51587	4212	5410	84473	6585	8467	132068	10289	13228	206349	16329	20974	327491	24396	31259	489290
14,0	1211	1555	22810	1891	2433	35634	2958	3816	55720	4843	6242	91241	7572	9770	142650	11830	15264	222883	18775	24201	353731	28052	36068	528494
16,0	1369	1762	24385	2139	2758	38094	3344	4324	59568	5476	7074	97541	8561	11073	152490	13376	17299	238272	21229	27427	378154	31718	40877	564984
18,0	1526	1969	25864	2384	3082	40405	3727	4833	63181	6103	7907	103458	9542	12375	161750	14909	19334	252725	23661	30654	401093	35352	45687	599256
20,0	1684	2177	27263	2631	3407	42590	4113	5342	66599	6736	8739	109054	10531	13678	170499	16454	21369	266396	26113	33881	422790		50496	631671
22,0	1841	2384	28594	2876	3731	44669	4497	5851	69850	7364	9571	114377	11514	14981	178821	17989	23404	279398		37108	443425			
24,0	2000	2592	29865	3124	4056	46656	4884	6360	72956	7998	10400	119463		16284	186772	19537	25440	291822		40334	463142			
26,0	2157	2799	31085	3370	4380	48561	5269	6868	75934		11236	124341		17586	194399		27475	303738		41948	482054			
28,0	2316	3006	32258	3618	4705	50394	5657	7377	78801		12068	129035		18889	201737		29510	315204						
30,0	2472	3214	33390	3861	5029	52163	6038	7886	81567		12900	133563		20192	208818		31545	326267						
32,0	2630	3421	34486	4109	5353	53873		8395	84242		13733	137944		21494	215665		33580	336967						
34,0		3628	35547		5678	55531		8904	86834															
36,0		3836	36578		6002	57141		9412	89352				Calculus according to "AD-Merkblatt A2".											
38,0		4043	37580		6327	58707		9667	91800															
40,0		4250	38556		6651	60232		10430	94185															

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 a 20°C. (ϱ_A=998 Kg/m³).
ϱ_L = Liquid density.

FACT LIST FOR SAFETY VALVE CALCULS

Calculus acording to AD-Merkblatt A2 SR,"Safety valve" 1)

Customer:

Theme:

Leaf: Of:

1		Consultation / Bid / Order								
2		Position Nº								
3		Nº 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 capacity	Required: kg/h, Nm³/h, l/h							
18			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 flow A_0	Necessary A_0 mm²							
32			Chosen A_0 mm²							
33		Allowed discharge coefficient αd								
34	CONNECTIONS	Input / Output	DN	Flange mm						
35				Thread inch						
36				Welding (soldering) ends						
37			PN bar							
38			Shape of joint surfaces (DIN-2526)							
39	OBSERVA-TIONS	Unit weight approx. Kg								
40										
41										
42										
43	ACCEP-TANCE	Certificate according to DIN - 50049 2.2								
44		Certificate according to DIN - 50049 3.1.B								
45										

Date:

Department:

Name:

VYC industrial, sa

Founded in 1914

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TRANSVERSAL, 179 - 08225 TERRASSA (BARCELONA) SPAIN

e-mail: info@vycindustrial.com

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Full lift safety valve with spring loading. (AIT)

Model 495

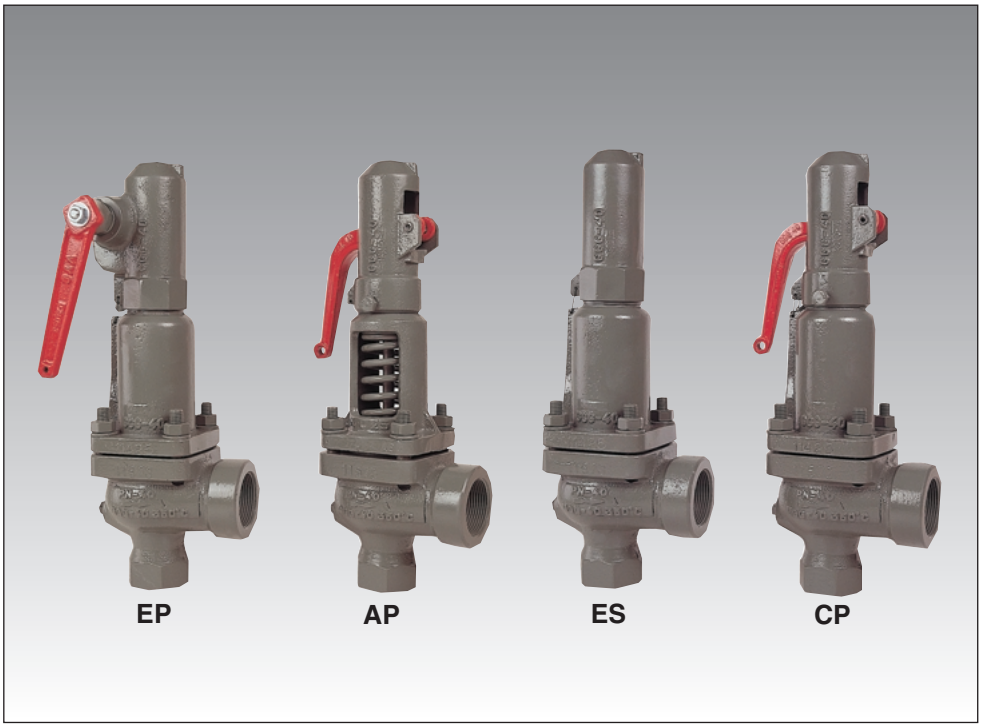
The valve works as an automatic pressure releasing regulator activated by the static pressure existing at the entrance to the valve and is characterized by its ability to open instantly and totally.

Design in 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 valves" (Steam boilers).

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

Licence N.°: PENDING ALLOCATION



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 DIN-3230 requeriments. Page 3.
— 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.

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

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

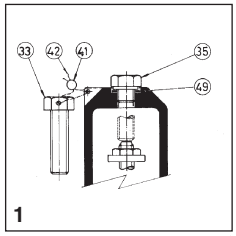
The ranges of application allow certain flexibility although we recommend limiting them to:

RANGE OF APPLICATION FOR THE SEALS					
FLUID		SET PRESSURE IN bar: 0,2 / 1,8 / 4,0 / 4,8 / 7,0 / 30,0 / 40,0			
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	-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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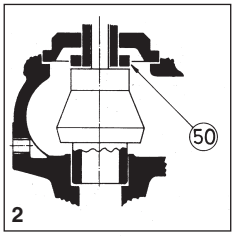

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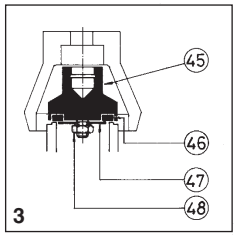

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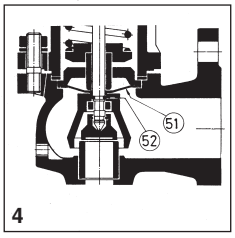

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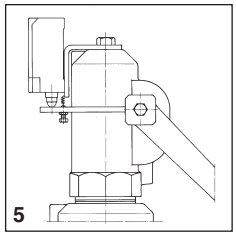
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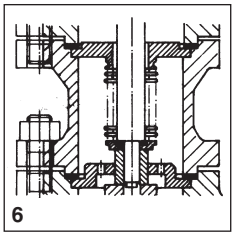

6

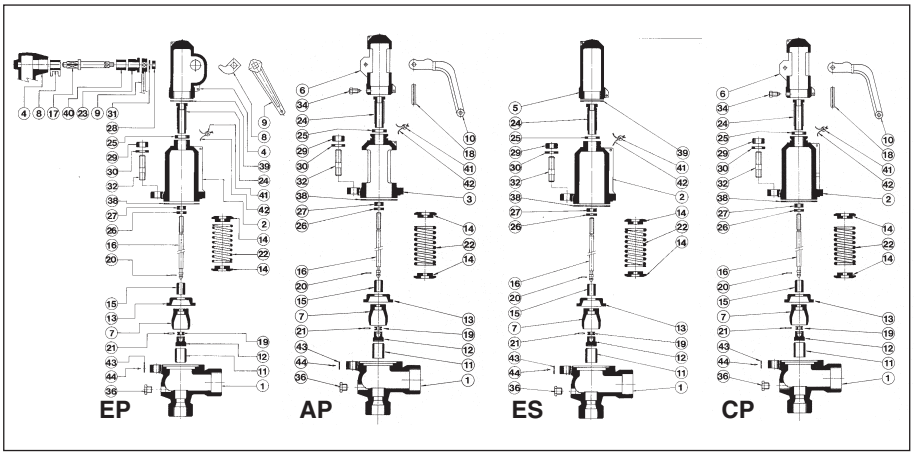
N°. PIECE	PIECE	MATERIAL			
		CAST IRON	NODULAR IRON	CAST STEEL	STAINLESS STEEL
1	Body	Cast iron (DIN-0.6025 GG-25)	Nodular iron (DIN-0.7040 GGG-40)	Cast steel (DIN-1.0619.01 GS-C 25N)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
2	Closed bell	Cast iron (DIN-0.6025 GG-25)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
3	Open bell	Cast iron (DIN-0.6025 GG-25)	Nodular iron (DIN-0.7040 GGG-40)	Cast steel (DIN-1.0619.01 GS-C 25N)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
4, 5, 6	Hood	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
7	Elevator	Nodular iron (DIN-0.7040 GGG-40) (1)	Nodular iron (DIN-0.7040 GGG-40) (1)	Nodular iron (DIN-0.7040 GGG-40) (1)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
8	Cam	Nodular iron (DIN-0.7040 GGG-40) (1)	Nodular iron (DIN-0.7040 GGG-40) (1)	Nodular iron (DIN-0.7040 GGG-40) (1)	Stainless steel (DIN-1.4408) (ASTM A351 CF8M)
9, 10	Lever	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)
11	Seating	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4542) (AISI-630) (17-4PH)
12	Plug	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4542) (AISI-630) (17-4PH)
13	Lead	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
14	Spring press	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Stainless steel (DIN-1.4305) (AISI-303)
15	Separator	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
16	Rod	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
17	Lever shaft	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Stainless steel (DIN-1.4305) (AISI-303)
18	Gudgeon	Carbon steel (DIN-1.1231 Ck-67)	Carbon steel (DIN-1.1231 Ck-67)	Carbon steel (DIN-1.1231 Ck-67)	Stainless steel (DIN-1.4310) (AISI-301)
19	Ring	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
20, 21	Safety ring	Stainless steel (DIN-1.4300) (AISI-302)	Stainless steel (DIN-1.4300) (AISI-302)	Stainless steel (DIN-1.4300) (AISI-302)	Stainless steel (DIN-1.4300) (AISI-302)
22	Spring	Vanadium-chrome steel (DIN-1.8159 50CrV4) (2)	Vanadium chrome steel (DIN-1.8159 50CrV4) (2)	Vanadium chrome steel (DIN-1.8159 50CrV4) (2)	Stainless steel (DIN-1.4300) (AISI-302)
23	Gland	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Stainless steel (DIN-1.4305) (AISI-303)
24	Hollow screw	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)
25	Hollow screw nut	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)
26	Buffer nut	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)	Stainless steel (DIN-1.4305) (AISI-303)
27	Rod check nut	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Stainless steel (DIN-1.4401) (AISI-316)
28, 29, 48	Nut	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Stainless steel (DIN-1.4401) (AISI-316)
30, 31	Washer	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Stainless steel (DIN-1.4401) (AISI-316)
32	Stud	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	Stainless steel (DIN-1.4401) (AISI-316)
33, 34, 35	Screw	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Stainless steel (DIN-1.4401) (AISI-316)
36	Cap	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	Stainless steel (DIN-1.4401) (AISI-316)
38	Coupling	Klingerit cardboard	Klingerit cardboard	Klingerit cardboard	PTFE (Teflón)
39, 49	Coupling	Copper	Copper	Copper	PTFE (Teflón)
40	Seal	Graphite	Graphite	Graphite	PTFE (Teflón)
41	Seal	Lead	Lead	Lead	Lead
42	Sealing wire	Sealing wire	Sealing wire	Sealing wire	Sealing wire
43	Characteristic plate	Aluminium	Aluminium	Aluminium	Aluminium
44	Rivets	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)
45	Plug	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)
46	Sealing disk	PTFE (Teflón)	PTFE (Teflón)	PTFE (Teflón)	PTFE (Teflón)
		Silicone's rubber	Silicone's rubber	Silicone's rubber	Silicone's rubber
		Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)
47	Washer	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)	Stainless steel (DIN-1.4401) (AISI-316)
50	Limiter	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4028) (AISI-420)	Stainless steel (DIN-1.4401) (AISI-316)
51	Membrane	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)
52	O-ring	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)	Fluorelastomer (Vitón)

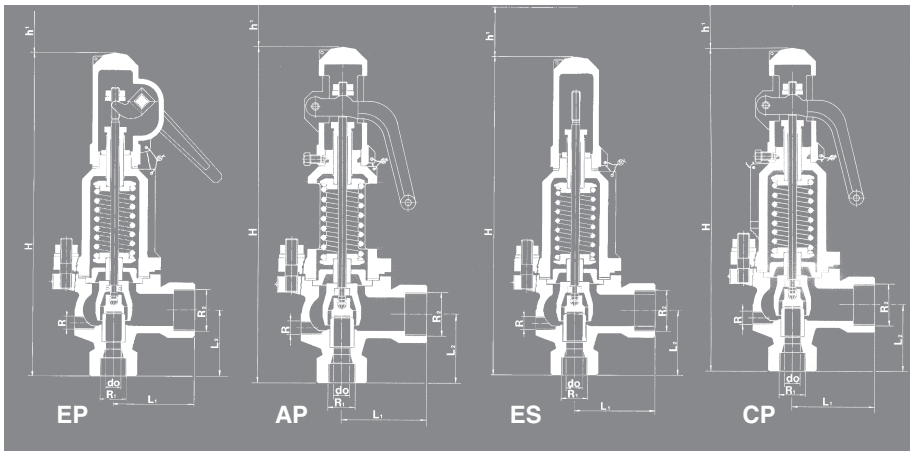
$R_1 \times R_2$		3/4" x 1 1/4" to 1" x 1 1/2"																			
PN		16				40					40							40			
OPERATING CONDITIONS	PRESSURE IN bar	16	13	13	13	40	35	32	28	24	40	35	32	28	24	21	20	40	34	32	29
	MAX. TEMP. IN °C	120	200	250	300	120	200	250	300	350	120	200	250	300	350	400	450	120	200	300	400
	MIN. TEMP. IN °C	-10				-10					-10							-60			

(1) R.3/4 x 1 1/4 in stainless steel (DIN-1.4408) (ASTM A351 CF8M).

(2) Spring steel (DIN-1.0600 GRADE B) for wire spring Ø < 8 mm. Maximum temperature 250°C.

$R_1 \times R_2$		3/4" x 1 1/4"				1" x 1 1/2"			
CONNECTIONS		Whitworth cylindrical female thread ISO 228/1 de 1978 (DIN-259)							
do		16				20			
Ao = $\frac{\pi \cdot do^2}{4}$		201				314			
H		320				370			
h¹		112				129			
L_1		80				85			
L_2		65				80			
R		1/4"				1/4"			
		Whitworth cylindrical female thread ISO 228/1 de 1978 (DIN-259)							
MODEL		EP	AP	ES	CP	EP	AP	ES	CP
WEIGHT IN Kgs.	CAST IRON	5,24	4,64	4,84	5,04	6,60	5,88	6,12	6,32
	NODULAR IRON	5,97	5,31	5,53	5,73	7,47	6,68	6,94	7,14
	CAST STEEL STAINLESS STEEL	5,65	5,01	5,22	5,42	7,50	6,70	6,97	7,17
CODE	CAST IRON 2002-495.	5346	53461	53462	53463	5106	51061	51062	51063
	NODULAR IRON 2002-495.	8346	83461	83462	53463	8106	81061	81062	81063
	CAST STEEL 2002-495.	8344	83441	83442	83443	8104	81041	81042	81043
	STAINLESS STEEL 2002-495.	8342	83421	83422	83423	8102	81021	81022	81023





Recommended ranges of application.
Open and closed pressures in % of set pressure.
Set pressures and regulating ranges.
Coefficient of discharge.
Discharge capacity.

See brochure Model 496.

Model 495 R.3/4" x 1 1/4" = Model 496 DN - 20x32. do = 16.
Model 495 R. 1" x 1 1/2" = Model 496 DN - 25x40. do = 20.

Informative brochure, without obligation and subject to our General Sales Conditions.

VYC industrial, sa
Founded in 1914
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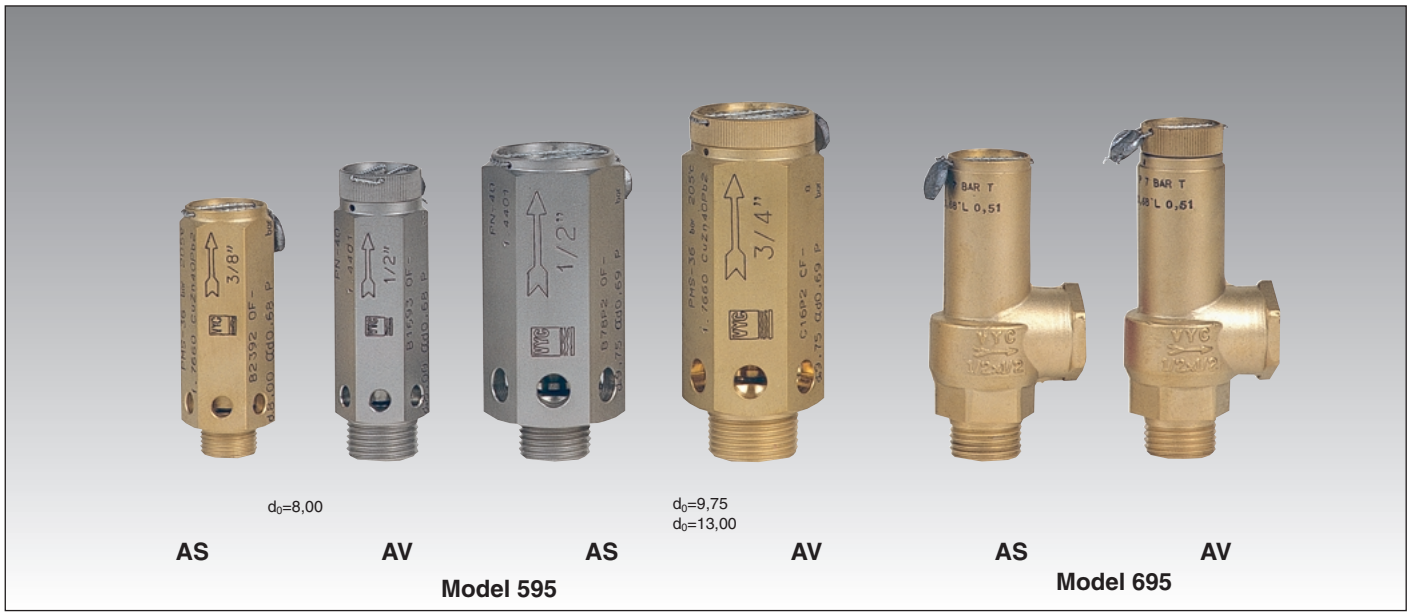
TRANSVERSAL, 179 - 08225 TERRASSA (BARCELONA) SPAIN
e-mail: info@vycindustrial.com
http: //www.vycindustrial.com

Full lift safety valve with spring loading. (AIT)

Free blow-off **Model 595**
Directed blow-off **Model 695**



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 line with the "AD-MERKBLATT A2 Specifications sheet" and "BS 6759 : Part 2 : 1984 Specification for safety valves for compressed air or inert gases".

Complies with the requirements of "Regulation for pressurised equipment ITC - MIE - AP 17 4.1.".

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

Licence N°: PENDING ALLOCATION

Specifications

— Model AS without manual discharge operation.
— Model AV with hand wheel threaded to the body and fastened to the shaft which allows immediate manual operation.
— Activated by direct action helicoid spring.
— Simplicity of construction ensuring minimum maintenance.
— Internal body designed to offer favourable flow profile.
— Pressed or vulcanised seal with a precise finish which guarantees tightness, even greater than that required by DIN-3230. Sheet 3.
— Great discharge capacity. For liquids typically used with openings similar to proportional safety valves.
— Totally precise open and close.
— All the valves are supplied sealed at the set pressure requested, simulating operational conditions, and are vigorously tested.
— All components are numbered, registered and checked. If requested in advance, material, casting, test and efficiency certificates will be enclosed with the valve.

IMPORTANT

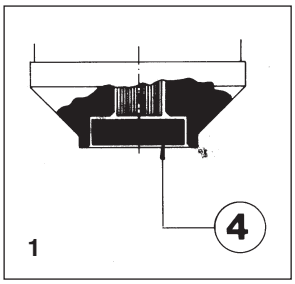
1.- Fluorelastomer (Vitón) seals or PTFE (Teflón), achieving leakage levels less than

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

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 — 5,0 — 8,5 — 11,5 — 36,0			
Saturated steam		V	T		
Liquids and gases		V (1)	T		
SEALS		TEMPERATURE IN °C			
		ACCORDING TO MANUFACTURERS		RECOMMENDED BY VYC	
		MINIMUM	MAXIMUM	MINIMUM	MAXIMUM
Fluorelastomer (Vitón)	V	–40	+250	–30	+150
PTFE (Teflón)	T	–265	+260	–80	+230

(1) For d_0=9,75 and d_0=13,00 we recommend restricting the use of Fluorelastomer (Vitón) at 8,5 bar.



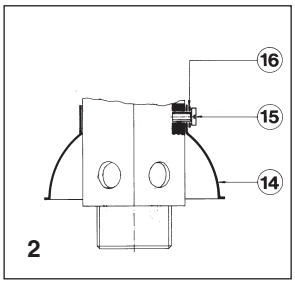
1

Depending on demand:

1.- Buna-nitryls seals, Butyl, Natural rubber, E.P.D.M., Chlorosulphonate polyethylene (Hypalon), Neoprene, Silicone's rubber, etc.

2.- Using the discharge deflector prevents:
- The inconvenience of free discharge.
- The entry of foreign bodies in the valve which will affect later operation. (Specially desIgned for moving transport).

3.- Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).



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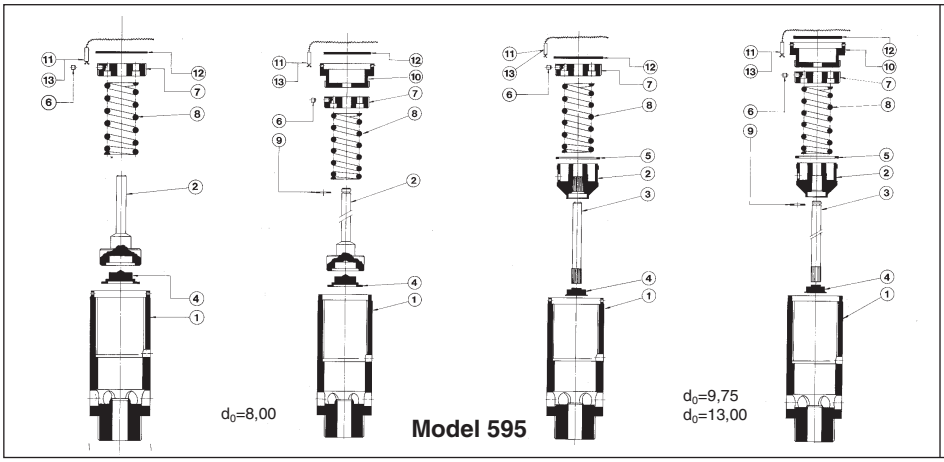
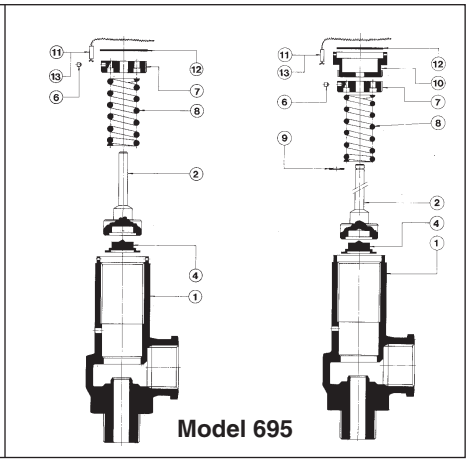
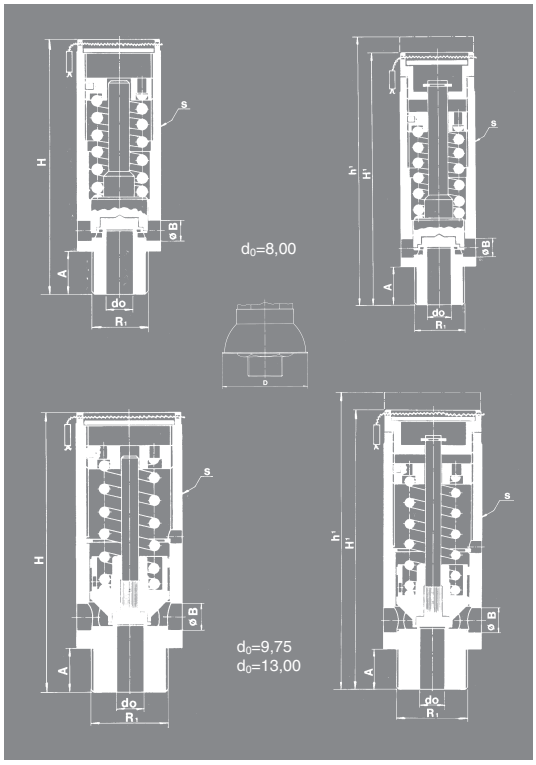




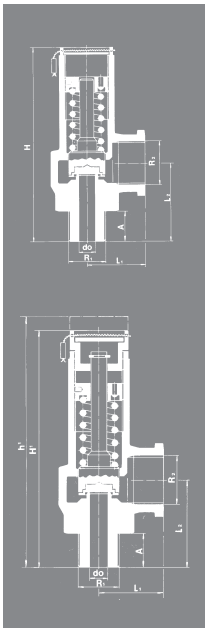
N.º PIECE	PIECE	MATERIAL	
		BRASS	STAINLESS STEEL
1	Body	Brass (DIN-1.7660 CuZn40Pb2)	S. steel (DIN-1.4401) (AISI-316)
2	Plug	Brass (DIN-1.7660 CuZn40Pb2)	S. steel (DIN-1.4401) (AISI-316)
3	Shaft	S. steel (DIN-1.4305) (AISI-303)	S. steel (DIN-1.4305) (AISI-303)
4	Seal	Fluorelastomer (Vitón) PTFE (Teflón)	Fluorelastomer (Vitón) PTFE (Teflón)
5	Limiter ring	S. steel (DIN-1.4310) (AISI-301)	S. steel (DIN-1.4310) (AISI-301)
6	End-stop	Buna-nitryl	Buna-nitryl
7	Spring press	Brass (DIN-1.7660 CuZn40Pb2)	S. steel (DIN-1.4305) (AISI-303)
8	Spring	S. steel (DIN-1.4300) (AISI-302)	S. steel (DIN-1.4300) (AISI-302)
9	Safety washer	Phosphorous bronze (CuSn6)	S. steel (DIN-1.4568)
10	Hand wheel	Brass (DIN-1.7660 CuZn40Pb2)	S. steel (DIN-1.4305) (AISI-303)
11	Sealing wire	Sealing wire	Sealing wire
12	Characteristic plate	Aluminium	Aluminium
13	Seal	Lead	Lead
14	Deflector	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
15	Screw	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
16	Washer	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
DN		3/8" to 1"	
PN		PMS. 36 bar	40
OPERATING CONDITIONS	PRESSURE IN bar	36	36
	MAXIMUM TEMP. IN °C	205	230
	MINIMUM TEMP. IN °C	–60	–60

MODEL 595													
R_1		3/8"		1/2"		1/2"		3/4"		3/4"		1"	
CONNECTIONS		Whitworth gas-tight cylindrical male thread ISO 228/1 1978 (DIN-259)											
d_0		8,00		8,00		9,75		9,75		13,00		13,00	
$A_0=\frac{\pi \cdot d_0^2}{4}$		50,27		50,27		74,66		74,66		132,73		132,73	
H		73		76		89		92		113		116	
H^1		81		84		98		101		123		126	
h^1		89		92		106		109		132		135	
A		9		12		12		15		15		18	
B		6,00		6,00		9,50		9,50		11,00		11,00	
D		40		40		65		65		65		65	
S		24		24		36		36		42(41) •		42(41) •	
		AV	AS	AV	AS	AV	AS	AV	AS	AV	AS	AV	AS
WEIGHT IN Kgs.	BRASS	0,22	0,19	0,23	0,20	0,52	0,47	0,56	0,50	0,89	0,81	0,94	0,85
	STAINLESS STEEL	0,21	0,18	0,22	0,19	0,49	0,43	0,52	0,47	0,83	0,75	0,88	0,79
CODE	BRASS 2002-595.	83811	83813	80211	80213	80212	80214	83411	83413	83412	83414	81011	81013
	S. STEEL 2002-595.	83821	83823	80221	80223	80222	80224	83421	83423	83422	83424	81021	81023



• Stainless steel (DIN-1.4401) (AISI-316).

MODEL 695					
R_1 x R_2		3/8" x 1/2"		1/2" x 1/2'	
CONNECTIONS		Male thread x Female thread Whitworth gas-tight cylindrical ISO 228/1 1978 (DIN-259)			
d_0		8,00		8,00	
$A_0=\frac{\pi \cdot d_0^2}{4}$		50,27		50,27	
H		85		88	
H^1		93		96	
h^1		101		104	
A		9		12	
L_1		26		26	
L_2		32,50		35,50	
		AV	AS	AV	AS
WEIGHT IN kgs.	BRASS	0,33	0,30	0,34	0,31
CODE	BRASS 2002-695.	83811	83813	80211	80213



RECOMMENDED RANGES OF APPLICATION						
MODEL			MODEL 595		MODEL 695	
			AS	AV	AS	AV
FLUID	SATURATED STEAM				*	*
	GASES	INERT	*	*	*	*
		NON INERT			*	*
	LIQUIDS				*	*
OPENING PRESSURE IN % OF THE SET PRESSURE			+10%			
CLOSURE PRESSURE IN % OF THE SET PRESSURE			−10%			

SET PRESSURES AND REGULATING RANGES

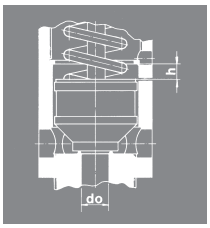
MODEL			695		595					
ENTRY CONNECTION		R_1	3/8"	1/2"	3/8"	1/2"	1/2"	3/4"	3/4"	1"
EXIT CONNECTION		R_2	1/2"		–		–		–	
		6 x B	–		6 x ø 6,00		6 x ø 9,50		6 x ø 11,00	
d_0			8,00				9,75		13,00	
SET PRESSURE IN bar	MAXIMUM	PMS. 36 bar	36				36		36	
		PN-40	36				36		36	
	MINIMUM	PMS. 36 bar	0,2				0,2		0,2	
		PN-40	0,2				0,2		0,3	
SPRING REGULATING RANGE IN bar	0,20 to 0,70	CODE	56160				56169		56178	
	0,60 to 1,60	CODE	56161				56170		56179	
	1,50 to 3,50	CODE	56162				56171		56180	
	3,40 to 5,50	CODE	56163				56172		56181	
	5,40 to 10,00	CODE	56164				56173		56182	
	9,80 to 15,00	CODE	56165				56174		56183	
	14,50 to 20,00	CODE	56166				56175		56184	
	19,00 to 25,00	CODE	56167				56176		56185	
	24,00 to 36,00	CODE	56168				56177		56186	

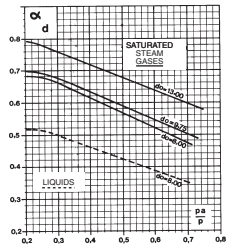
COEFFICIENT OF DISCHARGE

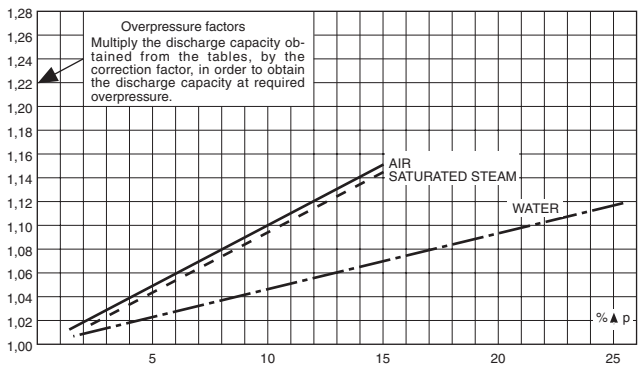
MODEL			695		595					
ENTRY CONNECTION		R_1	3/8"	1/2"	3/8"	1/2"	1/2"	3/4"	3/4"	1"
EXIT CONNECTION		R_2	1/2"		–		–		–	
		6 x B	–		6 x ø 6,00		6 x ø 9,50		6 x ø 11,00	
d_0			8,00				9,75		13,00	
h			2,50				4,00		5,50	
h/d_0			0,31				0,41		0,42	
COEFFICIENT OF DISCHARGE αd (1)	SATURATED STEAM GASES		0,68				0,69		0,79	
	LIQUIDS		0,51		–		–		–	

(1) For set pressures less than 3 bar see grapf of discharge coefficient.

pa = Overpressure permitted [bar] absolute.
p = Set pressure [bar] absolute.
αd = Coefficient of discharge.







OVERPRESSURE IN %

DISCHARGE CAPACITY

MODEL		695		595					
ENTRY CONNECTION	R_1	3/8"	1/2"	3/8"	1/2"	1/2"	3/4"	3/4"	1"
EXIT CONNECTION	R_2	1/2"		–		–		–	
	6 x B	–		6 x ø 6,00		6 x ø 9,50		6 x ø 11,00	
d_0		8,00		8,00		9,75		13,00	
$A_0 = \frac{\pi \cdot d_0^2}{4}$		50,26		50,26		74,66		132,73	
p [bar]		For other, not so dense liquids, other than water at 20°C apply: $V_L = \sqrt{\frac{\rho_A}{\rho_L}} \cdot V_A$ ó $V_A = V_L \cdot \sqrt{\frac{\rho_L}{\rho_A}}$ 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_A = Water flow according to table. V_L = Liquid flow. ρ_A = Water density at a 20° C. (ρ_A = 998 Kg/m³). ρ_L = Liquid density.						
SET PRESSURE IN bar		I	II	III	II	II	II		
0,5		20	23	654	23	37	78		
1,0		30	38	1070	38	57	118		
1,5		41	51	1445	51	78	159		
2,0		51	64	1739	64	97	198		
2,5		62	78	2031	78	117	236		
3,0		72	91	2270	91	136	277		
3,5		80	102	2448	102	153	311		
4,0		89	113	2618	113	170	347		
4,5		98	125	2776	125	188	381		
5,0		106	136	2927	136	205	416		
6,0		124	159	3206	159	239	485		
7,0		141	182	3463	182	273	555		
8,0		158	205	3702	205	307	625		
9,0		175	227	3927	227	341	694		
10,0		192	250	4139	250	376	763		
12,0		227	296	4534	296	444	902		
14,0		260	342	4897	342	513	1041		
16,0		293	387	5236	387	581	1180		
18,0			433	5553	433	649	1319		
20,0			478	5854	478	718	1458		
22,0			524	6139	524	786	1597		
24,0			570	6412	570	855	1736		
26,0			615	6674	615	923	1875		
28,0			660	6926	660	991	2010		
30,0			707	7169	707	1060	2150		
32,0			752	7405	752	1128	2290		
34,0			798	7632	798	1195	2427		
36,0			843	7854	843	1264	2565		

Calculus according to "AD-Merkblatt A2".

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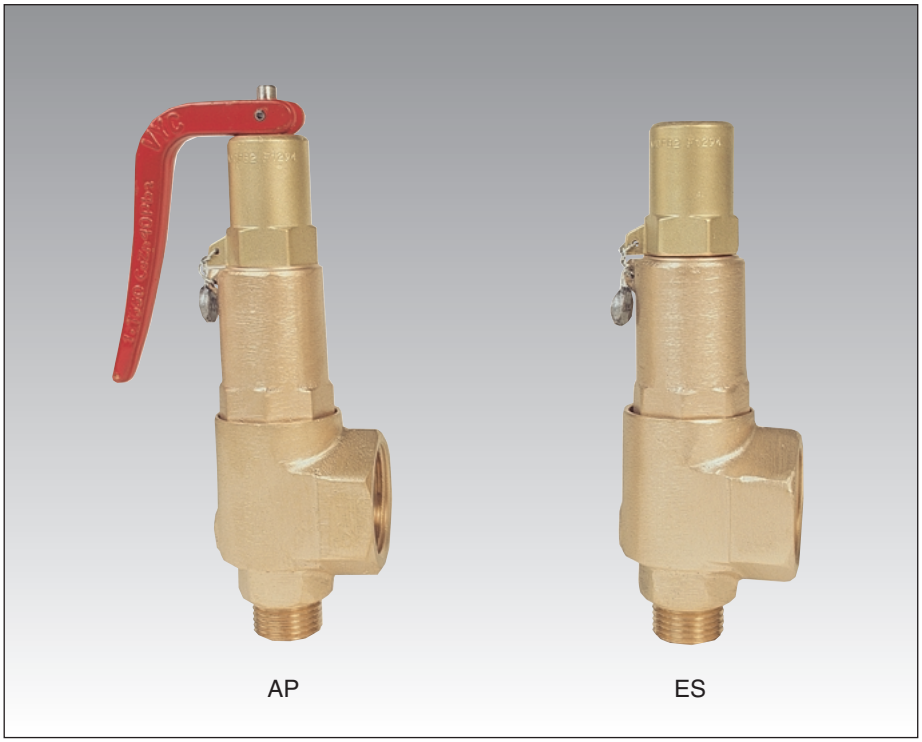
Normal safety valve with spring loading. (AN)

Model 295



AP ES

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 shet” 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:

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

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 — 25,0			
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	–30	+150
PTFE (Teflón)	T	–265	+260	–80	+230 (1)

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

Depending on demand:

– Buna-nitryls seals, Butyl, Natural rubber, E.P.D.M., Chlorosulphonate polyethylene (Hypalon), Neoprene, etc.

– Seal metal by metal.

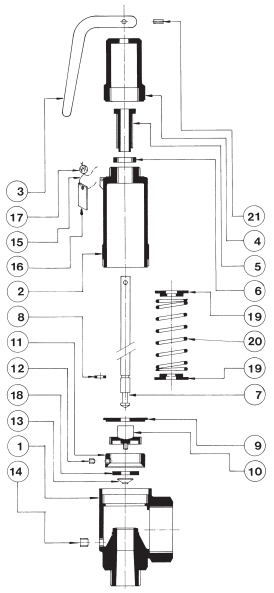
– Electrical contact indicating open/closed.

– Other connections.

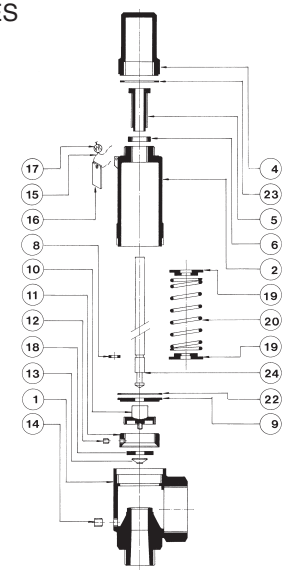
– Possibility of manufacture in other types of material, for special operating conditions (high temperatures, fluids, etc.).

– Totally free of oil and grease, to work with oxygen, avoiding possible fire risks (UV-Oxygen-VBG62).

AP



ES



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
R_1 x R_2		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 acces 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 secrew 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

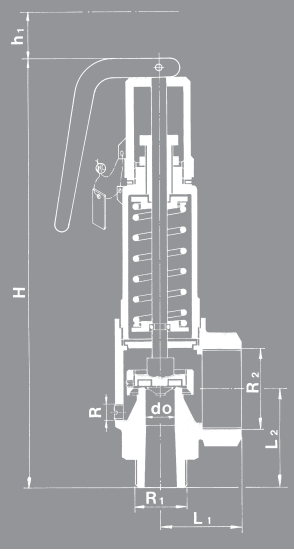
A – Slack the stud (12).
B – Twist or untwist the deflector (11) according the difference in the wished locking pressure (blowdown).
C – Fix the deflector position screwing the stud (12).

WARNING

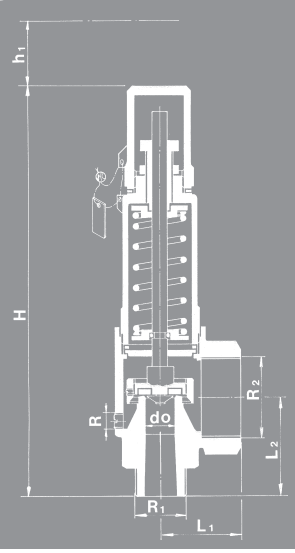
In case to do the change of the sealing disc (18) make sure that the surface of this as well as the one of the seat into the body (1) the correctly rectified and free of impurities.

R_1 x R_2	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_0	15		15	
$A_0 = \frac{\pi \cdot d_0^2}{4}$	176,7		176,7	
H	161	150	212	199
h^1	50	39	60	46
L_1	34	34	41	41
L_2	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

AP

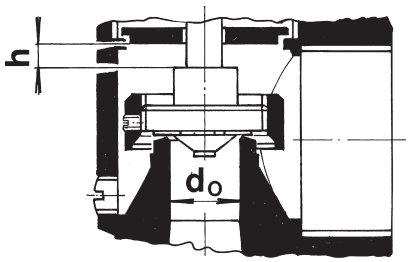


ES



SET PRESSURES AND REGULATING RANGES				
R_1 x R_2			1/2" x 1"	3/4" x 1 1/4"
SET PRESSURES IN 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 REGULATION RANGE IN 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.

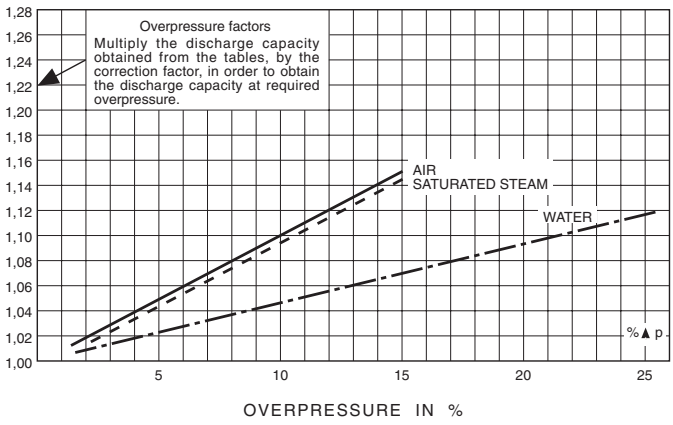


RECOMMENDED RANGES OF APPLICATION			
MODEL		AP	ES
FLUID	SATURATED STEAM	*	
	GASES	* (1)	*
	LIQUIDS	* (1)	*

(1) With noxious or expensives 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				
R_1 x R_2			1/2" x 1"	3/4" x 1 1/4"
d_0			15	15
h			2,20	3,75
h/d_0			0,14	0,25
COEFFICIENT OF DISCHARGE αd	SET PRESSURE IN bar	0,50 to 1,00	0,29	0,55
		1,00 to 25,00	0,35	0,62

p_a = Overpressure permitted [bar] absolute.
p = Set pressure [bar] absolute.



DISCHARGE CAPACITY						
R_1 x R_2	1/2" x 1"			3/4" x 1 1/4"		
d_0	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: $V_L = \sqrt{\frac{\varrho_A}{\varrho_L}} \cdot V_A$ ó $V_A = V_L \cdot \sqrt{\frac{\varrho_L}{\varrho_A}}$ 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_A = Water flow according to table. V_L = Liquid flow. ϱ_A = Water density at a 20°C. (ϱ_A=998 Kg/m³). ϱ_L = Liquid density.						
SET PRESSURE IN bar	I	II	III	I	II	III
0,5	40	50	1780	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	3980	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	24290

Calculus according “AD-Merkblatt A2”.

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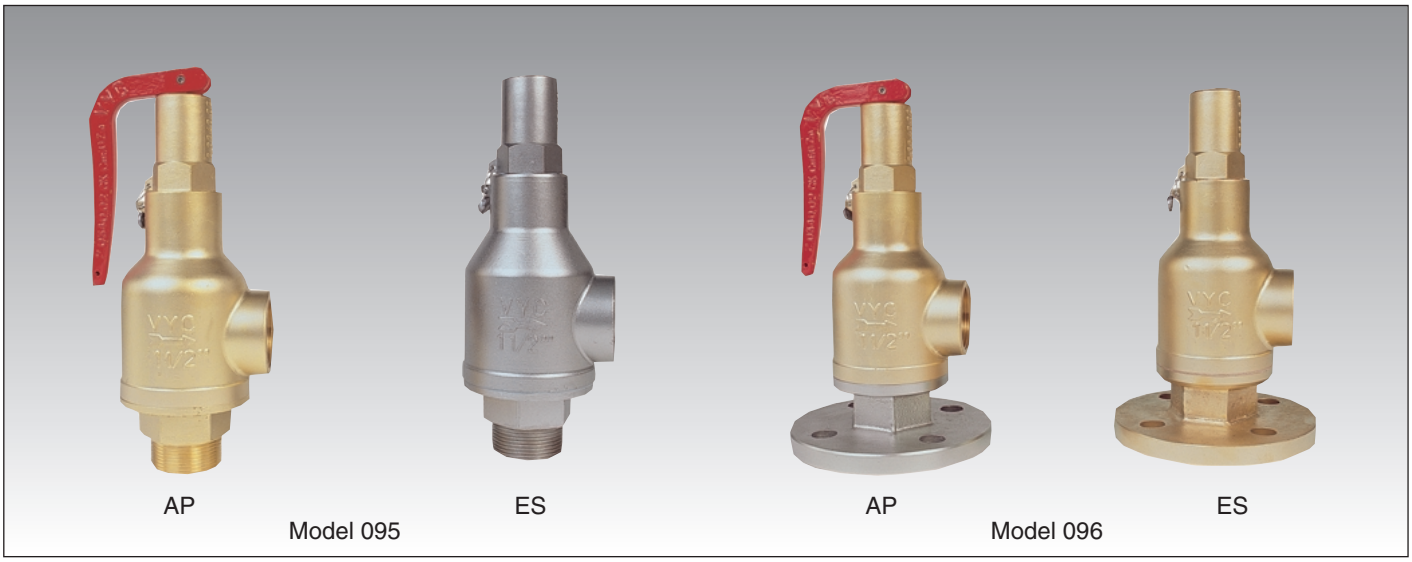
Proportional safety valve with spring loading. (AP)

Thread connection **Model 095**
Flange connection **Model 096**



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 proportional to the pressure increase.

Desing in line with the “AD-MERKBLATT A2 Specifications shet” and “Technical safety instructions for TRD-421 steam boilers”.

In accordance with UNE 9-100-86 “Proportional safety valve” (Steam boilers).

Complies with the requirements of “Regulation for pressurised equipment ITC-MIE-AP...” (Proportional 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.
– Guarantees absolute opening and closing precision.
– Equipped with draining screws for removing condensation. (For d_0 > 45,20 mm.).
– 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:

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

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 — 6,0 — 25,0			
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	–30	+150
PTFE (Teflón)	T	–265	+260	–80	+230 (1)

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

Depending on demand:

– Buna-nitryls seals, Butyl, Natural rubber, E.P.D.M., Chlorosulphonate polyethylene (Hypalon), Neoprene, etc.

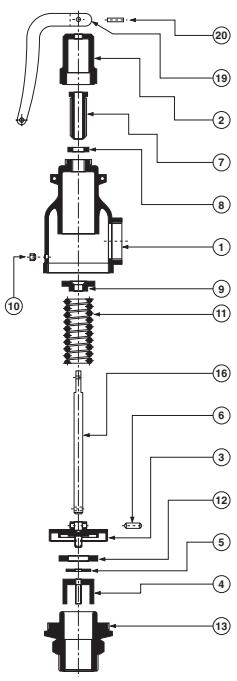
– Seal metal by metal.

– Electrical contact indicating open/closed.

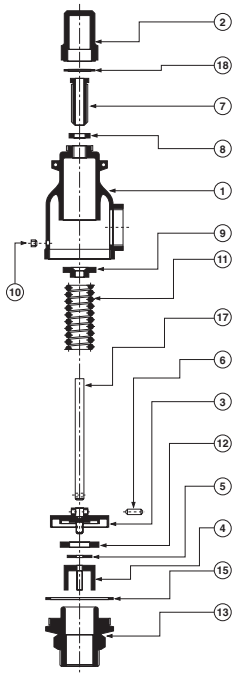
– Other connections.

– 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).

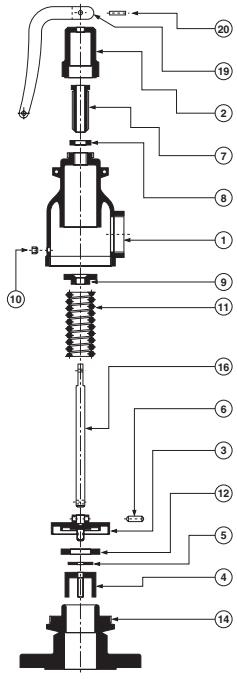


AP



ES

Model 095



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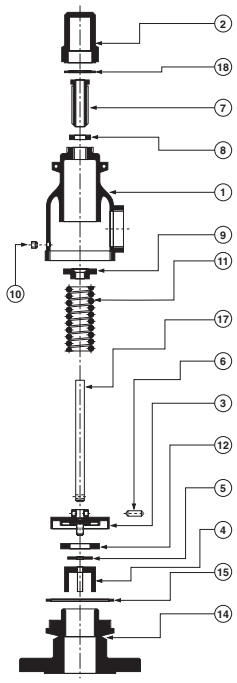


ES

Model 096

TYPE	N° PIECE	PIECE	R1 x R2 / DN1 x R2	1/4" x 1/4" / 8 x 1/4"	3/8" x 3/8" / 10 x 3/8"	1/2" x 1/2" / 15 x 1/2"	3/4" x 3/4" / 20 x 3/4"	1" x 1" / 25 x 1"	1 1/4" x 1 1/4" / 32 x 1 1/4"	1 1/2" x 1 1/2" / 40 x 1 1/2"	2" x 2" / 50 x 2"	2 1/2" x 2 1/2" / 65 x 2 1/2"	3" x 3" / 80 x 3"	4" x 4" / 100 x 4"	PN	OPERATING CONDITIONS A	B	C
BRONZE / BRASS	1	Body		Brass (DIN-1.7660 CuZn 40Pb2)							*	Bronze (DIN-2.0492.01 G-CuZn 15Si4)			16	16	200	-60
	2	Cap		Brass (DIN-1.7660 CuZn 40Pb2)						*		Bronze (DIN-2.0492.01 G-CuZn 15Si4)						
	3	Coupling		Brass (DIN-1.7660 CuZn 40Pb2)								Bronze (DIN-2.0492.01 G-CuZn 15Si4)						
	4	Lead		Brass (DIN-1.7660 CuZn 40Pb2)								Bronze (DIN-2.0492.01 G-CuZn 15Si4)						
	7	Hollow screw		Brass (DIN-1.7660 CuZn 40Pb2)														
	8	Hollow screw nut		Brass (DIN-1.7660 CuZn 40Pb2)														
	9	Spring press		Brass (DIN-1.7660 CuZn 40Pb2)														
	10	Cap										Brass (DIN-1.7660 CuZn 40Pb2)						
	13	Screwed seat		Brass (DIN-1.7660 CuZn 40Pb2)						*		Bronze (DIN-2.0492.01 G-CuZn 15Si4)						
	14	Flanged seat		Bronze (DIN-2.0492.01 G-CuZn 15Si4)														
	15	Body coupling		Klingerit cardboard														
	18	Hood coupling		Copper														
MIXED	1	Body		Brass (DIN-1.7660 CuZn 40Pb2)							*	Bronze (DIN-2.0492.01 G-CuZn 15Si4)			25	25	200	-60
	2	Cap		Brass (DIN-1.7660 CuZn 40Pb2)						*		Bronze (DIN-2.0492.01 G-CuZn 15Si4)						
	3	Coupling		Stainless steel (DIN-1.4401) (AISI-316)					Stainless steel (DIN-1.4408) (ASTM A351 CF8M)									
	4	Lead		Stainless steel (DIN-1.4408) (ASTM A351 CF8M)														
	7	Hollow screw		Brass (DIN-1.7660 CuZn 40Pb2)														
	8	Hollow screw nut		Brass (DIN-1.7660 CuZn 40Pb2)														
	9	Spring press		Brass (DIN-1.7660 CuZn 40Pb2)														
	10	Cap										Brass (DIN-1.7660 CuZn 40Pb2)						
	13	Screwed seat		Stainless steel (DIN-1.4408) (ASTM A351 CF8M)														
	14	Flanged seat		Stainless steel (DIN-1.4408) (ASTM A351 CF8M)														
	15	Body coupling		PTFE (Teflón)														
	18	Hood coupling		Copper														
STAINLESS STEEL	1	Body		Stainless steel (DIN-1.4408) (ASTM A351 CF8M)											25	25	250	-60
	2	Cap		Stainless steel (DIN-1.4305) (AISI-303)							Stainless steel (DIN-1.4408) (ASTM A351 CF8M)							
	3	Coupling		Stainless steel (DIN-1.4401) (AISI-316)						Stainless steel (DIN-1.4408) (ASTM A351 CF8M)								
	4	Lead		Stainless steel (DIN-1.4408) (ASTM A351 CF8M)														
	7	Hollow screw		Stainless steel (DIN-1.4305) (AISI-303)														
	8	Hollow screw nut		Stainless steel (DIN-1.4305) (AISI-303)														
	9	Spring press		Stainless steel (DIN-1.4301) (AISI-304)														
	10	Cap										Stainless steel (DIN-1.4401) (AISI-316)						
	13	Screwed seat		Stainless steel (DIN-1.4408) (ASTM A351 CF8M)														
	14	Flanged seat		Stainless steel (DIN-1.4408) (ASTM A351 CF8M)														
	15	Body coupling		PTFE (Teflón)														
	18	Hood coupling		PTFE (Teflón)														
	5	Washer		Stainless steel (DIN-1.4401) (AISI-316)														
	6	Clip		Stainless steel (DIN-1.4310) (AISI-301)														
	11	Spring		Stainless steel (DIN-1.4300) (AISI-302) (1)														
	12	Sealing disk		PTFE (Teflón)														
				Silicone's rubber														
				Fluorelastomer (Vitón)														
	16,17	Rod		Stainless steel (DIN-1.4301) (AISI-304)														
	19	Lever		Stainless steel (DIN-1.4301) (AISI-304)						•	*	Brass (DIN-2.0290.01 G-Cu65Zn)						
	20	Clip		Stainless steel (DIN-1.4301) (AISI-304)														

(1) Spring steel (DIN-1.0600 GRADO B) for wide spring Ø > 10 mm. but < 14 mm.
Vanadium chrome steel (DIN-1.8159 50Cr V4) for wide spring Ø > 13 mm.

* Brass (DIN-2.0340.02 GK-Cu60Zn).

• Brass (DIN-1.7660 CuZn 40Pb2).

A = PRESSURE IN bar
B = MAX. TEMP. IN °C
C = MIN. TEMP. IN °C

DISASSEMBLY AND ASSEMBLY

1 – Disassembly

To replace the spring (11), or clean any of the internal components of the valve, proceed in the following manner:

A – Withdraw the clip (20), using a punching tool, and lift the lever (19).
B – Unscrew the cap (2) and remove.
C – Holding the rod (16) (17) steady, loosen the hollow screw nut (8), until the constructive limit, and the hollow screw (7) until you note a releasing of the spring (11).
D – Unscrew the body (1) holding the rod (16) (17) and the seat (13) (14) steady.
E – Lift the body (1) and you will have acces to all the components.

2 – Assembly

A – Enter the body (1) and the joint (15) through the upper part the rod (16) (17).
B – Turn the body (1) holding the rod (16) (17) and the seat (13) (14) steady.
C – Replace the hollow screw (7) with the hollow secrew nut (8).
D – Adjust the set pressure with the hollow screw (7) and fix the adjustment position with the hollow screw nut (8).
E – Change the coupling (18) and lightly tighten the cap (2).
F – Place the lever (19) and fix it with the clip (20).

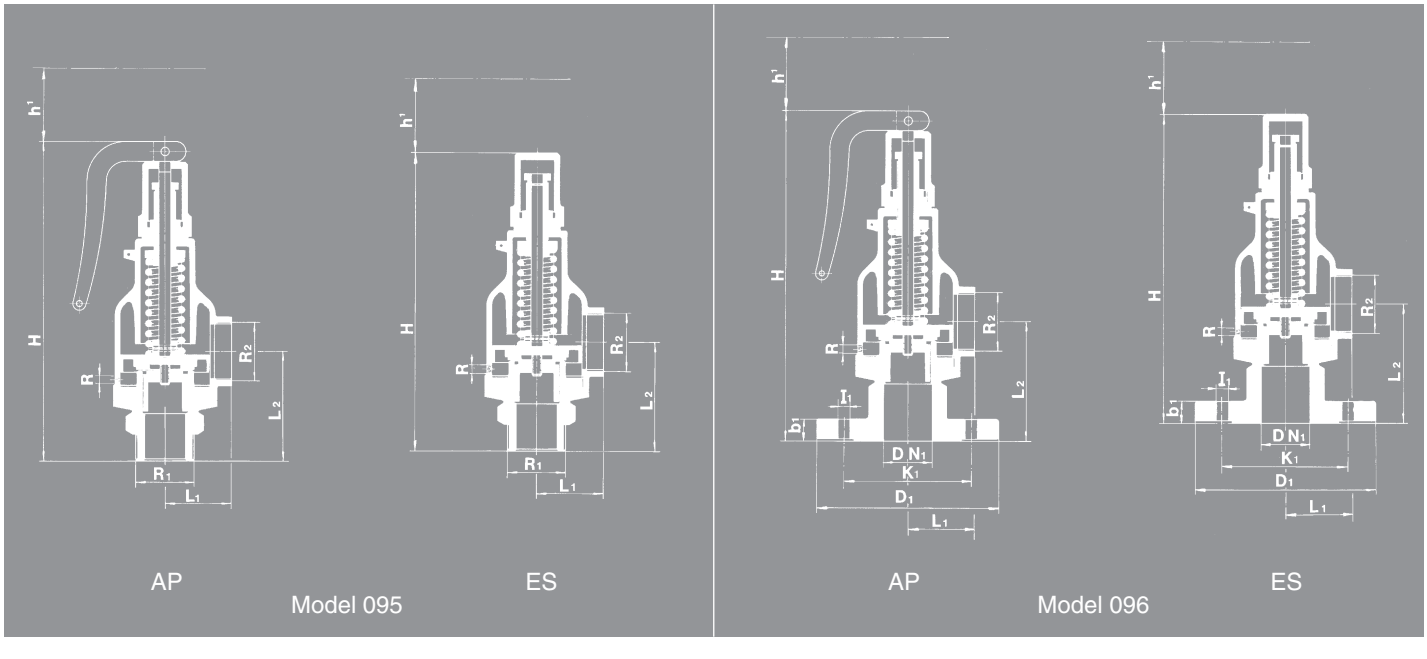
ADJUSTING THE SET PRESSURE

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

WARNING

In case to do the change of the sealing disc (12) make sure that the surface of this as well as the one of the seat (13) (14) the correctly rectified and free of impurities.

R_1 x R_2 DN_1 x R_2		1/4" x 1/4"		8 x 1/4"		3/8" x 3/8"		10 x 3/8"		1/2" x 1/2"		15 x 1/2"		3/4" x 3/4"		20 x 3/4"		1" x 1"		25 x 1"		1 1/4" x 1 1/4"		32 x 1 1/4"		1 1/2" x 1 1/2"		40 x 1 1/2"		2" x 2"		50 x 2"		2 1/2" x 2 1/2"		65 x 2 1/2"		3" x 3"		80 x 3"		4" x 4"		100 x 4"	
MODEL		095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES	095 AP	095 ES	096 AP	096 ES
d_0		10,20				10,20				16,20				20,80				25,20				32,20				38,20				45,20				60,20				75,20				95,20			
$A_0 = \frac{\pi \cdot d_0^2}{4} - S$		29,50				29,50				120,30				207,50				347,10				543,00				780,40				1157,60				2155,60				3161,40				5452,10			
H		139	129	148	138	139	129	148	138	150	140	165	155	168	158	176	166	191	181	198	188	224	212	232	220	263	247	270	254	331	315	334	318	373	349	373	349	439	415	441	417	507	483	507	483
h^1		35				35				38				42				46				55				62				80				86				100				112			
L_1		30				30				32				35				38				44				55				70				75				90				105			
L_2		43		52		43		52		52		67		61		69		72		79		80		88		91		98		110		113		125		125		136		138		163		163	
R		–				–				–				–				–				–				–				–				1/8"				1/8"				1/8"			
CONNECTIONS		Whitworth cylindrical Male x Female thread ISO 228/1 1978 (DIN-259)																																												
INTAKE FLANGE * PN-16 DIN-2532/2533 • PN-25 DIN-2544/2545	D_1	–		80		–		90		–		95		–		105		–		115		–		140		–		150		–		165		–		185		–		200		–		220* 235•	
	K_1	–		55		–		60		–		65		–		75		–		85		–		100		–		110		–		125		–		145		–		160		–		180* 190•	
	I_1	–		11,50		–		14		–		14		–		14		–		14		–		18		–		18		–		18		–		18		–		18		–		18* 22•	
	b_1 BRONZE BRASS	–		12		–		14		–		14		–		16		–		16		–		18		–		18		–		20		–		20		–		22		–		24	
	b_1 MIXED S. STEEL	–		14		–		16		–		16		–		18		–		18		–		18		–		18		–		20		–		22		–		24		–		24	
	DRILLS Nº	–		4		–		4		–		4		–		4		–		4		–		4		–		4		–		4		–		4* 8•		–		8		–		8	
WEIGHT IN Kgs.	BRONZE/BRASS	0,60	0,52	1,05	0,98	0,61	0,51	1,25	1,10	0,83	0,74	1,64	1,54	1,05	0,97	2,00	1,90	1,50	1,41	2,61	2,80	2,34	2,15	4,15	4,35	3,76	3,50	6,00	5,50	6,00	5,80	7,30	6,90	10,80	9,80	9,40	13,80	16,00	21,50	26,10	28,10	30,30	
	MIXED	0,60	0,50	1,03	0,96	0,60	0,50	1,22	1,15	0,80	0,70	1,60	1,50	1,04	0,90	1,93	1,83	1,50	1,30	2,50	2,70	2,20	2,01	4,00	4,20	3,70	3,30	5,80	5,30	5,70	5,50	7,00	6,60	10,50	9,50	9,10	13,50	15,70	21,20	25,00	27,00	29,20	
	STAINLESS STEEL	0,53	0,46	0,99	0,92	0,55	0,45	1,18	1,11	0,70	0,62	1,52	1,42	0,90	0,84	1,87	1,74	1,31	1,20	2,50	2,42	1,90	1,80	3,60	3,80	3,17	3,00	5,50	5,00	5,40	5,30	8,20	7,10	9,90	9,10	8,70	13,20	14,30	20,10	24,00	24,50	25,60	
CODE	BRONZE/BRASS	2002-095.5041	2002-095.50411	2002-096.5041	2002-096.50411	2002-095.5381	2002-095.53811	2002-096.5381	2002-096.53811	2002-095.5021	2002-095.50211	2002-096.5021	2002-096.50211	2002-095.5341	2002-095.53411	2002-096.5341	2002-096.53411	2002-095.5101	2002-095.51011	2002-096.5101	2002-096.51011	2002-095.5141	2002-095.51411	2002-096.5141	2002-096.51411	2002-095.5121	2002-095.51211	2002-096.5121	2002-096.51211	2002-095.5201	2002-095.52011	2002-096.5201	2002-096.52011	2002-095.5221	2002-095.52211	2002-096.5221	2002-096.52211	2002-095.5301	2002-095.53011	2002-096.5301	2002-096.53011	2002-095.5401	2002-095.54011	2002-096.5401	2002-096.54011
	MIXED	2002-095.6043	2002-095.60431	2002-096.6043	2002-096.60431	2002-095.6383	2002-095.63831	2002-096.6383	2002-096.63831	2002-095.6023	2002-095.60231	2002-096.6023	2002-096.60231	2002-095.6343	2002-095.63431	2002-096.6343	2002-096.63431	2002-095.6103	2002-095.61031	2002-096.6103	2002-096.61031	2002-095.6143	2002-095.61431	2002-096.6143	2002-096.61431	2002-095.6123	2002-095.61231	2002-096.6123	2002-096.61231	2002-095.6203	2002-095.62031	2002-096.6203	2002-096.62031	2002-095.6223	2002-095.62231	2002-096.6223	2002-096.62231	2002-095.6303	2002-095.63031	2002-096.6303	2002-096.63031	2002-095.6403	2002-095.64031	2002-096.6403	2002-096.64031
	STAINLESS STEEL	2002-095.6042	2002-095.60421	2002-096.6042	2002-096.60421	2002-095.6382	2002-095.63821	2002-096.6382	2002-096.63821	2002-095.6022	2002-095.60221	2002-096.6022	2002-096.60221	2002-095.6342	2002-095.63421	2002-096.6342	2002-096.63421	2002-095.6102	2002-095.61021	2002-096.6102	2002-096.61021	2002-095.6142	2002-095.61421	2002-096.6142	2002-096.61421	2002-095.6122	2002-095.61221	2002-096.6122	2002-096.61221	2002-095.6202	2002-095.62021	2002-096.6202	2002-096.62021	2002-095.6222	2002-095.62221	2002-096.6222	2002-096.62221	2002-095.6302	2002-095.63021	2002-096.6302	2002-096.63021	2002-095.6402	2002-095.64021	2002-096.6402	2002-096.64021



SET PRESSURES AND REGULATING RANGES									
R_1 x R_2 DN_1 x R_2	SPRING REGULATING RANGE IN bar	CODE	SET PRESSURES IN bar					
			MAXIMUN (LIQUIDS AND GASES)		MAXIMUM (SATURATED STEAM)		MINIMUM	
			PN-16	PN-25	PN-16	PN-25	STEAM & GASES	LIQUIDS (1)
1/4" x 1/4" 3/8" x 3/8" 8 x 1/4" 10 x 3/8"	0,5 at 1,0	56024 •	16	25	13	20	0,5	0,2
	1,1 at 1,9	56025 •						
	2,0 at 3,9	56026 •						
	4,0 at 7,9	56027 •						
	8,0 at 13,4	56028 •						
	13,5 at 19,8	56029 •						
	19,9 at 25,0	56030 •						
1/2" x 1/2" 15 x 1/2"	0,5 at 1,0	56033 •	16	25	13	20	0,5	0,2
	1,1 at 2,0	56034 •						
	2,1 at 4,0	56035 •						
	4,1 at 8,0	56036 •						
	8,1 at 12,0	56037 •						
	12,1 at 19,0	56038 •						
	19,1 at 25,0	56039 •						
3/4" x 3/4" 20 x 3/4"	0,5 at 1,0	56043 •	16	25	13	20	0,5	0,2
	1,1 at 2,0	56044 •						
	2,1 at 4,0	56045 •						
	4,1 at 6,0	56046 •						
	6,1 at 10,0	56047 •						
	10,1 at 13,2	56048 •						
	13,3 at 17,5	56049 •						
	17,6 at 25,0	56050 •						
1" x 1" 25 x 1"	0,5 at 1,5	56053 •	16	25	13	20	0,5	0,2
	1,6 at 2,6	56054 •						
	2,7 at 4,0	56055 •						
	4,1 at 7,5	56056 •						
	7,6 at 11,0	56057 •						
	11,1 at 14,5	56058 •						
	14,6 at 20,0	56059 •						
	20,1 at 25,0	56060 •						
1 1/4" x 1 1/4" 32 x 1 1/4"	0,5 at 1,5	56062 •	16	25	13	20	0,5	0,2
	1,6 at 2,6	56063 •						
	2,7 at 4,0	56064 •						
	4,1 at 7,5	56065 •						
	7,6 at 10,0	56066 •						
	10,1 at 12,5	56067 •						
	12,6 at 15,5	56068 •						
	15,6 at 19,5	56069 •						
	19,6 at 25,0	56070 •						
1 1/2" x 1 1/2" 40 x 1 1/2"	0,5 at 0,8	56073 •	16	25	13	20	0,5	0,2
	0,9 at 2,0	56074 •						
	2,1 at 4,0	56075 •						
	4,1 at 5,5	56076 •						
	5,6 at 8,0	56077 •						
	8,1 at 11,5	56078 •						
	11,6 at 15,7	56079 •						
	15,8 at 25,0	56080 •						
2" x 2" 50 x 2"	0,5 at 1,0	56083 •	16	25	13	20	0,5	0,2
	1,1 at 2,0	56084 •						
	2,1 at 5,2	56085 •						
	5,3 at 6,7	56086 •						
	6,8 at 11,0	56087 •						
	11,1 at 13,8	56088 •						
	13,9 at 18,9	56089 •						
	19,0 at 25,0	56090 –						
2 1/2" x 2 1/2" 65 x 2 1/2"	0,5 at 1,5	56092 •	16	25	13	20	0,5	0,2
	1,6 at 5,0	56093 •						
	5,1 at 9,0	56094 •						
	9,1 at 11,8	56095 –						
	11,9 at 15,0	56096 –						
	15,1 at 19,0	56097 –						
	19,1 at 25,0	56098 ▲						
3" x 3" 80 x 3"	0,5 at 2,0	56099 •	16	25	13	20	0,5	0,2
	2,1 at 6,0	56100 •						
	6,1 at 8,8	56101 –						
	8,9 at 12,0	56102 ▲						
	12,1 at 18,5	56103 ▲						
	18,6 at 21,5	56104 ▲						
	21,6 at 25,0	56105 ▲						
4" x 4" 100 x 4"	0,5 at 2,0	56106 •	16	25	13	20	0,5	0,2
	2,1 at 6,0	56107 –						
	6,1 at 9,0	56108 ▲						
	9,1 at 14,0	56109 ▲						
	14,1 at 19,0	56110 ▲						
	19,1 at 25,0	56111 ▲						

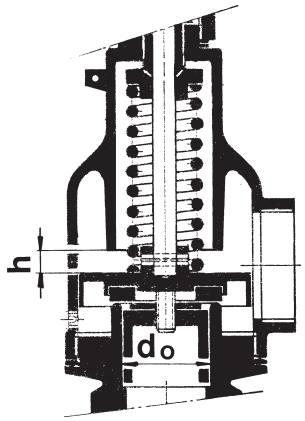
• Stainless steel (DIN-1.4300) (AISI-302).

– Sprin steel with Epoxi coating (DIN-1.0600 GRADE B).

▲ Vanadium chrome steel with Epoxi coating (DIN-1.8159 50CrV4).

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

COEFFICIENT OF DISCHARGE											
R_1 x R_2 DN_1 x R_2	1/4" x 1/4" 8 x 1/4"	3/8" x 3/8" 10 x 3/8"	1/2" x 1/2" 15 x 1/2"	3/4" x 3/4" 20 x 3/4"	1" x 1" 25 x 1"	1 1/4" x 1 1/4" 32 x 1 1/4"	1 1/2" x 1 1/2" 40 x 1 1/2"	2" x 2" 50 x 2"	2 1/2" x 2 1/2" 65 x 2 1/2"	3" x 3" 80 x 3"	4" x 4" 100 x 4"
d_0	10,20	10,20	16,20	20,80	25,20	32,20	38,20	45,20	60,20	75,20	95,20
h	2,50	2,50	3,00	5,00	6,00	8,50	11,00	12,00	15,00	19,00	28,00
h/d_0	0,25	0,25	0,19	0,24	0,24	0,26	0,29	0,27	0,25	0,25	0,29
$A_0 = \frac{\pi \cdot d_0^2}{4} - S$	29,50	29,50	120,30	207,50	347,10	543,00	780,40	1157,60	2155,60	3161,40	5452,10



$$A_0 = \frac{\pi \cdot d_0^2}{4} - S$$

S = Lead section

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

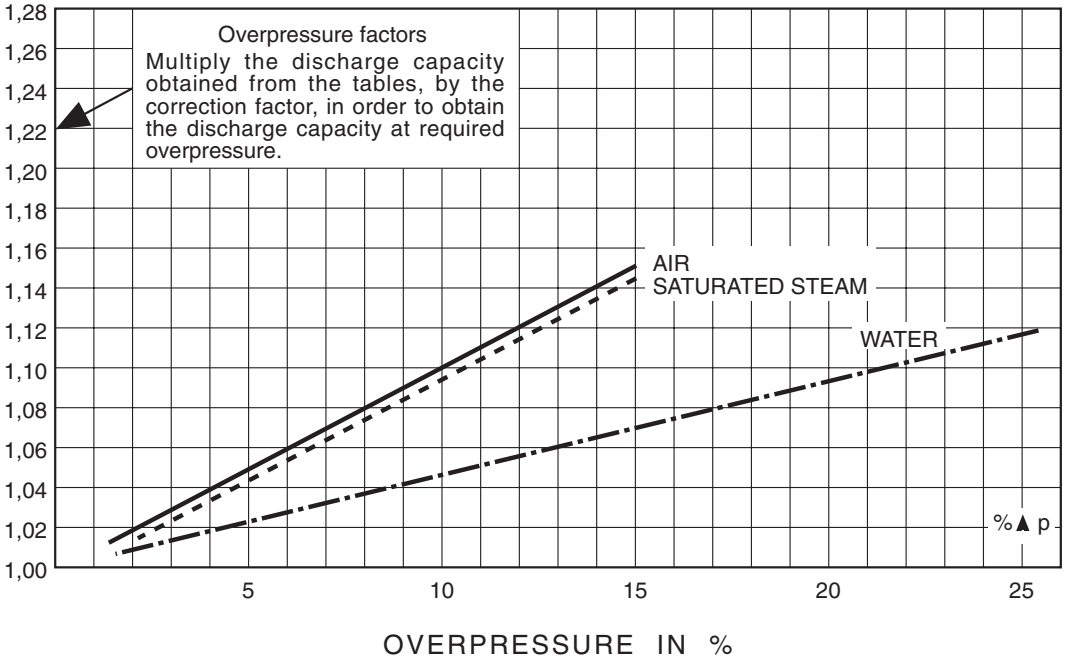
(1) With noxious or expensives fluids apply only ES model.
If external overpressure exists, the AP model cannot be used.
With external constant overpressure, the spring is adjusted deducting the overpressure from the set pressure.

DISCHARGE CAPACITY																		
R_1 x R_2 DN_1 x R_2	1/4" x 1/4" 8 x 1/4"			3/8" x 3/8" 10 x 3/8"			1/2" x 1/2" 15 x 1/2"			3/4" x 3/4" 20 x 3/4"			1" x 1" 25 x 1"			1 1/4" x 1 1/4" 32 x 1 1/4"		
d_0	10,2			10,2			16,2			20,8			25,2			32,2		
$A_0 = \frac{\pi \cdot d_0^2}{4} - S$	29,50			29,50			120,3			207,5			347,1			543		
p [bar]	I - Saturated steam in Kg/h. II - Air at 0°C and 1,013 bar in [Nm^3/h]. III - Water at 20°C in l/h.																	
SET PRESSURE IN bar	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	I	II	III
0,5	25	30	342	25	30	342	42	53	514	51	62	737	58	88	1036	65	123	1290
1,0	39	45	489	39	45	489	63	80	735	77	94	1053	88	133	1480	99	185	1844
1,5	42	51	582	42	51	582	68	94	857	86	106	1228	95	147	1674	114	227	2015
2,0	45	57	675	45	57	675	74	108	980	96	119	1403	102	161	1869	130	270	2187
2,5	50	66	768	50	66	768	83	120	1100	113	131	1590	121	180	2020	152	310	2707
3,0	54	75	861	54	75	861	91	133	1221	130	143	1778	140	199	2170	175	350	3227
3,5	60	85	955	60	85	955	110	145	1342	136	159	1944	154	233	2350	223	387	3468
4,0	66	96	1050	66	96	1050	129	157	1463	143	175	2110	168	268	2530	272	425	3710
4,5	70	106	1127	70	106	1127	137	173	1619	155	197	2282	195	282	2802	288	461	4130
5,0	75	117	1204	75	117	1204	146	190	1775	167	219	2455	222	296	3075	305	497	4551
5,5	79	127	1281	79	127	1281	155	206	1931	179	241	2627	249	310	3347	322	533	4971
6,0	84	138	1359	84	138	1359	164	223	2088	192	264	2800	276	325	3620	339	570	5392
6,5	87	148	1428	87	148	1428	171	255	2191	208	289	2902	300	341	3780	361	606	5690
7,0	91	159	1497	91	159	1497	178	287	2294	224	314	3004	324	358	3940	383	642	5988
7,5	95	169	1566	95	169	1566	185	319	2397	240	339	3106	348	375	4100	405	678	6286
8,0	99	180	1635	99	180	1635	192	352	2500	256	365	3208	372	392	4260	427	715	6584
9,0	107	204	1740	107	204	1740	226	376	2670	296	417	3404	412	442	4588	491	767	7292
10,0	115	228	1845	115	228	1845	260	400	2840	336	470	3600	453	493	4916	556	820	8000
11,0	123	252	1957	123	252	1957	300	426	3000	387	517	3780	506	541	5142	622	890	9010
12,0	132	276	2070	132	276	2070	340	452	3160	439	565	3960	560	590	5368	689	960	10020
13,0	139	301	2167	139	301	2167	372	476	3324	482	607	4102	602	655	5820	732	1042	10535
14,0	147	327	2265	147	327	2265	405	500	3488	526	650	4244	645	720	6272	776	1125	11050
15,0	154	349	2341	154	349	2341	442	526	3624	548	697	4402	683	760	6481	838	1202	11525
16,0	162	372	2418	162	372	2418	480	552	3760	570	745	4560	721	800	6690	900	1280	12000
17,0	169	396	2521	169	396	2521	520	572	3890	610	832	4750	796	883	6945	970	1360	12330
18,0	177	420	2625	177	420	2625	560	592	4020	650	920	4940	872	967	7200	1040	1440	12660
20,0	192	465	2829	192	465	2829	640	644	4360	725	1016	5076	956	1180	7740	1180	1600	13316
22,0		510	3036		510	3036		696	4652		1112	5092		1310	8216		1772	13976
24,0		544	3190		544	3190		750	4808		1184	5416		1415	8598		1896	14560
25,0		579	3345		579	3345		805	4964		1256	5740		1520	8980		2020	15144

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 a 20°C. (ϱ_A=998 Kg/m^3).
ϱ_L = Liquid density.



OVERPRESSURE IN %

DISCHARGE CAPACITY															
1 1/2" x 1 1/2" 40 x 1 1/2"			2" x 2" 50 x 2"			2 1/2" x 2 1/2" 65 x 2 1/2"			3" x 3" 80 x 3"			4" x 4" 100 x 4"			R_1 x R_2 DN_1 x R_2
38,2			45,2			60,2			75,2			95,2			d_0
780,4			1157,6			2155,6			3161,4			5452,1			$A_0 = \frac{\pi \cdot d_0^2}{4} - S$
															p [bar]
I	II	III	I	II	III	I	II	III	I	II	III	I	II	III	SET PRESSURE IN bar
104	176	1930	146	225	2898	188	272	4130	272	335	5201	484	656	6472	0,5
157	266	2758	220	339	4140	284	410	5900	410	505	7430	729	987	9247	1,0
176	310	3242	250	385	4628	318	458	6765	455	557	8307	850	1050	10141	1,5
196	353	3727	280	430	5117	351	507	7630	500	609	9184	972	1113	11035	2,0
234	391	4148	308	475	5540	385	565	8490	554	705	9992	1087	1202	11320	2,5
273	430	4570	336	521	5964	419	623	9350	609	802	10800	1203	1292	11604	3,0
308	463	4931	375	586	6788	454	686	11315	667	861	12453	1326	1376	13742	3,5
343	497	5292	415	652	7612	490	749	13280	725	920	14107	1449	1460	15880	4,0
364	557	5941	444	709	9134	532	809	14685	786	1024	15610	1567	1586	17756	4,5
385	618	6591	473	766	10656	575	870	16090	847	1128	17113	1686	1712	19632	5,0
406	679	7240	502	823	12178	617	931	17495	908	1232	18616	1804	1838	21508	5,5
427	740	7890	532	880	13700	660	992	18900	969	1336	20120	1923	1964	23384	6,0
452	786	8224	570	919	14687	681	1030	19338	1027	1420	20852	2042	2056	23910	6,5
478	832	8559	609	958	15674	702	1068	19776	1086	1504	21585	2161	2148	24437	7,0
503	878	8893	648	997	16661	723	1106	20214	1144	1588	22317	2280	2240	24963	7,5
529	925	9228	687	1036	17648	744	1145	20653	1203	1672	23050	2400	2332	25490	8,0
564	1014	10958	711	1106	19539	802	1215	22812	1327	1854	24373	2641	2414	26081	9,0
600	1104	12688	735	1176	21430	860	1285	24972	1452	2036	25696	2883	2496	26672	10,0
675	1188	13374	807	1258	22365	923	1388	25311	1576	2213	25968	3121	2714	27464	11,0
750	1272	14060	879	1340	23300	987	1492	25650	1700	2390	26240	3360	2932	28256	12,0
806	1358	14715	957	1430	24070	1056	1586	26525	1822	2577	27305	3601	3144	29108	13,0
862	1445	15370	1036	1520	24840	1125	1680	27400	1944	2765	28370	3843	3356	29960	14,0
957	1530	16310	1104	1615	25684	1190	1836	27915	2076	2948	29033	4086	3604	30950	15,0
1052	1615	17250	1172	1710	26528	1256	1992	28430	2209	3132	29697	4329	3852	31940	16,0
1124	1703	17945	1251	1877	27300	1374	2186	29575	2325	3294	31032	4566	4222	32592	17,0
1196	1792	18640	1330	2045	28072	1493	2380	30720	2442	3456	32368	4803	4592	33244	18,0
1292	1995	20230	1452	2385	29870	1590	2512	32456	2685	3812	33030	5295	5162	34936	20,0
	2232	21968		2556	31296		2952	35200		4156	36616		5750	38120	22,0
	2374	22090		2766	32590		3188	38088		4404	42400		6103	46320	24,0
	2516	22212		2976	33885		3424	40976		4652	48184		6456	54520	25,0

Calculus and measurement according "DIN-A4-109268/69/70"

FACT LIST FOR SAFETY VALVE CALCULS

Calculus acording to AD-Merkblatt A2 SR,"Safety valve" 1)

Customer:

Theme:

Leaf: Of:

1		Consultation / Bid / Order						
2		Position Nº						
3		Nº 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 capacity	Required: kg/h, Nm³/h, l/h					
18			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 flow A_0	Necessary A_0 mm²					
32			Chosen A_0 mm²					
33		Allowed discharge coefficient αd						
34	CONNECTIONS	Input / Output	DN Flange mm					
35			DN Thread inch					
36			DN Welding (soldering) ends					
37			PN bar					
38		Shape of joint surfaces (DIN-2526)						
39	OBSERVA-TIONS	Unit weight approx. Kg						
40								
41								
42								
43	ACCEP-TANCE	Certificate according to DIN - 50049 2.2						
44		Certificate according to DIN - 50049 3.1.B						
45								

Date:

Department:

Name:

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Founded in 1914

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Vacuum breaker safety valve

Model 795

The valve acts as an automatic regulator of pressure drops and prevents the creation of a vacuum inside pressurised installations or vessels.

Specifications

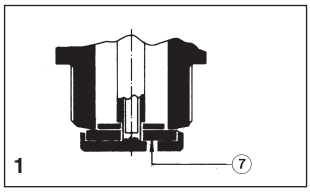
— Activated by direct action helicoid spring.
— Simplicity of construction ensuring minimum maintenance.
— Internal body designed to offer favourable flow profile.
— Soft seals giving greater tightness then that required by DIN-3230. Sheet 3, as long as the valve, in non operating conditions, is under equal or greater pressure than atmospheric pressure.
— Great discharge capacity.
— All the valves are supplied sealed at the set depressurising 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.- Fluorelastomer (Vitón) seals or Silicone's rubber, achieving leakage levels less than

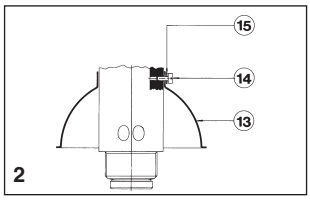
$$0{,}3 \times 10^{-3} \ \frac{\text{Pa cm}^3}{\text{sec.}}$$

as long as the valve, in non operating conditions, is under equal or greater pressure than atmospheric pressure.

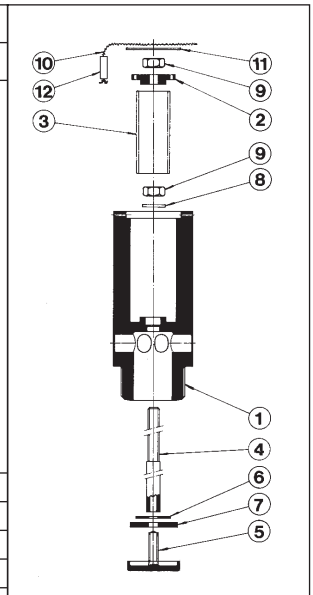


Depending on demand:

1.- Buna-nitryls seals, Butyl, Natural rubber, E.P.D.M., Chlorosulphonate polyethylene (Hypalon), Neoprene, ...etc.
2.- The intake deflector prevents the entry of foreign bodies in the valve which will affect later operation. (Specially designed for moving transport).
3.- Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids,... etc.).



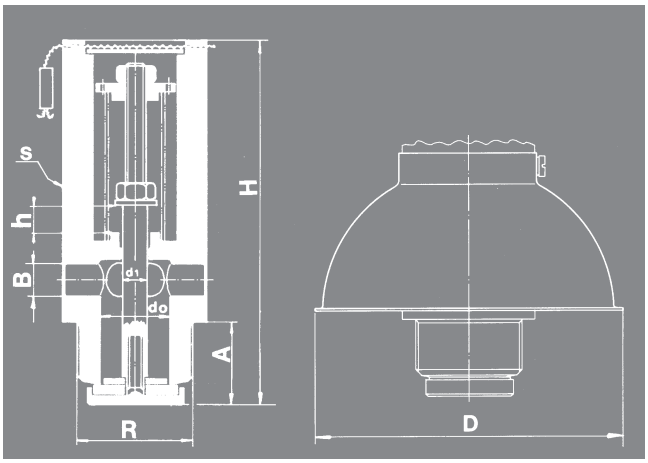
N°. PIECE	PIECE	MATERIAL			
		BRASS		STAINLESS STEEL	
1	Body	Brass (DIN-1.7660 CuZn40Pb2)		S. steel (DIN-1.4401) (AISI-316)	
2	Spring press	Brass (DIN-1.7660 CuZn40Pb2)		S. steel (DIN-1.4305) (AISI-303)	
3	Spring	S. steel (DIN-1.4300) (AISI-302)		S. steel (DIN-1.4300) (AISI-302)	
4	Shaft	S. steel (DIN-1.4305) (AISI-303)		S. steel (DIN-1.4305) (AISI-303)	
5	Plug	Brass (DIN-1.7660 CuZn40Pb2)		S. steel (DIN-1.4401) (AISI-316)	
6, 8, 15	Washer	S. steel (DIN-1.4401) (AISI-316)		S. steel (DIN-1.4401) (AISI-316)	
7	Seal	Fluorelastomer (Vitón) (2)		Fluorelastomer (Vitón) (2)	
		Silicone's rubber (3)		Silicone's rubber (3)	
9	Nut	S. steel (DIN-1.4401) (AISI-316)		S. steel (DIN-1.4401) (AISI-316)	
10	Sealing wire	Sealing wire		Sealing wire	
11	Charactetistic plate	Aluminium		Aluminium	
12	Seal	Lead		Lead	
13	Deflector	S. steel (DIN-1.4401) (AISI-316)		S. steel (DIN-1.4401) (AISI-316)	
14	Screw	S. steel (DIN-1.4401) (AISI-316)		S. steel (DIN-1.4401) (AISI-316)	
DN		3/8" to 1"			
PN		16		16	
OPERATING CONDITIONS	PRESSURE IN bar	16	12	16	12
	MAXIMUM TEMP. IN °C (1)	120	150	120	150
	MINIMUM TEMP. IN °C	-50		-50	



(1) For temperatures upper 150°C special seal. For temperatures upper 300°C special seal and spring.
(2) Recommended temperature field -30°C to + 150°C. Maximum pressure of service 12 bar.
(3) Recommended temperature field -50°C to + 115°C. Maximum pressure of service 9 bar.

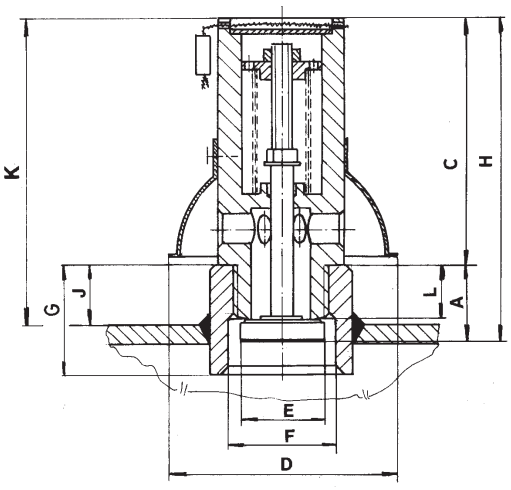
R		3/8"	1/2"	3/4"	1"
CONNECTIONS		Whitworth gas-tight cylindrical male thread ISO 228/1 1978 (DIN-259)			
d_0		9,50	12,50	16,50	20,00
$A_0 = \frac{\pi}{4}(d_0^2 - d_1^2)$		51,25	89,53	180,64	275,68
H		64	81	90	105
A		13,00	16,50	21,00	24,00
B		4,25	5,50	8,00	9,50
D		40	65	65	65
S		24	32	35 (36) •	40 (41) •
WEIGHT IN Kgs.	BRASS	0,15	0,36	0,46	0,78
	STAINLESS STEEL	0,19	0,34	0,51	0,80
CODE	BRASS 2002-795.	5381	5021	5341	5101
	STAINLESS STEEL 2002-795.	5382	5022	5342	5102

• Stainless steel (DIN-1.4401) (AISI-316).



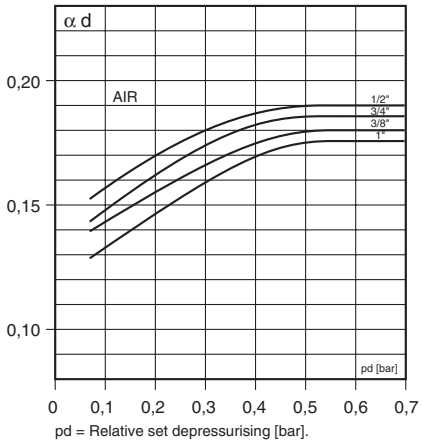
Example of installation

R	H	A	C	L	E	F	D	K	G	J
3/8"	64	13,00	51,00	9	13,90	20,00	40	63	24	12,00
1/2"	81	16,50	64,50	12	17,80	25,50	65	80	32	15,50
3/4"	90	21,00	69,00	15	22,00	34,00	65	95	40	20,00
1"	105	24,00	81,00	18	27,50	42,00	65	106	50	25,00



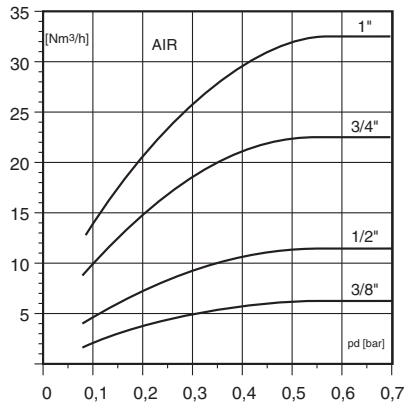
R			3/8"	1/2"	3/4"	1"
SET DEPRESSURISING IN bar	MAXIMUM		0,40	0,40	0,40	0,40
	MINIMUM		0,05	0,05	0,05	0,05
SPRING REGULATING RANGE IN bar	0,05 to 0,10	CODE	56187	56191	56195	56199
	0,09 to 0,20	CODE	56188	56192	56196	56200
	0,19 to 0,30	CODE	56189	56193	56197	56201
	0,29 to 0,40	CODE	56190	56194	56198	56202
INTAKE COEFFICIENTS	d_0		9,50	12,50	16,50	20,00
	h		3,42	4,50	5,94	7,20
	h/d_0		0,36	0,36	0,36	0,36

INTAKE COEFFICIENTS αd FOR AIR



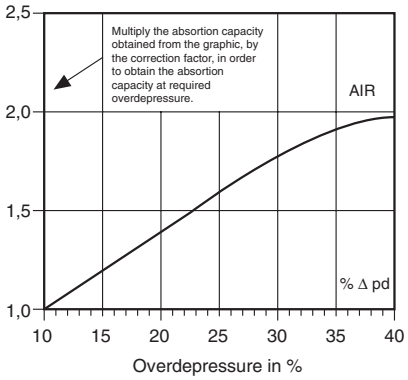
pd = Relative set depressurising [bar].

INTAKE CAPACITY
pd [bar]
Air at 0°C and 1,013 bar in [Nm³/h].
Calculus according "AD-Merkblatt A2".



pd = Relative set depressurising [bar].

OVERDEPRESSURE FACTORS



Overdepressure in %

Informative brochure, without obligation and subject to our General Sales Conditions.

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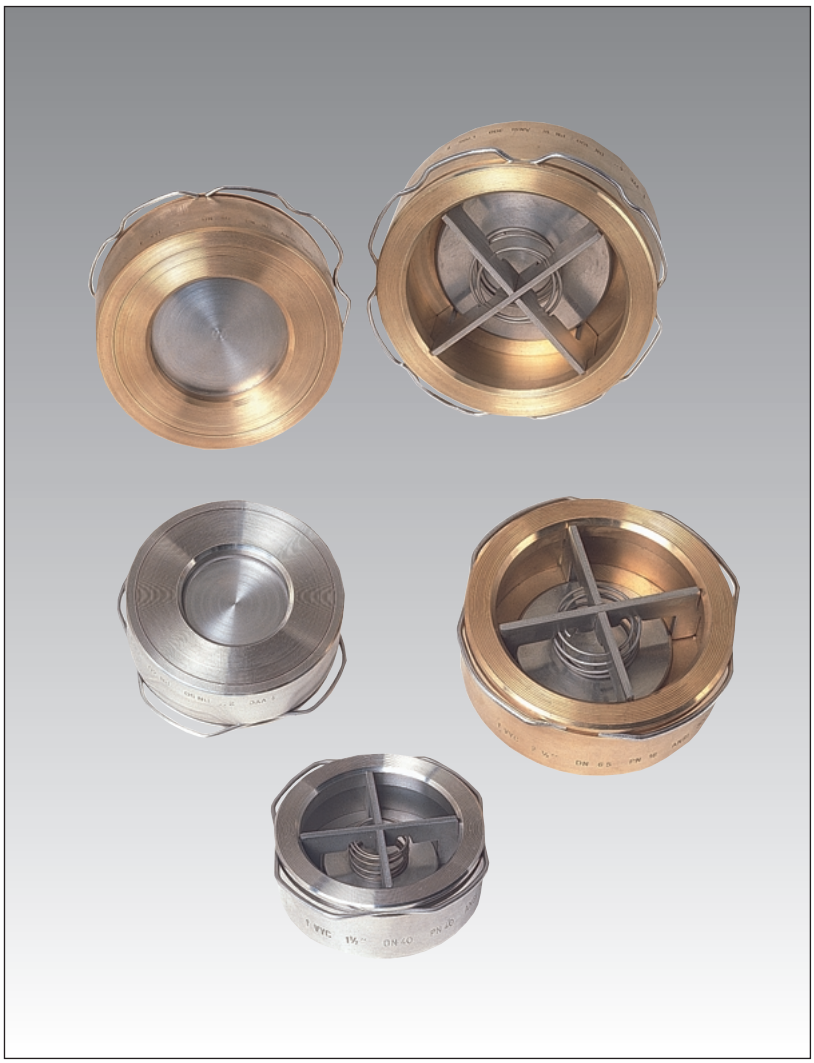
Disc check valve

Model 170

Disc check valve with centering ring for placing between flanges in accordance with DIN, UNE, ANSI, BS, etc. norms. DN-15 to 100 (DN-125 to 200 see catalogue for Model 172).

For liquids, gases and steam.
For use in hydraulic, pneumatic, heating and steam systems, chemical and food industries, etc.



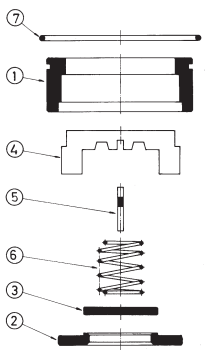
Specifications

— Reduced assembly time in accordance with DIN-3202, part 3, series K4.
— Minimum load loss.
— Avoids ram shock when closing at zero pressure, remaining completely watertight at the time of fluid reversion.
— Highly tightness, exceeding the requirements of DIN-3230. Page 3.
— Easily assembled in any position in accordance with the direction of the fluid flow. Without spring only in vertical ascending direction.
— The valves have one single centering ring for placing between flanges according to DIN and UNE norms (PN-6, 10, 16, 25 and 40), ASA (ANSI) (PSI-150 and 300) and other norms (NF, BS, etc.), with the exception of the DN-100 valve with 3 centering rings duly marked with their corresponding flange norms to aid assembly.

IMPORTANT

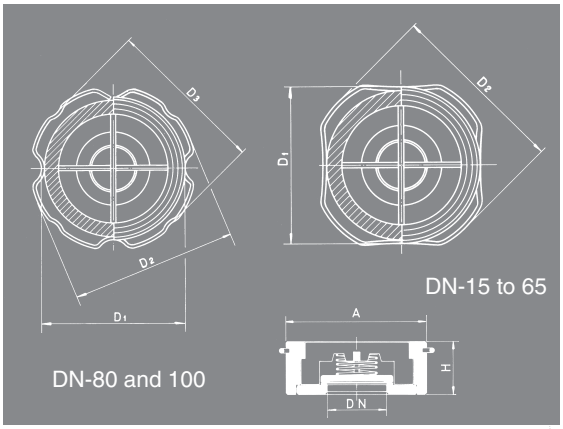
Depending on demand:
— Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).
— The fastener disc could be fitted up with PTFE joint (Teflón), Silicone's rubber, Fluorelastomer (Vitón), etc.

N.° PIECE	PIECE	MATERIAL		
		BRONZE	CARBON STEEL	STAINLESS STEEL
1	Body	Bronze (DIN-2.1086.04 GC-CuSn10Zn)	Carb. steel (DIN-1.0580 ST-52)	S. steel (DIN-1.4401)(AISI-316)
2	Seating	Bronze (DIN-2.1086.04 GC-CuSn10Zn)	S. steel (DIN-1.4028)(AISI 420)	S. steel (DIN-1.4401)(AISI-316)
3	Sealing disc	S. steel (DIN-1.4028)(AISI-420)	S. steel (DIN-1.4028)(AISI-420)	S. steel (DIN-1.4401)(AISI-316)
4,5	Spring press	S. steel (DIN-1.4401)(AISI-316)	S. steel (DIN-1.4401)(AISI-316)	S. steel (DIN-1.4401)(AISI-316)
6	Spring	S. steel (DIN-1.4571)(AISI-316Ti)	S. steel (DIN-1.4571)(AISI-316Ti)	S. steel (DIN-1.4571)(AISI-316Ti)
7	Centering ring	S. steel (DIN-1.4300)(AISI-302)	S. steel (DIN-1.4300)(AISI-302)	S. steel (DIN-1.4300)(AISI-302)
DN		15 to 100		
PN		16	40	40
OPERATING CONDITIONS	PRESSURE IN bar	16 / 15 / 14 / 13	40 / 35 / 28 / 21	40 / 34 / 32 / 29
	MAXIMUM TEMP. IN °C	120 / 180 / 200 / 250	120 / 200 / 300 / 400 (1)	120 / 200 / 300 / 400 (1)
	MINIMUM TEMP. IN °C	– 60	–10	– 60

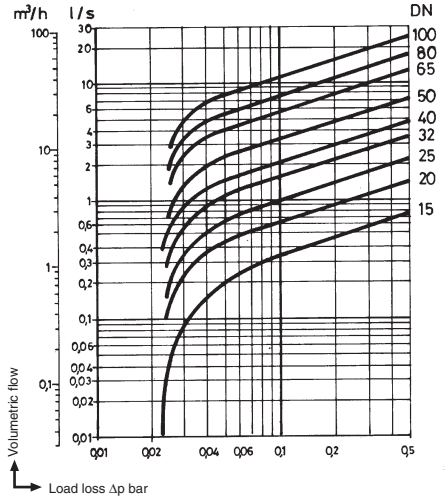


(1) For temperatures exceeding 300°C without spring only or depending on demand, with special spring.

DN		15	20	25	32	40	50	65	80	100		
										RING I	RING II	RING III
H		17	20	22	28	32	40	46	50	60	–	–
A		44,5	54,5	64,5	75	84	97,5	117	133	153	–	–
D_1		44,5	54,5	64,5	75	84	97,5	117	133	153	–	–
D_2		52	65,5	72	83	93,5	110	127	154	168,5	192	178
D_3		–	–	–	–	–	–	–	142,5	162,5	176	173
WEIGHT IN Kg.	BRONZE	0,14	0,24	0,35	0,56	0,82	1,10	2,15	2,90	4,02		
	CARBON STEEL	0,11	0,21	0,30	0,51	0,75	1,05	1,92	2,70	3,90		
	STAINLESS STEEL	0,11	0,21	0,30	0,51	0,75	1,05	1,92	2,70	3,90		
CODE	BRONZE	2003-170.5021	2003-170.5341	2003-170.5101	2003-170.5141	2003-170.5121	2003-170.5201	2003-170.5221	2003-170.5301	2003-170.5401		
	CARBON STEEL	2003-170.8024	2003-170.8344	2003-170.8104	2003-170.8144	2003-170.8124	2003-170.8204	2003-170.8224	2003-170.8304	2003-170.8404		
	STAINLESS STEEL	2003-170.8022	2003-170.8342	2003-170.8102	2003-170.8142	2003-170.8122	2003-170.8202	2003-170.8222	2003-170.8302	2003-170.8402		



DIRECTION OF FLUID FLOW		OPENING PRESSURE IN mbar: WITHOUT SPRING	OPENING PRESSURE IN mbar: WITH SPRING			FLOW COEFFICIENT: Kv m^3/h ΔP= 1 bar	FLOW COEFFICIENT: Cv l/min ΔP= 1 Psi =0,07 bar
		▲	▲	►	▼		
DN	15	2,51	22,00	20,50	17,00	3,96	15,80
	20	2,38	21,90	20,50	17,10	7,20	32,50
	25	1,96	21,50	20,50	17,50	10,80	49,20
	32	3,70	23,20	20,50	15,80	18,00	80,00
	40	4,00	23,50	20,50	15,50	23,00	105,00
	50	4,11	23,60	20,50	15,40	36,00	166,00
	65	4,95	24,40	20,50	14,60	60,00	306,00
	80	5,64	25,10	20,50	13,90	79,00	382,00
	100	6,81	26,30	20,50	12,70	118,00	540,00



Load losses

The adjoining diagram reflects the load loss curves for water at 20°C. Values are based on valves without springs and installed horizontally. In the case of vertical flow, the variations are virtually unimportant.
In order to determine other fluids load losses, calculate the flow of these equivalent to water.

$$Q_A = \sqrt{\frac{\varrho}{1.000}} \cdot Q$$

Q_A = Flow equivalent to water in m^3/h.
ϱ = Fluid density in operating conditions in Kg/m^3.
Q = Fluid flow in operating conditions in m^3/h.

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Disc check valve

Model 172

Disc check valve with centering ring for placing between flanges in accordance with DIN, UNE, ANSI, BS, etc. norms.
DN-125 to 200 (DN-15 to 100 see catalogue for Model 170).

For liquids, gases and steam.
For use in hydraulic, pneumatic, heating and steam systems, chemical and food industries, etc.

Specifications

— Reduced assembly time in accordance with DIN-3202, part 3, series K4.

— Minimum load loss.

— Avoids ram shock when closing at zero pressure, remaining completely tightness at the time of fluid reversion.

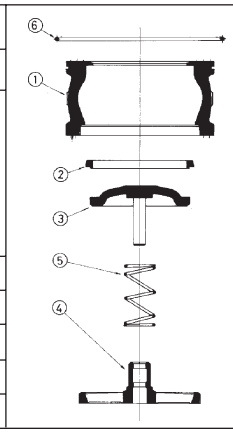
— Highly watertight, exceeding the requirements of DIN-3230. Page 3.

— Easily assembled in any position in accordance with the direction of the fluid flow. Without spring only in vertical ascending direction.

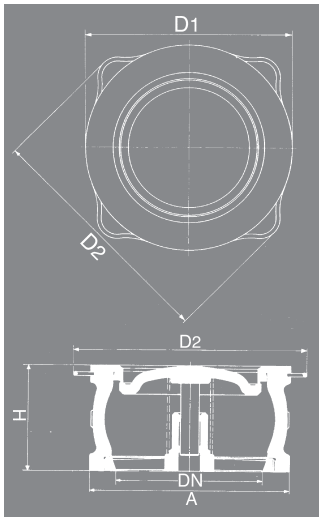
— The valves have one single centering ring for placing between flanges according to DIN and UNE norms (PN-6, 10, 16, 25 and 40), ASA (ANSI) (PSI-150 and 300) and other norms (NF, BS, etc.).

IMPORTANT
Depending on demand:
— Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).

N.° PIECE	PIECE	MATERIAL											
		BRONZE				CAST STEEL				STAINLESS STEEL			
1	Body	Bronze (DIN-2.1086.01 G-CuSn10Zn)				Cast steel (DIN-1.0619 GS-C 25)				S. steel (DIN-1.4408)(ASTM A351 CF8M)			
2	Seating	Bronze (DIN-2.1086.01 G-CuSn10Zn)				S. steel (DIN-1.4408)(ASTM A351 CF8M)				S. steel (DIN-1.4408)(ASTM A351 CF8M)			
3	Sealing disc	Bronze (DIN-2.1086.01 G-CuSn10Zn)				S. steel (DIN-1.4408)(ASTM A351 CF8M)				S. steel (DIN-1.4408)(ASTM A351 CF8M)			
4	Lead	Bronze (DIN-2.1086.01 G-CuSn10Zn)				S. steel (DIN-1.4408)(ASTM A351 CF8M)				S. steel (DIN-1.4408)(ASTM A351 CF8M)			
5	Spring	S. steel (DIN-1.4571)(AISI-316Ti)				S. steel (DIN-1.4571)(AISI-316Ti)				S. steel (DIN-1.4571)(AISI-316Ti)			
6	Centering ring	S. steel (DIN-1.4300)(AISI-302)				S. steel (DIN-1.4300)(AISI-302)				S. steel (DIN-1.4300)(AISI-302)			
DN		125 to 200											
PN		16				40				40			
OPERATING CONDITIONS	PRESSURE IN bar	16	15	14	13	40	35	28	21	40	34	32	29
	MAXIMUM TEMP. IN °C	120	180	200	250	120	200	300	400 (1)	120	200	300	400 (1)
	MINIMUM TEMP. IN °C	– 60				–10				– 60			



(1) For temperatures exceeding 300°C without spring only or depending on demand, with special spring.



DN		125	150	200
H		90	106	140
A		180	205	262
D_1		180	205	262
D_2		205	240	300
WEIGHT IN Kg.	BRONZE	8,13	12,05	21,66
	CAST STEEL	6,90	10,78	19,13
	STAINLESS STEEL	6,93	10,83	19,21
CODE	BRONZE	2003-172.5501	2003-172.5601	2003-172.5801
	CAST STEEL	2003-172.8504	2003-172.8604	2003-172.8804
	STAINLESS STEEL	2003-172.8502	2003-172.8602	2003-172.8802

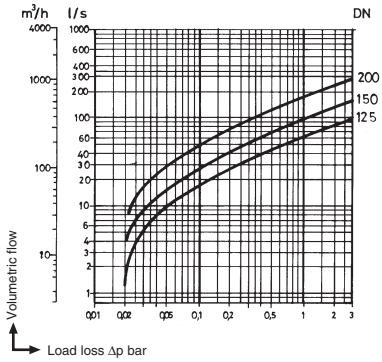
		OPENING PRESSURE IN mbar								FLOW COEFFICIENT	
		WITHOUT SPRING		WITH SPRING						Kv m^3/h	Cv l/min
DIRECTION OF FLUID FLOW		▲		▲		►		▼		ΔP= 1 bar	ΔP= 1 Psi =0,07 bar
VALVE MATERIAL		BRONZE	C. STEEL S. STEEL	BRONZE	C. STEEL S. STEEL	BRONZE	C. STEEL S. STEEL	BRONZE	C. STEEL S. STEEL		
DN	125	8,40	7,50	28,40	27,50	22,00		11,60	12,50	210,00	700,00
	150	11,70	10,50	31,70	30,50	24,00		8,30	9,50	349,00	1250,00
	200	13,00	11,60	33,00	31,60	24,00		7,00	8,40	640,00	2340,00

Load losses

The adjoining diagram reflects the load loss curves for water at 20°C. Values are based on valves without springs and installed horizontally. In the case of vertical flow, the variations are virtually unimportant. In order to determine other fluids load losses, calculate the flow of these equivalent to water.

$$Q_A = \sqrt{\frac{\varrho}{1.000}} \cdot Q$$

Q_A = Flow equivalent to water in m^3/h.
ϱ = Fluid density in operating conditions in Kg/m^3.
Q = Fluid flow in operating conditions in m^3/h.



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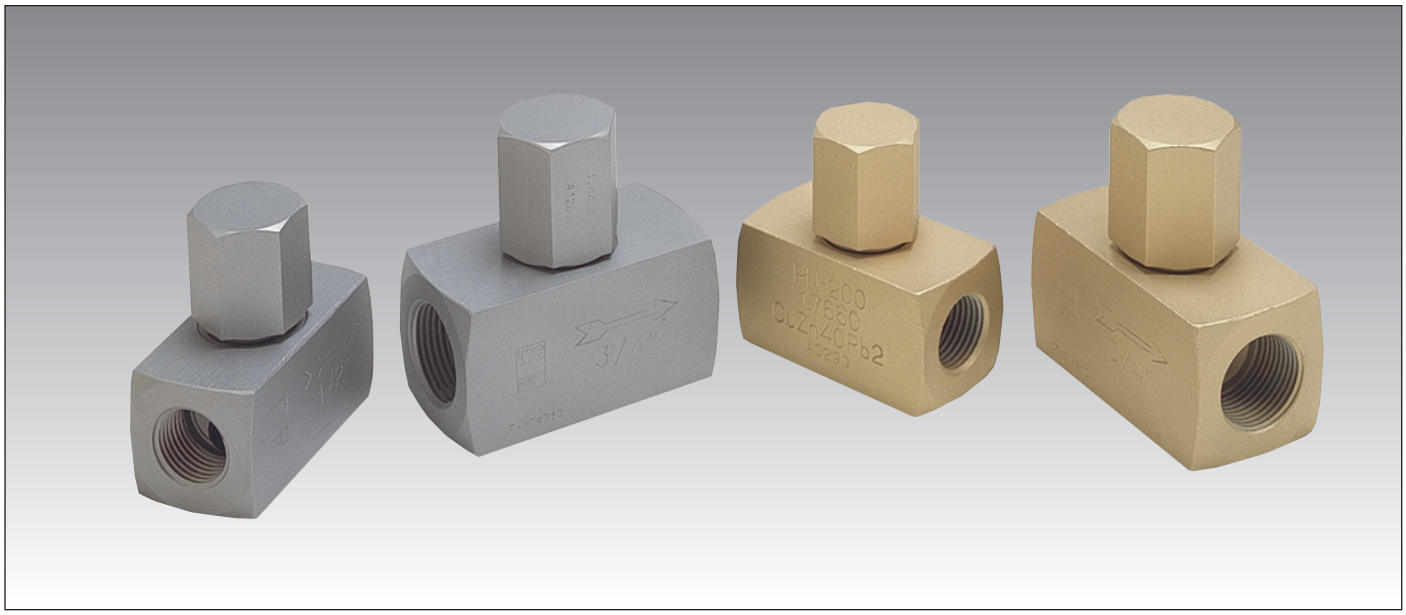
Piston check valve

Model 179



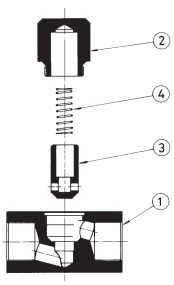
For liquids, gases and steam.
For use in hydraulic, pneumatic, heating and steam systems, chemical and food industries, etc.

Specifications

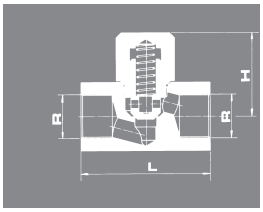
— Spring operated piston closure.
— Reduced pitch.
— Avoids ram shock when closing at zero pressure, remaining completely watertight at the time of fluid reversion.
— Highly tightness, exceeding the requirements of DIN-3230. Page 3.
— Easily assembled in any position in accordance with the direction of the fluid flow. Without spring only for horizontal mounting.
— Fully constructed from laminated bars.

IMPORTANT
Depending on demand:
— Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).
— Other connections.
— O-ring gasket closure.

N°. PIECE	PIECE	MATERIAL											
		BRASS			CARBON STEEL				STAINLESS STEEL				
1	Body	Brass (DIN-1.7660 CuZn40Pb2)			C. steel (DIN-1.1191 Ck-45)				S. steel (DIN-1.4401) (AISI-316)				
2	Cap	Brass (DIN-1.7660 CuZn40Pb2)			C. steel (DIN-1.1191 Ck-45)				S. steel (DIN-1.4401) (AISI-316)				
3	Piston	S. steel (DIN-1.4401) (AISI-316)			S. steel (DIN-1.4401) (AISI-316)				S. steel (DIN-1.4401) (AISI-316)				
4	Spring	S. steel (DIN-1.4571) (AISI-316Ti)			S. steel (DIN-1.4571) (AISI-316Ti)				S. steel (DIN-1.4571) (AISI-316Ti)				
DN		1/4" to 2" (GAS, NPT or SW)											
PN		200			250				250				
OPERATING CONDITIONS	PRESSURE IN bar	200	175	34	250	211	180	167	250	207	170	164	
	MAXIMUM TEMP. IN °C	120	150	200	120	300	350 (1)	400 (1)	120	200	350 (1)	400 (1)	
	MINIMUM TEMP. IN °C	- 60			- 10				- 60				



(1) For temperatures exceeding 300°C without spring only or depending on demand, with special spring.



R			1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
CONNECTIONS			Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259)							
			NPT thread ANSI - B 2.1							
			Socket welding ends SW ANSI - B 16.11							
H			34	39	48	55	62	64	82	85
L			50	55	65	75	90	95	100	112
REDUCED PITCH Ø			6,00	8,00	9,50	11,50	15,00	17,00	21,00	25,00
WEIGHT IN Kgs.	BRASS		0,31	0,47	0,92	0,95	2,21	2,66	3,82	6,43
	CARBON STEEL		0,29	0,44	0,78	0,88	2,05	2,47	3,56	6,16
	STAINLEES STEEL		0,29	0,44	0,79	0,90	2,07	2,50	3,61	6,24
CODE	BRASS 2003-179.	GAS	0041	0381	0021	0341	0101	0141	0121	0201
		NTP	00411	03811	00211	03411	01011	01411	01211	
	CARBON STEEL 2003-179.	GAS	0044	0384	0024	0344	0104	0144	0124	0204
		NTP	00441	03841	00241	03441	01041	01441	01241	02041
		SW	00442	03842	00242	03442	01042	01442	01242	02042
	STAINLESS STEEL 2003-179.	GAS	0042	0382	0022	0342	0102	0142	0122	0202
		NTP	00421	03821	00221	03421	01021	01421	01221	02021
		SW	00422	03822	00222	03422	01022	01422	01222	02022

		OPENING PRESSURE IN mbar				FLOW COEFFICIENT				
						Kv m^3/h ΔP = 1 bar	Cv l/min. ΔP = 1 Psi = 0,07 bar			
		WITHOUT SPRING	WITH SPRING			WITH SPRING	WITHOUT SPRING	WITH SPRING		
DIRECTION OF FLUID FLOW						(1)	(2)	(2)	(3)	
DN	1/4"	34,10	49,60	79,10	10,90	0,68	1,98	1,32	—	2,65
	3/8"	35,50	51,00	81,50	10,50	1,10	2,76	2,22	—	4,20
	1/2"	34,80	51,00	80,80	11,20	2,10	6,95	4,53	—	8,90
	3/4"	32,80	44,00	76,80	10,20	4,10	11,76	9,06	—	16,70
	1"	34,60	54,10	80,40	11,20	6,20	16,80	13,20	—	25,80
	1 1/4"	34,80	55,40	86,90	11,10	9,80	33,00	21,90	—	40,80
	1 1/2"	35,00	55,90	82,00	11,00	12,90	44,00	21,50	—	52,20
	2"	34,00	56,00	76,10	10,40	19,40	58,20	45,90	—	71,50

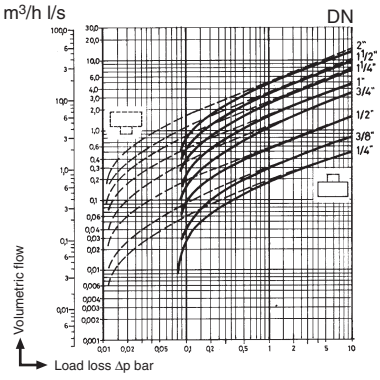
(1) For other mounting positions, with or without spring, the flow coefficient varies by ± 2%.
(2) Flow coefficient for orientation. The volumetric flows which cause loss of pressure to 0,07 bar = 1 Psi are in unstable areas (See diagram of pressure loss).
(3) Opening pressures are greater then 0,007 bar = 1 Psi. The Cv coefficient cannot be determined.

Load losses

The adjoining diagram reflects the load loss curves for water at 20°C. Values are based on valves without springs and installed horizontally. In order to determine other fluids load losses, calculate the flow of these equivalent to water.

$$Q_A = \sqrt{\frac{\varrho}{1.000}} \cdot Q$$

Q_A = Flow equivalent to water in m^3/h.
ϱ = Fluid density in operating conditions in Kg/m^3.
Q = Fluid flow in operating conditions in m^3/h.



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Thermodynamic steam trap

Without strainer **Model 041**
With strainer **Model 043**

For the extraction of steam condensates.
For use in: steam piping, irons, laundries, tanks and vessels with condensate discharge, multiple plate presses, vulcanizing autoclaves, pressure reduction equipment, etc.

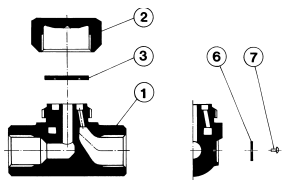
Specifications

— Materials carefully selected for resistance to wear, extreme temperatures and corrosion. They can be fully recycled.
— Without joints.
— Simplicity of construction. One single moveable piece ensures minimum maintenance.
— Easy installation with possibility to be mounted in any position.
— Compact and robust. Reduced weight and size which facilitates storage.
— Internal design of the body is conceived to provide the capacities required in each case without over sizing.
— Characteristiques plate which enables identification of the working conditions and direction of flow.
— Discontinuous and intermittent discharge.
— Precision opening and closing, avoiding loss of steam.
— Silent, although allows acoustic verification of working.
— Remain unaffected by vibrations, water hammer, reheated steam, corrosive condensate, frosts, etc.
— Protective strainer for the closing surfaces with access cap for cleaning. (Mod. 043).
— Sealing surfaces treated and balanced, making them extremely tightness, even exceeding DIN-3230 requeriments. Page 3.
— All steam traps undergo throrough testing.
— Each component is numbered, registered and inspected. If previously requested, the steam trap will be accompanied by certificates corresponding to materials, batch, test and performance.

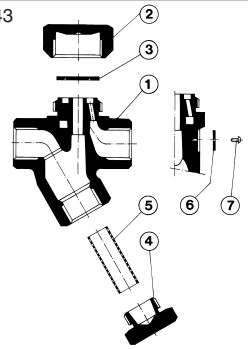
IMPORTANT
Depending on demand:
— May be manufactured using other materials for specific working conditions (high temperatures, fluids, etc.).
— Other connections.
— Isolation covers to avoid losses through radiation caused mainly by bad weather.

Nº PIECE	PIECE	MATERIAL
		STAINLESS STEEL
1	Body (Mod. 041)	Stainless steel (DIN-1.4021) (AISI-420)
1	Body (Mod. 043)	Stainless steel (DIN-1.4027) (ASTM A743CA40F)
2	Cover	Stainless steel (DIN-1.4305) (AISI-303)
3	Sealing disc	Stainless steel (DIN-1.4021) (AISI-420)
4	Cap	Stainless steel (DIN-1.4305) (AISI-303)
5	Strainer	Stainless steel (DIN-1.4301) (AISI-304)
6	Plate	Aluminium
7	Rivets	Carbon steel (DIN-1.1141 Ck-15)
R		1/2" to 1"(GAS,NPT or SW)
OPERATING CONDITIONS	MAX. PERMISSIBLE PRESSURE	PMA . 63 bar
	MAX. WORKING PRESSURE	PMS . 42 bar
	MIN. WORKING PRESSURE	PmS . 0,25 bar
	MAX. PERMISSIBLE TEMPERATURE	TMA . 400°C
	PERMISSIBLE BACK PRESSURE	Until 80% inlet pressure

Mod. 041

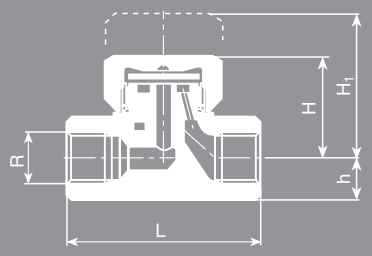


Mod. 043

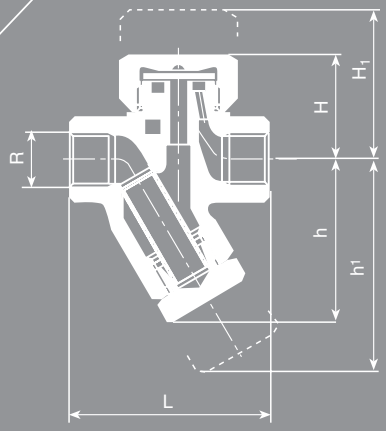


MODEL		041			043		
R1		1/2"	3/4"	1"	1/2"	3/4"	1"
CONNECTIONS		Whitworth gas tight cylindrical female thread ISO 228/1 1978 (DIN-259)					
		NPT thread ANSI-B2.1					
		Socket welding ends SW ANSI-B16.11					
H		40,0	43,5	51,5	40,5	43,5	51,5
H_1		55,0	58,5	70,5	55,5	58,5	70,5
h		16,0	19,0	22,5	64,0	67,5	70,0
h^1		—	—	—	75,0	78,5	81,0
L		70,0	80,0	90,0	78,0	90,0	95,0
WEIGHT IN Kg.		0,67	0,82	1,33	0,93	1,12	1,59
CODE 2108-	GAS	041.9022	041.9342	041.9102	043.9022	043.9342	043.9102
	NPT	041.90221	041.93421	041.91021	043.90221	043.93421	043.91021
	SW(1)	041.90222	041.93422	041.91022	043.90222	043.93422	043.91022

Mod. 041

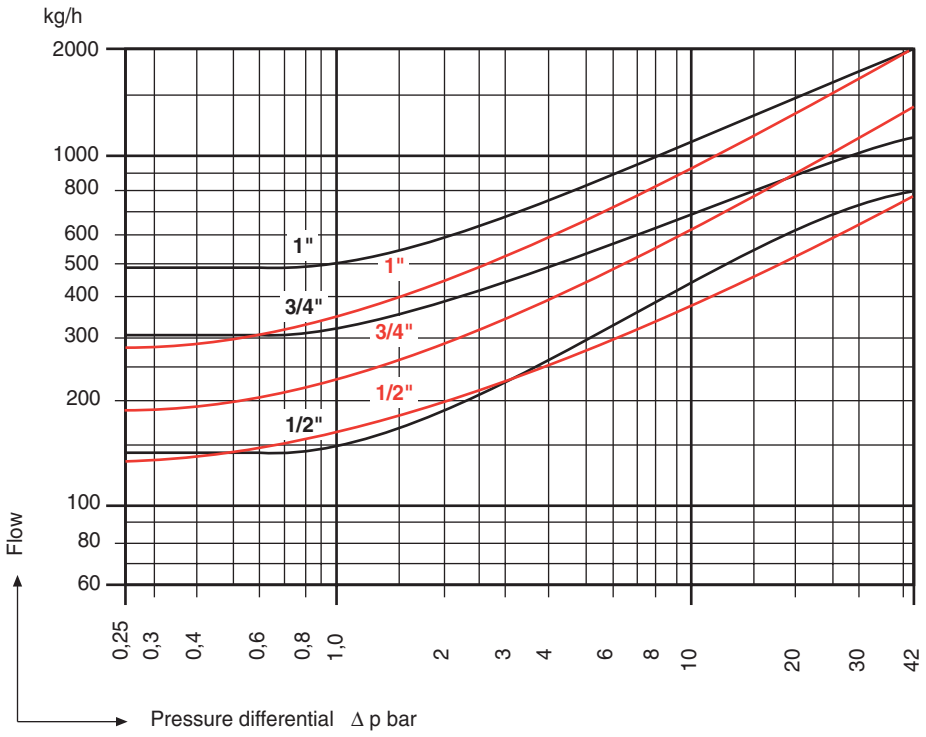


Mod. 043



(1) Previous consult with our technical department.

Flow diagram



Mod. 041 ——————

Mod. 043 ——————

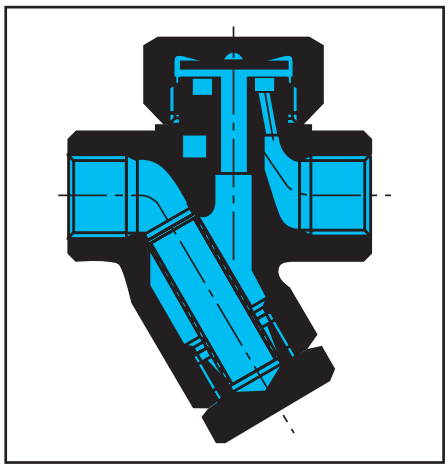
Condensate and air.

Low pressure steam.

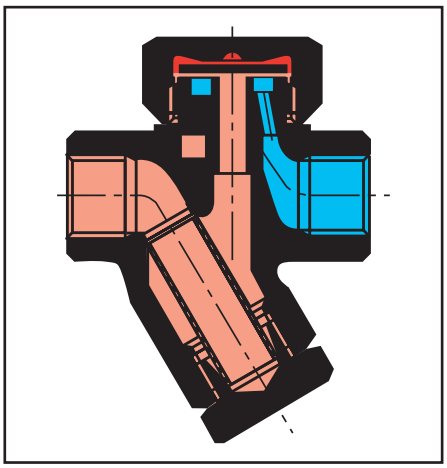
High pressure steam.

Operation

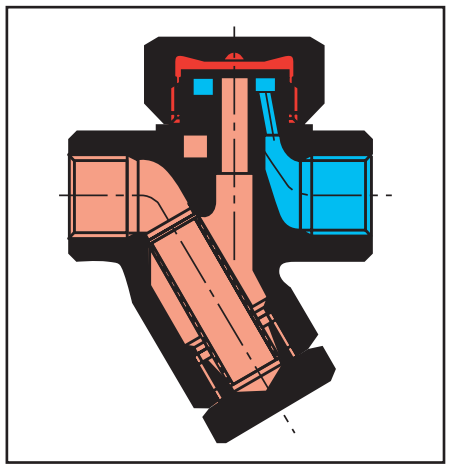
The operation of a thermodynamic steam trap is based on the Bernouilli principle: “In a fluid in motion, the sum of the static and dynamic pressures remains constant at all points, such that an increase in one results in a decrease in the other”.



The input pressure acts on the sealing disc which allows the immediate discharge of the condensate and air at the temperature of the steam.

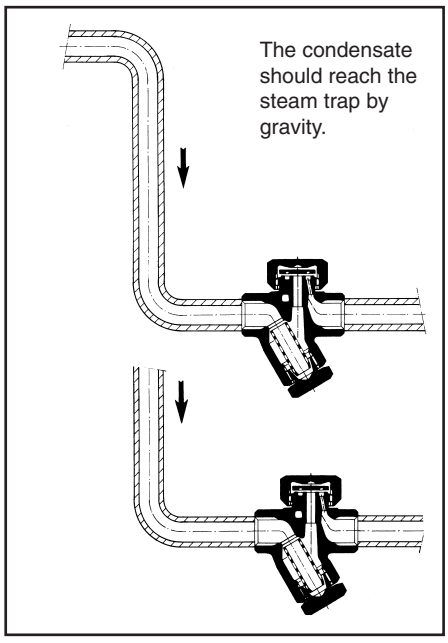


Subsequently the steam enters the steam trap. The high speed produced by the expansion of the steam creates a zone of low pressure in the inverse side of the sealing disc. The flow is deviated to the reverse of the sealing disc and creates a zone of high pressure by recompression. The sealing disc begins to descend.



When the high pressure acts on the whole surface of the sealing disc it exerts a force greater than the input pressure. The steam trap closes. The subsequent presence of condensate on the input causes the cycle to be repeated.

Recommended



Installation

— Verify that the fluid circulates in the direction indicated by the arrow on the characteristics plate.

— Avoid excessive losses of load on the input, and counterpressures on the output by generously sizing the piping. The conductors should have at least the same internal diameter as the steam trap.

— In model 041, it is essential to locate an additional strainer before the steam trap.

— If a sight glass is installed after the steam trap leave about 50 cm between them.

— Each consumption point should have its own steam trap. A common steam trap will give rise to problems.

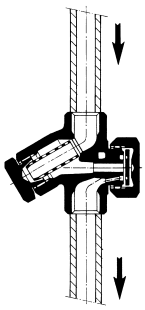
— The discharge of the steam trap to a consensate tank requires:

1 A tank with a larger diameter than the steam trap or the sum of the nominal cross sections of the steam trap connected to it.

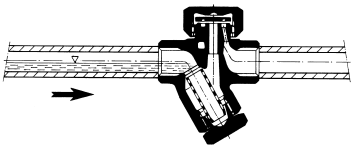
2 The steam trap that operate at different pressures must discharge to different tanks.

3 The input of condensate to the tank must be done through its upper side.

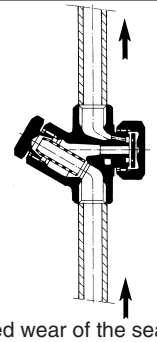
Not recommended



Increased wear of the sealing disc is produced.

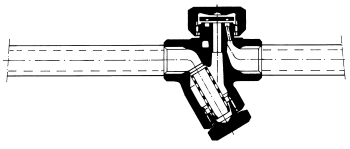


Avoid condensate begin left in the lower part of the pipe.



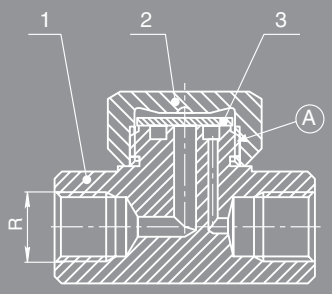
Increased wear of the sealing disc is produced along with the return of the dirt accumulated in the strainer.

Avoid welds

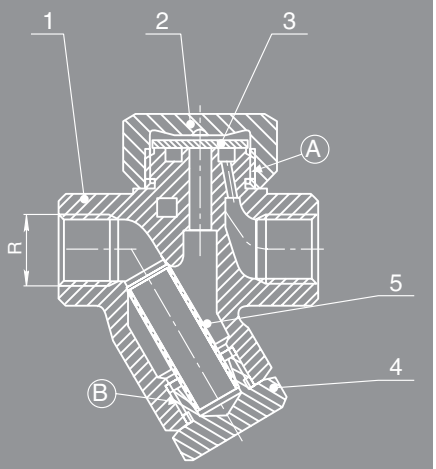


They would affect the hardness and finish of the closure zone.

Mod. 041



Mod. 043



Start-up

1- On start up avoid air reaching the steam trap at high speed as it could block it.

2- The steam trap will remain open if the compression exceeds 80% of the input pressure.

Assembly and disassembly

1- Unscrew cover (2).

2- Take out the sealing disc (3).

3- Unscrew the cap (4).

4- Extract the strainer (5).

5- Locate the sealing disc (3), with the slots facing the seating in the body (1).

6- Put on the cover (2) after greasing the screw threads (A) and (B) with molybdenum bisulphate or other lubricant which is resistant to high temperatures. Tighten up to the recommended torque.

7- Clean the strainer thoroughly (5) and insert into the body (1).

8- Screw on the cap (4) greasing the screw threads as in point 6.

TORQUES FOR ROOM TEMPERATURE OF 20°C			
N° PIECE	PIECE	R	Nm
2	Cover	1/2" and 3/4"	100
2	Cover	1"	150
4	Cap	1/2" to 1"	100

Maintenance

Before carrying out any maintenance work: Depressurize the steam trap and the input pipe.

The strainer (5) should be cleaned regularly.

The sealing disc (3) and the body seat (1) can be rectified and lapped as long as the quantity of material removed, with respect to the original thickness, does not exceed 0.25 mm.

The sealing disc (3) is rectified and lapped on both sides. The slotted side must be facing the body in order that, through the turbulence generated, a delay in the closure of the steam trap is achieved meaning that the discharge of the condensate is at a temperature close to that of the steam.

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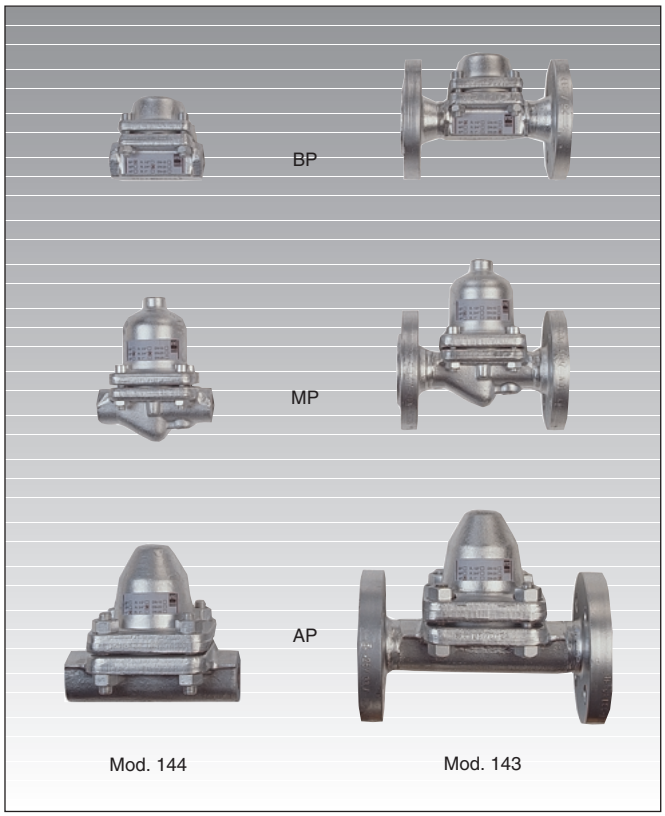
Bimetallic steam trap

Thread connections **Model 143**
Flange connections **Model 144**

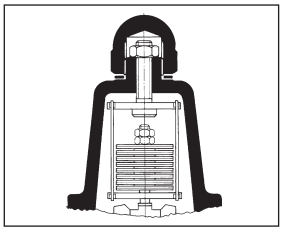
For the extraction of steam condensates.
Applicable in: steam piping, heat exchangers,... the chemical and petrochemical industries,... etc.

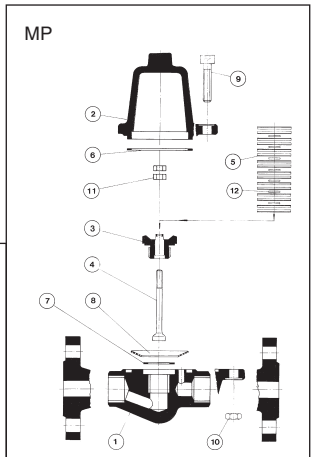


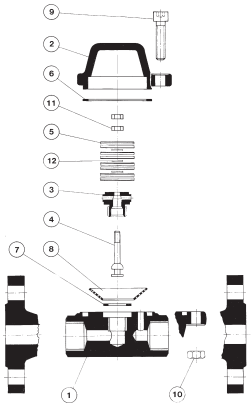
Specifications

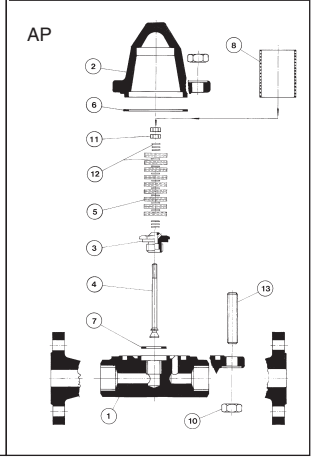
— Materials carefully selected for resistance to wear, extreme temperatures and corrosion.
— Simplicity of construction. A single moveable piece together with a bimetallic strip, highly resistant to corrosion to ensure minimum maintenance.
— Easy installation, can be mounted in any position, although we recommend horizontal mounting.
— Compact and robust. Reduced weight and size which facilitates storage.
— Internal design of the body is conceived to provide the capacities required in each case without over sizing.
— Great discharge capacity.
— The purger also acts as a deaerator and check valve.
— Precision opening and closing, avoiding loss of steam.
— Silent.
— Inseparable bimetallic strip, made from a single piece, with sides of different expansion mean a high degree of sensitivity of operation.
— Are unaffected by vibrations, water hammer, reheated steam, corrosive condensate, frosts, etc.
— Large surface area filter to protect closure areas.
— Sealing surfaces treated and balanced, making them extremely tightness, even exceeding DIN-3230 requeriments. Page 3.
— All steam traps undergo throrough testing.
— All components are numbered, registered and checked. If requested in advance, material, casting, test and efficiency certificates will be enclosed with the steam trap.

IMPORTANT
Depending on demand:
1.– Other connections: Thread NPT ANSI-B2.1.
BW or SW ANSI-B 16.11.
ASA ANSI-150, 300 or 600 Lbs. flanges.
2.– Model BP and MP with external on-line adjustment mechanism.







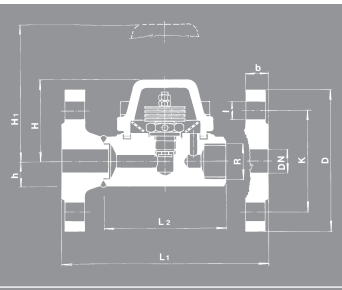


N° PIECE	PIECE	MATERIAL
		CARBON STEEL
1	Body	Carbon steel (DIN-1.0460 C22.8) (1)
2	Cover	Carbon steel (DIN-1.0460 C22.8) (1)
3	Seating	Stainless steel (DIN-1.4305) (AISI-303)
4	Plug	Stainless steel (DIN-1.4112) (AISI-440 B)
5	Bimetall	RGR
6	Joint	Graphite
7	Joint	Copper
8	Filter	Stainless steel (DIN-1.4301) (AISI-304)
9	Screw	Carbon steel (DIN-1.1191 Ck-45)
10	Nut	Carbon steel (DIN-1.1141 Ck-15)
11	Nut	Stainless steel (DIN-1.4305) (AISI-303)
12	Washer	Stainless steel (DIN-1.4305) (AISI-303)
13	Stud	Carbon steel (DIN-1.1191 Ck-45)

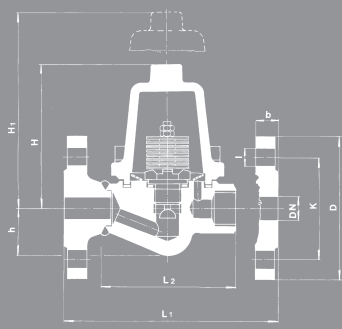
TYPE		BP	MP	AP
		LOW PRESSURE	MEDIUM PRESSURE	HIGH PRESSURE
R		1/2" and 3/4"	1/2" and 3/4"	1/2" to 1"
DN		15 to 25	15 to 25	15 and 25
PN		40	40	100
OPERATING CONDITIONS	MAX. PRESSURE IN bar	17	23	80
	MAX. TEMP. IN °C	400	400	450

(1) Type AP in Carbon steel (DIN-1.5415 15Mo3).

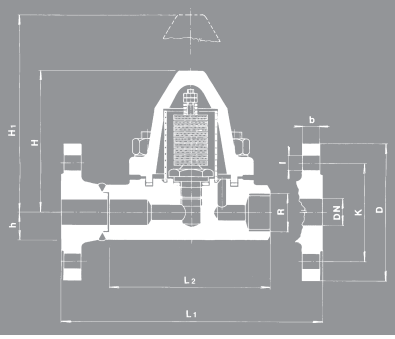
BP



MP

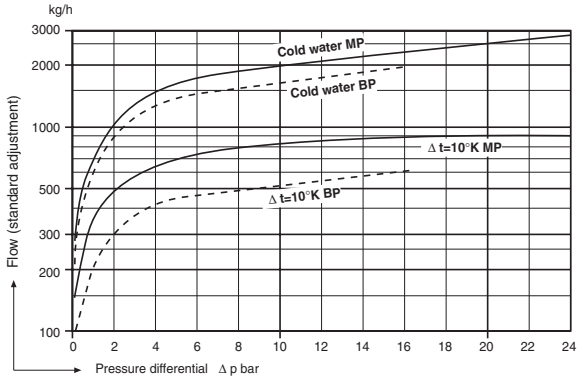


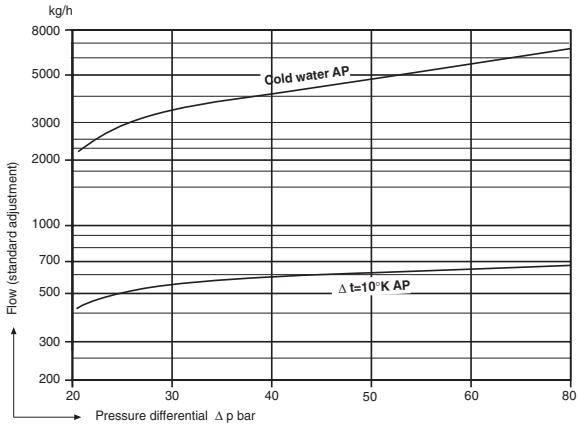
AP

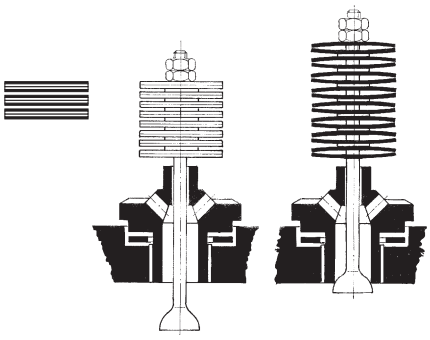


TYPE	LOW PRESSURE BP					MEDIUM PRESSURE MP					HIGH PRESSURE AP				
R	1/2"	3/4"	—	—	—	1/2"	3/4"	—	—	—	1/2"	3/4"	1"	—	—
CONNECTION	Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259)														
DN	—	—	15	20	25	—	—	15	20	25	—	—	—	15	25
CONNECTION	Flange PN-40 DIN-2544/2545										Flange PN-100 DIN-2547/2548				
H	56	56	56	56	56	115	115	115	115	115	120	120	120	120	120
H_1	91	91	91	91	91	165	165	165	165	165	210	210	210	210	210
h	24,0	24,0	—	—	—	26,0	26,0	—	—	—	25,0	25,0	25,0	—	—
L_1	—	—	150	150	160	—	—	150	150	160	—	—	—	230	230
L_2	90	90	—	—	—	110	110	—	—	—	160	160	160	—	—
D	—	—	95	105	115	—	—	95	105	115	—	—	—	105	140
K	—	—	65	75	85	—	—	65	75	85	—	—	—	75	100
l	—	—	14	14	14	—	—	14	14	14	—	—	—	14	18
b	—	—	16	18	18	—	—	16	18	18	—	—	—	20	24
N°DRILLS	—	—	4	4	4	—	—	4	4	4	—	—	—	4	4
WEIGHT IN Kgs.	1,60	1,50	3,00	3,50	4,00	2,60	2,50	4,00	4,50	5,00	6,00	6,00	6,00	9,00	11,00
CODE 2108 –	143.8024	143.8344	144.8024	144.8344	144.8104	143.80241	143.83441	144.80241	144.83441	144.81041	143.0024	143.0344	143.0104	144.0024	144.0104

Flow diagram







Operation

The operating principle of the bimetallic steam trap is based on the combination in a column of double sided bimetallic discs made up of one single bimetallic strip, where each face has a different coefficient of expansion.

The bimetallic strips are piled up in pairs, with the sides having the same coefficient of expansion (side without the marking) placed against each other.

In the presence of cold water the bimetallic strips remain flat. As the temperature increases the discs change shape, becoming convex, and displacing the plug against the seating. The maximum convexity, which coincides with a fully tight shut off is obtained just at the point when the condensate turns to steam.

It is important to remember that the distance between the plug and the seating when cold is that which determines the flow when in service.

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Direct action pressure reducing valve

Thread connection **Model 513**
Flange connection **Model 514**

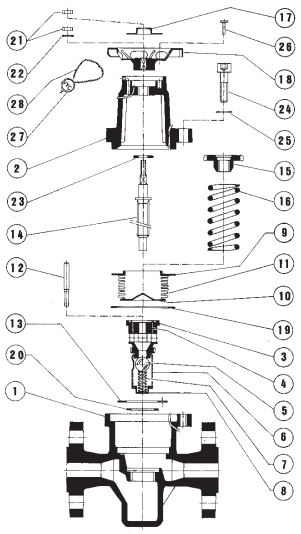
For steam and gases. (For liquids, consult our technical department). Suitable for application in; ironing machines, laundries and dry cleaners', cooking vats, textile machinery, drying cylinders, autoclaves, steam ovens, distilleries, heat exchangers, the food industry, chemical laboratories, etc.

Specifications

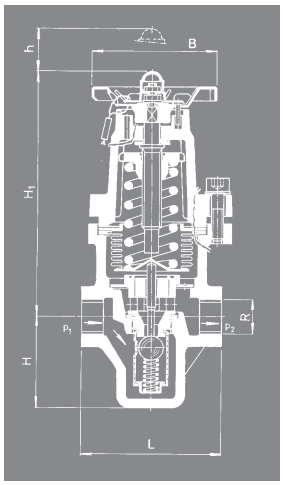
— Materials carefully selected for resistance to wear, extreme temperatures and corrosion. They can be fully recycled, and use a single, non-metallic, asbestos-free joint.
— Simplicity of design, ensuring minimum maintenance requirements.
— Easy installation; may be assembled in any position, even upside down.
— Moderate weight and size.
— Interior design conceived for maximum capacity and performance for size.
— Easy to adjust. The valves are supplied unregulated, but with the corresponding spring, duly identified, for the required pressure reduction.
— Rating plate which identifies the regulation field.
— Three springs, easily interchangeable and identified by colour and code.
— Anchoring system immune to vibrations; may be sealed to prevent manipulation.
— Selft-centring lock, independent of axle, designed to guarantee absolue precision of regulation at the most demanding points.
— Protective filter for the locking surfaces.
— High degree of airtightness of the lock at zero consumption, exceeding the requirements of DIN-3230. Page 3.
— Stainless steel bellows welded to the plasma. Airtightness tested with helium, ensuring absolute reliability and long life.
— All valves undergo throrough testing.
— Each component is numbered, registered and inspected. If previously requested, the valve will be accompanied by certificates corresponding to materials, batch, tests and performance.

IMPORTANT
Depending on demand:
— May be manufactured using other materials for specific working conditions (high temperatures, fluids, etc.).
— Other connections.
— Degreased and completely free of oils and greases.

N°. PIECE	PIECE	MATERIAL		
		NODULAR IRON	CARBON STEEL	STAINLESS STEEL
1	Body	Nodular iron (DIN-0.7043 GGG-40.3)	Carbon steel (DIN-1.0619 GS-C 25)	Stainless steel (DIN-1.4408) (AISI-316)
2	Cover	Aluminium (DIN-3.2581.01 G-AlSi12)	Aluminium (DIN-3.2581.01 G-AlSi12)	Aluminium (DIN-3.2581.01 G-AlSi12)
3	Seating	Stainless steel (DIN-1.4057) (AISI-431)	Stainless steel (DIN-1.4057) (AISI-431)	Stainless steel (DIN-1.4057) (AISI-431)
4	Guide	Graphite PTFE (Teflón)	Graphite PTFE (Teflón)	Graphite PTFE (Teflón)
5	Lock	Stainless steel (DIN-1.4034)	Stainless steel (DIN-1.4034)	Stainless steel (DIN-1.4034)
6	Filter	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)
7	Auxiliary spring	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)
8	Cap	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)
9	Bellows ring	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)
10	Bellows disc	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)
11	Bellows	Stainless steel (DIN-1.4571) (AISI-316Ti)	Stainless steel (DIN-1.4571) (AISI-316Ti)	Stainless steel (DIN-1.4571) (AISI-316Ti)
12	Axle	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)
13	Separator disc	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)
14	Regulation screw	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)
15	Spring press	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)
16	Spring	Chrome-silicon steel (DIN-1.7102 54SiCr6)	Chrome-silicon steel (DIN-1.7102 54SiCr6)	Chrome-silicon steel (DIN-1.7102 54SiCr6)
17	Rating plate	Stainless steel (DIN-1.4301) (AISI-304)	Stainless steel (DIN-1.4301) (AISI-304)	Stainless steel (DIN-1.4301) (AISI-304)
18	Handwheel	Aluminium (DIN-3.2581.01 G-AlSi12)	Aluminium (DIN-3.2581.01 G-AlSi12)	Aluminium (DIN-3.2581.01 G-AlSi12)
19	Body joint	Graphite	Graphite	Graphite
20	Seating joint	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)	Stainless steel (DIN-1.4404) (AISI-316L)
21	Nut	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)
22	Washer	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)
23	Washer	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)
24	Screw	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Stainless steel (DIN-1.4401) (AISI-316)
25	Washer	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Stainless steel (DIN-1.4401) (AISI-316)
26	Anchoring bolt	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)
27	Seal	Lead	Lead	Lead
28	Sealing wire	Sealing wire	Sealing wire	Sealing wire
R		1/2" to 1"		
DN		15 to 25		
PN		25	40	40
OPERATING CONDITIONS	PRESSURE IN bar	17	17	17
	MAX. TEMP. IN °C	210	230	230
	MIN. TEMP. IN °C	-10	-10	-60



MODEL		513			514		
R	DN	1/2"	3/4"	1"	15	20	25
CONNECTIONS		Whitworth gas-tight cylindrical female ISO 228/1 1978 (DIN-259)			PN-25 DIN-2544 PN-40 DIN-2545		
H		57	57	57	57	57	57
H_1		150	150	150	150	150	150
h		25	25	25	25	25	25
L		85	95	105	150	150	160
B		75	75	75	75	75	75
D		—	—	—	95	105	115
K		—	—	—	65	75	85
I		—	—	—	14	14	14
b		—	—	—	16	18	18
DRILLS N°.		—	—	—	4	4	4
WEIGHT IN Kgs.	NODULAR IRON	1,98	2,05	2,29	3,60	3,65	4,73
	CARBON STEEL	2,08	2,15	2,44	3,85	3,95	5,05
	STAINLESS STEEL	2,13	2,25	2,55	3,95	4,08	5,20
SPRING REGULATING RANGE IN bar (REDUCED PRESSURE)		0,14 a 1,70	1,40 a 4,00	3,50 a 8,60	0,14 a 1,70	1,40 a 4,00	3,50 a 8,60	0,14 a 1,70	1,40 a 4,00	3,50 a 8,60	0,14 a 1,70	1,40 a 4,00	3,50 a 8,60	0,14 a 1,70	1,40 a 4,00	3,50 a 8,60
CODE	NODULAR IRON 2001-	513.60261	513.60262	513.60263	513.63461	513.63462	513.63463	513.61061	513.61062	513.61063	514.60261	514.60262	514.60263	514.63461	514.63462	514.63463	514.61061	514.61062	514.61063
	CARBON STEEL 2001-	513.80241	513.80242	513.80243	513.83441	513.83442	513.83443	513.81041	513.81042	513.81043	514.80241	514.80242	514.80243	514.83441	514.83442	514.83443	514.81041	514.81042	514.81043
	STAINLESS STEEL 2001-	513.80221	513.80222	513.80223	513.83421	513.83422	513.83423	513.81021	513.81022	513.81023	514.80221	514.80222	514.80223	514.83421	514.83422	514.83423	514.81021	514.81022	514.81023



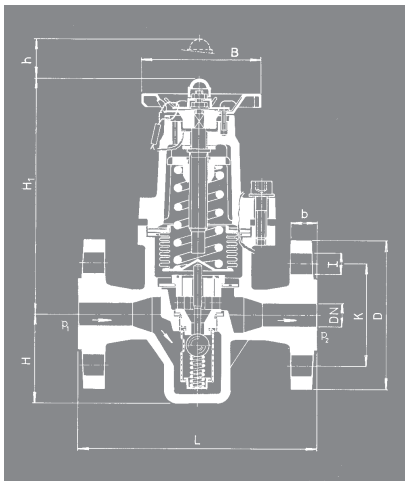
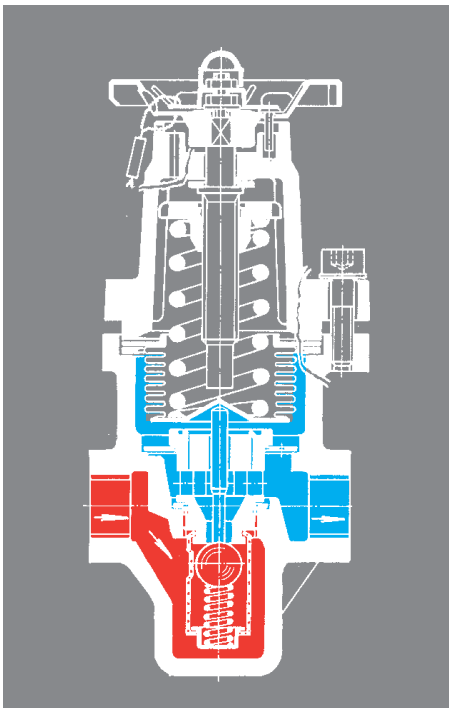


TABLE OF PRESSURES, FLOW COEFFICIENTS AND REGULATION FIELDS					
R			1/2"	3/4"	1"
DN			15	20	25
MAXIMUM INPUT PRESSURE IN bar (P_1 MAX.)			17		
MAXIMUM REDUCTION DIFFERENTIAL IN bar			P1 : 10		
MINIMUM REDUCED PRESSURE IN bar (P_2 MIN.)			0,14		
FLOW COEFFICIENT Kvs m^3/h ΔP = 1 bar			1,50	2,50	3,00
SPRING REGULATING RANGE IN bar (REDUCED PRESSURE)	0,14 to 1,70	CODE	56494		
		IDENTIFICATION COLOUR	White		
	1,40 to 4,00	CODE	56495		
		IDENTIFICATION COLOUR	Pink		
	3,50 to 8,60	CODE	56496		
		IDENTIFICATION COLOUR	Red		

FLOWS							
R		1/2"		3/4"		1"	
DN		15		20		25	
PRESSURE IN bar		I - Saturated steam in Kg/h. II - Air at 0°C and 1,013 bar in [Nm^3/h]. For liquids, consult our technical department.					
INPUT P_1	REDUCED P_2	I	II	I	II	I	II
2	0,2	6	8	7	9	10	14
	1	26	35	32	39	42	58
	1,5	30	40	37	48	52	71
3	0,3	12	15	15	18	21	27
	1	30	33	37	49	54	74
	1,5	42	54	52	67	73	101
	2	50	67	64	82	89	123
	2,5	66	75	70	93	99	138
4	0,4	19	25	24	30	32	43
	1	38	49	45	61	69	89
	1,5	50	67	62	82	87	121
	2	62	82	77	100	108	150
	2,5	70	91	87	114	122	172
	3	75	98	92	121	129	189
5	0,5	42	57	52	69	79	98
	2	68	90	85	113	120	168
	3	88	115	108	143	153	213
	4	96	125	120	155	168	232
6	0,6	46	60	57	74	82	108
	2	74	98	92	123	132	181
	3	98	126	120	159	171	236
	4	110	142	136	180	192	265
	5	106	139	132	175	188	260
7	0,7	50	67	63	84	89	119
	2	81	106	102	133	142	194
	3	104	135	131	171	182	254
	4	118	154	148	194	206	288
	6	114	150	142	188	201	278
8	0,8	54	71	67	88	94	129
	2	87	113	108	141	152	213
	3	112	146	138	181	196	272
	4	129	169	162	221	227	314
	6	138	180	173	253	245	338
9	0,9	48	67	63	82	92	125
	2	90	116	120	147	157	216
	3	116	151	145	189	204	280
	4	136	177	170	221	239	333
	5	150	195	187	244	264	363
	7	155	199	194	250	275	374
10	1	58	77	73	95	105	142
	2	92	122	121	151	164	227
	3	120	158	150	196	214	293
	4	142	186	178	233	250	347
	6	170	208	212	277	297	412
	8	178	229	220	286	307	426
11	1,1	66	88	82	108	121	160
	2	96	127	123	159	171	240
	3	130	170	162	212	227	316
	4	158	205	195	255	276	380
	6	196	221	242	317	339	473
	8	214	278	266	347	374	518
	8,6	218	284	271	355	383	530
12	1,2	73	99	95	126	132	186
	2	108	135	128	167	178	249
	3	138	177	170	221	240	332
	4	165	214	205	268	290	398
	6	206	268	255	332	360	492
	8	230	300	285	374	404	578
	8,6	233	305	289	380	414	579
13	1,3	85	111	106	140	148	208
	2	110	141	134	175	187	260
	3	141	185	175	231	249	343
	4	170	224	213	278	298	412
	6	217	283	281	350	382	527
	8	246	325	307	403	435	604
	8,6	251	356	314	412	445	615
15	1,5	92	117	113	148	161	220
	2	112	142	138	179	196	266
	3	144	187	177	236	252	348
	4	172	229	208	285	308	420
	6	202	284	290	365	390	544
	8	222	336	318	419	448	626
	8,6	240	343	355	428	459	639
17	1,7	104	128	123	160	173	239
	2	116	145	141	183	196	270
	3	147	191	181	241	258	355
	4	174	233	221	328	314	429
	6	206	300	296	373	404	556
	8	229	349	340	434	469	650
	8,6	252	359	344	444	478	673



Area of influence of input pressure. (P_1)
Area of influence of reduced pressure. (P_2)

Operation

The operation of the reducing valve is based on the principle of direct action. The force exerted by the spring displaces the axle and maintains the locking ball open. The fluid exerts an opposite force on the hood as it passes, which tends to reduce the section of passage of the fluid through the seating. The action of the spring and reaction of the pressure on the bellows balance each other, and the reduced pressure is maintained constant.

The fluctuations in consumption affect the reduced pressure. The bellows detects these variations via the balance hole, provoking a change in the passage of fluid as a function of the established reduced pressure.

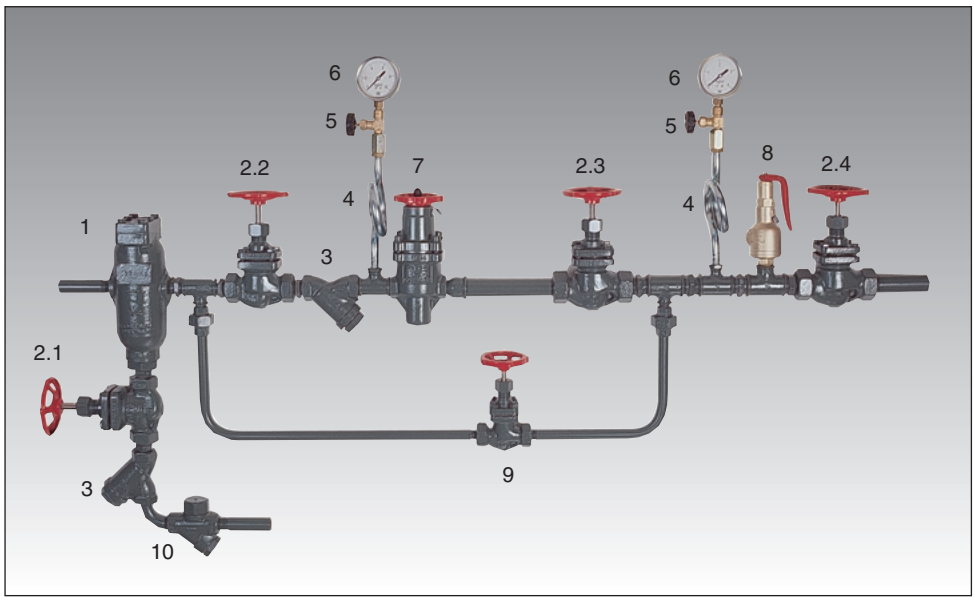
In working conditions with zero consumption, the valve remains closed and completely airtight when there is a slight increase in reduced pressure.

Installation

— Allways install the valve in a section of horizontal tubing, as close as possible to the point of consumption.
— The valve may be assembled in any position, even upside-down.
— Verify that the fluid flows in the direction indicated by the arrow on the body of the valve.
— The input and output tubes must be of the correct size and properly supported, to avoid any fall in pressure or tension.
— The output tubing should ideally have a greater diameter than the input tubing, to avoid excessive velocity of flow of the liquid.
— In accordance with the requirements of “Regulations for pressure devices ITC-MIE-AP 2 5.8”, the pressure reduction facilities in steam circuits will be supplied with:

1- A pressure gauge with syphon tube and three end cock, in accordance with article 11 of the MIE-AP 1 instructions, “Boilers”, located before and after the reduction valve.
2- A safety valve following the reduction valve, capable of evacuating the maximum flow of steam, which permits flow at the level regulated and adjusted to the maximum reduced pressure of service plus a maximum of 10%.

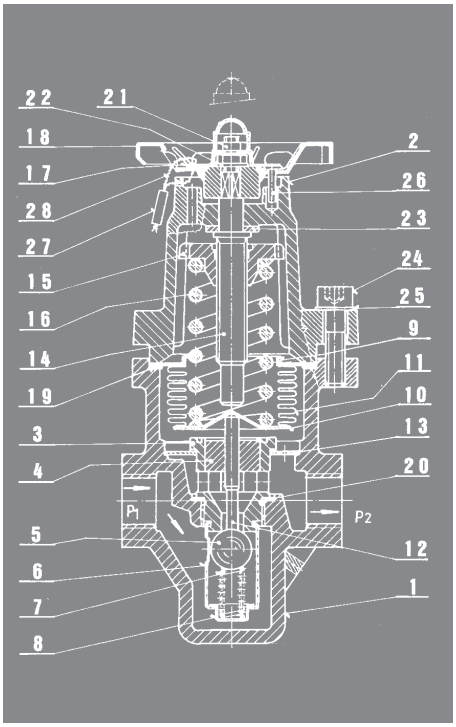
Example of installation for steam

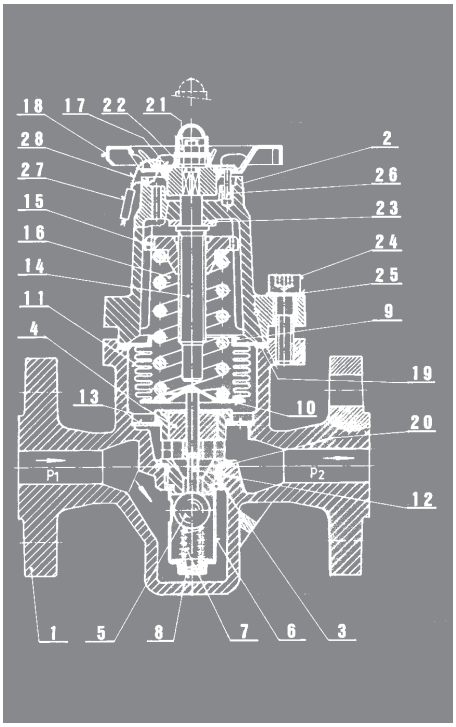


1 Condensate separator.
2 Interruption valve.
3 Filter.
4 Syphon tube.
5 Pressure gauge cock.
6 Pressure gauge.
7 Pressure reducing valve.
8 Safety valve.
9 Interruption valve with adjusting cone.
10 Condensate purger.

IMPORTANT

— The distance between the pressure reducing valve 7 and the interruption valves 2.2 and 2.3 must be 8 ÷ 10 times the diameter of the tube.
— It is advisable to install the separator 1 and the condensate purger 10 using wet steam with dragging.
— We recommend that the reduction device be equipped with a by-pass and interruption valve with an adjusting cone 9.





Start-up and adjustment of the reduced pressure

1- Before start-up, the tubes and the inside of the valve itself should be cleaned, eliminating any residues or impurities, particularly from the locking surfaces.
2- Check the rating plate (17) to verify that the regulation field for the reduced pressure is appropriate and that the spring (16) corresponds to the same range.
3- Remove the nut (21), the rating plate (17) and the anchoring bolt (26).
4- With the input interruption valve fully open and the output interruption valve closed, turn the handwheel (18) gradually from left to right to increase the reduced pressure, or from right to left to decrease it, until the required reduced pressure is obtained at zero consumption.
5- Slowly open the output interruption valve.
6- Readjust the required reduced pressure in consumption conditions.
7- Put the anchoring bolt (26) and the rating (17) in place, and fix with the nut (21).
8- Seal the valve to prevent further adjustments, using the sealing wire (28) and the seal (27).
9- We recommend that the input pressure P_1 and the reduced pressure P_2 be recorded in the corresponding space of the rating plate (17).

Assembly and disassembly

1- Unseal the valve by cutting the wire (28).
2- Remove the nut (21), the rating plate (17) and the anchoring bolt (26).
3- Turn the handwheel (18) from right to left until you notice the spring (16) loosening.
4- Remove the screws (24) along with the washers (25).
5- Separate the cover (2) from the body (1), and you will have access to all the internal components. This enables simple maintenance and replacement of the spring (16), the bellows components (9) (10) (11) and the seating components (3) (4) (5) (6) (7) (8).
6- If the seating has been disassembled, replace the joint (20) with a new one. Put a new body joint in place (19).
7- Put the axle (12) in the guide hole (4) and check that it can move freely and is perpendicular to the bellows disc (10) when the bellows components (9) (10) (11) are put in place.
8- Select the spring (16) corresponding to the reduced pressure.
9- Put the cover (2) on the body (1) and the screws (24) with the washers (25), and screw them in.
10- Finally, proceed as described in “Start-up and adjustment of the reduced pressure”.

Maintenance

Correct installation with interruption valves at the input and output points facilitates maintenance.
The filter (6) should be cleaned regularly.
When assembling the valve, replace the seating joint (20) and body joint (19) with new ones.

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Steam-water mixing valve

Model 253

In installations with steam, the steam can be mixed with cold water to obtain instant hot water in the most economical way. Can be used in packaging plants, dairies, detergent plants, slaughterhouses, meat processing plants, hospitals,... etc. For cleaning floors, vehicles, toilets, tanks, filters,... etc. In the manufacture of food, chemical, paper and tannery products,... etc.

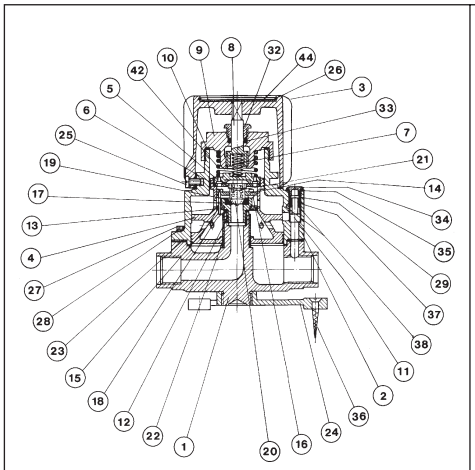
Specifications

— Efficient, safe, simple installation and moderate cost.
— Water temperature easily adjusted to suit the needs of the consumer.
— Installation does not require pressure reducing valves.
— In certain applications they make an ideal and economical substitute for heat exchangers.
— Equipped with a safety device which prevents the input of steam until there is water flow through the mixer.
— Design aimed at eliminating noises and vibrations which are characteristics of the mixing of steam with cold water.
— Materials carefully selected for resistance to wear, extreme temperatures and corrosion.
— Simplicity of design, ensuring minimum maintenance requirements.
— Moderate weight and size.
— Easy to connect.
— Three single springs witch are easily interchangeable and identified by their colour and number of notches.
— All valves undergo throrough testing.
— Each component is numbered, registered and inspected. If previously requested, the valve will be accompanied by certificates corresponding to materials, batch, tests and performance.

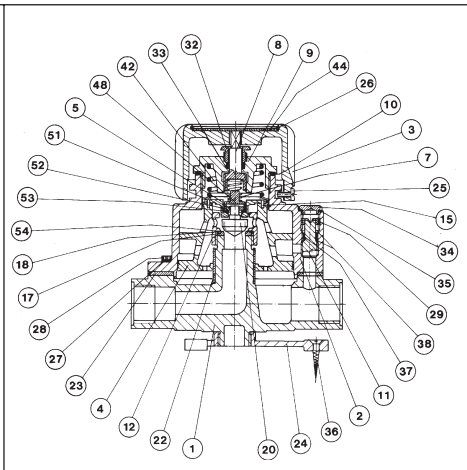
IMPORTANT
Depending on demand:
— Valves made entirely from Stainless steel.
— Valves coated internally and externally with PTFE (Teflon).
— Thermostatic valves.
— Chrome or nickel finish.
— Venturi type doser for mixing detergent with hot water.
— Support for coiling the hose.
— Automatic hose coiler.
— Pistol with lance for spraying hot water.

Nº PIECE	PIECE	MATERIAL
		BRONZE
1	Body	Bronze (DIN-2.1096.01 G-Cu Sn 5 Zn Pb)
2	Cover	Bronze (DIN-2.1096.01 G-Cu Sn 5 Zn Pb)
3	Control	Plastic ABS (1)
4	Piston	Bronze (DIN-2.1096.01 G-Cu Sn 5 Zn Pb)
5	Upper buffer	Bronze (DIN-2.1096.01 G-Cu Sn 5 Zn Pb)
6	Lower buffer	Stainless steel (DIN-1.4401) (AISI-316)
7	Fixed spring	Stainless steel (DIN-1.4300) (AISI-302)
8	Axis	Bronze (DIN-2.0530.10 Cu Zn 39 Sn F35)
9	Spring press	Bronze (DIN-2.1096.01 G-Cu Sn 5 Zn Pb)
10/23	Joint	Klingerit cardboard/Fluorelastomer (Vitón)
11	Valve	Brass (DIN-2.0401.08 Cu Zn 39 Pb 3p)
12	Lead	Stainless steel (DIN-1.4401) (AISI-316)
13	Ring	Brass (DIN-2.0401.08 Cu Zn 39 Pb 3p)
14	Plate	Stainless steel (DIN-1.4401) (AISI-316)
15, 25, 27, 36, 41	Screw	Stainless steel (DIN-1.4401) (AISI-316)
16	Rivets	Stainless steel (DIN-1.4401) (AISI-316)
17	Seating	PTFE (Teflon)
18, 40	Washer	Copper
19, 49, 52	Washer	Brass (DIN-2.0401.08 Cu Zn 39 Pb 3p)
20	Valve	Stainless steel (DIN-1.4401) (AISI-316)
21	Spring press	Stainless steel (DIN-1.4300) (AISI-302)
22	Shirt	Bronze (DIN-2.1096.03 GC-Rg-5)
24	Bracket	Polimer + FV (2)
26	Clip	Stainless steel (DIN-1.4401) (AISI-316)
28, 38	Washer	Stainless steel (DIN-1.4401) (AISI-316)
29	Adjusting screw	Brass (DIN-2.0401.08 Cu Zn 39 Pb 3p)
30	Dowel	Stainless steel (DIN-1.4401) (AISI-316)
31	Cap	Bronze (DIN-2.1096.01 G-Cu Sn 5 Zn Pb)
32	Gland	Brass (DIN-2.0401.08 Cu Zn 39 Pb 3p)
33, 37	Seal	Graphite
34	Cap	Brass (DIN-2.0401.08 Cu Zn 39 Pb 3p)
35	Joint	PTFE (Teflon)
39	Gudgeon	Stainless steel (DIN-1.4401) (AISI-316)
42	Variable spring	Stainless steel (DIN-1.4300) (AISI-302)
43, 44, 45, 46, 47	Plate	Aluminium
48	Lead	Brass (DIN-2.0401.08 Cu Zn 39 Pb 3p)
50	Ball	Stainless steel (DIN-1.4401) (AISI-316)
51	Nut	Brass (DIN-2.0401.08 Cu Zn 39 Pb 3p)
53, 54	Washer	Bronze - Berilium
55	Lower plate	Stainless steel (DIN-1.4401) (AISI-316)
56	Upper plate	Stainless steel (DIN-1.4401) (AISI-316)
R		1/2", 3/4", 1" and 1 1/2"
PN		16
OPERATING CONDITIONS	MAX. STEAM PRESSURE IN bar	10,5
	MIN. STEAM PRESSURE IN bar	0,35
	MAX. TEMP. IN °C	187

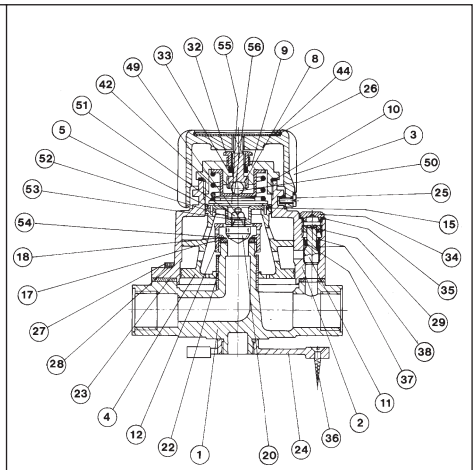
(1) The 1 1/2" control is supplied in Aluminium (DIN-3.2581.01 G-Al Si 12).
(2) R- 1 1/2" is supplied in Bronze (DIN-2.1096.01 G-Cu Sn 5 Zn Pb).



1/2" and 3/4"



1"

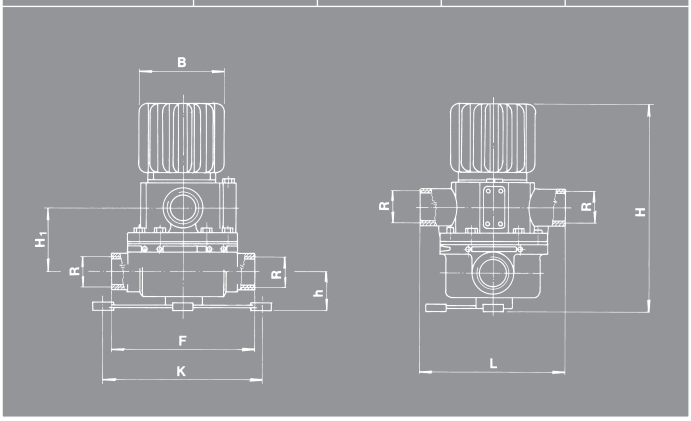


1 1/2"

R	VARIABLE SPRING REGULATION RANGE IN bar (STEAM PRESSURE)	IDENTIFICATION COLOUR	N° NOTCHES	MINIMUM HOT WATER FLOW FOR OPEN STEAM VALVE IN l/min.
1/2"	0,35 a 3,50	Black	1	2,30
	3,50 a 7,00	Green	2	2,70
	7,00 a 10,80	Yellow	3	4,50
3/4"	0,35 a 3,50	White	1	7,00
	3,50 a 7,00	Blue	2	7,00
	7,00 a 10,80	Red	3	8,00
1"	0,35 a 3,50	White	1	27,00
	3,50 a 7,00	Blue	2	32,00
	7,00 a 10,80	Red	3	36,00
1 1/2"	0,35 a 3,50	White	1	55,00
	3,50 a 7,00	Blue	2	55,00
	7,00 a 10,80	Red	3	55,00

NOTE: The mixing valve is supplied mounted with a variable spring ranging from 3,50 to 7,00 bar and two extra springs are included in case it is required to work at other steam pressures. To change the springs, unscrew the screw (25) remove the control (3) and the spring press (9), and the variable spring (42) will be accessible. To reassemble carry out the reverse sequence.

R	1/2"	3/4"	1"	1 1/2"
CONNECTIONS	Whitworth gas-tight cylindrical female ISO 228/1 1978 (DIN-259)			
H	197	197	216	286
H_1	57	60	70	98
h	32	40	44	60
L	140	151	173	213
F	144	152	201	266
B	108	108	121	143
K	134	159	134	200
DRILLS N°	3	3	3	3
WEIGHT IN Kgs.	6,4	9,4	11,2	26,0
CODE 2106 – 253.	5021	5341	5101	5121



Flows

Data required to determine the internal diameter of the valve:
– Temperature of consumer hot water:
– Flow of consumer hot water:
– Pressure available at the cold water input:
– Pressure available at the steam input:

Calculation process

1– Start with table for 1/2".
2– For the available cold water input pressure, work out the flow of cold water.
3– For the available steam input pressure, work out the hot water flow at the consumer temperature.
4– From the values obtained in steps 2 and 3 choose the smaller value, and compare if this is sufficient to cover the requirements for consumer hot water. If not repeat the process using the 3/4" table and so on up to the 1 1/2" table.

FLOW R.1/2"															
COLD WATER			STEAM	HOT WATER IN l/min.											
	FLOW IN l/min. (11)			SERVICE TEMPERATURE IN °C											
PRESSURE IN bar	OPEN VALVE	CLOSED VALVE	PRESSURE IN bar	38	43	49	54	60	66	71	77	82	88	93	99
0,35	13	7	0,35	13	10	8	7	6	6	5	5	4	4	4	3
0,70	19	9	0,70	21	16	13	11	10	9	8	7	7	6	6	5
1,40	29	11	1,40	32	23	20	17	15	13	12	11	10	9	9	8
2,10	36	13	2,10	38	27	23	20	18	16	14	13	12	11	10	10
2,80	42	14	2,80	49	35	30	26	23	20	19	17	16	15	13	13
3,50	47	15	3,50	62	45	38	33	29	26	24	21	20	18	17	16
4,20	52	16	4,20	67	48	41	35	31	28	26	23	21	20	18	17
4,90	56	17	4,90	72	52	44	38	34	30	27	25	23	21	20	19
5,60	60	18	5,60	77	56	47	41	36	32	29	27	25	23	21	20
6,30	65	19	6,30	82	59	50	43	38	34	31	28	26	24	23	21
7,00	69	19	7,00	87	63	53	46	41	37	33	30	28	26	24	22
7,70	73	19	7,70	91	66	56	49	43	39	35	32	29	27	25	24
8,40	77	20	8,40	97	70	60	52	45	41	37	34	31	29	27	25
9,10	79	20	9,10	102	74	63	54	48	43	39	35	33	30	28	26
9,80	82	21	9,80	107	77	65	57	50	45	41	37	34	32	29	28
10,50	85	21	10,50	112	81	69	60	53	47	43	39	36	33	31	29

FLOW R.3/4"															
COLD WATER			STEAM	HOT WATER IN l/min.											
	FLOW IN l/min. (11)			SERVICE TEMPERATURE IN °C											
PRESSURE IN bar	OPEN VALVE	CLOSED VALVE	PRESSURE IN bar	38	43	49	54	60	66	71	77	82	88	93	99
0,35	14	9	0,35	23	19	16	14	12	11	10	9	8	8	7	7
0,70	20	10	0,70	37	28	25	22	19	17	16	14	13	12	11	10
1,40	34	13	1,40	55	45	39	33	30	26	24	22	20	19	17	16
2,10	52	17	2,10	66	54	45	40	35	31	28	26	24	22	20	19
2,80	56	21	2,80	85	72	59	51	45	40	37	34	31	29	27	25
3,50	65	23	3,50	93	89	75	65	57	51	46	42	39	36	34	31
4,20	71	25	4,20	115	95	80	70	61	55	50	45	42	39	36	34
4,90	77	28	4,90	124	101	86	75	66	59	53	49	45	41	38	36
5,60	83	30	5,60	132	108	91	79	70	63	57	52	47	44	41	38
6,30	87	31	6,30	149	122	104	90	79	70	64	58	54	50	46	43
7,00	93	33	7,00	165	136	115	100	88	79	71	65	60	55	51	48
7,70	98	35	7,70	182	149	126	109	97	86	78	71	66	60	57	39
8,40	102	36	8,40	199	163	138	120	105	94	85	78	72	66	62	58
9,10	107	38	9,10	205	168	142	124	109	97	88	80	74	69	64	60
9,80	111	40	9,80	209	171	145	125	111	99	90	81	75	70	65	61
10,50	125	42	10,50	213	174	147	127	112	101	91	83	76	71	66	62

FLOW R.1"															
COLD WATER			STEAM	HOT WATER IN l/min.											
	FLOW IN l/min.			SERVICE TEMPERATURE IN °C											
PRESSURE IN bar	OPEN VALVE (11)	CLOSED VALVE	PRESSURE IN bar	38	43	49	54	60	66	71	77	82	88	93	99
0,35	55	14	0,35												
0,70	73	18	0,70	62	45	38	33								
1,40	91	27	1,40	125	91	77	67	59	53	48	44	40	37	34	32
2,10	105	30	2,10	150	109	92	80	70	63	57	52	48	45	41	39
2,80	118	32	2,80	170	123	105	90	80	72	65	59	55	50	47	44
3,50	127	36	3,50	189	138	117	101	89	80	72	66	60	56	52	49
4,20	141	45	4,20	209	151	129	114	95	85	81	73	67	63	59	55
4,90	150	45	4,90	227	166	140	122	107	96	87	80	73	68	63	59
5,60	164	48	5,60	249	182	153	133	107	105	95	86	79	74	69	64
6,30	168	50	6,30	268	195	165	143	126	113	102	93	86	80	74	69
7,00	177	52	7,00	288	209	177	154	135	121	110	100	92	85	80	76
7,70	182	52	7,70	308	223	189	163	145	129	117	107	98	91	85	80
8,40	191	55	8,40	327	238	201	174	154	137	125	114	105	97	90	85
9,10	195	57	9,10	348	252	214	185	164	146	132	121	111	103	95	90
9,80	200	59	9,80	364	266	226	195	173	154	139	127	117	108	101	95
10,50	200	64	10,50	378	275	233	202	178	159	145	132	121	112	105	97

FLOW R.1 1/2"															
COLD WATER			STEAM	HOT WATER IN l/min.											
	FLOW IN l/min.			SERVICE TEMPERATURE IN °C											
PRESSURE IN bar	OPEN VALVE	CLOSED VALVE	PRESSURE IN bar	38	43	49	54	60	66	71	77	82	88	93	99
0,35	70	27	0,35												
0,70	93	40	0,70	80	58										
1,40	139	58	1,40	130	95	80	70	61							
2,10	164	69	2,10	170	124	105	91	72	65	59	55				
2,80	192	77	2,80	216	157	133	115	102	91	82	75	69	64	60	56
3,50	215	85	3,50	258	187	159	137	121	108	98	90	82	76	71	66
4,20	235	93	4,20	299	218	184	160	141	126	114	104	96	89	83	78
4,90	235	93	4,90	341	248	210	182	160	144	129	119	109	101	94	88
5,60	267	106	5,60	380	276	234	202	179	160	145	132	122	113	105	98
6,30	284	112	6,30	415	302	255	221	195	175	158	144	133	123	115	111
7,00	300	118	7,00	446	324	275	238	210	188	169	155	143	132	123	115
7,70	313	124	7,70	474	344	291	253	223	199	180	165	152	140	131	122
8,40	325	129	8,40	498	362	306	265	234	209	189	173	159	147	139	127
9,10	340	134	9,10	517	376	318	276	243	218	197	180	165	153	143	134
9,80	352	139	9,80	533	388	331	284	251	224	202	185	171	158	147	137
10,50	364	143	10,50	546	397	336	291	257	230	208	190	175	162	150	141

Operation

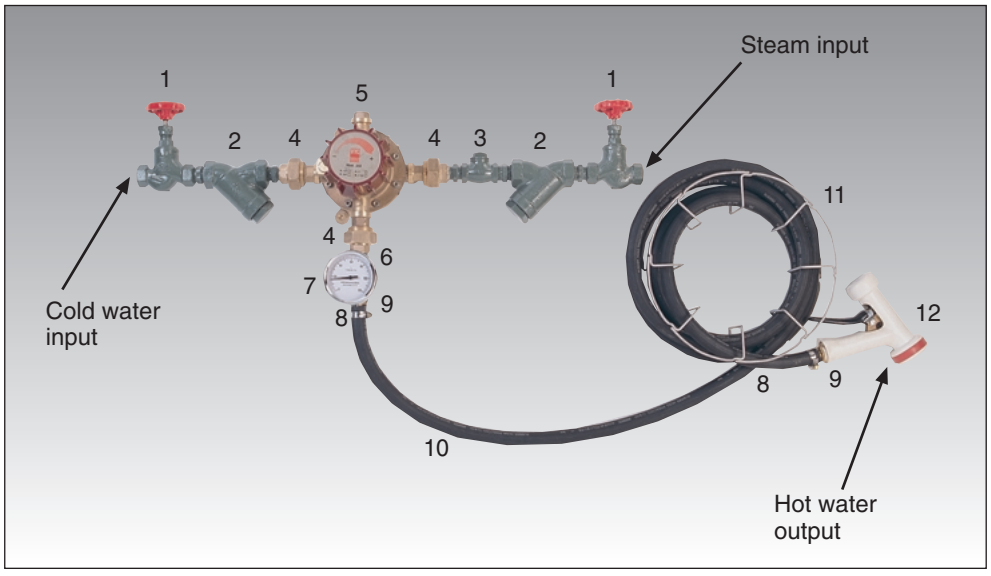
For consumer situations the cold water enters the mixer and lifts up the piston, compressing the variable spring. This enables the opening of the steam input valve and the mixing of steam with the cold water to give hot water to the consumer. When there is no consumption, the static water pressure allows the variable spring to close the steam shut off valve to ensure that no steam remains in the mixing chamber in the absence of water.

Installation

— The mixing valve has four connections: Cold water input, steam input, and two hot water outputs. One of the two hot water ouputs should be taken out of service by using the corresponding cap and joint. Both outputs can be used simultaneously as long as there is sufficient pressure on the inputs.

— When the mixing valve is used in a closed circuit, it is necessary to generate a pressure loss of 1 bar in order to counterbalance the force of the variable spring to allow the steam to enter the mixing chamber.

Recommended installation example



1 Interruption valve.
2 Filter.
3 Check valve.
4 Connection.
5 Mixing valve.
6 Thermometer connection.
7 Thermometer.
8 Hose connection.
9 Clamp.
10 Hose.
11 Support for coiling the hose or automatic hose coiler.
12 Watergun.

IMPORTANT

— We recommend that filters be installed in the cold water and steam inputs in order to protect the internal mechanism of the mixing valve.

— Only use EPDM type P hose, reinforced with internal material.

Start-up and adjustment of the temperature

There are two ways to obtain the required temperature: turning the control (3) on the mixing valve or adjusting the cold water shut off interruption valve 1 .

To adjust the valve:

1– Remove screw (25) and turn the control (3) from left to right until the end of its travel.

2– Remove cap (34) .

3– Turn valve (11) from left to right and then carry out the reverse process, simultaneously controlling the temperature in the hot water consumption until the required temperature is set.

4– Turn the control (3) from right to left to get lower temperatures.

5– Insert screw (25) , the cap (34) and tighten them up.

Maintenance

We recommend cleaning the inside of the valve only if the water is specially hard, using a descaling product or a light solution of 7 parts water to one part hydrochloric acid.

Watergun

PI-1

Specifications

— Body of bronze covered with black synthetic rubber.
— Operated using rear-mounted trigger, more manageable, safe and less tiring.
— Instant, automatic and water-proof closure.
— Ring on one end of the pistol for hanging after use or for insertion in the trigger for a fixed setting in order to obtain an effortless, continuous flow.

Spray adjustment

1– Fine spray: Press lightly on the trigger.
Adjustable using the adjustment screw located at the other end from the water output.
2– Constant spray: Press the trigger fully on.

R	1/2"
CONNECTIONS	Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259)
HOLE Ø	11
WEIGHT IN Kgs.	1,20
CODE	2106-253.0000

HOT WATER FLOW		
R	1/2"	
PRESSURE IN bar	FLOW IN l/min.	
0,35	13,50	
0,70	19,30	
3,40	37,80	
7,00	45,00	
17,50	54,00	
24,50	85,50	
28,00	90,00	
OPERATING CONDITIONS	MAX. PRESSURE IN bar	28
	MAX. HOT WATER TEMP. IN °C	82

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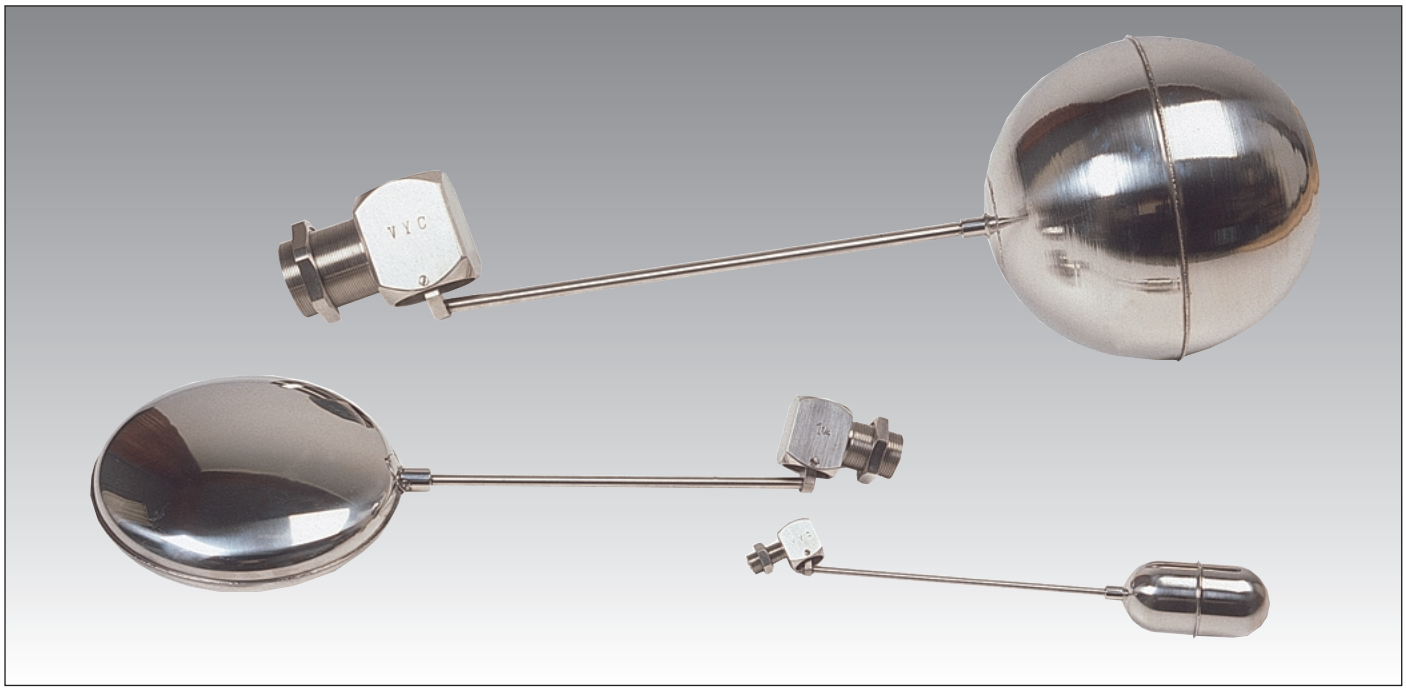
Float valve

Model 151



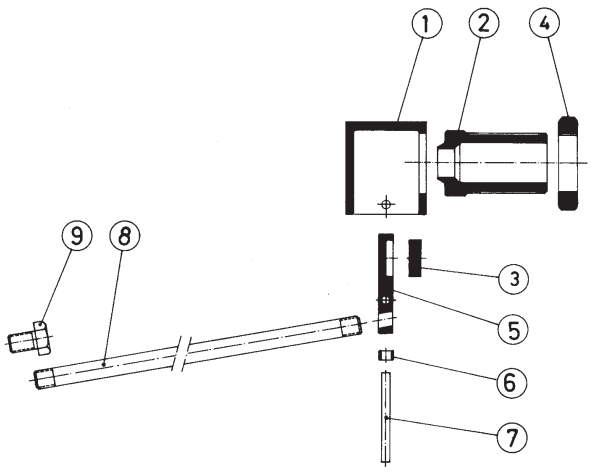
To control the level of liquids in tanks, deposits, etc.

Specifications

— Nominal pressure: PN-16.
— Whitworth gas-tight male thread cylindrical connector ISO 228/1 1978 (DIN-259), from 3/8" to 2 1/2".

IMPORTANT
Depending on demand:
— Fluorelastomer closure (Viton), etc.
— Buoy with coating of Epoxy, PTFE (Teflón), Chemical nickel, Shining smooth, etc.
— Entirely Stainless steel (DIN-1.4571) (AISI-316Ti).
(DIN-1.4301) (AISI-304), etc.

N°. PIECE	PIECE	MATERIAL		
		STAINLESS STEEL		
1	Body	S. steel (DIN-1.4401) (AISI-316)		
2	Coupling	S. steel (DIN-1.4401) (AISI-316)		
3	Closure	Silicone's rubber		
4	Nut	S. steel (DIN-1.4401) (AISI-316)		
5	Lever	S. steel (DIN-1.4401) (AISI-316)		
6	Separator	S. steel (DIN-1.4401) (AISI-316)		
7	Pin	S. steel (DIN-1.4401) (AISI-316)		
8	Stem	S. steel (DIN-1.4401) (AISI-316)		
9	Connector	S. steel (DIN-1.4401) (AISI-316)		
DN		3/8" to 2 1/2"		
PN		16		
OPERATING CONDITIONS	PRESSURE IN bar	16	15	14
	MAXIMUM TEMP. IN °C	120	180	200
	MINIMUM TEMP. IN °C	- 60		



Closure pressure

The closure pressure of the valve will vary with relation to the specific weight of the liquid being controlled according to the following formula:

$$P = \frac{p}{pa} Pa$$

P = Closure pressure liquid.
p = Specific weight liquid.
Pa = Closure pressure water.
pa = Specific weight water.

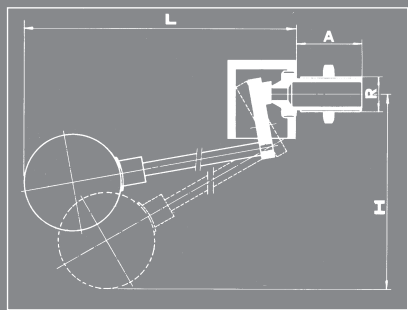
R	REDUCED PITCH Ø	A	PRESSURE bar	1	0,5	2	0,5	3	0,5	4	0,5	5	0,5	6	0,5	7	0,5	8	0,5	9	0,5	10	0,5	11	0,5	12	0,5	13	0,5	14	0,5	15	0,5	16
3/8"	6	31	BUOY	C. Ø60x120					E. Ø90						E. Ø110																			P.Ø150x60
			L	396					366						386																			428
			H	215					210						225																			222
			WEIGHT IN kgs.	0,38					0,41						0,50																			0,60
			CODE	2008-151.3382					2008-151.3382 (+) 34005																											
			FLOW l/h WATER 20°C	1058		1560		1780		2027		2270		2482		2603		2640		2794		2880		2970		3120		3250		3380		3510		3614
1/2"	10	35	BUOY	C. Ø60x120					E. Ø90			E. Ø110			P. Ø150x60																			
			L	434					404			424			466																			
			H	252					245			260																						
			WEIGHT IN kgs.	0,53					0,56			0,64			0,90																			
			CODE	2008-151.30221 (-) 34005					2008-151.30221						2008-151.30222																			
			FLOW l/h WATER 20°C	2644		3738		4575		5287		5640		6346		7385		7457		7931		8354		8674		9051		9425						
3/4"	12,5	40	BUOY	E. Ø90			E. Ø110			P. Ø150x60			E. Ø150																				
			L	450			469			509			507																				
			H	240			255			250			282																				
			WEIGHT IN kgs.	1,04			1,12			1,27			1,32																				
			CODE	2008-151.3342																														
			FLOW l/h WATER 20°C	4522		6395		7823		9044		10090		11033		11937		12797		13566		14289		14850										
1"	16	45	BUOY	E. Ø110		P. Ø150x60		P. Ø200x80			E. Ø150		E. Ø150		P. Ø250x95																			
			L	475		507		565			510		615		732																			
			H	257		250		275			285		327		350																			
			WEIGHT IN kgs.	1,20		1,34		1,48			1,38		1,25		1,77																			
			CODE	2008-151.31021									2008-151.31022																					
			FLOW l/h WATER 20°C	6480		9270		11352		13148		14667		16044		17363		18369		19398		20510												
1 1/4"	21	50	BUOY	E. Ø150			P. Ø250x95				E. Ø200						P. Ø300x15																
			L	637			737				680						787																
			H	317			327				355						350																
			WEIGHT IN kgs.	1,82			2,21				1,95						2,72																
			CODE	2008-151.31421							2008-151.31422																							
			FLOW l/h WATER 20°C	11508		16226		19925		23016		25663		28080		30382		32204		34136		36040												
1 1/2"	24	57	BUOY	P. Ø250x95				E. Ø200				P. Ø300x115					P. Ø350x130 or E. Ø300																
			L	660				610				710					760 or 710																
			H	285				315				310					330 or 385																
			WEIGHT IN kgs.	2,60				2,57				3,11					3,25 or 3,30																
			CODE	2008-151.3121				2008-151.3122																										
			FLOW l/h WATER 20°C	14548		20512		25167		29070		32442		35362		38544		42216		46089		50200												
2"	29	60	BUOY	E. Ø200					P. Ø300x115				P. Ø350x150						E. Ø300														
			L	677					777				827						777														
			H	410					417				440						485														
			WEIGHT IN kgs.	3,86					4,39				4,81						4,87														
			CODE	2008-151.3202																														
			FLOW l/h WATER 20°C	22136		31648		38296		44273		49364		54010		58439		63114		68030		72792												
2 1/2"	40	79	BUOY	E. Ø200					P. Ø300x115			P. Ø350x130 or E. Ø300																				
			L	704					804			845 or 804																				
			H	420					427			450 or 490																				
			WEIGHT IN kgs.	6,52					7,30			7,72 or 7,50																				
			CODE	2008-151.3222																														
			FLOW l/h WATER 20°C	36015		50138		61128		70615		78342																						

IMPORTANT

— C. - Cylindrical buoy.
E. - Spherical buoy.
P. - Flat buoy.

— Use the relevant code for the buoy, according to brochure Model 152.

— Buoys suitable for higher pressure are also suitable for use at lower pressure.



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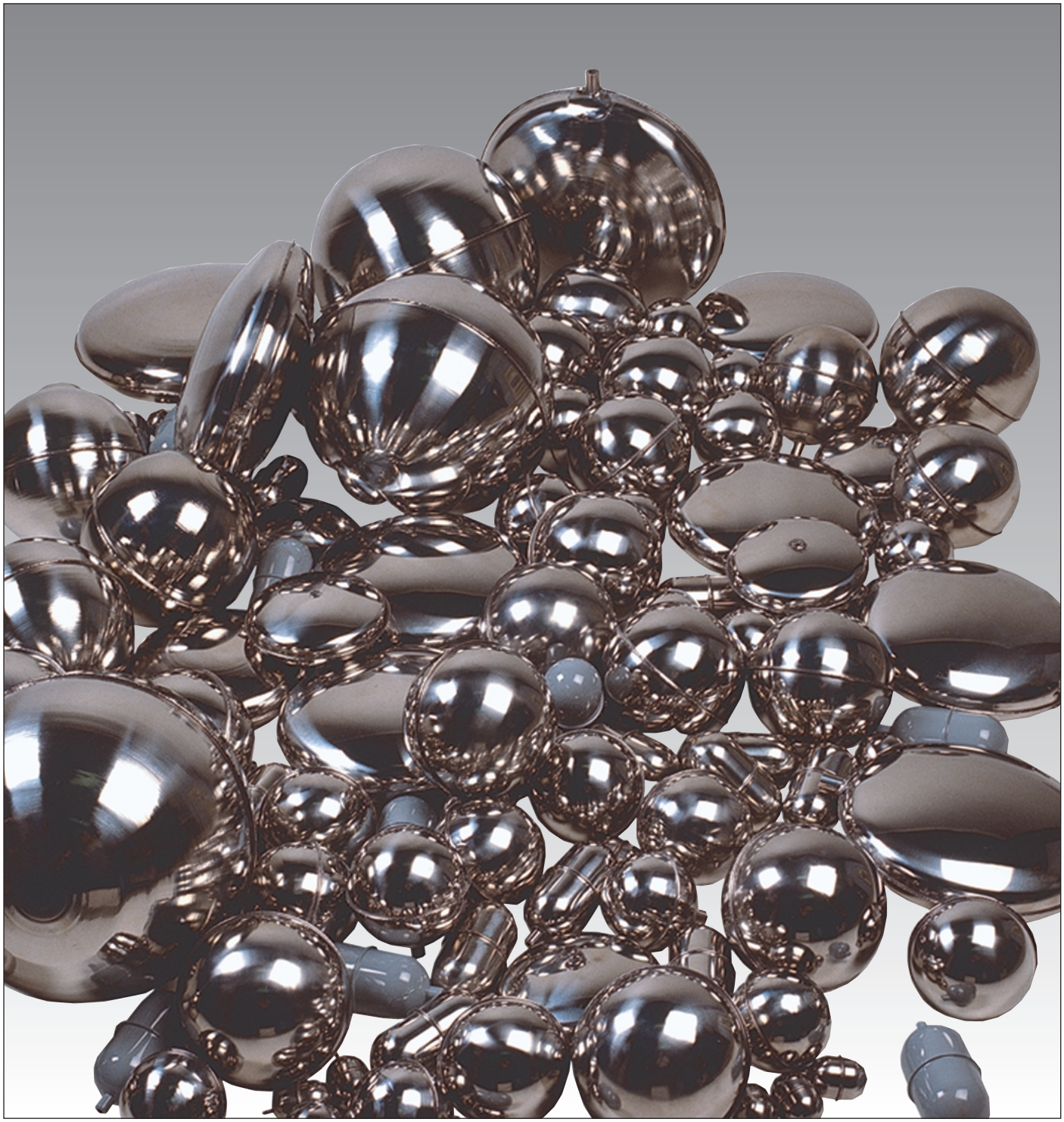
Buoys Model 152

Specifications

Entirely Stainless steel (DIN-1.4401) (AISI-316).
Finished: Glass-ball blast.

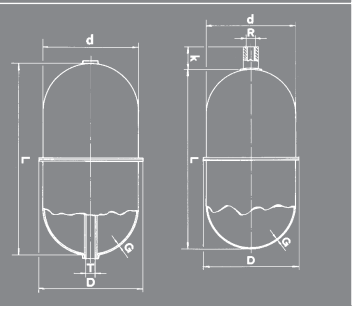
IMPORTANT
Depending on demand:
— Stainless steel (DIN-1.4571) (AISI-316Ti).
(DIN-1.4301) (AISI-304), etc.
— Coating of Epoxy, PTFE (Teflón), Chemical nickel, Shining smooth, etc.



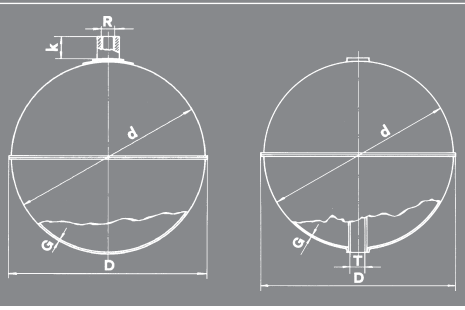
	BUOY d x L	D	SUPPORT R	K	TUBE T	SERVICE TEMPERATURE °C 20	50	100	150	200	PLATE G	WEIGHT IN Kgs.	MAXIMUM THRUST IN WATER (Kp)	CODE 2008 —
CYLINDRICAL	Ø 40 x 50	Ø 42(1)	M4	10	—	20,0	18,0	15,5	14,0	12,5	0,8	0,04	0,015	152.0012
			—	—	4/6							0,05	0,012	152.0022
	Ø 60 x 120 *	Ø 65	M6	16	—	19,0	17,1	14,8	13,3	11,9		0,13	0,128	152.0032
						22,0	20,0	17,2	15,0	13,5		0,14		152.00321
	*		—	—	6/8	19,0	17,1	14,8	13,3	11,9		0,16	0,110	152.0042
						22,0	20,0	17,2	15,0	13,5		0,17		152.00421
	d													
SPHERICAL	Ø 60	Ø 63	M4	30	—	38,0	34,2	29,6	26,6	23,9	0,8	0,08	0,025	152.0052
	Ø 90	Ø 94	M10	16	—	25,0	22,5	19,5	17,5	15,7		0,16	0,194	152.0062
	Ø 105	Ø 112	—	—	18/20	21,9	19,7	17,1	15,4	13,8		0,28	0,340	152.0172
	Ø 110	Ø 116	M10	16	—	20,0	18,0	15,6	14,0	12,6		0,24	0,434	152.0072
	Ø 150	Ø 156				15,0	13,5	11,7	10,5	9,4		0,42	1,220	152.0082
	Ø 200	Ø 206	M12	16	—	13,5	12,2	10,5	9,4	8,5	1	0,62	3,340	152.0092
	Ø 300	Ø 307				8,5	7,7	6,6	5,9	5,3		1,60	12,280	152.0102
	d x H													
FLAT	Ø 150 x 60	Ø 156	M10	20	—	5,8	5,2	4,5	4,0	3,6	0,8	0,34	0,380	152.0112
			—	—	8/10							0,32	0,370	152.0122
	Ø 200 x 80	Ø 206	M10	20	—	4,3	3,9	3,3	3,0	2,7		0,52	0,954	152.0132
	Ø 250 x 95	Ø 256				3,5	3,2	2,7	2,4	2,1		0,94	2,160	152.0142
	Ø 300 x 115	Ø 307	M12	25	—	3,3	2,9	2,5	2,3	2,0	1	1,40	3,700	152.0152
	Ø 350 x 130	Ø 356				2,8	2,5	2,1	1,9	1,7		1,82	6,300	152.0162

DIAGRAM

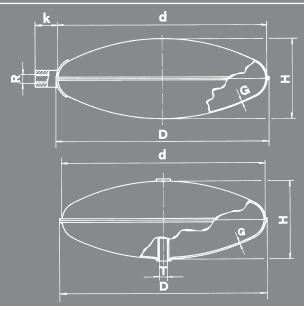
CYLINDRICAL



SPHERICAL



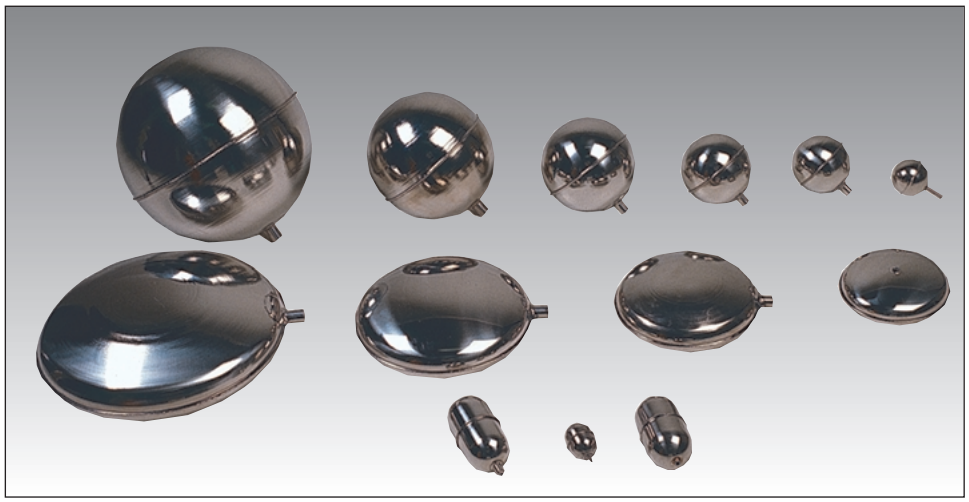
FLAT



* These buoys are supplied with Epoxy coating.

— Maximum service pressure in bar, for the effect of corrosion, into the vessel.
If corrosion is greater than 0,1 mm. we advise you change the buoy.

(1) Male thread



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Siphon tube

For pressure gauges Model 011

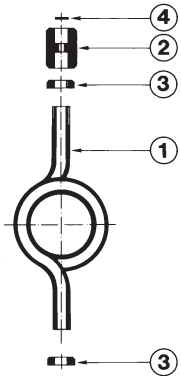
Prevents breakdowns and misalignments in pressure gauges.
Absorbs abrupt pressure changes or water hammer which cause malfunctioning pressure gauges.
Isolates the pressure gauge from extreme temperatures by creating thermal isolation space.
If working with steam, ensure that the pressure gauge is activated by water condensation and not by steam.

Specifications

— Manufactured from unweldered tubing.
— Standard model bent cold.
— Pressure and temperature permitted by DIN-2401. Sheet 2.

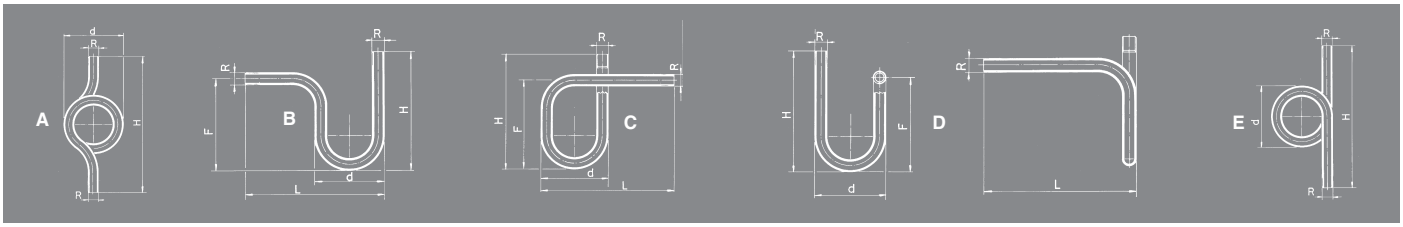
IMPORTANT
Depending on demand:
— From B, C, D and E.
— NPT screws, ISO metric, socket welding ends "SW", etc.
— Alternative thicknesses and materials.
— Complies with DIN-16282, DIN-16283 and DIN-16284.

N°. PIECE	PIECE	MATERIAL						
		CARBON STEEL			STAINLESS STEEL			
1	Siphon tube	Carbon steel (DIN-1.0308 ST-35)			Stainless steel (DIN-1.4401) (AISI-316)			
2	Sleeve	Brass (DIN-1.7660 CuZn40Pb2)			Stainless steel (DIN-1.4401) (AISI-316)			
3	Nut	Brass (DIN-1.7660 CuZn40Pb2)			Stainless steel (DIN-1.4401) (AISI-316)			
4	Gasket	Klingerit cardboard			Klingerit acidit cardboard			
DN		1/4" to 1/2"						
PN		32			40			
OPERATING CONDITIONS	PRESSURE IN bar	32	25	20	40	32	25	
	MAXIMUM TEMP. IN °C	120	300 (1)	400 (1)	120	300	400	
	MINIMUM TEMP. IN °C	- 10			- 60			



(1) For temperatures over 250°C only without sleeve and nut.

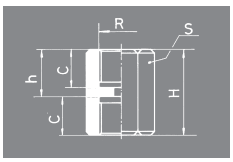
R		1/4"					3/8"					1/2"				
CONNECTIONS		Whitworth gas-tight cylindrical male thread ISO 228/1 1978 (DIN-259)														
TUBE CONSTRUCTION STANDARD	CARBON STEEL	DIN-2440 without welding														
	STAINLESS STEEL	DIN-2462 without welding														
TUBE EXTERIOR Ø	CARBON STEEL	13,80					17,20					21,30				
	STAINLESS STEEL	13,71					17,15					21,34				
TUBE INTERIOR Ø	CARBON STEEL	8,80					12,50					16,00				
	STAINLESS STEEL	9,23					12,53					15,80				
FORM		A	B	C	D	E	A	B	C	D	E	A	B	C	D	E
d		85	85	85	85	85	100	100	100	100	100	118	118	118	118	118
F		—	130	130	130	—	—	140	140	140	—	—	160	160	160	—
H		193	165	165	165	193	230	180	180	180	230	278	205	205	205	278
L		—	180	180	180	—	—	210	210	210	—	—	240	240	240	—
WEIGHT IN Kgs.	CARBON STEEL	0,28	0,26	0,31	0,31	0,27	0,43	0,38	0,45	0,45	0,42	0,72	0,62	0,74	0,74	0,71
	STAINLESS STEEL	0,27	0,26	0,30	0,30	0,26	0,43	0,38	0,45	0,45	0,41	0,76	0,66	0,78	0,78	0,75
CODE	CARBON STEEL	2201-011.7045	2201-011.70453	2201-011.70455	2201-011.70457	2201-011.70459	2201-011.7385	2201-011.73853	2201-011.73855	2201-011.73857	2201-011.73859	2201-011.7025	2201-011.70253	2201-011.70255	2201-011.70257	2201-011.70259
	STAINLESS STEEL	2201-011.8042	2201-011.80423	2201-011.80425	2201-011.80427	2201-011.80429	2201-011.8382	2201-011.83823	2201-011.83825	2201-011.83827	2201-011.83829	2201-011.8022	2201-011.80223	2201-011.80225	2201-011.80227	2201-011.80229

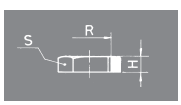


SLEEVE				
R		1/4"	3/8"	1/2"
CONNECTIONS		Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259)		
C		12	15	18
H		28	34	40
h		16	19	22
S		20 (1)	24	28 (2)
WEIGTH IN Kgs.	BRASS	0,06	0,09	0,12
	S. STEEL	0,05	0,08	0,12
CODE	BRASS	2201-011.00411	2201-011.03811	2201-011.00211
	S. STEEL	2201-011.00421	2201-011.03821	2201-011.00221

NUT				
R		1/4"	3/8"	1/2"
CONNECTIONS		Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259)		
H	BRASS	6	7	5
	S. STEEL	5	6	7
S	BRASS	20	24	28
	S. STEEL	19	24	25
WEIGTH IN Kgs.	BRASS	0,01	0,02	0,02
	S. STEEL	0,01	0,02	0,02
CODE	BRASS	2201-011.00412	2201-011.03812	2201-011.00212
	S. STEEL	2201-011.00422	2201-011.03822	2201-011.00222

The sleeves are supplied with the gasket for connection to the pressure gauge.
(1) 19 in Stainless steel.
(2) 27 in Stainless steel.





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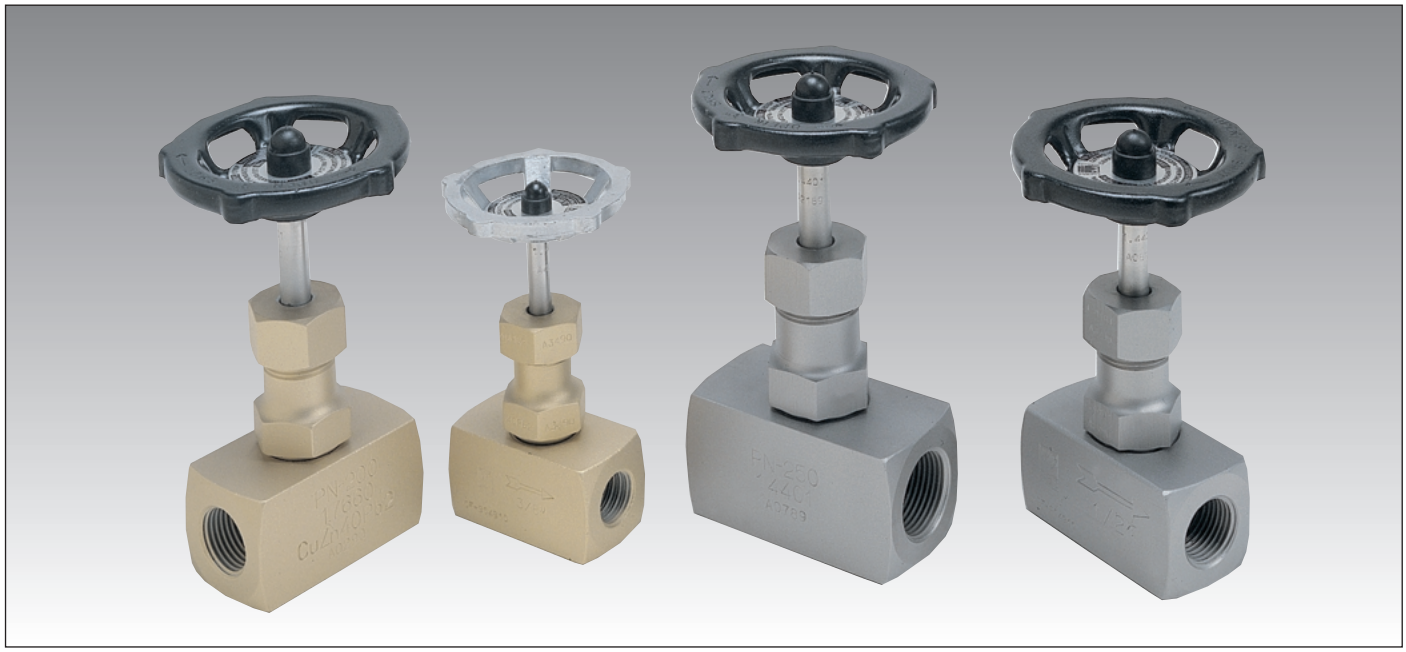
Needle valve

Model 147



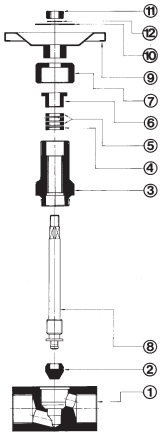
For liquids, gases and steam.
For use in hydraulic, pneumatic, heating and steam systems, chemical and food industries, etc.

Specifications

— Mobile or floating closure.
— Reduced pitch.
— Lightly tightening the handwheel guarantees it is perfectly tightness, which exceeds the standard DIN-3230. Sheet 3.
— Axis with rear closure "back seating" which allows the packing to be changed while in use and thus avoids it having any contact with the fluid.
— Fully constructed from laminated bars.

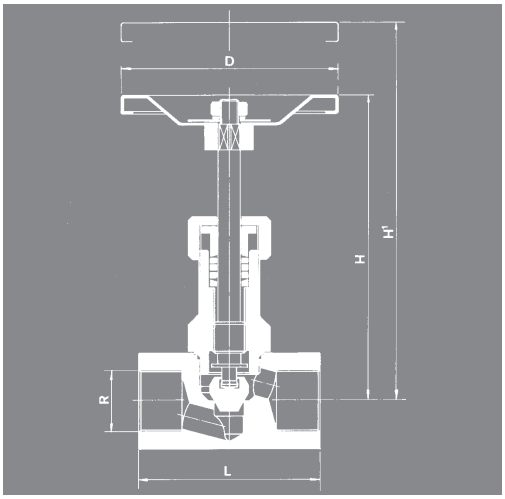
IMPORTANT
Depending on demand:
— Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).
— PTFE (Teflón) packing.
— Stainless steel handwheel or handle (DIN-1.4401) (AISI-316).
— Other connections.

N°. PIECE	PIECE	MATERIAL										
		BRASS			CARBON STEEL				STAINLESS STEEL			
1	Body	Brass (DIN-1.7660 CuZn40Pb2)			C. steel (DIN-1.1191 Ck-45)				S. steel (DIN-1.4401) (AISI-316)			
2	Closure	S. steel (DIN-1.4401) (AISI-316)			S. steel (DIN-1.4401) (AISI-316)				S. steel (DIN-1.4401) (AISI-316)			
3	Stuffing box body	Brass (DIN-1.7660 CuZn40Pb2)			C. steel (DIN-1.1191 Ck-45)				S. steel (DIN-1.4401) (AISI-316)			
4	Ring	S. steel (DIN-1.4401) (AISI-316)			S. steel (DIN-1.4401) (AISI-316)				S. steel (DIN-1.4401) (AISI-316)			
5	Packing	Graphite			Graphite				Graphite			
6	Stuffing box	Brass (DIN-1.7660 CuZn40Pb2)			C. steel (DIN-1.1191 Ck-45)				S. steel (DIN-1.4401) (AISI-316)			
7	Stuffing box nut	Brass (DIN-1.7660 CuZn40Pb2)			C. steel (DIN-1.1191 Ck-45)				S. steel (DIN-1.4401) (AISI-316)			
8	Axis	S. steel (DIN-1.4401) (AISI-316)			S. steel (DIN-1.4401) (AISI-316)				S. steel (DIN-1.4401) (AISI-316)			
9	Handwheel (1)	C. steel (DIN-1.0517 MU ST-3)			C. steel (DIN-1.0517 MU ST-3)				C. steel (DIN-1.0517 MU ST-3)			
10	Plate	Aluminium			Aluminium				Aluminium			
11	Nut	S. steel (DIN-1.4401) (AISI-316)			S. steel (DIN-1.4401) (AISI-316)				S. steel (DIN-1.4401) (AISI-316)			
12	Washer	S. steel (DIN-1.4401) (AISI-316)			S. steel (DIN-1.4401) (AISI-316)				S. steel (DIN-1.4401) (AISI-316)			
DN		1/4" to 2" (GAS, NPT or SW)										
PN		200			250				250			
OPERATING CONDITIONS	PRESSURE IN bar	200	175	34	250	211	180	167	250	207	170	164
	MAXIMUM TEMP. IN °C	120	150	200	120	300	350	400	120	200	350	400
	MINIMUM TEMP. IN °C	- 60			- 10				- 60			



(1) The 1/4" to 1 1/4" handwheels are supplied in Aluminium (DIN-3.2581.01 G-AlSi12).

R			1/4"	3/8"	1/2"	3/4"	1"	1 1/4"	1 1/2"	2"
CONNECTIONS			Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259)							
			NPT thread ANSI - B 2.1							
			Socket welding ends SW ANSI - B 16.11							
H			77	89	102	111	132	158	172	191
h^1			83	94	111	121	146	173	192	216
L			50	55	65	75	90	95	100	112
D			60	60	75	75	90	100	125	125
REDUCED PITCH Ø			6,00	8,00	9,50	11,50	15,00	17,00	21,00	25,00
WEIGHT IN Kgs.	BRASS		0,38	0,65	0,98	1,12	2,58	3,36	4,59	7,76
	CARBON STEEL		0,35	0,50	0,92	1,05	2,40	3,16	4,31	7,22
	STAINLEES STEEL		0,36	0,51	0,93	1,06	2,43	3,20	4,36	7,31
CODE	BRASS 2004-147.	GAS	0041	0381	0021	0341	0101	0141	0121	0201
		NTP	00411	03811	00211	03411	01011	01411	01211	02011
	CARBON STEEL 2004-147.	GAS	0044	0384	0024	0344	0104	0144	0124	0204
		NTP	00441	03841	00241	03441	01041	01441	01241	02041
		SW	00442	03842	00242	03442	01042	01442	01242	02042
	STAINLESS STEEL 2004-147.	GAS	0042	0382	0022	0342	0102	0142	0122	0202
		NTP	00421	03821	00221	03421	01021	01421	01221	02021
		SW	00422	03822	00222	03422	01022	01422	01222	02022



DN	FLOW COEFFICIENT	
	Kv m^3/h ΔP = 1 bar	Cv l/min. ΔP = 1 Psi = 0,07 bar
1/4"	0,68	3,00
3/8"	1,11	5,00
1/2"	2,16	10,10
3/4"	4,10	18,80
1"	6,20	25,00
1 1/4"	9,80	43,00
1 1/2"	12,95	52,00
2"	19,40	82,00

Load losses

The adjoining diagram reflects the load loss curves for water at 20°C.

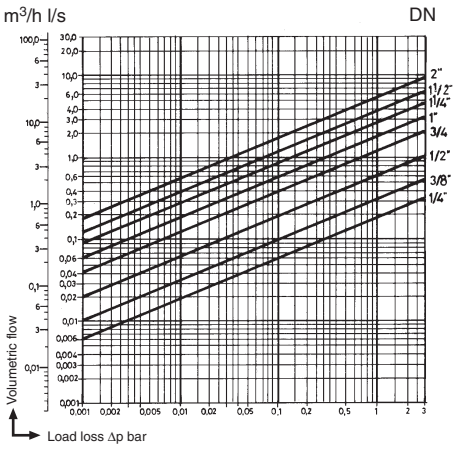
In order to determine other fluids load losses, calculate the flow of these equivalent to water.

$$Q_A = \sqrt{\frac{\varrho}{1.000}} \cdot Q$$

Q_A = Flow equivalent to water in m^3/h.

ϱ = Fluid density in operating conditions in Kg/m^3.

Q = Fluid flow in operating conditions in m^3/h.



Informative brochure, without obligation and subject to our General Sales Conditions.

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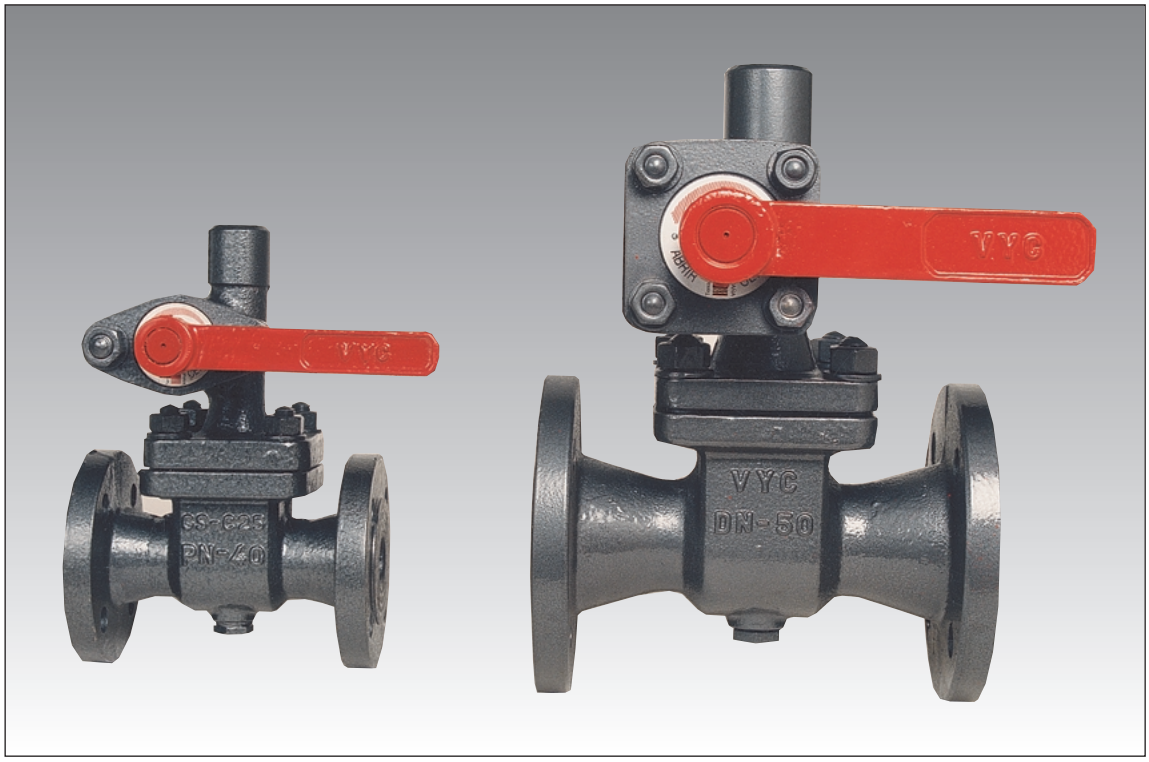
Blowdown valve for bleeding dirt and sludge

For steam boilers **Model 460**



The water in the boiler contains salts, which are built up by the continuous evaporation. If these salts are not eliminated, bubbles and foam are formed when the density of the water increased.

To prevent these lime deposits forming, the water supply must be suitably treated, with the result that certain salts are changed producing impurities which form sludge and encrusted deposits which then adhere to the sides or the bottom of the boiler and to the combustion tubes, together with particles of dirt, remains of electrodes, carbonic acid, oxygen, etc. This leads to a high level of rust which may:

- Destroy the metal plate of the boiler, causing high maintenance costs.
- Produce thermic voltages, causing cracks in the metal plate and soldering cord.
- Notably slow down thermic transmission, meaning an unnecessary and excessive consumption of fuel.

Nominal pressure: PN-40.

Permitted pressures and temperatures according to DIN-2401. Sheet 2.

Flange connection: DN-25, 32, 40 and 50 (DIN-2545).

Specifications

— A the draining section is opened quickly and completely by driving the lever from right to left. The deposits, collected at the bottom of the boiler, are disturbed and sucked up by the sudden air intake which carries them out.

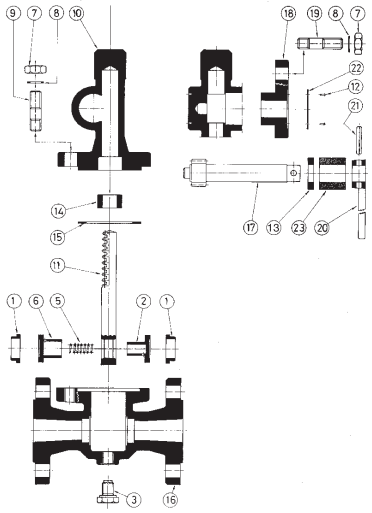
— Direct emptying passage, meaning a high volume and low level of load loss.

— Rotating the lever from left to right causes instant closing, preventing irrevocable losses of water and pressure.

— Seatings and stoppers treated and balanced ensuring a level of tightness higher than that required by DIN-3230, Sheet 3.

— Equipped with a screw for the drainage of the sedimentations.

— Simplicity of design ensures good performance.



According to demand: Closing surfaces with "stellita n°. 6" DIN-8555.

N°. PIECE	PIECE	MATERIAL
1	Seating	S. steel (DIN-1.4028) (AISI-420)
2,6	Plug	S. steel (DIN-1.4028) (AISI-420)
3	Cap	Carb. steel (DIN-1.1191 Ck-45)
4,15	Coupling	Klingerit cardboard
5	Spring	S. steel (DIN-1.4300) (AISI-302)
7	Nut	Carb. steel (DIN-1.1141 Ck-15)
8	Washer	Carb. steel (DIN-1.1141 Ck-15)
9,19	Stud	Carb. steel (DIN-1.1181 Ck-35)
10	Cover	Cast steel (DIN-1.0619 GS-C 25)
11	Rack	S. steel (DIN-1.4305) (AISI-303)
12	Rivets	Carb. steel (DIN-1.1141 Ck-15)
13	Gland disc	Bronze (DIN-2.1096.03 GC-Rg-5)
14	Valve base	Bronze (DIN-2.1096.04 GC-CuSn5ZnPb)
16	Body	Cast steel (DIN-1.0619 GS-C 25)
17	Axis with pinion	S. steel (DIN-1.4305) (AISI-303)
18	Gland	Cast steel (DIN-1.0619 GS-C 25)
20	Lever	Cast iron (DIN-0.6020 GG 20)
21	Elastic gudgeon	Carb. steel (DIN-1.1231 Ck-67)
22	Gauge plate	Aluminium
23	Seal	Graphite

DN		25 to 50		
PN		40		
OPERATING CONDITIONS	PRESSURE IN bar	40	35	32
	MAXIMUM TEMP. IN °C	120	200	250

Efficiency and Emptying

Bleeding processes should coincide as far as possible with moments when the water is at rest or at minimum steam extraction, so that the deposits are collected at the bottom of the boiler.

Carry out bleeding process at least every 8 hours. The effective duration is estimated to be 3÷4 seconds although we recommend you keep to the following mathematical model:

To establish the salinity of the water, the quantity of salts extracted per unit of time must be equal to that of the water supply in this same period. Which can be expressed:

$$M \cdot A = S \cdot P$$

Where:

Q = Real steam production of the boiler. (Kg/h).
A = Water supply. (l/h).
M = Salinity of the water supply. (mg/l).
P = Water extracted in the bleeding process. (l/h).
S = Desired salinity inside the boiler. (mg/l).
ϱ = Specific mass of water inside the boiler. (Kg/l).
p = Working pressure. (bar).

Example:
Q = 1.850 Kg/h.
M = 150 mg/l.
S = 4.000 mg/l.
ϱ = 1 Kg/l.
p = 20 bar.

The water to be bled compared to the steam produced is:

$$P = \frac{M}{(S-M) \cdot \varrho} \cdot Q$$

P = 72,07 l/h.

For the DN the volume (C) in l/s can be calculated as shown in the diagram.

C = 18 l/s.

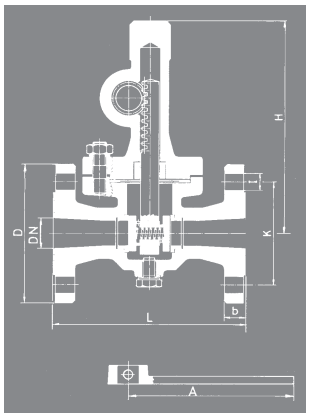
The quotient (P/C) tells us the intervals between bleeding processes and the duration of them (T) in seconds per hour.

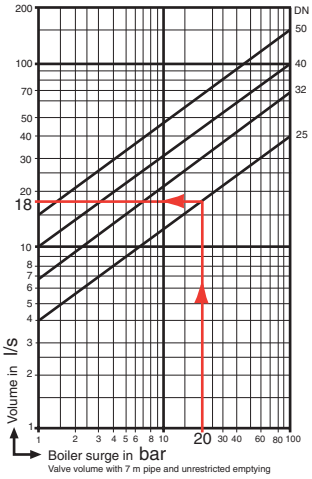
T = 4 s.
- The boiler will bleed itself for 4 seconds every hour.
- If, in accordance with the mathematical model, times shorter or longer than 3÷4 seconds are obtained, the bleeding process must be carried out more or less times.

The combination of the Continuous desalting valve* and the Blowdown valve for bleeding dirt and sludge• is essential for optimizing the boiler's efficiency, and include its maximum security and availability.

Neither of them can be replaced with others not designed for this specific application. Their moderate cost is depreciated in the short term.

* (See brochure for Models 560 and 560-A).
• (See brochure for Models 260 and 260-A).





DN	25	32	40	50
H	179	245	245	245
L	160	180	200	230
D	115	140	150	165
K	85	100	110	125
I	14	18	18	18
b	18	18	18	20
A	135	170	170	170
DRILLS N°.	4	4	4	4
WEIGHT IN Kgs.	8,50	16,40	18,50	20.00
CODE	2103-460.8104	2103-460.8144	2103-460.8124	2103-460.8204

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Blowdown valve for bleeding dirt and sludge

For steam boilers **Model 260**

The water in the boiler contains salts, which are built up by the continuous evaporation. If these salts are not eliminated, bubbles and foam are formed when the density of the water increases.

To prevent these lime deposits forming, the water supply must be suitably treated, with the result that certain salts are changed producing impurities which form sludge and encrusted deposits which then adhere to the sides or the bottom of the boiler and to the combustion tubes, together with particles of dirt, remains of electrodes, carbonic acid, oxygen, etc. This leads to a high level of rust which may:

- Destroy the metal plate of the boiler, causing high maintenance costs.
- Produce thermic voltages, causing cracks in the metal plate and soldering cord.
- Notably slow down thermic transmission, meaning an unnecessary and excessive consumption of fuel.

Nominal pressure: PN-40.

Permitted pressures and temperatures according to DIN-2401. Sheet 2.

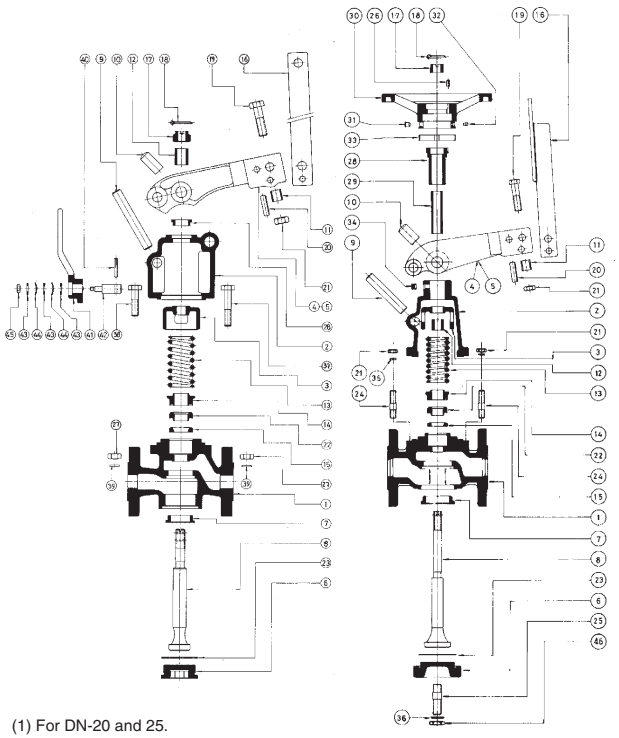
Flange connection: DN-20, 25, 32, 40 and 50 (DIN-2545).

Specifications

— Pushing the pedal downwards causes the drain section to open quickly and completely. The deposits collecting at the botton of the boiler, are disturbed and sucked up by the sudden air intake which carries them out.
— Instant closing device, preventing irrevocable losses of water and pressure.
— Seating and closing axis treated and balanced, so that a degree of tightness, even higher than the level required by DIN-3230, Sheet 3, is obtained.
— Coupling of the closing axis is self-tightening and maintenance free.
— To solve problems of space, the pedal can be positioned vertically or horizontally.

Model DN-20 and 25. (Pedal driven).
— By moving the blocking lever towards the emptying position, the opening blocks.
— With the blocking lever in the opposite direction to that of the passage, the valve is in manual drive.
— When the valve is being manually driven and with an interlocking gudgeon, it can be fixed in the continuous draining position for emptying the boiler.

Model DN-32, 40 and 50. (Pedal and flywheel driven).
— Rotating the flywheel towards (C) all the way round, locks the valve into the closed position.
— Driving the flywheel between the closed position (C) and the central buffer ("Clic") an emptying position is obtained, with the pedal, which is proportionate to the pitch section which we set.
— Rotating the flywheel towards (A), the valve stays open increasing progressively, the pitch section. When it will go no further towards (A), a maximum opening is obtained which facilitates the emptying of the boiler.



(1) For DN-20 and 25.
(2) For DN-32, 40 and 50.

N°. PIECE	PIECE	MATERIAL
1	Body	Cast steel (DIN-1.0619 GS-C 25)
2	Headstock	Cast steel (DIN-1.0619 GS-C 25)
3	Spring press	Cast steel (DIN-1.0619 GS-C 25)
4, 5	Bracket	Cast steel (DIN-1.0619 GS-C 25)
6	Cap	Carbon steel (DIN-1.1191 Ck-45)
7	Seating	Stainless steel (DIN-1.4028) (AISI-420)
8	Axis	Stainless steel (DIN-1.4028) (AISI-420)
9	Buffer axis	Carbon steel (DIN-1.1181 Ck-35)
10	Leading axis	Carbon steel (DIN-1.1181 Ck-35)
11	Removal coupling	Carbon steel (DIN-1.0308 ST-35)
12, 29	Valve base	Carbon steel (DIN-1.0308 ST-35)
13	Spring	Spring steel (DIN-1.0600 GRADE-B)
14	Gland	Bronze (DIN-2.1096.03 GZ-Rg-5)
15	Ring	Bronze (DIN-2.1096.03 GZ-Rg-5)
16	Pedal (1)	Carbon steel (DIN-1.1141 Ck-15)
	(2)	Cast steel (DIN-1.0619 GS-C 25)
17, 21, 27, 45, 46	Nut	Carbon steel (DIN-1.1141 Ck-15)
18, 40	Gudgeon	Carbon steel (DIN-1.1141 Ck-15)
19, 37, 38	Screw	Carbon steel (DIN-1.1191 Ck-45)
20	Elastic gudgeon	Carbon steel (DIN-1.1231 Ck-67)
22	Retene	E.P.D.M.
23	Cover joint	Klingerit cardboard
24, 25	Stud	Carbon steel (DIN-1.1181 Ck-35)
26	Dowel	Carbon steel (DIN-1.1181 Ck-35)
28	Valve base	Bronze (DIN-2.1096.03 GZ-Rg-5)
30	Flywheel	Cast iron (DIN-0.6020 GG-20)
31, 34	Buffer	Stainless steel (DIN-1.4028) (AISI-420)
32	Buffer ring	Carbon steel (DIN-1.1141 Ck-15)
33	Ring	Molybdenum chrome steel (DIN-1.7223 41CrMo4)
35, 36, 39, 43, 44	Washer	Carbon steel (DIN-1.1141 Ck-15)
41	Lever	Cast steel (DIN-1.0619 GS-C 25)
42	Leading axis	Stainless steel (DIN-1.4028) (AISI-420)

DN		25 to 50		
PN		40		
OPERATING CONDITIONS	PRESSURE IN bar	10	35	32
	MAXIMUM TEMP. IN °C	120	200	250

Efficiency and Emptying

Bleeding processes should coincide as far as possible with moments when the water is at rest or at minimum steam extraction, so that the deposits are collected at the bottom of the boiler.

Carry out bleeding process at least every 8 hours. The effective duration is estimated to be 3 ÷ 4 seconds although we recommend you keep to the following mathematical model:

To establish the salinity of the water, the quantity of salts extracted per unit of time must be equal to that of the water supply in this same period. Which can be expressed:

$$M \cdot A = S \cdot P$$

Where:

Q = Real steam production of the boiler. (Kg/h).
A = Water supply. (l/h).
M = Salinity of the water supply. (mg/l).
P = Water extracted in the bleeding process. (l/h).
S = Desired salinity inside the boiler. (mg/l).
ϱ = Specific mass of water inside the boiler. (Kg/l).
p = Working pressure. (bar).

Example:
Q = 1.520 Kg/h.
M = 200 mg/l.
S = 4.000 mg/l.
ϱ = 1 Kg/l.
p = 3 bar.

The water to be bled compared to the steam produced is:

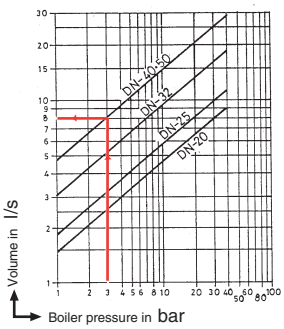
$$P = \frac{M}{(S-M) \cdot \varrho} \cdot Q$$

P = 80 l/h.

For the DN the volume (C) in l/s can be calculated as shown in the diagram.

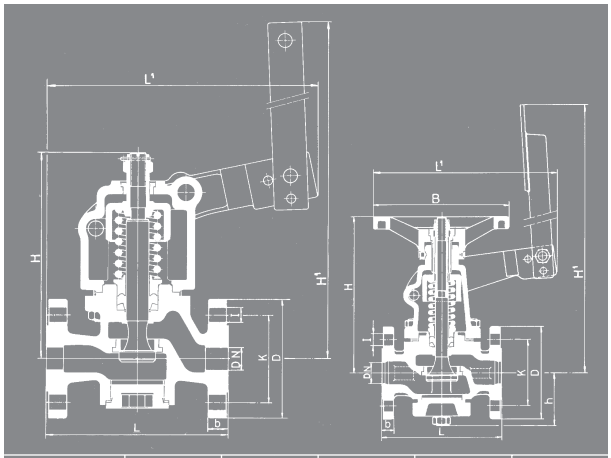
The quotient (P/C) tells us the intervals between bleeding processes and the duration of them (T) in seconds per hour.

C = 8 l/s.



T = 10 s.

- The boiler will bleed itself for 10 seconds every hour.
- If the bleeding time is of 3 seconds = 3 bleeding every hour. The interval between bleeding should be of 20 minutes.



DN	20	25	32	40	50
H	180	180	237	237	237
H¹	438	438	464	464	464
h	—	—	78	80	86
L	150	160	180	200	230
L¹	275	275	320	320	320
B	—	—	200	200	200
D	105	115	140	150	165
K	75	85	100	110	125
I	14	14	18	18	18
b	18	18	18	18	20
DRILLS N°.	4	4	4	4	4
WEIGHT IN Kgs.	11,12	12,13	20,20	20,22	22,14
CODE	2103-260.8344	2103-260.8104	2103-260.8144	2103-260.8124	2103-260.8204

The combination of the Continuous desalting valve* and the Blowdown valve for bleeding dirt and sludge• is essential for optimizing the boiler's efficiency, and include its maximum security and availability.

Neither of them can be replaced with others not designed for this specific application.
Their moderate cost is depreciated in the short term.

* (See brochure for Models 560 and 560-A).
• (See brochure for Models 460 and 260-A).

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Blowdown valve for automatic bleeding dirt and sludge

For steam boilers **Model 260-A**

The water in the boiler contains salts, which are built up by the continuous evaporation. If these salts are not eliminated, bubbles and foam are formed when the density of the water increases.

To prevent these lime deposits forming, the water supply must be suitably treated, with the result that certain salts are changed producing impurities which form sludge and encrusted deposits which then adhere to the sides or the bottom of the boiler and to the combustion tubes, together with particles of dirt, remains of electrodes, carbonic acid, oxygen, etc. This leads to a high level of rust which may:

- Destroy the metal plate of the boiler, causing high maintenance costs.
- Produce thermic voltages, causing cracks in the metal plate and soldering cord.
- Notably slow down thermic transmission, meaning an unnecessary and excessive consumption of fuel.

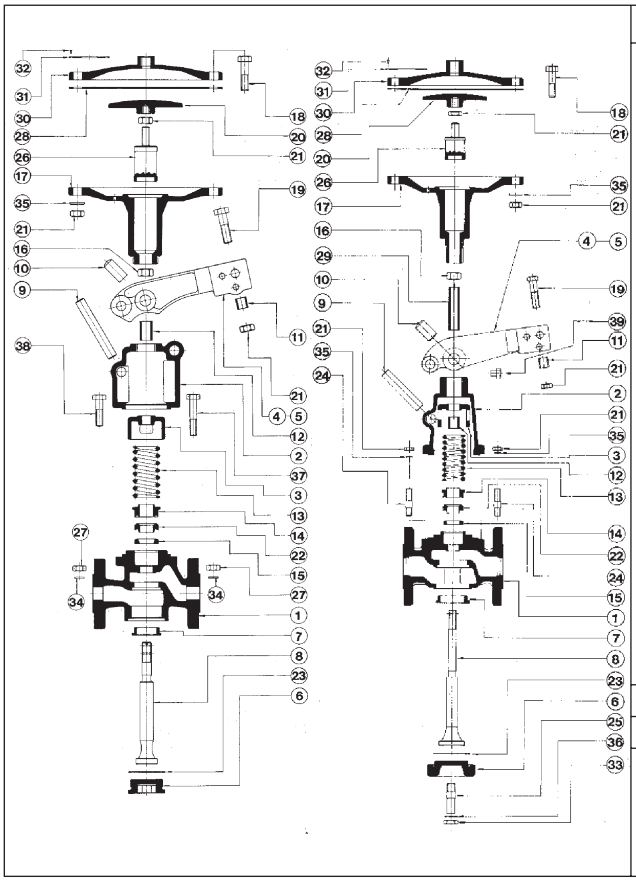
Nominal pressure: PN-40.

Permitted pressures and temperatures according to DIN-2401. Sheet 2.

Flange connection: DN-20, 25, 32, 40 and 50 (DIN-2545).

Specifications

— The drainage section is opened quickly and completely by the pressure of the control fluid on the membrane. The deposits collecting at the bottom of the boiler, are disturbed and sucked up by the sudden air intake which carries them out.
— Instant closing device, preventing irrevocable losses of water and pressure.
— Seating and closing axis treated and balanced, so that a degree of tightness, even higher than the leve required by DIN-3230, Sheet 3, is obtained.
— Coupling of the closing axis is self-tightening and maintenance free.



N°. PIECE	PIECE	MATERIAL
1	Body	Cast steel (DIN-1.0619 GS-C 25)
2	Headstock	Cast steel (DIN-1.0619 GS-C 25)
3	Spring press	Cast steel (DIN-1.0619 GS-C 25)
4, 5	Bracket	Cast steel (DIN-1.0619 GS-C 25)
6	Cap	Carbon steel (DIN-1.1191 Ck-45)
7	Seating	Stainless steel (DIN-1.4028) (AISI-420)
8	Axis	Stainless steel (DIN-1.4028) (AISI-420)
9	Buffer axis	Carbon steel (DIN-1.1181 Ck-35)
10	Leading axis	Carbon steel (DIN-1.1181 Ck-35)
11	Removal coupling	Carbon steel (DIN-1.0308 ST-35)
12, 29	Valve base	Carbon steel (DIN-1.0308 ST-35)
13	Spring	Spring steel (DIN-1.0600 GRADE-B)
14	Gland	Bronze (DIN-2.1096.03 GZ-Rg-5)
15	Ring	Bronze (DIN-2.1096.03 GZ-Rg-5)
16, 21, 27, 33	Nut	Carbon steel (DIN-1.1141 Ck-15)
17	Support	Nodular iron (DIN-0.7040 GGG-40)
18, 19, 37, 38	Screw	Carbon steel (DIN-1.1191 Ck-45)
20	Lead	Cast iron (DIN-0.6020 GG-20)
22	Retene	E.P.D.M.
23	Cap coupling	Klingerit cardboard
24, 25	Stud	Carbon steel (DIN-1.1181 Ck-35)
26	Chuck	Carbon steel (DIN-1.1151 Ck-25)
28	Membrane	Nitrile/Nylon
30	Cap	Nodular iron (DIN 0.7040 GGG-40)
31	Plaque	Aluminium
32	Rivet	Carbon steel (DIN-1.1141 Ck-15)
34, 35, 36	Washer	Carbon steel (DIN-1.1141 Ck-15)
39	Screw	Brass (DIN-1.7660 CuZn40Pb2)

DN		25 to 50		
PN		40		
OPERATING CONDITIONS	PRESSURE IN bar	40	35	32
	MAXIMUM TEMP. IN °C	120	200	250
	CONTROL FLUID	Compressed air		
	CONTROL PRESSURE IN bar	4 ÷ 7		

Efficiency and Emptying

Bleeding processes should coincide as far as possible with moments when the water is at rest or at minimum steam extraction, so that the deposits are collected at the bottom of the boiler.

Carry out bleeding process at least every 8 hours. The effective duration is estimated to be 3 ÷ 4 seconds although we recommend you keep to the following mathematical model:

To establish the salinity of the water, the quantity of salts extracted per unit of time must be equal to that of the water supply in this same period. Which can be expressed:

$$M \cdot A = S \cdot P$$

Where:

Q = Real steam production of the boiler. (Kg/h).
A = Water supply. (l/h).
M = Salinity of the water supply. (mg/l).
P = Water extracted in the bleeding process. (l/h).
S = Desired salinity inside the boiler. (mg/l).
ϱ = Specific mass of water inside the boiler. (Kg/l).
p = Working pressure. (bar).

Example:
Q = 1.520 Kg/h.
M = 200 mg/l.
S = 4.000 mg/l.
ϱ = 1 Kg/l.
p = 3 bar.

The water to be bled compared to the steam produced is:

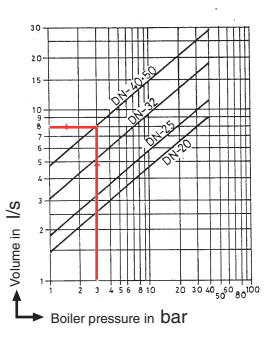
$$P = \frac{M}{(S-M) \cdot \varrho} \cdot Q$$

P = 80 l/h.

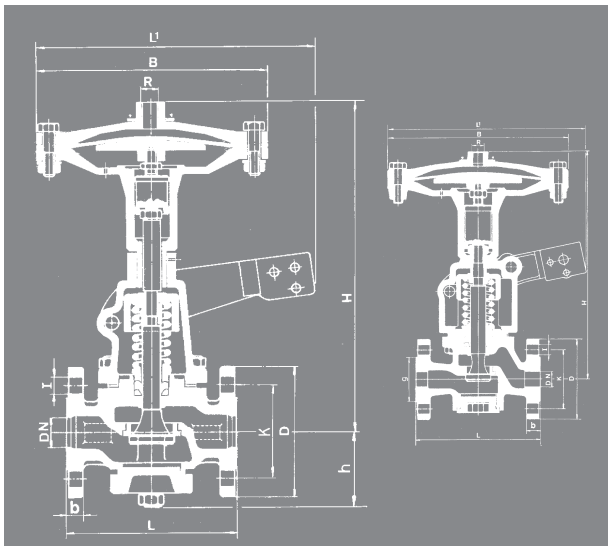
For the DN the volume (C) in l/s can be calculated as shown in the diagram.

C = 8 l/s.

The quotient (P/C) tells us the intervals between bleeding processes and the duration of them (T) in seconds per hour.



T = 10 s.
- The boiler will bleed itself for 10 seconds every hour.
- If the bleeding time is of 3 seconds = 3 bleeding every hour. The interval between bleeding should be of 20 minutes.



DN	20	25	32	40	50
R	1/8"				
CONNECTION	Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259)				
H	300	300	340	340	340
h	—	—	78	80	86
L	150	160	180	200	230
L^1	278	278	295	295	295
B	236	236	236	236	236
D	105	115	140	150	165
K	75	85	100	110	125
I	14	14	18	18	18
b	18	18	18	18	20
DRILLS N°.	4	4	4	4	4
WEIGHT IN Kgs.	17,80	19,40	22,75	25,20	28,00
CODE	2103-260.83441	2103-260.81041	2103-260.81441	2103-260.81241	2103-260.82041

Programmable control for automatic bleeding of dirt and sludge

MP-1

The control device for automatic bleeding of dirt and sludge consists of air regulator filter with manometer, three-way electro-valve, on-off switch, voltage gauge, bleeding gauge, manual bleeding switch, timer for intervals between bleeding processes and bleeding process duration timer. All this in one single control panel, especially conceived and properly wired and connected.

Specifications

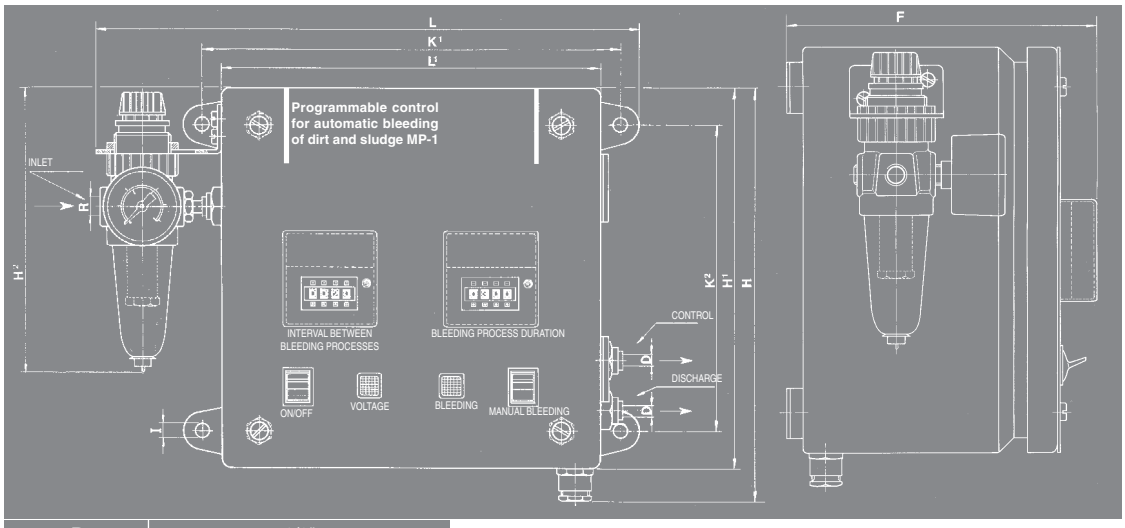
— Voltage: 220 V.A.C. ± 10% 50/60 Hz.

— Consumption: 10 V.A.

— Temperature: -10 to +55°C.

— Protection: IP-50.

— Fuses: 1 A/250 V.



R	1/8"
CONNECTION	Whitworth gas-tight cylindrical female thread ISO 228/1 de 1978 (DIN-295)
H	218
H^1	200
H^2	150
F	152
L	280
L^1	200
D	Tube connection Ø 6/4
K^1	220
K^2	161
I	7
WEIGHT IN Kgs.	4,56
CODE	2103-260.0000

1 Regulator filter with manometer:
- — Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259): 1/8".
- — Filtering elements: 25 µ.
- — Maximum working conditions: 10,5 bar to 50°C.
- — With manual bleeding device.
- — Regulation control without axial shift and with quick blocking device for regulated pressure.

2 Three-way electro-valve:
- — Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259): 1/8".
- — Effective pitch: Ø 2 mm.
- — Maximum working pressure: 10 bar.
- — Maximum control frequency: 2000 min. at 7 bar.
- — Bi-stable manual control supplies, for emergencies.
- — Does not necessarily require lubrication.

3 On-off switch.

4 Voltage gauge.

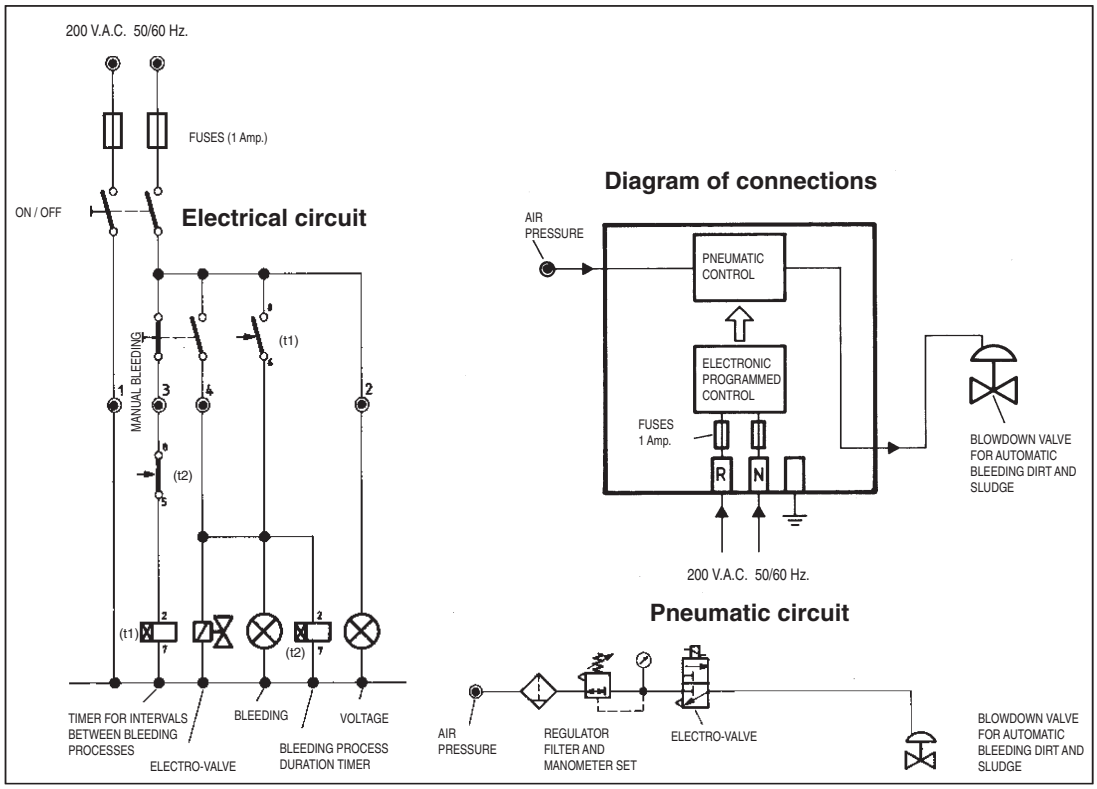
5 Bleeding gauge.

6 Manual bleeding switch.

7 Timer for intervals between bleeding processes:
- — Adjustable from 1 minute to 99 hours 59 minutes.

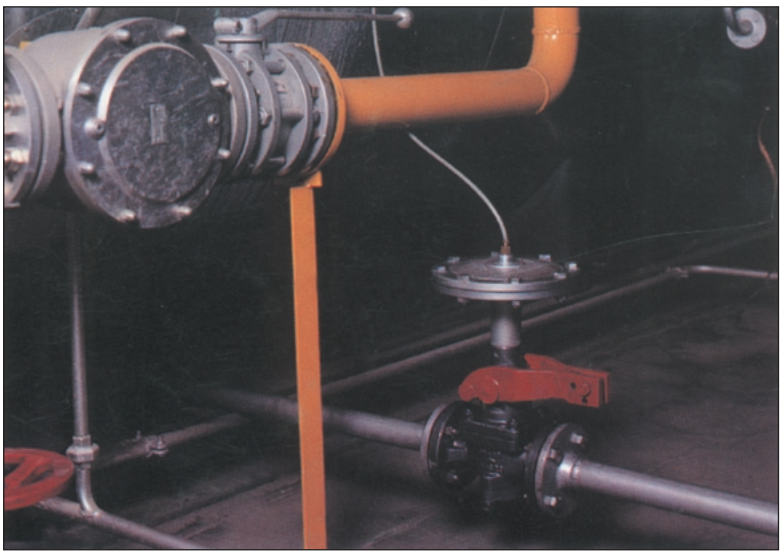
8 Bleeding process duration timer:
- — Adjustable from 1 tenth of a second to 99 seconds 99 tenths of a second.

Operating diagram



Operation

Before starting the automatic bleeding process, we must preset the time for the "interval between bleeding processes" and that of the "bleeding process duration".
Check that the air pressure in the regulator filter is 4 ÷ 7 bar and the input voltage between the terminals R-N 220 V.A.C.
Activating the switch "on", we activate the whole process. Once the pre-set time has passed, the timer for the "interval between bleeding processes" (t1), sends an impulse to the three-way electro-valve. This lets the control fluid (air) through and the valve opens quickly and completely. When the time for "bleeding process duration", (t2) has passed, another impulse on the electro-valve cuts the passage of the control fluid and the valve closes mechanically by the action of the spring. The next bleeding session will occur once the time of the "interval between bleeding processes" has passed (t1).
Activating the "manual bleeding" switch leads to a prompt bleeding process and allows the boiler, if so desired, to be emptied.
The three-way electro-valve can be activated manually in case of a power cut.



The combination of the Continuous desalting valve* and the Blowdown valve for bleeding dirt and sludge• is essential for optimizing the boiler's efficiency, and include its maximum security and availability.

Neither of them can be replaced with others not designed for this specific application. Their moderate cost is depreciated in the short term.

* (See brochure for Models 560 and 560-A).
• (See brochure for Models 460 and 260).

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Continuous desalting valve

For steam boilers **Model 560**

The continuous desalting valve is used to empty an adjustable quantity of water from the steam boiler, removing:

- Organic matter and mineral salts in solution. (Calcium, magnesium, sodium, potassium, iron, bicarbonate ions, chlorides, sulphates, nitrates, ...etc.).
- Solid materials in suspension. (Sand, clay, metal residues, rock residues, organic matter, ...etc.).

The continuous bleeding process prevents:

- Damage caused by erosion and perforation, entailing the following high costs:
  - — Direct: Replacement or repair of materials.
  - — Indirect: Stoppages, product losses, ...etc.
- Danger of boiler explosion.

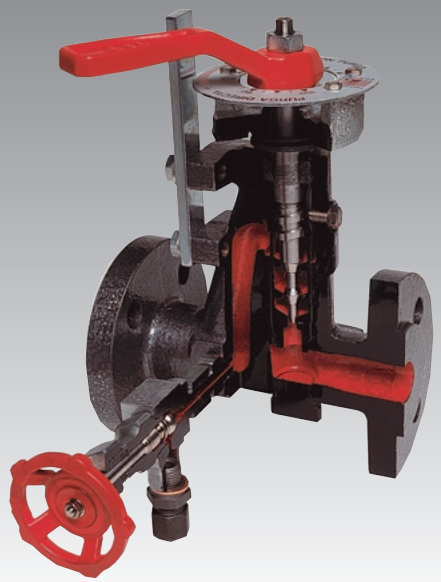
and reduces:

- Incrustations and sediments caused by precipitation of calcium and magnesium salts, which obstruct thermic transmission and which cause unnecessary and excessive fuel consumption.
- Foam formation caused by excessive saline concentration, with its corresponding drag.

Nominal pressure: PN-40.
Permissible pressures and temperatures according to DIN-2401. Page 2.
Flange connection: DN-20 (DIN-2545).

Specifications

— Consists of Faucet for taking samples and Measuring nozzle in one single unit.



1 Faucet for taking samples: Makes process of analysing the salt concentration of boiler water easier. Possibility of guided connection for pipes with a Ø of 6/8 mm.

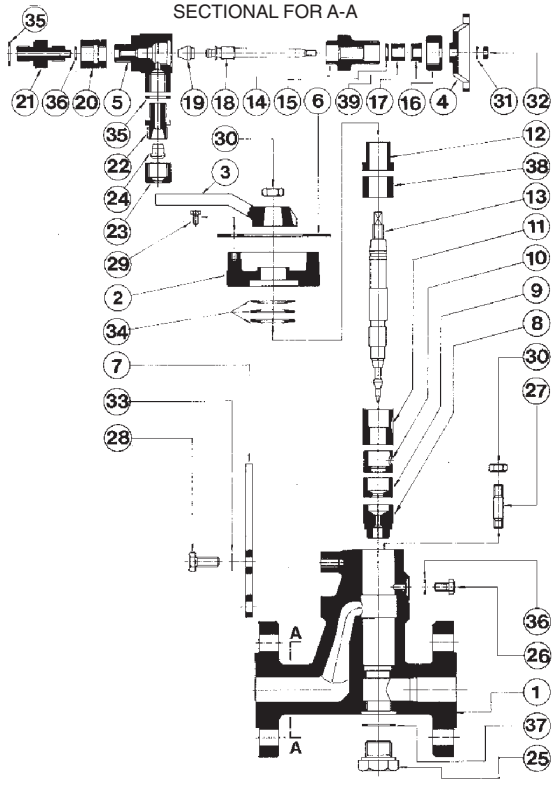
2 Reader plate: Allows bleeding positions to be seen clearly and concisely, even from some distance away.

3 Control lever. For precise and progressive adjusting of quantities to be bled.

4 Plug for draining the measuring nozzle.

5 Measuring nozzle: Acts as a valve, measuring and control organ. The water under pressure expands silently and gradually into it. Thus, dirt, incrustations and salt deposits are removed. Due to this gradual expansion, the system does not suffer erosion.

SECTIONAL FOR A-A



N°. PIECE	PIECE	MATERIAL
1	Body	Cast steel (DIN-1.0619 GS-C 25)
2	Gland body	Cast steel (DIN-1.0619 GS-C 25)
3	Control lever	Cast iron (DIN-0.6020 GG-20)
4	Flywheel	Aluminium (DIN-3.2581.01 G-AlSi 12)
5	Sample-taking faucet body	Stainless steel (DIN-1.4008) (ASTM A743 CA15)
6	Reader plate	Aluminium
7	Lever lock	Carbon steel (DIN-1.1141 Ck-15)
8	Measuring nozzle seating	Stainless steel (DIN-1.4028) (AISI-420)
9,10	Measuring nozzle cap	Stainless steel (DIN-1.4028) (AISI-420)
11	Measuring nozzle endless nut	Stainless steel (DIN-1.4028) (AISI-420)
12,17	Gland	Carbon steel (DIN-1.1191 Ck-45)
13	Measuring nozzle shaft	Stainless steel (DIN-1.4028) (AISI-420)
14	Sample-taking faucet gland body	Carbon steel (DIN-1.1191 Ck-45)
15	Sample-taking faucet gland washer	Stainless steel (DIN-1.4401) (AISI-316)
16	Gland nut	Carbon steel (DIN-1.1191 Ck-45)
18	Sample-taking faucet shaft	Stainless steel (DIN-1.4401) (AISI-316)
19	Seal	Stainless steel (DIN-1.4401) (AISI-316)
20	Sample-taking faucet connection nut	Carbon steel (DIN-1.1191 Ck-45)
21	Sample-taking faucet connection	Carbon steel (DIN-1.1191 Ck-45)
22	Adapter	Carbon steel (DIN-1.0308 ST-35)
23	Adapter nut	Carbon steel (DIN-1.0308 ST-35)
24	Cutting ring	Carbon steel (DIN-1.0308 ST-35)
25	Draining plug	Carbon steel (DIN-1.1191 Ck-45)
26,28	Screw	Carbon steel (DIN-1.1191 Ck-45)
27	Stud	Carbon steel (DIN-1.1181 Ck-35)
29	Screw	Stainless steel (DIN-1.4401) (AISI-316)
30	Nut	Carbon steel (DIN-1.1141 Ck-15)
31	Washer	Stainless steel (DIN-1.4401) (AISI-316)
32	Nut	Stainless steel (DIN-1.4401) (AISI-316)
33	Washer	Carbon steel (DIN-1.1141 Ck-15)
34	Disc spring	Vanadium chrome steel (DIN-1.8159 50CrV4)
35, 36, 37	Joint	Copper
38, 39	Seal	Graphite

DN		20			
PN		40			
OPERATING CONDITIONS	PRESSURE IN bar	40	35	32	28
	MAXIMUM TEMP. IN °C	120	200	250	300

Installation

a) Make a by-pass with some kind of drilling pipe, leading out from inside the steam chamber at 30÷50 mm. below the minimum water level.

b) Connect this by-pass to the continuous desalting valve, which can be installed in any position.

c) Convey the water coming out of the valve to the outlet.

When the bleeding percentage is high, the heat can be overcome using an exchanger.

Operation, efficiency and emptying

To establish the boiler's salinity, the quantity of salts extracted per unit of time must be equal to that of the water supply in this same period. This can be expressed in the following way:

$$M \cdot A = S \cdot P$$

Q = Real steam production of the boiler. (Kg/h).
A = Water supply. (l/h).
M = Salinity of the water supply. (mg/l).
P = Water extracted in the bleeding process. (l/h).
S = Desired salinity inside the boiler. (mg/l).
ϱ = Specific mass of water inside the boiler. (Kg/l).
p = Working pressure. (bar).

Example:
Q = 1.000 Kg/h.
M = 1.000 mg/l.
S = 6.000 mg/l.
ϱ = 1 Kg/l.
p = 13 bar.

The effect is achieved when the salts are removed continuously and without movement to prevent uncontrolled water losses from the boiler.

The water to be bled in relation to the steam produced is:

$$P = \frac{M}{(S-M) \cdot \varrho} \cdot Q$$

P = 200 l/h.

Using the calibrated scale, the lever allows exact adjustment of the measuring nozzle.

We shall set the lever at the position that allows us to remove a volume of water (P) at a differential pressure. Differential pressure = Working pressure - (Back pressure + Load losses).
Continuous desalting is achieved with adjustment values of 0 to 35.

The position "Direct bleeding" corresponds to the section of nozzle that is totally open and allows complete bleeding in a few seconds. In this case, the volume is approximately three times greater than that for 35 on the scale.

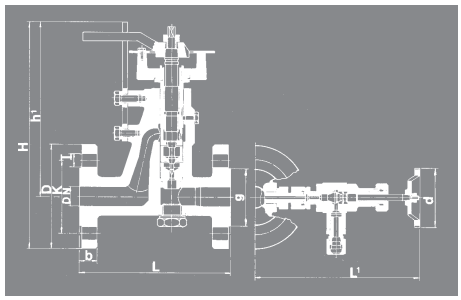
The combination of the Continuous desalting valve* and the Blowdown valve for bleeding dirt and sludge• is essential for optimizing the boiler's efficiency, and include its maximum security and availability.

Neither of them can be replaced with others not designed for this specific application.

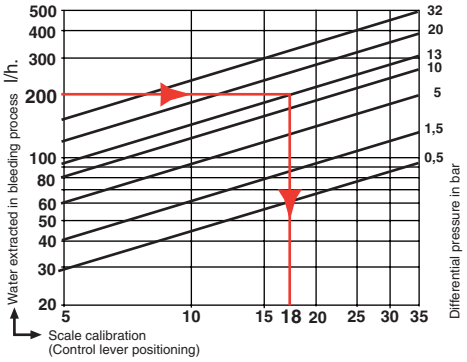
Their moderate cost is depreciated in the short term.

* (See brochure for Models 560-A).

• (See brochure for Models 260, 260-A and 460).



DN	20
H	227
h1	174
L	150
L1	167
d	60
D	105
K	75
l	14
b	18
DRILLS N°.	4
WEIGHT IN Kgs.	5,70
CODE	2102-560.8344



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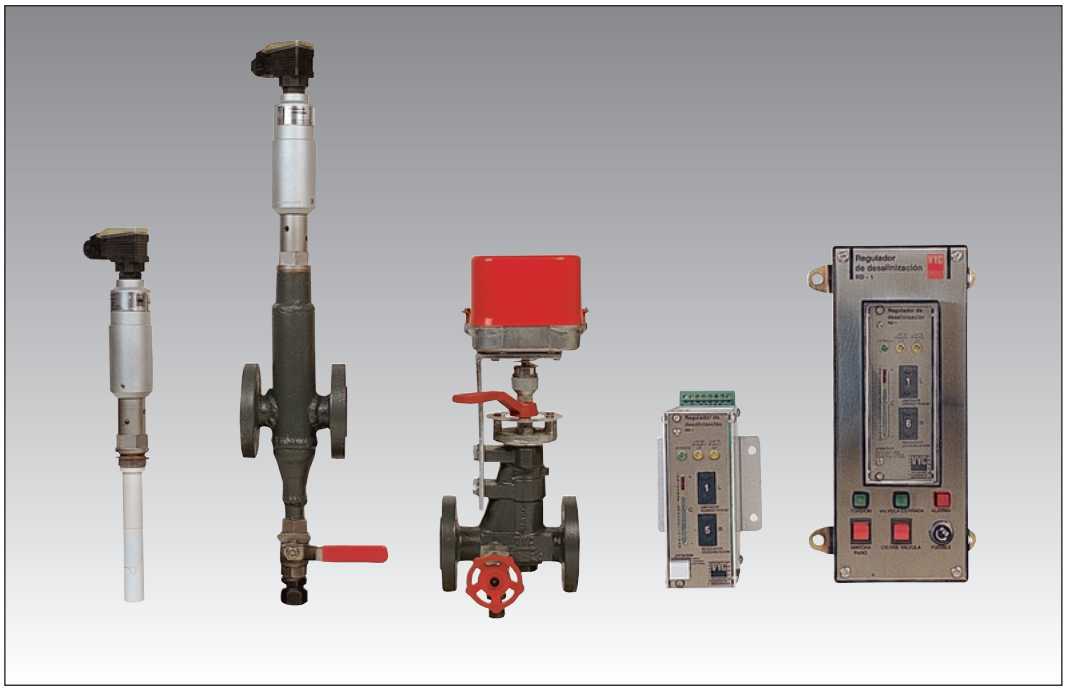
Automatic continuous desalting valve

For steam boilers **Model 560 - A**



The conductivity electrode EC-1, the desalting controller RD-1 and the continuous desalting valve with servomotor allow the automatic desalting process of boiler water which eliminates:

- Organic matter and mineral salts in solution. (Calcium, magnesium, sodium, potassium, iron, bicarbonate ions, chlorides, sulphates, nitrates, ...etc.).
- Solid materials in suspension. (Sand, clay, metal residues, rock residues, organic matter, ...etc.).

The continuous bleeding process prevents:

- Damage caused by erosion and perforation, entailing the following high costs:
  — Direct: Replacement or repair of materials.
  — Indirect: Stoppages, product losses, ...etc.
- Danger of boiler explosion.

and reduces:

- Incrustations and sediments caused by precipitation of calcium and magnesium salts, which obstruct thermic transmission and which cause unnecessary and excessive fuel consumption.
- Foam formation caused by excessive saline concentration, with its corresponding drag. This combination of measuring comparison and control ensures minimum water loss and thus gives considerable energy savings.

Nominal pressure: PN-40.

Permissible pressures and temperatures according to DIN-2401. Page 2.

Flange connection: DN-20 (DIN-2545).

Specifications

— The unit consists of a Continuous desalting valve with servomotor, a Conductivity electrode EC-1 and Desalting controller RD-1 with or without assembly cupboard.

A Continuous desalting valve with servomotor

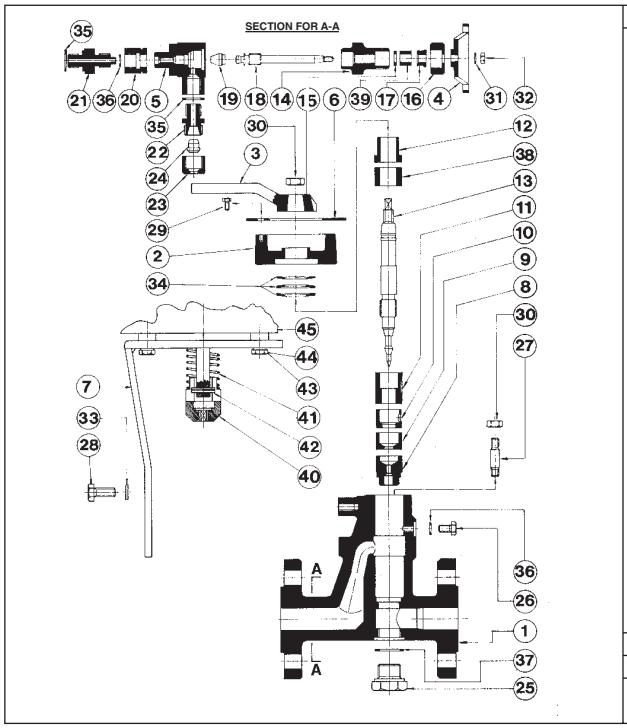
1 Faucet for taking samples: Makes process of analysing the salt concentration of boiler water easier. Possibility of guided connection for pipes with a Ø of 6/8 mm.

2 Reader plate: Allows bleeding positions to be seen clearly and concisely, even from some distance away.

3 Plug for draining the measuring nozzle.

4 Measuring nozzle: Acts as a valve, measuring and control organ. The water under pressure expands silently and gradually into it. Thus, dirt, incrustations and salt deposits are removed. Due to this gradual expansion, the system does not suffer erosion.

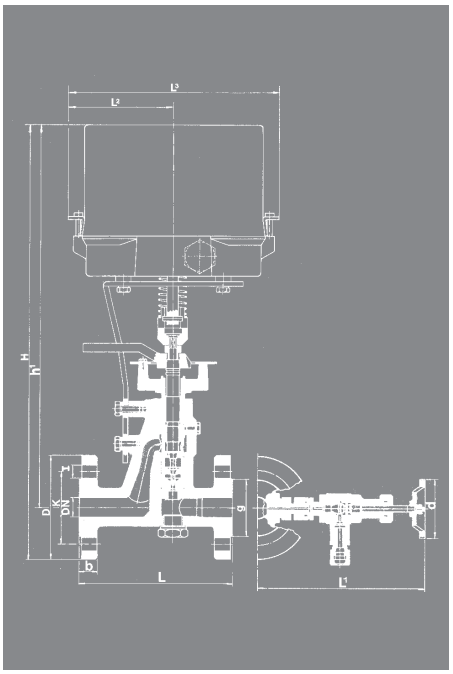
5 Servomotor mounted on the valve on an angle mounting. A synchronised reversable motor is used as a transmission element. Via gearing it adjusts the position of the regulation lever.



PIECE N°.	PIECE	MATERIAL
1	Body	Cast steel (DIN-1.0619 GS-C 25)
2	Gland body	Cast steel (DIN-1.0619 GS-C 25)
3	Control lever	Cast iron (DIN-0.6020 GG-20)
4	Flywheel	Aluminium (DIN-3.2581.01 G-AlSi12)
5	Sample-taking faucet body	Stainless steel (DIN-1.4008) (ASTM A743 CA15)
6	Reader plate	Aluminium
7	Lever lock	Carbon steel (DIN-1.1141 Ck-15)
8	Measuring nozzle seating	Stainless steel (DIN-1.4028) (AISI-420)
9, 10	Measuring nozzle cap	Stainless steel (DIN-1.4028) (AISI-420)
11	Measuring nozzle endless nut	Stainless steel (DIN-1.4028) (AISI-420)
12, 17	Gland	Carbon steel (DIN-1.1191 Ck-45)
13	Measuring nozzle shaft	Stainless steel (DIN-1.4028) (AISI-420)
14	Sample-taking faucet gland body	Carbon steel (DIN-1.1191 Ck-45)
15	Sample-taking faucet gland washer	Stainless steel (DIN-1.4401) (AISI-316)
16	Gland nut	Carbon steel (DIN-1.1191 Ck-45)
18	Sample-taking faucet shaft	Stainless steel (DIN-1.4401) (AISI-316)
19	Seal	Stainless steel (DIN-1.4401) (AISI-316)
20	Sample-taking faucet connection nut	Carbon steel (DIN-1.1191 Ck-45)
21	Sample-taking faucet connection	Carbon steel (DIN-1.1191 Ck-45)
22	Adapter	Carbon steel (DIN-1.0308 ST-35)
23	Adapter nut	Carbon steel (DIN-1.0308 ST-35)
24	Cutting ring	Carbon steel (DIN-1.0308 ST-35)
25	Draining plug	Carbon steel (DIN-1.1191 Ck-45)
26, 28, 43	Screw	Carbon steel (DIN-1.1191 Ck-45)
27	Stud	Carbon steel (DIN-1.1181 Ck-35)
29	Screw	Stainless steel (DIN-1.4401) (AISI-316)
30	Nut	Carbon steel (DIN-1.1141 Ck-15)
31	Washer	Stainless steel (DIN-1.4401) (AISI-316)
32	Nut	Stainless steel (DIN-1.4401) (AISI-316)
33, 44	Washer	Carbon steel (DIN-1.1141 Ck-15)
34	Disc spring	Vanadium chrome steel (DIN-1.8159 50CrV4)
35, 36, 37	Joint	Copper
38, 39	Seal	Graphite
40	Coupling	Carbon steel (DIN-1.1191 Ck-45)
41	Spring	Stainless steel (DIN-1.4300) (AISI-302)
42	Elastic gudgeon	Carbon steel (DIN-1.1231 Ck-67)
45	Servomotor	—
DN		20
PN		40
OPERATING CONDITIONS	PRESSURE IN bar	40 / 35 / 32 / 28
	MAXIMUM TEMPERATURE IN °C	120 / 200 / 250 / 300

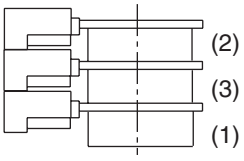
Operation

If the accepted conductivity value previously selected is exceeded the desalting controller RD-1, via indication from the conductivity electrode EC-1, operates the servomotor and opens the continuous desalting valve to the **OPEN** position. When the conductivity decreases the adjustment mechanism returns to the **SERVICE** position giving continuous economical desalting. When the "valve closed" switch is on the adjustment mechanism automatically puts the valve in the **CLOSED** position. These positions are fixed by the micro limit switches.



Adjustment of micro limit switches

The micro limit switches come ready adjusted from the factory:



Micro switch position	Position of the lever on the indicator plate
(1) CLOSED	**0**
(2) SERVICE	**8**
(3) OPEN	**35**

Using an screwdriver the positions of the micro switch can be readjusted. Turning the right to left decreases the purge position and turning it the left to right increases it.

Manual or automatic operation

To operate the valve manually:

1- Cut off the power supply.
2- Mark the position of the regulation lever on the indicator plate.
3- Push the connection against the spring and turn it 90°.
4- Place the regulation lever in the required position.

Restoring automatic operation:

1- Place the regulation lever in the position marked on the indicator plate.
2- Turn the connection 90° and fit it in the axis of the measuring nozzle.
3- Reconnect the power supply.

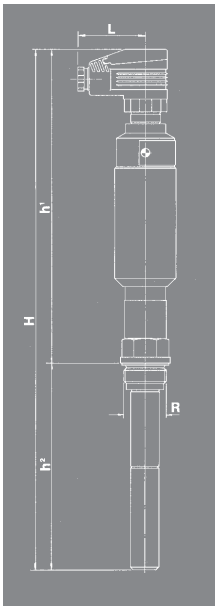
B Servomotor

Reversible synchronised motor.
Gearbox with permanent lubrication.
Voltage: 220 V.A.C. ± 10% 50/60 Hz.
Commutated micro limit switches: 3.
Adjustment time: 135 s/90°.
Cell: Maximum load. 15 Nm.
Ambient temperature: 50°C.
Protection: IP-54.

DN	20
H	372
h^1	319,5
L	150
L^1	167
L^2	70
L^3	140
d	60
D	105
K	75
I	14
b	18
DRILLS N°.	4
WEIGHT IN Kgs.	7,40
CODE	2102-560.83441

Conductivity electrode. EC-1

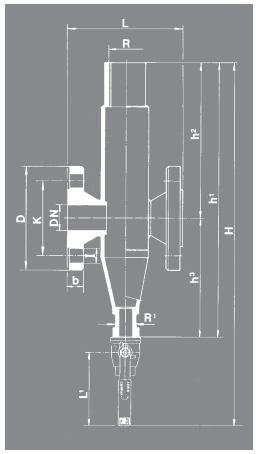
Connection: Whitworth gas-tight cylindrical male thread ISO 228/1 1978 (DIN-259) 1".
Maximum operating temperature: 238°C.
Maximum operating pressure: 32 bar.
Protection: IP-65.



R	1"
H	419
h^1	252
h^2	167
L	53
WEIGHT IN Kgs.	0,97
CODE	2102-560.7102

Electrode connection collector
Nominal pressure: PN-40.
Allowable pressures and temperatures according to DIN-2401. Sheet 2.
Flange connection: DN-20 (DIN-2545).
Electrode connection: Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259) 1".

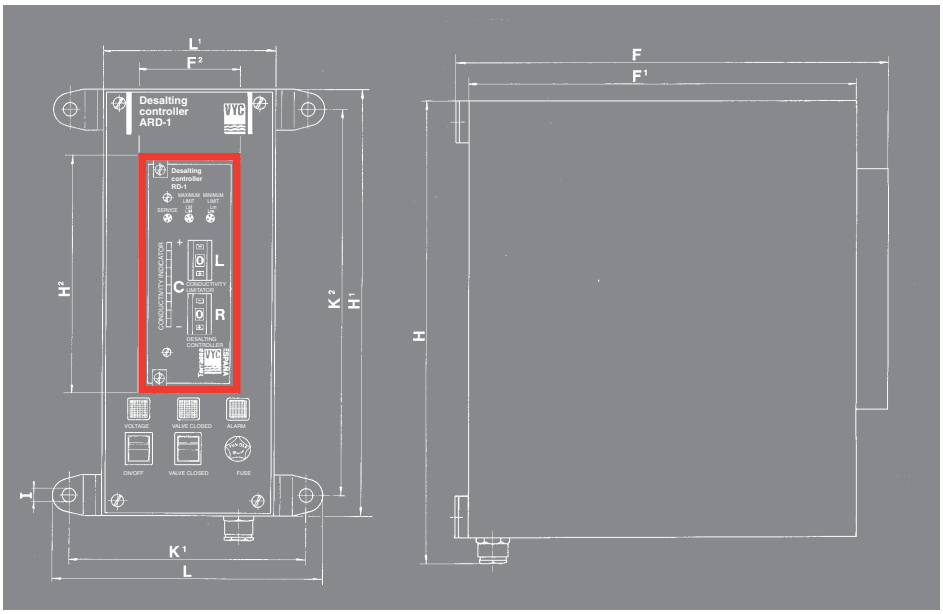
DN	20
R	1"
H	390
h^1	267
h^2	157
h^3	110
L	115
R_1	1/2"
L^1	100
D	105
K	75
I	14
b	18
DRILLS N°.	4
WEIGHT IN Kgs.	3,33
CODE	2102-560.83442



We recommend adding a blowoff valve to the equipment, Mod. 999, 1/2" joined to the waste pipe for periodic release of sludge. As a minimum a 2 ÷ 3 second release must be performed every 8 hours.

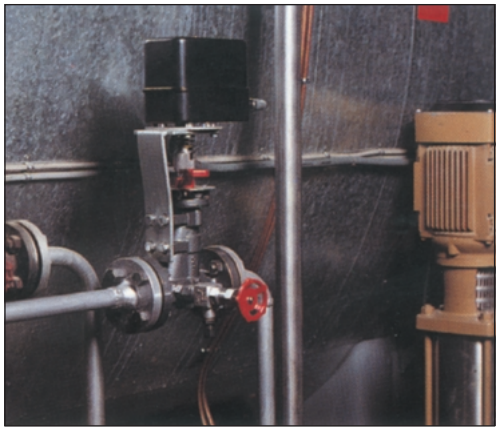
Desalting controller. ARD-1. RD-1

Voltage: 220 V.A.C. ± 10% 50/60 Hz.
Electric consumption: Approximately 4,5 VA.
Relay contact: 250 V/4 A 750 VA.
Safety contact: Maximum 2A-Mitteltraeg.
Ambient temperature: -20 to + 70°C.
Regulator protection: IP - 00.
Regulator protection in assembly cupboard: IP - 50.
Regulation index: 2,5 to 20 mS.
Limit index: 40 to 75 mS.
▭ Desalting controller with assembly cupboard ARD-1.
— Desalting controller without assembly cupboard RD-1.

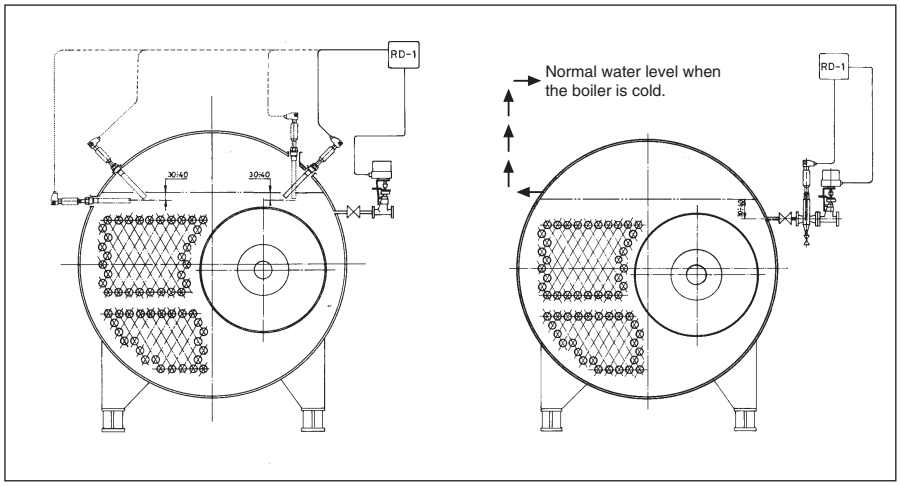


MODEL	ARD-1	RD-1
H	265	—
H^1	250	—
H^2	—	137
F	245	—
F^1	220	—
F^2	—	57
L	158	—
L^1	100	—
K^1	138	—
K^2	226	—
I	7,5	—
WEIGHT IN Kgs.	2,50	0,93
CODE 2102-560.	0001	0002

The desalting controller without assembly cupboard RD-1 is supplied in a 19" sub-rack according to DIN-41494.



Installation examples



Operation, efficiency and emptying

To establish the boiler's salinity, the quantity of salts extracted per unit of time must be equal to that of the water supply in this same period. This can be expressed in the following way:

$$M \cdot A = S \cdot P$$

Q = Real steam production of the boiler. (Kg/h).
A = Water supply. (l/h).
M = Salinity of the water supply. (mg/l).
P = Water extracted in the bleeding process. (l/h).
S = Desired salinity inside the boiler. (mg/l).
ϱ = Specific mass of water inside the boiler. (Kg/l).
p = Working pressure. (bar).

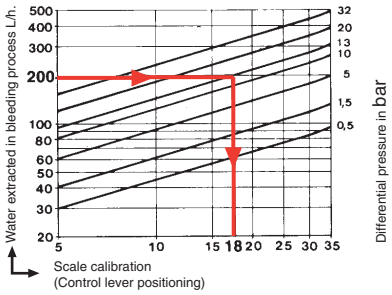
Example:
Q = 1.000 Kg/h.
M = 1.000 mg/l.
S = 6.000 mg/l.
ϱ = 1 Kg/l.
p = 13 bar.

The effect is achieved when the salts are removed continuously and without movement to prevent uncontrolled water losses from the boiler.

The water to be bled in relation to the steam produced is:

$$P = \frac{M}{(S-M) \cdot \varrho} \cdot Q$$

P = 200 l/h.



Using the calibrated scale, the lever allows exact adjustment of the measuring nozzle.
We shall set the lever at the position that allows us to remove a volume of water (P) at a differential pressure. Differential pressure = Working pressure - (Back pressure + Load losses). Continuous desalting is achieved with adjustment values of 0 to 35.
The position "Direct bleeding" corresponds to the section of nozzle that is totally open and allows complete bleeding in a few seconds. In this case, the volume is aproximately three times greater than that for 35 on the scale.

The combination of the Continuous desalting valve* and the Blowdown valve for bleeding dirt and sludge• is essential for optimizing the boiler's efficiency, and include its maximum security and availability.
Neither of them can be replaced with others not designed for this specific application.
Their moderate cost is depreciated in the short term.
* (See brochure for Models 560).
• (See brochure for Models 260, 260-A and 460).

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Samples water-cooled

For steam boilers **Model 560 DRM-1**

Efficient monitoring of the purging of salts, dirt and sludge in a steam boiler requires regular analysis of the water in order to verify that its parameters are within the ideal levels af salinity and alkalinity demanded by law.

All the Continuous desalting valve (Mod. 560 and 560-A) are provided with taps for obtaining samples. As the water is extracted continuously 30 ÷ 50 mm. below the minimum level, the collection level is ideal and does not interfere with the control and level regulation devices.

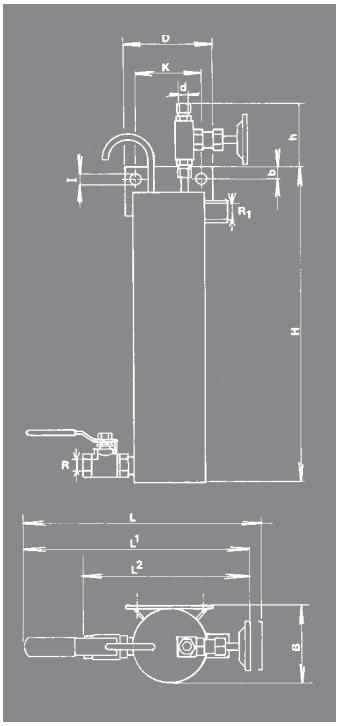
Direct sampling is incorrect:
- Losses by expansion increase the density of the water and falsify results.
- There is an obvious physical risk involved.

The basic premise for conducting analyses correctly is to bring the samples from the tap of the Continuous desalting valve to the Samples water-cooled DRM-1, and bring them down to between 24 ÷ 26°C.

Specifications

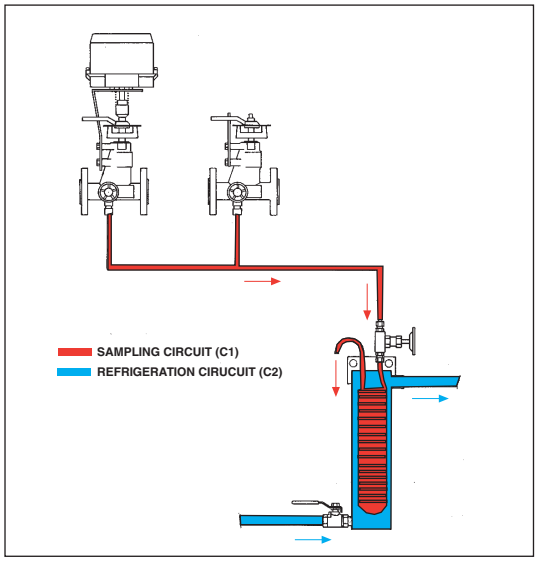
— The Samples water-cooled DRM-1 consists of:
1 Needle valve Mod. 147 of 1/4", with a simple box joint for connecting to the 6/8 mm Ø tube from the sample-taking faucet.
2 One-piece coil with collection nozzle, with no welding, and cold-bent.
3 Ball valve Mod. 999 of 1/2", for entry of coolant water to the device.
4 Wrapper cylinder with cooling water inlet and outlet.
— Entirely Stainless steel (DIN-1.4401) (AISI-316)
— Finished: Glass-ball blast.
— Simplicity of construction.
— Easy to connect.
— Each of the components is numbered, registered, and checked. If prior request is made a certificates of materials, batch and tests will be supplied.

IMPORTANT
Depending on demand:
— Other thicknesses, connections, materials, lengths of body and coil.



MODEL	DRM-1
R	1/2"
R_1	1/2"
CONNECTIONS	Whitworth gas-tight cylindrical female thread ISO 228/1 1978 (DIN-259)
H	390
h	95
L	313
L^1	307
L^2	235
d	Connection pipe Ø 6/8
B	89
D	105
K	80
I	12
b	15
DRILLS N°.	2
WEIGHT IN Kgs.	3,87
CODE	2102-560.0022

OPERATING CONDITIONS	SAMPLING CIRCUIT C_1	MAX. PRESSURE IN bar	140
		MAX. TEMP. IN °C	340
		VOLUME IN ℓ.	0,16
	REFRIGERATION CIRCUIT C_2	MAX. PRESSURE IN bar	10
		MAX. TEMP. IN °C	As required to bring the samples down to 24 ÷ 26°C
		VOLUME IN ℓ.	1,48



Operation

1- Open the coolant water entry valve.
2- Gradually open the sampling circuit interruption valve until a significant sample between 24 ÷ 26°C is obtained.
3- Close the sampling circuit interruption valve.
4- Close the coolant water entry valve.

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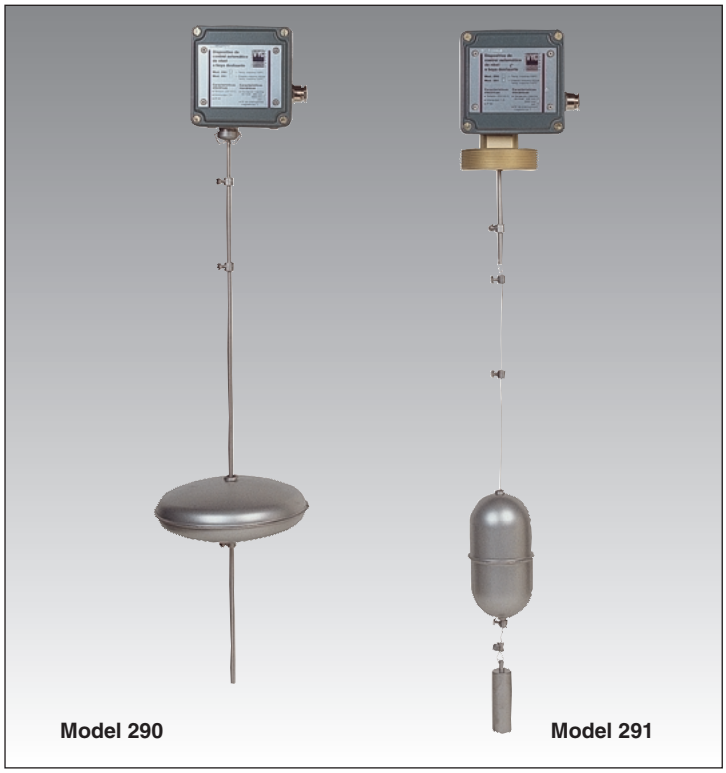
Sliding buoy type automatic level controller

Bracket connection **Model 290**
Thread connection **Model 291**



Model 290 Model 291

Model 262

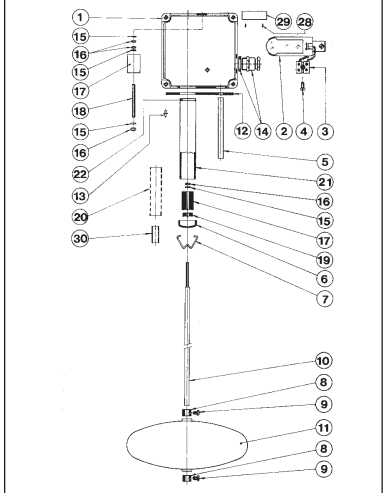
This device guarantees automatic, safe and reliable control, regulation and signalling of the level of liquids in; wells, tanks, cisterns, etc.

Specifications

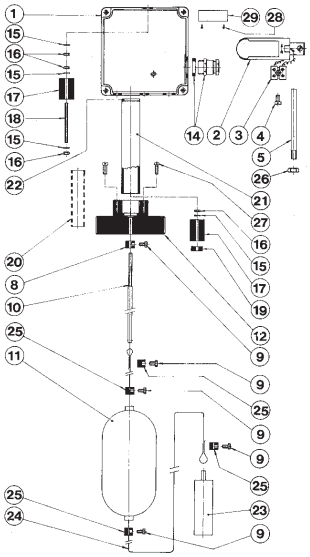
— Materials carefully selected for their resistance to wear and tear, temperature and corrosion.
— Simplicity of construction ensuring minimum maintenance.
— The area of connectors, terminals, magnetic switches, etc., housed in a box made of isolating temperature resistant material which prevents the entry of dust or dirt, etc. IP-65 protection.
— The components of the magnetic switch are rigorously selected to guarantee long life and total operating safety.
— Silver alloy breakers.
— Easy to connect.
— Adjustment of operating points using end stops.
— All of the equipment and the switches have been thoroughly tried and tested.
— Each of the components is numbered, registered and checked. If prior request is made a certificates of materials, batch and will be supplied.

IMPORTANT
If this equipment is connected to vessels with turbulent fluids they must be supplied with the corresponding breakwater.

Depending on demand:
— Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).
— Other connections and fluctuation length.
— Stainless steel buoy (DIN-1.4401) (AISI-316) with coating of Epoxy, PTFE (Teflón), Chemical nickel, etc.
— Other sizes of buoy.



Model 290



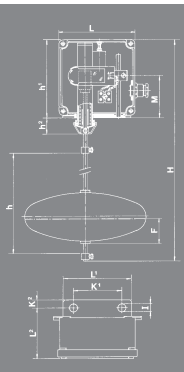
Model 291

N°. PIECE	PIECE	MATERIAL	
		MODEL 290	MODEL 291
1	Box	Aluminium (ASTM B 85 y B 179)	Aluminium (ASTM B 85 y B 179)
2	Magnetic switch	Model 262	Model 262
3	Block	Bakelite	Bakelite
4	Block screw	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
5	Switch fastening axis	S. steel (DIN-1.4301) (AISI-304)	S. steel (DIN-1.4301) (AISI-304)
6	Cap end stop	S. steel (DIN-1.4301) (AISI-304)	—
7	Cap securing clip	S. steel (DIN-1.4300) (AISI-302)	—
8,25	Buffer	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
9,27	Stop-screw	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
10	Guide road	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
11	Buoy (1)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
12	Bracket	S. steel (DIN-1.4301) (AISI-304)	Brass (DIN-1.7660 CuZn40Pb2)
13,28	Rivets	Aluminium (AlMg5)	Aluminium (AlMg5)
14	Gland	Brass (DIN-1.7660 CuZn40Pb2)	Brass (DIN-1.7660 CuZn40Pb2)
15	Washer	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
16,26	Nut	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
17	Magnet	Alnico - 500	Alnico - 500
18	Dowel	S. steel (DIN-1.4301) (AISI-304)	S. steel (DIN-1.4301) (AISI-304)
19	Spacer	S. steel (DIN-1.4305) (AISI-303)	S. steel (DIN-1.4305) (AISI-303)
20	Spring	S. steel (DIN-1.4300) (AISI-302)	S. steel (DIN-1.4300) (AISI-302)
21,30	Case	S. steel (DIN-1.4301) (AISI-304)	S. steel (DIN-1.4301) (AISI-304)
22	Case cover	S. steel (DIN-1.4301) (AISI-304)	S. steel (DIN-1.4301) (AISI-304)
23	Weight	—	S. steel (DIN-1.4401) (AISI-316)
24	Guide wire	—	S. steel (DIN-1.4300) (AISI-302)
29	Characteristic plate	Aluminium	Aluminium

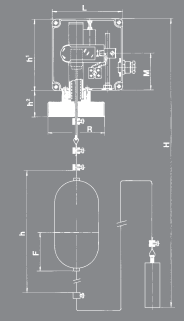
DN		Bracket with 2 screws M.8x...	2 1/2"			
PN		—	PMS . 19 bar			
OPERATING CONDITIONS	PRESSURE IN bar (2)	—	19,0	17,1	14,8	13,3
	MAXIMUN TEMP. IN °C (2)	150	20	50	100	150
	MINIMUM TEMP. IN °C	0	-60 (3)			
	MAX. VISCOSITY IN Cps	500	280			

(1) See brochure for Model 152 Ø150x60 and Ø60x120 slidings.
(2) For higher pressures and temperatures see our technical department.
(3) As long as the equipment is free of humidity.

MODEL		290	291
R		—	2 1/2"
CONNECTION		2 screws M.8x...	Whitworth gas-tight male thread cylindrical ISO 228/1 1978 (DIN-259)
H	STANDARD	630	3320
	MAXIMUM	—	30320
h (LEVEL FLUCTUATION)	STANDARD	495	3000
	MAXIMUM	—	30000
h^1		98,5	95,5
h^2		20	35
M (MAXIMUM)		52	49
MAX. N°. OF SWITCHES		1	1
BUOY		Ø 150 x 60	Ø 60 x 120
F (FLOATING LEVEL IN WATER)		28	54
L		95,5	95,5
L^1		85	—
L^2		65	—
K^1		59	—
K^2		10	—
I		9	—
DRILLS N°.		2	—
WEIGHT IN Kgs.		1,08	1,65
CODE		2104-290.0002	2104 - 291.5222



Model 290



Model 291

Magnetic switch

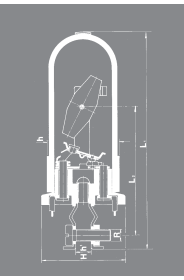
Model 262

Specifications

Electrical characteristics: — Voltage: 220 V.A.C.
— Current: 1 A.

Magnetic characteristics: — Material: ALNICO - 1500.
— Residual induction (Br): 8500 / 8600 G.
— Coercive force (Hc): 1400 / 1500 Oe.
— Energy index (B-H) maximum: 4,2.

MODEL	262
R	M.4 Metric male thread ISO (DIN-13) 1973
H	27
h	23
h^1	5
L_1	70
L_2	43
WEIGHT IN Kgs.	0,041
CODE	2104 - 262.0000



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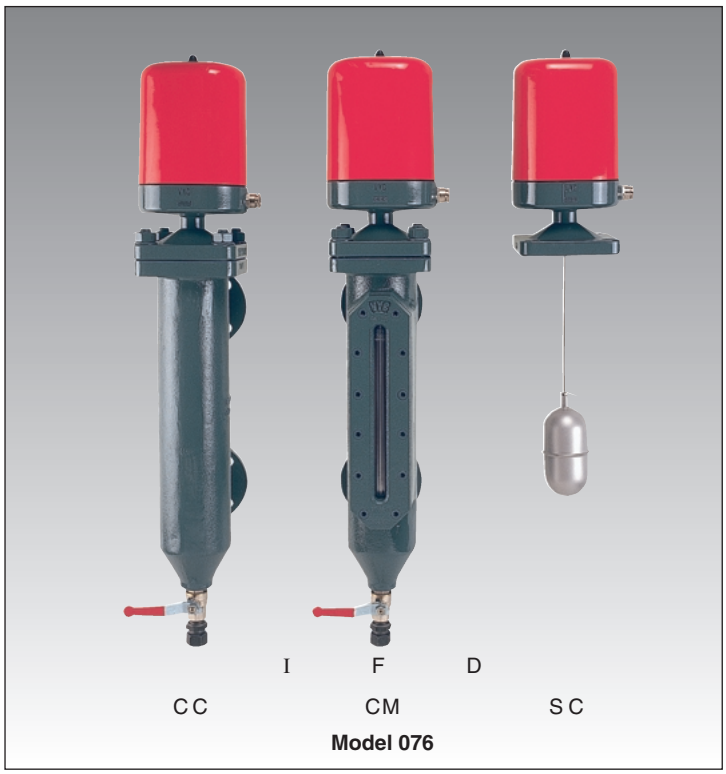
Buoy type automatic level controller

Model 076



Model 076


Model 262

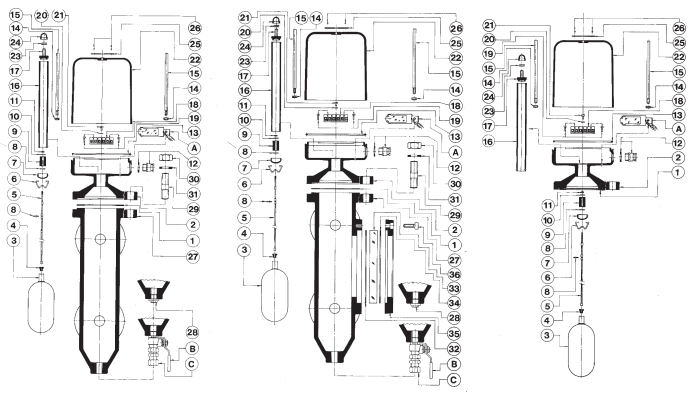
This device guarantees automatic, safe and reliable control, regulation and signalling of the level of liquids in; steam boilers, pressurised vessels, preheaters, processes, etc.

Specifications

— Materials carefully selected for their resistance to wear and tear, temperature and corrosion.
— Simplicity of construction ensuring minimum maintenance.
— The area of connectors, terminals, magnetic switches, etc., is attached to a totally tightness base in the area in contact with the fluid. A cover of isolating temperature resistant material prevents the entry of dust or dirt, etc. IP-65 protection.
— The components of the magnetic switch are rigorously selected to guarantee long life and total operating sefety.
— Silver alloy breakers.
— Easy to connect and adjust the operating points.
— Models with multi-slatted polyprismatic reflector sight glass allow visual level readings, making a clear difference between the liquid and gas stages of the fluids. The sight glass is made of boron silicate and is designed so that if it accidentally breaks it will not fall out in pieces.
— All of the equipment and the switches have been thoroughly tried and tested.
— Each of the components is numbered, registered and checked. If prior request is made a certificates of materials, batch and tests will be supplied.

IMPORTANT
In steam boilers and other vessels with precipitating fluids we recommend adding a blowoff valve to the equipment, Mod. 999, 1/2" joined to the waste pipe for periodic release of sludge. As a minimum a 2 ÷ 3 second release must be performed every 8 hours. If the 076-SC Model is connected to steam boilers or to vessels with turbulent fluids they must be supplied with the corresponding breakẇater.

Depending on demand:
— Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).
— Other connections and body length.
— Stainless steel buoy (DIN-1.4401) (AISI-316) with coating of Epoxy, PTFE (Teflón), Chemical nickel, etc.
— Other sizes of buoy.



CC CM SC

N°. PIECE	PIECE	MATERIAL
1	Base joint	Klingerit cardboard
2	Base	S. steel (DIN-1.4408) (ASTM A351 CF8M)
3	Buoy (1)	S. steel (DIN-1.4401) (AISI-316)
4	Connector	S. steel (DIN-1.4401) (AISI-316)
5	Guide rod	S. steel (DIN-1.4401) (AISI-316)
6	Cap securing clip	S. steel (DIN-1.4300) (AISI-302)
7	Cap end stop	S. steel (DIN-1.4301) (AISI-304)
8	Buffer	S. steel (DIN-1.4301) (AISI-304)
9	Magnet	Alnico - 500
10,20	Washer	S. steel (DIN-1.4401) (AISI-316)
11,14,23	Nut	S. steel (DIN-1.4401) (AISI-316)
12	Gland	Brass (DIN-1.7660 CuZn40Pb2)
13	O-ring gasket	Fluorelastomer (Vitón)
15	Switch mounting	S. steel (DIN-1.4305) (AISI-303)
16	Guide tube	S. steel (DIN-1.4401) (AISI-316)
17	Cap	S. steel (DIN-1.4301) (AISI-304)
18	Terminal block	Bakelite
19,21	Screw	S. steel (DIN-1.4401) (AISI-316)
22	Cap	Aluminium (DIN-3.2381.01 G-AlSi10Mg)
24	Cap	Plastic
25	Plate	Aluminium
26	Rivets	Aluminium (AlMg5)
27	Body	Cast iron (DIN-0.6025 GG-25)
28	Cap	Carb. steel (DIN-1.1181 Ck-35)
29	Stud	Casb. steel (DIN-1.1181 Ck-35)
30	Nut	Carb. steel (DIN-1.1141 Ck-15)
31	Washer	Carb. steel (DIN-1.1141 Ck-15)
32	Coupling	Klingerit cardboard
33	Crystal	Boron-Silicate
34	Coupling	Klingerit oilit cardboard
35	Sight glass cover	Cast iron (DIN-0.6025 GG-25)
36	Cover screws	Cast steel (DIN-1.1191 Ck-45)

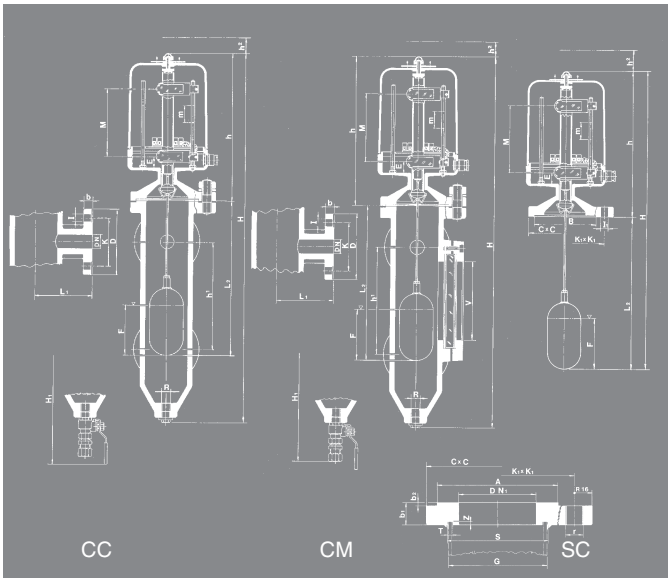
DN		25 (2)			
PN		16			
OPERATING CONDITIONS	PRESSURE IN bar	13,3	11,9	10,9	10,4
	MAX. TEMP. IN °C	150	200	250	300
	MIN. TEMP. IN °C	-10 (3)			

(1) See brochure for Model 152 Ø60x120.
(2) In Model 076-SC the coupling is made with 4 M.16x40 screws.
(3) As long as the equipment is free of humidity. Under the same conditions Model 076-SC can work up to -60°C.

Ⓐ The buoy type automatic level controller Model 076 is supplied with no Model 262 magnetic switches. All switches requested are supplied separately.
Ⓑ Ⓒ The blowoff valve and the waste water pipe joint are options on request.

MODEL		CC		CM						SC	
DN		25		25						—	
CONNECTION		—		—						4 Screws M.16x40	
h^1		190	250	190	250					—	—
H		655	715	655	715					536	596
H_1		790	840	790	840					—	—
M (MAX. LEVEL FLUCTUATION)		120		120						120	
m (MIN. DISTANCE BETWEEN SWITCHES) (1)		30		30						30	
E (MINIMUM)		25		25						25	
MAX. N°. OF SWITCHES (2)		5		5						5	
h^2		160		160						160	
h		262		262						262	
L_2		312	372	312	372					312	372
L_1		100	100	100	100					—	—
BUOY		Ø 60 x 120		Ø 60 x 120						Ø 60 x 120	
F (FLOATING LEVEL IN WATER)		87		87						87	
REFLECTION GLASS		—	—	N°. III 165 x 34 x 17				N°. VI 250 x 34 x 17		—	—
V		—		140				225		—	
R		1/2"		1/2"						—	
		Whitworth gas-tight cylindrical female thread ISO 228/1 1987 (DIN-259)								—	
CONNECTING FLANGE PN-10/16 DIN-2532/2533	D	115		115						—	
	K	85		85						—	
	I	14		14						—	
	b	16		16						—	
	DILLS N°.	4		4						—	
	C x C	—		—						130 x 130	
	K_1 x K_1	—		—						98,3 x 98,3	
	I_1	—		—						18	
	B	—		—						110	
COUPLING FLANGE	DN_1	—		—						70	
	K_1 x K_1	—		—						98,3 x 98,3	
	r	—		—						M.16	
		—		—						Metric female thread ISO (DIN-13) 1973	
	b_1	—		—						20	
	b_2	—		—						3,5	
	N°. OF THREADS	—		—						4	
	C x C	—		—						130 x 130	
	A	—		—						109,8	
	S	—		—						90	
	T	—		—						4,5	
	G	—		—						88,9x3,2 (DIN-2448)	
	N	—		—						3	
WEIGHT IN Kgs.		14,40	17,40	16,30	22,00					4,60	
CODE	VIEWER (3)	—	—	F	D	I	F	D	I	—	—
	2104-076.	51061	51062	51063	51064	51065	51066	51067	51068	50061	50062

(1) Attached to the same mounting.
(2) The maximum number of switches is 5 for each of the two mountings. The buoy type automatic level controller Model 076 is supplied with no Model 262 magnetic switches. All switches requested are supplied separately.
(3) F = Front viewer. D = Right viewer. I = Left viewer.



Magnetic switch

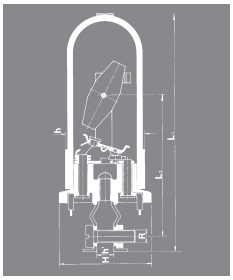
Model 262

Specifications

Electrical characteristics: — Voltage: 220 V.A.C.
— Current: 1 A.

Magnetic characteristics: — Material: ALNICO - 1500.
— Residual induction (Br): 8500 / 8600 G.
— Coercive force (Hc): 1400 / 1500 Oe.
— Energy index (B-H) maximum: 4,2.

MODEL	262
R	M.4
	Metric male thread ISO (DIN-13) de 1973
H	27
h	23
h^1	5
L_1	70
L_2	43
WEIGHT IN Kgs.	0,041
CODE	2104 - 262.0000



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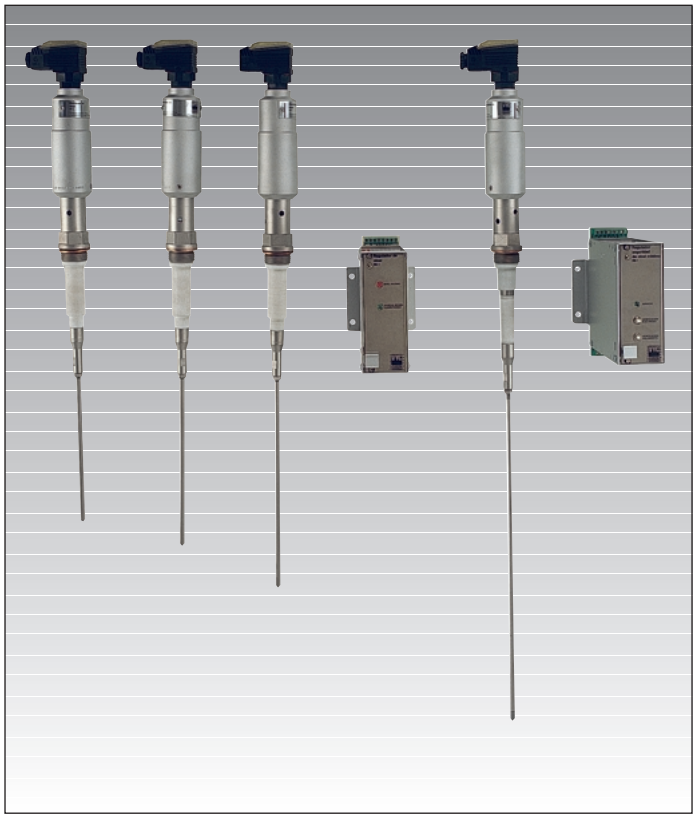
Electrode based electronic level controller

For steam boilers **Model 176**



This device guarantees a safe and reliable control, regulation and electronic signalling of the level of electrically conducting liquids in; steam and hot water boilers, autoclaves, preheaters, pressure vessels, feedwater and condensates tanks, processes, etc.

Specifications

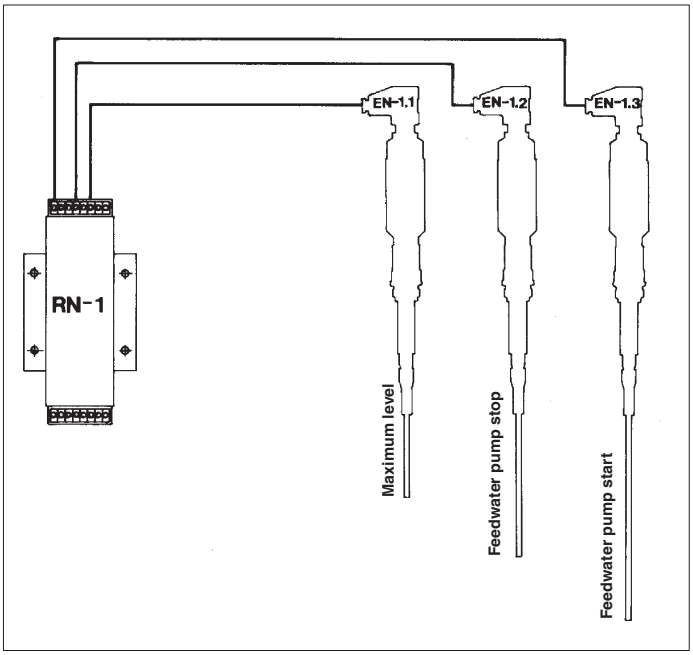
— The electrode design is technically perfect, being fully tightness in steam, with several sealing points.
— Simplicity of construction, eliminating the need for moving mechanical parts, which leads to minimum maintenance.
— Materials carefully selected for their resistance to wear, temperature and pressure conditions.
— Due to solid construction the electrodes can operate in critical temperature and corrosion.
— Ease of connection and adjustment of operating points. Being a fixed installation greatly inhibits any type of manipulation.
— High reliability and safety which allows operation of steam boilers without permanent supervision.
— Through the elimination of unnecessary equipment and the direct installation of the electrode in the boiler body a maintenance free installation is obtained, with the corresponding financial savings.
— Centralized control and possibility of executing complex regulation and control.
— All controllers and electrodes are rigorously tested and verified.
— Each of the components is numbered, registered and checked. If prior request is made a certificates of materials, batch and tests will be supplied.

Level controller. RN-1
Level electrode. EN-1

An RN-1 level controller together with two EN-1 level electrodes controls the operation of the boiler feedwater pumps, and consequently the level of the water in the boiler.
In installations without constant preventative maintenance we recommend the installation of a third EN-1 level electrode, associated with the same RN-1 level controller, whose function is to cut-off the feedwater pump if the maximum allowed level in the boiler is exceeded.

Operating principles
The operation of the RN-1 level controller is based on the measurement by conductivity principle. When the probe of the EN-1 level electrode is submerged or out of the water, the bridging circuit of the switching amplifier is made or broken respectively. The signal is amplified and is used to energize a relay.
The circuits for water level control and maximum water level are symmetrical and totally separated. The switching relays of each circuit are independent, but with a common power supply.
In order to avoid disturbances to the control system caused by waves in the boiler water, the power signals from the RN-1 level controller have a built in 10 second delay. This means that the motors and connection elements are protected from spurious interruptions.

Operation
When the level of water falls below the normal operating level, the probe of the EN-1.2 level electrode (feedwater pump stop) is exposed followed by that of the EN-1.3 (feedwater pump start). Automatically, the RN-1 level controller switching relay is energized and the feedwater pump is started. The green lamp, which indicates that the feedwater pump is running, is lit up. The probe of the EN-1.3 level electrode (feedwater pump start) is gradually submerged along with that of EN-1.2 (feedwater pump stop). When the EN-1.2 level electrode probe (feedwater pump stop) is submerged the switching relay is deenergised, the green lamp switched off, and the pump shut down. If, due to failure, the pump continues running until the EN-1.1 level electrode probe is submerged (maximum level) the second switching relay on the RN-1 level controller is energized, the red lamp indicating maximum level is lit up, and the feedwater pump is disconnected.



Maintenance
The RN-1 level controller does not require daily checking. However a functional check should be carried out periodically. Check the electrode probe every six months and clean thoroughly.
After every change of controllers or electrodes, the correct operation of the controls should be checked before putting the boiler in service.

Breakdown
1- The feedwater pump does not start and the RS-1 minimum level safety controller indicates insufficient water:
- — Check the state of the thermal protection relay on the feedwater pump motor.
- — Check the supply voltages on the RN-1 level controller.
- — Check the connections between controller and electrode (RN-1 / EN-1.3).
- — Check the RN-1 level controller fuse (M.250/0,10A).
- — The probe on the EN-1.3 level electrode for feedwater pump start-up is too long.
- — The probe on the EN-1.2 level electrode for feedwater pump stop is not earthed.
- — Change the RN-1 level controller.

2- The feedwater pump does not stop and the boiler is over-filled:
- — Check the controller-electrode connections (RN-1/EN-1.2).
- — The probe on the EN-1.2 level electrode for feedwater pump stop is too short.
- — Change the RN-1 level controller.

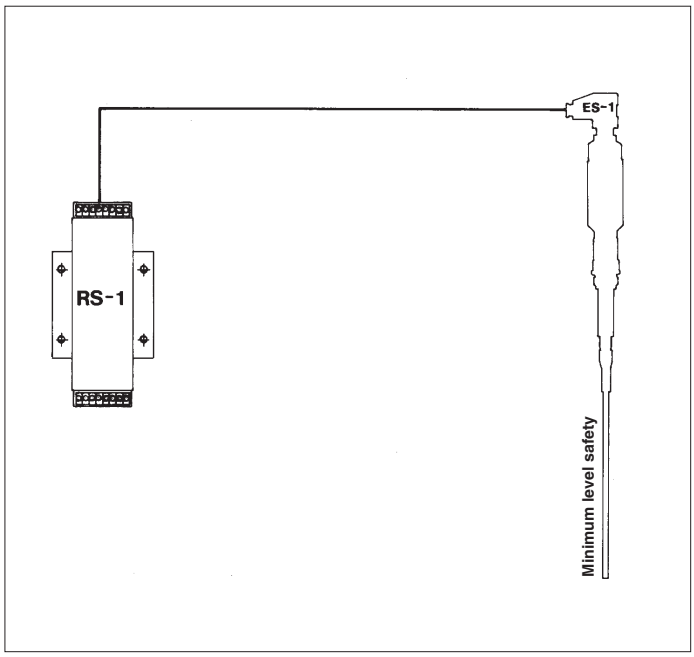
VYC controllers and electrodes are officially approved by several international organisations and must be repaired only in our workshops.

Minimum level safety controller. RS-1
Minimum level safety electrode. ES-1

The RS-1 minimum level safety controller, together with the ES-1 minimum level safety electrode, facilitates the measurement of minimum water level in the boiler.
If a minimum level is detected, the failure signal is automatically activated and the burner is disconnected. The controller and the electrode are equipped with devices for selfchecking and manual checking, which ensures reliable and safe operation. Any number of RS-1 minimum level safety controllers, each with its own ES-1 minimum level safety electrode, can be installed to obtain the required level of protection.

Operating principles
The operation of the RS-1 minimum level safety controller is based on the difference in conductivity of water and steam. The ES-1 minimum level safety electrode consists of a water measuring probe and a steam compensating ring. These are concentrically mounted and separated by special insulating covers. When the water measuring probe is out of the water the bridging circuit in the switching amplifier is lost. The signal is amplified and desenergizes a relay which activates the failure signal and disconnects the burner. The RS-1 minimum level safety controller has two channels and is equipped with a self-checking device. At a given switching frequency, the device carries out a periodic checking of the electronic circuitry and the connection between the electrode and the controller. This self-checking is generated by simulating a loss of water. In order to avoid disturbances to the safety system, caused by waves in the boiler water, the signal generated by the RS-1 minimum level safety controller has a built in 5 second delay. This prevents shutdowns caused by spurious failures.

Operation
The green operation lamp is on when the RS-1 minimum level safety controller is energized indicating that there is sufficient water in the boiler.
The RS-1 minimum level safety controller is equipped with buttons for manual checking:
1-Checking electrode (measuring probe): When this button is pressed for 5 seconds the electronic circuit and the connection between controller and electrode are checked. The simulation of water loss caused by cutting the voltage to the electrode causes a shutdown of the relay. The operation lamp goes off, the failure signal is activated and the burner is disconnected.
2-Isolation checking: When this button is pressed for 5 seconds the isolation is checked. The isolation of electronic circuitry and the steam-water compensation tube of the ES-1 minimum level safety electrode is checked, i.e. that there is no short-circuit or leakage to earth. The simulation of loss of isolation causes a shutdown of the relay. The operation lamp goes off, the failure signal is activated and the burner is disconnected.



Maintenance
The RS-1 minimum level safety controller, as it is self-checking, only requires a 6 monthly inspection by a qualified technician. We recommend carrying out the above mentioned manual checks once or twice per week.
Check the electrode measuring probe every 6 months and clean thoroughly.
After every change of controller or electrode, the correct functioning of the controls should be checked before putting the boiler back in service.

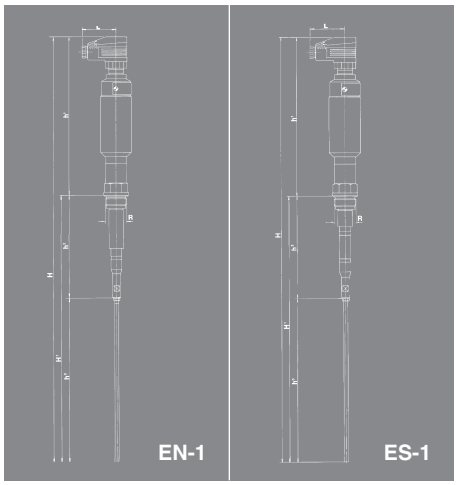
Breakdown
The RS-1 minimum level safety controller is an electronic device which is not subject to any mechanical wear or breakage. In the unlikely case of breakdown:
— Check the boiler water level.
— Check the RS-1 minimum level safety controller fuse (M.250/0,20A).
— Check the connection between controller and electrode (RS-1/ES-1).
— Change the RS-1 minimum level safety controller. If the failure continues the failure is caused by the ES-1 minimum level safety electrode.

VYC controllers and electrodes are officially approved by several international organisations and must be repaired only in our workshops.

Electrodes

Connection: Whitworth gas-tight cylindrical male thread ISO 228/1 1978 (DIN-259) 1".
Maximum operating temperature: 238°C.
Maximum operating pressure: 32 bar.
Protection: IP-65.

MODEL	EN-1	ES-1
R	1"	1"
H	952	952
H^1	700	700
h^1	252	252
h^2	153	153
h^3	547	547
L	53	53
WEIGHT IN Kgs.	1,09	1,12
CODE 2104 - 176.	71021	71022



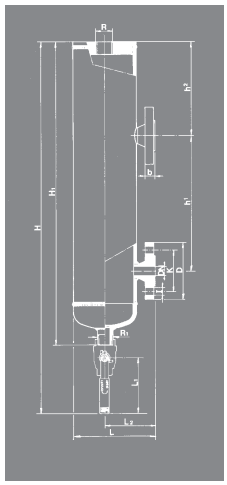
Electrode connection collector
As the body of the boiler cannot be perforated, the electrode connection collector allows the boiler to be equipped with an electrode based electronic level control device or the substitution of an old buoy type automatic level controller.

Nominal pressure: PN-40.
Allowable pressures and temperatures according to DIN-2401. Sheet 2.
Flange connection: DN-25 (DIN-2545).
Electrode connection: Whitworth gas-tigth cylindrical female thread ISO 228/1 1978 (DIN-259) 1".

We recommend adding a blowoff valve to the equipment, Mod. 999, 1/2" joined to the waste pipe for periodic release of sludge. As a minimum a 2 ÷ 3 second release must be performed every 8 hours.
If an electrode connection is to be taken out of service, the necessary plugs and seals can be supplied.

DN	25	25	25	25
R	1"	1"	1"	1"
h^1 (1)	190	190	250	250
N°. OF ELECTRODE CONNECTIONS	1	3	1	3
H	650	650	680	680
H_1	529	529	559	559
h^2	205	205	175	175
L	150	150	150	150
R_1	1/2"	1/2"	1/2"	1/2"
L_1	100	100	100	100
L_2	93	93	93	93
D	115	115	115	115
K	85	85	85	85
I	14	14	14	14
b	18	18	18	18
DRILLS N°.	4	4	4	4
WEIGHT IN Kgs.	10,90	10,70	11,50	11,30
CODE 2104 - 176.	83441	83442	83443	83444

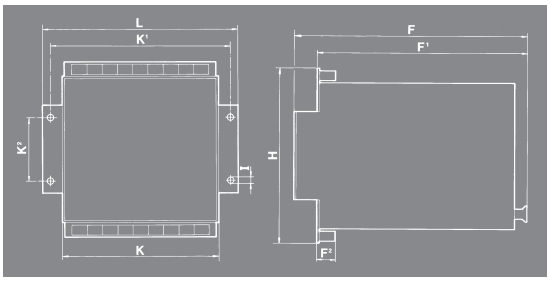
(1) Can be manufactured with other distances between centres of flanges.



Controllers

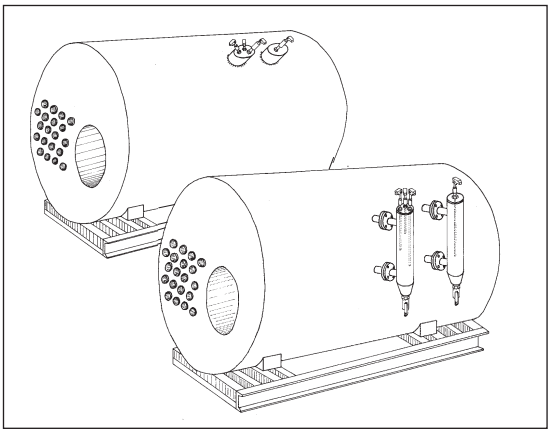
Voltage: 220 V.A.C. ± 10% 50/60 Hz.
Electrical consumption: Approximately 6 VA. (RN-1), 10 VA. (RS-1).
Relay contact: 250 V., 5 A.
Electrode circuit voltage: Galvanically isolated from mains. 7V. AC.
Output relays delay on deenergising: 10 seconds (RN-1), 5 seconds (RS-1).
Minimum operating conductivity: 3 µs/cm (RN-1), 0,05 ÷ 1 µs/cm (RS-1).
Ambient temperature: 0 to 55°C.
Controller protection: IP-10.

The controllers are supplied in an individual 19" sub-rack DIN-41494. If specified, we can supply from 2 to 5 controllers in the same sub-rack, and also include the desalting controller RD-1 in the assembly. (See brochure Model 560-A).



MODEL	RN-1	RS-1	19" sub-rack for controller mounting				
			1	2	3	4	5
H	157	157	157	157	157	157	157
F	210	210	210	210	210	210	210
F^1	189	189	189	189	189	189	189
F^2	17	17	17	17	17	17	17
L	86	86	86	132	177	223	269
K	52	52	52	98	143	189	235
K^1	72	72	72	118	163	209	255
K^2	57	57	57	57	57	57	57
I	6	6	6	6	6	6	6
WEIGHT IN Kgs.	0,90	0,90	0,32	0,37	0,43	0,48	0,53
CODE 2104 - 176.	0001	0002	00001	00002	00003	00004	00005

Installation examples



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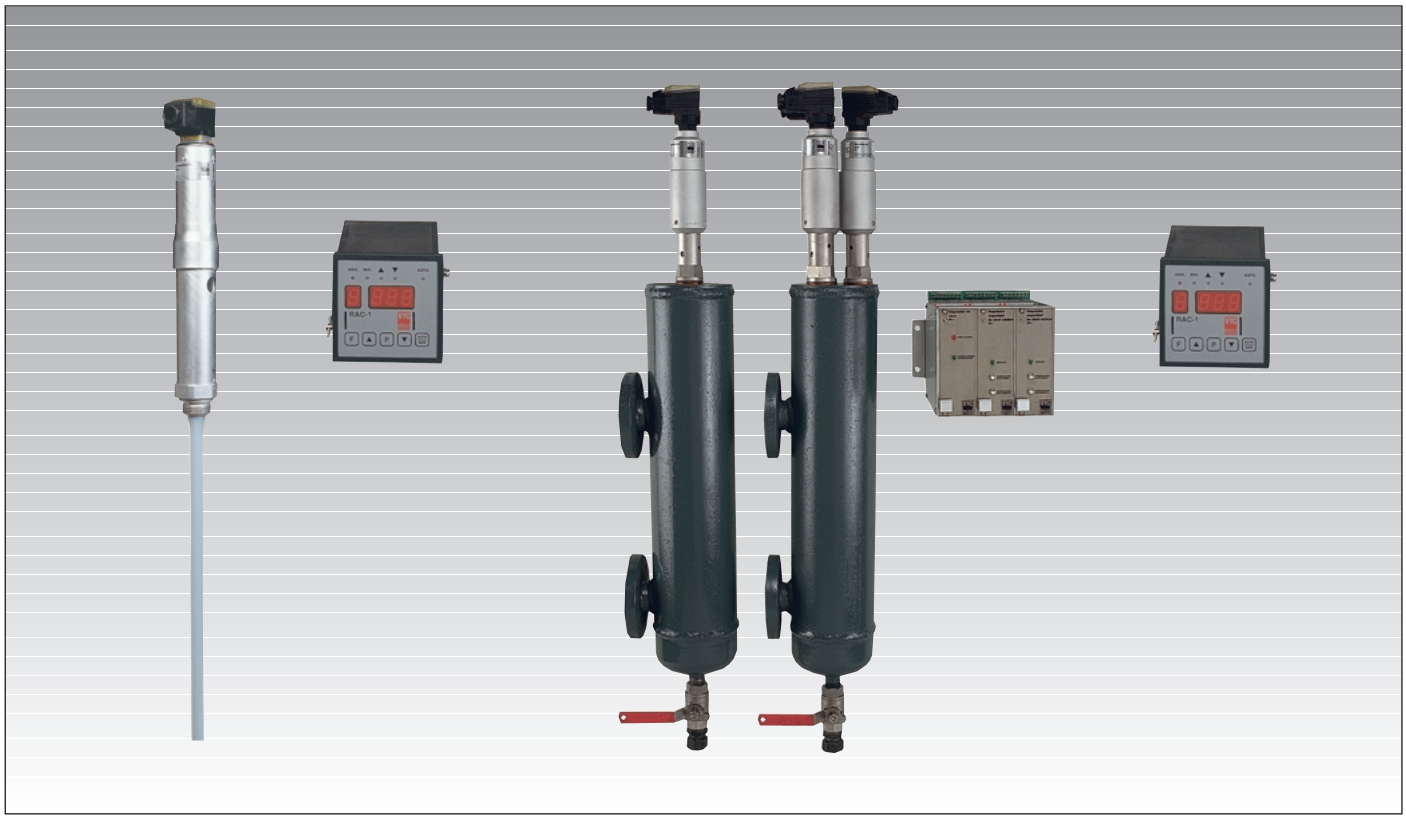
Capacitive electrode based electronic level controller

For steam boilers **Model 276**



This device, when combined with a motorised valve, ensures the continuous control and display of the level, with a high and low level alarm for; steam and hot water boilers, autoclaves, pre-heaters, pressured vessels, condensation and feedwater tanks, processing, etc.
Applicable to steam boilers that meet TRD-602 and TRD-604.

Features

— The design of the electrodes is technically perfect, achieving total steam-proofing with several sealing points.
— Simple construction eliminating mechanical moving parts, so they require minimum maintenance.
— Materials carefully selected for their resistance to wear, temperature and corrosion.
— Given their solid construction, the electrodes can work under critical pressure and temperature conditions.
— Very easy to connect and adjust for the control points. Since it is a fixed installation it makes any kind of handling much more difficult.
— High level of reliability and safety which allows them, in steam boilers, to work without permanent surveillance.
— By removing unnecessary support equipment and by installing the electrodes directly into the boiler, it achieves a completely maintenance-free control system, with the resulting cash savings.
— Centralised control and possibility of performing complex controls and adjustments.
— All the control units and electrodes are strictly tested and checked.
— Each one of the components is given a serial number, registered and controlled. If requested beforehand, the equipment will come with the certificates for materials, casting and trials.

Continuous feed control. RAC-1

It is an electronic control with a microprocessor for continuous level adjustment in combination with an EAC-1 continuous feed electrode and a motorised valve with a potentiometer for adjusting the flow rate.

Working principle

The electronic level control device is based on the capacitive measuring principle. The electrode rod and the wall of the container for measuring form a condenser.
The dielectric is air or the corresponding product. In electrically conductive products, the condenser is formed by the product and the electrode for which the insulating cover acts as a dielectric. Thus the capacity of the condenser depends on the level present in the electrode.
This capacity is measured by applying a high frequency and constant voltage to the electrodes.
The high frequency current that passes through the condenser is proportional to the capacity.
This current is transformed into a signal that is proportional to the level, which will then work an electrical element.

Installation and start-up

We base this on the assumption that the container to be controlled is a steam boiler. The process may be applied to other types of equipment.

1- Electrical connection.
A screened cable measuring 3 x 1 mm^2 with a maximum length of 100 m should be used for connecting the electrode end the potentiometer for the motorised valve. For working the valve, it may be connected directly to the adjuster with a voltage of 250 V, 3 A. If the power absorbed is greater, auxiliary relays must be installed between them.

2- Adjustments for the measurement range.
When switching on the control unit check that position C is displayed on the screen ④. Otherwise pressr [F] several times until it is displayed.
A Adjusting the level to 0%.
Fill the boiler with supply water until the water appears in the bottom part of the level box glass. Turn the potentiometer ⑮ until on the display ⑨ we achieve a digital readout of 0%.
B Adjusting the level to 100%.
Keep filling the boiler until the water reaches the top part of the level box glass. Turn the potentiometer ⑯ until 100% appears on the display ⑨.
Empty the boiler and repeat this operation then readjust, if necessary, the measurement range.

3- Selecting the minimum level and maximum levels.
Within the measurement range from 0 to 100%, you can adjust it by pressing [P] down for over two seconds until 2 appears on the screen ④.
A Selecting the minimum level.
With the push-button [F] select 4 on the screen ④. With [▲] or [▼] define, in percentage terms, the point for the minimum alarm in the display ⑨.
B Selecting the maximum level.
With the push-button [F] select 5 on the screen ④. With [▲] or [▼] define, in percentage terms, the point for the maximum alarm in the display ⑨. Press [F].

4- Selecting the pre-set adjustment reading.
You must define within the measurement range by entering a reading of between 0 and 100%. Press [P] down for over two seconds and 2 will appear on the screen ④. With [▲] or [▼] define, in percentage terms, the reading selected in the display ⑨.

5- Selecting the reading for the proportional band Xp %.
The proportional reading Xp determines the maximum and minimum percentage deviation for the real level with respect to the pre-set adjustment reading, depending on the working conditions for the boiler.
In order to obtain an adjustment without sudden changes, the Xp reading must be as high as possible.
Press [P] down for over 2 seconds and 2 will appear on the screen ④. With [F] display 3 on the screen ④. Using [▲] or [▼] define the desired Xp reading from 0 to 50% of the proportional band.

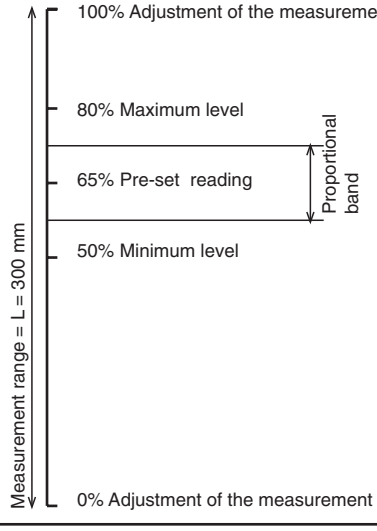
Example:

Xp = ± 10%

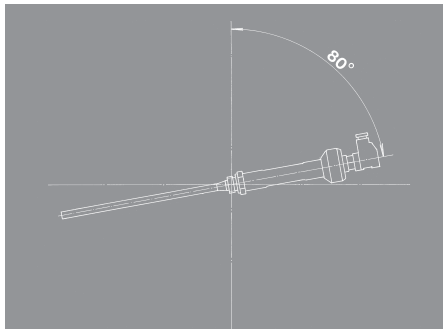
L = 300 mm

Proportional band = 60 mm

(30 mm above the pre-set reading
30 mm beneath the pre-set reading)



Continuous feed electrode. EAC-1



The electrode is a measuring probe that must be handled with the utmost care. Avoid contact, in particular with the measuring area, which might alter the sealing points.

Installing the electrode

Before installing the electrode, clean the polytetrafluorethylene cover (PTFE) using a clean and slightly damp cloth. The cover must be completely free from oil or grease. After putting the seal into place, screw in the electrode manually and tighten with a wrench.

Caution: Only stainless steel joints may be used!.
Use a new joint for each new assembly!.

The part above the hexagon must not be included in the insulation for the boiler. The electrode can be installed in a vertical or sloping position, with the measuring cover facing downwards. In the sloped position with respect to the vertical one, it should not exceed an angle of 80º. The measuring cover must be completely parallel to the metal wall of the vessel, collector, breakwater or, if missing, a metal rod to form a condenser.

Connecting the electrode

Unscrew the bolt for attaching the connector cover ①, remove the connector cover ②, the connector body ③ and unplug the contact holder ④. Pass the cable through the gland box ⑤, attaching a wire to connections Nos. 1, 2 and the third one to the earth point ⏚ in the contact holder ④. Check the connections, introduce the contact holder ④ into the socket ⑥ with its pertinent joint ⑦. Place the connector body ③, the connector cover ② and tighten the connector cover bolt ①.

Caution!: Fit joint ⑦ correctly!.
Connector body ③ can be oriented when necessary!.

Start-up

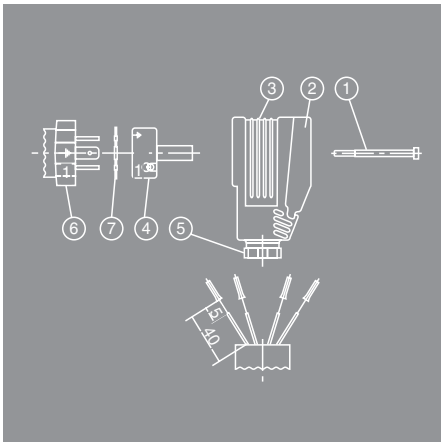
It is well known that polytetrafluorethylene (PTFE) dilates at high temperature. Make a check on each electrode at start-up and after any handling. Only if there is a satisfactory result should the electrodes be installed in the boiler and then turn it on.

Maintenance

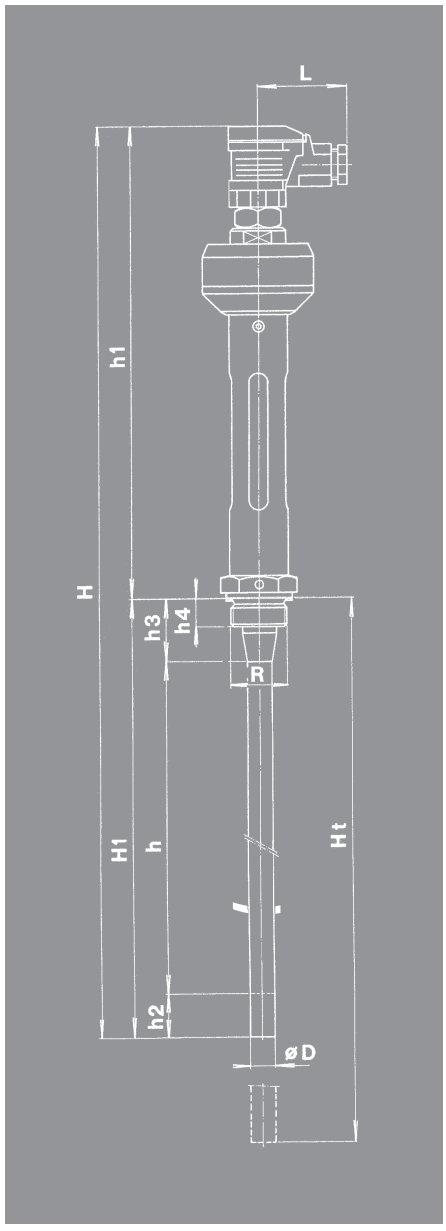
We recommend that thorough cleaning of the electrode should be performed according to the working conditions. Though we do recommend that the gap between each cleaning should not be over 6 months.

Problems

Any leak through the connecting joint can usually be solved simply by tightening it. If this is not so, replace the joint with a new one.



Connection: 1" Whitworth Male gas cylinder pin thread, ISO 228/1 from 1978 (DIN-259) . Maximum service temperature: 238°C. Maximum service pressure: 32 bar.Protection: IP-65.



EFFECTIVE FIELD OF MEASUREMENT h	300	400	500	600	700	800	900	1000	1100	1200	1300	1400	1500
R	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"	1"
H	650	750	850	950	1050	1150	1250	1350	1450	1550	1650	1750	1850
H^1	364	464	564	664	764	864	964	1064	1164	1264	1364	1464	1564
h^1	286	286	286	286	286	286	286	286	286	286	286	286	286
h^2	26	26	26	26	26	26	26	26	26	26	26	26	26
h^3	38	38	38	38	38	38	38	38	38	38	38	38	38
h^4	17	17	17	17	17	17	17	17	17	17	17	17	17
Ht 238ºC	374	479	584	689	793	898	1003	1108	1213	1318	1422	1527	1632
D	15	15	15	15	15	15	15	15	15	15	15	15	15
L	53	53	53	53	53	53	53	53	53	53	53	53	53
WEIGHT IN Kgs.	0,85	0,90	0,95	1,01	1,07	1,12	1,18	1,23	1,28	1,34	1,39	1,45	1,50
CODE 2104 - 276.	71001	71002	71003	71004	71005	71006	71007	71008	71009	71010	71011	71012	71013

Examples for installation

Collector connection for electrodes. Up to an effective field of measurement h = 400 mm (See catalogue for Mod. 176).

6- Adjusting the motorised valve.
Press F down until reaching position 1 on the screen ④.
Check that the control is in the manual working position (pilot light ⑧ off).
In order to change the position, press down AUTO/MAN for over two seconds.
A Closed position.
Close the valve manually with the push-button ▼.Turn the potentiometer ⑭ until achieving the digital readout of 0% on the display ⑨.
B Open position.
Open the valve manually with the push-button ▲.Turn the potentiometer ⑬ until achieving the digital readout of 100% on the display ⑨.
Repeat this operation checking and readjusting, if necessary, the positions of the valve.

7- Selecting the working system.
Press down AUTO/MAN for over two seconds.
A Automatic.
Pilot light ⑧ on.
B Manual
Pilot light ⑧ off.

8- Displaying the current working status.
Press down P for over two seconds and 2 will appear on the screen ④.
A Motorised valve status.
Press down the key F until leaving the screen ④ in position 1. See display ⑨.
B Percentage status for the water level.
Press down the key F until leaving the screen ④ in position 0. See display ⑨.

9- Summary

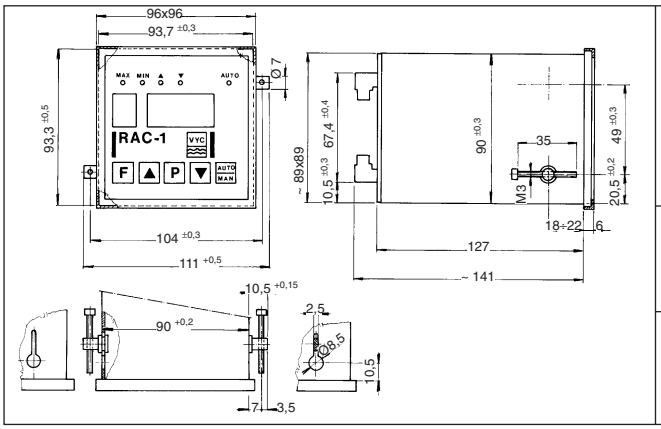
DISPLAY	F	F	0 Water level in % 1 Motorised velve position in %
CONFIGURATION	P	Keep pressed down for over two seconds	
		F	2 Select pre-set adjustment reading in % 3 Select Xp proportional band reading in Xp % 4 Select minimum level in % 5 Select maximum level in %
SELECTION	AUTO/MAN	Keep pressed down for over two seconds	

IMPORTANT!
During servicing conditions, we recommend leaving the control on the display in the current working status according to point 8.

VYC controls and electrodes are officially recognised by several international bodies and must only be repaired at our workshops.

Features

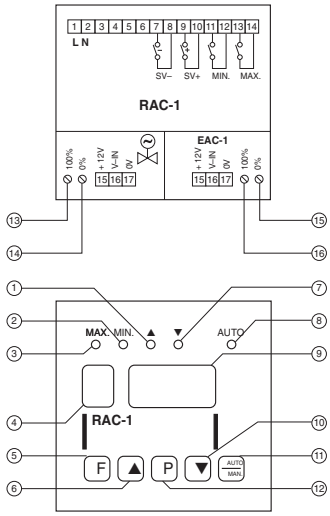
Control unit: With front, membrane-covered push-buttons and potentiometers for adjustment at the rear.
Voltage: 220 V.A.C. ± 10% 50/60 Hz.
Electrical consumption: 8 VA.
Fuses: 2,5 Amp. for protecting the switch contacts (SV-, SV+, MIN, MAX).
Control for motorised valve: Two contacts free from potential (SV- and SV+).
MIN and MAX level alarm: Using contacts free from potential adjustable for the whole measurement range of the electrode.
Load for contacts: 250 V, 3 A.
Current output (Under special demand): 0... 20 m A or 4... 20 m A.
Measurement range: 0 ÷ 100% of the effective measurement field h for the electrode.
Measurement range adjustment: By means of the rear potentiometers, adjustment from 0 and 100%.
Proportional band: 0 ÷ 50%.
Control for the proportional range: Using front push-buttons.
Feedback: Potentiometer for replacement inside the motorised valve.
Potentiometer: 1.000 ÷ 20.000 ohms.
Air temperature: 0 to 50°C.
Protection for the control unit: IP - 54.



CONNECTION
DIN-43700 box for building into wall. Metric pin thread ISO (DIN-13) from 1973 (M3)

WEIGHT IN Kgs.
0,740

CODE
2104-276.0001



① Valve open light
② Minimum alarm light
③ Maximum alarm light
④ Screen
⑤ Push-button F
⑥ Push-button ▲
⑦ Valve close light
⑧ Manual/automatic light
⑨ Display
⑩ Push-button ▼
⑪ Push-button AUTO/MAN
⑫ Push-button P
⑬ Open valve control potentiometer 100%
⑭ Closed valve control potentiometer 0%
⑮ Level control potentiometer 0%
⑯ Level control potentiometer 100%

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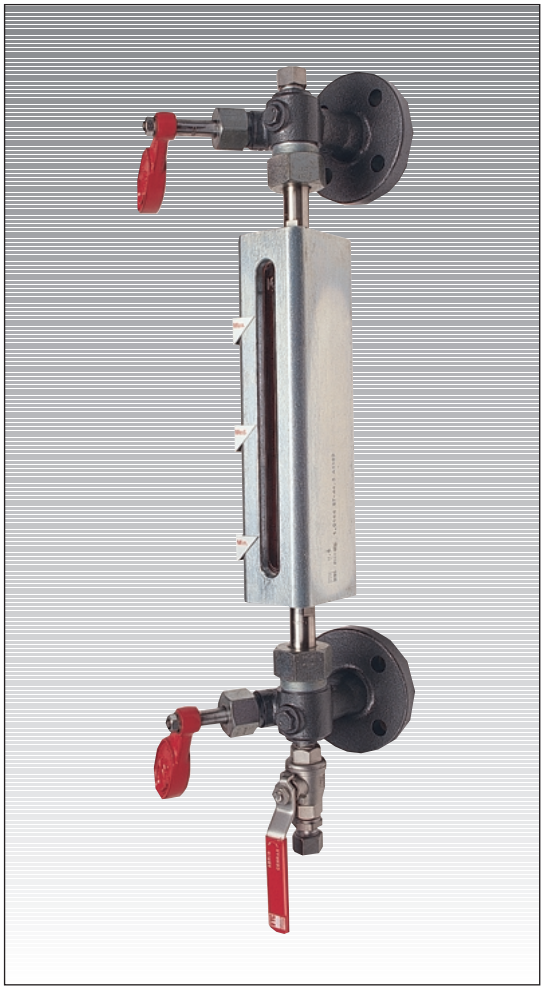
http: //www.vycindustrial.com

Round-dowel level indicator

Level gauges **Model 666**
Level indicator box **Model 166-ER**



For use in boilers, receivers, cisterns, reservoirs, ...etc., to control the level of liquids, gases and steam.
A multiple-slot polyprismatic viewer allows the level to be optically read, clearly differentiating liquid and gas phases from liquid ones.

Specifications

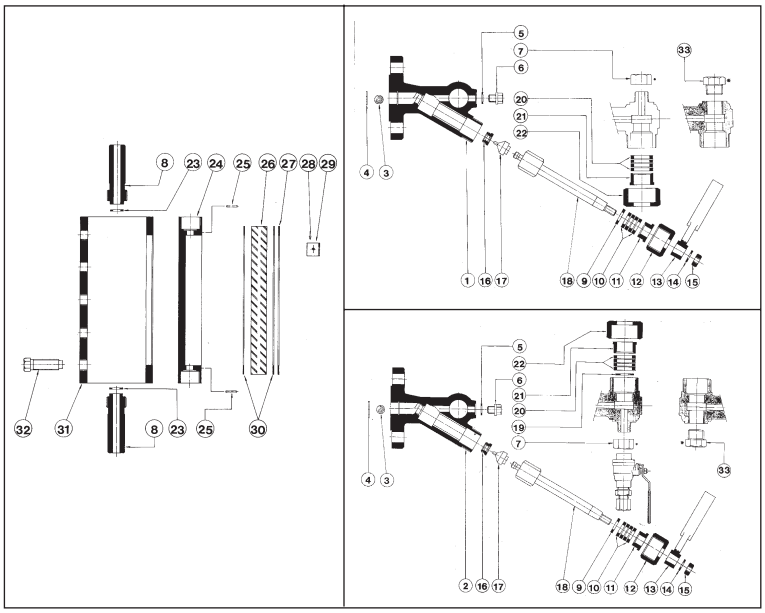
— Level gauges with replaceable floating or mobile needle seal and safety ball. Should the viewer break a pressure imbalance is caused which moves the ball onto the seating preventing the fluid from flowing out.
— Gauge activation by means of a fast control lever.
— Indiscriminate gauge assembly with lever on the right or on the left.
— Seals are highly tightness, exceeding the requirements of the DIN-3230 norms. Page 3.
— Gauges with draining plugs allowing crystals and sediments to be thoroughly cleaned out by inserting a Ø 7 mm. rod.
— The round-dowell system, in certain applications, allows the level indicator box to be replaced with a Ø 20 mm. glass tube.
— Level box which can be positioned at any angle in the 360°.
— Maximum, medium and minimum level optical mobile indicators.
— Boron silicate viewer with the special feature that if accidentally broken it is not shed out in pieces.

IMPORTANT
When assembling remove the washer (19) of the gauge operating as the upper one. We advise you to perfect the system with a cleaning valve, 3/8" Mod. 999 connected to the draining tube, in order to check the level indicator and its state of cleanliness periodically.
In steam boilers and other receivers with fluids that precipitate carry out at least one 2 ÷ 3 second cleaning session at 8 hour intervals.

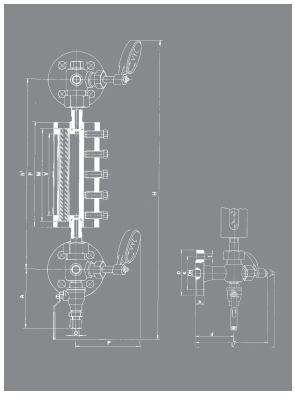
Depending on demand:
— Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).
— Special gaskets.
— Transparent viewers with mica plates, recommendable for temperatures exceeding 250° C.
— Possibility to replace the level indicator box for Ø 20 mm. glass tube and to fit it out with a protective pipe in case that it should be necessary.
— Boxes with special dowels for other distances between flange centres.
— Link boxes for viewing long levels.

N°. PIECE	PIECE	MATERIAL			
		CAST IRON	NODULAR IRON	CAST STEEL	STAINLESS STEEL
1,2	Body	Cast iron (DIN-0.6025 GG-25)	Nodular iron (DIN-0.7040 GGG-40)	Cast steel (DIN-1.0619 GS-C25)	S. steel (DIN-1.4408) (ASTM A351 CF8M)
3	Safety ball	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
4	Safety ring	S. steel (DIN-1.4300) (AISI-302)	S. steel (DIN-1.4300) (AISI-302)	S. steel (DIN-1.4300) (AISI-302)	S. steel (DIN-1.4300) (AISI-302)
5/23	Coupling	Aluminium/Copper	Aluminium/Copper	Aluminium/Copper	PTFE (Teflón)
6	Screw	Carbon steel (DIN-1.1151 Ck-22)	Carbon steel (DIN-1.1151 Ck-22)	Carbon steel (DIN-1.1151 Ck-22)	S. steel (DIN-1.4401) (AISI-316)
7,33	Cover•/Cap*	Carbon steel (DIN-1.1181 Ck-35)*	Carbon steel (DIN-1.1181 Ck-35)*	Carbon steel (DIN-1.1191 Ck-45)•	S. steel (DIN-1.4401) (AISI-316)•
8	Dowel	S. steel (DIN-1.4305) (AISI-303)	S. steel (DIN-1.4305) (AISI-303)	S. steel (DIN-1.4305) (AISI-303)	S. steel (DIN-1.4401) (AISI-316)
9	Ring	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
10,20	Seal	Graphite	Graphite	Graphite	PTFE (Teflón)
11,21	Gland	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
12,22	Gland nut	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
13	Lever	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)
14	Washer	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	S. steel (DIN-1.4401) (AISI-316)
15	Nut	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	S. steel (DIN-1.4401) (AISI-316)
16	Seating	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4401) (AISI-316)
17	Seal	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
18	Shaft	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4401) (AISI 316)
19	Washer	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
24	Box	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
25	Gudgeon	Carbon steel (DIN-1.1231 Ck-67)	Carbon steel (DIN-1.1231 Ck-67)	Carbon steel (DIN-1.1231 Ck-67)	S. steel (DIN-1.4310) (AISI-301)
26	Viewer	Boron-Silicate	Boron-Silicate	Boron-Silicate	Boron-Silicate
27	Reglet	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
28	Rivet	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)
29	Indicator arrow	Aluminium	Aluminium	Aluminium	Aluminium
30	Coupling	Klingerit cardboard	Klingerit cardboard	Klingerit cardboard	Klingerit cardboard
31	Body	Carbon steel (DIN-1.0570 ST-52.3)	Carbon steel (DIN-1.0570 ST-52.3)	Carbon steel (DIN-1.0570 ST-52.3)	S. steel (DIN-1.4408) (ASTM A351 CF8M)
32	Screw	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)

	DN	20																			
	PN	16				40					40						40				
OPERATING CONDITIONS	PRESSURE IN bar	16	13	13	13	40	35	32	28	24	40	35	32	28	24	21	40	34	32	29	
	MAXIMUN TEMP. IN °C	120	200	250	300	120	200	250	300	350	120	200	250	300	350	400	120	200	300	400	
	MINIMUM TEMP. IN °C	-10				-20					-29						-60				



LEVEL GAUGE			UPPER		LOWER	
DN			20	25	20	25
A			—	—	110	110
L			165	165	165	165
L[1]			180	180	180	180
P			155	155	155	155
d			87	87	87	87
O			—	—	12	12
PN-16 DIN-2532/2533 PN-40 DIN-2880/7 DIN-2544/2545	D		105	115	105	115
	K		75	85	75	85
	I		14	14	14	14
	b	PN-16	16	16	16	16
		PN-40	18	18	18	18
REDUCED PITCH Ø			15	15	15	15
DRILLS N°.			4	4	4	4
WEIGHT IN Kgs.	CAST IRON		2,35	2,58	2,27	2,49
	NODULAR IRON		2,35	2,58	2,28	2,50
	CAST STEEL		2,55	2,80	2,50	2,75
	STAINLESS STEEL		2,55	2,80	2,50	2,75
CODE 2101-666.	CAST IRON		53461	51061	53462	51062
	NODULAR IRON		83461	81061	83462	81062
	CAST STEEL		83441	81041	83442	81042
	STAINLESS STEEL		83421	81021	83422	81022



N°. LEVEL INDICATOR BOX		0	I	II	III	IV	V	VI	VII	VIII	IX	X
h[1]		285	305	330	355	380	410	445	470	510	530	560
V		75	95	120	145	170	200	230	260	300	320	350
M		95	115	140	165	190	220	250	280	320	340	370
F		115	135	160	185	210	240	275	300	340	360	390
H		518	538	563	588	613	643	678	703	743	763	793
WEIGHT IN Kgs.	CARBON STEEL. PN-16	2,84	3,30	3,89	4,40	4,97	5,59	6,20	6,79	7,40	7,80	8,40
	CARBON STEEL. PN-40	2,84	3,30	3,89	4,40	4,97	5,59	6,20	6,79	7,40	7,80	8,40
	STAINLESS STEEL.	2,98	3,39	4,05	4,46	5,11	5,80	6,60	7,00	7,80	8,40	9,00
CODE 2101-166.	PN-40	53440	53441	53442	53443	53444	53445	53446	53447	53448	53449	5344
	CARBON STEEL. PN-16	83440	83441	83442	83443	83444	83445	83446	83447	83448	83449	8344
	CARBON STEEL. PN-40	83420	83421	83422	83423	83424	83425	83426	83427	83428	83429	8342

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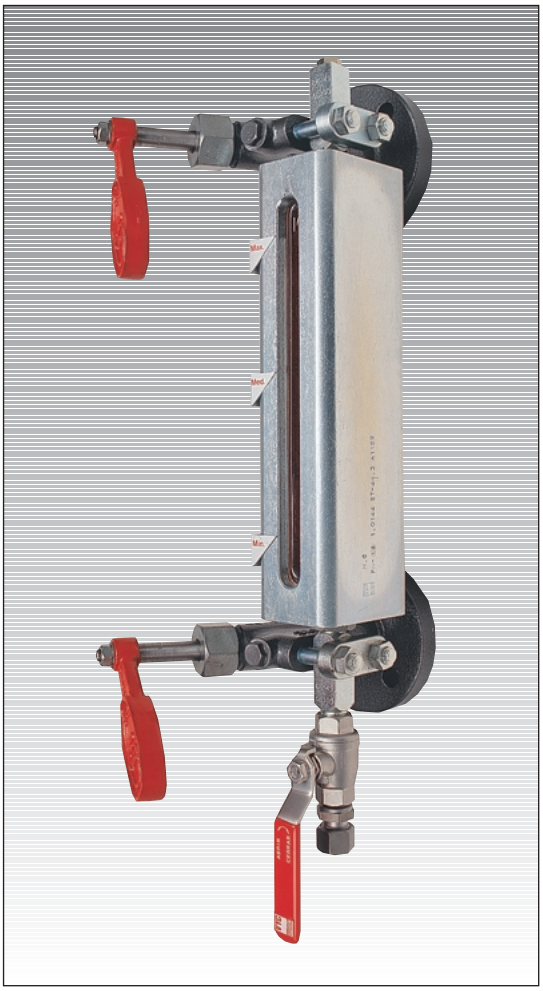
TRANSVERSAL, 179 - 08225 TERRASSA (BARCELONA) SPAIN
e-mail: info@vycindustrial.com
http: //www.vycindustrial.com

Square-dowel level indicator

Level gauges **Model 466**
Level indicator box **Model 166-EC**



For use in boilers, receivers, cisterns, reservoirs, ...etc., to control the level of liquids, gases and steam.
A multiple-slot polyprismatic viewer allows the level to be optically read, clearly differentiating liquid and gas phases from liquid ones.

Specifications

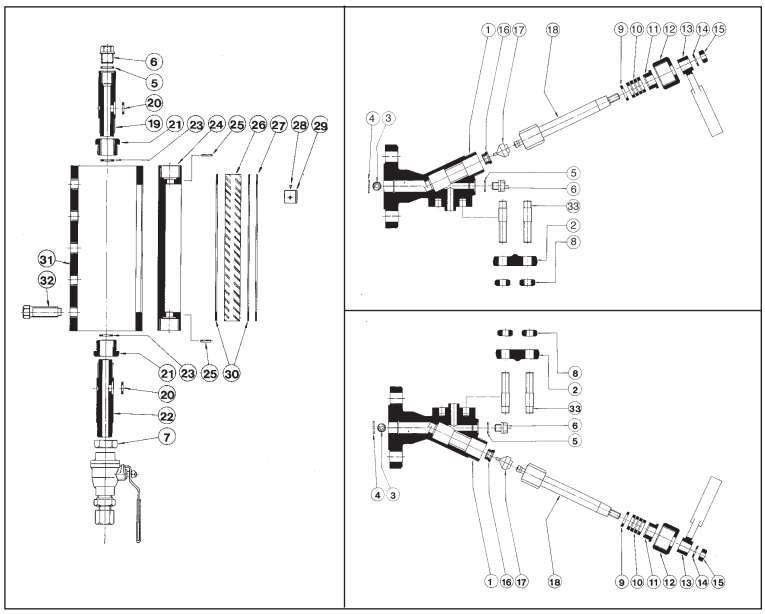
— Level gauges with replaceable floating or mobile needle seal and safety ball. Should the viewer break a pressure imbalance is caused which moves the ball onto the seating preventing the fluid from flowing out.
— Gauge activation by means of a fast control lever.
— Indiscriminate gauge assembly with lever on the right or on the left.
— Seals are highly tightness, exceeding the requirements of the DIN-3230 norms. Page 3.
— Gauges and level indicator box with draining plugs allowing crystals and sediments to be thoroughly cleaned out by inserting a Ø 7 mm. rod.
— Box easily attached with flanges, facilitating maintenance without needing to take gauges apart even when operational. Has no glands avoiding irrecoverable losses of fluid in these areas. Can be positioned at 360°.
— Maximum, medium and minimum level optical mobile indicators.
— Boron silicate viewer with the special feature that if accidentally broken it is not shed out in pieces.
— Greater reading area than in the round-dowel system, at the same distance between flange centre.

IMPORTANT
We advise you to perfect the system with a cleaning valve, 3/8" Mod. 999 connected to the draining tube, in order to check the level indicator and its state of cleanliness periodically.
In steam boilers and other receivers with fluids that precipitate carry out at least one 2÷3 second cleaning session at 8 hour intervals.

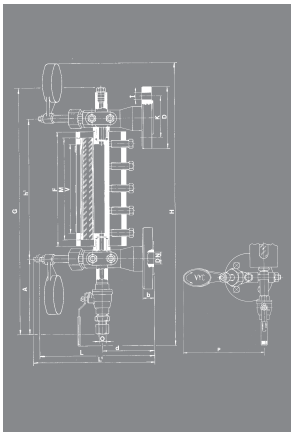
Depending on demand:
— Possibility of manufacture in other types of material, for use in special working conditions (high temperatures, fluids, etc.).
— Special gaskets.
— Transparent viewers with mica plates, recommendable for temperatures exceeding 250° C.
— Boxes with special dowels for other distances between flange centres.
— Link boxes for viewing long levels.

N°. PIECE	PIECE	MATERIAL			
		CAST IRON	NODULAR IRON	CAST STEEL	STAINLESS STEEL
1	Body	Cast iron (DIN-0.6025 GG-25)	Nodular iron (DIN-0.7040 GGG-40)	Cast steel (DIN-1.0619 GS-C 25)	S. steel (DIN-1.4408) (ASTM A351 CF8M)
2	Flange	Cast steel (DIN-1.0619 GS-C 25)	Cast steel (DIN-1.0619 GS-C 25)	Cast steel (DIN-1.0619 GS-C 25)	S. steel (DIN-1.4408) (ASTM A351 CF8M)
3	Safety ball	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
4	Safety ring	S. steel (DIN-1.4300) (AISI-302)	S. steel (DIN-1.4300) (AISI-302)	S. steel (DIN-1.4300) (AISI-302)	S. steel (DIN-1.4300) (AISI-302)
5/23	Coupling	Aluminium / Copper	Aluminium / Copper	Aluminium / Copper	PTFE (Teflón)
6	Screw	Carbon steel (DIN-1.1151 Ck-22)	Carbon steel (DIN-1.1151 Ck-22)	Carbon steel (DIN-1.1151 Ck-22)	S. steel (DIN-1.4401) (AISI-316)
7	Cap	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
8/15	Nut	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	S. steel (DIN-1.4401) (AISI-316)
9	Ring	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
10	Seal	Graphite	Graphite	Graphite	PTFE (Teflón)
11	Gland	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
12	Gland nut	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
13	Lever	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)	Nodular iron (DIN-0.7040 GGG-40)
14	Washer	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	S. steel (DIN-1.4401) (AISI-316)
16	Seating	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4401) (AISI-316)
17	Seal	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
18	Shaft	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4028) (AISI-420)	S. steel (DIN-1.4401) (AISI-316)
19	Upper dowel	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
20	Coupling	Copper	Copper	Copper	PTFE (Teflón)
21	Double screw	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
22	Lower dowel	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
24	Box	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
25	Gudgeon	Carbon steel (DIN-1.1231 Ck-67)	Carbon steel (DIN-1.1231 Ck-67)	Carbon steel (DIN-1.1231 Ck-67)	S. steel (DIN-1.4310) (AISI-301)
26	Viewer	Boron-Silicate	Boron-Silicate	Boron-Silicate	Boron-Silicate
27	Reglet	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)	S. steel (DIN-1.4401) (AISI-316)
28	Rivet	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	Carbon steel (DIN-1.1141 Ck-15)	C. steel (DIN-1.1141 Ck-15)
29	Indicator arrow	Aluminium	Aluminium	Aluminium	Aluminium
30	Coupling	Klingerit cardboard	Klingerit cardboard	Klingerit cardboard	Klingerit cardboard
31	Body	Carbon steel (DIN-1.0570 ST.52.3)	Carbon steel (DIN-1.0570 ST.52.3)	Carbon steel (DIN-1.0570 ST.52.3)	S. steel (DIN-1.4408) (ASTM A351 CF8M)
32	Screw	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	Carbon steel (DIN-1.1191 Ck-45)	S. steel (DIN-1.4401) (AISI-316)
33	Stud	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	Carbon steel (DIN-1.1181 Ck-35)	S. steel (DIN-1.4401) (AISI-316)

DN		20 and 25																		
PN		16				40					40						40			
OPERATING CONDITIONS	PRESSURE IN bar	16	13	13	13	40	35	32	28	24	40	35	32	28	24	21	40	34	32	29
	MAXIMUM TEMP. IN °C	120	200	250	300	120	200	250	300	350	120	200	250	300	350	400	120	200	300	400
	MINIMUM TEMP. IN °C	-10				-20					-29						-60			



LEVEL GAUGE			UPPER		LOWER	
DN			20	25	20	25
A			–	–	127	127
L			165	165	165	165
L^1			180	180	180	180
P			185	185	185	185
d			83	83	83	83
O			–	–	12	12
PN-16 DIN-2532/2533 PN-40 DIN-28607 DIN-2544/2545	D		105	115	105	115
	K		75	85	75	85
	I		14	14	14	14
	b	PN-16	16	16	16	16
		PN-40	18	18	18	18
REDUCED PITCH Ø			15	15	15	15
DRILLS N°.			4	4	4	4
WEIGHT IN Kgs.	CAST IRON		2,18	2,39	2,18	2,39
	NODULAR IRON		2,20	2,42	2,20	2,42
	CAST STEEL		2,30	2,53	2,30	2,53
	STAINLESS STEEL		2,30	2,53	2,30	2,53
CODE 2101-466	CAST IRON		5346	5106	5346	5106
	NODULAR IRON		8346	8106	8346	8106
	CAST STEEL		8344	8104	8344	8104
	STAINLESS STEEL		8342	8102	8342	8102



N°. LEVEL INDICATOR BOX		0	I	II	III	IV	V	VI	VII	VIII	IX	X
h^1		160	180	205	230	255	285	320	345	385	405	435
V		75	95	120	145	170	200	230	260	300	320	350
M		95	115	140	165	190	220	250	280	320	340	370
F		115	135	160	185	210	240	275	300	340	360	390
G		337	357	382	407	432	462	497	522	562	582	612
H		413	433	458	483	508	538	573	598	638	658	688
WEIGHT IN Kgs.	CARBON STEEL. PN-16	2,84	3,30	3,89	4,40	4,97	5,59	6,20	6,79	7,40	7,80	8,40
	CARBON STEEL. PN-40	2,84	3,30	3,89	4,40	4,97	5,59	6,20	6,79	7,40	7,80	8,40
	STAINLESS STEEL. PN-40	2,98	3,39	4,05	4,46	5,11	5,80	6,60	7,00	7,80	8,40	9,00
CODE 2101-166.	CARBON STEEL. PN-16	51840	51841	51842	51843	51844	51845	51846	51847	51848	51849	5184
	CARBON STEEL. PN-40	81840	81841	81842	81843	81844	81845	81846	81847	81848	81849	8184
	STAINLESS STEEL. PN-40	81820	81821	81822	81823	81824	81825	81826	81827	81828	81829	8182

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Founded in 1914

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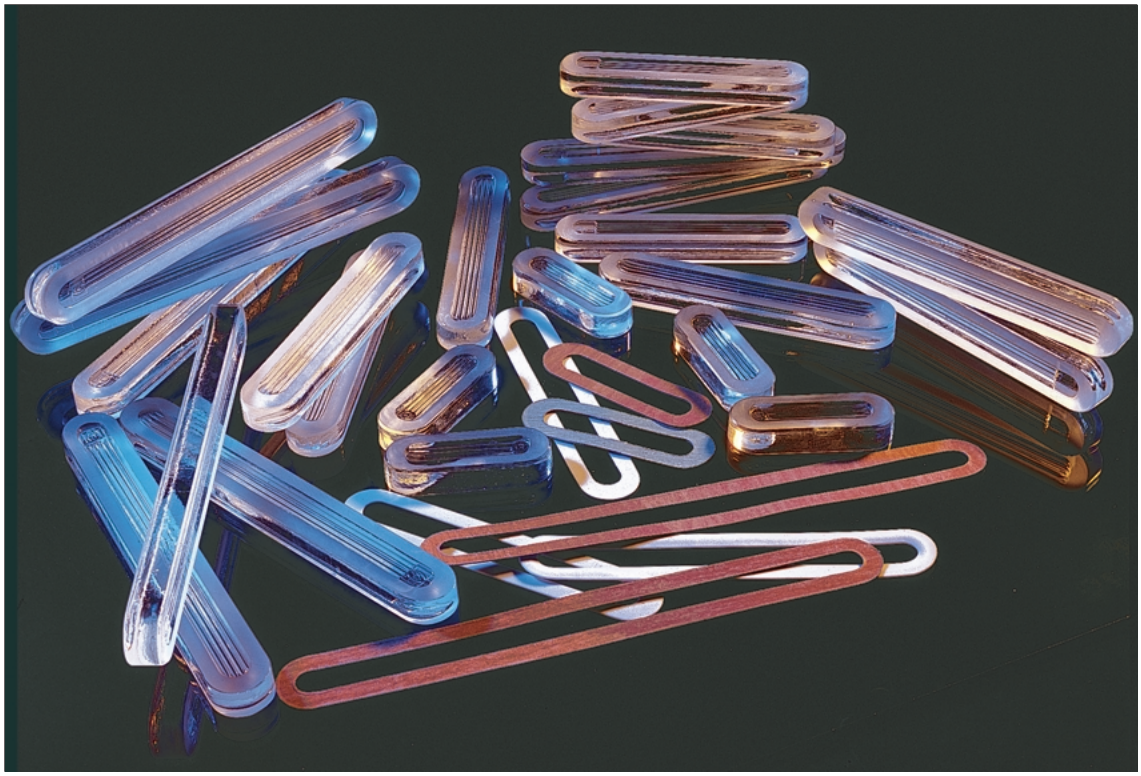
Reflection and transparency glasses

For level indicator box **Model 066**

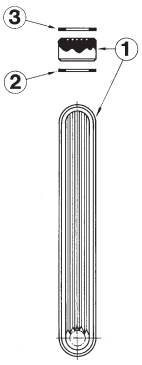


For visual checking of the level of liquids in all types of vessel, including those under pressure, in special thermal and chemical conditions. Also for checking processes.
The quality of the sight glass satisfies the most demanding safety standards and industry guarantees in general.

Specifications

— Boron silicate glass of high chemical stability.
— Of great purity and homogeneity.
— Low thermal expansion coefficient.
— Thermally prestressed which guarantees high mechanical resistance.
— High resistance to sharp changes of temperature, pressure and chemical aggression, guaranteeing a long life.
— Joint surfaces are perfectly flat.
— The prisms are pressed, not cut, with a precise angle of reflection.
— If the glass is accidentally broken it does not shatter.
— Satisfies the international standards: DIN-7080, DIN-7081, BS-3463, Ö Norm M7353,Ö Norm M7354, JIS B 8211, MIL G 18498, TGL 7210, ESSO/EXXON, Ö MV H 2009, SOD Spec. 123, etc.

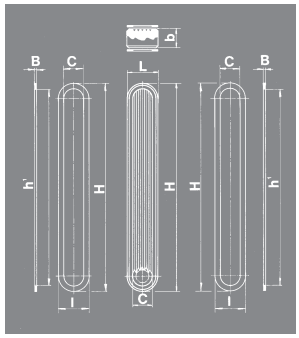
IMPORTANT
Depending on demand:
— Other types of joints: Cardboard type klingerit acidit, PTFE (Teflón), etc.



N°. PIECE	PIECE	MATERIAL		
1	Glass	Boron-Silicate		
2	Joint	Red klingerit cardboard		
3	Joint	Oilit klingerit cardboard		
OPERATING CONDITIONS(2)	FLUID	WITH OUTSTANDING ATTACK	WITHOUT OUTSTANDING ATTACK	TRANSPARENCY WITH MICA
	PRESSURE IN bar	35	100	70
	MAXIMUM TEMPERATURE IN °C	243	120	280 ÷ 300

(1) For level indicator box in steam, joint (2) must be exposed to the medium. For level indicator box in processes, joint (3) must be exposed to the medium.
(2) Type H 340 bar at 120ºC, 42 bar at 253ºC.

	TYPE	N°. OF PRISMS	N°.	H x L x b	C	TOLERANCES H	TOLERANCES L	TOLERANCES b	TOLERANCES C	PARALLELISM TOLERANCES ≤	h¹	I	B	WEIGHT IN Kgs.	CODE
REFLECTION	A	5	0	95x30x17	15	+0 -1,5	+0,2 -0,8	+0,5 -0,5	+0,2 -0,8	0,05	79	30	1,5	0,08	2101-066.1005*
			I	115x30x17	15						99			0,11	2101-066.1015
			II	140x30x17	15						124			0,14	2101-066.1025
			III	165x30x17	15						149			0,17	2101-066.1035
			IV	190x30x17	15					0,08	174			0,20	2101-066.1045
			V	220x30x17	15						204			0,23	2101-066.1055
			VI	250x30x17	15						234			0,27	2101-066.1065
			VII	280x30x17	15						264			0,31	2101-066.1075
			VIII	320x30x17	15					0,13	304			0,36	2101-066.1085
			IX	340x30x17	15						324			0,38	2101-066.1095
			X	370x30x17	15						354			0,40	2101-066.1105*
	B	5	0	95x34x17	17	+0 -1,5	+0,2 -0,8	+0,5 -0,5	+0,2 -0,8	0,05	75	35	1,5	0,10	2101-066.2005*
			I	115x34x17	17						95			0,12	2101-066.2015
			II	140x34x17	17						120			0,16	2101-066.2025
			III	165x34x17	17						145			0,19	2101-066.2035
			IV	190x34x17	17					0,08	170			0,22	2101-066.2045
			V	220x34x17	17						200			0,26	2101-066.2055
			VI	250x34x17	17						230			0,30	2101-066.2065
			VII	280x34x17	17						260			0,35	2101-066.2075
			VIII	320x34x17	17					0,13	300			0,41	2101-066.2085
			IX	340x34x17	17						320			0,43	2101-066.2095
			X	370x34x17	17						350			0,45	2101-066.2105*
	H	5	0	95x34x22	17	+0 -1,5	+0,2 -0,8	+0,5 -0,5	+0,2 -0,8	0,05	75	35	1,5	0,15	2101-066.3005*
			I	115x34x22	17						95			0,17	2101-066.3015
			II	140x34x22	17						120			0,22	2101-066.3025
			III	165x40x22	17						145			0,25	2101-066.3035
			IV	190x34x22	17					0,08	170			0,28	2101-066.3045
			V	220x34x22	17						200			0,34	2101-066.3055
			VI	250x34x22	17						230			0,39	2101-066.3065
			VII	280x34x22	17						260			0,46	2101-066.3075
			VIII	320x34x22	17					0,13	300			0,53	2101-066.3085
			IX	340x34x22	17						320			0,55	2101-066.3095
			X	370x34x22	17						350			0,57	2101-066.3105*
TRANSPARENCY	A	-	0	95x30x17	-	+0 -1,5	+0,2 -0,8	+0,5 -0,5	-	0,05	79	30	1,5	0,09	2101-066.10051*
			I	115x30x17							99			0,12	2101-066.10151*
			II	140x30x17							124			0,15	2101-066.10251*
			III	165x30x17							149			0,18	2101-066.10351*
			IV	190x30x17						0,08	174			0,21	2101-066.10451*
			V	220x30x17							204			0,24	2101-066.10551
			VI	250x30x17							234			0,28	2101-066.10651
			VII	280x30x17							264			0,32	2101-066.10751
			VIII	320x30x17						0,13	304			0,37	2101-066.10851
			IX	340x30x17							324			0,39	2101-066.10951
			X	370x30x17							354			0,41	2101-066.11051*
	B	-	0	95x34x17	-	+0 -1,5	+0,2 -0,8	+0,5 -0,5	-	0,05	75	35	1,5	0,11	2101-066.20051*
			I	115x34x17							95			0,13	2101-066.20151*
			II	140x34x17							120			0,17	2101-066.20251*
			III	165x34x17							145			0,20	2101-066.20351*
			IV	190x34x17						0,08	170			0,23	2101-066.20451*
			V	220x34x17							200			0,27	2101-066.20551
			VI	250x34x17							230			0,31	2101-066.20651
			VII	280x34x17							260			0,36	2101-066.20751
			VIII	320x34x17						0,13	300			0,42	2101-066.20851
			IX	340x34x17							320			0,44	2101-066.20951
			X	370x34x17							350			0,46	2101-066.21051*
	H	-	0	95x34x22	-	+0 -1,5	+0,2 -0,8	+0,5 -0,5	-	0,05	75	35	1,5	0,16	2101-066.30051*
			I	115x34x22							95			0,18	2101-066.30151*
			II	140x34x22							120			0,23	2101-066.30251*
			III	165x34x22							145			0,26	2101-066.30351*
			IV	190x34x22						0,08	170			0,29	2101-066.30451*
			V	220x34x22							200			0,35	2101-066.30551
			VI	250x34x22							230			0,40	2101-066.30651
			VII	280x34x22							260			0,47	2101-066.30751
			VIII	320x34x22						0,13	300			0,54	2101-066.30851
			IX	340x34x22							320			0,56	2101-066.30951
			X	370x34x22							350			0,58	2101-066.31051*



* Material without stock.

Chemical properties			
Hydrolytic resistance	0,019	DIN-12111	ISO-719 CLASS-1
	0,030	DIN-28817	ISO-720 CLASS-1
Acid resistance	0,2	DIN-12116	CLASS-1
Alkaline resistance	89	DIN-52322	ISO-675 CLASS-2

Physical properties

Type of glass.....Ggl 490
Average coefficient of linear expansion α20ºC/300ºC.....<5•10^{-6} K^{-1}
Transformation temperature according to DIN-52324.....575ºC
Temperature of the glass at viscosities dPas (Poise):10^{13}.....553ºC
10^{7,6}.....775ºC
10^{4}.....1.225ºC
Density.....2,39 g/cm^3

Elasticity modulus.....73,54 N/mm^{-2}
Poisson index.....0,19 μ
Specific thermal tension $\varphi = \frac{E \cdot \alpha}{1-\mu}$ .....0,405 Nmm^{-2}K^{-1}
Thermal conductivity λ.....1,168 $\cdot \frac{W}{m \cdot K}$
Refraction index nd λ = 587,6 mm.....1,494
Photoelasticity constant K.....2,9 · 10^{-6} mm^2/N

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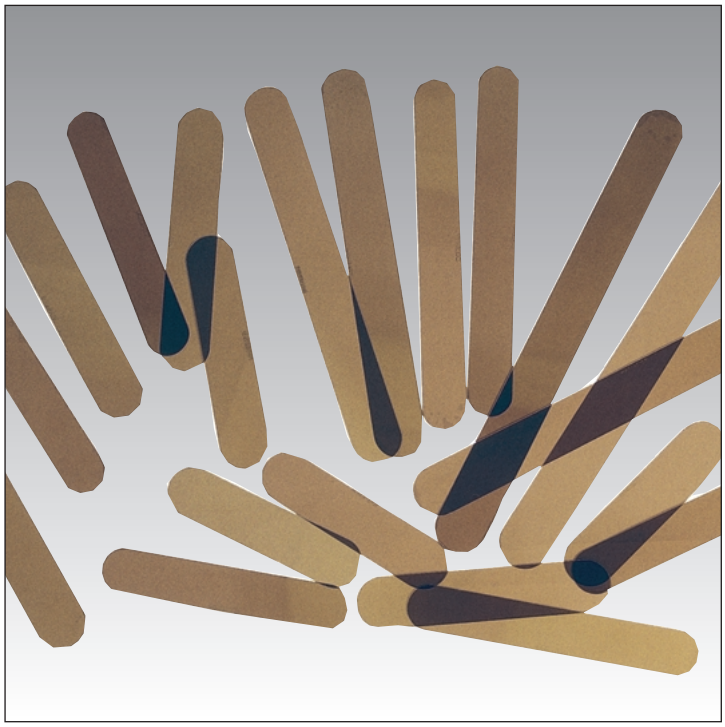
Mica shield

Model 066-PM

For level indicators



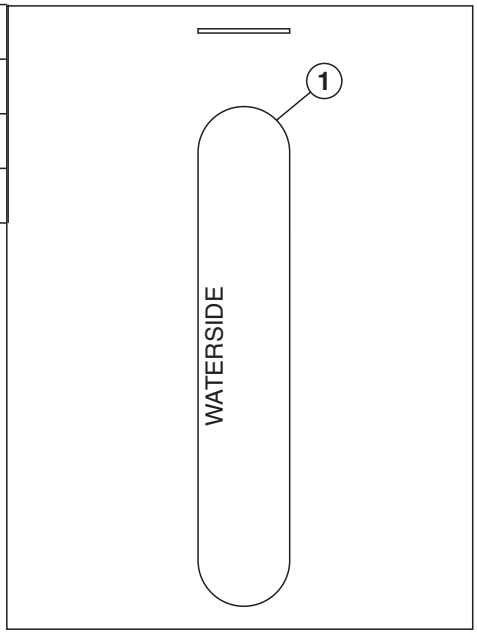
In combination with transparent glasses the life of these is increased when working at high pressures and temperatures. Also, they are protected from erosion, which results from the effects of the corrosive chemical components, alkaline solutions, boiler water, steam, caustic products, hydrofluoric acids, hot and concentrated phosphoric acids, sodium and potassium hydroxides and other contaminating, viscous or corrosive media.
Applicable in level indicators for electrical generation plants, thermal power plants, petroleum refineries, petrochemical plants, pressure vessels, fertilizers, sugar refining plants, paper mills,... etc..

Specifications

— Manufactured from laminas of natural muscovite mica.
— High heat resistance.
— Colourless with good transparency and optical quality, even in the presence of temperature fluctuations and with aggressive fluids.
— Smooth, flexible and unbreakable surface, guaranteeing an absolutely sealed joint.
— Resistant to shocks, stress and vibrations.
— Protects the environment in case of glass breakage.
— Complies with international standards: ASTM D351-57T and IS 1175-57.
— Each lamina is rigorously tested and inspected.

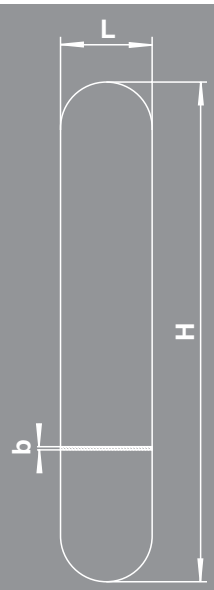
N° PIECE	PIECE		MATERIAL
1	Mica shield		Natural muscovite mica
OPERATING CONDITIONS		PRESSURE IN bar	392
		MAX. TEMPERATURE IN °C	600

(1) We recommend mica laminas to be used above 24 bar or 196°C.



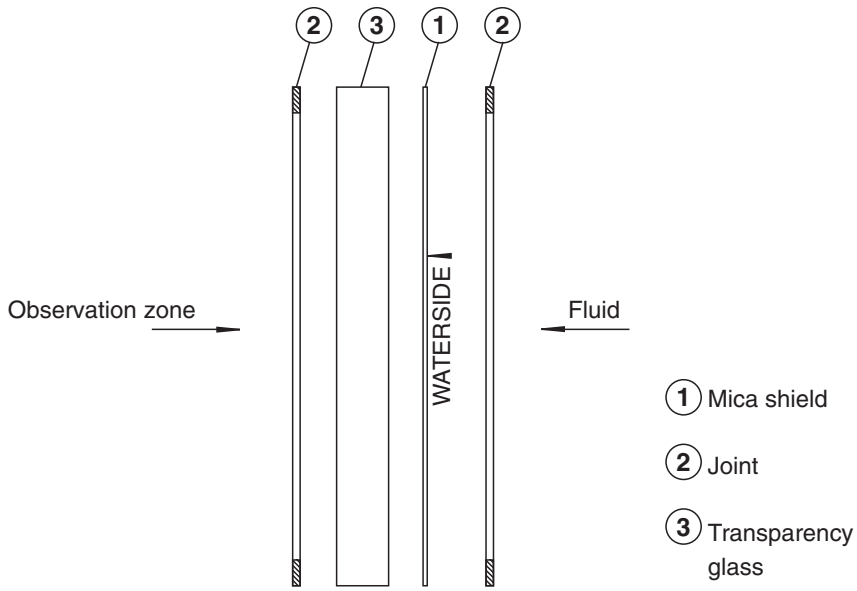
IMPORTANT
Depending on demand:
— Other thicknesses.
— Any shape or size.

TYPE	Nº	H x L x b	CODE
A	I	115 x 30 x 0,2	2101-066.10152
	II	140 x 30 x 0,2	2101-066.10252
	III	165 x 30 x 0,2	2101-066.10352
	IV	190 x 30 x 0,2	2101-066.10452
	V	220 x 30 x 0,2	2101-066.10552
	VI	250 x 30 x 0,2	2101-066.10652
	VII	280 x 30 x 0,2	2101-066.10752
	VIII	320 x 30 x 0,2	2101-066.10852
	IX	340 x 30 x 0,2	2101-066.10952
	X	370 x 30 x 0,2	2101-066.11052
B/H	I	115 x 34 x 0,2	2101-066.20152
	II	140 x 34 x 0,2	2101-066.20252
	III	165 x 34 x 0,2	2101-066.20352
	IV	190 x 34 x 0,2	2101-066.20452
	V	220 x 34 x 0,2	2101-066.20552
	VI	250 x 34 x 0,2	2101-066.20652
	VII	280 x 34 x 0,2	2101-066.20752
	VIII	320 x 34 x 0,2	2101-066.20852
	IX	340 x 34 x 0,2	2101-066.20952
	X	370 x 34 x 0,2	2101-066.21052



Installation

It is of vital importance that the mica shield is mounted such that the side market with the work “Waterside” is in contact with the liquid. The other side must be applied directly to the glass.



Maintenance

The life of a transparency glass depends to a large extent on the mica shield used. Once the lamina is worn out the installation should be changed, including the glass.

The average life cycle of the mica shield varies widely end depends upon the liquid, pressure and temperature.

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