Blowdown valve for automatic bleeding dirt and sludge

EN

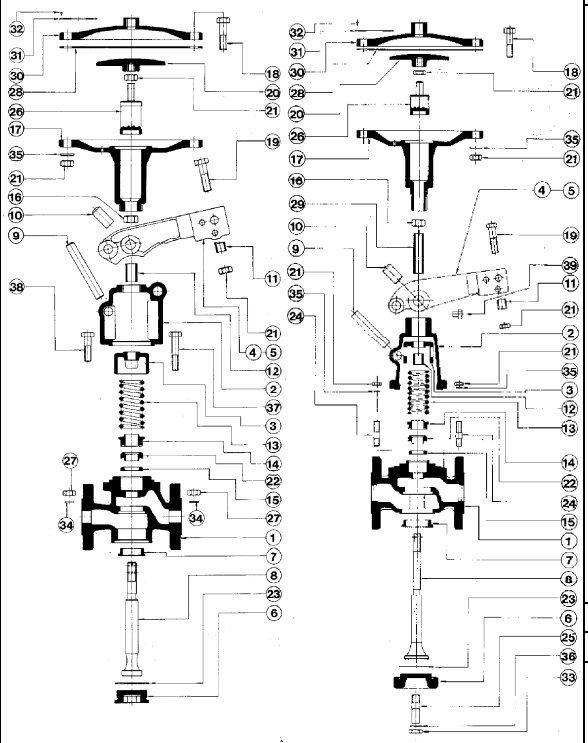
The water in the boiler contains salts, which are built up by the continuous evaporation. If these salts are not eliminated, bubbles and foam are formed when the density of the water increases.
To prevent these lime deposits forming, the water supply must be suitably treated, with the result that certain 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.
Flange connection: DN-20, 25, 32, 40 and 50 (EN-1092-1).

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 EN 12266-1, is obtained.
— Coupling of the closing axis is self-tightening and maintenance free.



(1) DN-32 a 50 Cast steel (EN-1.0037 S235JR)

N°. PIECE	PIECE	MATERIAL
1	Body	Cast steel (EN-1.0619)
2	Headstock	Nodular iron (EN-5.3106)
3	Spring press	Nodular iron (EN-5.3106)
4, 5	Bracket	Nodular iron (EN-5.3106)
6	Cap (1)	Carbon steel (EN-1.1191)
7	Seating	Stainless steel (EN-1.4028)
8	Axis	Stainless steel (EN-1.4028)
9	Buffer axis	Carbon steel (EN-1.1181)
10	Leading axis	Carbon steel (EN-1.1181)
11	Removal coupling	Carbon steel (DIN-1.0308)
12, 29	Valve base	Carbon steel (DIN-1.0308)
13	Spring	Spring steel (EN-10270-1-SH)
14	Gland	Bronze (EN-CC491K-GZ)
15	Ring	Bronze (EN-CC491K-GZ)
16, 21, 27, 33	Nut	Carbon steel (EN-1.1141)
17	Support	Nodular iron (EN-5.3106)
18, 19, 37, 38	Screw	Carbon steel (EN-1.1191)
20	Lead	Cast iron (EN-5.1300)
22	Retene	E.P.D.M.
23	Cap coupling	PTFE (Topchem)
24, 25	Stud	Carbon steel (EN-1.1181)
26	Chuck	Carbon steel (EN-1.1151)
28	Membrane	Nitrile/Nylon
30	Cap	Nodular iron (EN-5.3106)
31	Plaque	Aluminium
32	Rivet	Carbon steel (EN-1.1141)
34, 35, 36	Washer	Carbon steel (EN-1.1141)
39	Screw	Brass (EN-CW617N)

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:

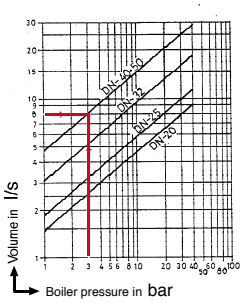
$$P = \frac{M}{(S-M) \cdot \varrho} \cdot Q$$

P = 80 l/h.

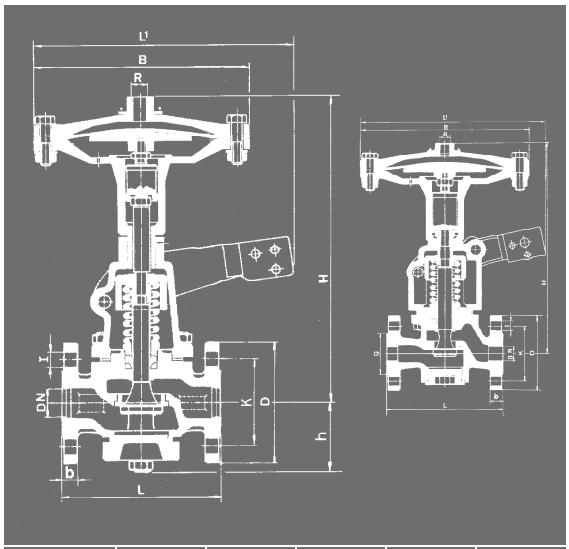
For the DN the volume (C) in l/s can be calculated as shown in the diagram.

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

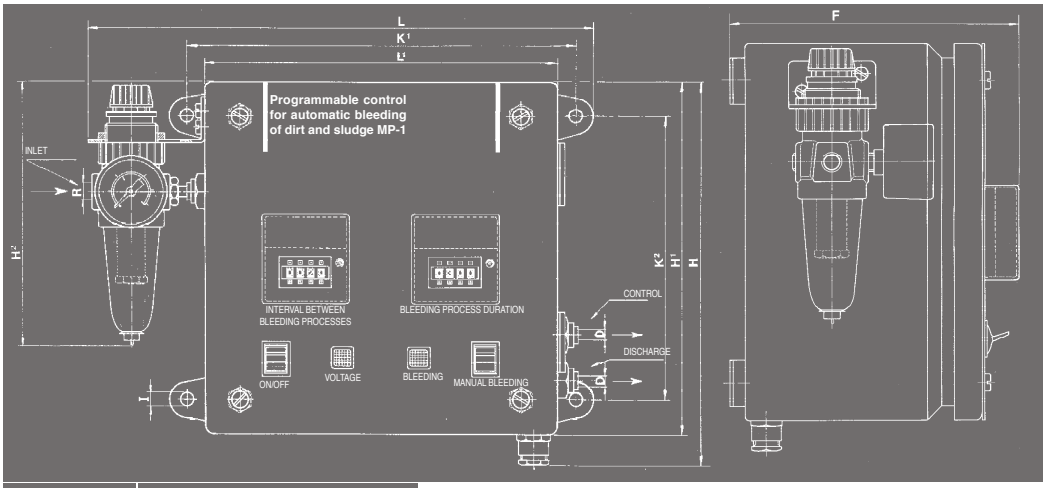
— Voltage: 220 V.A.C. ± 10% 50/60 Hz.

— 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.

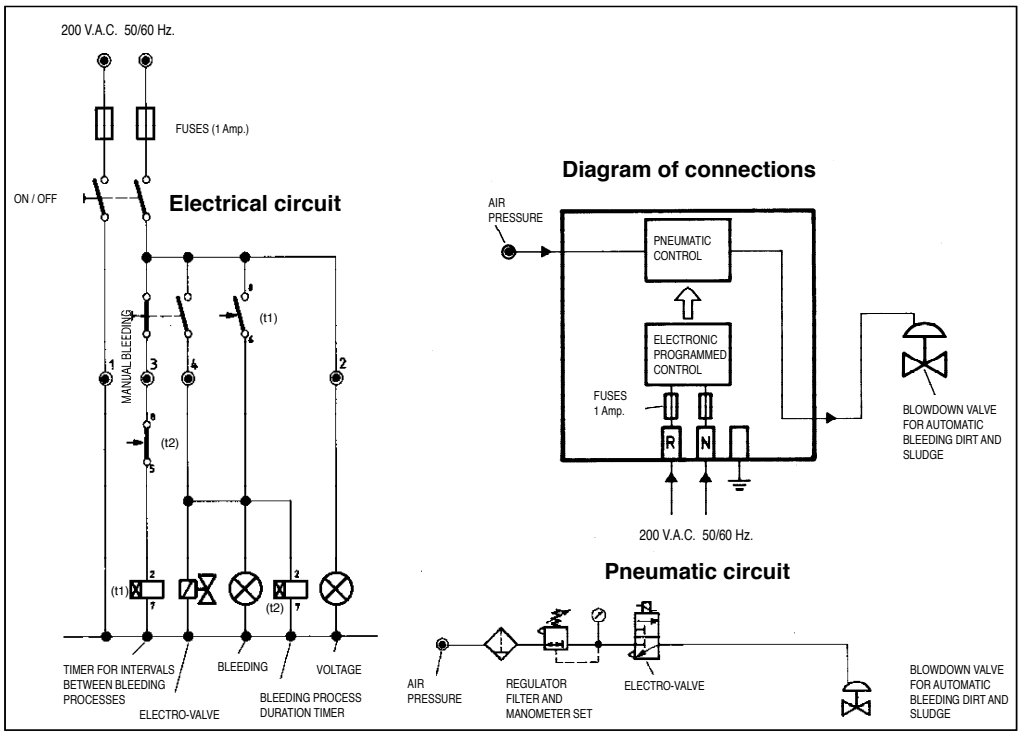
5 Bleeding gauge.

6 Manual bleeding switch.

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

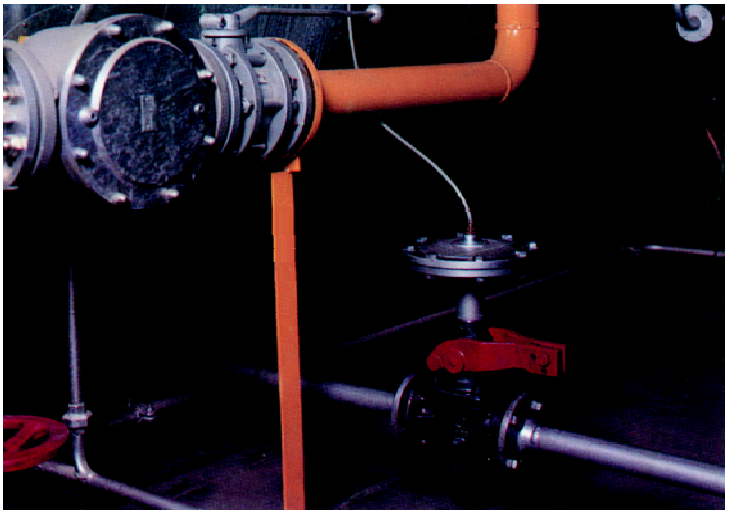
8 Bleeding process duration timer:
- — Adjustable from 1 tenth of a second to 99 seconds 99 tenths of a second.

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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