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ERHARD BEV SEWAGE AIR VALVES

Although the same conditions as in clear-water water are existing in waste-water transport plants both in hydrostatic and hydrodynamic respects, the air valves approved for drinking water are not suitable for this purpose. Sewage fluids contain inorganic and organic substances, having sedimentary form, floating and / or colloidal suspended matters of different concentration. Air valves used in such flow media must be able to work optimally despite those dirt.

Air valves for waste water and sewage were developed for these special requirements, their simple and robust construction especially adapted to these conditions of use:

- The large nozzle of the body cover (item 17 – drawing p. 8) closes automatically in case of excessive air outflow. This feature protects the nozzle against deposits.
- Operating thanks to the aerocinetic principle, with high safety of the floating body.
- The precised adjustment of the air flow level triggers the surge absorption and protects from contamination.
- Free distance designed between floating part and internal body (>100 mm) (item 3), in order to avoid dirt to block the floating part.
- Spherical shape of the ball makes it extremely stable, having also no parallel surface with the body.
- The lower part of the chamber (item 1) is funnel-shaped, in order to avoid deposition of suspended solids.
- The three ventilation nozzles (one large nozzle in item 17 + two venting screws, item 23) are placed in an upper chamber equipped with a reduced inlet. The floating body almost abuts on this connection in its upper position, which avoids the penetration of dirt, even in case of turbulences.
- The valve geometry and the center of gravity of the float are designed in order that, even with compressed air, the water level does not reach the upper chamber.
- The ventilation cross sections are characterized by their high capacity. Air is discharged through two nozzles (item 23) under full operating pressure : high air throughput means high safety.
- Optionally a diameter extraction DN 80, and a version with ventilation lock is available.

Operating instruction
BA69E006_BEV_Abwasser_DN80-200

RANGE OF APPLICATION, MATERIALS, HEIGHTS

Nominal size	Pressure rating	Hydr. test pressure in bars for		Admissible working pressure in bars at a working temp.
DN	PN	Body	Seat	up to 60° C for water
80 - 200	16	24	16	0,1 - 16
200	10	15	10	0,1 - 10

When ordering, please specify flow medium, working pressure and working temperature.

Flanges DN 80-150, PN 16, GG, Type 21, EN 1092-2

Flanges DN 200, PN 16[1] GG, Type 21, EN 1092-2

Flanges DN 200, PN 10[1] GG, Type 21, EN 1092-2

Materials

- **Body and bonnet:** Spheroidal graphite cast iron EN-JS1030
- **Body components:** Injected cast iron EN-JL1040
- **Floating body, seat rings, nozzles and connecting bolts:** Stainless steel
- **Ball guide bush and switching ring:** Plastic material
- **Seals and O-rings:** Perbunan, resistant to methane gas
- **Protection against corrosion:** Inside and outside Epoxy coating blue color

Height for air valve mounted with a gate valve

Nominal size DN	Multamed valve Premium	ERU K1 knife gate valve
80	895	762
100	905	767
150	925	772
200	860	690

Weight: approx. 140 kg

[1] DN 200 will be supplied without inlet piece
PN 16 = 12 studs M 20
PN 10 = 8 studs M 20

AIR CAPACITY DIAGRAMS

Diagram 1: Air evacuation through small nozzles (under pressure)

- **Example:** Pressure in the pipeline: P_e = 1.2 bar
- Air rate for small nozzles referring to normal conditions:

  Q_N = 7,5 l/s (from diagram 1)
- Working temperature: T_R = 293,15° (corr. 20° C)
- Working pressure (abs.): $P_R = P_{amb} + P_e$ = 2,2 bar
- Air rate according to operating conditions:

$$Q_R = \frac{1.01325 \cdot 293,15}{273,15 \cdot 2,2} \cdot 7,5$$

Q_R = 3,7 l/s

Diagram 2: Air evacuation through the large orifice (during pipe filling)

Air rate Q_R is equivalent to the rate of water flowing in. We recommend to fill the pipeline at such a velocity that the air volume to be discharged per valve does not exceed the limits shown in the diagram.

Diagram 2: Air admission through large orifice (during pipe emptying)

Air rate Q_R is equivalent to the rate of water flowing out. The number of valves required is to be fixed considering the limits shown in the diagram.

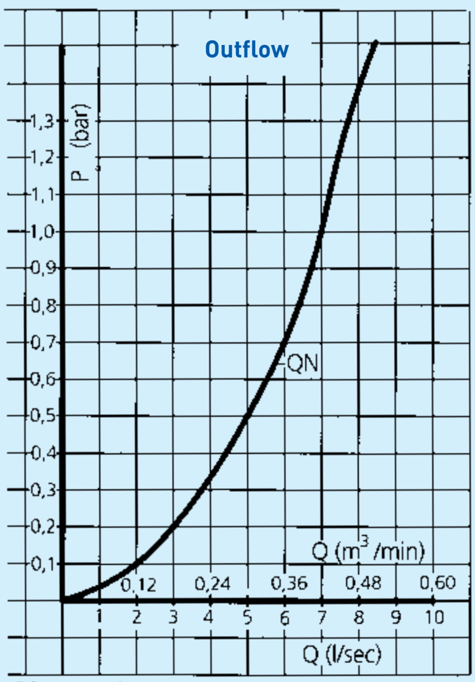


Diagram 1

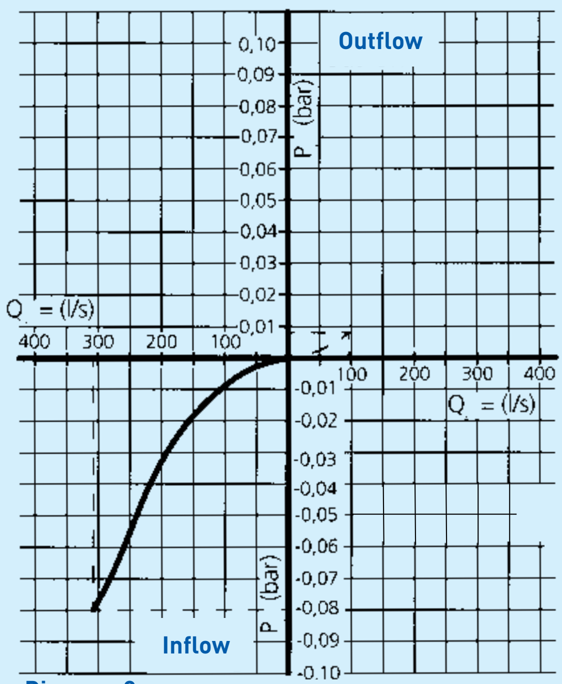


Diagram 2

AIR CAPACITY – EXAMPLES OF CALCULATION

The diagram values Q_N refer to normal operating conditions (T_N = 273,15° K, P = 1,01325 hPa).

Diagram values Q_R refer to working condition

Working temperature: T_R = 293,15° K (corr. 20° C)

Ambient pressure (abs.): P_{amb} = 1 bar

Working pressure (abs.): $P_R = P_{amb} + P_e$ = 1,3 bar

Air rate referring to working conditions:

$$Q_R = \frac{P_N \cdot T_R}{T_N \cdot P_R} \cdot Q_N$$

The air capacity may be gathered from diagrams 1 and 2. A distinction is to be made between:

- Air evacuation through large nozzle
- Air evacuation through small nozzles
- Air admission through large nozzle

If the air rate determined for air admission or evacuation cannot be obtained thanks to one valve, an adequate number of valves is to be installed in series at each necessary point of the pipeline.

Approximate data

Air evacuation when filling the pipeline: 21 l/s[1)]
Air inflow when emptying the pipeline 310 l/s
Air release under pressure 4 l/s

1) For setting range, see operating instructions

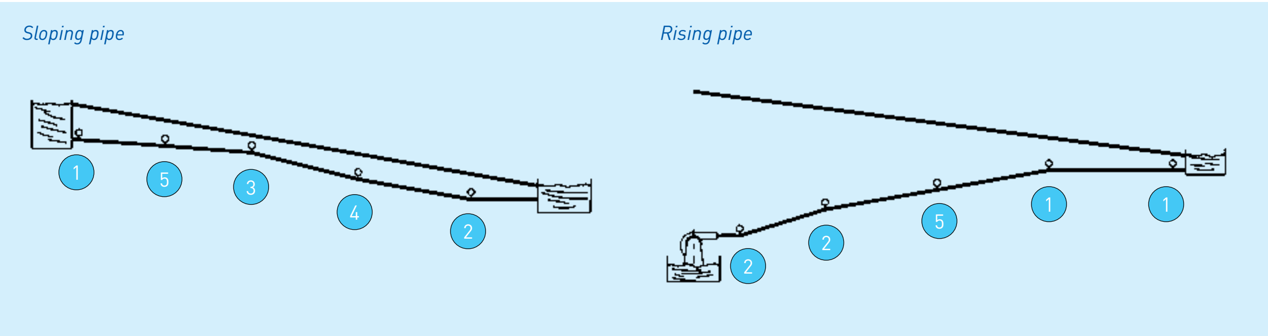
INSTALLATION AND ASSEMBLY

Air valves should be located at the following points in a pipeline:

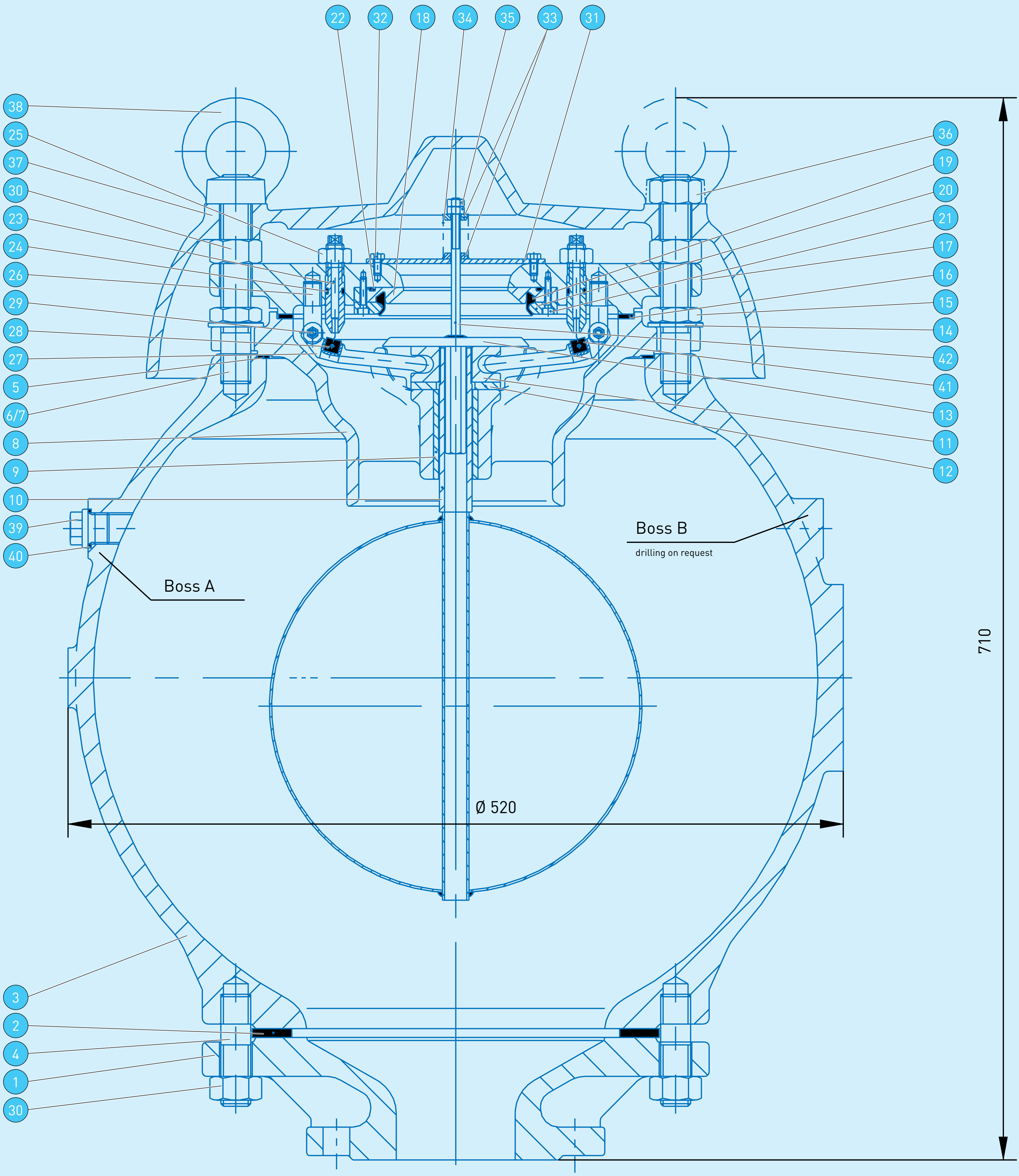
- At each absolute high point **[1]**
- At each high point where pipe section has an ascending run compared to the hydraulic gradient, or when the slope decreases **[2]**
- At each point where a pipeline slope starts **[3]**
- At each pipeline point endangered by negative pressure **[4]**
- On long, rising or sloping pipeline sections at distances of approx. 800 m **[5]**

The mounting location on the pipeline should be chosen so that the pressure difference is not lower than 4 m water column in comparison to the pressure line. Otherwise, the sealing pressure required for tightness is unsufficient. For lower pressures open rising pipes are to be used.

We recommend to install a shut-off valve between pipe socket and air valve and this shut-off valve must remain open during operation.



COMPONENTS AT A GLANCE



No.	Component	No.	Component
1	Body	22	O-ring
2	Seal	23	Venting screw
3	Body	24	O-ring
4	Studs	25	Hexagon nut
5	Gasket	26	Fork bolt
6	Studs	27	Lever
7	Studs	28	Seal
8	Guide insert	29	Adjusting screw with nut
9	Bush	30	Hexagon nut
10	Float	31	Guide crosspiece
11	Threaded ring	32	Hexagon nut
12	Gasket	33	Spring plate
13	Valve disc	34	Pressure spring
14	Washer	35	Hexagon nut
15	Hexagon nut	36	Hexagon nut
16	Gasket	37	Bonnet
17	Body cover	38	Eye nut
18	Fastening ring	39	Screw plug
19	V-ring	40	Sealing ring
20	Clamping ring	41	Straight grooved pin
21	Socket head cap screw	42	Special nut

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