

**Triple function air valve full bore version with anti-surge
anti-water hammer device PN 16-25-40 Mod. - FBR**

The surge dampening, anti-slam automatic air valve Mod. FBR has been designed to allow the release of air pockets accumulated in working conditions, the entrance of large volumes of air in case of pipe draining or bursts and to prevent pipeline damages coming from pressure transients, associated with high air outflow velocities.



Technical features and benefits

- Uncontrolled pipeline filling operations and transient events will inevitably generate the rapid closure of the air valves installed along the system, with consequent damages. The air valve FBR will automatically adjust the outflow capacity, thus reducing the velocity of the incoming water column minimizing the risk of water hammer.
- The spray effect during closing and the risk of drowning, compared to standard combination air valves, are reduced.
- Single chamber full bore body in ductile cast iron, PN 40 bar rated, provided with internal ribs for accurate guiding of the mobile block.
- Mobile block composed of the main float and upper disk, joined together by the air release system in AISI 316 (patent pending), and an additional anti surge obturator.
- Nozzle and gasket holder, part of air release system, entirely made in AISI 316.
- Cover in ductile and screen in stainless steel as a standard execution, to prevent the entrance of insects, with optional outlet for submerged applications and air conveyance.

Applications

- Main transmission lines.
- Water distribution networks.
- Irrigation systems.
- In general this model is used, in combination with anti-water hammer technology, on changes in slope and high points of the profile to provide the best air management and control with effective surge protection.

Operating principle



Discharge of large volumes of air

During the pipe filling it is necessary to discharge air as water flows in. The FBR, thanks to an aerodynamic full port body and deflector, will make sure to avoid premature closures of the mobile block during this phase.



Controlled outflow

If the differential pressure of air, during pipe filling, increases above a certain value without control there is the risk of water hammer and damages to the system. Should that happen the upper float will rise automatically, reducing the outflow and consequently the velocity of the approaching water column.



Air release during working conditions

During operation the air produced by the pipeline is accumulated in the upper part of the air valve. Little by little it is compressed and the pressure arrives at water pressure, therefore its volume increases pushing the water level downwards allowing the air release through the nozzle.



Entrance of large volumes of air

During pipeline draining, or pipe bursts, it is necessary to bring in as much air as the quantity of outflowing water to avoid negative pressure and serious damages to the pipeline, and to the entire system.

Optional



■ **Vacuum breaker version Mod. FBR 2F**, to allow the entrance of large volumes of air and the controlled outflow only. This model is normally recommended in changes in slope ascending, long ascending segments, dry fire systems, and wherever the water hammer effect has to be reduced without the necessity of air release.



■ **Version for submerged applications, KIT C series**, available both for FBR and FBR 2F Models, with threaded elbow for air conveyance. The design sprang from the necessity of having an air valve performing also in case of flood, without the risk of contaminated water entering the pipeline. Another benefit of KIT C is the possibility of conveying spurts coming from the closure away from the air valve.

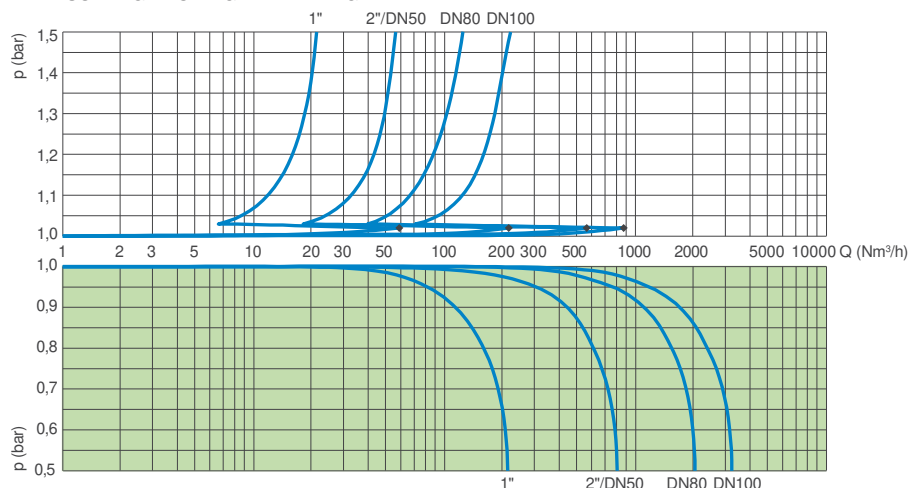


■ **Version for air discharge only KIT E series**, available both for FBR and FBR 2F models. The most important application of KIT E is to allow the air valve installation in those locations of the system where HGL may drop below the pipe profile, and to any other node where for project requirements air entrance must be avoided, such as in pump suction lines or siphons pipelines.

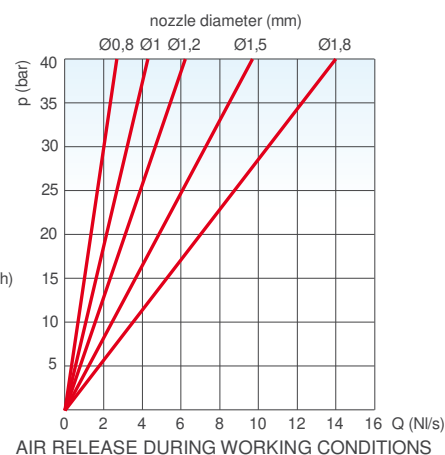
Technical data

Air flow performance charts

AIR DISCHARGE DURING PIPE FILLING

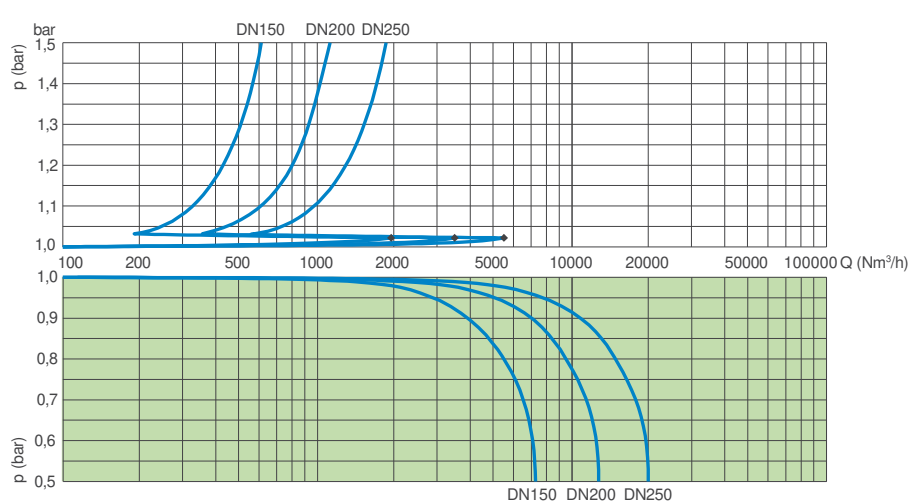


AIR ENTRANCE DURING PIPE DRAINING

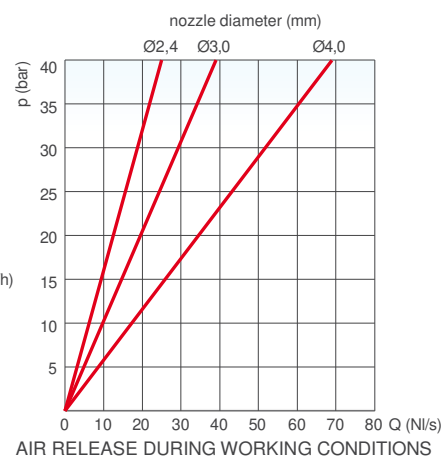


AIR RELEASE DURING WORKING CONDITIONS

AIR DISCHARGE DURING PIPE FILLING



AIR ENTRANCE DURING PIPE DRAINING



AIR RELEASE DURING WORKING CONDITIONS

The air flow charts were created in Kg/s from laboratory tests and numerical analysis, without the screen, then converted in Nm³/h using a safety factor.

Working conditions

Treated water max. 60°C.
Max. pressure 40 bar.
Min. pressure 0,2 bar. Lower on request.

Standard

Designed in compliance with EN-1074/4 and AWWA C-512. Flanges according to EN 1092/2 or ANSI 150. Epoxy painting applied through fluidized bed technology blue RAL 5005. Changes on the flanges and painting on request.

Nozzle choice

Nozzle diameter in mm according to the size of the air valve and the PN.

| | PN 10 | PN 16 | PN 25 | PN 40 |
|----------|-------|-------|-------|-------|
| 1" | 1,5 | 1,2 | 1 | 0,8 |
| 2"/DN 50 | 1,8 | 1,5 | 1,2 | 1 |
| DN 80 | 1,8 | 1,5 | 1,2 | 1 |
| DN 100 | 3 | 2,4 | 1,8 | 1,2 |
| DN 150 | 4 | 3 | 2,4 | 1,8 |
| DN 200 | 4 | 4 | 4 | 3 |
| DN 250 | 4 | 4 | 4 | 4 |

WATER AIR VALVES

DN 50 to 250



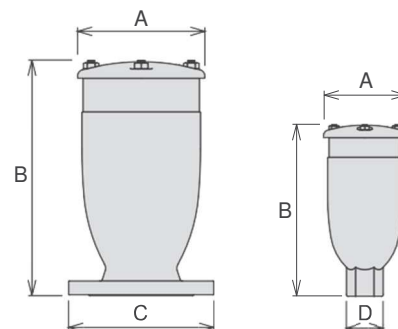
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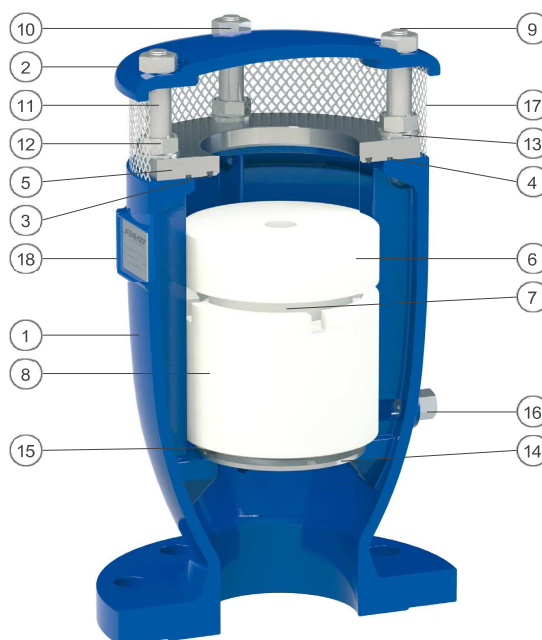
Weights and dimensions

| CONNECTION inch/mm | A mm | B mm | C mm | | D mm | Weight Kg |
|-----------------------|---------|---------|---------|-----|---------|--------------|
| Threaded 1" | 117 | 240 | - | - | CH 45 | 4,0 |
| Threaded 2" | 141 | 295 | - | - | CH 70 | 7,5 |
| Flanged 50 | 141 | 305 | 165 | - | - | 9,5 |
| Flanged 80 | 172 | 322 | 210 | 205 | - | 13,8 |
| Flanged 100 | 206 | 370 | 235 | 220 | - | 21,7 |
| Flanged 150 | 285 | 555 | 305 | 285 | - | 44,5 |
| Flanged 200 | 365 | 635 | 375 | 340 | - | 85,0 |
| Flanged 250 | 450 | 785 | 450 | 405 | - | 134,0 |

All values are approximate



Technical details



| N. | Component | Standard material | Optional |
|----|-------------------------------|--|--------------------------|
| 1 | Body | ductile cast iron GJS 450-10 | |
| 2 | Cap | ductile cast iron GJS 450-10 | |
| 3 | O-ring | NBR | EPDM/Viton/silicone |
| 4 | O-ring | NBR | EPDM/Viton/silicone |
| 5 | Seat | stainless steel AISI 304 | stainless steel AISI 316 |
| 6 | RFP flat with O-ring | polypropylene and NBR | EPDM/Viton/silicone |
| 7 | Upper flat with nozzle subset | polypropylene and stainless steel AISI 316 | |
| 8 | Float | polypropylene | |
| 9 | Studs | stainless steel AISI 304 | stainless steel AISI 316 |
| 10 | Nuts | stainless steel AISI 304 | stainless steel AISI 316 |
| 11 | Spacers | stainless steel AISI 304 | stainless steel AISI 316 |
| 12 | Nuts | stainless steel AISI 304 | stainless steel AISI 316 |
| 13 | Washers | stainless steel AISI 304 | stainless steel AISI 316 |
| 14 | Deflector (not in 1") | stainless steel AISI 304 | stainless steel AISI 316 |
| 15 | Screws | stainless steel AISI 304 | stainless steel AISI 316 |
| 16 | Drain valve | stainless steel AISI 303 | stainless steel AISI 316 |
| 17 | Screen | stainless steel AISI 304 | |
| 18 | Tag | stainless steel AISI 304 | |

The list of materials and components is subject to changes without notice.