



D-020 250 PSI



Combination Air Valve for Wastewater

Description

The D-020 Combination Air Valve combines an air & vacuum orifice and an air release orifice in a single body. The valve is specially designed to operate with liquids carrying solid particles such as wastewater and effluents. The combination air valve discharges air (gases) during the filling or charging of the system, admits air into the system while it is being emptied of liquid and releases accumulated air (gases) from the system while it is under pressure and operating. The valve's unique design enables the separation of the liquid from the sealing mechanism and assures optimum working conditions.

Applications

- Pump stations for sewage, wastewater & water treatment plants.
- Wastewater, effluent water and sea water supply lines.

Operation

The air & vacuum component discharges air at high flow rates during the filling of the system and admits air into the system at high flow rates during its drainage and at water column separation.

High velocity air should not blow the float shut. Water will lift the float which seals the valve.

At any time during system operation, should internal pressure of the system fall below atmospheric pressure, air will re-enter the system.

The smooth discharge of air reduces pressure surges and other destructive phenomena.

The intake of air in response to negative pressure protects the system from destructive vacuum conditions and prevents damage caused by water column separation. Air re-entry is essential to efficiently drain the system.

The air release component releases entrapped air in pressurized systems. Without air valves, pockets of accumulated air may cause the following destructive phenomena:

- Impediment of effective flow and hydraulic conductivity of the system along with a throttling effect as would a partially closed valve. In extreme cases this will cause complete flow stoppage.
- Accelerate cavitation damages.
- High-pressure surges.
- Accelerate corrosion of metal parts.
- Danger of high-energy bursts of compressed air.

As the system starts to fill, the combination wastewater valve functions according to the following stages:

1. Entrapped air/gas is discharged by the valve
2. When the liquid level reaches the valve's lower portion, the lower float is lifted, pushing the sealing mechanism to its sealing position.
3. The entrapped air is confined in a pocket between the liquid and the sealing mechanism. The air pressure is equal to the system pressure.
4. Increases in system pressure compress the trapped air in the upper section of the conical chamber. The conical shape assures the height of the air gap. This enables separation of the liquid from the sealing mechanism.
5. Entrapped air (gas), accumulating at peaks along the system, rises to the top of the valve, and displaces the liquid in the valve's body.
6. When the liquid level is lowered to a point where the float is no longer buoyant, the float drops, unsealing the rolling seal. The air release orifice opens and allows part of the air that accumulated in the upper portion of the valve to be released to the atmosphere.
7. Liquid re-enters the valve. The float rises, pushing the rolling seal to its sealing position. The remaining air gap prevents the wastewater from fouling the mechanism.

When internal pressure falls below atmospheric pressure (negative pressure):

1. The floats will immediately drop down, opening the air & vacuum and air release orifices.
2. Air will reenter the system.

Main Features

- Working pressure range: 3 - 250 psi
- Testing pressure: 360 psi.
- Maximum working temperature: 140° F.
- Maximum intermittent temperature: 194° F.
- The unique design of the valve prevents contact between the wastewater and the sealing mechanism by creating an air gap at the top of the valve. These features are achieved by:
 - **The conical body shape:** designed to maintain the maximum distance between the liquid and the sealing mechanism and still obtain minimum body length.
 - **Spring-loaded joint between the stem and the upper float:** vibrations of the lower float will not unseal the air release component. Release of air will occur only after enough air accumulates.
 - **The Rolling Seal Mechanism:** less sensitive to pressure differentials than a direct float seal. It accomplishes this by having a comparably large orifice for a wide pressure range (up to 250 psi).

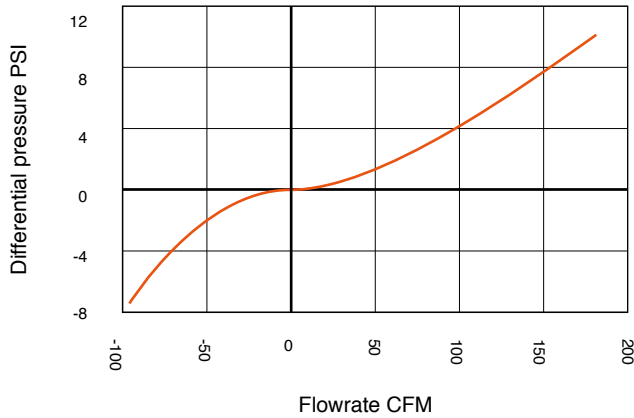
- **Funnel-shaped lower body:** designed to ensure that residue wastewater matter will fall back into the system and be carried away by the main pipe.
- All inner metal parts made of stainless steel.
- 1 1/2" threaded drainage outlet enables removal of excess fluids.
- Dynamic design allows for high velocity air discharge while preventing premature closure.

Valve Selection

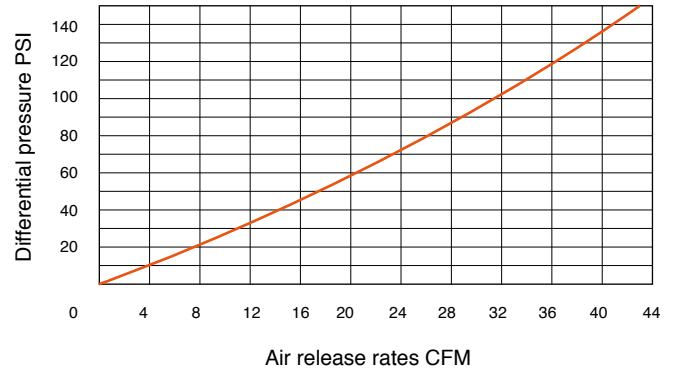
- Size range 2" – 8".
- These valves are manufactured with flanged ends to meet ASA 150 standard or any requested standard
- The 2" valve is also available with a threaded NPT connection.
- Standard stainless steel body, also available with a metal body .
- Valve metal body coating: FBE coating according to the international standard DIN 30677-2.
- Other coatings are available upon request.
- **Additional Accessories:**
 - With a Vacuum Guard, Out-only attachment, allows for air discharge only, prevents air intake.
 - With a Vacuum Breaker, In-only attachment, allows for air intake only, prevents air discharge.
 - With a Non-Slam discharge-throttling attachment, allows for free air intake, throttles air discharge.
- For best suitability, it is recommended to send the fluid chemical properties along with the valve request.

Upon ordering, please specify: model, size, working pressure, threads standard and type of liquid.

AIR & VACUUM FLOWRATE



AUTOMATIC AIR RELEASE



DIMENSIONS AND WEIGHTS

| Nominal Size | Dimensions inch. | | | | Weight Lbs. | Orifice Area Sq.in | |
|--------------|------------------|------|------------|----------|-------------|--------------------|-------|
| | A | B | internal C | external | | Air & Vac. | Auto. |
| 2" Threaded | 18.2 | 25.4 | 1.4 NPT | 2.1 | 34.6 | 1.246 | 0.018 |
| 2" Flanged | 18.2 | 23.8 | 1.4 NPT | 2.1 | 36.6 | 1.246 | 0.018 |
| 3" | 18.2 | 23.8 | 1.4 NPT | 2.1 | 40.7 | 1.246 | 0.018 |
| 4" | 18.2 | 23.8 | 1.4 NPT | 2.1 | 42.9 | 1.246 | 0.018 |
| 6" | 18.2 | 24 | 1.4 NPT | 2.1 | 46.2 | 1.246 | 0.018 |
| 8" | 18.2 | 24 | 1.4 NPT | 2.1 | 52.9 | 1.246 | 0.018 |

PARTS LIST AND SPECIFICATION

| No. Part | Material |
|--------------------------|---|
| 1. Flushing Connection | Polypropylene |
| 2. Rolling Seal Assembly | Reinforced Nylon+E.P.D.M+St.St. |
| 3. Float | Foamed Polypropylene |
| 4. Clamping Stem | Reinforced Nylon |
| 5. Body | Reinforced Nylon /Stainless Steel SAE 316 |
| 6. Bolt | Stainless Steel SAE 316 |
| 7. Cover | Reinforced Nylon /Stainless Steel SAE 316 |
| 8. O-Ring | BUNA-N |
| 9. Crown Nut | Stainless Steel SAE 316 |
| 10. Stopper | Polypropylene |
| 11. O-Ring | BUNA-N |
| 12. Spring | Stainless Steel SAE 316 |
| 13. Washer | Stainless Steel SAE 316 |
| 14. Stem | Stainless Steel SAE 316 |
| 15. Ball Valve 1" | Stainless Steel SAE 316 |
| 16. Float | Polycarbonate /Stainless Steel SAE 316 |
| 17. Body | Stainless Steel SAE 316 / Steel DIN St.37 |

