



D-021 150 PSI



Combination Air Valve for Reclaimed and Non-Potable Water

Description

The D-021 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 reclaimed water 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 guarantees complete separation of the liquid from the sealing mechanism and provides optimum working conditions.

Applications

- Reclaimed water
- Raw water
- Effluent water
- Water with suspended solids
- Coolant water

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 systems. 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.

- Acceleration of cavitation damages.
- High-pressure surges.

- Acceleration of 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 reclaimed water 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 reclaimed water 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 guarantees the height of the air gap. This assures complete 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 reclaimed water 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 reenters into the system.

Main Features

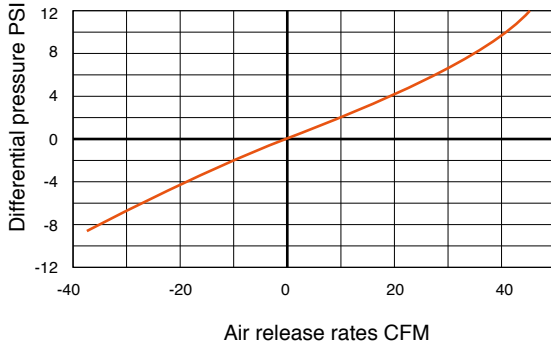
- Working pressure range: 3 - 150 psi
- Testing pressure: 250 psi
- Maximum working temperature: 140° F.
- Maximum intermittent temperature: 194 ° F.
- The unique design of the valve prevents any contact between the reclaimed water and the sealing mechanism by creating an air gap at the top of the valve. 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 150 psi).
 - **Funnel-shaped lower body:** designed to ensure that residue reclaimed water solid matter will fall back into the system and be carried away by the main pipe.
- Body made of composite materials, resistant to corrosion.
- Internal metal parts are made of corrosion-resistant stainless steel.
- Floats are made of composite materials.
- Flexible rolling seal provides smooth positive opening, closing, and leak-free sealing over a wide range of pressure differentials.
- Drainage tap with ball valve is provided.
- 3/8" threaded discharge outlet enables removal of excess fluids.
- Dynamic design allows for high velocity air discharge while preventing premature closure.

Valve Selection

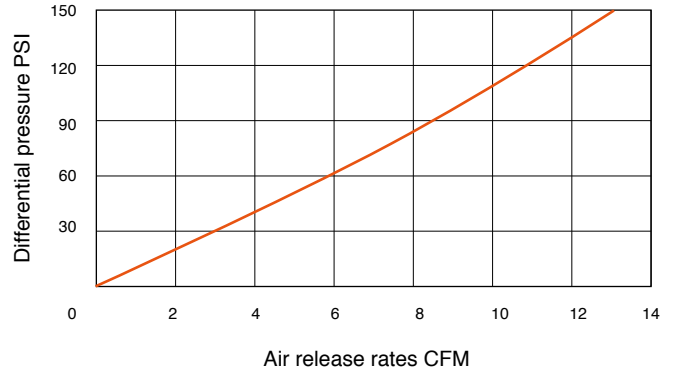
- These valves are available with a 1", 2" male threaded NPT connection.
- Additional one-way out check valve attachment allows air discharge, not allowing air intake.
- For best suitability, it is recommended to send the fluid chemical properties along with the valve request.

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.
1" 2"	8.5	12.7	3/8 NPT	0.7	3.9	0.155	0.012

PARTS LIST AND SPECIFICATION

No. Part	Material
1. Body D-040 1"	Reinforced Nylon
2. Discharge Outlet	Polypropylene
3. Rolling Seal	E.P.D.M.
4. Clamping Stem	Reinforced Nylon
5. Float	Foamed Polypropylene
6. O-Ring	BUNA-N
7. Body	Reinforced Nylon
8. Float Stem	Stainless Steel SAE 316
9. Clamp	Reinforced Nylon
10. O-Ring	BUNA-N
11. Bolt & Nut	Stainless Steel SAE 316
12. Float	Foamed Polypropylene
13. Base	Reinforced Nylon
14. Seal	Reinforced Nylon
15. Ball Valve	Stainless Steel

