



# D-023

PN 16



## COMBINATION AIR VALVE FOR SEWAGE “GALIL”

### Description

The Combination Air Valve combines an Air & Vacuum large orifice and an Automatic small orifice in a single body. The valve is specially designed to operate with liquids carrying solid particles such as sewage and effluent. The combination air valve discharges air (gases) during the filling or charging of the system, admits air to the system while it is being emptied of liquid and discharges 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 work conditions.

### Applications

- Pump stations for sewage, waste water & water treatment plants.
- Sewage water, 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.

Water entry into the lower portion of the valve will cause the sealing of 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 release of air prevails pressure surges and other destructive phenomena.

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

The automatic component releases entrapped air from peaks of pressurized systems in areas where the valve should be installed.

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 a high-energy burst of compressed air.

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

1. Entrapped air is released by the valve
2. When the sewage level reaches the valve's lower portion, the lower float rises, and draws the "seal Plug" to its sealing position.
3. The entrapped air is confined in a pocket between the sewage and the sealing mechanism. The air Pressure is the system pressure.
4. Increases in system pressure compress the trapped air in the upper section of the cone shaped 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 (where air valves should be installed) along the system rises to the top of the valve, which in turn 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 will descend, Peeling the rolling seal. This action opens the valve's orifice 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, unrolling the rubber-sealing band to its sealing position. The remaining air gap prevails the sewage from fouling the mechanism.

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

1. Both orifices will be immediately unplugged as the floats drop away.
2. Air is admitted to the system.

### Main Features

- Working pressure range: 0.2-16 bar.
- The valve's unique design prevents any contact between sewage and the sealing mechanism by creating an air gap at the top of the valve. This air gap is guaranteed even under extreme conditions.

Those features are achieved by:

- The conical body shape and the external lever designed to: maintain the maximum distance between the liquid and the sealing mechanism; so as to obtain minimum body length.
- Spring loaded joint between the stem and the upper float. Vibrations of the lower float will not unseal the automatic valve. Release of air will occur only after enough air accumulates.
- Funnel-shaped lower body is designed to ensure that residues sewage matter will fall back into the system and be carried away by the main pipe.
- All inner metal parts made of stainless steel.
- Unique design of external lever prevents contact between the

sewage and the sealing mechanism and clogging by floating solids, ensuring drip tight sealing.

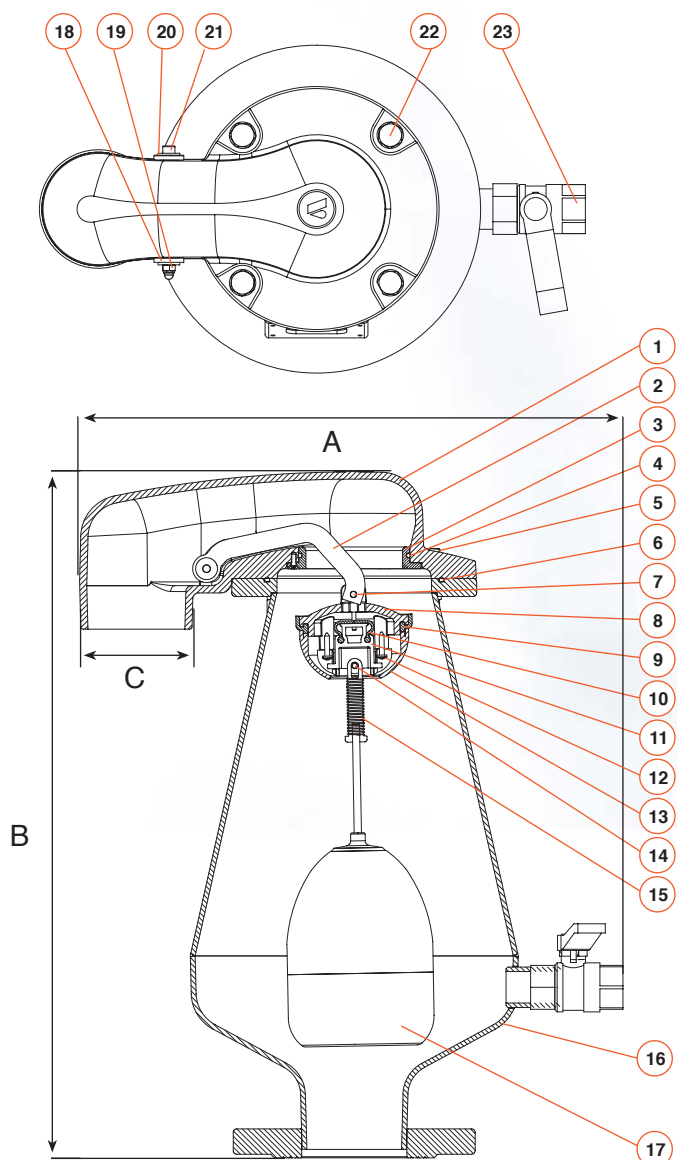
- Stainless steel or steel DIN St.37
- Steel Body coating: epoxy phenol 250 microns. High resistance to chemical corrosion and mechanical wear and tear. (Tested in salt cell test for 1000 hours). Other coatings are available.
- The D-023's orifice plug-disc linkage assembly is external, keeping the levers and pins outside the air valve body and its corrosive atmosphere.

## Valve Selection

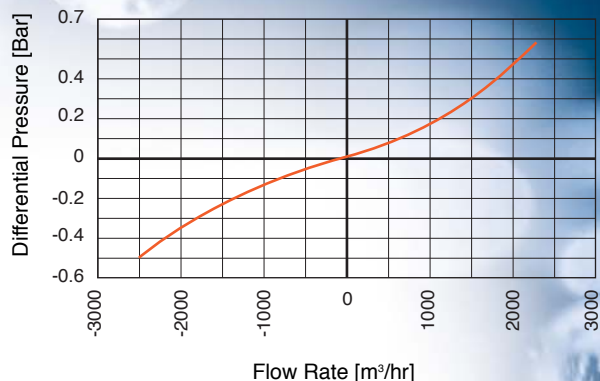
- These valves are available with flanged 3" -4", All standards.
- A.R.I Valves can be adapted to various types of liquid by coating with Enamel or Vulcanized Coating upon request.

## DIMENSIONS AND WEIGHT

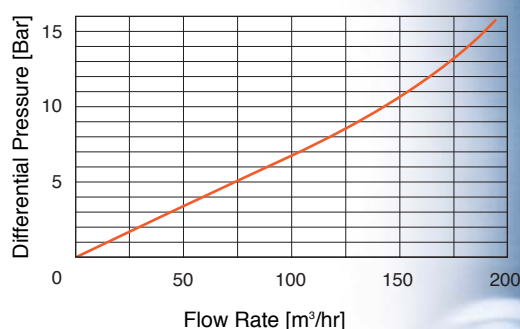
Nominal Size	Dimensions mm				Weight Kg.	Orifice Area mm <sup>2</sup>	
	A	B	internal C	external		Kin.	Auto.
3" (80 mm)	448	567	98	3"	22	5024	15.7
4" (100 mm)	448	567	98	3"	23	5024	15.7



## AIR AND VACUUM FLOW RATE



## AUTOMATIC AIR DISCHARGE



## PARTS LIST AND SPECIFICATION

No.	Part	Material
1.	Cover	St.St. SAE 316 / Ductile Iron
2.	Disc Arm Ass.	Stainless Steel SAE 316
3.	Nozzle	Stainless Steel SAE 316
4.	O-Ring	BUNA-N
5.	Bolt (X3)	Stainless Steel SAE 316
6.	O-Ring	BUNA-N
7.	Rivet	Stainless Steel SAE 316
8.	Kinetic Disc	St.St. SAE 316/ Reinforced Nylon
9.	Kinetic Disc Seal	E.P.D.M.
10.	Automatic Disc Seal	E.P.D.M.
11.	Automatic Disc	Reinforced Nylon
12.	Bolt	Stainless steel SAE 316
13.	Kinetic Disc Cover	Reinforced Nylon
14.	Pin	Stainless Steel SAE 316
15.	Spring	Stainless Steel SAE 302
16.	Body	St.St. SAE 316/ Steel DIN St.37
17.	Float Assembly	Polycarbonate + St.St.
18.	Crown Nut	Stainless Steel SAE 316
19.	Bushing	Acetal
20.	Washer	Stainless Steel SAE 316
21.	Bolt	Stainless Steel SAE 316
22.	Bolt, Nut & Washer (X4)	Stainless Steel SAE 316
23.	Ball Valve 1"	Stainless Steel SAE 316