



# D-46 PN 16



## PRO Combination Air Valve for High Flow PAT.PEND

### Description

The D-46 series High Flow Combination Air Valve has the features of both an air release valve and an air & vacuum valve.

The air release component is designed to automatically release small pockets of air to the atmosphere as they accumulate along a pipeline or piping system when it is full and operating under pressure.

The air & vacuum component is designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This air valve will open to relieve negative pressures whenever water column separation occurs.

### Applications

- Pump stations: after the pump and after the check valve.
- Downstream (after) and upstream (before) of shut-off valves.
- After deep-well pumps.
- On long constant-sloped pipeline segments.
- At peaks along the pipeline and at peaks relative to hydraulic gradient.
- At end lines.
- Before water meters.
- On strainers and filters.

### Operation

The air & vacuum component, with the large orifice, 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 will 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 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 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 hydraulic disturbances:**

- Restriction of effective flow due to a reduction of the flow area. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Acceleration of cavitation damages.

- Increase in pressure transients and surges.
- Internal corrosion of pipes, fittings and accessories.
- Dangerous high-energy bursts of compressed air.
- Inaccuracies in flow metering.

**As the system fills and is pressurized, the combination air valve functions in the following stages:**

1. Air in the pipeline is discharged by the air valve.
2. Liquid enters the air valve, lifting the complete float and seal assembly to its sealing position.
3. Entrapped air, which accumulates at peaks and along the system, rises to the top of the air valve, which in turn displaces the liquid in the air valve body.
4. The lower component of the float and seal assembly drops down unsealing the rolling seal, opening the air release orifice and releasing the accumulated air.
5. Liquid enters the air release valve, the lower component of the float and seal assembly rises, pushing the rolling seal to its sealing position.

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

1. The complete float and seal assembly will drop down, immediately opening the air & vacuum and air release orifices.
2. Air will enter into the system.

### Main Features

- Working pressure range: 0.1 - 16 bar.
- Testing pressure: 25 bar.
- Maximum working temperature: 60° C.
- Maximum intermittent temperature: 90° C.
- Reliable operation reduces water hammer incidents.
- Dynamic design allows for high capacity air discharge while preventing premature closure.
- All main flow cross-sections are equal or greater than the nominal port area.
- Lightweight, small dimensions, simple and reliable structure.
- Unique one-piece body lessens the chance of leaks and vandalism.
- The discharge outlet enables the connection of a vent pipe.
- All internal operating parts are made of specially selected, corrosion-resistant materials.
- Minimum down-time for maintenance:
  - 2" - all operating parts are consolidated into one replaceable cartridge
  - 3" - 4" - air release component can be maintained without dismantling the air valve
- The large size of the automatic air release orifice relative to the air

valve body:

Discharges air at high flow rates.

Lessens the danger of its obstruction by debris.

Enables the usage of the rolling seal, making it less sensitive to pressure differential than a direct float seal.

## Valve Selection

- Size range: 2" –4"
- These valves are manufactured with flanged ends to meet any requested standard
- Valve coating: Fusion bonded epoxy coating according to the standard DIN 30677-2

## Options

### D-46 NS Non-Slam Addition

The addition of an adjustable non-slam disc converts the D-46 into a non-slam air valve. The NS addition can be easily assembled in the field on an existing D-46 or bought already assembled (D-46 NS).

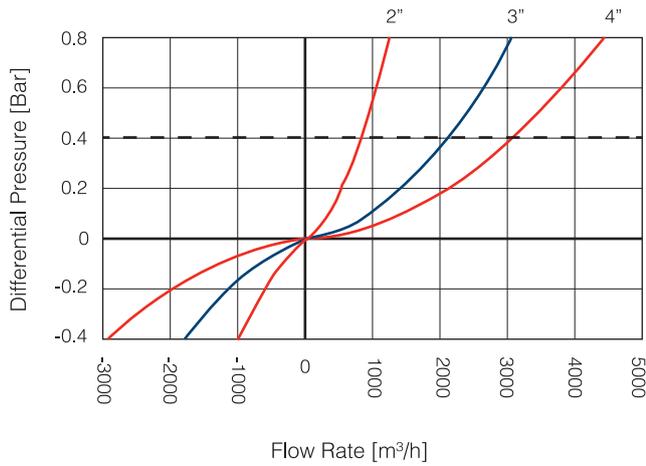
**Upon ordering, please specify: model, size, working pressure, threads standard and type of liquid.**



**D-46 NS Non-Slam Add-on Component Data Table for Variable Orifices**

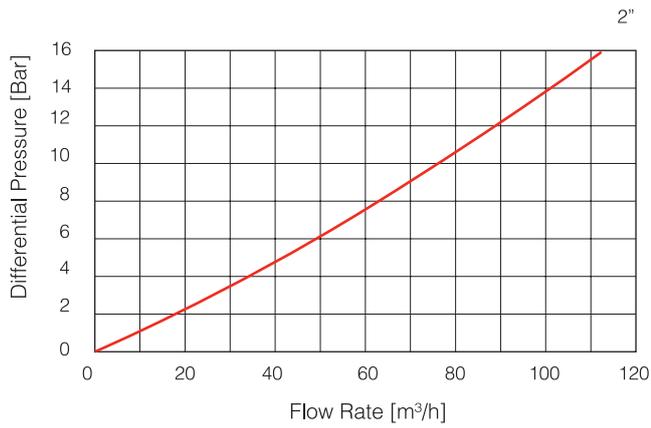
DN	Discharge orifice	Total NS area	NS orifice	Switching point	Flow at Switching Point
2" (50mm)	50 mm	78.5mm <sup>2</sup>	10 mm	0.03 m	35 m <sup>3</sup> /h
3" (80mm)	80 mm	176.7mm <sup>2</sup>	15 mm	0.04 m	121 m <sup>3</sup> /h
4" (100mm)	100 mm	314.0mm <sup>2</sup>	20 mm	0.04 m	223 m <sup>3</sup> /h

## AIR & VACUUM FLOW RATE

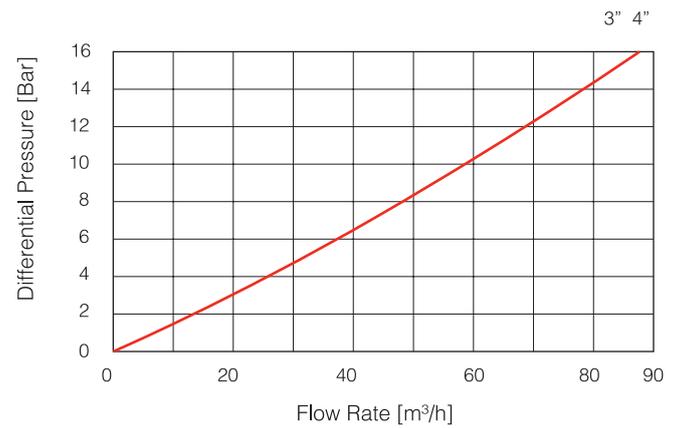


- - - - Max. recommended design air discharge

## AUTOMATIC AIR RELEASE FLOW RATE

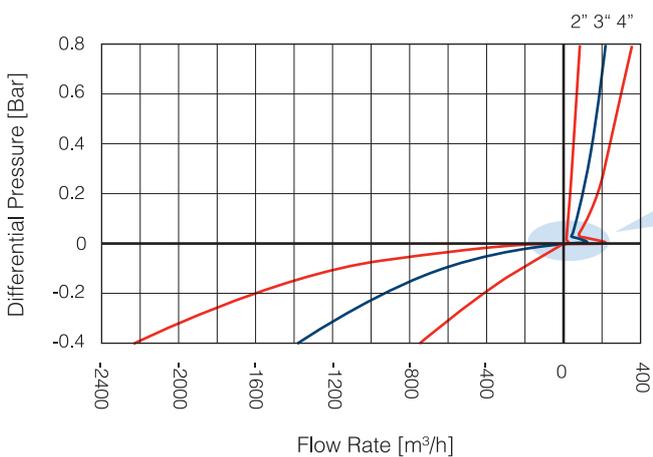


## AUTOMATIC AIR RELEASE FLOW RATE

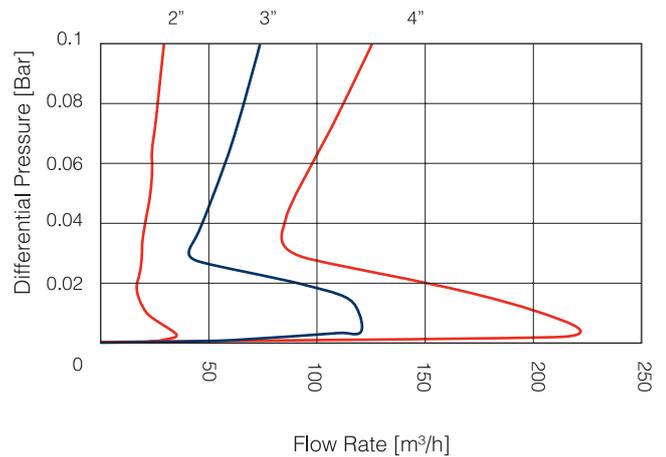


# D-46 NS

## AIR & VACUUM FLOW RATE



## AIR DISCHARGE SWITCHING REGION



## DIMENSIONS AND WEIGHT

Size	Dimensions mm		Connections C	Weight Kg.	Orifice Area mm <sup>2</sup>	
	A	B			A / V	Auto.
2" (50mm)	165	336	2" BSP Female	7.3	1963	13.8
3" (80mm)	200	467	3" BSP Female	13.0	5027	13.8
4" (100mm)	220	537	4" BSP Female	18.2	7854	13.8

## PARTS LIST AND SPECIFICATION

No.	Part	Material
1	Discharge Outlet	Polypropylene
2	Threaded Rod	Stainless Steel 304
3	Discharge Outlet Seal	BUNA-N
4	NS Disc (Optional)	Reinforced Nylon
5	Air & Vacuum Seal	EPDM
6	Automatic Float Cover	Acetal
7	O-Ring	EPDM
8	Rolling Seal	EPDM
9	Air & Vacuum Float	Reinforced Polypropylene ( 3") Polypropylene ( 4")
10	Automatic Float	Polypropylene
11	Body	Ductile Iron
12	Pressure Release Plug	Stainless Steel 316
13	Float Lock	Acetal
14	Snap Ring	Acetal
15	Drain Outlet	Polypropylene

