



# D-040 PN 10, PN 16



## D-040-C PN 10, PN 16



### COMBINATION AIR VALVE FOR SEA WATER **PATENTED**

#### Description

The D-040 Combination Air Valve has the features of both an Air-release valve and an Air/vacuum valve.

The Air-release component of the D-040 was designed to automatically release to the atmosphere small pockets of air as they accumulate at local high points along a pipeline when the pipeline or piping system is full and operating under pressure. The Air/vacuum component was designed to automatically discharge or admit large volumes of air during the filling or draining of a pipeline or piping system. This valve will open to relieve negative pressures whenever water column separation occurs.

#### Applications

Specially designed for sea water

- Pump stations: after the pump and after the check valve
- Downstream (after) and upstream (before) shut-off valve
- After deep-well pump
- On long water supply lines
- At peaks along the line
- At the end of lines
- Before water meter
- 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, should not blow the float shut. Water will lift the float and cause 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 systems, preventing down-surge and cavitation.

The smooth release of air prevents pressure surges and other destructive phenomena.

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

The automatic small orifice air release component releases

entrapped air in the pressurized systems.

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 burst of compressed air.
- Inaccuracies in flow metering.

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

1. Entrapped air is released by the valve
2. Liquid enters the valve, lifting the float which draws the "seal plug" to its sealing position.
3. Entrapped air, which accumulates at peaks along the system (where combination air valves should be installed), rises to the top of the valve, which in turn displaces the liquid in the valve's body.
4. The float descends, peeling the "rolling seal", the smaller orifice opens and the accumulated air is released.
5. Liquid penetrates into the valve and the float rises unrolling the rolling seal to its sealing position.

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

1. Both orifices will be immediately unplugged and the float drops away.
2. Air is admitted to the system.

#### Main Features

- Working pressure range: D-040 PP : 0.1-10 bar (2-150psi)  
D-040-P/D-040 STST : 0.2-16 bar (3-250 psi.)
- Testing pressure: 25 bar (360 psi.)
- Working Temperature: 60° C
- Maximum instantaneous working temperature: 90° C
- Light, simple and reliable structure.
- Prevents premature closing.
- The valve discharges air at high velocity.

- The orifice of the automatic continuous acting valve is larger than in any other air release valve of it's kind, therefore it discharges air at higher flow rates.
- The size of the automatic orifice makes its obstruction by debris most unlikely.
- The valve design - rolling seal mechanism: is 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 16 bar).
- The body is made of high strength composite materials or stainless steel, and all operating parts are made of specially selected corrosion resistant materials.
- Due to its light weight, the valve may be installed on plastic piping systems, as well as other lightweight piping.
- A threaded drainage outlet enables removal of excess fluids (1 1/2" in the 2", 3/8" in the 3/4", 1")

## Valve Selection

The air valve is available:

- With 3/4", 1", 2" male NPT , BSPT connections, as requested.
- With a ball valve tap BSPT/NPT male connection upon request.
- Vacuum check - The valve is available as a valve that will only release air from the system and will not admit air to the system when under pressure condition occur. This feature is accomplished by the addition of a check valve inserted in the air outlet.

## Project (tender) Specification

**Type** Combination air valve

### Operation

-Kinetic component

The valve must discharge air at high velocity during filling of the system and admit air during its drainage. The valve should be designed to prevent premature closing and discharge air.

-Automatic component

The valve will release accumulated air from the system while it is under pressure and operating.

Large dimension automatic orifice of at least 804 mm<sup>2</sup> ,attached to the air & vacuum orifice making it less prone to obstruction by debris.

The same orifice for a wide pressure range (up to 16 bar).

**Pressure** - D-040 PP : 0.1-10 bar (2-150psi)

D-040-P/D-040 STST : 0.2-16 bar (3-250 psi.)

Testing pressure: 25 bar (360 psi.)

**Ends** 3/4", 1", 2" male threads NPT, BSP.

**Body material** Composite materials or stainless steel.

**Drainage outlets** For easy removal of excess fluids.

## ACCESSORIES

### Flanges

Made of reinforced nylon / cast nylon

Suitable for: D-040 1" 2", D-040-C 1" 2"

Diameter 40/50/60 Internal threads: 3/4" 1" 2"

Diameter 40/50/65 Internal threads: 3/4" 1" 2"

Diameter 80 Internal threads: 2" 3"

### Freeze Jacket

Made of polyurethan



### Pressure & Drainage cock (only 2")



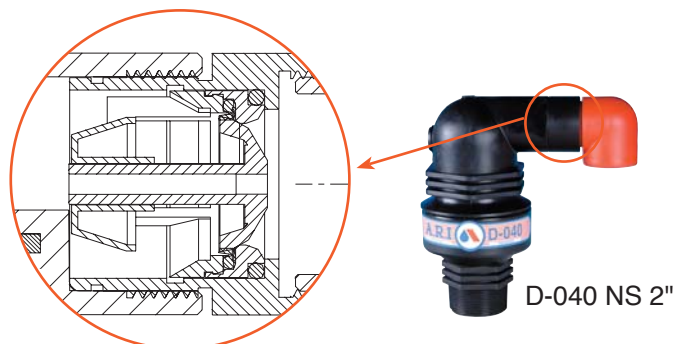
### Model one way

The D-040 air valve is available:

D040-V -With a vacuum guarding, out-only attachment, which only allows air discharge, not allowing air intake (all models).

D-040-I -With a vacuum breaking, In-only attachment, which only allows air intake, not allowing air discharge (D-040 2" only).

D-040-NS -With a non-slam, discharge-throttling attachment, which allows free air intake, but throttles air discharge (D-040 2" only).



D-040 NS 2"



D-040 PA 3/4" 1"



D-040 PA 2"



D-040 PP 2"



D-040 ST 2"

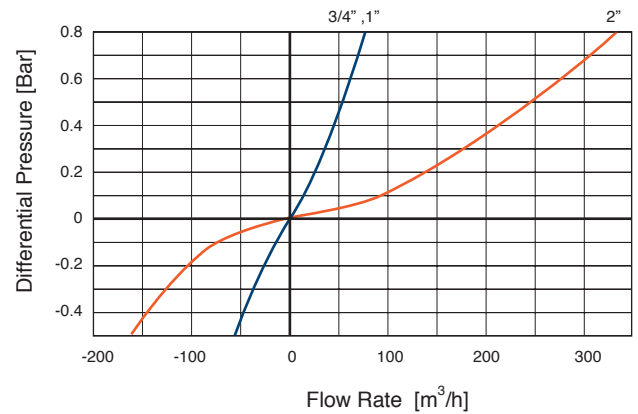


D-040 STST 2"



D-040 PP 3/4" 1"

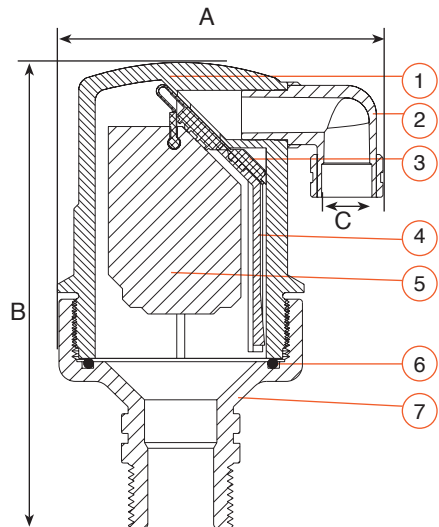
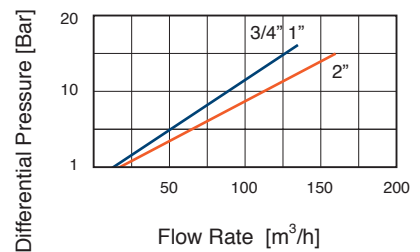
## AIR AND VACUUM FLOW RATE



## PARTS LIST AND SPECIFICATION

No.	Part	Material	Material	Material
		D-040 P / ST	D-040 PP	D-040 ST ST
1.	Body	PA	PP	STST SAE 316
2.	Drainage Elbow	PP	PP	PP
3.	Seal Plug Ass.			
3a.	Screws	PA	PP	PP
3b.	Plug Cover	PA	PP	PP
3c.	Rolling Seal	Viton /BUNA-N /E.P.D.M.	Viton /BUNA-N /E.P.D.M.	Viton /BUNA-N /E.P.D.M.
3d.	Plug	PA	PP	PP
4.	Clamping Stem	PA	PP	PP
5.	Float	Foamed PP	Foamed PP	Foamed PP
6.	O-Ring	Viton /BUNA-N /E.P.D.M.	Viton /BUNA-N /E.P.D.M.	Viton /BUNA-N /E.P.D.M.
7.	Base	PA/STST SAE 316	PP/STST SAE 316	STST SAE 316

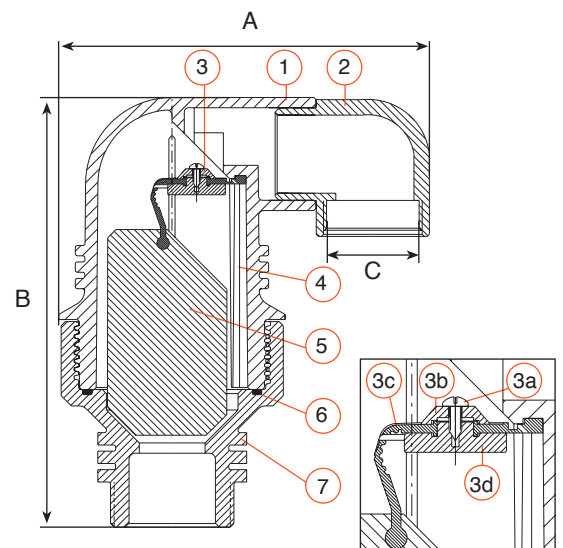
## AUTOMATIC AIR DISCHARGE



PA-Reinforced Nylon PP-Polypropylene STST-Stainless Steel

## DIMENSIONS AND WEIGHTS

Model	Dimensions mm			Weight Kg.	Orifice Area (mm <sup>2</sup> )	
	A	B	C		Auto.	Kin.
1", 3/4"						
D-040 PA	100	143	3/8" BSP	0.33	7.8	100
D-040 PP	100	143	3/8" BSP	0.33	7.8	100
D-040 ST.	100	143	3/8" BSP	0.65	7.8	100
D-040 STST	100	143	3/8" BSP	1.40	7.8	100
2"						
D-040 PA	180	209	1 1/2" BSP	1.1	12	804
D-040 PP	180	209	1 1/2" BSP	1.1	12	804
D-040 ST	180	209	1 1/2" BSP	2.1	12	804
D-040 STST	180	209	1 1/2" BSP	3.1	12	804





D-040-C 1"



D-040-C 2"



D-040-C F 2"

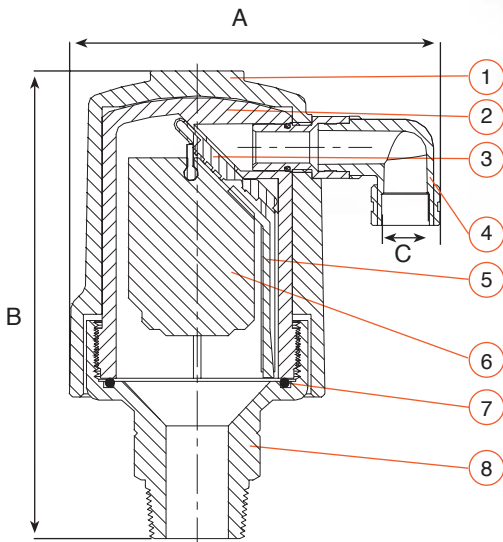
## PARTS LIST AND SPECIFICATION

No.	Part	Material
1.	Body	Cast Iron ASTM A48 CL.35B*
2.	Sleeve	Reinforced Nylon
3.	Seal Plug Assembly	
3a.	Screws	Polypropylene
3b.	Plug Cover	Reinforced Nylon/Polypropylene
3c.	Rolling Seal	E.P.D.M. / Viton
3d.	Plug	Reinforced Nylon / Polypropylene
4.	Drainage Elbow	Polypropylene
5.	Clamping Stem	Reinforced Nylon / Polypropylene
6.	Float	Foamed Polypropylene
7.	O - Ring	Buna-N. / Viton
8.	Base 3/4" 1"	STST SAE 316
	2"	Cast Iron ASTM A48 CL.35B*
9.	Bolt & Nut (x4)	STST SAE 316

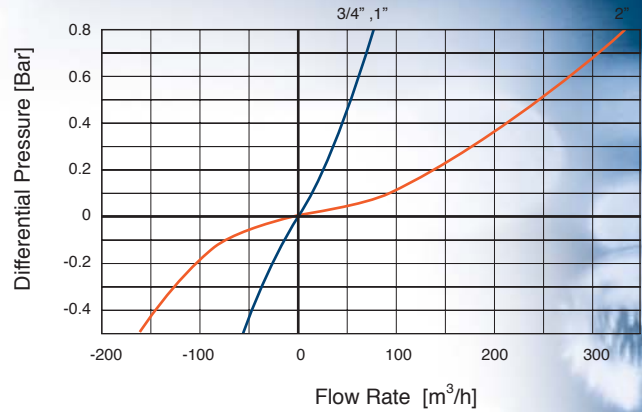
\* Dacromet coated

## DIMENSIONS AND WEIGHTS

Model	Dimensions mm			Weight Kg.	Orifice Area (mm <sup>2</sup> )	
	A	B	C		Auto.	Kin.
1", 3/4"						
D-040-C	119	150	3/8" BSP	1.7	5	82
2"						
D-040-C	203	231	1 1/2" BSP	5.4	12	804
D-040-C F	250	233	1 1/2" BSP	7.3	12	804



## AIR AND VACUUM FLOW RATE



## AUTOMATIC AIR DISCHARGE

