



D-040 PN 16

D-040-C PN 16



Combination Air Valve

Description

The D-040 series 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 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.

D-040-C - additional applications

- Water pipelines vulnerable to vandalism and/or water theft.
- Water systems found in remote areas.

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 float which pushes the sealing mechanism 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 float drops down, unsealing the rolling seal. The air release orifice opens and the accumulated air is released.
5. Liquid enters the air release valve, the float rises pushing the rolling seal to its sealing position.

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

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

Main Features

- Working pressure range: 0.2 - 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.
- Lightweight, small dimensions, simple and reliable structure.
- The discharge outlet enables the connection of a vent/drain pipe.
- 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 mechanism, making it less sensitive to pressure differential than a direct float seal.
- The body is made of high-strength composite materials 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 systems.
- D-040-C the body is protected in a metal shell for anti-vandalism/theft applications.

Valve Selection

The air valve is available with:

- Wide size range: 1/2", 3/4", 1", 2" threaded male connections, NPT or BSPT.
- Optional ball valve tap; BSPT or NPT male connection.

Options

- The D-040 air valve is available in the following options:
 - D-040 1" & 2" - reinforced nylon body and base
 - D-040 B 1" & 2" - reinforced nylon body and brass base
 - D-040 C 1" & 2" - ductile iron shell and base (1" base - brass)
 - D-040 ST. - reinforced nylon body and stainless steel base
 - D-040 ST ST - stainless steel body and stainless steel base
- D-040 LP air valve is designed for very low pressure systems with a maximum working pressure of PN 6
- DG-10 air valve is designed for low pressure systems with a maximum working pressure of PN10
- D-040 HT air valve (rated PN10) is designed for hot water systems with a maximum working temperature of 90°C.

Note

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, thread and flange standard and type of liquid.

ACCESSORIES

Ball Valve

Shut-off valve: Made of brass ATSM B-124
 Suitable for: D-040 1" 2"
 D-040-C 1" 2"

Flanges

Made of Reinforced Nylon / Cast Ductile / ST. 37
 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 50mm Internal threads: 1" 2"

Diameter 80mm Internal threads: 2" 3"



D-040 P T 2"



D-040 P T 1"



D-040-C T 2"



D-040-C T 1"

Thermal Protection Jacket

Made of polyurethane



Extension

Available with extended pipe.

One-way models

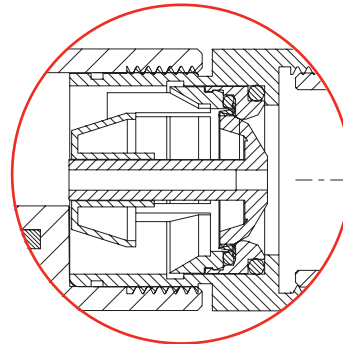
The D-040 series air valve is available as:

The D-040 series air valve is available as:

D040-V With a one-way, out-only attachment, allows air discharge only, prevents air intake (all models).

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

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



D-040-NS 2"

D-040 Non-Slam Single Orifice Add-on Component Data Table

Model	Nominal Size	Discharge orifice	Total NS area	NS orifice	Switching point	Flow at 0.4 bar
D-040 NS	2" (50mm)	37.5 mm	12.6 mm ²	4 mm	Spring loaded normally closed	17.5 m ³ /h



D-040 1"



D-040 2"



D-040 B 2"



D-040 ST 2"



D-040 ST ST 1"

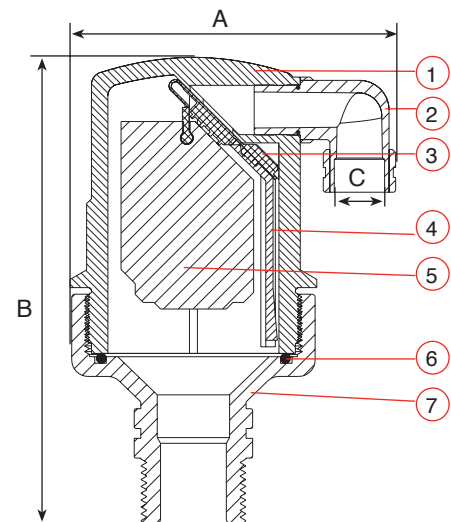


D-040 ST ST 2"

DIMENSIONS AND WEIGHTS

Model	Dimensions mm		Connection C	Weight Kg.	Orifice Area mm ²	
	A	B			Auto.	A / V
1/2" 3/4" 1"						
D-040	100	143	3/8" BSP Female	0.33	7.8	100
D-040 B	100	143	3/8" BSP Female	0.70	7.8	100
D-040 ST	100	143	3/8" BSP Female	0.65	7.8	100
D-040 ST ST 2"	94	139	3/8" BSP Female	1.00	7.8	100
D-040 P	183	215	1 1/2" BSP Female	1.10	12	804
D-040 B	183	215	1 1/2" BSP Female	1.80	12	804
D-040 ST	183	215	1 1/2" BSP Female	2.10	12	804
D-040 ST ST	183	215	1 1/2" BSP Female	3.10	12	804

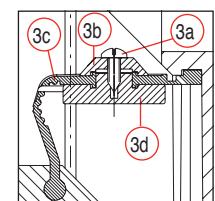
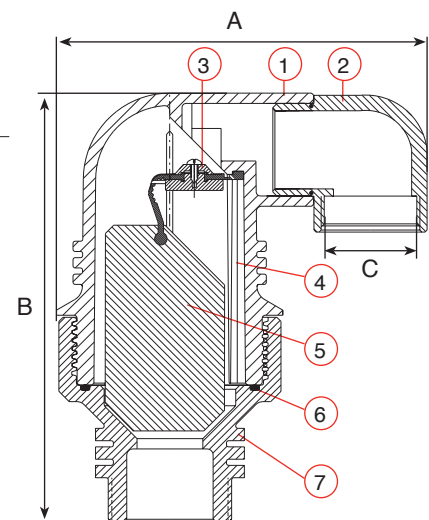
* All product weights are approximate due to the differences in flange standards and variable accessories



PARTS LIST AND SPECIFICATION

No.	Part	Material D-040 / B / ST	Material D-040 ST ST
1.	Body	Reinforced Nylon	Stainless Steel 316
2.	Discharge Outlet	Polypropylene	Polypropylene
3.	1/2" 3/4" 1" 2" Rolling Seal assembly:	EPDM	Viton / BUNA-N / EPDM
3a.	Screws	Stainless Steel	Stainless Steel
3b.	Plug Cover	Reinforced Nylon	Polypropylene / Reinforced Nylon
3c.	Rolling Seal	EPDM	Viton / BUNA-N / EPDM
3d.	Plug	Reinforced Nylon	Polypropylene / Reinforced Nylon
4.	Clamping Stem	Reinforced Nylon	Polypropylene / Reinforced Nylon
5.	Float	Foamed Polypropylene	Foamed Polypropylene
6.	O-Ring	BUNA-N	BUNA-N
7.	Base	Reinforced Nylon / Brass / Stainless Steel 316	Stainless Steel 316

Optional Ball Valve Brass Nickel plated





D-040-C 1"



D-040-C 2"

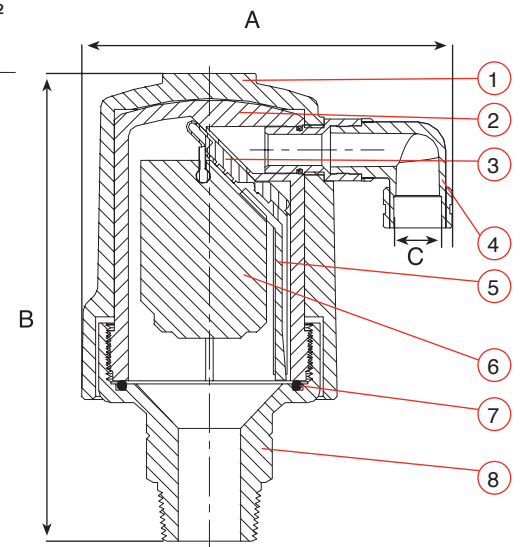


D-040-C F 2"

DIMENSIONS AND WEIGHTS

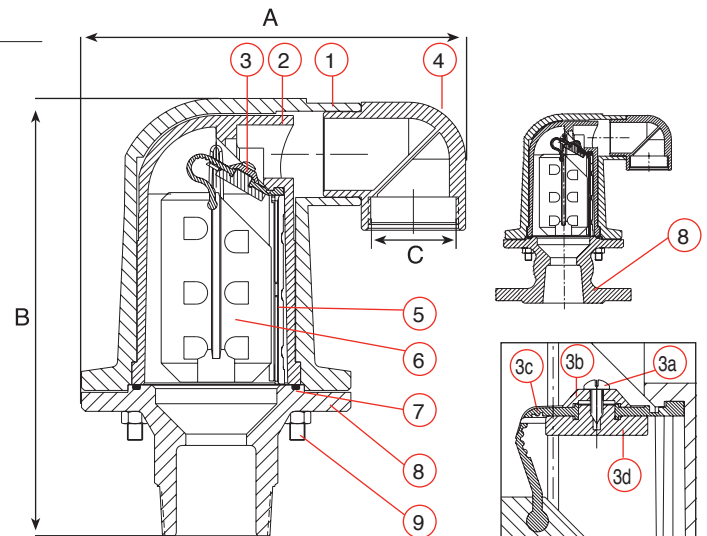
Model	Dimensions mm		Connection C	Weight Kg.	Orifice Area mm ²	
	A	B			Auto.	A / V
1/2" 3/4" 1"						
D-040-C	125	150	3/8" BSP Female	1.2	5	82
2"						
D-040-C	203	230	1 1/2" BSP Female	5.4	12	804
D-040-C F	214	230	1 1/2" BSP Female	7.3	12	804

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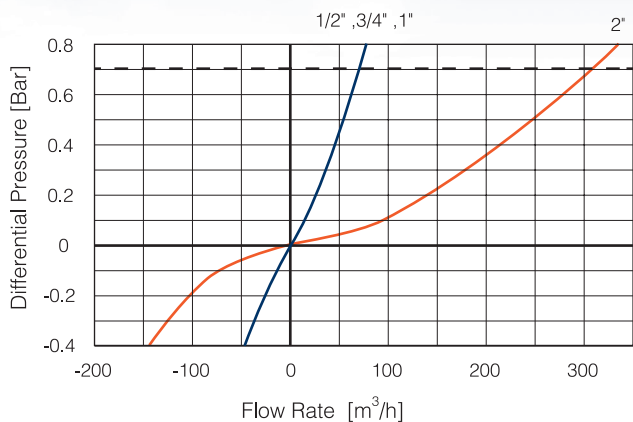
PARTS LIST AND SPECIFICATION

N0.	Part	Material
1.	Shell	Ductile Iron
2.	Body	Reinforced Nylon
3.	1/2" 3/4" 1" Rolling Seal	EPDM
3.	2" Rolling Seal Assembly	
3a.	Screws	Stainless Steel
3b.	Plug Cover	Reinforced Nylon
3c.	Rolling Seal	EPDM
3d.	Plug	Reinforced Nylon
4.	Discharge Outlet	Polypropylene
5.	Clamping Stem	Reinforced Nylon
6.	Float	Foamed Polypropylene
7.	O - Ring	BUNA-N
8.	Base 1/2" 3/4" 1"	Brass
	2"	Ductile Iron
9.	Bolt & Nut (x4)	Steel Zinc Cobalt Coated



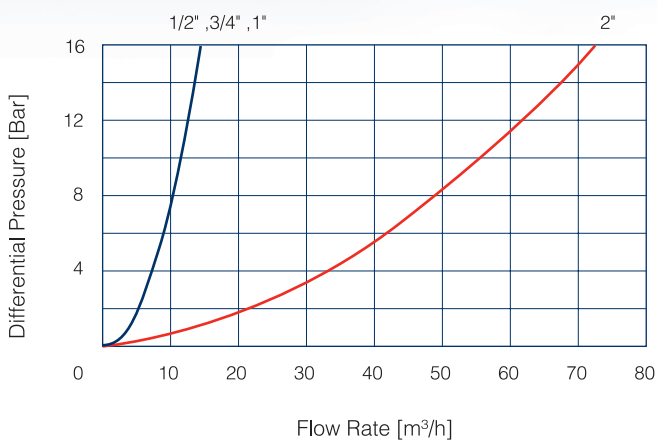
Optional Ball Valve Brass, Nickel plated

AIR AND VACUUM FLOW RATE



— — — Max. recommended design air discharge

AUTOMATIC AIR RELEASE FLOW RATE



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