A.R.I.

D-040 PN 16

D-040-C PN 16

Water Supply

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 throttling effect as would a partially closed valve. In extreme cases this will cause complete flow stoppage.
- Obstruction of efficient hydraulic transmission due to air flow disturbances.
- Accelerate cavitation damages.
- Pressure transients and surges.
- Corrosion in pipes, fittings and accessories.
- Danger of a 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 in the pipeline is discharged by the valve.
2. Liquid enters the 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 valve, which in turn displaces the liquid in the valve's body.
4. The float descends, unsealing the rolling seal. The air release orifice opens and the accumulated air is released.
5. Liquid enters the valve and the float rises, pushing the rolling seal back to its sealing position.

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

1. The float will immediately drop down, opening the air & vacuum and air release orifices.
2. Air will enter 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 velocity air discharge while preventing premature closure.
- Lightweight, small dimensions, simple and reliable structure.
- The drainage outlet enables removal of excess fluids.
- 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 patented 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" - cast 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.
- The D-040 LP air valve is made for very low pressure systems with a maximum working pressure of PN 6.
- The DG-10 air valve is made for low pressure systems with a maximum working pressure of PN10.

Upon ordering, please specify: model, size, working pressure, threads 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"

D-040 P T 2"

D-040 P T 1"

D-040-C T 2"

D-040-C T 1"

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"

Thermal frotection Jacket

Made of polyurethane

Extension

Available with extended pipe.

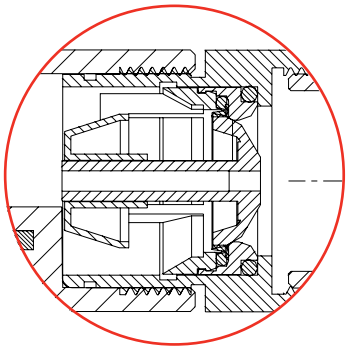
One-way models

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

A.R.I.

D-040 1"

D-040 2"

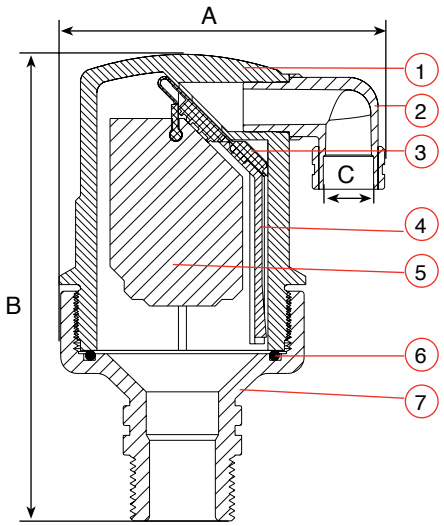
D-040 B 2"

D-040 ST 2"

D-040 ST ST 2"

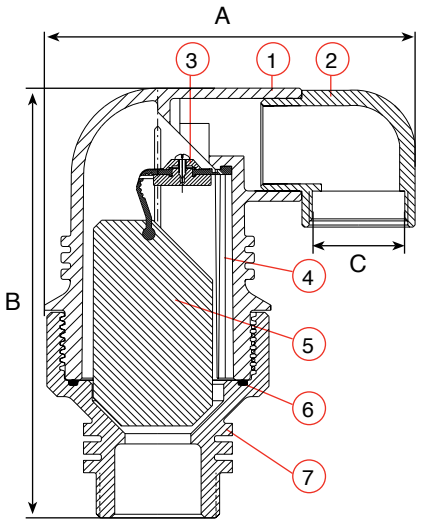
DIMENSIONS AND WEIGHTS

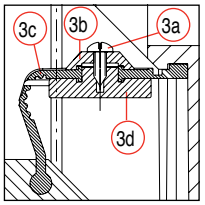
Model	Dimensions mm		Connection	Weight	Orifice Area mm²	
	A	B	C	Kg.	Auto.	A / V
1/2" 3/4" 1"						
D-040	100	143	3/8" BSP Female	0.33	7.8	100
D-040 B	100	143	3/8" BSP Female	0.70	7.8	100
D-040 ST	100	143	3/8" BSP Female	0.65	7.8	100
D-040 ST ST	100	143	3/8" BSP Female	1.40	7.8	100
2"						
D-040 P	183	215	1½" BSP Female	1.10	12	804
D-040 B	183	215	1½" BSP Female	1.80	12	804
D-040 ST	183	215	1½" BSP Female	2.10	12	804
D-040 ST ST	183	215	1½" BSP Female	3.10	12	804



PARTS LIST AND SPECIFICATION

No.	Part	Material D-040 / B / ST	Material D-040 ST ST
1.	Body	Reinforced Nylon	St.St. SAE 316
2.	Discharge Outlet	Polypropylene	Polypropylene
3.	1/2" 3/4" 1" Rolling Seal	E.P.D.M.	Viton / BUNA-N / E.P.D.M.
	2" Rolling Seal Assembly:		
	3a. Screws	Stainless Steel	Stainless Steel
	3b. Plug Cover	Reinforced Nylon	Polypropylene / R.N.
	3c. Rolling Seal	E.P.D.M.	Viton / BUNA-N / E.P.D.M.
	3d. Plug	Reinforced Nylon	Polypropylene / R.N.
4.	Clamping Stem	Reinforced Nylon	Polypropylene / R.N.
5.	Float	Foamed Polypropylene	Foamed Polypropylene
6.	O-Ring	BUNA-N	BUNA-N
7.	Base	Reinforced Nylon / Brass ASTM B124 / St.St. SAE 316	St.St. SAE 316
Optional	Ball valve	Brass ASTM-B-124, Nickel plated.	





D-040-C

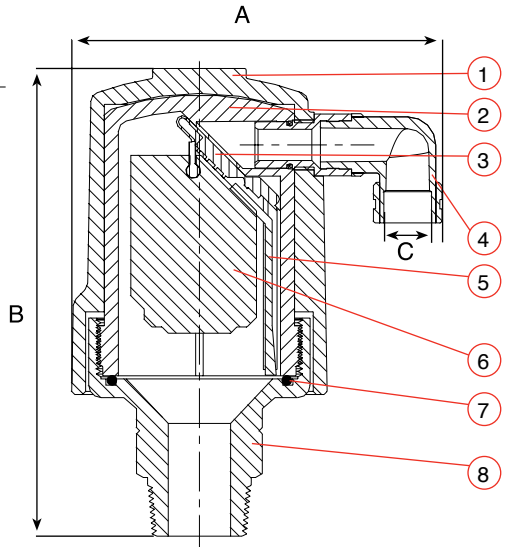

D-040-C 1"


D-040-C 2"


D-040-C F 2"

DIMENSIONS AND WEIGHTS

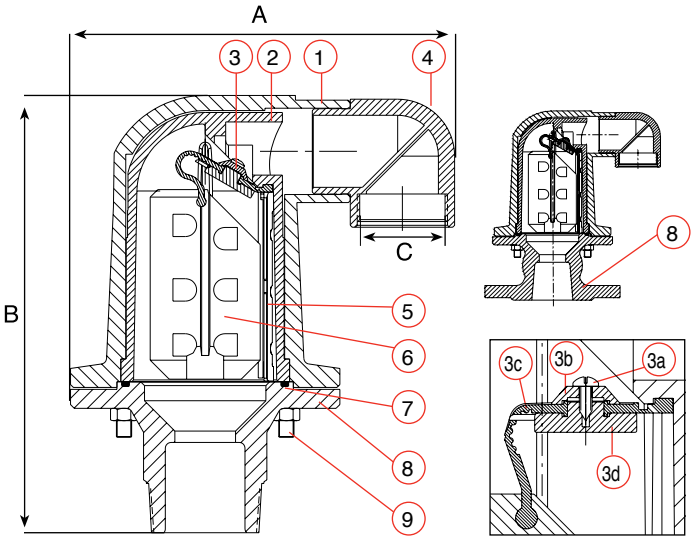
Model	Dimensions mm		Connection	Weight	Orifice Area mm²	
	A	B	C	Kg.	Auto.	A / V
1/2" 3/4" 1"						
D-040-C	125	150	3/8" BSP Female	1.2	5	82
2"						
D-040-C	203	230	1½" BSP Female	5.4	12	804
D-040-C F	214	230	1½" BSP Female	7.3	12	804



PARTS LIST AND SPECIFICATION

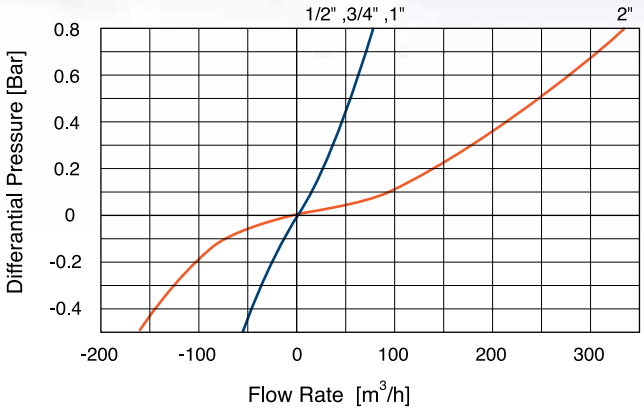
N0.	Part	Material
1.	Shell	Cast Iron ASTM A48 CL.35B
2.	Body	Reinforced Nylon
3.	1/2" 3/4" 1" Rolling Seal	E.P.D.M.
3.	2" Rolling Seal Assembly	
3a.	Screws	Stainless Steel
3b.	Plug Cover	Reinforced Nylon
3c.	Rolling Seal	E.P.D.M.
3d.	Plug	Reinforced Nylon
4.	Discharge Outlet	Polypropylene
5.	Clamping Stem	Reinforced Nylon
6.	Float	Foamed Polypropylene
7.	O - Ring	Buna-N
8.	Base 1/2" 3/4" 1"	Brass
	2"	Cast Iron ASTM A48 CL.35B
9.	Bolt & Nut (x4)	Steel Zinc Cobalt Coated

Optional Ball valve — Brass ASTM-B-124, Nickel plated.

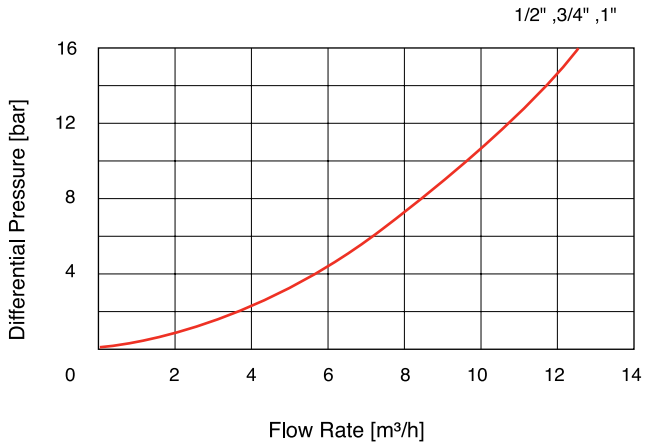


D-040

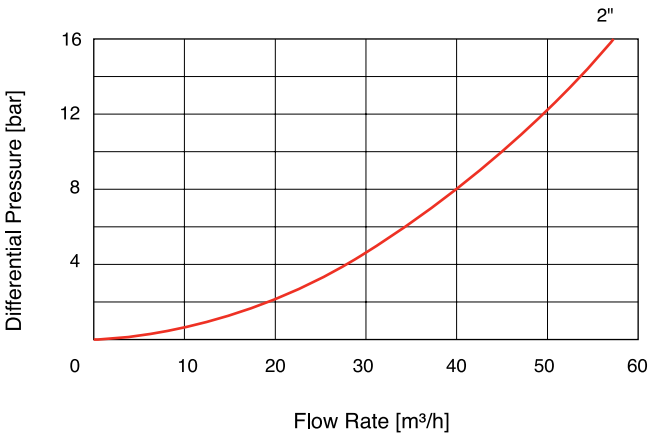
AIR AND VACUUM FLOW RATE



AUTOMATIC AIR RELEASE FLOW RATE



AUTOMATIC AIR RELEASE FLOW RATE



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