Sewage & Wastewater Combination Air Valve

Model C60

BERMAD C60 is a high quality combination air valve for a variety of sewage and wastewater networks and operating conditions. It evacuates air during pipeline filling, allows efficient release of air and gas pockets from pressurized pipes, and enables large volume air intake in the event of network draining.

With its advanced aerodynamic design, double orifice and anti-slam/slow closing device, this valve provides excellent protection against air and gas accumulation, surge and water hammers with improved sealing under low pressure conditions.

Typical Applications

- Sewage and wastewater pumping stations – Air relief, vacuum prevention and surge protection.
- Sewage and wastewater pipelines – Protection against air and gas accumulation and vacuum formation at elevations, slope change points and at road/river crossings. Protection against vacuum formation, surge and water hammer at points likely to experience water column separation.
- Municipal and industrial wastewater treatment plants – Protection against air and gas accumulation and vacuum formation.

Features Benefits

- Straight flow cast ductile iron body with nominal (equal) inlet and outlet size – Higher than usual flow rates.
- Aerodynamic full-body kinetic shield – Prevents premature closing, without disturbing air intake or discharge.
- Dynamic Sealing – Prevents leakage even under low pressure conditions (0.1 bar).
- Two optional outlets (sideways, circular-surround mushroom configuration) that can swivel 360° – Easy to install in a variety of site conditions.
- Elongated body design with non-stick coating – Prevents solids from clogging valve or making contact with valve's operating parts.
- Compact, simple, robust and reliable structure with fully corrosion-resistant parts – Lower maintenance and increased life span.
- Designed in compliance with AWWA C-512 standard.
- Two service ports – Positioned to create powerful vortex during back flushing and drainage.
- Factory Approval and Quality Control – Performance and specification tested and measured with specialized test bench, including vacuum pressure conditions.

Additional Features

- Built in Adjustable Surge Protection (anti slam) – Smoother operation, preventing damage to the valve and the system. The conditions for partially closing the kinetic orifice (the "switching value") can be adjusted according to the specific system requirements (C60-SP, C60-AS).
- Inflow Prevention – Prevents intake of atmospheric air in cases where this could lead to damaged pumps, required re-priming, or disruption of siphons (C60-IP).
- Drainage Valve.
- Insect Screen.

Principles of Operation

Pipeline Filling:

During the filling process of a pipeline, high air flow is forced out through the kinetic orifice of the air valve. Once water enters the valve's chamber, the float buoyed upwards causes the kinetic orifice to close. The unique aerodynamic structure of the valve body and float ensures that the float cannot be closed before water reaches the valve.

Pressurized Operation:

During pressurized operation of the pipeline, air accumulates in the upper part of the air valve chamber, causing the float to gravitate downwards. This in turn causes the automatic orifice to open, releasing the accumulated air. Once the air is discharged, the water level and float rise, causing the automatic orifice to close.

Surge Protection (anti-slam):

In the event of a pressure surge, the Surge Protection disc rises, partially closing the valve's orifice. The approaching water column decelerates due to the resistance of the rising air pressure in the valve.

Pipeline Draining:

When a pipeline is drained, a negative differential pressure is created causing atmospheric air to push the float down. The kinetic orifice stays open and air enters the valve chamber, preventing vacuum formation in the pipe.

Inflow Prevention:

The inflow prevention mechanism is a Normally Closed check disc mounted on the top of the valve's orifice and preventing flow of atmospheric air into the valve.

Valve Selection

- Body Material:
  - Standard – Cast ductile iron
  - Optional – Stainless Steel, Bronze
- Coatings:
  - Standard – Baked epoxy, blue
  - Optional – Additional coatings and colors
- Inlet sizes – DN50, DN80 (2", 3")
- Connections:
  - Threaded female BSPT – only for DN50 (2")
  - Flanged ISO PN16
- Outlets – Sideway, mushroom configuration
- Additional features:
  - Surge Protection (C60-SP, C60-AS)
  - Inflow Prevention (C60-IP)

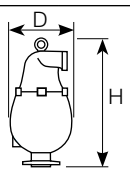
Operational Data

- Pressure rating: ISO PN16
- Operating pressure range: 0.1 - 16 bar
- Operating temperature: up to 60°C

Orifice Specifications

Size		Kinetic		Surge Protection		Automatic
DN	Inch	D [mm]	Ad [mm²]	D [mm]	Ad [mm²]	Ad [mm²]
50	2"	50	1,963	5x4	79	8.0
80	3"	80	5,027	8x4	201	8.0

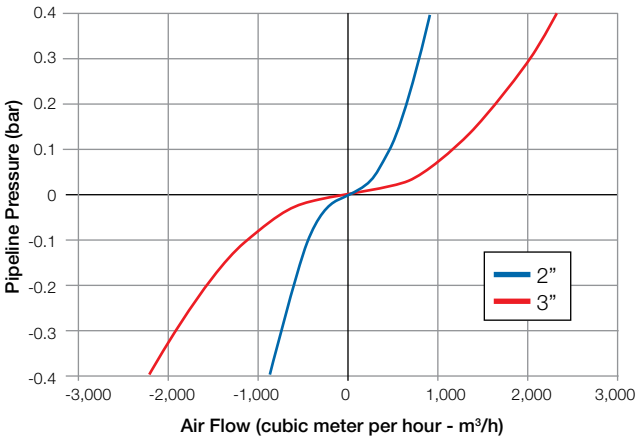
Dimensions & Weights



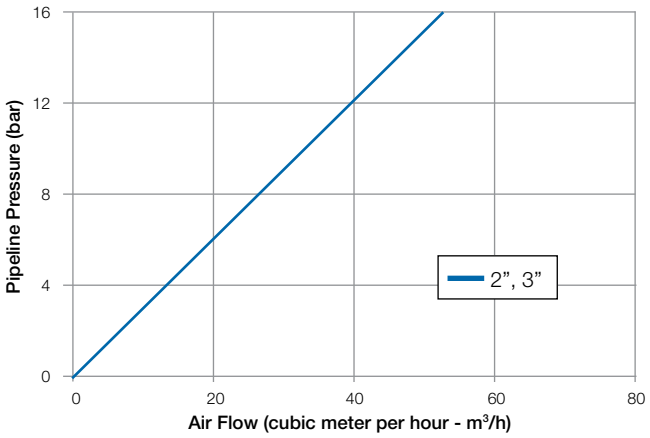
Size			Side Outlet			Mushroom Outlet		
DN	Inch	Connection	D (mm)	H (mm)	Weight (Kg)	D (mm)	H (mm)	Weight (Kg)
50	2"	Threaded	300	588	31	300	562	30
50	2"	Flanged	300	630	33.5	300	604	32.5
80	3"	Flanged	300	640	37.5	300	608	36.5

Air Flow Performance Charts

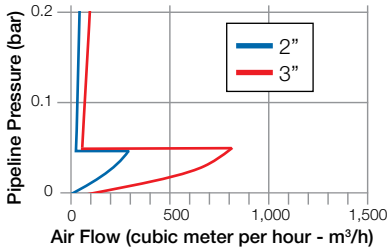
Air Relief and Intake (Pipeline Filling, Draining and Vacuum Conditions)

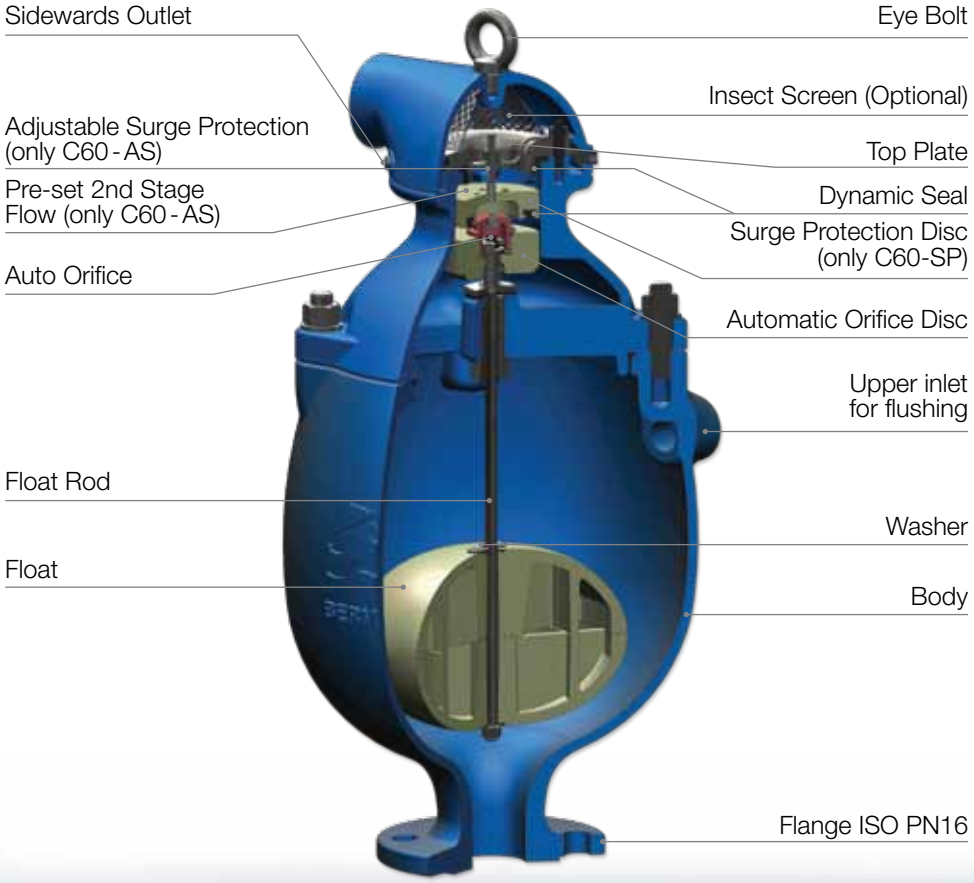


Air Release (Pressurized Operation)

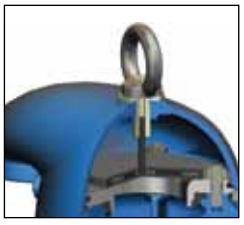


Air Relief with Surge Protection





Without Surge Protection (C60)



With Inflow Prevention (C60-IP)

Parts List and Materials

	Description	Material	Standards/Remarks
1	Body	Casted, Ductile Iron	ASTM A536 GR. 65-45-12 (EN-GJS 450-10 DIN EN1563)
2	Cover side, mushroom	Casted, Ductile Iron	ASTM A536 GR. 65-45-12 (EN-GJS 450-10 DIN EN1563)
3	Neck	Casted, Ductile Iron	ASTM A536 GR. 65-45-12 (EN-GJS 450-10 DIN EN1563)
4	Top Plate Seal	EPDM	
5	Surge Protection Disc	Polyproylene	Only C60-SP
6	Surge Protection Disc Seal	EPDM	Only C60-SP
7	Check Disk (Inflow Prevention)	Stainless Steel + EPDM	Only at C60-IP
8	Auto Orifice Disc	Polyproylene	
9	Float	Polyproylene	
10	Top Plate	Stainless Steel	ASTM A744 Gr. CF8M
11	Float Rod	Stainless Steel	AISI/SAE S31600
12	Guide	Stainless Steel	AISI/SAE S31600
13	Auto Orifice	Stainless Steel	AISI/SAE S31600
14	Auto Orifice Plug	Glass Reinforced Nylon	
15	Auto Orifice Plug O-Ring	EPDM	
16	Auto Orifice Seal	EPDM	
17	Orifice Rod	Stainless Steel	AISI/SAE S31600
18	Auto Orifice Plug O-Ring	EPDM	
19	Float Rod Nut	Stainless Steel	AISI/SAE S31600
20	Soft Stop Disc	EPDM	
21	Auto Orifice O-Ring	EPDM	
22	Cover O-Ring	EPDM	
23	Eye Bolt	Stainless Steel	AISI/SAE S31600 DIN580 A4
24	Stud	Stainless Steel	AISI/SAE S31600 DIN939 A4
25	Washer	Stainless Steel	AISI/SAE S31600 DIN125 A2
26	Nut	Stainless Steel	AISI/SAE S31600 DIN934 A2
27	O-Ring	EPDM	
28	Stud	Stainless Steel	AISI/SAE S31600 DIN939 A4
29	Washer	Stainless Steel	AISI/SAE S31600 DIN125A A2
30	Nut	Stainless Steel	AISI/SAE S31600 DIN934 A2
31	Nut	Stainless Steel	AISI/SAE S31600 DIN934 A2
32	Insect Screen (Optional)	Stainless Steel	AISI/SAE S303000
33	Drainage Valve (Optional)	Stainless Steel	AISI / SAE S31600