



## Sewage & Wastewater Combination Air Valve

### Model C60, C65

BERMAD C60/C65 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 – Higher than usual flow rates.
- Aerodynamic full-body kinetic shield – Prevents premature closing, without disturbing air intake or discharge.
- Dynamic Sealing – Prevents leakage 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.
- 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 (SP, AS).
- Inflow Prevention – Prevents intake of atmospheric air in cases where this could lead to damaged pumps, required re-priming, or disruption of siphons (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.

### 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.

### Surge Protection (anti-slam):

The anti-slam device is fitted to the air valve outlet. In the event of pressure surge, it partially closes the valve's outlet. The approaching water column decelerates due to the resistance of the rising air pressure in the valve. This is typically used on pump stations and at specific pipeline locations to minimise pressure surges during pipe filling or power failure conditions at the pump station.

### Inflow Prevention:

The inflow prevention is a Normally Closed check device fitted on the valve's outlet and prevents flow of atmospheric air into the valve. Typically used to prime pump suction lines or on pipelines requiring only air discharge and no air re-entry such as siphons.

## Valve Selection

- Body Material:
  - Standard – Cast ductile iron
- Coatings:
  - Standard – Baked epoxy, blue
  - Optional – Additional coatings and colors
- Inlet sizes – DN50 (2"), DN80 (3"), DN100 (4")
- Connections:
  - Threaded Female BSPT – only for DN50 (2")
  - Flange ISO PN16
- Outlets – Sideway, Threaded DN50 (2")
- Additional features:
  - Surge Protection (SP, AS)
  - Inflow Prevention (IP)

## Operational Data

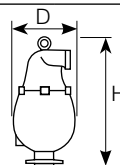
- Pressure rating: ISO PN16
- Operating pressure range: 0.1 - 16 bar
- Operating temperature: up to 60°C

## Orifice Specifications

Size		Kinetic		Surge Protection		Automatic
DN	Inch	D [mm]	Ad [mm <sup>2</sup> ]	D [mm]	Ad [mm <sup>2</sup> ]	Ad [mm <sup>2</sup> ]
50	2"	50	1,963	5x4	79	9.1
80	3"	50	1,963	5x4	79	9.1
100	4"	50	1,963	5x4	79	9.1

## Dimensions & Weights

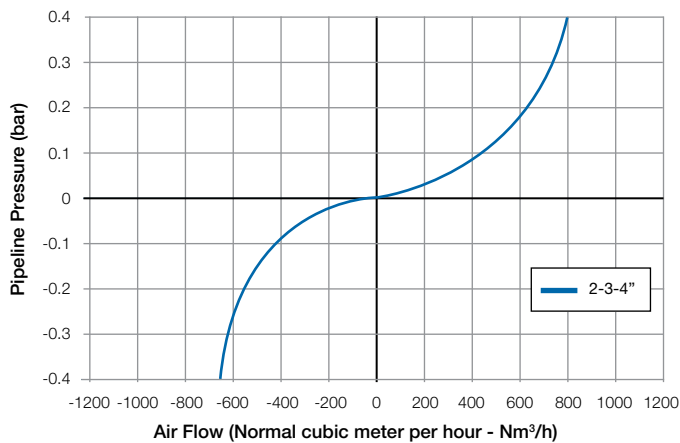
Size		Connection	Side Outlet		
DN	Inch		Width (mm)	Height (mm)	Weight (Kg)
50	2"	Threaded	300	584	33
50	2"	Flanged	300	630	36
80	3"	Flanged	300	623	37
100	4"	Flanged	300	625	39



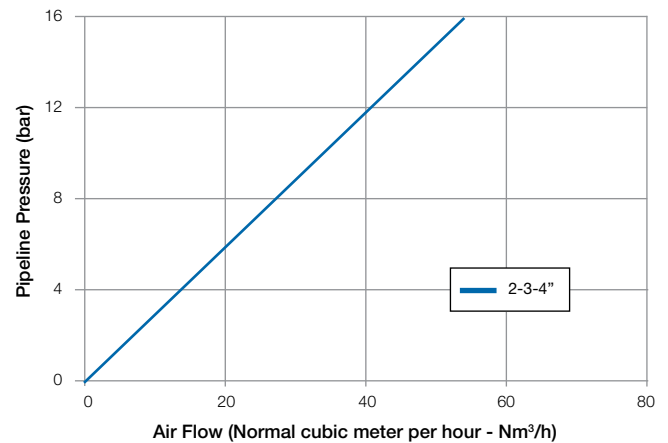


## Air Flow Performance Charts

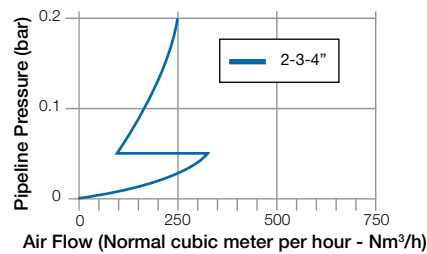
### Air Relief and Intake (Pipeline Filling, Draining and Vacuum Conditions)



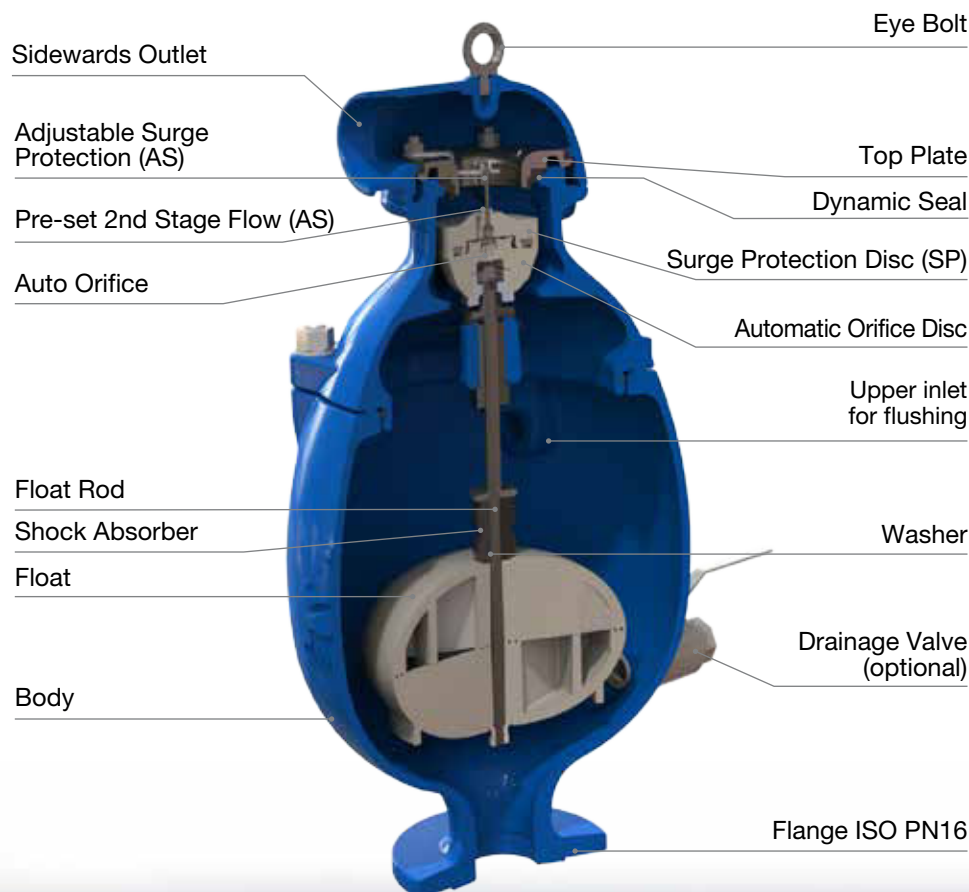
### Air Release (Pressurized Operation)



### Air Relief with Surge Protection



Air relief and intake charts are based on actual measurements, made during 2014 in BERMAD Air Flow test bench, according to EN-1074/4 standard and refer to Side outlet.



Without Surge Protection



With Inflow Prevention (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	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	Polypropylene	Only C65-SP
6	Surge Protection Disc Seal	EPDM	Only C65-SP
7	Check Disk (Inflow Prevention)	Stainless Steel + EPDM	Only C65-IP
8	Auto Orifice Disc-SW	Polypropylene	
9	Float-SW	Polypropylene	
10	Top Plate	Stainless Steel	AISI/SAE S316
11	Float Rod-SW	Stainless Steel	AISI/SAE S316
12	Gide-SW	Stainless Steel	AISI/SAE S316
13	Auto Orifice	Stainless Steel	AISI/SAE S316
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 S316
18	Auto Orifice Plug O-Ring	EPDM	
19	Float Rod Nut-SW	Stainless Steel	AISI/SAE S316
20	Soft Stop Disc-SW	EPDM	
21	Auto Orifice O-Ring	EPDM	
22	Cover O-Ring	EPDM	
23	Eye Bolt	Stainless Steel	AISI/SAE S316 DIN580 A4
24	Stud	Stainless Steel	AISI/SAE S316 DIN939 A4
25	Washer	Stainless Steel	AISI/SAE S316 DIN125 A4
26	Nut	Stainless Steel	AISI/SAE S316 DIN934 A4
27	O-Ring	EPDM	
28	Stud	Stainless Steel	AISI/SAE S316 DIN 939 A4
29	Washer	Stainless Steel	AISI/SAE S316 DIN125A A4
30	Nut	Stainless Steel	AISI/SAE S316 DIN 934 A4
31	Nut	Stainless Steel	AISI/SAE S316 DIN 934 A4
32	Washer	Stainless Steel	AISI/SAE S316 DIN125A A4
33	Insects' Screen (Optional)	Stainless Steel	AISI/SAE S316