Sewage & Wastewater Combination Air Valve

Model C50

BERMAD C50 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 and double orifice, this valve provides excellent protection against air and gas accumulation and vacuum formation with improved sealing under low pressure conditions.

Typical Applications

- Sewage and wastewater pumping stations – Air relief and vacuum prevention.
- Sewage and wastewater pipelines – Protection against air and gas accumulation and vacuum formation at elevations, slope change points and at road / river crossings.
- Wastewater treatment plants – Air relief, protection against air and gas accumulation and vacuum formation.

Features & Benefits

- Straight flow body with large diameter automatic orifice – 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 (0.05 bar).
- Elongated body design – Prevents solids from making contact with valve's operating parts.
- Compact, simple and reliable structure with fully corrosion-resistant parts – Lower maintenance and increased life span.
- Two inlets – Enabling 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

- Surge Protection (anti-slam) – Smoother operation, preventing damage to the valve and the system (C50-SP).
- Inflow Prevention – Prevents intake of atmospheric air in cases where this could lead to damaged pumps, required re-priming, or disruption of siphons (C50-IP).
- Drainage Valve.
- Threaded Side outlet (DN50/2") for connection of Surge Protection (SP) or Inflow prevention (IP) devices.

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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 Surge Protection device is fitted to the air valve outlet. In the event of a 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 mechanism is a Normally Closed check device fitted on the valve's outlet and preventing 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 – Glass-reinforced Nylon
- Inlet sizes – DN50, DN80, DN100 (2" 3" 4")
- Connections:
  - Threaded Male BSPT
  - Flanged
- Outlets – Sideways, downwards
- Additional features:
  - Surge Protection, connected to DN50/2" threaded side outlet (C50-SP).
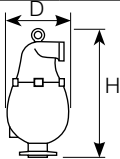 - Inflow Prevention, connected to DN50/2" threaded side outlet (C50-IP)

Operational Data

- Maximum test pressure - 16 bar (PN16)
- Operating pressure range: 0.05 - 10 bar
- Operating temperature: up to 60°C

Orifice Specifications

Size		Kinetic		Automatic
DN	Inch	D (mm)	Ad (mm²)	Ad (mm²)
50	2"	45.0	1,590	12.2
80	3"	45.0	1,590	12.2
100	4"	45.0	1,590	12.2

Dimensions & Weights

Size			Side Outlet		
DN	Inch	Connection	D (mm)	H (mm)	Weight (kg)
50	2"	Threaded	230	458	5.8
50	2"	Flanged	230	478	6.4
80	3"	Flanged	230	478	6.7
100	4"	Flanged	230	478	7.0

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Air Flow Performance Charts

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

Chart — Pipeline Pressure (bar) vs Air Flow (normal meter per hour - nm^3/h)

Legend:
- 2", 3", 4"
- 2", 3", 4"-SP
- 2", 3", 4"-IP
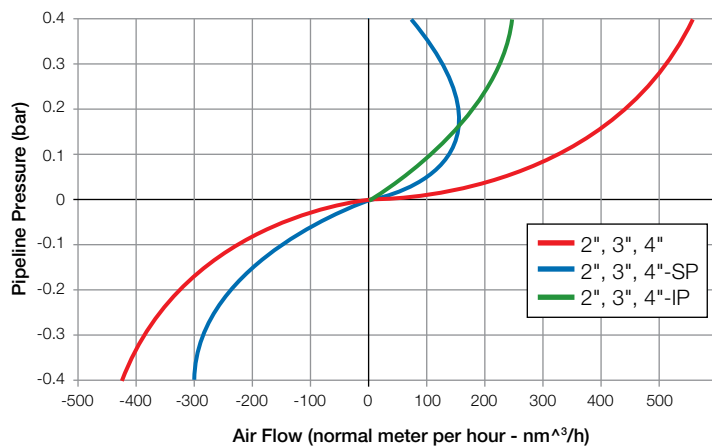
Air Release (Pressurized Operation)

Chart — Pipeline Pressure (bar) vs Air Flow (normal meter per hour - nm^3/h)

Legend:
- 2", 3", 4"
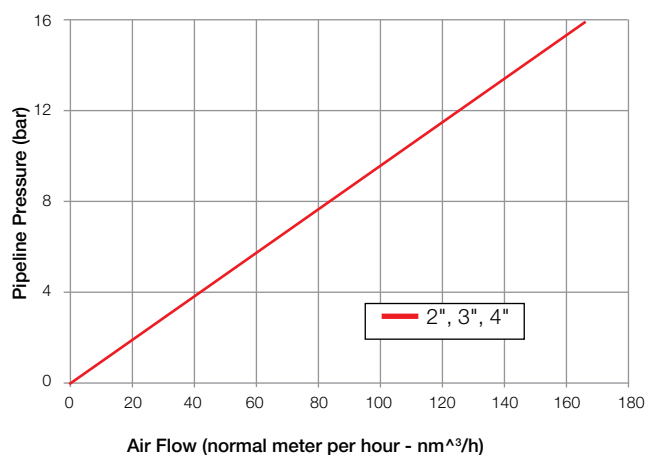
Air relief and intake charts are based on actual measurements, made during 2015 in Bermad Air Flow test bench, according to EN-1074/4 standard and refer to Side outlet.

Insect Screen

Kinetic Orifice

Kinetic Plug

Top Float

Cover

Shock Absorber

Float Rod

Main Float

BSPT Male Threaded

Female Threaded for retrofitting Surge Protection (SP) or Inflow Prevention (IP) functions or drain lines [1] [2] [3]

Automatic Orifice

Dynamic Seal (Kinetic Orifice)

Peel Seal (Automatic Orifice)

Spring

Washer
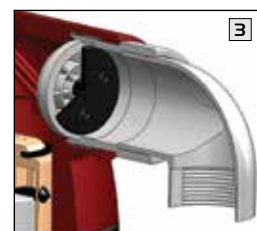
Upper inlet for flushing

Body

Lower outlet for draining

Flanged DN50-100 (2-4")

Down outlet and connection DN40 (1.5") to drainage pipe

Surge Protection (anti slam) – (C50-SP)

Inflow Prevention (C50-IP)

Parts List and Materials

	Description	Material	Standards/Remarks
1	Body BSP/NPT Male	Glass Reinforced Nylon	Optional - Stainless Steel
2	Cover-2"-Sewage	Glass Reinforced Nylon	Optional - Stainless Steel
3	Down outlet	Polypropylene	
4	2-C-Body	Glass Reinforced Nylon	Optional - Stainless Steel
5	Top Float	Polypropylene	
6	Main Float	Polypropylene	
7	Kinetic Plug	Nylon	
8	Peel Seal	EPDM	Optional - Viton
9	Kinetic Seal	EPDM	Optional - Viton
10	Hex domed nut	Stainless Steel	SS316 A4
11	Washer	Stainless Steel	SS316 A4
12	Float Rod	Stainless Steel	SS316 A4
13	Top Float Nut	Nylon	
14	Spring	Stainless Steel	SS316 A4
15	Washer	Stainless Steel	SS316 A4
16	Nut	Stainless Steel	SS316 A4
17	Insert M12	Stainless Steel	SS316
18	O-Ring	EPDM	Optional - Viton
19	Bolt	Stainless Steel	SS316 A4
20	Washer	Stainless Steel	SS316 A4
21	Surge Protection (Optional)	Glass Reinforced Nylon, PP, EPDM	
22	Inflow Prevention (Optional)	Glass Reinforced Nylon, PP, EPDM	