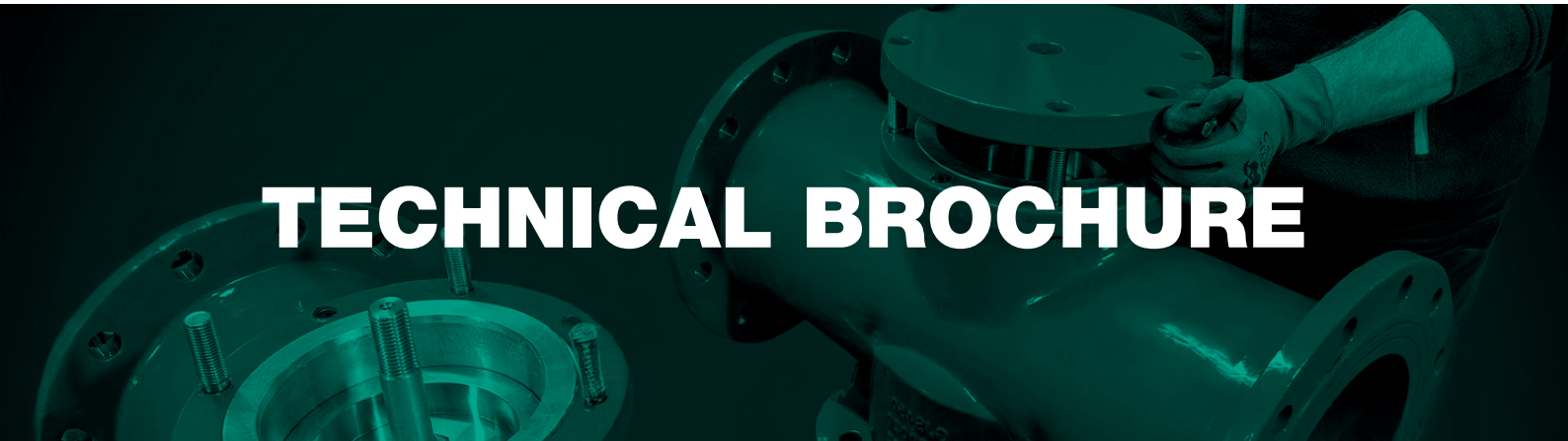
Pietro Fiorentini

WAVE LP90

Air valve for aqueduct and irrigation



TECHNICAL BROCHURE

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WAVE LP90_technicalbrochure_ENG_revA

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Combined air valve

WAVE LP90 3S

WAVE LP90 series air valves are combined automatic devices that ensure the smooth operation of treated water and irrigation networks. They manage the entrance and discharge air volumes inside the pipelines and allow the air to be degassed.

The WAVE LP90 3S model, intended for application in irrigation and water treatment plants, performs three functions: degassing of pressurised air during normal operation, and management of the entrance and discharge of large volumes of air during the draining and filling of pipelines.

Constructive features and advantages

- Single chamber housing class PN 16, with internal ribs for optimum guidance of the central mobile block.
- Full bore aerodynamic body, preventing premature closing of the mobile block even at high entrance and discharge speeds.
- Anti-water hammer (AWH) and air entrance only (IO) or air discharge only (EO) devices available.
- Version with RFP rapid filling prevention system available.
- Drain valve available for draining the chamber during maintenance.
- Very easy to intervene from above without removing the air valve from the pipeline.
- Materials suitable for use with drinking water.

Main applications

- Intake pipelines
- Distribution networks
- Irrigation systems
- Cooling systems and industrial plants
- It is generally used at slope changes and at the high points of the pipelines

Operating principle

Discharge of large volumes of air

During the pipe filling, it is necessary to let out as much air as water enters. Thanks to the aerodynamic shape of the full-bore body and the float, the WAVE LP90 air valve prevents the mobile block from closing prematurely during this phase.

Pressurised air degassing

During operation, the air inside the pipeline accumulates at the top of the air valve, compresses, and arrives at the same pressure as the water. By increasing its volume, it pushes the float down and thus allows degassing through the nozzle.

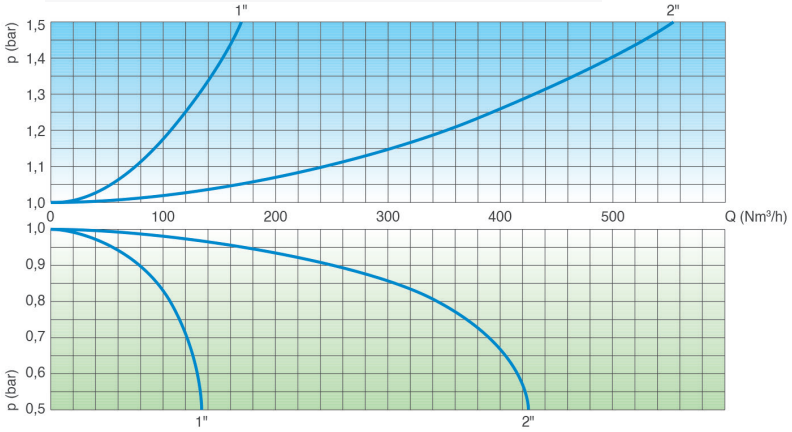
Entrance of large volumes of air

In the event of emptying or rupture of the pipe, it is necessary to draw in as much air as there is water coming out to avoid depressions and serious damage to the network.

Technical data

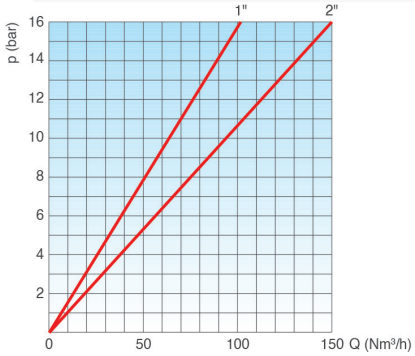
Air flow characteristic charts

AIR OUTFLOW RATE DURING PIPELINE FILLING



AIR INFLOW RATE FOR PIPELINE DRAINING

AIR FLOW RATE DURING DEGASSING



Air flow charts are obtained in Kg/s from laboratory tests and numerical analysis, without filtering, and converted to Nm3/h by applying an appropriate safety factor.

Operating conditions

Maximum treated water	60°C
Maximum pressure	16 bar
Minimum pressure	0.2 bar (lower on request)

Standard

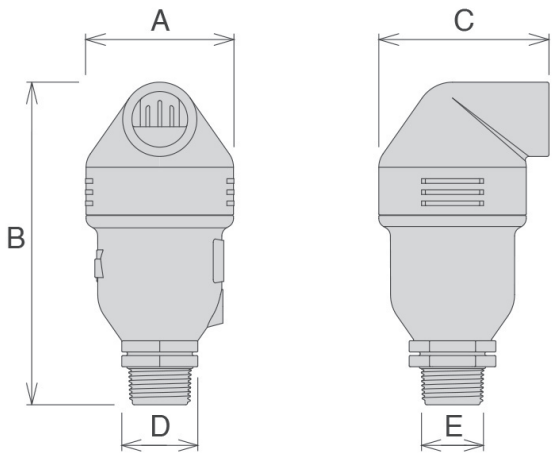
- PP body reinforced with glass fibre
- Entrance section: DN 25, DN 50 (1”, 2”)
- Fittings: BSPT or NPT male thread
- Certification according to EN-1074/4
- Testing and quality control certificate according to ISO 9001:2008

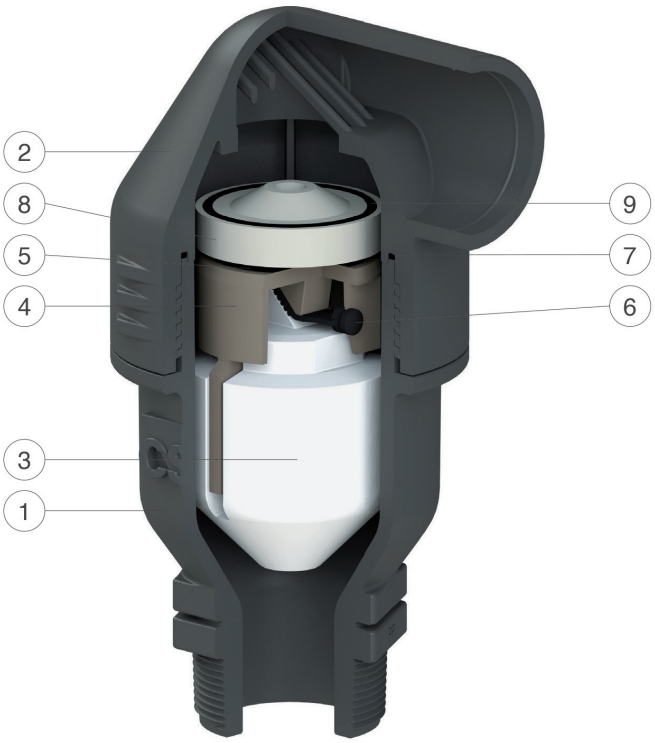
Air passage sections

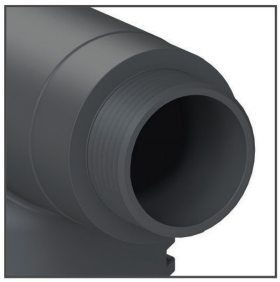
Air valve size	discharge section		degas.orif.
	d (mm)	A (mm^2)	A (mm^2)
1”	21	346	5
2”	45	1590	12

Dimensions and weights

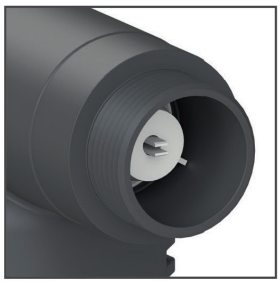
CONNECTION inches/mm	A mm	B mm	C mm	D mm	Weight Kg
Threaded 1”	80	167	92	CH 41	0.3
Threaded 2”	110	226	135	CH 65	0.75







AWH/10 polypropylene insert with 2" BSP threaded connection.



Polypropylene EO insert with 2" BSP threaded connection.

No.	Component	Standard material	Optional
1	Body	polypropylene with glass fibre	with guiding ribs of the mobile block
2	Cap	polypropylene with glass fibre	with protective grid at discharge
3	Float	polypropylene	full float for greater resistance
4	Plug plate	polyamide with glass fibre	with high flow rate during degassing
5	Flat gasket	EPDM	
6	Gasket	EPDM	
7	O-ring	EPDM	

Combination air valve

WAVE LP90 3S-AWH

WAVE LP90 series air valves are combined automatic devices that ensure the smooth operation of treated water and waterworks networks. They actuate the entrance and discharge air volumes inside the pipelines and allow the air to be degassed.

The WAVE LP90 3S-AWH model ensures degassing during operation, and the entrance of large volumes of air when draining pipelines. In addition, during the filling phase, it keeps the air discharge speed within a preset safety limit to avoid the risk of water hammer.

Constructive features and advantages

- Single chamber housing class PN 16, with internal ribs for optimum guidance of the central mobile block.
- Full bore aerodynamic body, preventing premature closing of the mobile block even at high entrance and discharge speeds.
- It reduces to a minimum water spurts during closure, and the risk of flooding of the air valve during possible rapid filling of the pipeline at low pressure.
- Entrance only (IO) devices available.
- Drain valve available for draining the chamber during maintenance.
- Very easy to intervene from above without removing the air valve from the pipeline.
- Compact design, chemical-resistant components, little maintenance required.
- Materials suitable for use with drinking water.

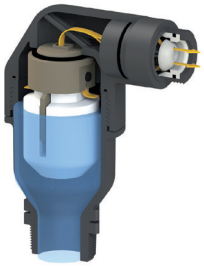
Main applications

- Intake pipelines
- Distribution networks
- Irrigation systems
- Cooling systems and industrial plants
- It is generally used at slope changes and at the high points of the pipelines

Operating principle

Controlled air discharge

During air discharge, the anti-shock system (AWH) reduces the speed of the incoming water column by decreasing the outflow. This avoids rapid air valve closures, the resulting overpressure and the risk of water hammer.



Pressurised air degassing

During operation, the air inside the pipeline accumulates at the top of the air valve, compresses, and arrives at the same pressure as the water. By increasing its volume, it pushes the float down and thus allows degassing through the nozzle.

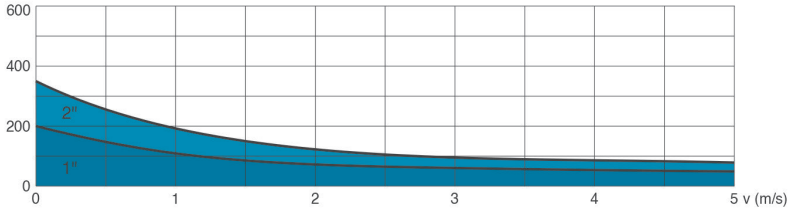
Entrance of large volumes of air

In the event of emptying or rupture of the pipe, it is necessary to draw in as much air as there is water coming out to avoid depressions and serious damage to the network.

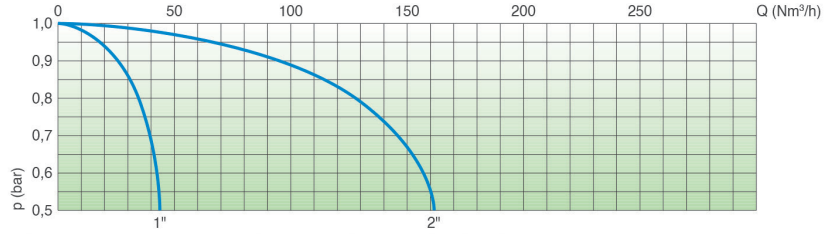
Technical data

Air valve selection chart

Preliminary dimensioning according to pipeline diameter and required air discharge speed.
Pipeline DN (mm)

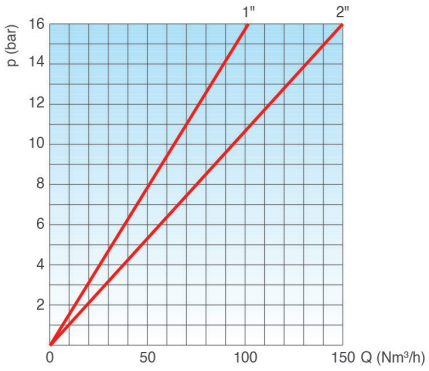


Air flow characteristic charts



AIR INFLOW RATE FOR PIPELINE DRAINING

AIR FLOW RATE DURING DEGASSING



Operating conditions

Maximum treated water	60°C
Maximum pressure	16 bar
Minimum pressure	0.2 bar (lower on request)

Standard

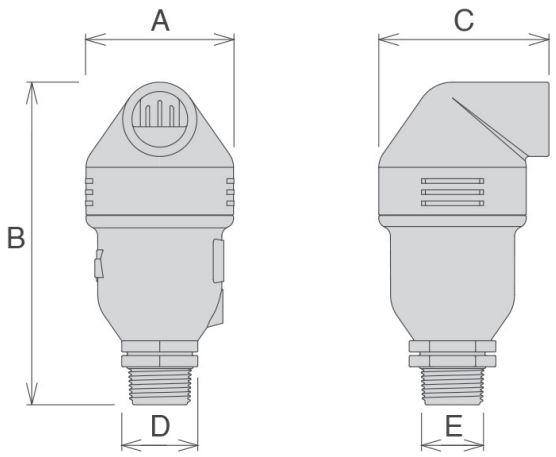
- PP body reinforced with glass fibre
- Entrance section: DN 25, DN 50 (1”, 2”)
- Fittings: BSPT or NPT male thread
- Certification according to EN-1074/4
- Testing and quality control certificate according to ISO 9001:2008

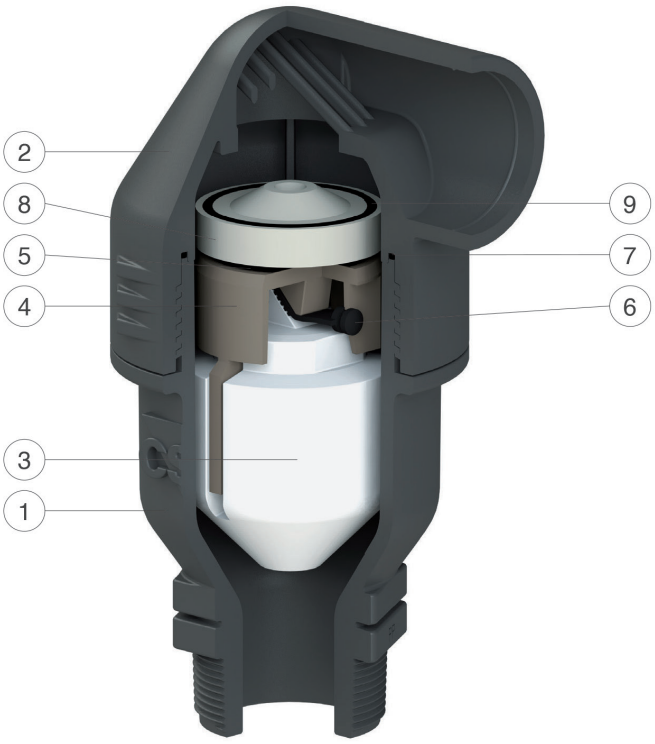
Air passage sections

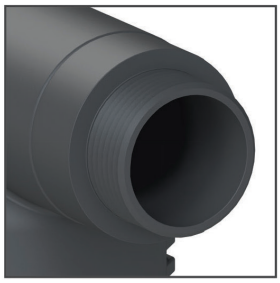
Air valve size	discharge section		degas.orif.
	d (mm)	A (mm^2)	A (mm^2)
1”	21	346	5
2”	45	1590	12

Dimensions and weights

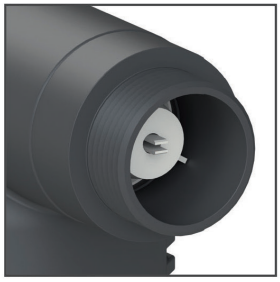
CONNECTION inches/mm	A mm	B mm	C mm	D mm	Weight Kg
Threaded 1”	80	167	92	CH 41	0.3
Threaded 2”	110	226	135	CH 65	0.75







AWH/10 polypropylene insert with 2" BSP threaded connection.



Polypropylene EO insert with 2" BSP threaded connection.

No.	Component	Standard material	Optional
1	Body	polypropylene with glass fibre	with guiding ribs of the mobile block
2	Cap	polypropylene with glass fibre	with protective grid at discharge
3	Float	polypropylene	full float for greater resistance
4	Plug plate	polyamide with glass fibre	with high flow rate during degassing
5	Flat gasket	EPDM	
6	Gasket	EPDM	
7	O-ring	EPDM	

Combined air valve

WAVE LP90 3S-CSF

WAVE LP90 series air valves are combined automatic devices that ensure the smooth operation of treated water and irrigation networks. They actuate the entrance and discharge air volumes inside the pipelines and allow the air to be degassed.

The WAVE LP90 3S-CSF model ensures degassing during operation, and the entrance of large volumes of air when draining pipelines. In addition, during the filling phase, it keeps the air discharge speed within a preset safety limit to avoid the risk of water hammer.

Constructive features and advantages

- Uncontrolled filling of the pipeline and transient eventscause the system air valves to close quickly, resulting in damage. In such cases, thanks to its additional anti-shock plate, the WAVE LP90 3S-CS air valve, automatically decreases the outflow capacity and therefore reduces the speed of the incoming water column, minimising the risk of water hammer.
- It reduces to a minimum water spurts during closure, and the risk of flooding of the air valve during possible rapid filling of the pipeline at low pressure.
- Single chamber housing class PN 16, with internal ribs for optimum guidance of the central mobile block.
- Insert with threaded discharge connection and discharge only (EO) device available on request.

- Drain valve for draining the chamber during maintenance available on request.
- Very easy to intervene from above without removing the air valve from the pipeline.
- Compact design, chemical-resistant components, little maintenance required.
- Materials suitable for use with drinking water.

Main applications

- Intake pipelines and distribution networks
- Cooling systems and industrial plants
- It is generally used as an alternative to AWH at slope changes and high points in pipelines

Operating principle

Discharge of large volumes of air

During the pipe filling, it is necessary to let out as much air as water enters. Thanks to the aerodynamic shapes of the body and float, the WAVE LP90 3S-CSF air valve prevents the premature closure of the mobile block during this phase.

Controlled air discharge

During the filling of the pipeline, if the air pressure rises above a certain value, with the risk of water hammer and damage to the system, the CSF upper plate automatically rises, reducing the outflow and consequently the speed of the approaching water column.

Pressurised air degassing

During operation, the air produced by the pipeline accumulates at the top of the air valve, compresses, and arrives at the same pressure as the water. By increasing in volume, it pushes the float down and thus allows degassing.

Entrance of large volumes of air

In the event of emptying or rupture of a pipeline, it is necessary to draw in as much air as there is water coming out to avoid depressions and possible serious damage to the network.

Optional functions

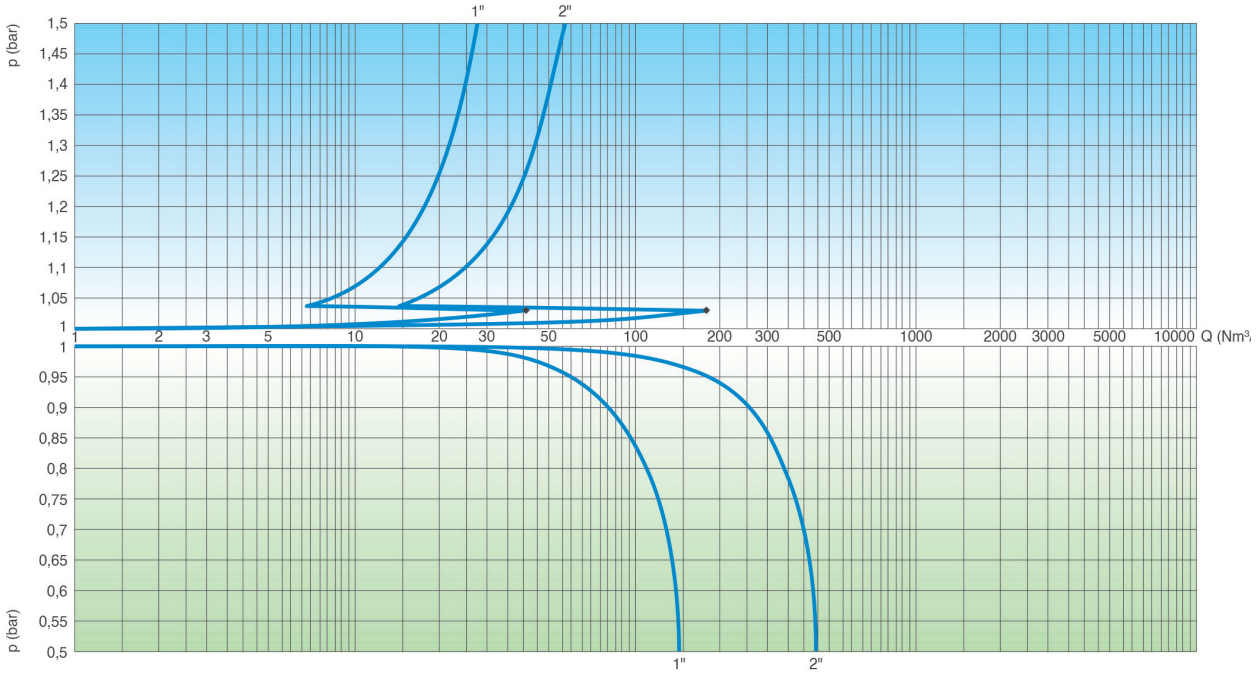
EO SERIES discharge only version, available for WAVE LP90 2S and 3S models. This variant is designed to allow the air valve to be installed at critical points of the layout where HGL may drop below the pipe profile, and at any other junction where, for design reasons, air entrance must be absolutely avoided.

SUB version, with conveyance drain, available for WAVE LP90 2S and 3S models. The threaded bend, connected to a discharge pipe, allows the air valve to operate even in the event of flooding of the well or the installation site, without the risk of contaminated water entering the pipeline. Another advantage of the SUB model is the possibility of conveying spurts when the air valve is closing.

Technical data

Air flow characteristic charts

AIR OUTFLOW RATE DURING PIPELINE FILLING



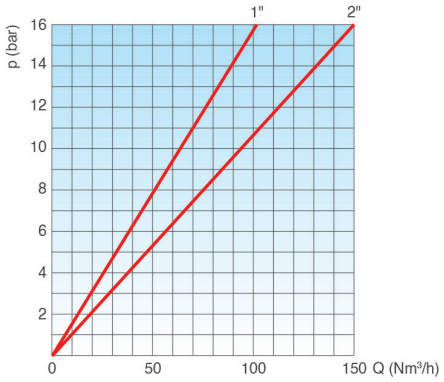
AIR INFLOW RATE FOR PIPELINE DRAINING

The air flow rate charts were obtained in Kg/s, from laboratory tests and numerical analysis, and converted to Nm/h by applying a safety factor.

Operating conditions

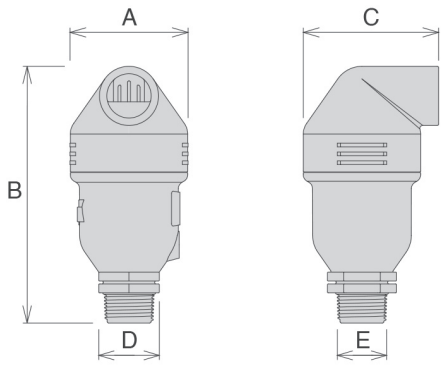
Maximum treated water	60°C
Maximum pressure	16 bar
Minimum pressure	0.2 bar (lower on request)

AIR FLOW RATE DURING DEGASSING



Standard

- Body made of glass-fibre reinforced PP.
- Entrance section: DN 25, DN 50 (1”, 2”)
- Fittings: BSPT or NPT male thread
- Certification according to EN-1074/4
- Testing and quality control certificate according to ISO 9001:2008



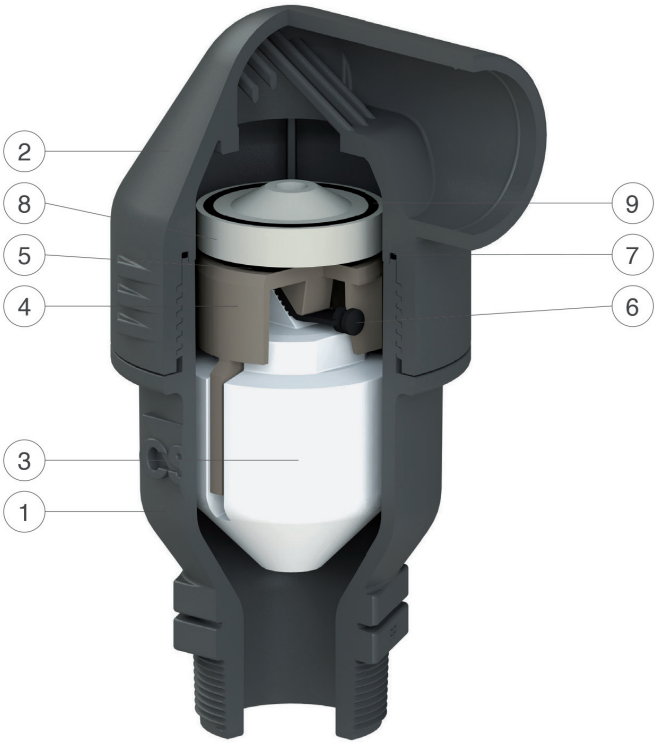
Dimensions and weights

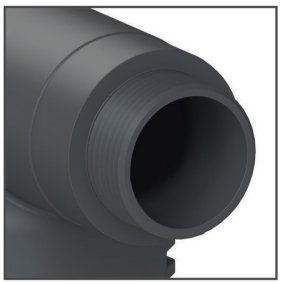
FITTINGS (E) inches	A mm	B mm	C mm	D mm	Weight Kg
Threaded 1”	80	167	92	CH 41	0.3
Threaded 2”	110	226	135	CH 65	0.75

Air passage sections

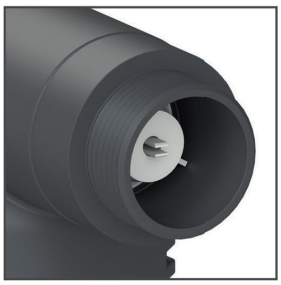
Air valve size	discharge section		degas.orif.
	d (mm)	A (mm^2)	A (mm^2)
1”	21	346	5
2”	45	1590	12

Construction details





AWH/10 polypropylene insert with 2" BSP threaded connection.



Polypropylene EO insert with 2" BSP threaded connection.

No.	Component	Standard material	Optional
1	Body	polypropylene with glass fibre	with guiding ribs of the mobile block
2	Cap	polypropylene with glass fibre	with protective grid at discharge
3	Float	polypropylene	full float for greater resistance
4	Plug plate	polyamide with glass fibre	with high flow rate during degassing
5	Flat gasket	EPDM	
6	Gasket	EPDM	
7	O-ring	EPDM	
8	RFP plate	polypropylene	
9	O-ring	EPDM	

The table of materials and components is subject to change without notice.

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