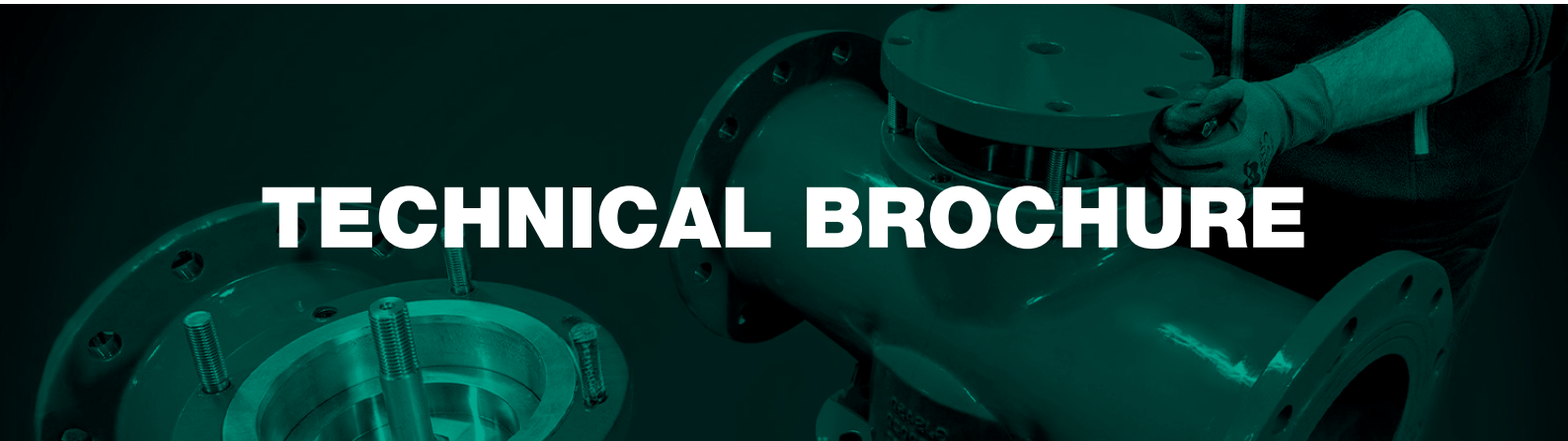
Pietro Fiorentini

SWV PRO TH

Air valve for sewerage, and corrosive environments



TECHNICAL BROCHURE

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Combined AISI 316 stainless steel air valve for sewerage and industry

SWV PRO TH 3S

The SWV PRO TH series air valves are high-performance single-chamber combined automatic devices. They manage the air volumes inside the pipelines and allow the pressurised air to be degassed. Intended for harsh environments, they stand out for their reliability and durability.

The SWV PRO TH 3S model allows the entrance and discharge of large volumes of air when draining and filling pipelines, and the degassing of air pockets during operation.

Constructive features and advantages

- AISI 316 lower body with strongly inclined walls to prevent the accumulation of residues or impurities that could generate malfunctions.
- AISI 316 upper body housing the degassing system. A deflector protects it from possible splashes, drops and impurities that might reach it during the rapid filling phase.
- Mobile block made entirely of AISI 316 stainless steel, consisting of a large float housed inside the lower body and a connecting rod to the air valve mechanism.
- Drain valve for control and maintenance operations
- Cap with 1" threaded connection for conveyance, ideal for environments at risk of flooding and for controlled evacuation of gaseous emissions during operation.
- Easy maintenance from above, without removing the air valve from the pipeline.

Main applications

- Sewer pipelines or industrial systems subject to water hammers, with the presence of suspended solids or debris
- Mines
- Desalination plants
- Wells
- A special version is available for pipeline installation

Operating principle

Discharge of large volumes of air

During the pipe filling, it is necessary to let out as much air as water enters. The SWV PRO TH 3S air valve prevents premature closure of the mobile block 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. As the volume increases, it pushes the float downwards, allowing the degassing nozzle to open.

Entrance of large volumes of air

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

Optional functions

Dual-function SWV PRO TH 2S version, also called vacuum breaker. Suitable for locations where no accumulated air pockets are required to be expelled during operation. It is used at upward slope changes and long ascending sections of the profile.

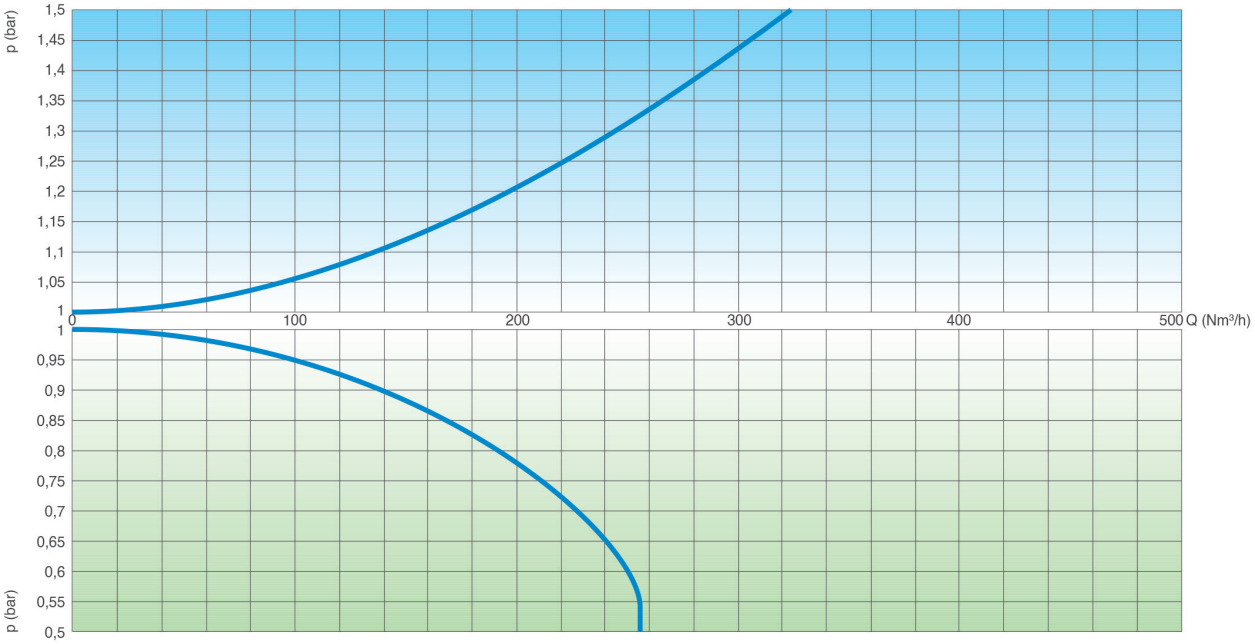
EO SERIES discharge only version, available for SWV PRO TH 2S and 3S models. This variant is designed to allow the air valve to be installed at critical points of the layout where HGL may drop below the pipe profile, and at any other junction where, for design reasons, air entrance must be absolutely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

IO entrance only version, only available for the SWV PRO TH 2S dual function model. This variant is designed to allow for the installation of the air valve at critical points of the layout where, for design reasons, air discharge must be avoided. It should be noted that, when using the IO version, the air valve does not provide any protection against overpressure caused by filling the pipeline.

Technical data

Air flow characteristic charts

AIR OUTFLOW RATE DURING PIPELINE FILLING



AIR INFLOW RATE FOR DUCT 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 (Version for higher temperatures on request)
Maximum pressure	16 bar
Minimum pressure	0.2 bar (lower on request)

Standard

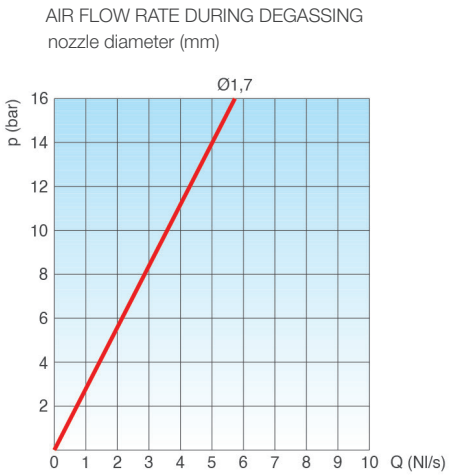
- Certification and testing according to EN 1074/4
- Provided with 2" threaded connection; supplied on request with EN 1092-2 or ANSI drilled flanges

Modifications to painting and flanging standards on request.

Choice of nozzle

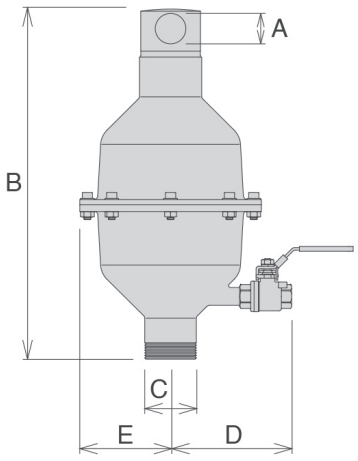
Nozzle diameter in mm depending on air valve size and PN.

PN 10	PN 16
1.7	1.7

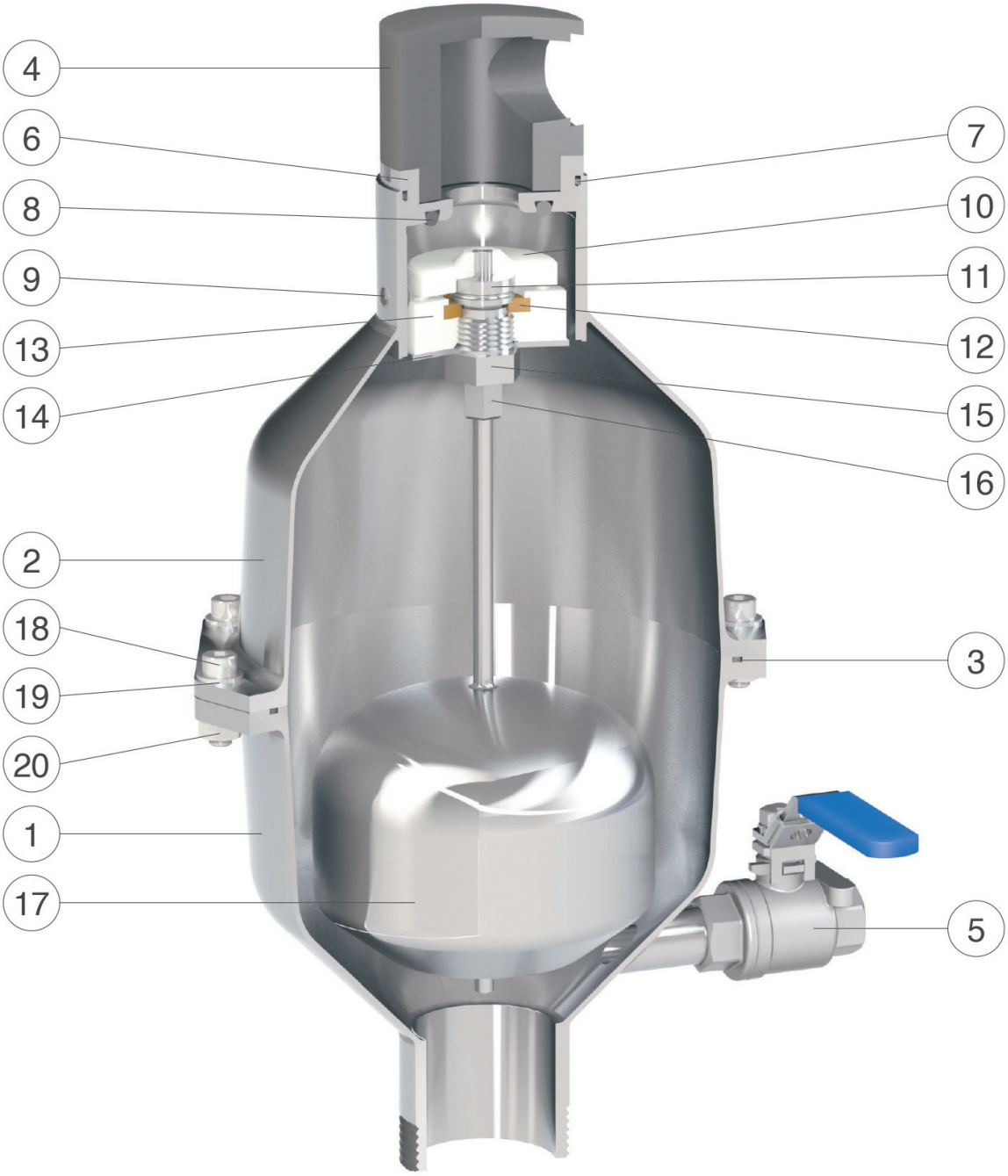


Dimensions and weights

C inches	A inches	B inches	D mm	E mm	Main orifice mm²	Nozzle orifice mm²	Weight Kg
2”	1”	415	137	106,5	490	2.3	4



Construction details



No.	Component	Standard material	Optional
1	Lower body	AISI 316 stainless steel	
2	Upper body	AISI 316 stainless steel	
3	Body O-ring	NBR	EPDM/Viton/silicone
4	Cap	PVC	
5	1/2" ball valve	AISI 316 stainless steel	
6	Seal seat	AISI 316 stainless steel	
7	Seal seat O-ring	NBR	EPDM/Viton/silicone
8	Seal seat gasket	NBR	EPDM/Viton/silicone
9	Conical screw	AISI 316 stainless steel	
10	Plug plate	polypropylene	
11	Nozzle unit	AISI 316 stainless steel	
12	Protective rubber	NBR	
13	Protective bushing	polypropylene	
14	Deflector	AISI 316 stainless steel	
15	Guide nut	AISI 316 stainless steel	
16	Gasket holder	AISI 316 stainless steel	
17	Float	AISI 316 stainless steel	
18	Screws	AISI 304 stainless steel	AISI 316 stainless steel
19	Washers	AISI 304 stainless steel	AISI 316 stainless steel
20	Nuts	AISI 304 stainless steel	AISI 316 stainless steel

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

Automatic combination anti-water hammer air valve for sewerage and industry

SWV PRO TH 3S-AWH

The SWV PRO TH series air valves are high-performance single-chamber combined automatic devices. They manage the air volumes inside the pipelines and allow the pressurised air to be degassed. Intended for harsh environments, they stand out for their reliability and durability.

The SWV PRO TH 3S-AWH air valve ensures degassing, the entrance of air when draining pipelines, and the discharge of air at a controlled speed to avoid the risk of water hammer.

Constructive features and advantages

- AISI 316 lower body with strongly inclined walls to prevent the accumulation of residues or impurities that could generate malfunctions.
- AISI 316 upper body housing the degassing system. A deflector protects it from possible splashes, drops and impurities that might reach it during the filling phase.
- Mobile block made entirely of AISI 316 stainless steel, consisting of a large float housed inside the lower body and a connecting rod to the air valve mechanism.
- Anti-shock system (AWH) consisting of a stainless steel spring and guide shaft, and a plate with sizable holes to control the air discharge.
- Drain valve for control and maintenance operations.
- Cap with 1" threaded connection for conveyance, ideal for environments at risk of flooding and for controlled evacuation of gaseous emissions during operation.
- Easy maintenance from above, without removing the air valve from the pipeline.

Main applications

- Sewer pipelines or industrial systems subject to water hammers, with the presence of suspended solids or debris
- Mines
- Desalination plants
- Wells
- A special version is available for pipeline installation

Operating principle

Controlled air discharge

During air discharge, the anti-shock system, by decreasing the air outflow, reduces the speed of the incoming water column, so as to avoid rapid closing of the air valve 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. As the volume increases, it pushes the float downwards, allowing the degassing nozzle to open.

Entrance of large volumes of air

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

Optional functions

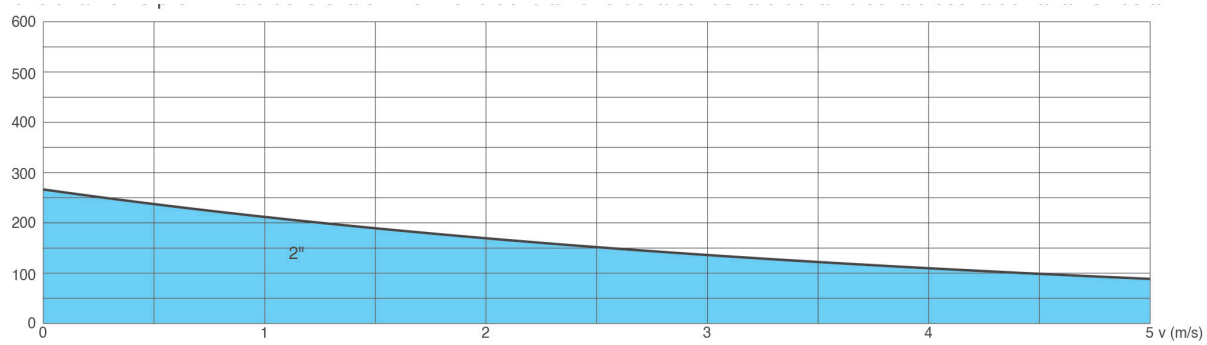
Dual function version. Suitable for locations where, although protection against water hammer is required, no air release is needed.In particular, it is installed at pumps, upward slope changes and long upward sections of the profile subject to varied motion phenomena.

The force of the **counter spring** as well as the **sonic nozzles,** both responsible of the proper operation of the AWH, can be modified according to the to the project conditions and the results of the transient analysis.

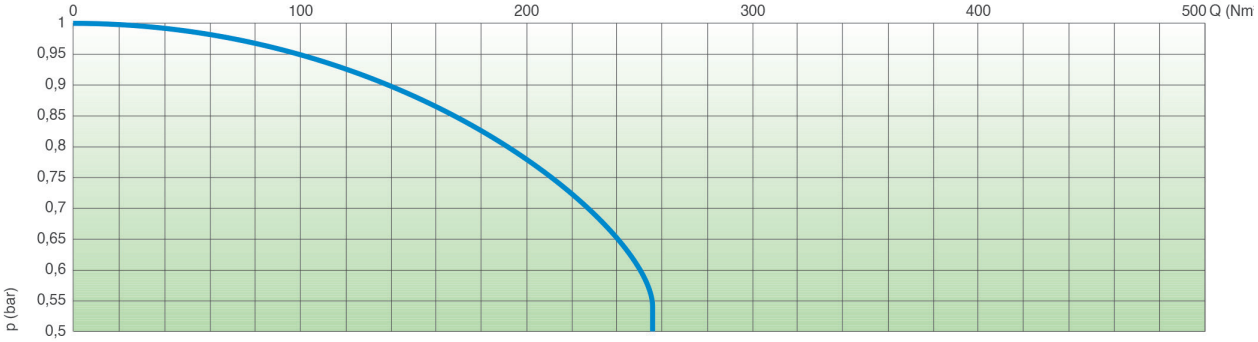
Technical data

Air valve selection chart

Preliminary dimensioning of the air valve according to pipeline diameter and required air discharge speed



Air flow characteristic charts



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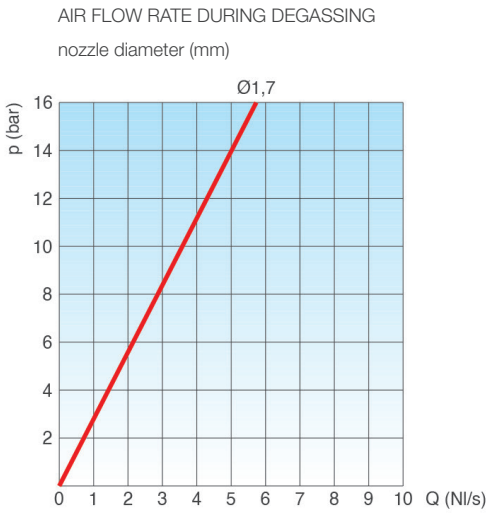

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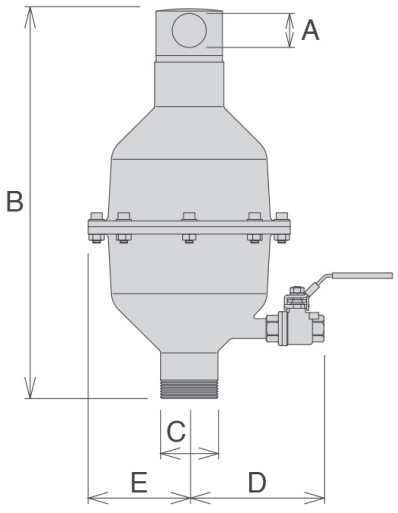
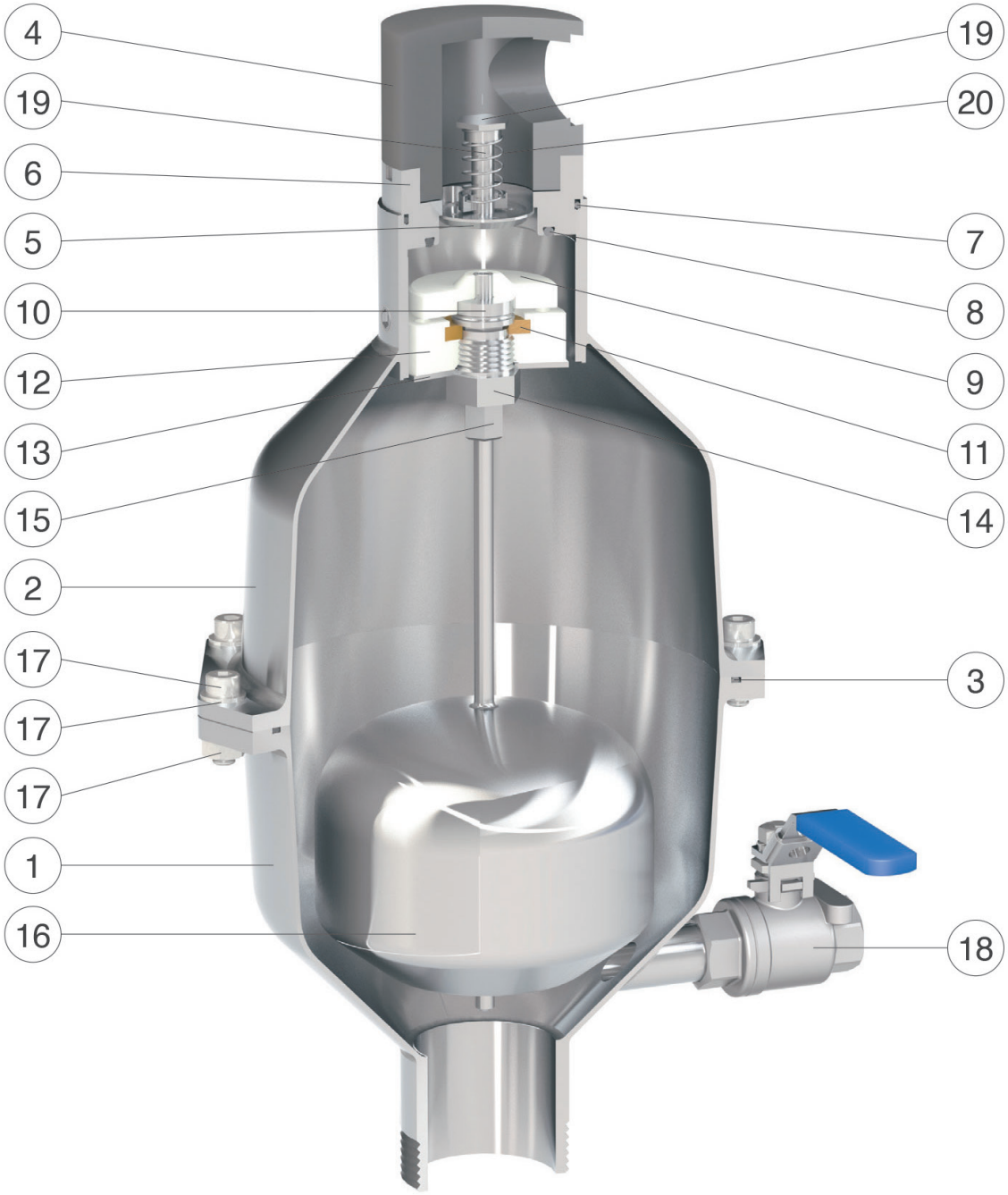


Construction details



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4	Cap	PVC	
5	AWH plate	AISI 316 stainless steel	
6	Seal seat	AISI 316 stainless steel	
7	Seal seat O-ring	NBR	EPDM/Viton/silicone
8	Seal seat gasket	NBR	EPDM/Viton/silicone
9	Plug plate	polypropylene	
10	Nozzle unit	AISI 316 stainless steel	
11	Protective rubber	NBR	
12	Protective bushing	polypropylene	
13	Deflector	AISI 316 stainless steel	
14	Guide nut	AISI 316 stainless steel	
15	Gasket holder	AISI 316 stainless steel	
16	Float	AISI 316 stainless steel	
17	Screws, washers and nuts	AISI 304 stainless steel	AISI 316 stainless steel
18	1/2" ball valve	AISI 316 stainless steel	
19	Guide shaft	AISI 316 stainless steel	
20	Spring	AISI 302 stainless steel	

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

Sustainability

Here at Pietro Fiorentini, we believe in a world capable of improvement through technologies and solutions that can shape a more sustainable future. That is why respect for people, society and the environment form the cornerstones of our strategy.

Our commitment to the world of tomorrow

While in the past we limited ourselves to providing products, systems and services for the oil & gas sector, today we want to broaden our horizons and create technologies and solutions for a digital and sustainable world, with a particular focus on renewable energy projects to help make the most of our planet's resources and create a future in which the younger generations can grow and prosper.

The time has come to put the why we operate before the what and how we do it.

Pietro Fiorentini

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