Wastewater anti-shock combination air valve in stainless steel AISI 316 - Mod. SCS - AS

The CSA anti-shock, non slam, surge dampening combination air valve guarantees the proper operation of sewage lines allowing the entrance of large air quantity in case of pipe bursting or draining, the release of air pockets during working conditions and the controlled air outflow speed to prevent surge effects.

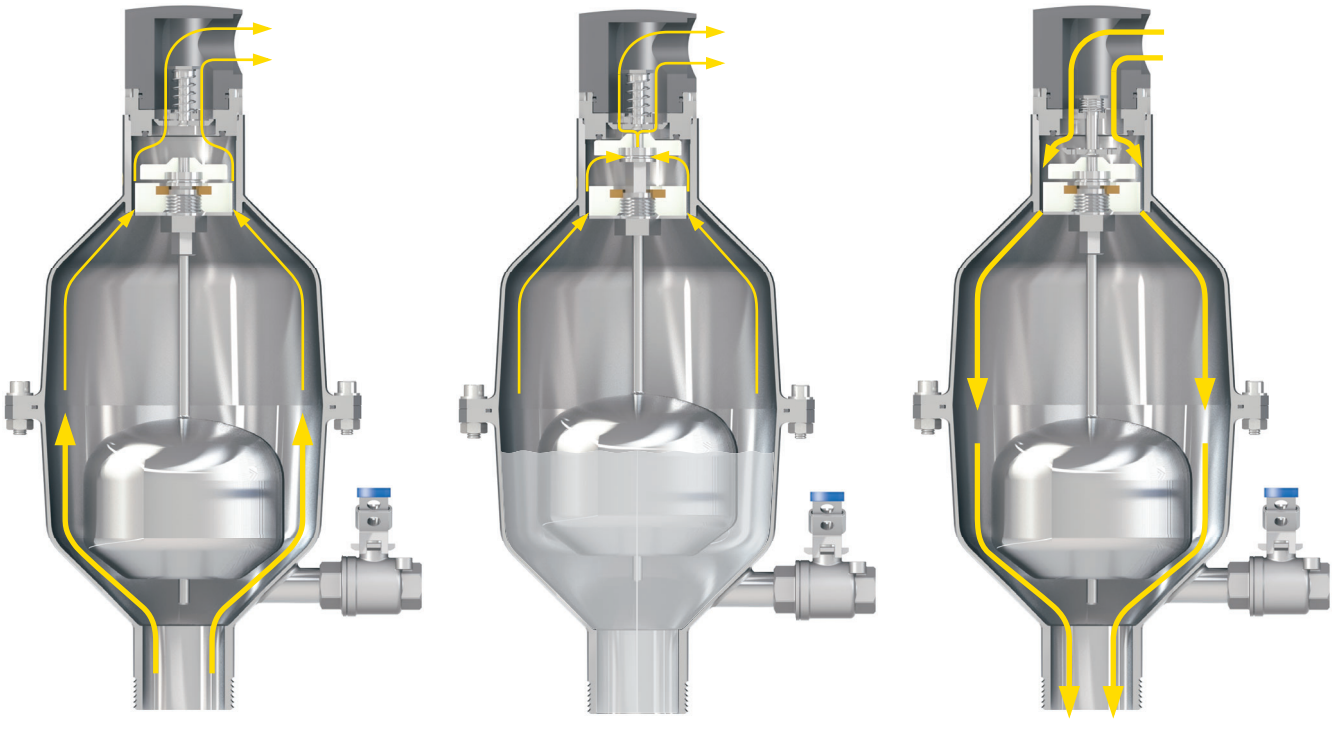
Technical features and benefits

- Lower body in AISI 316 designed with strongly sloped funnel shaped walls to avoid grease and other material deposit.
- Upper body in AISI 316 containing the air release device protected against possible projections and spurts during rapid filling phases, by a stainless steel deflector.
- Mobile block including a shaft and a large float, both in stainless steel AISI 316, placed on the lower body and connected to the air release mechanism and to the main orifice obturator.
- Anti-Shock automatism, never in contact with the fluid, is composed of a metallic disk with 2 or more adjustable orifices, a guide bar and a counteracting spring in stainless steel.
- Drainage valve for chamber control and draining.
- Maintenance can easily be performed from the top without removing the air valve from the pipe.
- Evacuation threaded elbow suitable for flooded environments with 1" threaded outlet.

Applications

- Industrial and civil plants, exposed to water hammer events, in presence of liquid with solids and debris.
- Mining.
- Deep well boreholes.
- Special version for coal seam gas.

Operating principle



Controlled air discharge

During the pipe filling it is necessary to avoid rapid closures of the mobile block, responsible of water hammer effects. The SCS AS will control the air outflow reducing the water approach velocity and thus minimizing the risk of overpressure.

Air release during working conditions

During operation the air produced by the pipeline is accumulated in the upper part. Little by little it is compressed and its volume increases, pushing the liquid level downwards allowing the air release through the nozzle.

Entrance of large volumes of air

During pipeline draining, or pipe bursts, it is necessary to bring in as much air as the quantity of outflowing liquid, to avoid negative pressure and serious damages to the pipeline and the entire system.

Optional

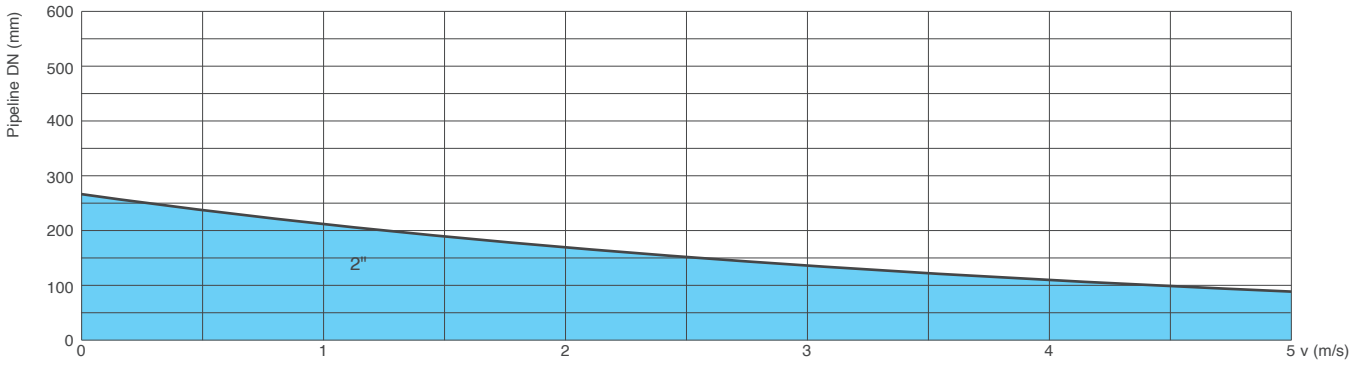
- **Vacuum breaker version**, to allow the entrance of large volumes of air only with the anti water hammer feature. This model is normally recommended at the pumps and in changes in slope ascending, long ascending segments exposed to transients events. More in general wherever air release won't be required still providing some protection against water hammer.

- The counteracting spring force as well as the sonic nozzles, both responsible of the proper operation of the AS device, can be modified on request according to the project conditions and the transient analysis.

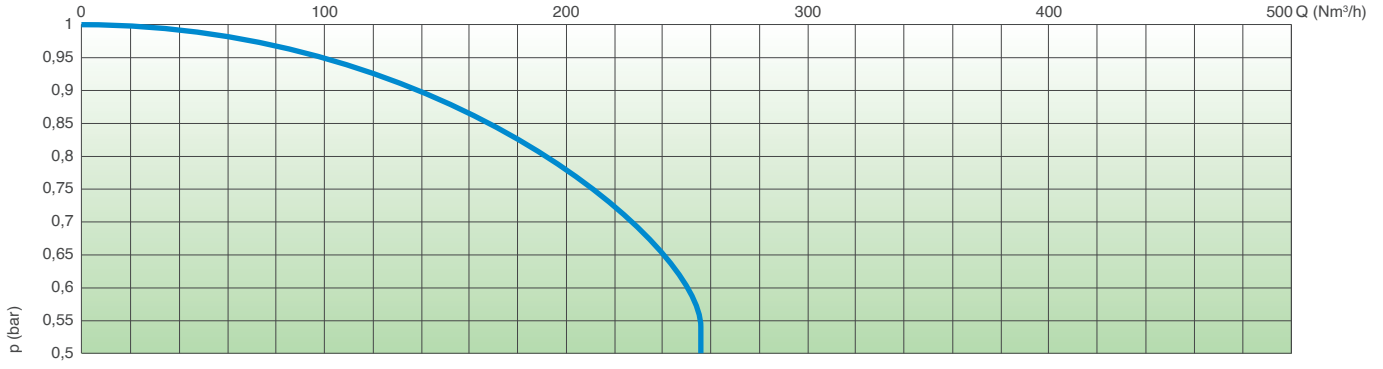
Technical data

Air valve selection chart

Air valve preliminary sizing as a function of pipeline internal diameter and fluid flow velocity expressed in m/s.



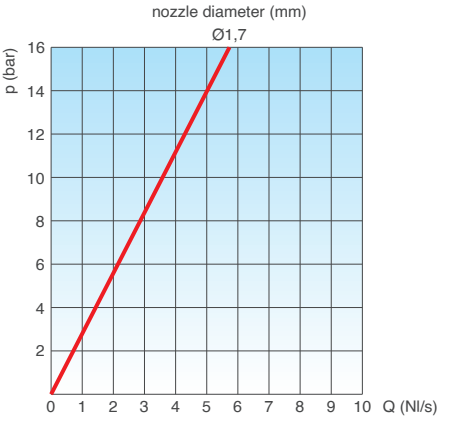
Air flow performance chart



AIR ENTRANCE DURING PIPE DRAINING

The air flow charts were created in Kg/s from laboratory tests and numerical analysis, then converted in Nm³/h using a safety factor.

AIR RELEASE DURING WORKING CONDITIONS



Working conditions

Treated water and wastewater max. 60°C.
Maximum pressure 16 bar.
Minimum pressure 0,2 bar. Lower on request.
Version for high temperature available on request.

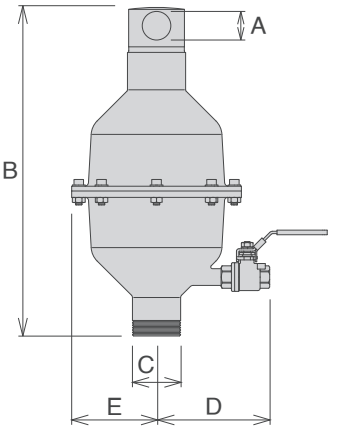
Standard

Certified and tested in compliance with EN 1074/4.
Manufactured with 2" inlet; supplied on request with flanges according to EN 1092/2 or ANSI.
Changes on the flanges details on request.

Nozzle choice

Nozzle diameter in mm according to the PN of the air valve.

PN 10	PN 16
1,7	1,7

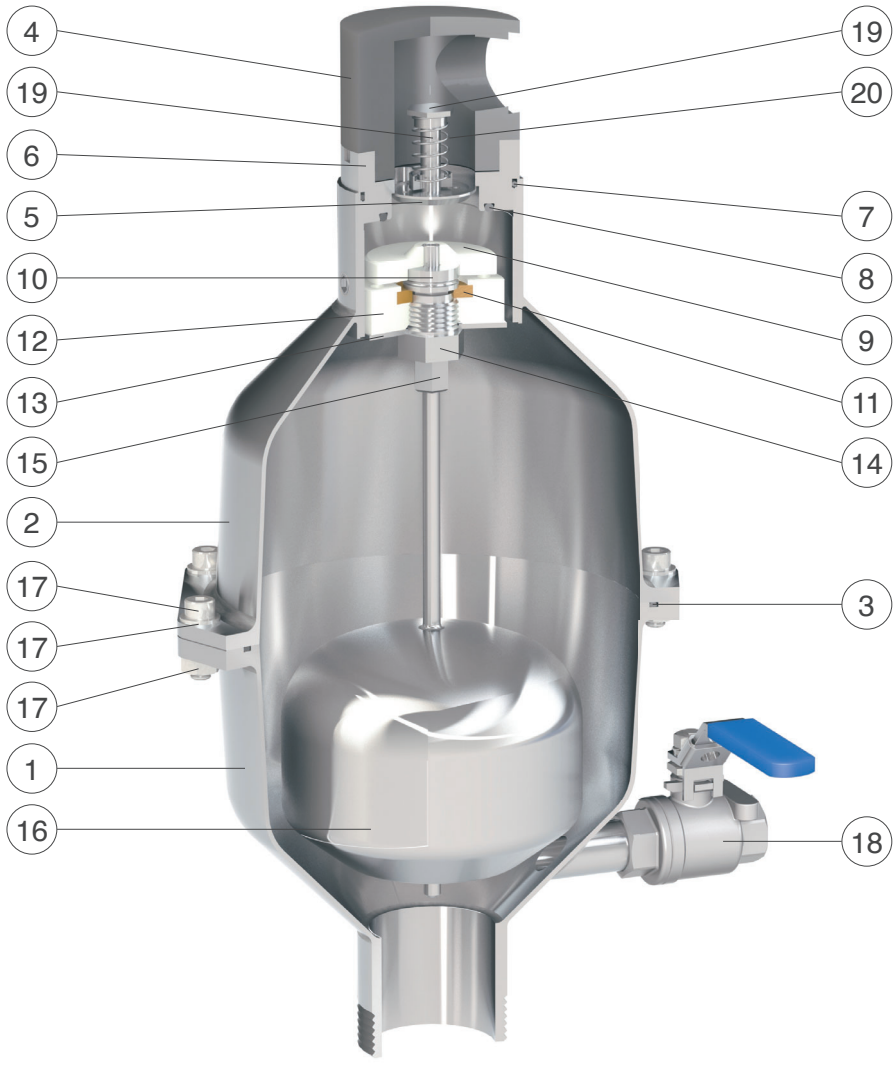


Weight and dimensions

C inch	A inch	B mm	D mm	E mm	Main orifice mm²	Nozzle orifice mm²	Weight Kg
2"	1"	421	137	106,5	490	2,3	4

All values are approximate, consult CSA service for more details.

Technical details

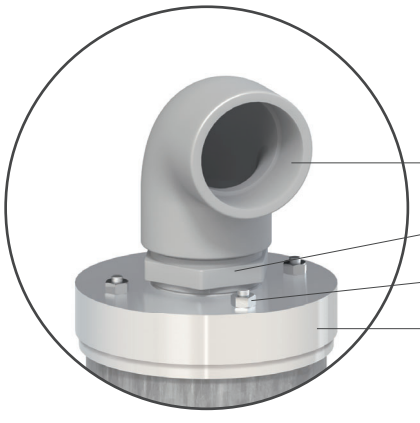


N.	Component	Standard material	Optional
1	Lower body	stainless steel AISI 316	
2	Upper body	stainless steel AISI 316	
3	O-ring	NBR	EPDM/Viton/silicone
4	Cap	PVC	
5	AS flat	stainless steel AISI 316	
6	Seat	stainless steel AISI 316	
7	O-ring	NBR	EPDM/Viton/silicone
8	Seat gasket	NBR	EPDM/Viton/silicone
9	Obturator	polypropylene	
10	Nozzle subset	stainless steel AISI 316	
11	Plane gasket	NBR	
12	Lower gasket holder	polypropylene	
13	Deflector	stainless steel AISI 316	
14	Guiding nut	stainless steel AISI 316	
15	Upper gasket holder	stainless steel AISI 316	
16	Float	stainless steel AISI 316	
17	Screws, washers and nuts	stainless steel AISI 304	stainless steel AISI 316
18	Drain valve	stainless steel AISI 316	
19	AS shaft	stainless steel AISI 316	
20	Spring	stainless steel AISI 302	

The list of materials and components is subject to changes without notice.

GOLIA air valves range
conveyance system bias kit - Mod. SUB

The air conveyance system SUB, provided with watertight threaded elbow for submerged applications, has been created to be retrofitted on existing CSA GOLIA air valves or as a standalone version. The design sprang from the necessity of having an air valve performing also in case of flood, without the risk of contaminated water entering the pipeline. Another benefit of SUB is the possibility of conveying spurts coming from the rapid closure of the air valve.



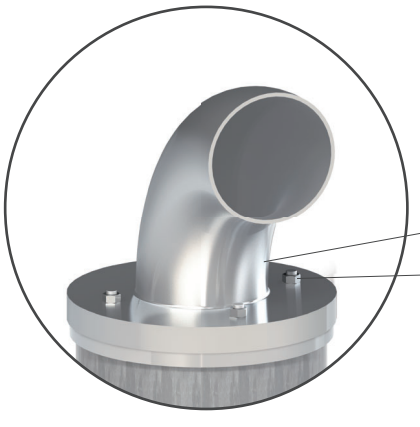
Plastic elbow for 1", 2", DN 50-200R

Threaded elbow in PVC (PP for 1", 2", DN 50-65)

Fitting in PVC (PP for 1", 2", DN 50-65)

Nuts in stainless steel

SUB flat in PP or stainless steel



Elbow in stainless steel for DN 200 and 250R *

SUB flat and elbow in stainless steel

Nuts in stainless steel

Technical data

Working conditions

Treated water max. 60°C.
Max. pressure 40 bar.
Min. pressure 0,2 bar. Lower on request.
Version for high temperatures on request.

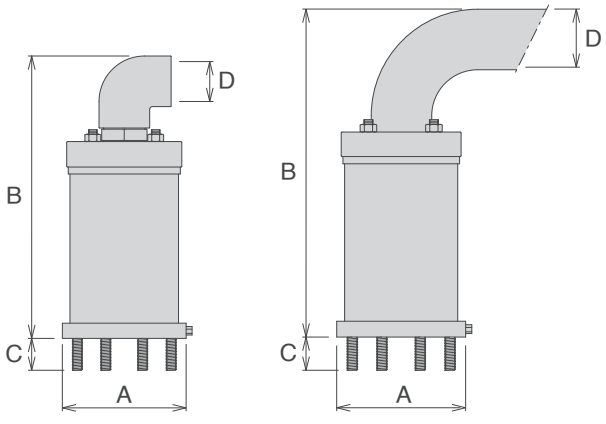
Standard

Certified and tested in compliance with EN 1074/4.
Flanges according to EN 1092/2 or ANSI.
Gaskets in NBR, EPDM or Viton.
Changes and variations on the flanges and gaskets on request.

Weights and dimensions

CONNECTION inch/mm	A mm	B mm	C mm	D inch	Weight Kg
Threaded 1"	95	252	-	1"	7,0
Threaded 2"	165	356	-	2"	7,7
Flanged 50	165	356	40	2"	9,3
Flanged 65	185	356	40	2"	9,3
Flanged 80	200	413	50	2" 1/2	13,4
Flanged 100	235	484	50	3"	19,7
Flanged 150R	235	494	50	3"	29,7
Flanged 150	300	624	70	4"	51,4
Flanged 200R	360	624	70	4"	55,4
Flanged 200	360	*	70	*	78,3
Flanged 250R	405	*	70	*	88,3

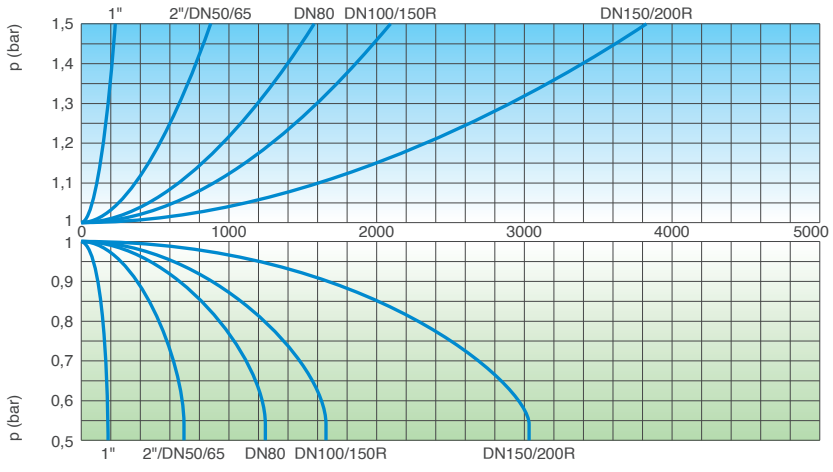
R: reduced bore. - Larger sizes available on request. - Approximate values.
*: Mod. SUB is stock available up to DN 200R, for larger sizes consult with CSA.



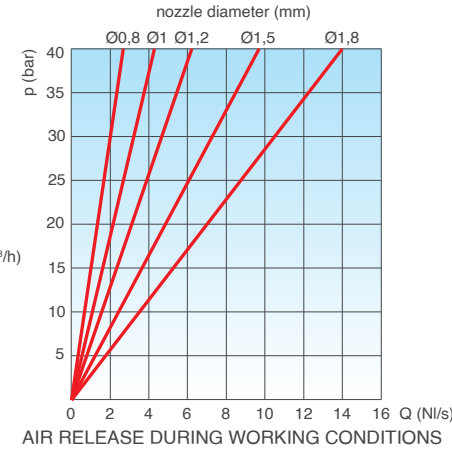
Technical data

GOLIA SUB - Air flow performance charts

AIR DISCHARGE DURING PIPE FILLING



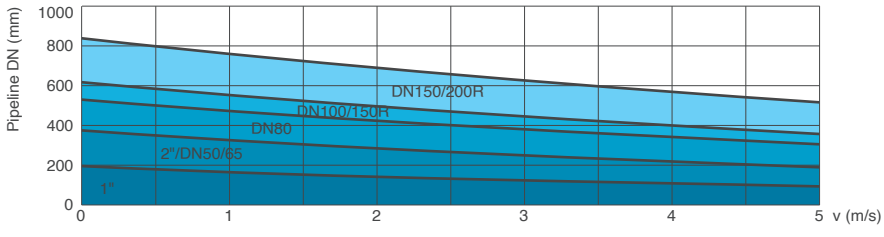
AIR ENTRANCE DURING PIPE DRAINING

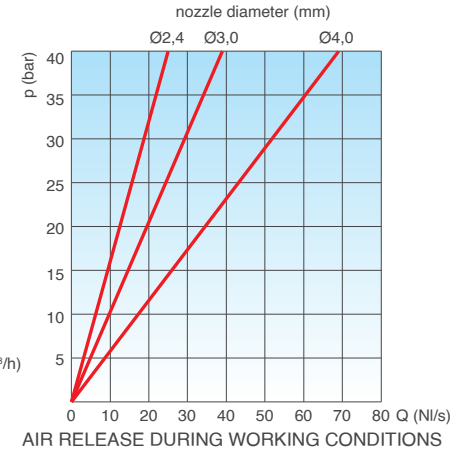


AIR RELEASE DURING WORKING CONDITIONS

GOLIA AS SUB - Air valve selection chart

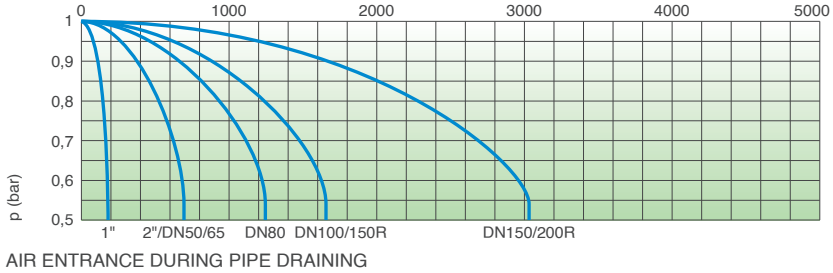
Air valve preliminary sizing as a function of pipeline internal diameter and fluid flow velocity in m/s.





AIR RELEASE DURING WORKING CONDITIONS

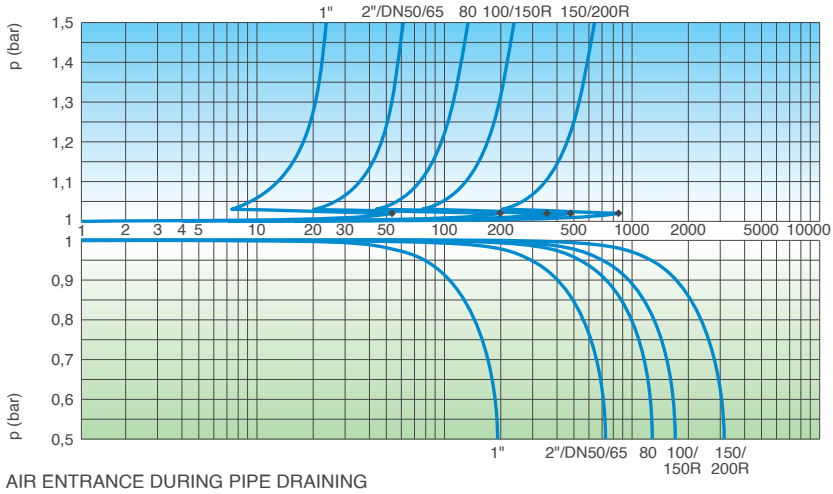
GOLIA AS SUB - Air flow performance chart



AIR ENTRANCE DURING PIPE DRAINING

GOLIA RFP SUB - Air flow performance charts

AIR DISCHARGE DURING PIPE FILLING



AIR ENTRANCE DURING PIPE DRAINING

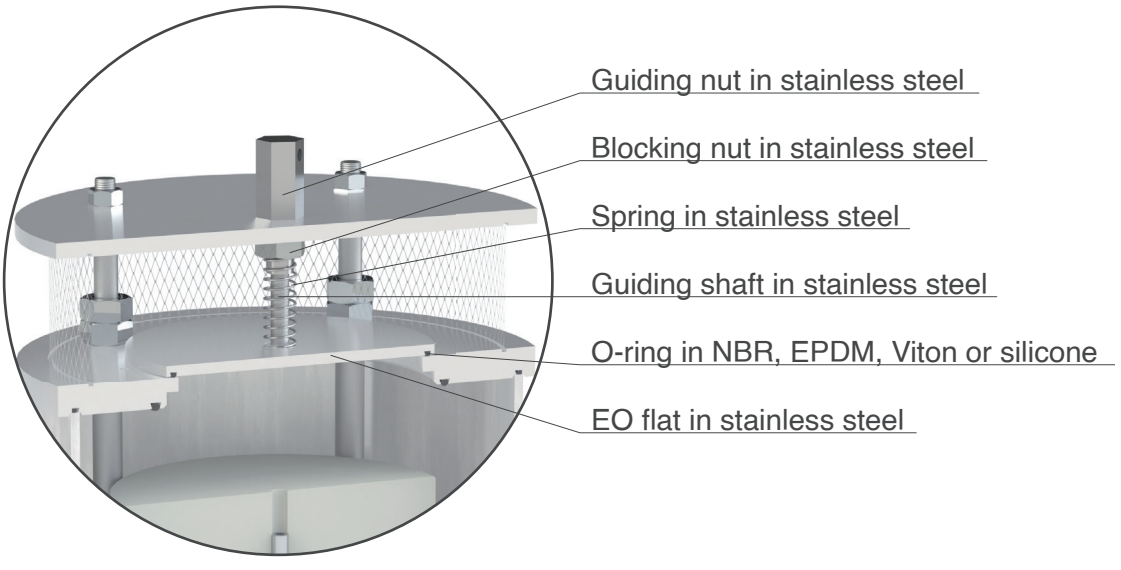
The air flow charts were created in Kg/s from laboratory tests and numerical analysis, then converted in Nm³/h using a safety factor.

Nozzle choice

For the nozzle choice make reference to the available technical data sheets of the GOLIA models.

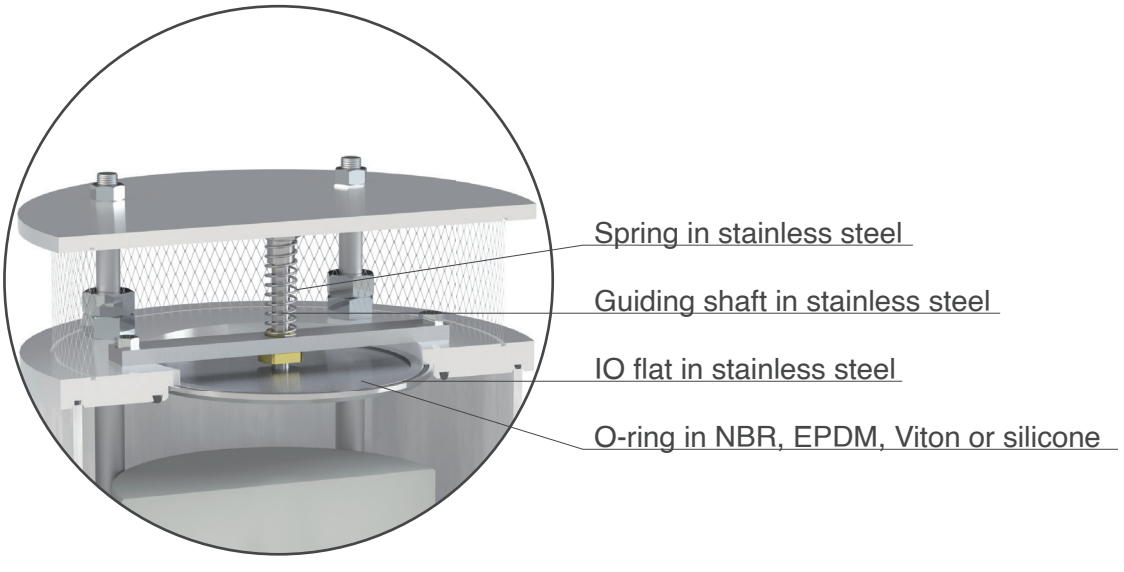
Version for air discharge only GOLIA - EO series

Version for air discharge only EO series, available both for GOLIA 3F and 2F models. The most important application of EO is to allow the air valve installation in those locations of the system where HGL may drop below the pipe profile, and whenever for project requirements air entrance must be avoided.



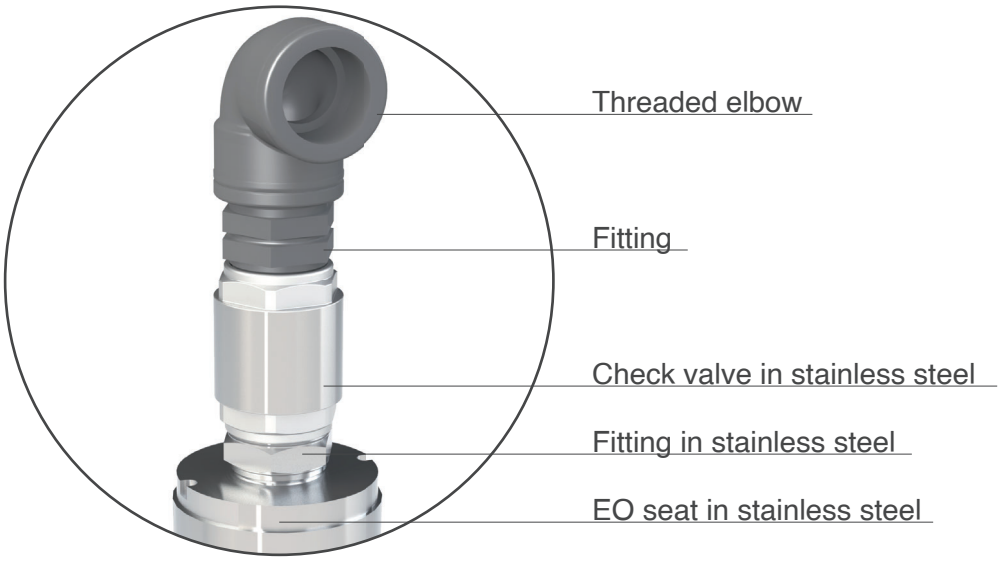
Version for air entrance only GOLIA - IO series

Version for air entrance only IO series, available for GOLIA 2F model only. The most important application of IO is to allow the air valve installation in those locations of the system where, for project requirements, air discharge and release must be avoided.



Version for air discharge only SCS - EO series

Version for air discharge only EO series (on request), available both for SCS and SCS 2F models. The most important application of EO is to allow the air valve installation in those locations of the system where HGL may drop below the pipe profile, and whenever for project requirements air entrance must be avoided. The threaded elbow is normally produced in plastic, available on request in different materials.



Version for air entrance only SCS - IO series

Version for air entrance only IO series, available for vacuum breaker model only. The most important application of IO is to allow the air valve installation in those locations of the system where, for project requirements, air discharge and release must be avoided.