

Comeval®



CSA

Control valves, Air valves and Protection devices

*Flowing innovation
.... since 1974*



www.comeval.es



The company was founded in 1987 by transforming the former CSA, which was a trading company dealing with pipes and valves for water networks, into a manufacturing company, through the research and realization of pillar fire hydrants. Since then many other products have been added.

The history of our company is characterised by years of technical and commercial research, which have enabled us to offer a complete range of valves designed for controlling, regulating and protecting the pipelines under pressure in both waterworks and sewage lines as well as fire hydrants.

Our many industrial patents and innovative technical solutions, together with modern and attractive style of design, have made it possible to differentiate our products from those offered by competitors and have allowed us to become a point of reference in our sector.

Flexibility and reliability have been the key points of CSA's rapid growth over the last few years. We are perfectly aware that we are managing the world's most precious resource and, motivated by this responsibility and the commitment towards our customers, we have dedicated ourselves to constantly improving our products, placing them at the highest levels of quality.

Quality

In the manufacturing business today, quality is the fundamental requirement for achieving and maintaining a growing market share.

For this reason we have always aimed at developing a synergy between the various sectors of the company and thus ensuring:

- quick and precise answers;
- evaluation of data received and immediate response;
- rigorous control of incoming and outgoing products.

Since 1998 CSA is certified according to regulation ISO 9001 by RINA (Italian Naval Registry) recently converted into ISO 9001/2008.





During the research and realisation of new products, CSA has always focused his efforts on:

- Listening to the customer's needs and finding the best solution both at the design and operational phases.
- Guiding our R&D department to develop ranges of modern, reliable and complementary products.
- Adopting production techniques that, even while complying with the severest quality standards, would allow us to reduce delivery times.
- Guaranteeing complete technical support for our customers and prompt after-sales assistance.

This philosophy characterizes us not only as a valve manufacturer but also as a reliable partner whom you can always depend on for consulting and solutions.

The production cycle, aimed at the constant improvement of our products and complete customer satisfaction, ensures predetermined margins of tolerance by establishing production standards, which guarantee that the semi finished products reach the next production stage with the required specifications. All our valves are made of ductile cast iron GJS 400-15 / 500-7 in absolute compliance with European standards, and are suitable for PN 25-40 bar.

The manufacturing process is carried out exclusively by means of numerically controlled lathes, mills, and horizontal machining units. Subsequent step-by-step controls are based on strict quality procedures.

Painting, pre-treated by sand blasting grade SA 2.5, is carried out inside a fluidized bed containing epoxy powder, which guarantees maximum surface protection. All our products are tested under water pressure and certified.



Combination air valve Mod. GOLIA 3F

The CSA air valve Mod. Golia 3F will ensure the proper operation of the pipeline network allowing the release of air pockets during working conditions, the evacuation and entrance of large volumes of air during filling and draining operations.



Technical features and benefits

- Entirely made in high resistant materials suitable for industrial and aggressive environments.
- Mobile block composed of a cylindrical float and upper disk in solid polypropylene, joined together by the CSA air release system (pat. Pending). The solid cylindrical floats avoid deformations and ensure a great sliding precision.
- Nozzle and gasket holder, part of CSA air release system, entirely made in AISI 316/Duplex and designed with gasket compression control to prevent aging process and consequent leakage during working conditions.
- Connection between the stand pipe and the components without any welded parts.
- Maintenance can be easily performed from the top, without removing the air valve from the pipe.
- Mesh and cap in stainless steel.
- High flow design with reduced turbulence thanks to the single chamber design.
- Supplied with flanged or threaded outlets including studs.

Applications

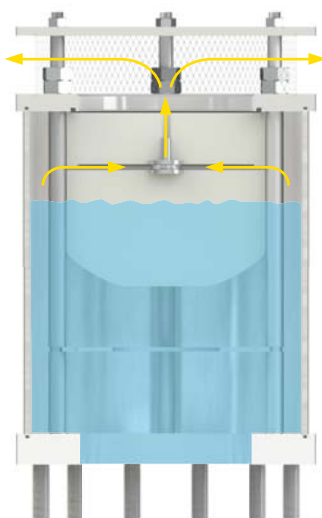
- Seawater main transmission lines.
- Desalination plants.
- Demineralized water.
- Mines.
- Aggressive and corrosive fluid, and more in general whenever ductile cast iron is not accepted by project requirements.

Operating principle



Discharge of large volumes of air

During the pipe filling it is necessary to discharge air as water flows in. The Golia 3F, thanks to an aerodynamic full port body and deflector, will make sure to avoid premature closures of the mobile block during this phase.



Air release during working conditions

During operation the air produced by the pipeline is accumulated in the upper part of the air valve. Little by little it is compressed and the pressure arrives to water pressure, therefore its volume increases pushing the water 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 water to avoid negative pressure and serious damages of the pipeline, and to the entire system.

Optional



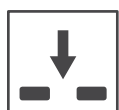
■ **Vacuum breaker version Mod. Golia 2F**, to allow the entrance and discharge of large volumes of air only. This model is normally recommended in changes in slope ascending, long ascending segments, dry fire systems, and wherever the air release won't be required.



■ **Version for submerged applications, SUB series**, available both for Golia 3F and 2F Models, with elbow for air conveyance. 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 to avoid the spray effect, conveying spurts coming from the rapid closure of the air valve.



■ **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 to any other node where for project requirements air entrance must be avoided.

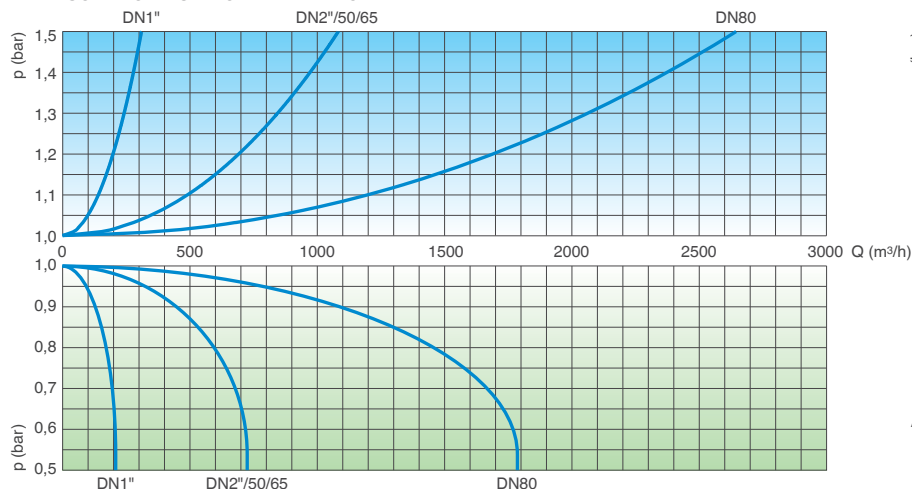


■ **Version for air entrance only IO series**, available for Golia 2F model only. The most important application of IO is to allow the air valve installation in those locations of the system where, for project requirements, air discharge and release must be avoided.

Technical data

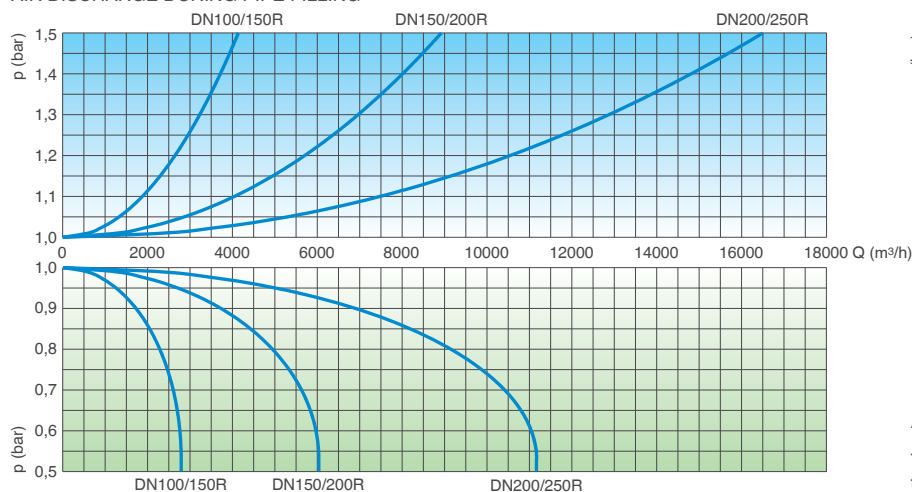
Air flow performance charts

AIR DISCHARGE DURING PIPE FILLING

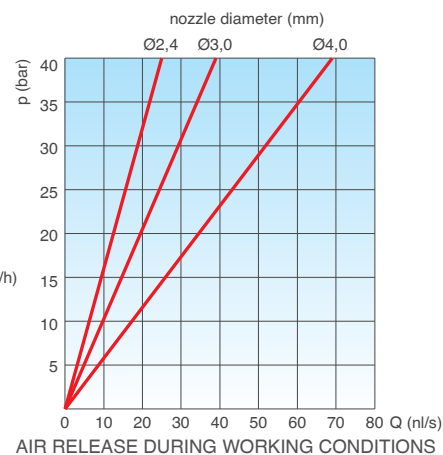
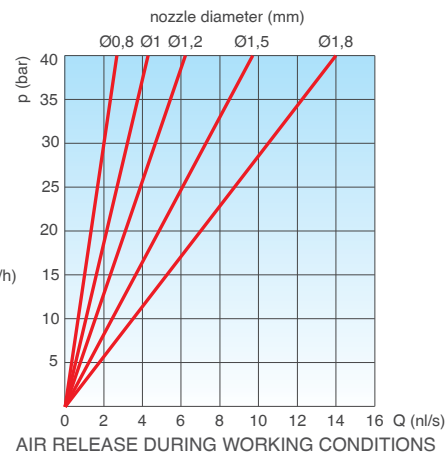


AIR ENTRANCE DURING PIPE DRAINING

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 using a safety factor.

Working conditions

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

Standard

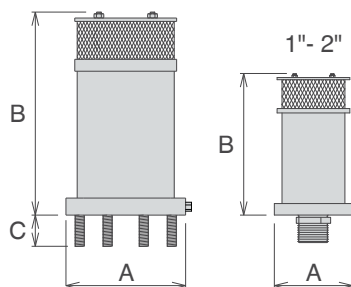
Designed in compliance with EN-1074/4 and AWWA C-512.
Flanges according to EN 1092/2 or ANSI.
Gaskets in NBR, EPDM or Viton.
Changes and variations on the flanges and gaskets on request.

Weights and dimensions

CONNECTION inch/mm	A mm	B mm	C mm	Weight Kg
Threaded 1"	165	200	-	6,4
Threaded 2"	165	255	-	6,4
Flanged 50	165	255	40	8,0
Flanged 65	185	255	40	8,0
Flanged 80	200	285	50	12,0
Flanged 100	235	335	50	17,0
Flanged 150R	235	385	50	27,0
Flanged 150	300	445	70	45,0
Flanged 200R	360	445	70	49,0
Flanged 200	360	515	70	62,0
Flanged 250R	405	515	70	72,0

R: reduced bore. Larger sizes available on request.

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

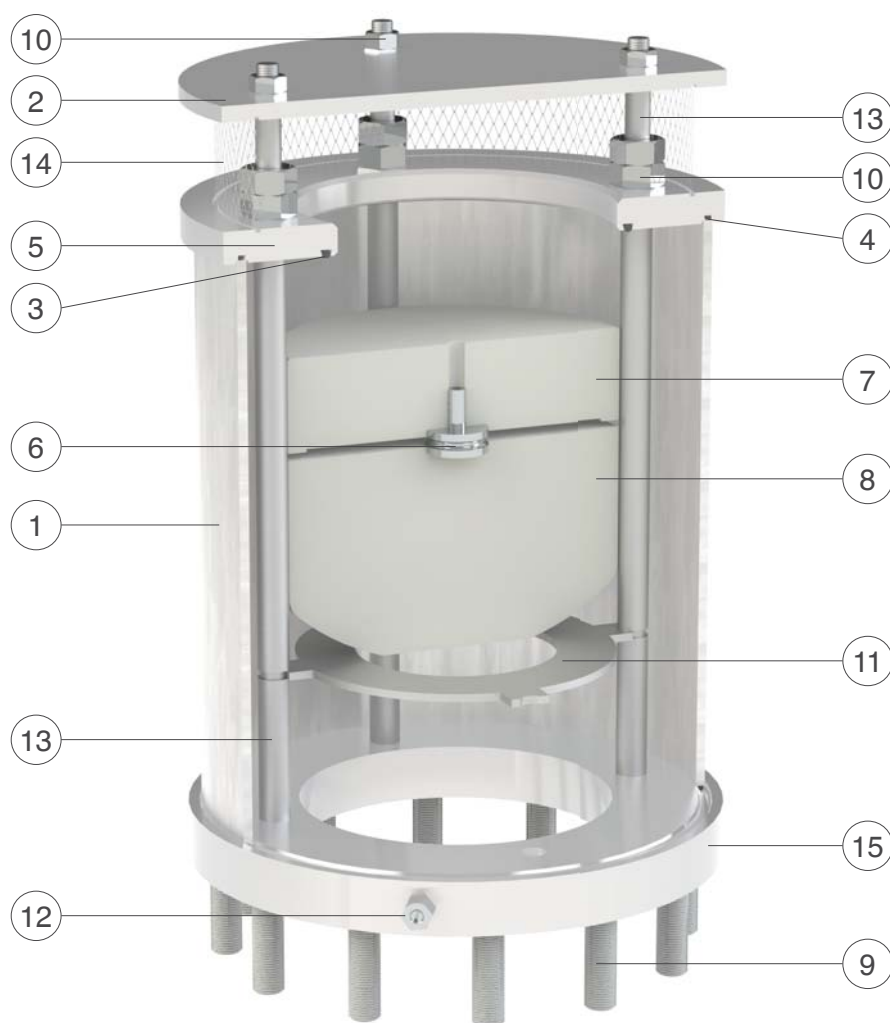


Nozzle choice

	PN 10	PN 16	PN 25	PN 40
DN 1"	1,2	1,2	1	0,8
DN 2"/50/65	1,5	1,2	1	0,8
DN 80	1,8	1,5	1,2	1
DN 100/150R	2,4	1,8	1,8	1,2
DN 150/200R	4	3	2,4	1,8
DN 200/250R	4	4	4	3

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

Technical details



N.	Component	Standard material	Optional
1	Body	stainless steel AISI 316	s.s. Duplex/Super Dupl.
2	Cap	stainless steel AISI 304	stainless steel AISI 316
3	O-ring	NBR	EPDM/Viton/silicone
4	O-ring	NBR	EPDM/Viton/silicone
5	Seat	stainless steel AISI 316	s.s. Duplex/Super Dupl.
6	Nozzle Subset	stainless steel AISI 316	stainless steel Duplex
7	Upper flat	polypropylene	
8	Float	polypropylene	
9	Studs	stainless steel AISI 304	stainless steel AISI 316
10	Bolts	stainless steel AISI 316	
11	Deflector	stainless steel AISI 316	s.s. Duplex/Super Dupl.
12	Drain valve	stainless steel AISI 316	
13	Spacers	stainless steel AISI 316	s.s. Duplex/Super Dupl.
14	Screen	stainless steel AISI 304	stainless steel AISI 316
15	Flange	stainless steel AISI 316	s.s. Duplex/Super Dupl.

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



Anti water hammer combination air valve

Mod. GOLIA 3F - AS

The CSA air valve Mod. GOLIA 3F AS will ensure the proper operation of the pipeline network allowing the release of air pockets during working conditions, the entrance of large volumes of air during draining operations and pipeline bursts and the air discharge with controlled speed, to avoid water hammer.



Technical features and benefits

- Entirely made in high resistant materials suitable for industrial and aggressive environments.
- Mobile block composed of a cylindrical float and upper disk in solid polypropylene, joined together by the CSA air release system (pat. Pending). The solid cylindrical floats avoid deformations and ensure a great sliding precision.
- Nozzle and gasket holder, part of CSA air release system, entirely made in AISI 316/Duplex and designed with gasket compression control to prevent aging process and consequent leakage during working conditions.
- Anti water hammer system (also called AS function), never in contact with water, obtained by a spring and shaft in stainless steel, disk with adjustable sonic nozzles for air flow control.
- Mesh and cap in stainless steel.
- High flow design with reduced turbulence thanks to the single chamber design.
- Supplied with flanged or threaded outlets including studs.

Applications

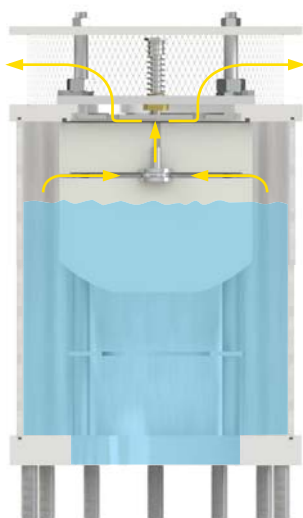
- Seawater main transmission lines.
- Desalination plants.
- Demineralized water.
- Mines.
- Aggressive and corrosive fluid, and more in general whenever ductile cast iron is not accepted by project requirements.

Operating principle



Controlled air discharge

During the pipe filling it is necessary to discharge air as water flows in. The Golia 3F AS, thanks to the anti-shock feature, will control the air outflow thus reducing the velocity of the approaching water column. The risk of overpressure will therefore be minimized.



Air release during working conditions

During operation the air produced by the pipeline is accumulated in the upper part of the air valve. Little by little it is compressed and the pressure arrives to water pressure, therefore its volume increases pushing the water 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 water to avoid negative pressure and serious damages of the pipeline, and to the entire system.

Optional



■ **Vacuum breaker version Mod. Golia 2F AS**, to allow the entrance of large volumes of air and the controlled outflow only. This model is normally recommended in changes in slope ascending, long ascending segments, dry fire systems.



■ **Version for submerged applications, SUB series**, available both for Golia 3F AS and 2F AS Models, with elbow for air conveyance. 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 to avoid the spray effect, conveying spurts coming from the closure away from the air valve.



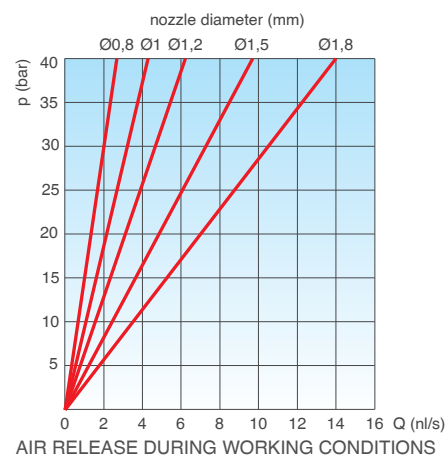
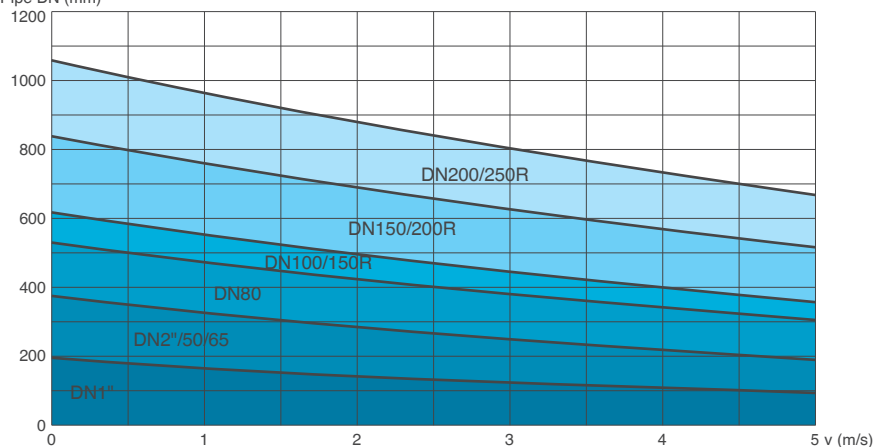
■ The counteracting spring force as well as the sonic nozzles, both responsible of the proper operation of the AS device, can be modified on request according to the project conditions and the transient analysis.

Technical data

Air valve selection chart

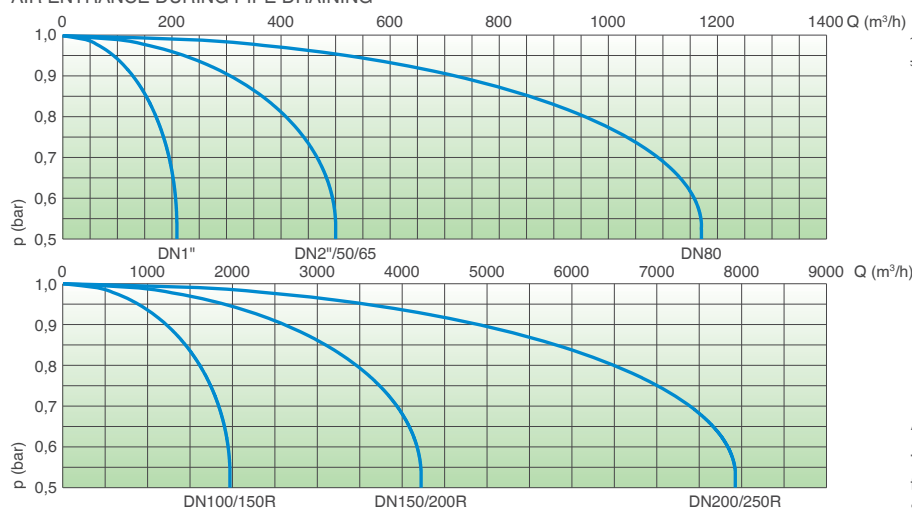
Air valve size as a function of pipeline internal diameter and fluid flow velocity expressed in m/s.

Pipe DN (mm)

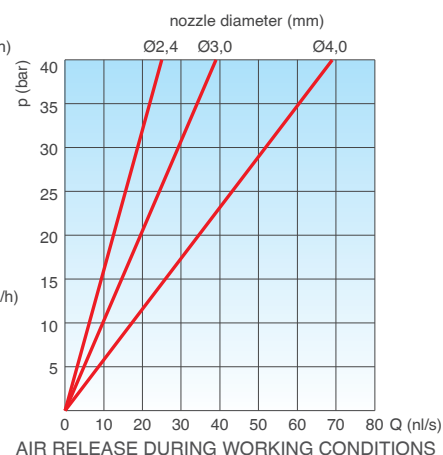


Air flow performance charts

AIR ENTRANCE DURING PIPE DRAINING



AIR ENTRANCE DURING PIPE DRAINING



AIR RELEASE DURING WORKING CONDITIONS

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

Working conditions

Treated water max. 60°C.

Max. pressure 40 bar.

Min. pressure 0,2 bar. Lower pressure on request.

Version for high temperatures on request.

Standard

Designed in compliance with EN-1074/4 and AWWA C-512.

Flanges according to EN 1092/2 or ANSI.

Gaskets in NBR, EPDM or Viton.

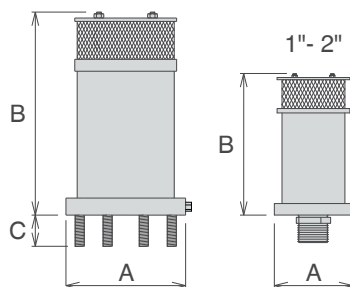
Changes and variations on the flanges and gaskets on request.

Weights and dimensions

CONNECTION inch/mm	A mm	B mm	C mm	Weight Kg
Threaded 1"	165	200	-	6,4
Threaded 2"	165	255	-	6,4
Flanged 50	165	255	40	8,0
Flanged 65	185	255	40	8,0
Flanged 80	200	285	50	12,0
Flanged 100	235	335	50	17,0
Flanged 150R	235	385	50	27,0
Flanged 150	300	445	70	45,0
Flanged 200R	360	445	70	49,0
Flanged 200	360	515	70	62,0
Flanged 250R	405	515	70	72,0

R: reduced bore. Larger sizes available on request.

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

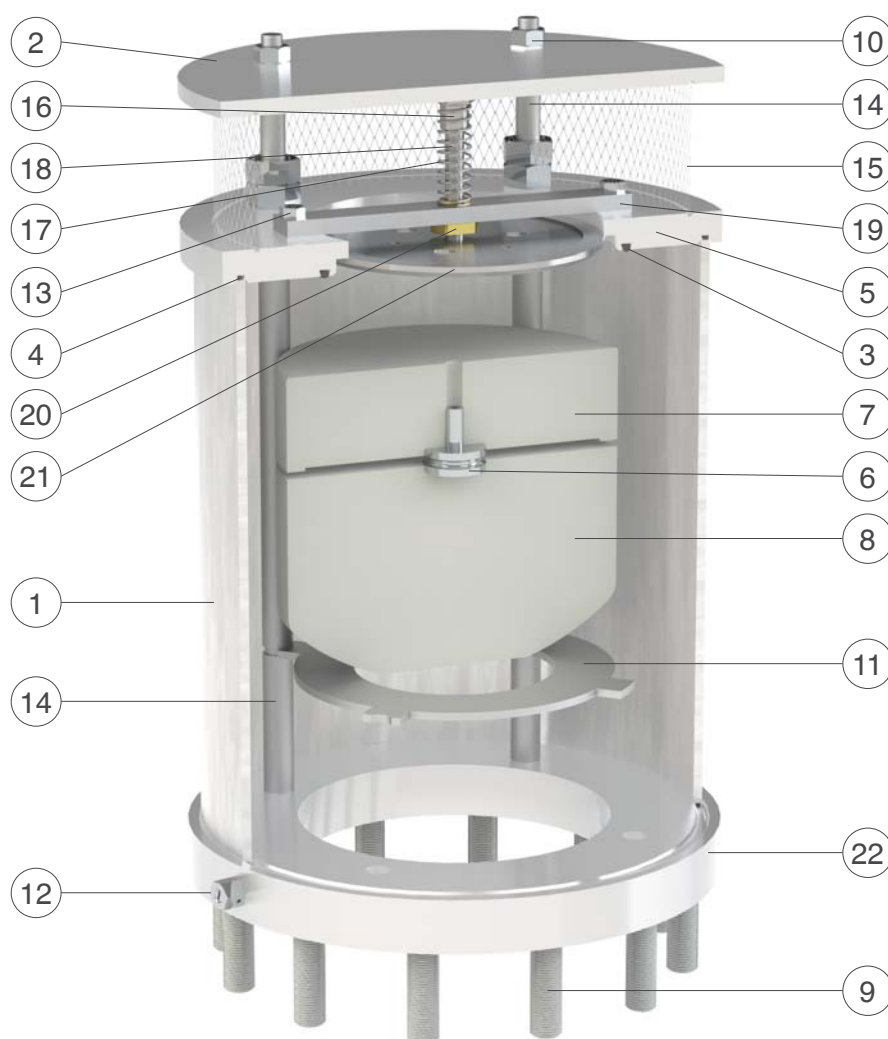


Nozzle choice

	PN 10	PN 16	PN 25	PN 40
DN 1"	1,2	1,2	1	0,8
DN 2"/50/65	1,5	1,2	1	0,8
DN 80	1,8	1,5	1,2	1
DN 100/150R	2,4	1,8	1,8	1,2
DN 150/200R	4	3	2,4	1,8
DN 200/250R	4	4	4	3

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

Technical details



N.	Component	Standard material	Optional
1	Body	stainless steel AISI 316	s.s. Duplex/Super Dupl.
2	Cap	stainless steel AISI 304	stainless steel AISI 316
3	O-ring	NBR	EPDM/Viton/silicone
4	O-ring	NBR	EPDM/Viton/silicone
5	Seat	stainless steel AISI 316	s.s. Duplex/Super Dupl.
6	Nozzle subset	stainless steel AISI 316	stainless steel Duplex
7	Upper flat	polypropylene	
8	Float	polypropylene	
9	Studs	stainless steel AISI 304	stainless steel AISI 316
10	Nuts	stainless steel AISI 316	
11	Deflector	stainless steel AISI 316	s.s. Duplex/Super Dupl.
12	Drainage valve	stainless steel AISI 316	
13	Screws (from DN 150R)	stainless steel AISI 316	
14	Spacers	stainless steel AISI 316	s.s. Duplex/Super Dupl.
15	Screen	stainless steel AISI 304	stainless steel AISI 316
16	Spring guide nut (from DN 100)	stainless steel AISI 303	stainless steel AISI 316
17	Spring	stainless steel AISI 302	
18	AS shaft	stainless steel AISI 303	stainless steel AISI 316
19	Spring support (from DN 150R)	stainless steel AISI 304	stainless steel AISI 316
20	Guiding nut (from DN 150R)	Delrin (polyoxymethylene)	
21	AS flat	stainless steel AISI 316	
22	Flange	stainless steel AISI 316	s.s. Duplex/Super Dupl.

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



Combination air valve with rapid filling preventer mechanism Mod. GOLIA 3F - RFP

The CSA air valve Mod. GOLIA 3F RFP will ensure the proper operation of the system allowing the air release during working conditions, and the entrance of large volumes of air during draining. In addition to that this model will always control the air outflow within a safety limit, without the risk of water hammer.



Technical features and benefits

- Uncontrolled pipeline filling operations and transient events will inevitably generate the rapid closure of the air valves install along the system, with consequent damages. The CSA air valve GOLIA 3F RFP will automatically adjust the outflow capacity, thus reducing the velocity of the incoming water column minimizing the risk of water hammer.
- The spray effect during closure and the risk of downing, compared to standard combination air valves, are reduced.
- Entirely made in high resistant materials suitable for industrial and aggressive environments.
- Mobile block composed of a cylindrical float and obturator, joined together by the CSA air release system (pat. Pending), along with the upper disk all made in solid polypropylene. The solid cylindrical floats, obtained by CNC machining, avoid deformations and ensure a great sliding precision.
- Nozzle and gasket holder, part of CSA air release system, entirely made in AISI 316/Duplex and designed with gasket compression control to prevent aging process and consequent leakage during working conditions.

Applications

- Seawater main transmission lines.
- Desalination plants.
- Demineralized water.
- Mines.
- Aggressive and corrosive fluid, and more in general whenever ductile cast iron is not accepted.

Operating principle



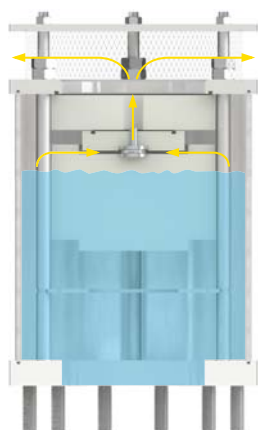
Discharge of large volumes of air

During the pipe filling it is necessary to discharge air as water flows in. The Golia 3F RFP, thanks to an aerodynamic full port body and deflector, will make sure to avoid premature closures of the mobile block during this phase.



Controlled outflow

If the differential pressure of air, during pipe filling, increases above a certain value without control there is the risk of water hammer and damages to the system. Should that happen the RFP upper float will rise automatically, reducing the outflow and consequently the velocity of the approaching water column.



Air release during working conditions

During operation the air produced by the pipeline is accumulated in the upper part of the air valve. Little by little it is compressed and the pressure arrives at water pressure, therefore its volume increases pushing the water 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 water to avoid negative pressure and serious damages of the pipeline, and to the entire system.

Optional



■ **Vacuum breaker version Mod. Golia 2F RFP**, to allow the entrance of large volumes of air and the controlled outflow only. This model is normally recommended in changes in slope ascending, long ascending segments, dry fire systems, and wherever the water hammer effect has to be reduced without the necessity of air release.



■ **Version for submerged applications, SUB series**, available both for Golia 3F RFP and 2F RFP Models, with elbow for air conveyance. 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 to avoid the spray effect, conveying spurts coming from the closure away from the air valve.

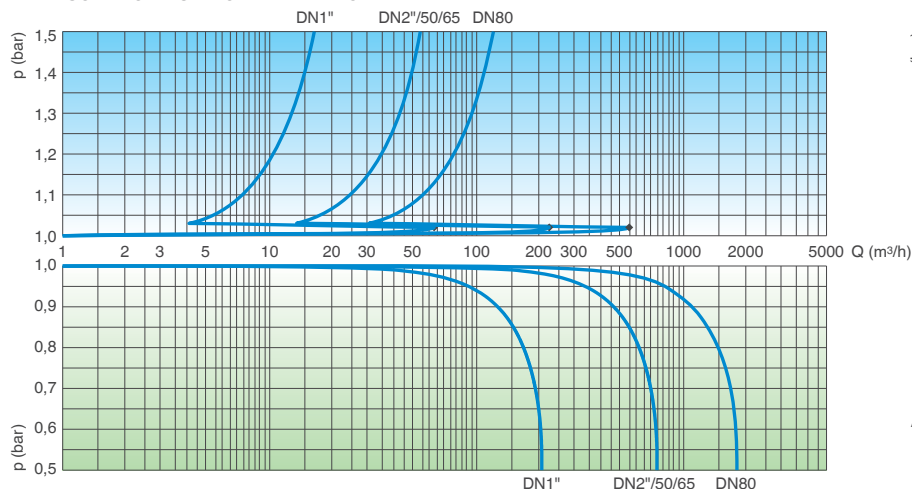


■ **Version for air discharge only EO series**, available both for Golia 3F RFP and 2F RFP models. The most important application of EO is to allow the air valve installation in those locations of the system where HGL may drop below the pipe profile, and to any other node where for project requirements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

Technical data

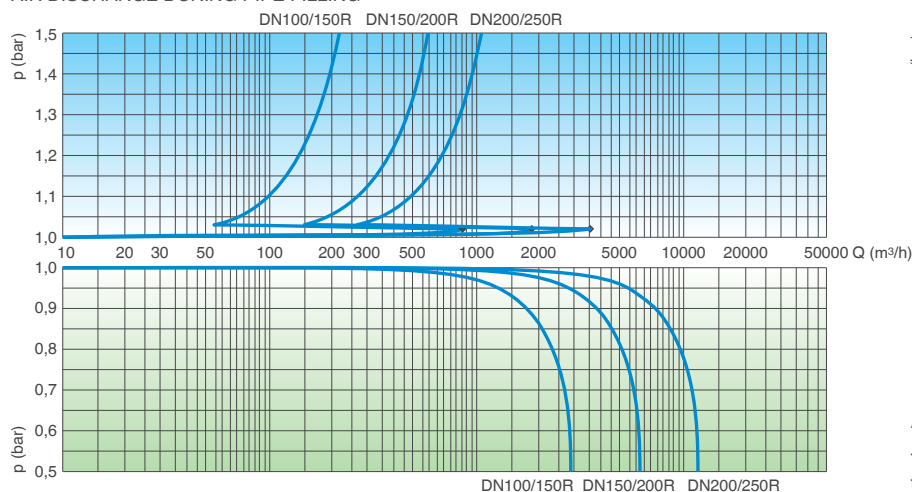
Air flow performance charts

AIR DISCHARGE DURING PIPE FILLING

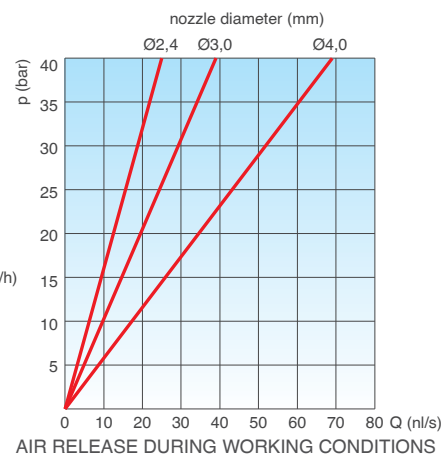
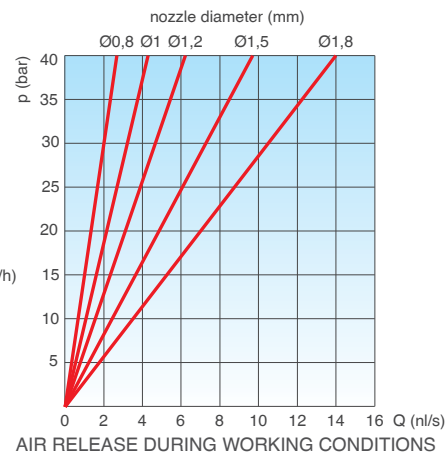


AIR ENTRANCE DURING PIPE DRAINING

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 using a safety factor.

Working conditions

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

Standard

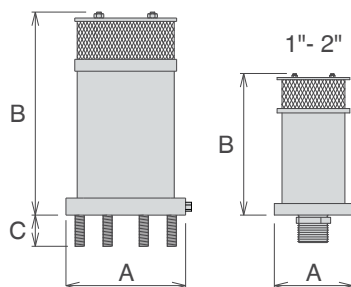
Designed in compliance with EN-1074/4 and AWWA C-512.
Flanges according to EN 1092/2 or ANSI.
Gaskets in NBR, EPDM or Viton.
Changes and variations on the flanges and gaskets on request.

Weights and dimensions

CONNECTION inch/mm	A mm	B mm	C mm	Weight Kg
Threaded 1"	165	200	-	6,4
Threaded 2"	165	255	-	6,4
Flanged 50	165	255	40	8,0
Flanged 65	185	255	40	8,0
Flanged 80	200	285	50	12,0
Flanged 100	235	335	50	17,0
Flanged 150R	235	385	50	27,0
Flanged 150	300	445	70	45,0
Flanged 200R	360	445	70	49,0
Flanged 200	360	515	70	62,0
Flanged 250R	405	515	70	72,0

R: reduced bore. Larger sizes available on request.

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

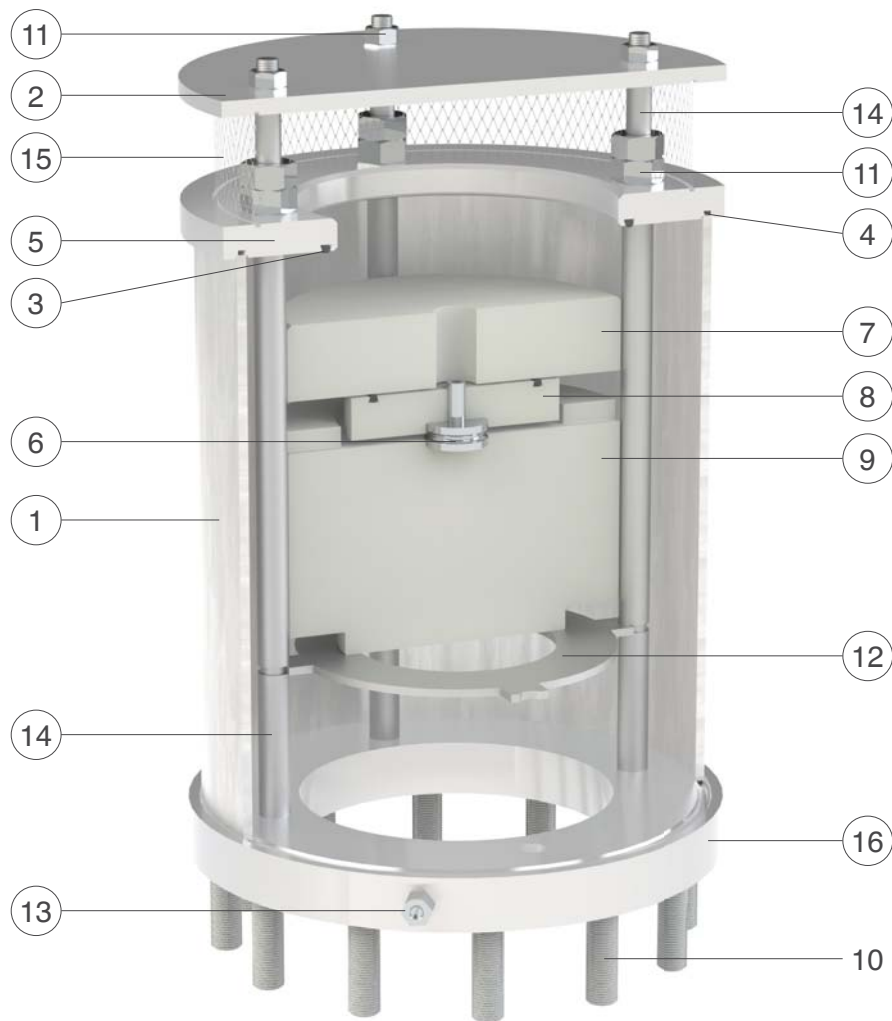


Nozzle choice

	PN 10	PN 16	PN 25	PN 40
DN 1"	1,5	1,2	1	0,8
DN 2"/50/65	1,8	1,5	1,2	1
DN 80	1,8	1,5	1,2	1
DN 100/150R	3	2,4	1,8	1,2
DN 150/200R	4	3	2,4	1,8
DN 200/250R	4	4	4	3

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

Technical details



	Component	Standard material	Optional
1	Body	stainless steel AISI 316	s.s. Duplex/Super Dupl.
2	Cap	stainless steel AISI 304	stainless steel AISI 316
3	O-ring	NBR	EPDM/Viton/silicone
4	O-ring	NBR	EPDM/Viton/silicone
5	Seat	stainless steel AISI 316	s.s. Duplex/Super Dupl.
6	Nozzle Subset	stainless steel AISI 316	stainless steel Duplex
7	RFP flat	polypropylene	
8	Upper flat	polypropylene	
9	Float	polypropylene	
10	Studs	stainless steel AISI 304	stainless steel AISI 316
11	Bolts	stainless steel AISI 316	
12	Deflector	stainless steel AISI 316	s.s. Duplex/Super Dupl.
13	Drain valve	stainless steel AISI 316	
14	Spacers	stainless steel AISI 316	s.s. Duplex/Super Dupl.
15	Screen	stainless steel AISI 304	stainless steel AISI 316
16	Flange	stainless steel AISI 316	s.s. Duplex/Super Dupl.

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

Wastewater combination air valve in stainless steel AISI 316 Mod. SCS

The air valve guarantees the proper operation of sewage/industrial lines allowing the entrance of large quantity of air in case of pipe bursting or draining, the release of air pockets during working conditions and the discharge during pipe filling.



Technical features and benefits

- Lower body in AISI 316 designed with strongly sloped walls to avoid grease and/or other material deposit.
- Upper body in AISI 316 containing the air release device in stainless steel, 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.
- Drainage valve for chamber control and draining.
- Maintenance can be easily performed from the top without removing the air valve from the pipe.
- Evacuation bend suitable for flooded environments with 1" threaded outlet.

Applications

- Industrial and civil plants in presence of liquid with solids and debris.
- Mines.
- Desalination plants.
- Deep well boreholes.
- Special version as a gas air release valve.

Operating principle



Discharge of large volumes of air

During the pipe filling it is necessary to discharge air as water flows in. The SCS, thanks to an aerodynamic body and deflector, will make sure to avoid premature closures of the mobile block during this phase.

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 water, to avoid negative pressure and serious damages of the pipeline and the entire system.

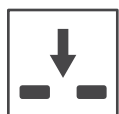
Optional



■ **Vacuum breaker version Mod. SCS 2F**, to allow the entrance and discharge of large volumes of air only. This model is normally recommended in changes in slope ascending, long ascending segments, and wherever the air release won't be required.



■ **Version for air discharge only SCS 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 to any other node where for project requirements air entrance must be avoided.

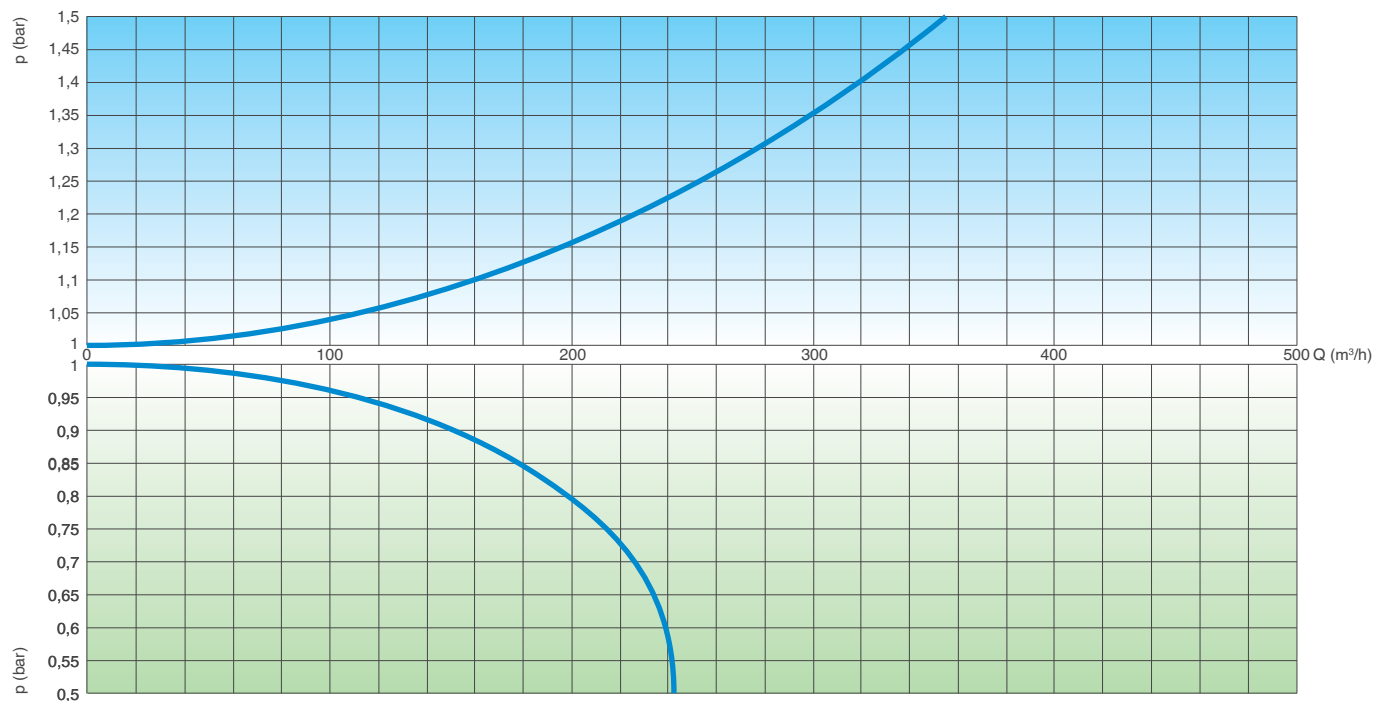


■ **Version for air entrance only SCS IO series**, available for vacuum breaker model only. The most important application of IO is to allow the air valve installation in those locations of the system where, for project requirements, air discharge and release must be avoided.

Technical data

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 using a safety factor.

Working conditions

Waste water max. 60°C.

Maximum pressure 16 bar.

Minimum pressure 0,2 bar. Lower pressure on request.

Version for high temperature available on request.

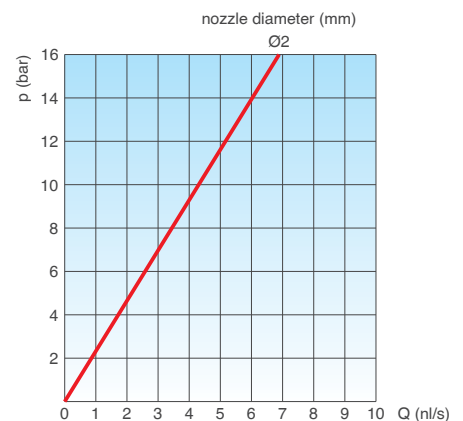
Standard

Designed in compliance with EN-1074/4.

Manufactured with 2" outlet; supplied on request with flanges according to EN 1092/2 or ANSI.

Changes on the flanges details on request.

AIR RELEASE DURING WORKING CONDITIONS



Nozzle choice

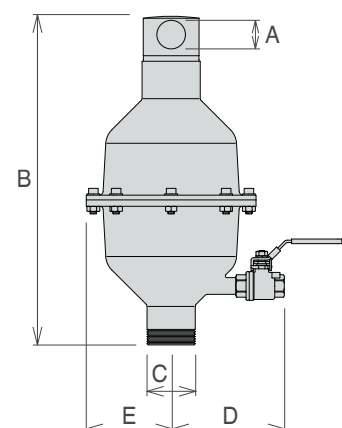
Nozzle diameter in mm according to the size of the air valve and the PN.

	PN 10	PN 16
DN 2"	2	2

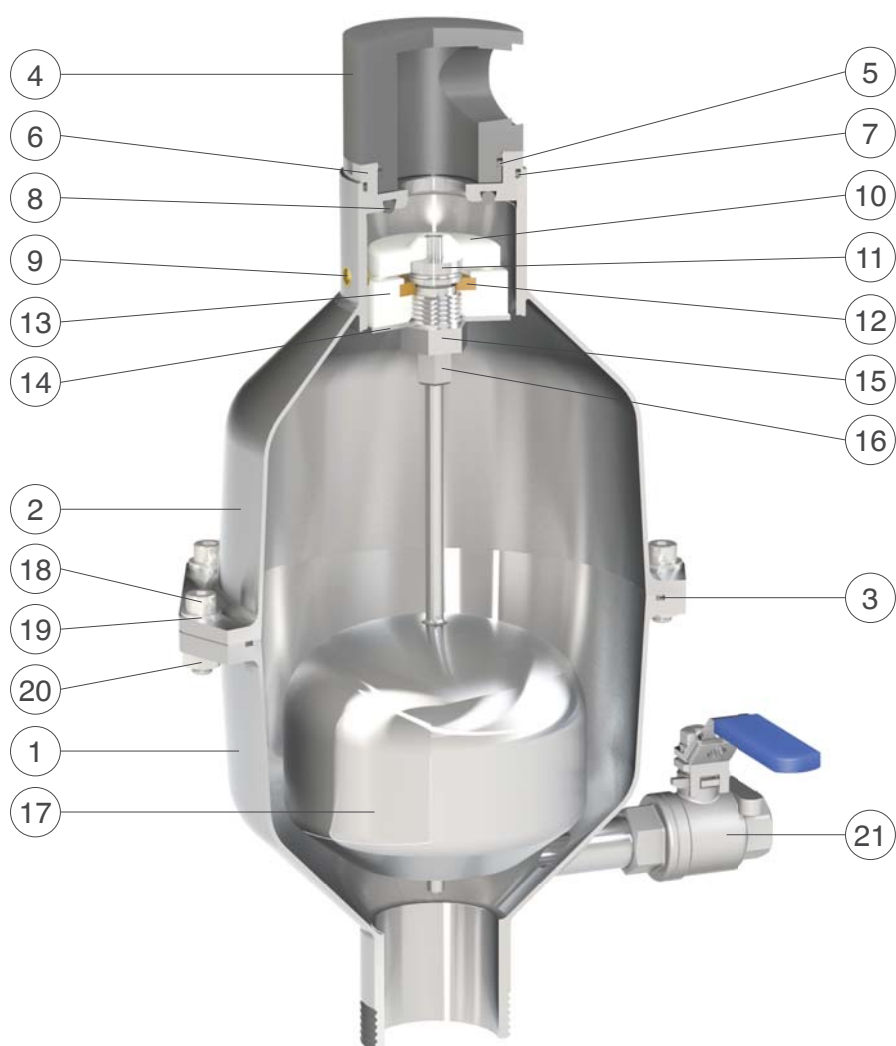
Weight and dimensions

DN (C) inch	A inch	B mm	D mm	E mm	Main orifice mm ²	Nozzle mm ²	Weight Kg
2"	1"	415	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	O-ring	NBR	EPDM/Viton/silicone
6	Seat	stainless steel AISI 316	
7	O-ring	NBR	EPDM/Viton/silicone
8	Seat gasket	NBR	EPDM/Viton/silicone
9	Plug	brass OT58	stainless steel AISI 316
10	Obturator	polypropylene	
11	Nozzle subset	stainless steel AISI 316	
12	Plane gasket	NBR	
13	Lower gasket holder	polypropylene	
14	Deflector	stainless steel AISI 316	
15	Guiding nut	stainless steel AISI 316	
16	Upper gasket holder	stainless steel AISI 316	
17	Float	stainless steel AISI 316	
18	Screws	stainless steel AISI 304	stainless steel AISI 316
19	Washers	stainless steel AISI 304	stainless steel AISI 316
20	Nuts	stainless steel AISI 304	stainless steel AISI 316
21	Drain valve	stainless steel AISI 316	

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

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

The 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 walls to avoid grease and/or 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 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 bend 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.
- Mines.
- Desalination plants.
- Deep well boreholes.
- Special version as a gas air release valve.

Operating principle



Controlled air discharge

During the pipe filling it is necessary to avoid rapid closures, responsible of water hammer effects. The SCS AS, thanks to the anti-shock feature, will control the air outflow; the risk of overpressure will therefore be minimized.

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.

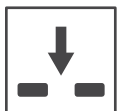
Entrance of large volumes of air

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



■ **Version for air entrance only SCS 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.

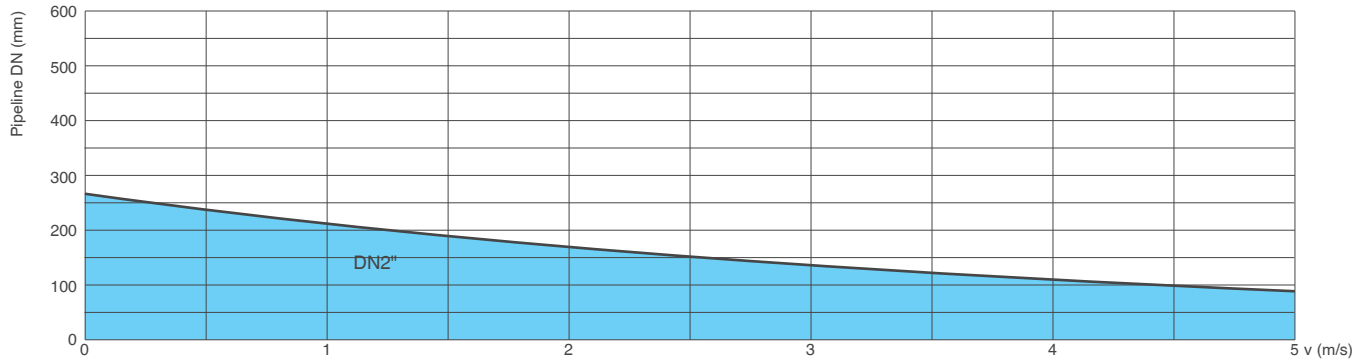


■ The counteracting spring force as well as the sonic nozzles, both responsible of the proper operation of the AS device, can be modified on request according to the project conditions and the transient analysis.

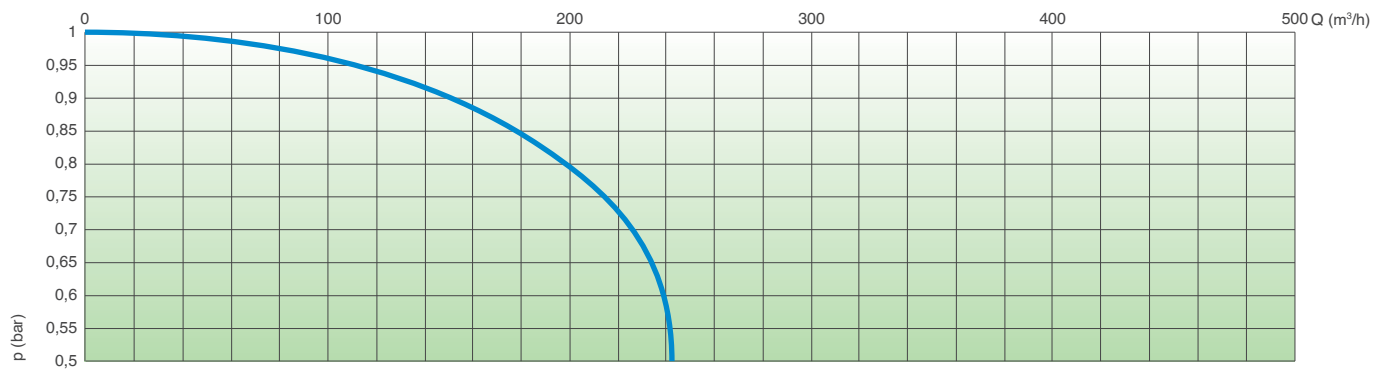
Technical data

Air valve choice chart

Air valve size as a function of pipeline diameter and fluid flow.



Air flow performance charts



AIR ENTRANCE DURING PIPE DRAINING

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

Working conditions

Waste water max. 60°C.

Maximum pressure 16 bar.

Minimum pressure 0,2 bar. Lower pressure on request.

Version for high temperature available on request.

Standard

Designed in compliance with EN-1074/4.

Manufactured with 2" outlet; 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 size of the air valve and the PN.

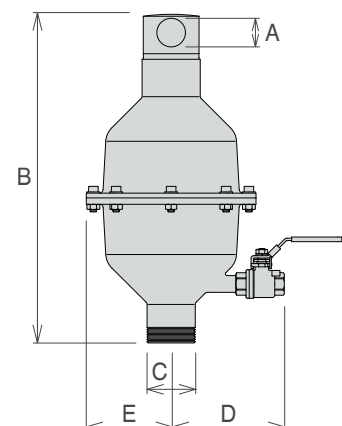
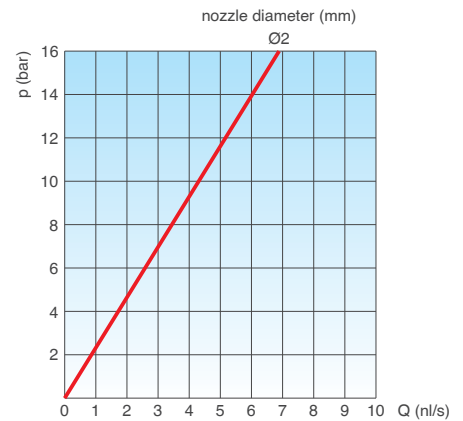
	PN 10	PN 16
DN 2"	2	2

Weight and dimensions

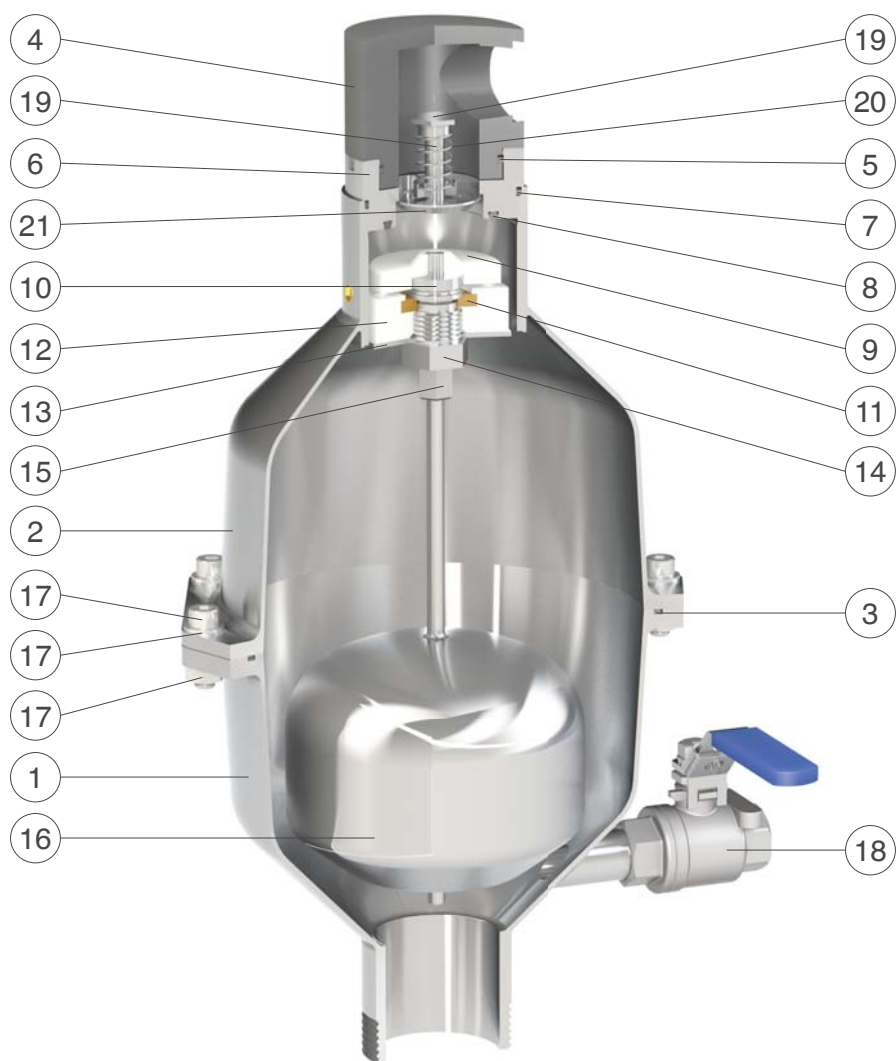
DN (C) inch	A inch	B mm	D mm	E mm	Main orifice mm ²	Nozzle mm ²	Weight Kg
2"	1"	421	137	106,5	490	2,3	4

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

AIR RELEASE DURING WORKING CONDITIONS



Technical details



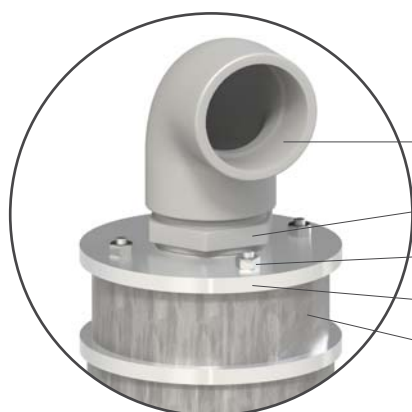
N.	Component	Standard material	Optional
1	Lower body	stainless steel AISI 316	
2	Upper body	stainless steel AISI 316	
3	O-ring	NBR	EPDM/Viton/silicone
4	Cap	PVC	
5	O-ring	NBR	EPDM/Viton/silicone
6	Seat	stainless steel AISI 316	
7	O-ring	NBR	EPDM/Viton/silicone
8	Seat gasket	NBR	EPDM/Viton/silicone
9	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	
21	AS flat	stainless steel AISI 316	

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

Combination air valve - Mod. Golia 3F

Version for submerged applications - SUB series

Version for submerged applications, SUB series available for all CSA Golia models except for EO version, with threaded elbow for air conveyance. 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 DN 1"-150R

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

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

Nuts in stainless steel

SUB flat in stainless steel

SUB extension in stainless steel



Elbow in stainless steel for DN 200 and 250R (available on request for other DN)

SUB flat and elbow in stainless steel

Nuts in stainless steel

SUB extension in stainless steel

Technical data

Working conditions

Treated water max. 60°C.

Max. pressure 40 bar.

Min. pressure 0,2 bar. Lower pressure on request.

Version for high temperatures on request.

Standard

Designed in compliance with EN-1074/4 and AWWA C-512.

Flanges according to EN 1092/2 or ANSI.

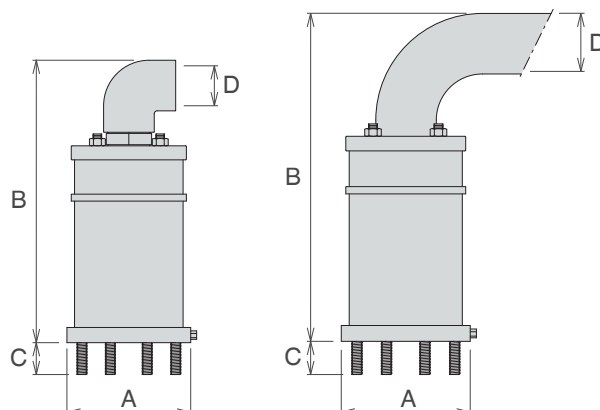
Gaskets in NBR, EPDM or Viton.

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"	165	285	-	1"	7,0
Threaded 2"	165	380	-	2"	7,7
Flanged 50	165	380	40	2"	9,3
Flanged 65	185	380	40	2"	9,3
Flanged 80	200	435	50	2" 1/2	13,4
Flanged 100	235	510	50	3"	19,7
Flanged 150R	235	560	50	3"	29,7
Flanged 150	300	650	70	4"	51,4
Flanged 200R	360	650	70	4"	55,4
Flanged 200	360	830	70	6"	78,3
Flanged 250R	405	830	70	6"	88,3

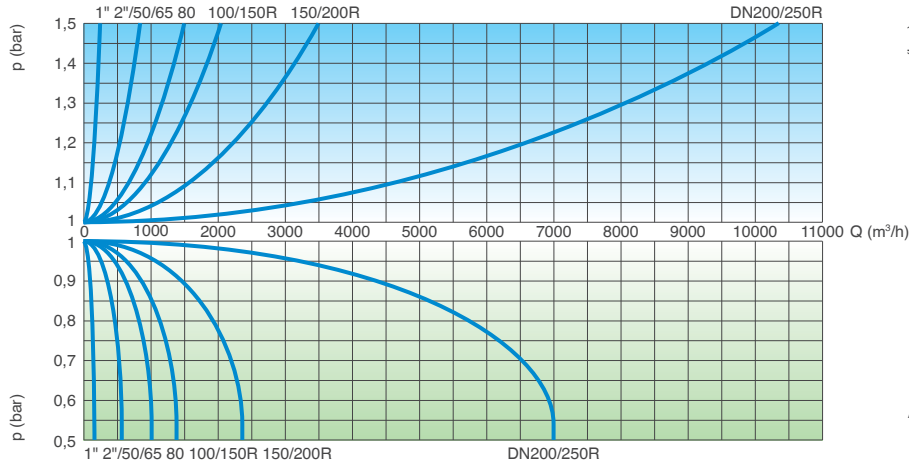
All values are approximate, consult CSA service for more details.



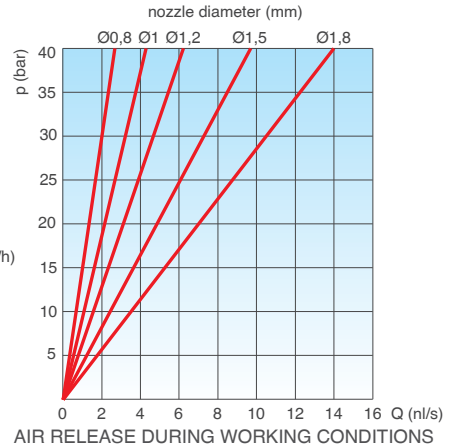
Technical data

Golia SUB - Air flow performance charts

AIR DISCHARGE DURING PIPE FILLING

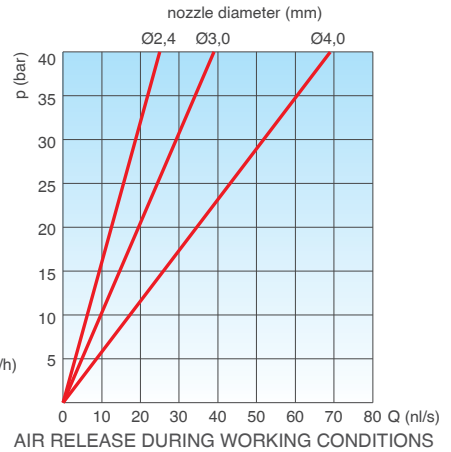
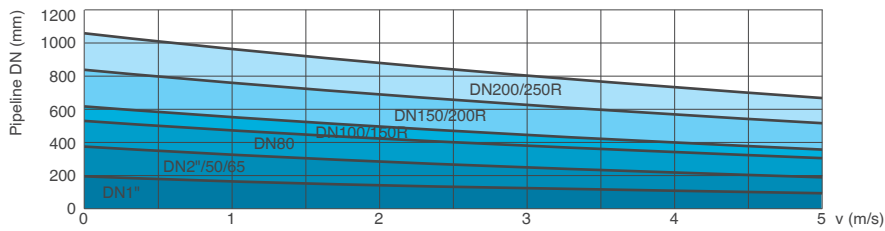


AIR ENTRANCE DURING PIPE DRAINING

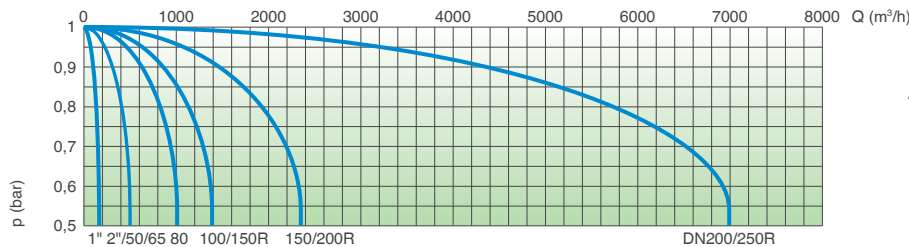


Golia AS SUB - Air valve choice chart

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



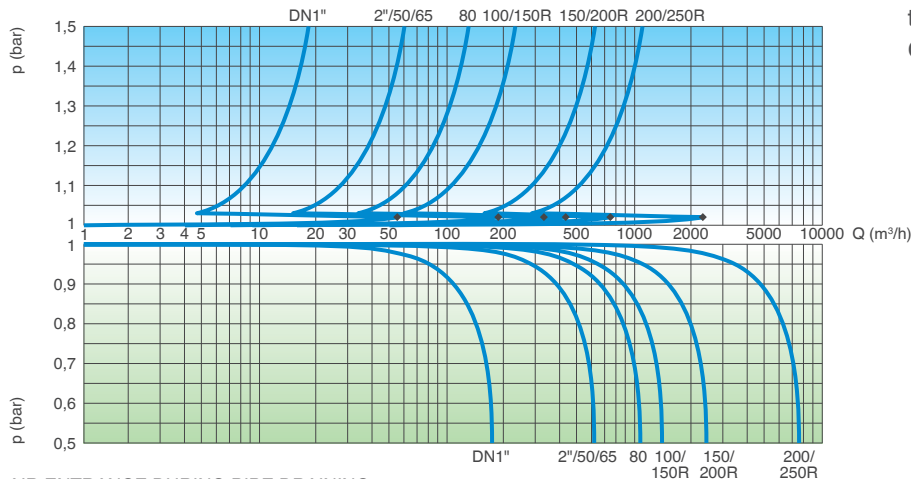
Golia AS SUB - Air flow performance charts



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 using a safety factor.

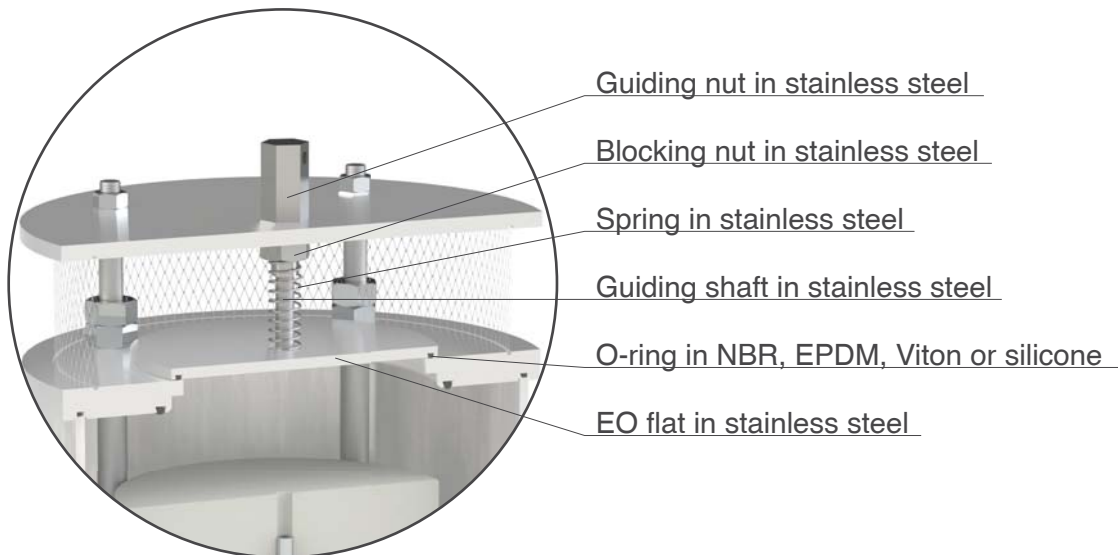
Nozzle choice

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



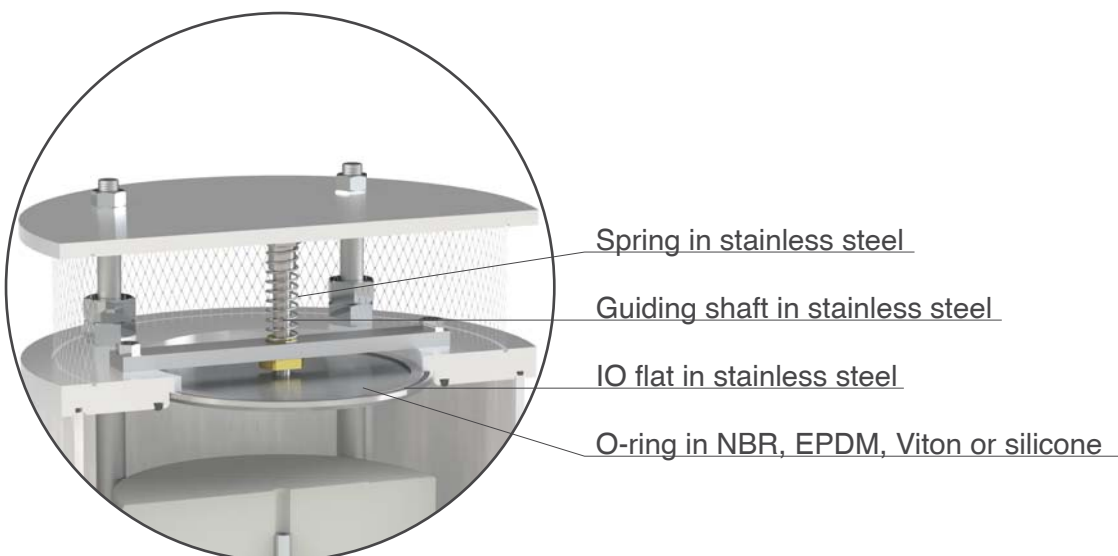
Version for air discharge only Golia - EO series

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

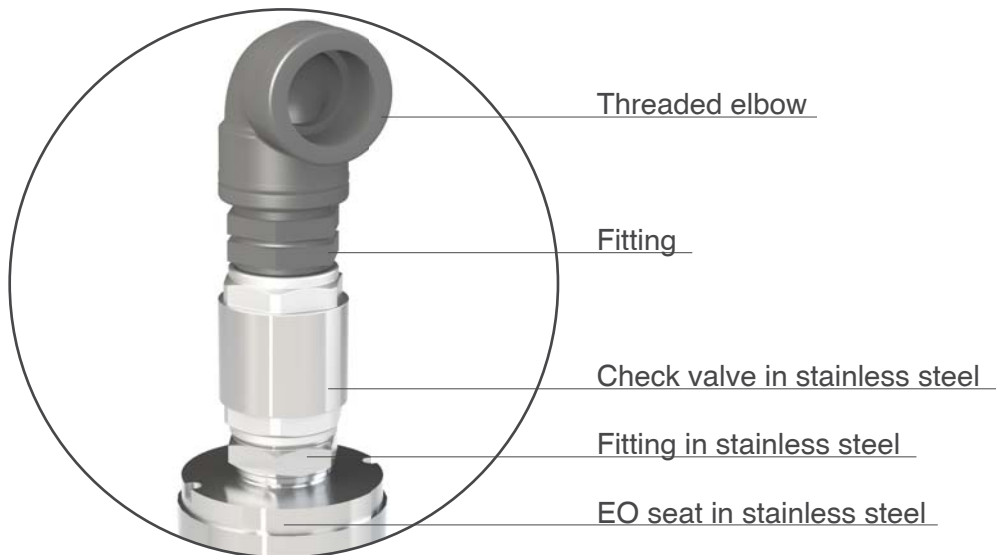
Version for air entrance only IO series, available for Golia 2F model only. The most important application of IO is to allow the air valve installation in those locations of the system where, for project requirements, air discharge and release must be avoided.





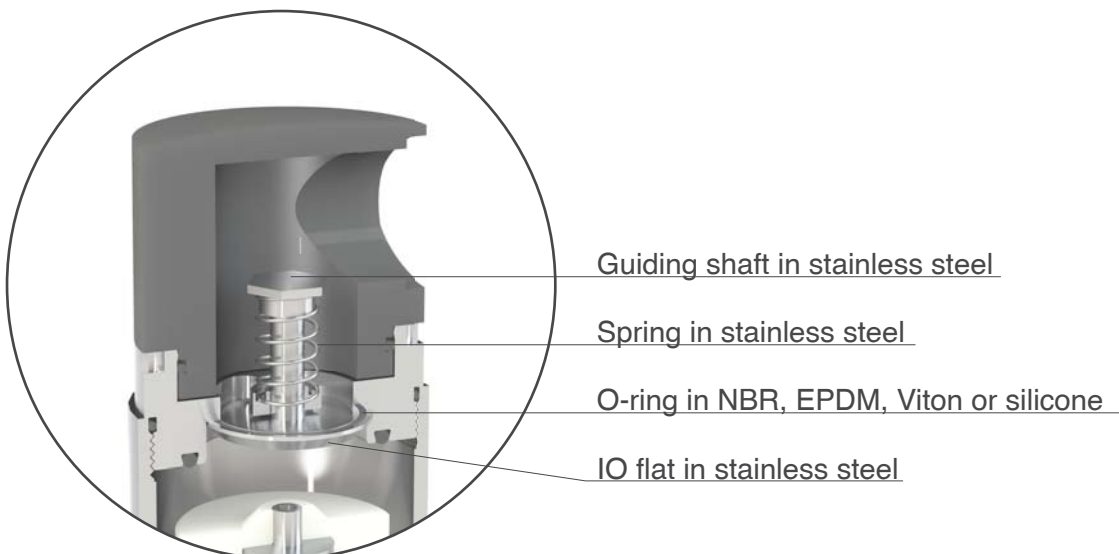
Version for air discharge only SCS - EO series

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 exhaust system is normally produced in plastic, and it is 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.





Advanced testing facilities

Designed to reproduce real conditions of modern water distribution systems the CSA testing facility is able to assess the dynamic performances of automatic control valves, direct acting pressure control valves, air valves and anti water hammer valves.

Provided with a high capacity booster pumps station, and linked to an advanced high frequency pressure transducers and flow meters, the testing rig allows for a real time visualization of pressure and flow evolutions. Water hammer events can also be simulated and recorded to prove the efficacy of CSA fast acting relief valve, in addition to level control for which, using an auxiliary stilling tank, a part of the pipeline system is entirely dedicated.

The PLC and control station allows for the operation of step by step and solenoid operated valves to determine the sensitivity of such kind of application and pressure management solutions. Thanks to this important and powerful tool valves can be customized, simulated and set according to the project requirements assuring the perfect performance and accuracy.

The testing process

All our valves undergo severe tests according to EN standards to ensure they are mechanically resistant, watertight, and high performing. After testing every valve is identified by means of a metallic tag or sticker, and duly registered and certified.



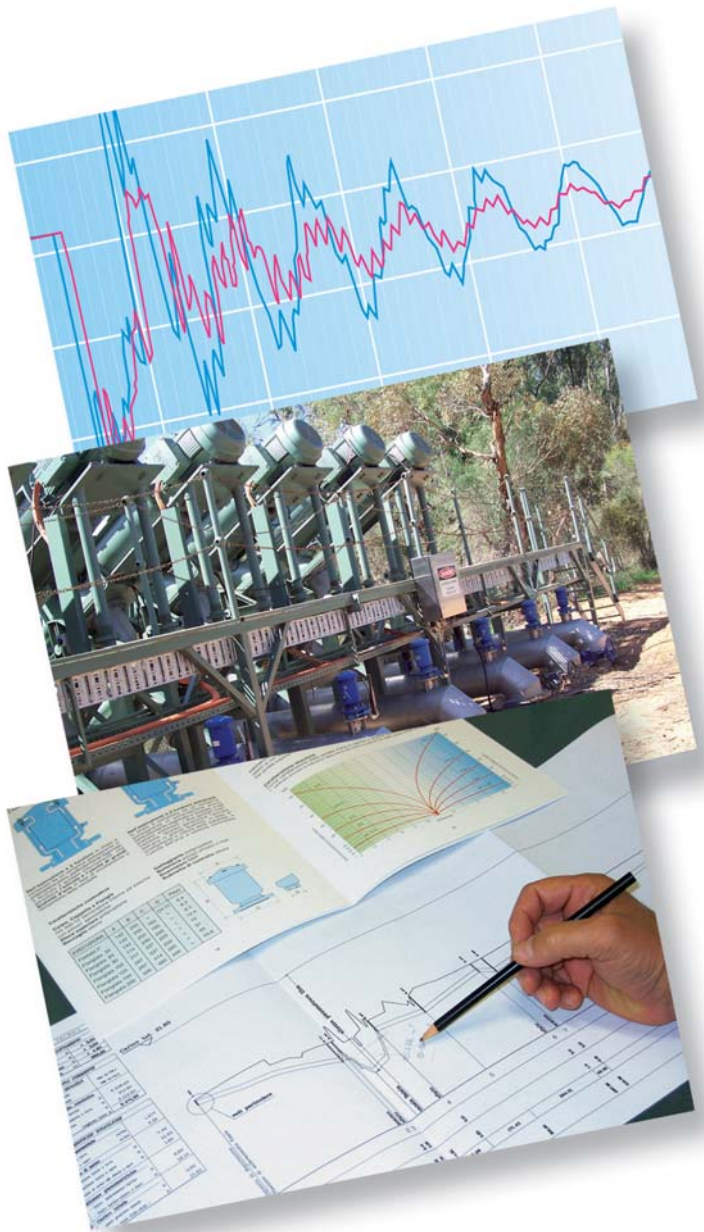
CSA HYCONSULT

Water hammer analysis CSA Hyconsult

CSA Hyconsult was founded to provide designers and consultants, involved in the design of water distribution and sewage systems, with accurate and unique technical support.

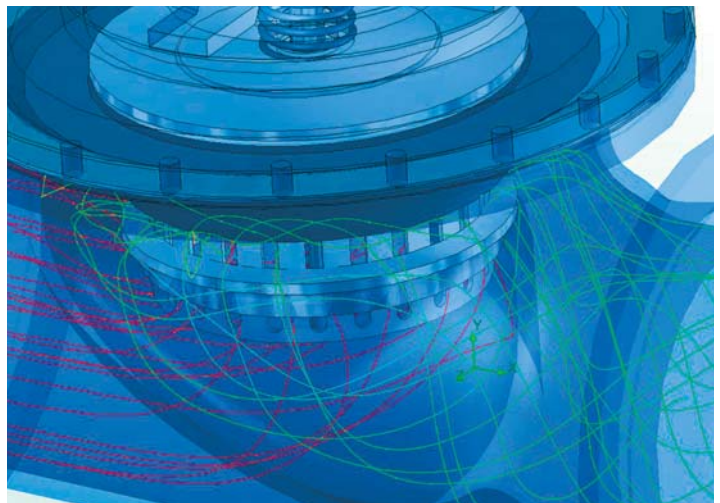
CSA Hyconsult has specialized in hydraulic modelling and transients analysis, entirely through the use of modern computational tools and advanced algorithms. Simulations are essential to predict system responses to events under a wide range of conditions without disrupting the actual system.

Using simulations, problems can be anticipated in possible or existing situations, and solutions can be evaluated in order to invest time, money and material in the most productive manner.



Research and innovation

CSA has always regarded knowledge as being indispensable for the kind of research that consistently feeds innovation at all levels. The R&D department at CSA constantly strives to improve product performance and continually searches for new solutions to meet our customer's needs. Twenty years of experience in valve design and sizing, supported by advanced computational tools, cooperation with external entities at the highest level, and test facilities for the verification of theoretical results which are available for our customers, guarantee our professionalism and reliability.





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