



Combination air valve Mod. FOX 3F

The CSA air valve Mod. FOX 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.



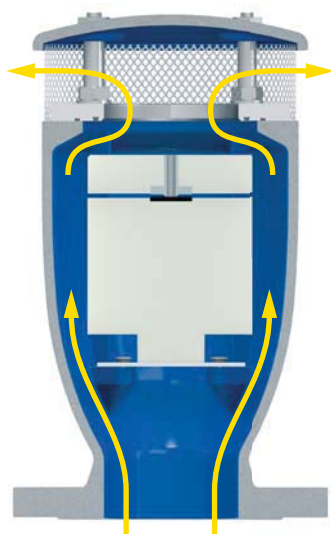
Technical features and benefits

- Single chamber full bore body in ductile cast iron, PN 40 bar rated, provided with internal ribs for consistent and accurate guiding of the mobile block.
- Aerodynamic deflector in stainless steel to avoid premature closures.
- Drainage valve, produced by CSA, for chamber control and pressure relief during maintenance.
- Mobile block composed of a cylindrical float and upper disk in solid polypropylene, joined together by the CSA air release system in AISI 316 (pat. Pending). The solid cylindrical floats, obtained by CNC machining, avoid deformations and ensure a great sliding precision inside the body processed ribs and a perfectly vertical thrust.
- Nozzle and gasket holder, part of CSA air release system, entirely made in AISI 316 and designed with gasket compression control to prevent aging process and consequent leakage during working conditions.
- Maintenance can be easily performed from the top, without removing the air valve from the pipe.
- Cover in ductile and screen in stainless steel as a standard execution to prevent the entrance of insects, with three more optional outlets (for submerged applications, air inlet only, air outlet only).

Applications

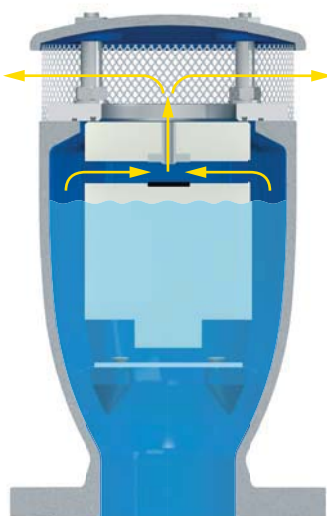
- Main transmission lines.
- Water distribution networks.
- Irrigation systems.
- In general this model is used on changes in slope and at the high points of the pipeline.

Operating principle



Discharge of large volumes of air

During the pipe filling it is necessary to discharge air as water flows in. The FOX 3F, thanks to the 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



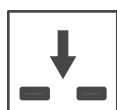
■ **Vacuum breaker version Mod. FOX 2F**, to allow the entrance and discharge of large volumes of air only. This model is normally recommended in changes in slope ascending, long ascending segments, dry fire systems, and wherever the air release won't be required.



■ **Version for submerged applications, SUB series**, available both for FOX 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 the possibility of conveying spurts coming from the rapid closure of the air valve.



■ **Version for air discharge only EO series**, available both for FOX 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, such as in pump suction lines or siphons pipelines.

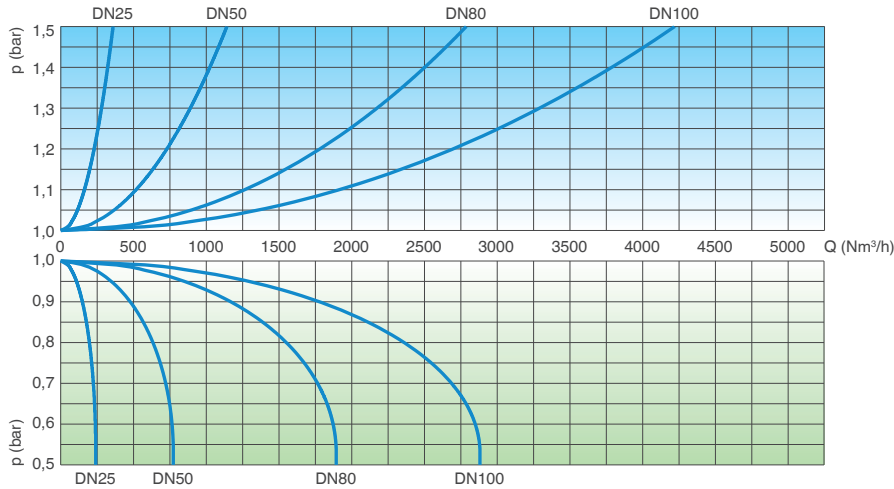


■ **Version for air entrance only IO series**, available for FOX 2F model only. The most important application of IO is to allow the air valve installation in those locations of the system where, for project requirements, air discharge and release must be avoided.

Technical data

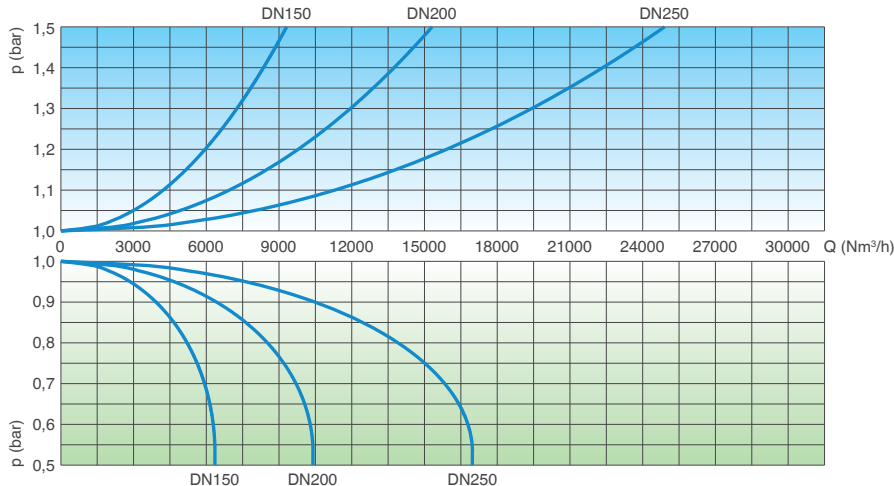
Air flow performance charts

AIR DISCHARGE DURING PIPE FILLING



AIR ENTRANCE DURING PIPE DRAINING

AIR DISCHARGE DURING PIPE FILLING



AIR ENTRANCE DURING PIPE DRAINING

Working conditions

Treated water max. 60°C.

Max. pressure 40 bar.

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

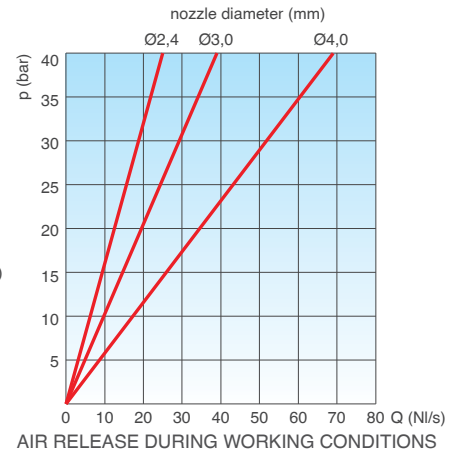
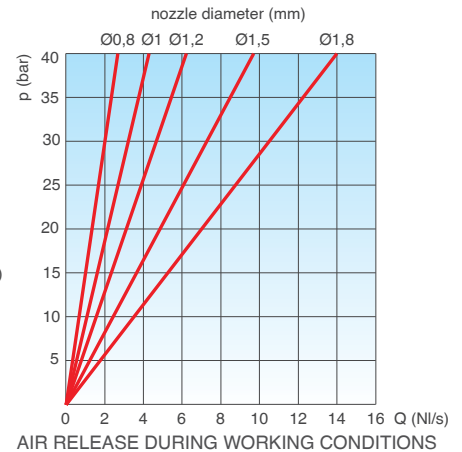
Standard

Designed in compliance with EN-1074/4 and AWWA C-512. Flanges according to EN 1092/2 or ANSI. Epoxy painting applied through fluidized bed technology blue RAL 5005. Changes on the flanges and painting on request.

Weights and dimensions

CONNECTION inch/mm	A mm	B mm	C mm		D mm	Weight Kg
Threaded 1"	117	240	-	-	CH 45	4,0
Threaded 2"	141	295	-	-	CH 70	7,5
Flanged 50	141	305	165	-	-	9,5
Flanged 80	172	315	210	205	-	13,8
Flanged 100	206	370	235	220	-	21,7
Flanged 150	285	515	305	285	-	44,5
Flanged 200	380	625	375	340	-	85,0
Flanged 250	440	785	450	-	-	134,0

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

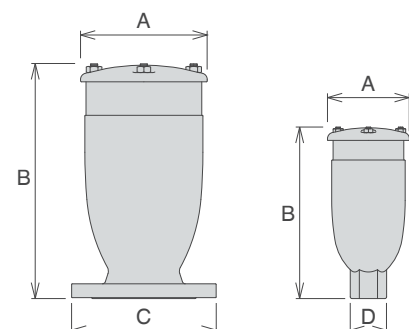


The air flow charts were created in Kg/s from laboratory tests and numerical analysis, then converted using a safety factor.

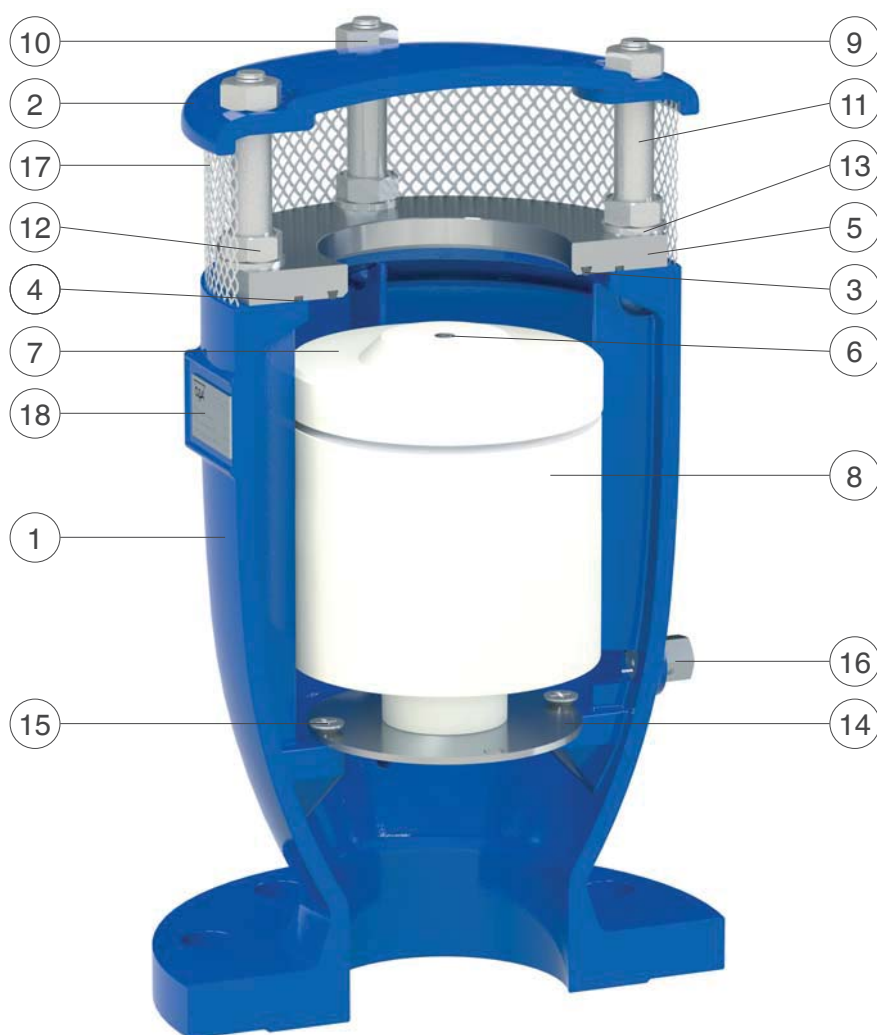
Nozzle choice

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

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



Technical details



N.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 500-7 or GJS 450-10	
2	Cap	ductile cast iron GJS 500-7 or GJS 450-10	
3	O-ring	NBR	EPDM/Viton/silicone
4	O-ring	NBR	EPDM/Viton/silicone
5	Seat	stainless steel AISI 304	stainless steel AISI 316
6	Nozzle Subset	stainless steel AISI 316	
7	Upper flat	polypropylene	
8	Float	polypropylene	
9	Studs	stainless steel AISI 304	stainless steel AISI 316
10	Nuts	stainless steel AISI 304	stainless steel AISI 316
11	Spacers	stainless steel AISI 304	stainless steel AISI 316
12	Nuts	stainless steel AISI 304	stainless steel AISI 316
13	Washers	stainless steel AISI 304	stainless steel AISI 316
14	Deflector	stainless steel AISI 304	stainless steel AISI 316
15	Screws	stainless steel AISI 304	stainless steel AISI 316
16	Drain valve	stainless steel AISI 303	stainless steel AISI 316
17	Screen	stainless steel AISI 304	
18	Tag	stainless steel AISI 304	

Anti water hammer combination air valve Mod. FOX 3F - AS

The CSA air valve Mod. FOX 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 prevent water hammer.



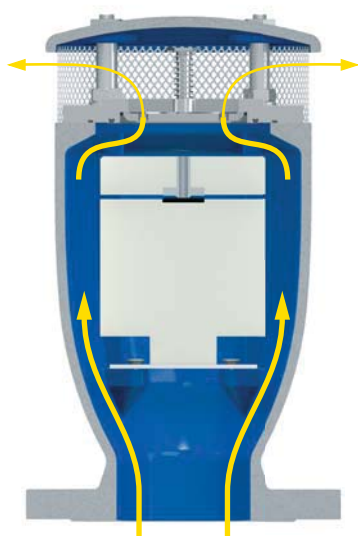
Technical features and benefits

- Single chamber full bore body in ductile cast iron, PN 40 bar rated, provided with internal ribs for consistent and accurate guiding of the mobile block.
- Drainage valve produced by CSA, for chamber control and pressure relief during maintenance.
- Mobile block composed of a cylindrical float and upper disk in solid polypropylene, joined together by the CSA air release system in AISI 316 (pat. Pending). The solid cylindrical floats, obtained by CNC machining only, avoid deformations and ensure a great sliding precision inside the body processed ribs and a perfectly vertical thrust.
- Nozzle and gasket holder, part of CSA air release system, entirely made in AISI 316.
- Maintenance can be easily performed from the top, without removing the air valve from the pipe.
- 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.
- Cover in ductile and screen in stainless steel as a standard execution, to prevent the entrance of insects, with optional outlet for submerged applications.

Applications

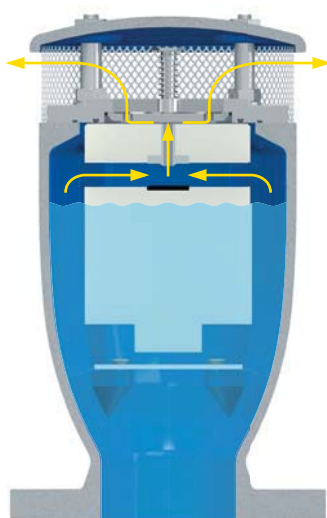
- Main transmission lines.
- Water distribution networks.
- Irrigation systems.
- In general this model is used near pumps, on changes in slope ascending, and at the high points of the pipeline subjected to water hammer.

Operating principle



Controlled air discharge

During the pipe filling it is necessary to avoid rapid closures, responsible of water hammer effects. The FOX 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. FOX 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 FOX 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 the possibility of conveying spurts coming from the closure away from the air valve.



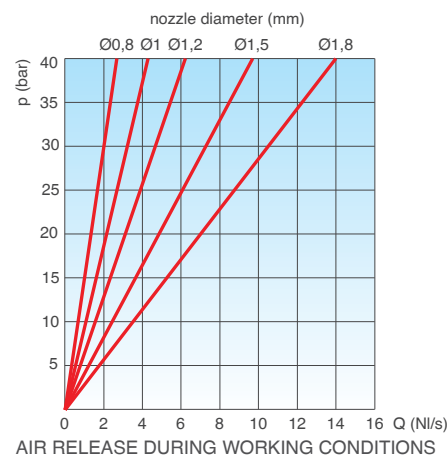
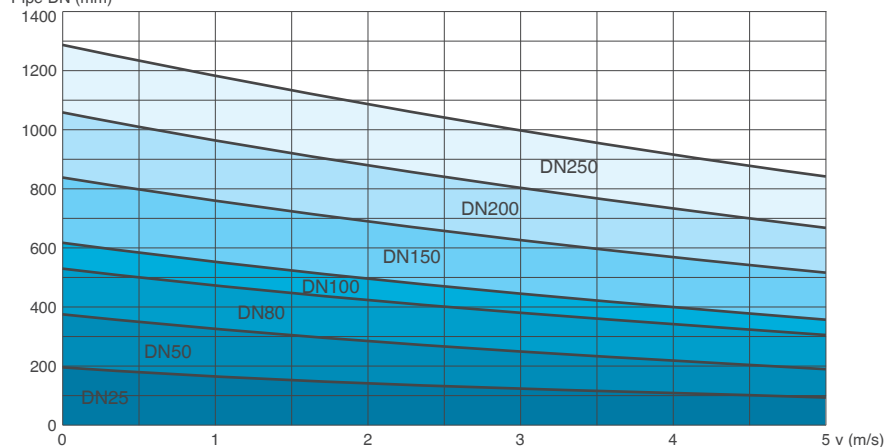
■ The counteracting spring force as well as the sonic nozzles, both responsible of the proper operation of the AS device, can be modified on request according to the project conditions and the transient analysis.

Technical data

Air valve selection chart

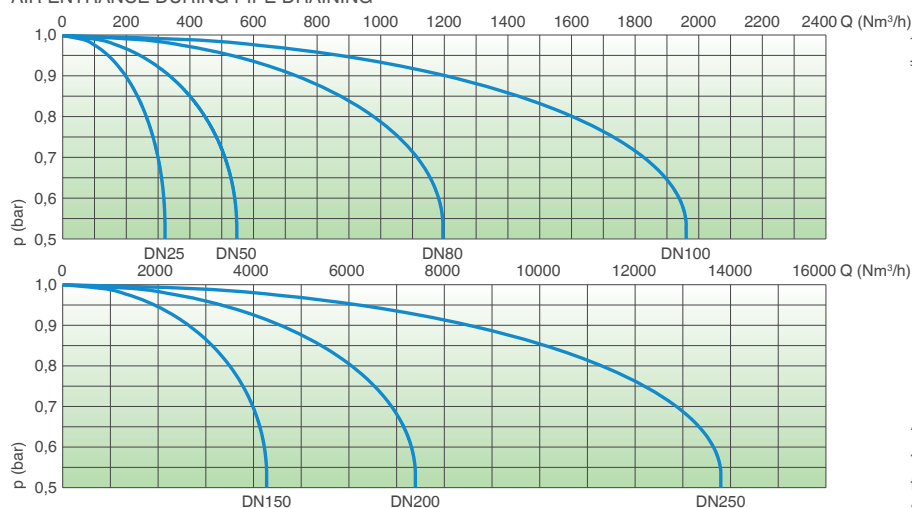
Air valve size as a function of pipeline internal diameter and fluid flow velocity expressed in m/s.

Pipe DN (mm)

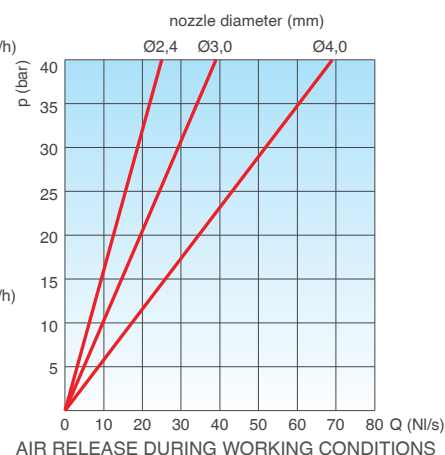


Air flow performance charts

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.

Standard

Designed in compliance with EN-1074/4 and AWWA C-512. Flanges according to EN 1092/2 or ANSI. Epoxy painting applied through fluidized bed technology blue RAL 5005. Changes on the flanges and painting on request.

Weights and dimensions

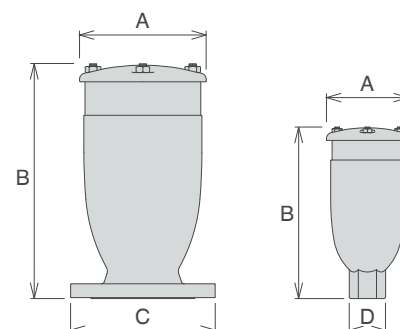
CONNECTION inch/mm	A mm	B mm	C mm		D mm	Weight Kg
Threaded 1"	117	240	-	-	CH 45	4,0
Threaded 2"	141	295	-	-	CH 70	7,5
Flanged 50	141	305	165	-	-	9,5
Flanged 80	172	315	210	205	-	13,8
Flanged 100	206	370	235	220	-	21,7
Flanged 150	285	515	305	285	-	44,5
Flanged 200	380	625	375	340	-	85,0
Flanged 250	440	785	450	-	-	134,0

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

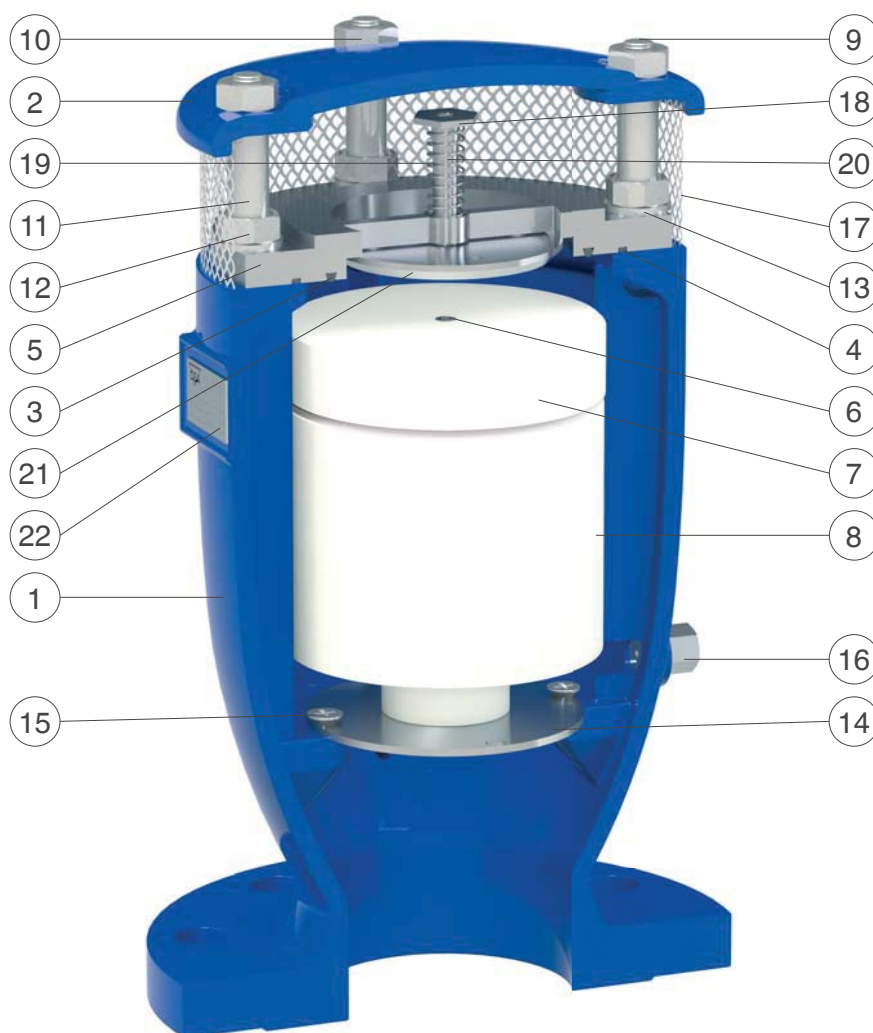
Nozzle choice

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

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



Technical details



N.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 500-7 or GJS 450-10	
2	Cap	ductile cast iron GJS 500-7 or GJS 450-10	
3	O-ring	NBR	EPDM/Viton/silicone
4	O-ring	NBR	EPDM/Viton/silicone
5	Seat	stainless steel AISI 304	stainless steel AISI 316
6	Nozzle subset	stainless steel AISI 316	
7	Upper flat	polypropylene	
8	Float	polypropylene	
9	Studs	stainless steel AISI 304	stainless steel AISI 316
10	Nuts	stainless steel AISI 304	stainless steel AISI 316
11	Spacers	stainless steel AISI 304	stainless steel AISI 316
12	Nuts	stainless steel AISI 304	stainless steel AISI 316
13	Washers	stainless steel AISI 304	stainless steel AISI 316
14	Deflector	stainless steel AISI 304	stainless steel AISI 316
15	Screws	stainless steel AISI 304	stainless steel AISI 316
16	Drain valve	stainless steel AISI 303	stainless steel AISI 316
17	Screen	stainless steel AISI 304	
18	Spring guide nut (from DN 100)	stainless steel AISI 303	stainless steel AISI 316
19	Spring	stainless steel AISI 302	
20	AS shaft	stainless steel AISI 303	stainless steel AISI 316
21	AS flat	stainless steel AISI 304	stainless steel AISI 316
22	Tag	stainless steel AISI 304	

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



Combination air valve Mod. FOX 3F - HP

The CSA air valve Mod. FOX 3F HP 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.



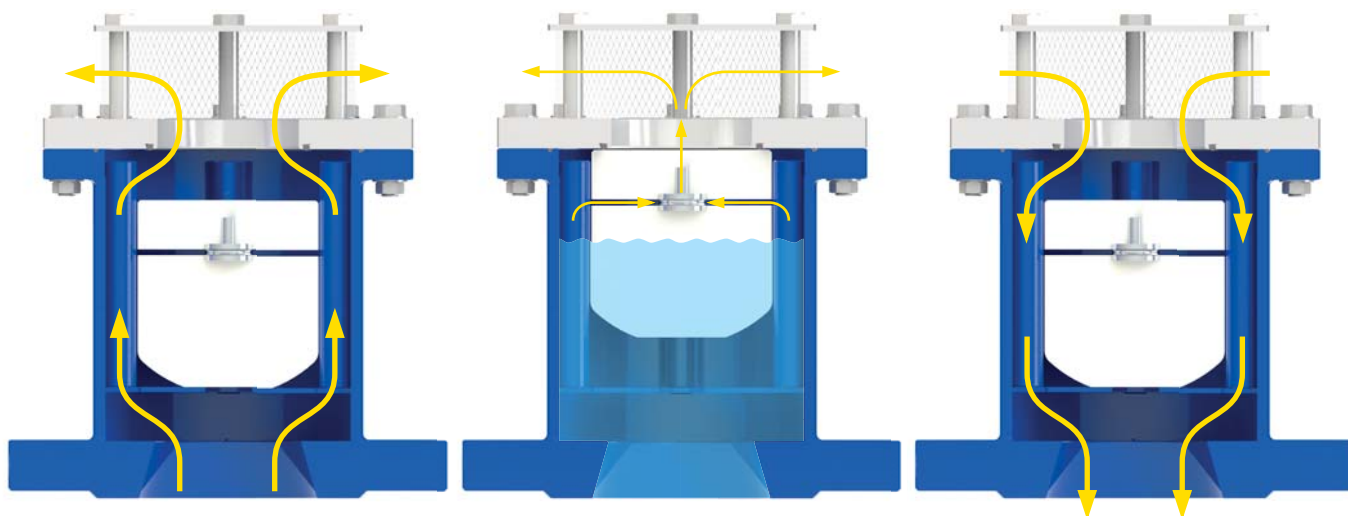
Technical features and benefits

- Body in carbon welded steel, PN 64 bar rated, provided with internal spacers for consistent and accurate guiding of the mobile block.
- In general supplied with fixed flanges according to EN 1092/2 or different on request.
- Mobile block composed of a cylindrical float and upper disk in solid polypropylene, joined together by the CSA air release system in AISI 316 (pat. Pending). The solid cylindrical floats, obtained by CNC machining, avoid deformations and ensure a great sliding precision inside the body processed ribs and a perfectly vertical thrust.
- Nozzle and gasket holder, part of CSA air release system, entirely made in AISI 316 and designed with gasket compression control to prevent aging process and consequent leakage during working conditions.
- Maintenance can be easily performed from the top, without removing the air valve from the pipe.
- Mesh and cap in stainless steel.

Applications

- Main transmission lines.
- Mines.
- Dams and high pressure systems
- In general this model is used on changes in slope descending and at the high points of the pipeline for those locations exposed to high pressure conditions when ductile cast iron is not acceptable.

Operating principle



Discharge of large volumes of air

During the pipe filling it is necessary to discharge air as water flows in. The FOX 3F HP, thanks to an aerodynamic 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



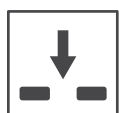
■ **Vacuum breaker version Mod. FOX 2F HP** to allow the entrance and discharge of large volumes of air only. This model is normally recommended in changes in slope ascending, long ascending segments, dry fire systems, and wherever the air release won't be required.



■ **Version for submerged applications, SUB series**, available both for FOX 3F HP and 2F HP 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.



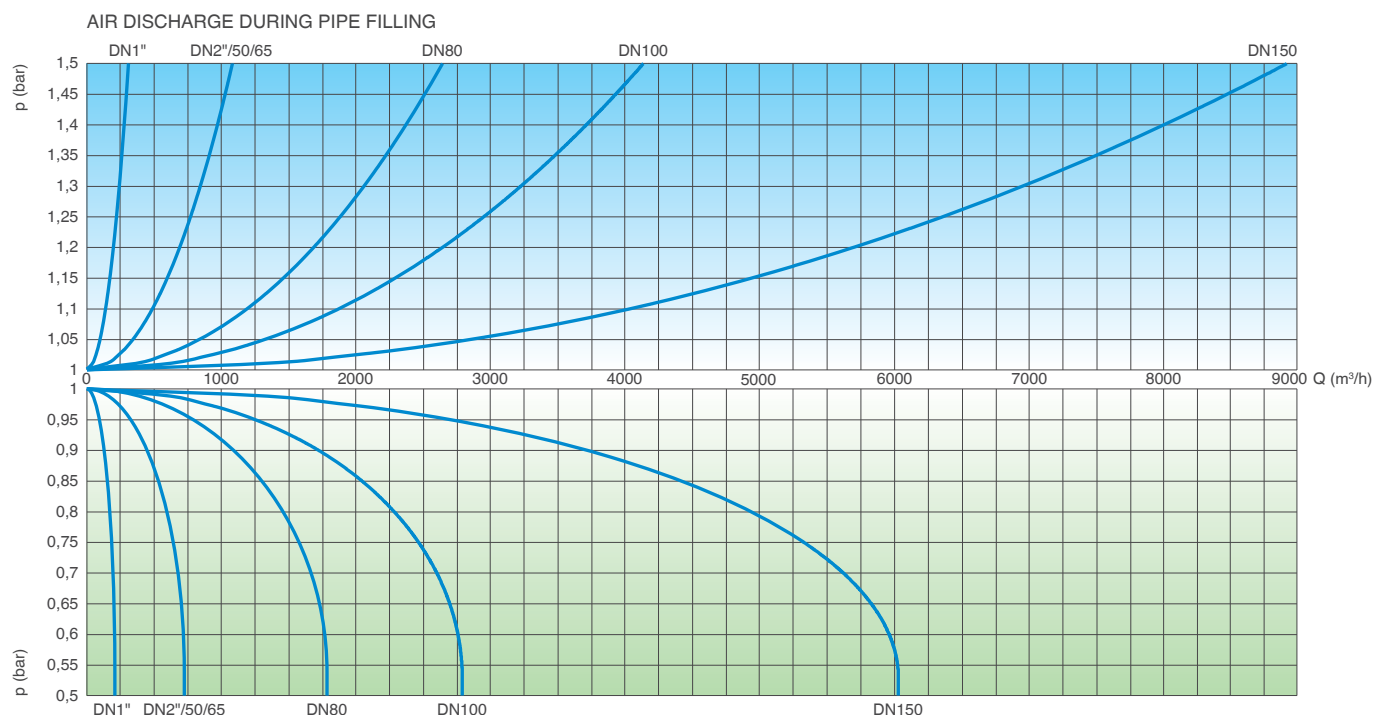
■ **Version for air discharge only EO series**, available both for FOX 3F HP and 2F HP models. The most important application of EO is to allow the air valve installation in those locations of the system where HGL may drop below the pipe profile, and to any other node where for project requirements air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



■ **Version for air entrance only IO series**, available for FOX 2F HP 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



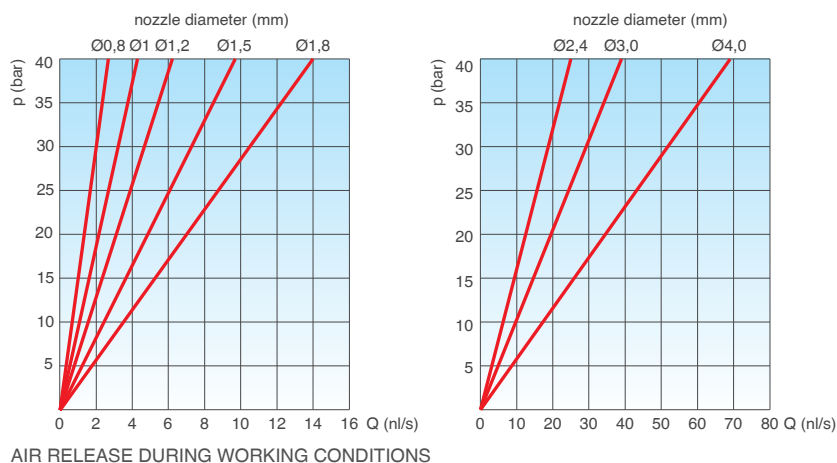
The air flow charts were created in Kg/s from laboratory tests and numerical analysis, then converted using a safety factor.

Working conditions

Treated water max. 60° C. Version for high temperature available on request.
Maximum pressure 64 bar.
Min. press. 0,2 bar. Lower press. on request.

Standard

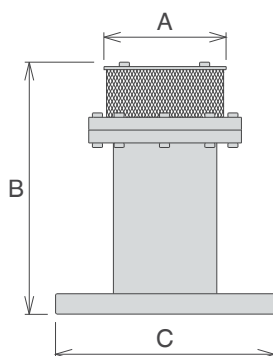
Designed in compliance with EN-1074/4.
Flanges according to EN 1092/2, ANSI.
Epoxy painting applied through fluidized bed technology blue RAL 5005.
Changes and variations on the flanges and painting details available on request.



Weights and dimensions

CONNECTION inch/mm	A mm	B mm	C mm	Weight Kg
Threaded 1"	165	240	180	4,2
Threaded 2"	165	240	180	5,0
Flanged 50	165	240	180	6,0
Flanged 65	185	240	180	6,0
Flanged 80	200	265	205	9,2
Flanged 100	235	334	205	13,0
Flanged 150	300	380	250	35,0

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

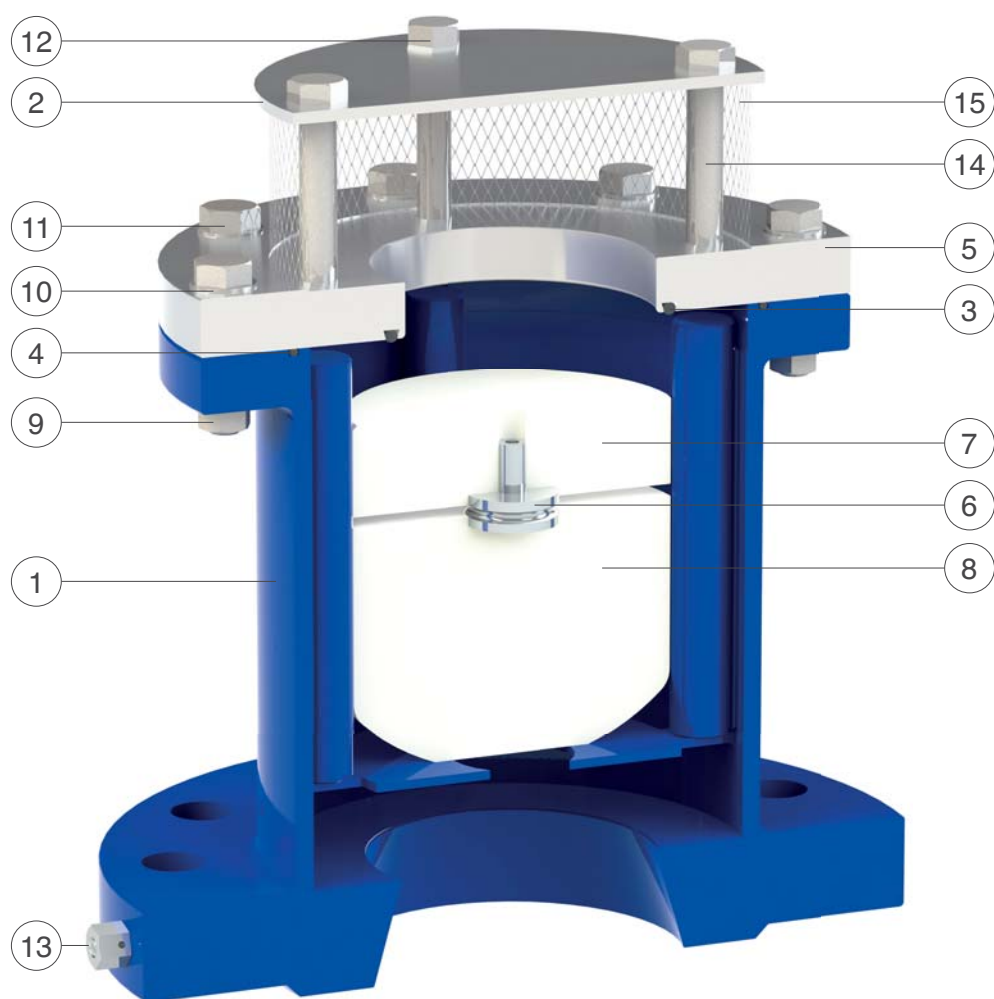


Nozzle choice

	PN 10	PN 16	PN 25	PN 40	PN 64
DN 1"	1,2	1,2	1	0,8	0,8
DN 2"/50/65	1,5	1,2	1	0,8	0,8
DN 80	1,8	1,5	1,2	1	0,8
DN 100	2,4	1,8	1,8	1,2	1
DN 150	4	3	2,4	1,8	1,2

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

Technical details



N.	Component	Standard material	Optional
1	Body	painted steel Fe 37	
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 304	stainless steel AISI 316
6	Nozzle Subset	stainless steel AISI 316	
7	Upper flat	polypropylene	
8	Float	polypropylene	
9	Nut	stainless steel AISI 304	stainless steel AISI 316
10	Washers	stainless steel AISI 304	stainless steel AISI 316
11	Screws	stainless steel AISI 304	stainless steel AISI 316
12	Screws	stainless steel AISI 304	stainless steel AISI 316
13	Drain valve	stainless steel AISI 303	stainless steel AISI 316
14	Spacers	stainless steel AISI 304	stainless steel AISI 316
15	Filter	stainless steel AISI 304	



Anti water hammer combination air valve

Mod. FOX 3F - AS - HP

The CSA air valve Mod. FOX 3F AS HP 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 prevent water hammer.



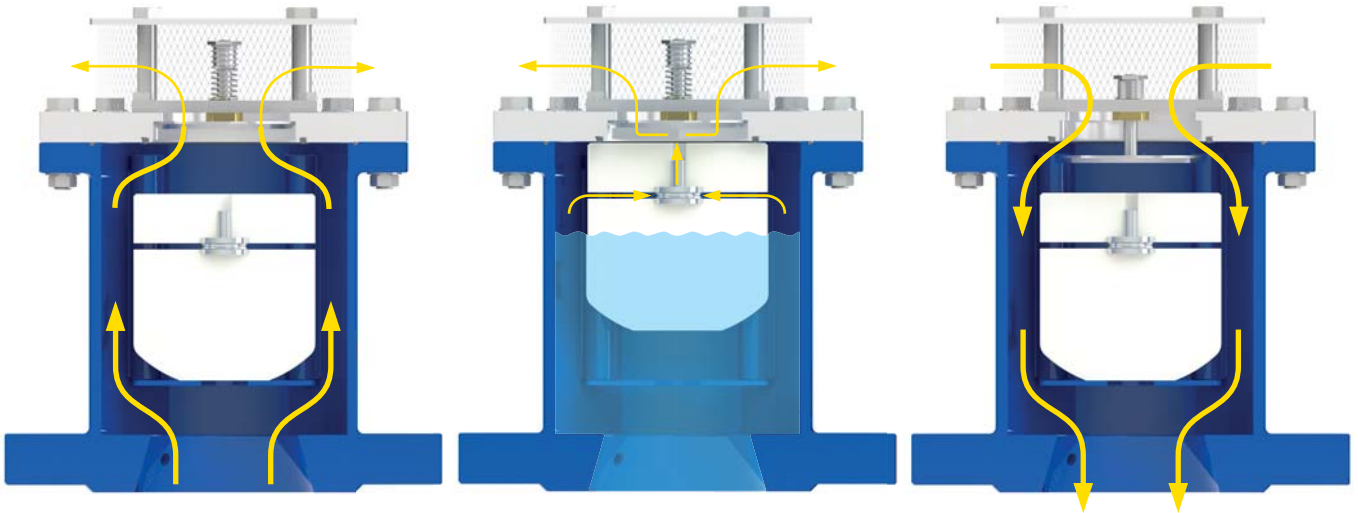
Technical features and benefits

- Body in carbon welded steel, PN 64 bar rated, provided with internal spacers for consistent and accurate guiding of the mobile block.
- In general supplied with fixed flanges according to EN 1092/2 or different on request.
- Mobile block composed of a cylindrical float and upper disk in solid polypropylene, joined together by the CSA air release system in AISI 316 (pat. Pending). The solid cylindrical floats, obtained by CNC machining only, avoid deformations and ensure a great sliding precision inside the body processed ribs and a perfectly vertical thrust.
- Nozzle and gasket holder, part of CSA air release system, entirely made in AISI 316 and designed with gasket compression control to prevent aging process and consequent leakage during working conditions.
- Maintenance can be easily performed from the top, without removing the air valve from the pipe.
- 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.

Applications

- Main transmission lines.
- Mines.
- Dams and high pressure systems.
- In general this model is used on changes in slope ascending, and at the high points of the pipeline subjected to water hammer.

Operating principle



Controlled air discharge

During the pipe filling it is necessary to avoid rapid closures, responsible of water hammer effects. The FOX 3F AS HP, 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. FOX 2F AS HP**, 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 FOX 3F AS HP and 2F AS HP 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.

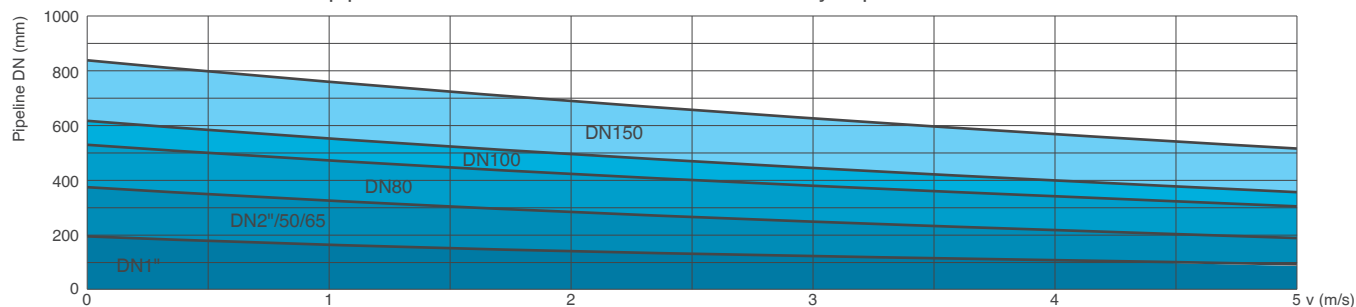


■ The counteracting spring force as well as the sonic nozzles, both responsible of the proper operation of the AS device, can be modified on request according to the project conditions and the transient analysis.

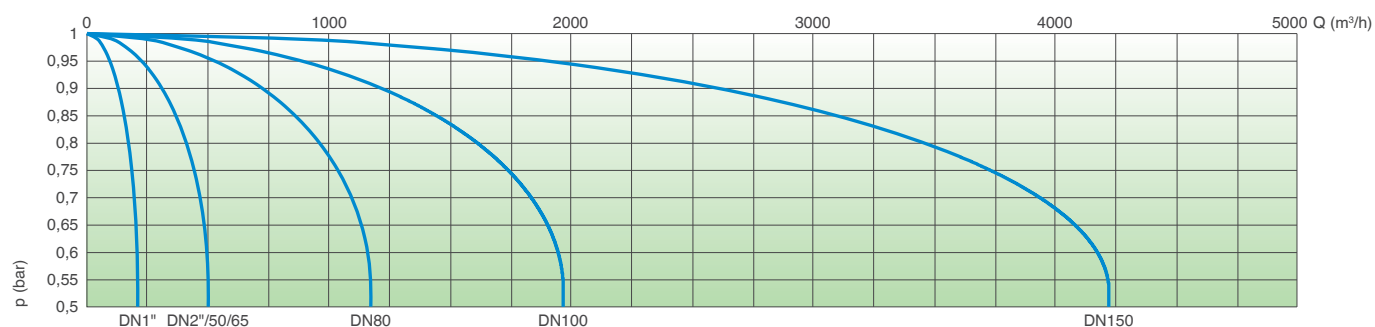
Technical data

Air flow selection chart

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



Air flow performance charts



AIR ENTRANCE DURING PIPE DRAINING

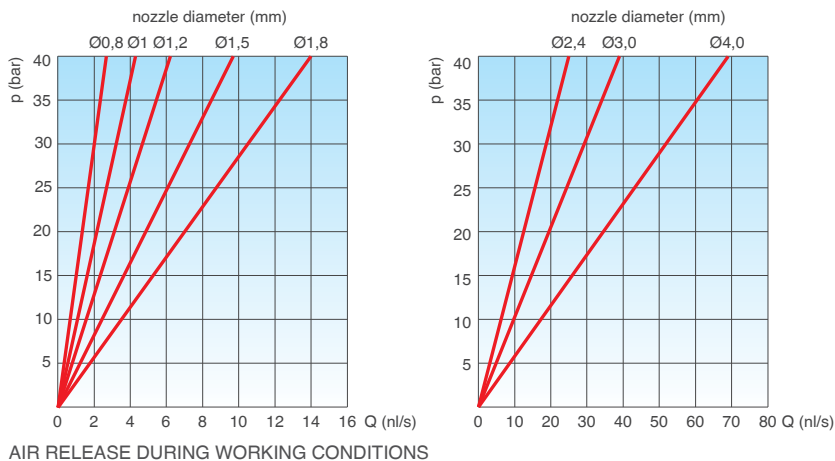
The air flow charts were created in Kg/s from laboratory tests and numerical analysis, then converted using a safety factor.

Working conditions

Treated water max. 60° C. Version for high temperature available on request.
Maximum pressure 64 bar.
Min. press. 0,2 bar. Lower press. on request.

Standard

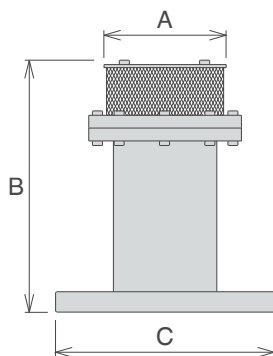
Designed in compliance with EN-1074/4.
Flanges according to EN 1092/2, ANSI.
Epoxy painting applied through fluidized bed technology blue RAL 5005.
Changes and variations on the flanges and painting details available on request.



AIR RELEASE DURING WORKING CONDITIONS

Weights and dimensions

CONNECTION inch/mm	A mm	B mm	C mm	Weight Kg
Threaded 1"	165	240	180	4,2
Threaded 2"	165	240	180	5,0
Flanged 50	165	240	180	6,0
Flanged 65	185	240	180	6,0
Flanged 80	200	265	205	9,2
Flanged 100	235	334	205	13,0
Flanged 150	300	380	250	35,0



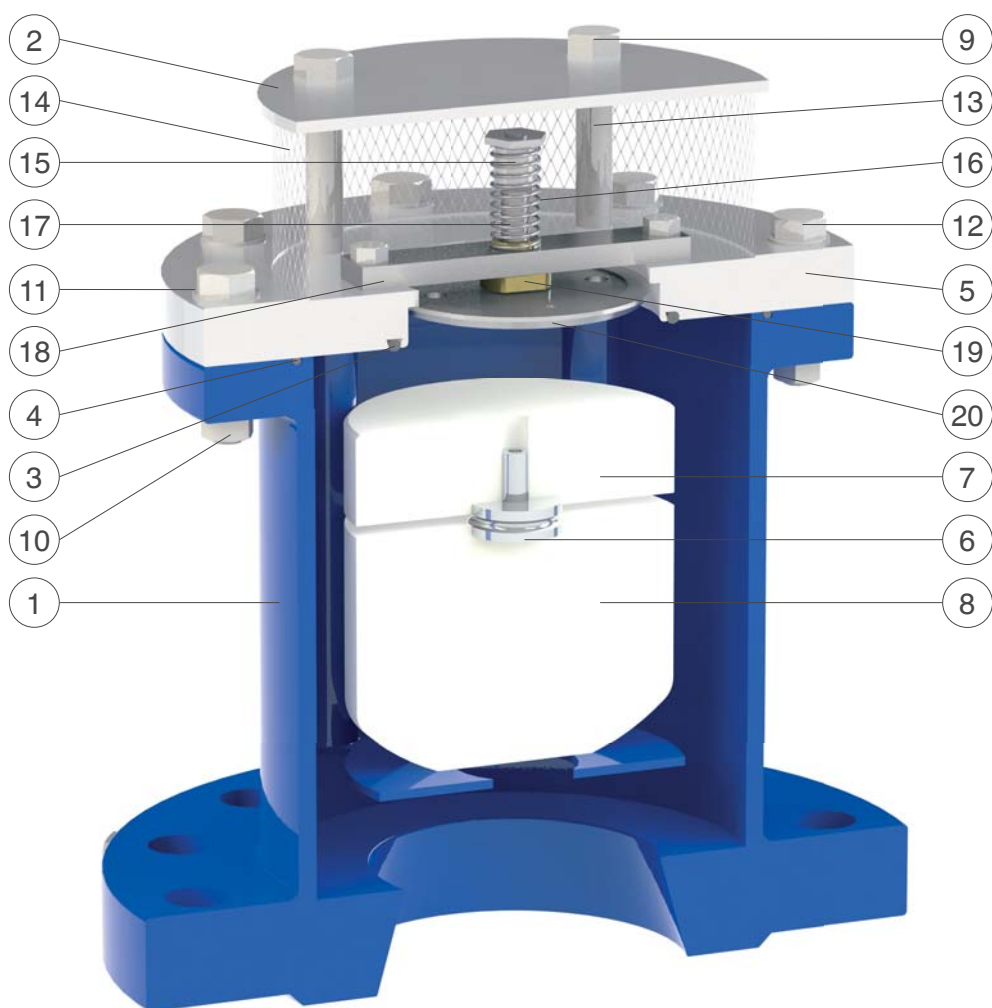
Nozzle choice

	PN 10	PN 16	PN 25	PN 40	PN 64
DN 1"	1,2	1,2	1	0,8	0,8
DN 2"/50/65	1,5	1,2	1	0,8	0,8
DN 80	1,8	1,5	1,2	1	0,8
DN 100	2,4	1,8	1,8	1,2	1
DN 150	4	3	2,4	1,8	1,2

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

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

Technical details



N.	Component	Standard material	Optional
1	Body	painted steel Fe 37	
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 304	stainless steel AISI 316
6	Nozzle subset	stainless steel AISI 316	
7	Upper flat	polypropylene	
8	Float	polypropylene	
9	Screws	stainless steel AISI 304	stainless steel AISI 316
10	Nuts	stainless steel AISI 304	stainless steel AISI 316
11	Washer	stainless steel AISI 304	stainless steel AISI 316
12	Screws	stainless steel AISI 304	stainless steel AISI 316
13	Spacers	stainless steel AISI 304	stainless steel AISI 316
14	Filter	stainless steel AISI 304	
15	Spring guide nut	stainless steel AISI 303	stainless steel AISI 316
16	Spring	stainless steel AISI 302	
17	AS shaft	stainless steel AISI 303	stainless steel AISI 316
18	Support with screws (in DN150)	stainless steel AISI 304	stainless steel AISI 316
19	Guiding nut (in DN150)	Delrin (polyoxymethylene)	
20	AS flat	stainless steel AISI 304	stainless steel AISI 316

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



Anti surge combination air valve Mod. FOX 3F - RFP

The CSA air valve Mod. FOX 3F RFP has been designed to allow the release of air pockets accumulated in working conditions, the entrance of large volumes of air in case of pipe draining or bursts and to prevent pipeline damages coming from pressure transients, associated with high air outflow velocities.



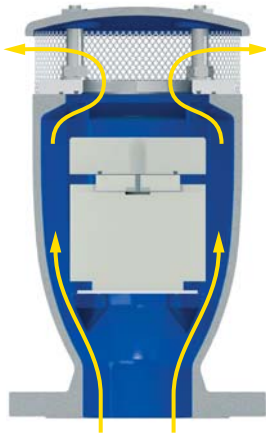
Technical features and benefits

- Uncontrolled pipeline filling operations and transient events will inevitably generate the rapid closure of the air valves installed along the system, with consequent damages. The CSA air valve FOX 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 closing and the risk of drowning, compared to standard combination air valves, are reduced.
- Single chamber full bore body in ductile cast iron, PN 40 bar rated, provided with internal ribs for consistent and accurate guiding of the mobile block.
- Mobile block composed of the main float and upper disk, joined together by the CSA air release system in AISI 316 (pat. pending), and an additional anti surge obturator.
- Nozzle and gasket holder, part of CSA air release system, entirely made in AISI 316.
- Cover in ductile and screen in stainless steel as a standard execution, to prevent the entrance of insects, with optional outlet for submerged applications.

Applications

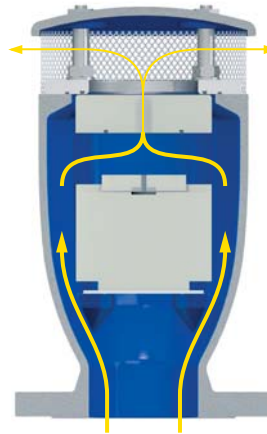
- Main transmission lines.
- Water distribution networks.
- Irrigation systems.
- In general this model is used, in combination with CSA AS technology, on changes in slope and high points of the profile to provide the best air control and safety of the pipeline.

Operating principle



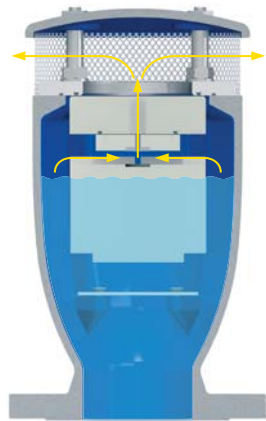
Discharge of large volumes of air

During the pipe filling it is necessary to discharge air as water flows in. The FOX 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 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. FOX 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 FOX 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 the possibility of conveying spurts coming from the closure away from the air valve.

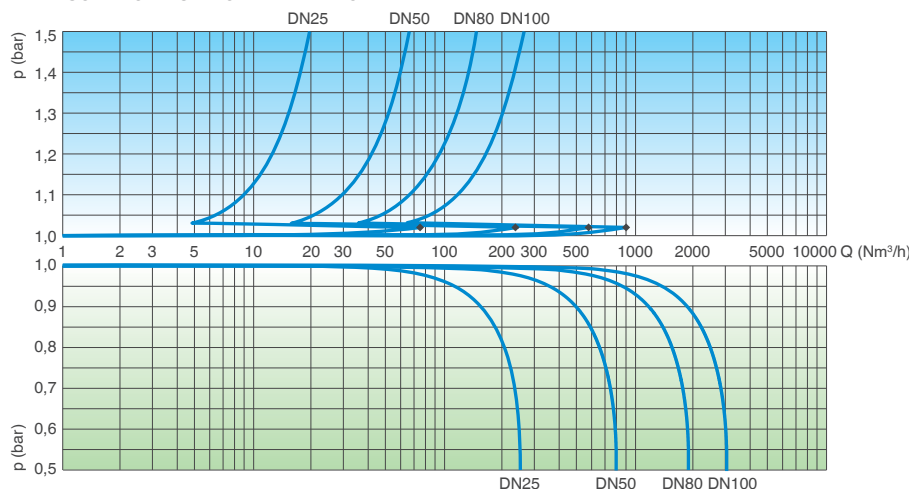


■ **Version for air discharge only EO series**, available both for FOX 3F RFP and 2F RFP models. The most important application of EO is to allow the air valve installation in those locations of the system where HGL may drop below the pipe profile, and to any other node where for project requirements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

Technical data

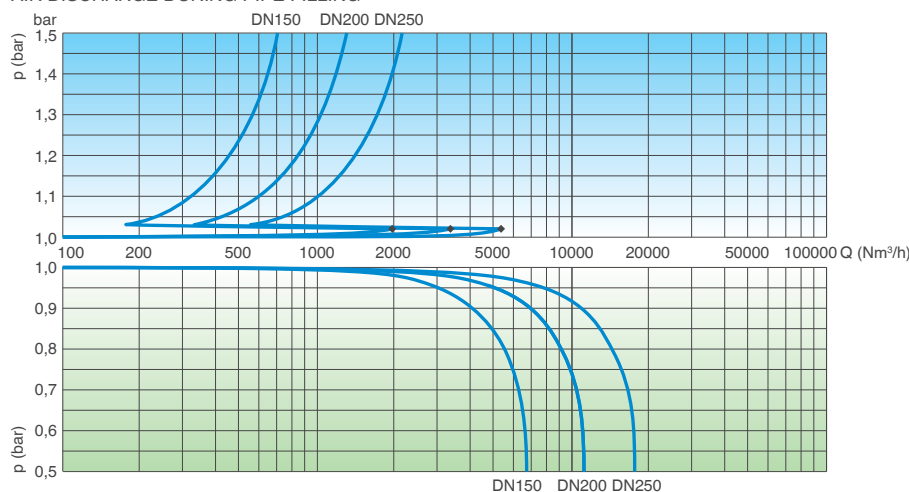
Air flow performance charts

AIR DISCHARGE DURING PIPE FILLING



AIR ENTRANCE DURING PIPE DRAINING

AIR DISCHARGE DURING PIPE FILLING



AIR ENTRANCE DURING PIPE DRAINING

Working conditions

Treated water max. 60°C.

Max. pressure 40 bar.

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

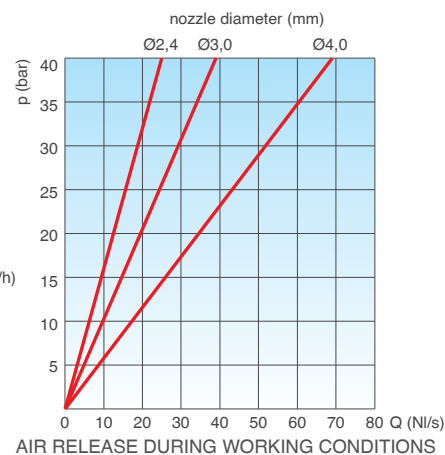
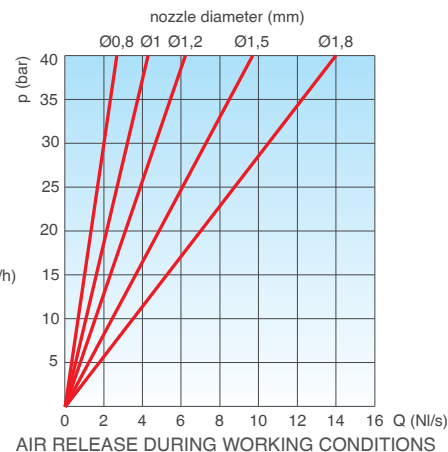
Standard

Designed in compliance with EN-1074/4 and AWWA C-512. Flanges according to EN 1092/2 or ANSI. Epoxy painting applied through fluidized bed technology blue RAL 5005. Changes on the flanges and painting on request.

Weights and dimensions

CONNECTION inch/mm	A mm	B mm	C mm	D mm	Weight Kg
Threaded 1"	117	240	-	-	CH 45 4,0
Threaded 2"	141	295	-	-	CH 70 7,5
Flanged 50	141	305	165	-	- 9,5
Flanged 80	172	315	210	205	- 13,8
Flanged 100	206	370	235	220	- 21,7
Flanged 150	285	515	305	285	- 44,5
Flanged 200	380	625	375	340	- 85,0
Flanged 250	440	785	450	-	- 134,0

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

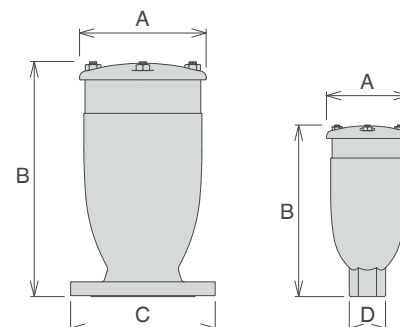


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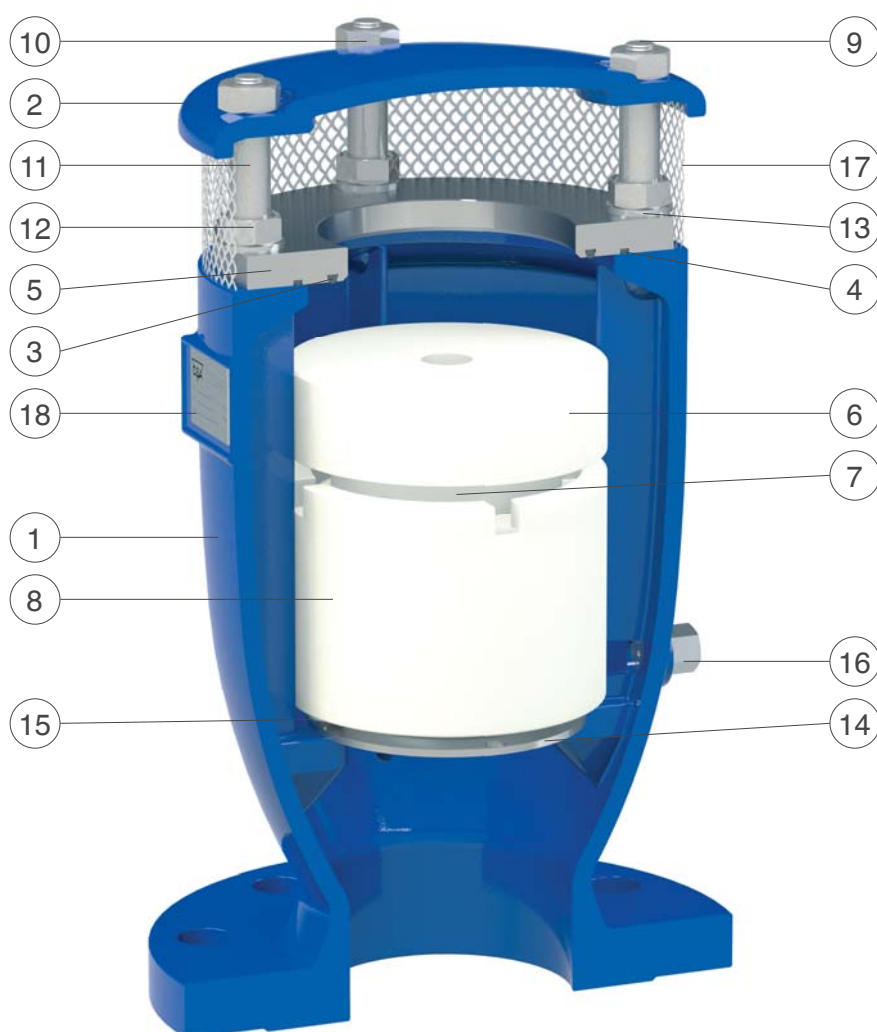
Nozzle choice

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

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



Technical details



N.	Component	Standard material	Optional
1	Body	ductile cast iron GJS 500-7 o GJS 450-10	
2	Cap	ductile cast iron GJS 500-7 or GJS 450-10	
3	O-ring	NBR	EPDM/Viton/silicone
4	O-ring	NBR	EPDM/Viton/silicone
5	Seat	stainless steel AISI 304	stainless steel AISI 316
6	RFP flat with o-ring	polypropylene and NBR	EPDM/Viton/silicone
7	Upper flat with nozzle subset	polypropylene and stainless steel AISI 316	
8	Float	polypropylene	
9	Studs	stainless steel AISI 304	stainless steel AISI 316
10	Nuts	stainless steel AISI 304	stainless steel AISI 316
11	Spacers	stainless steel AISI 304	stainless steel AISI 316
12	Nuts	stainless steel AISI 304	stainless steel AISI 316
13	Washers	stainless steel AISI 304	stainless steel AISI 316
14	Deflector	stainless steel AISI 304	stainless steel AISI 316
15	Screws	stainless steel AISI 304	stainless steel AISI 316
16	Drain valve	stainless steel AISI 303	stainless steel AISI 316
17	Screen	stainless steel AISI 304	
18	Tag	stainless steel AISI 304	