



Product features and benefits

- Single chamber with a golden ratio design to generate fantastic outline.
- Full bore and reduced bore body in ductile iron and stainless steel, maximum PN 40 bar rated, provided with internal ribs for accurate guiding of the floats.
- Aerodynamic flow path of air discharge, air release and air entrance.
- Tangential drainage to ensure fully drain.
- Composed of cylindrical floats achieve miscellaneous functions.
- Replacement between three floats and two floats can be easily performed from the top.
- Stainless steel plate under the bottom float to eliminate surged flow impact to the floats in short time.
- Nozzle can be different port size to fit for demands of different valve models.
- Flat venting screen in stainless steel as a standard to prevent the entrance of insects, while umbrella venting screen as a premium.

Design and test standard

- Designed in compliance with EN 1074/4 and AWWA C 512.
- Epoxy painting applied through fluidized bed technology blue RAL 5005.
- Customized changes on the flanges and painting on request.

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.

Working conditions

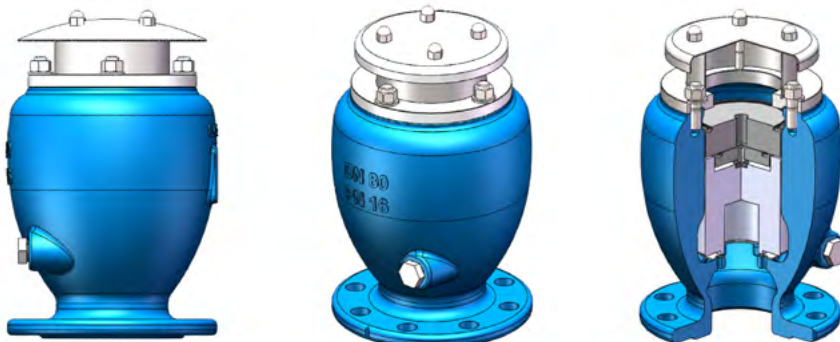
Medium	Water
Temperature	0-70°
Max. pressure	40bar
Min. pressure	0,2bar (lower on request)

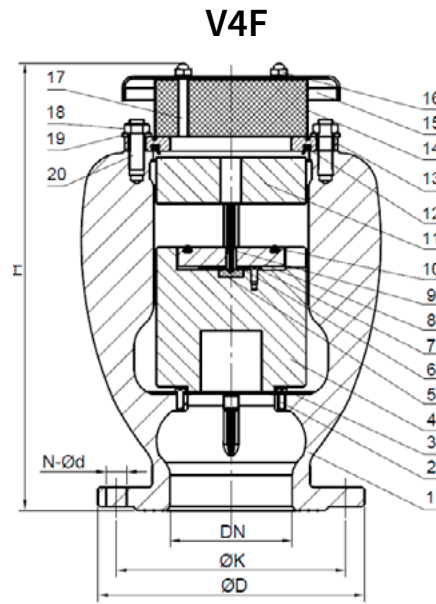
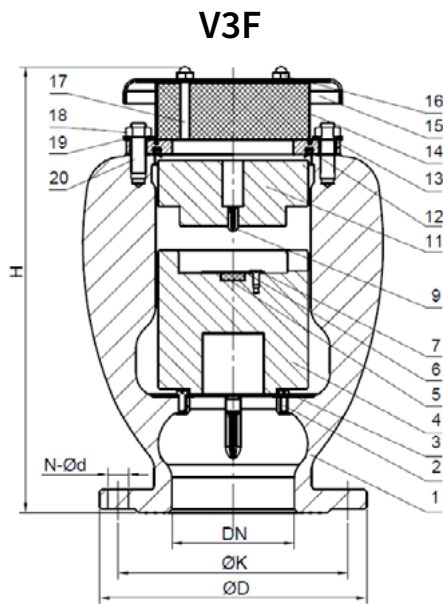
Size

- DN50 300 for Ductile Iron
- DN50 200 for Stainless Steel (CF8/CF8M/Duplex)

Flange standard

- BS EN 1092 2 PN10 16 25 40
- ANSI Class 125 150 250





Combined air release valve V3F

The V3F air valve is a three-functional valve with inlet, outlet and purge functions. Its main feature is being manufactured with highly resistant, non-adherent materials and without the need for centering or guiding shafts, which gives it a range of use up to 40 bar of pressure. Inside, it has two solid and machined impact resistant floats with high buoyancy, a simple design with great sensitivity in both venting/intake and purging functions where the spray effect, so detrimental to the drains, is removed. The purge hole section is configurable, so it can be adapted to the characteristics of the installation. Sealing is achieved through two joints easily replaceable.

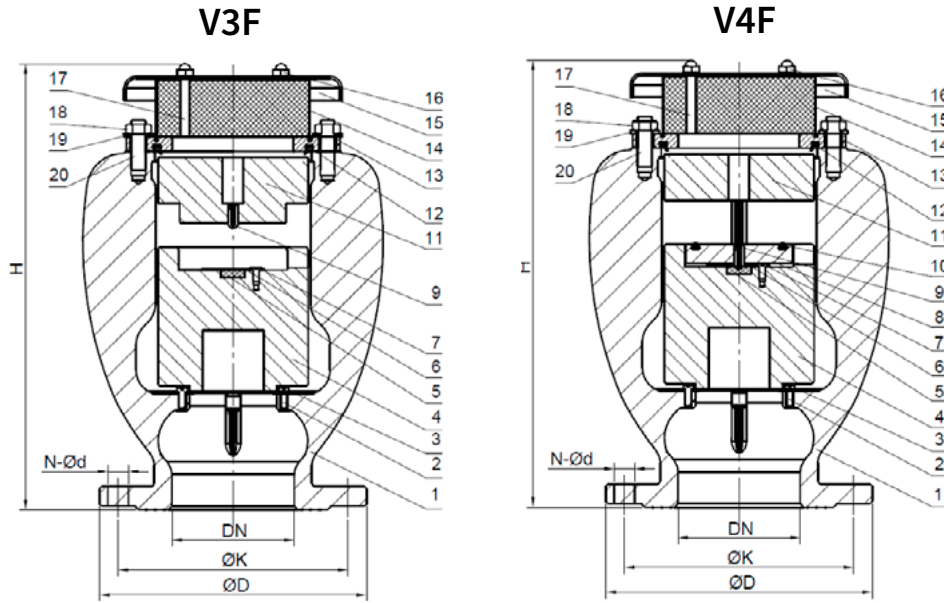
It has a side connection for cleaning, sampling, or depressurizing for maintenance.

It is, therefore, a valve with a great venting capacity, fast action, and high sensitivity, with low maintenance, capable of closing at very low pressure, with robust and simple construction to avoid unforeseen incidents, making it ideal to protect the installation. It is finished with an insect-proof mesh that allows venting and is crowned by a stainless steel piece that closes and protects the equipment.

Combined air release valve V4F

Based on the design of its predecessor the V3F, this air valve incorporates a fourth function and a third closing disc. This disc allows a premature closing at a certain pressure differential, reducing then the total passage section to a significantly smaller orifice, which forces a slow air evacuation, performing the slowing down filling function and therefore, reducing water hammer. This process only occurs during filling, since during emptying and purging, the flow graph and the operating characteristics are both the same.

Constructively, this air valve, compared to the V3F, incorporates one more disc, making it a total of 3, and an additional function. The elements are of the same material and characteristics as those described for its predecessor, as well as the simplicity of maintenance, impact resistance, and non-adherent effect. The body of both air valves is the same, so replacing the floats is enough to switch from one type to another.



Materials

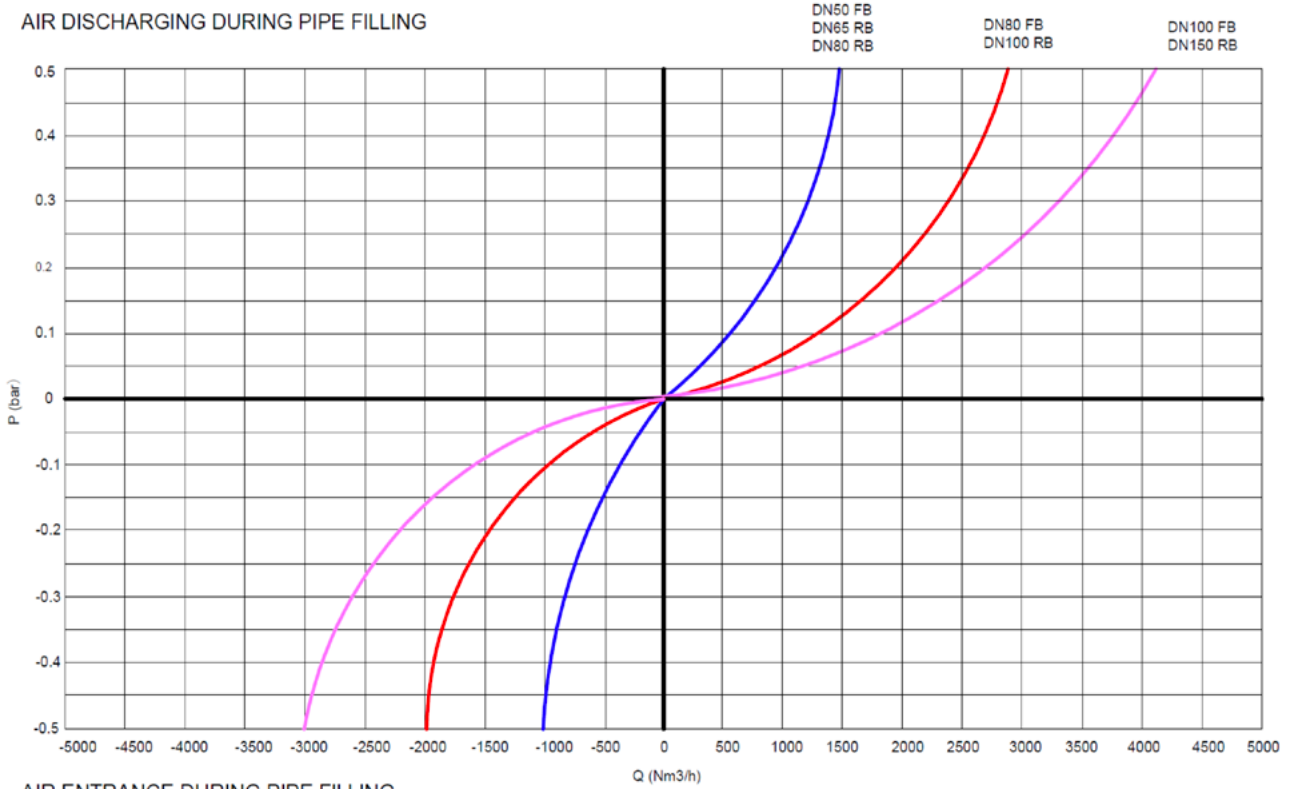
ITEM	PART NAME	MATERIAL
1	Valve body	D1
2	Screw	A2
3	Plate ring	SS304
4	Lower float	PP
5	Seal	EPDM
6	Seal retainer	SS304
7	Screw	A2
8	Middle float	PP
9	Nozzle	SS304
10	O Ring	NBR

ITEM	PART NAME	MATERIAL
11	Top float	PP
12	Seal ring	FKM
13	Top flange	SS304
14	Screen	SS304
15	Cap	SS304
16	Screw	A2
17	Bolt	A2
18	Nut	A2
19	Washer	A2
20	Bolt	A2

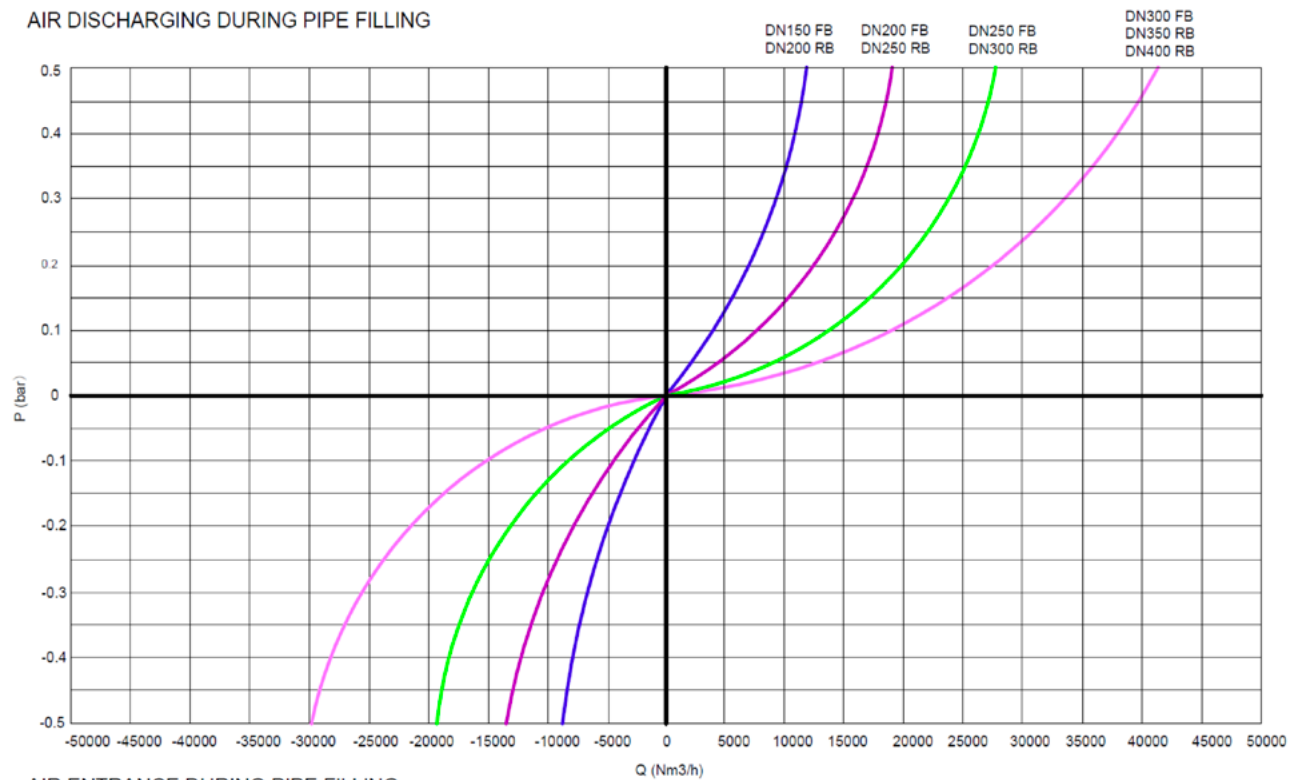
Weights and dimensions

DN	øD (mm)				øK (mm)				N-ød (mm)				Full bore		Reduced bore	
	PN10	PN16	PN25	PN40	PN10	PN16	PN25	PN40	PN10	PN16	PN25	PN40	H (mm)	Weight (kg)	H (mm)	Weight (kg)
50	165				ø125				ø4-19				220	14	-	-
80	200				ø160				ø8-19				300	25	220	16
100	220		235		ø180		ø190		ø8-19		ø8-23		370	33	300	27
150	285		300		ø240		ø250		ø8-23		ø8-28		520	68	370	38
200	340		360	375	ø295		ø310	ø320	8ø23	12ø23	12ø28	12ø31	650	125	520	74
250	395	405	425	450	ø350	ø355	ø370	ø385	12ø23	12ø28	12ø31	12ø34	800	180	650	135
300	445	460	485	515	ø400	ø410	ø430	ø450	12ø23	12ø28	16ø31	16ø34	980	280	800	200

Air performance chart of V3F

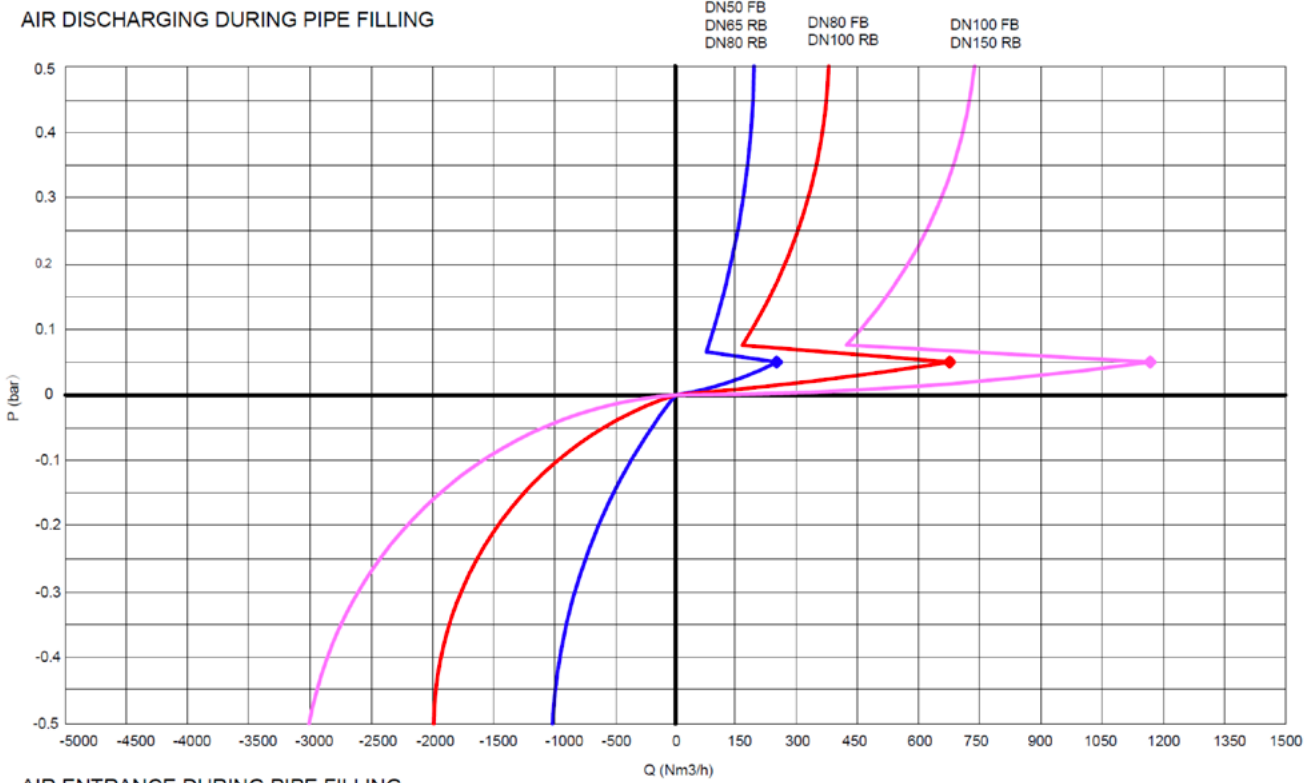


AIR ENTRANCE DURING PIPE FILLING

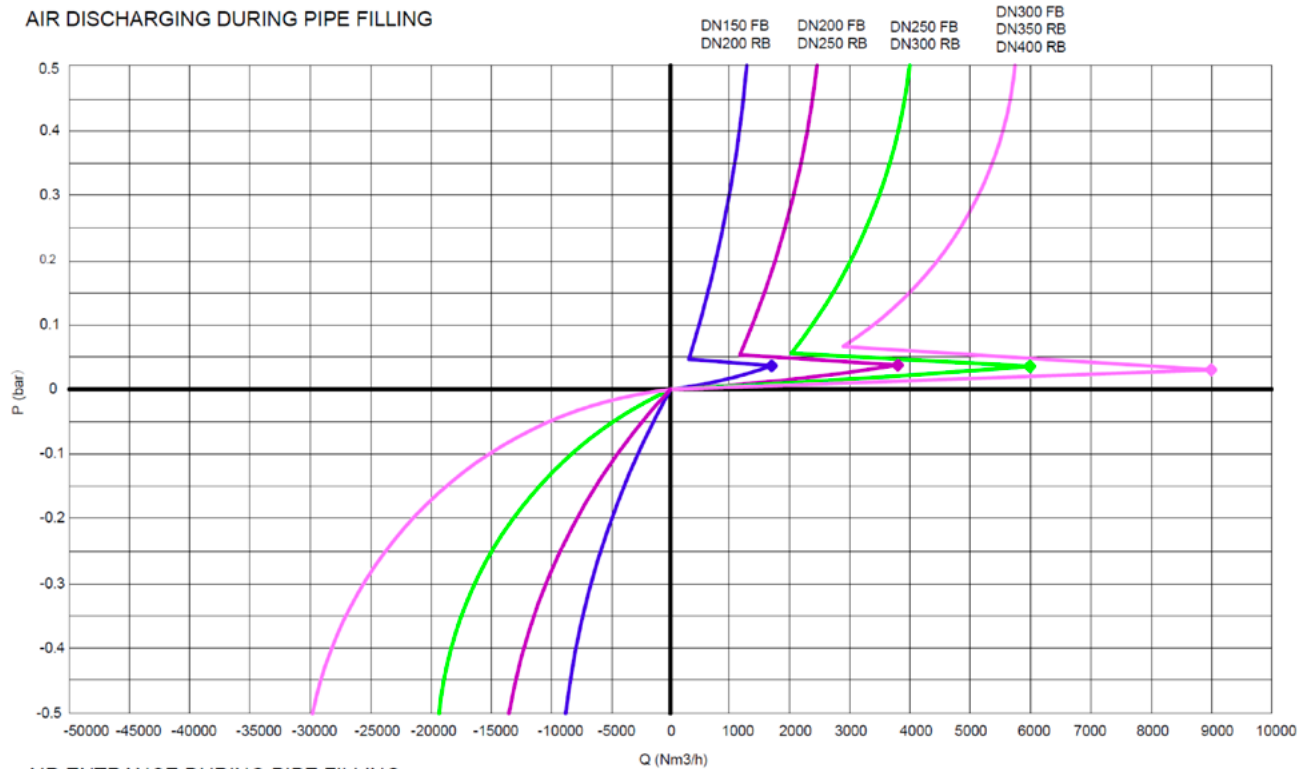


AIR ENTRANCE DURING PIPE FILLING

Air performance chart of V4F

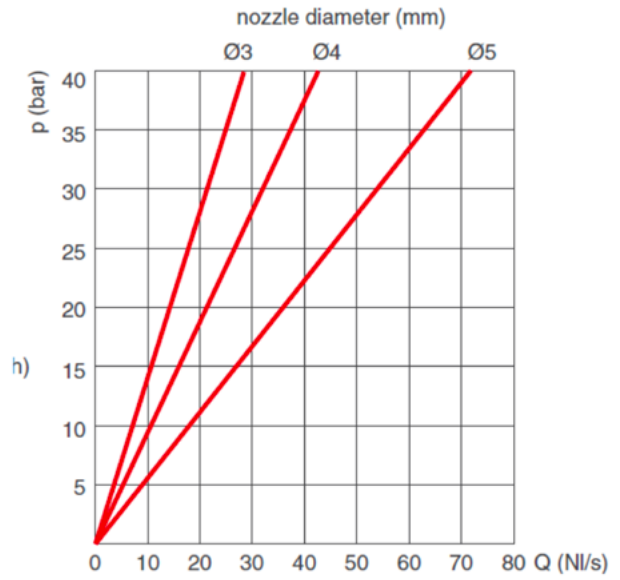
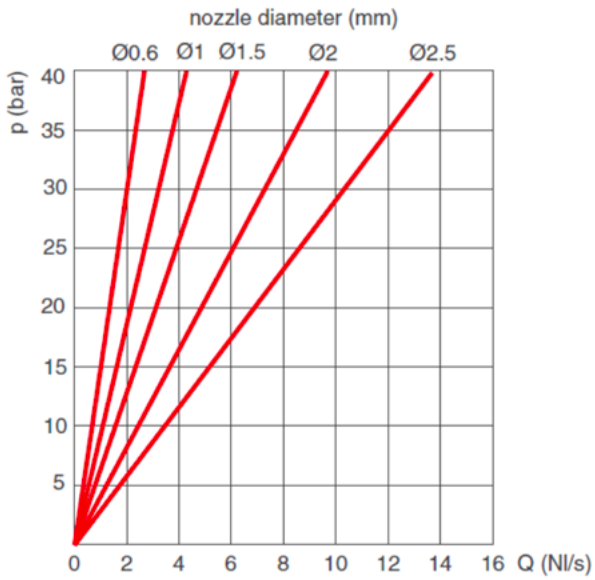


AIR ENTRANCE DURING PIPE FILLING



AIR ENTRANCE DURING PIPE FILLING

Air release chart of V4F & V3F

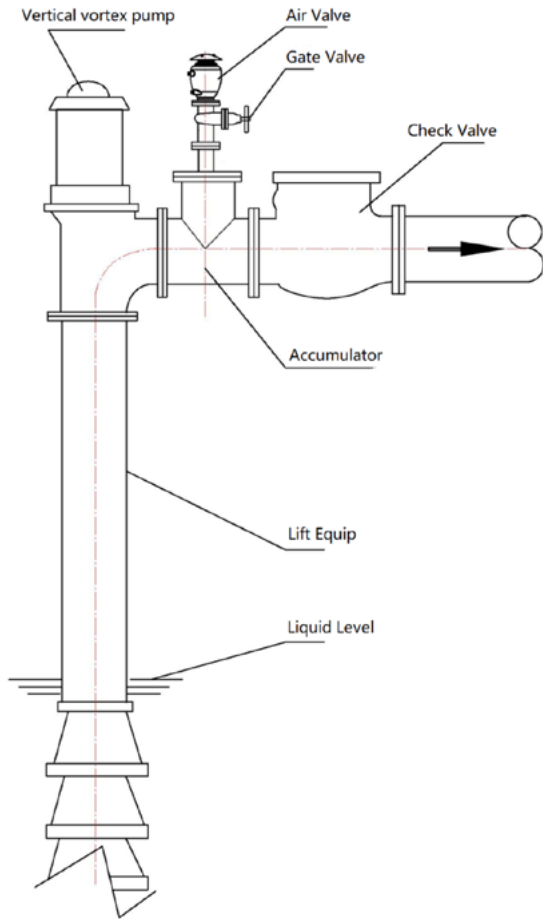


AIR RELEASE DURING WORKING CONDITIONS

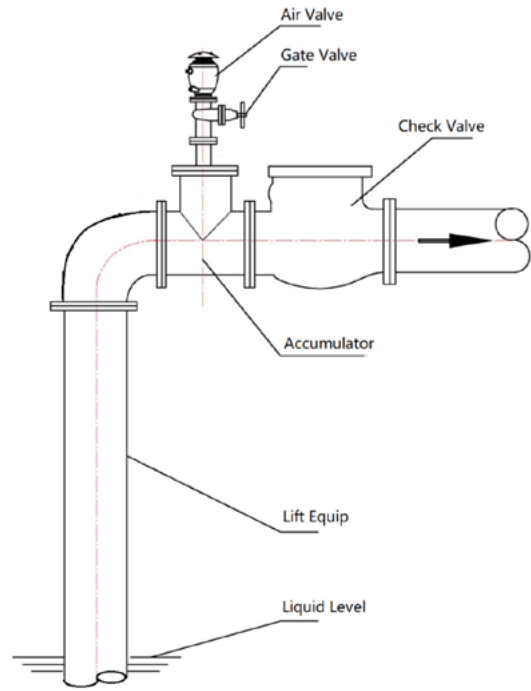
Full bore	Reduced bore	PN10	PN16	PN25	PN40
DN25	-	0,6	0,6	0,4	0,4
DN50	-	1,0	1,0	0,6	0,6
-	DN65				
-	DN80	1,5	1,5	1,0	1,0
DN80	-				
-	DN100	2,0	2,0	1,5	1,5
DN100	-				
-	DN150	3,0	3,0	2,0	2,0
DN150	-				
-	DN200	4,0	4,0	2,5	2,5
DN200	-				
-	DN250	5,0	5,0	3,0	3,0
DN250	-				
-	DN300				
DN300	-				
-	DN350				
-	DN400				

Installation

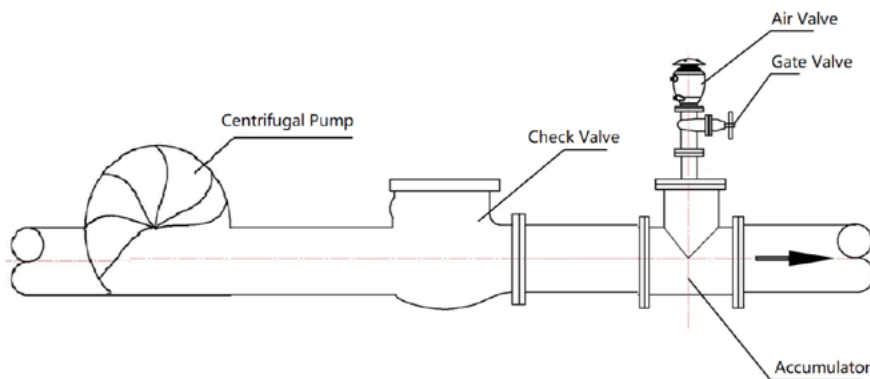
Vertical vortex pump application



Well application



Centrifugal pump application



Instructions

1. Before installation, remove foreign material such as weld spatter, oil, grease, and kinds of dirt from the pipeline.
2. Prepare pipe ends and install valves in accordance with the pipe manufacturer's instructions for the joint used. The water combination air valve should always be installed in a vertical position, an isolation valve should be installed before the air valve to make sure maintenance convenience.
3. Make sure enough space for valve assembly and disassembly, then tighten the air valve's flange bolts or studs in a crisscross pattern and minimum of four stages.
4. A Strainer before air valve is strongly recommended to avoid any suspended objects.



- A. Inlet isolation valve
- B. Strainer
- C. Pressure reducing valve
- D. Combined air valve

Operation

The combination air valve is under automatic operation in the range from permitted low pressure to high pressure (PFA).

Maintenance

The combination air valve is automatic in operation and requires very little maintenance as soon as there is no suspended objects or dirt interrupt the floats and seals. It should always be installed in a vertical position. A monthly visual inspection for leakage is recommended. A malfunction of the air valve can be identified by water seepage of through the air release nozzle and/or through the main seal. While a malfunction occurs, the following steps should be taken to repair the valve.

1. Inspection or maintenance can be accomplished without removing the valve from the line.
2. Repair kits with new seals, nozzle and floats are recommended to be prepared on hand before maintenance work begins.
3. To change the parts where the visual leakage occurs.

⚠ WARNING!

Before maintenance, the isolating valve before the air valve must be fully closed to avoid water escape from the pipeline.

Trouble shooting

Symptom	NO.	Probable cause	Solution
Valve leaks at flange joint	1	Loose flange bolting	Tighten flange bolting
	2	Blown flange seal	Replace flange seal
	3	Miss-alignment or damage to field piping	Adjust miss-alignment or repair piping or supports
	4	Damaged flange face or improper flange connections	Repair flange, replace valve body or adjust flange connections
Valve leaks out of the seal ring	1	Valve is not vertical	Place the valve in a vertical position
	2	Possible corrosion through the wetted parts	Check the fluid chemicals compatibility
	3	Dirty seat or top float	Clean seat or float
	4	Worn seat or float	Replace seat or float
	5	Worn O-ring between on the mid float	Inspect and replace O-ring
Valve leaks out of the air release nozzle	1	Valve is not vertical	Place the valve in a vertical position
	2	Possible corrosion through the wetted parts	Check the fluid chemicals compatibility
	3	Dirt accumulated on the air release nozzle	Inspect and clean the air release nozzle, replace if necessary

Disassembly

Disassemble the parts in order per the following steps, and be careful to the warning matters:

⚠ WARNING!

Servicing the air/vacuum valve while the pipeline is under pressure can cause personal injury or equipment damage. Relieve pipeline pressure or shut off isolation valve before servicing the air/vacuum valve.

1. Relieve pipeline pressure or shut off isolation valve before repairing the air valve.
2. Slowly remove the tangential drain plug to drain internal water.
3. Remove cap screws, cap, screen, top flange bolt/washer and top flange.

⚠ WARNING!

When removing the screen be aware of sharp edges, use protective gloves and exert care during handling

4. Remove seal ring under the top flange.
5. Inspect seal ring surface, check whether any worn or damaged places, change to a new one if needed.
6. Pull out the top float, mid float, lower float.
7. Inspect the O-ring on the mid float, check whether any worn or damaged places, change to a new one if needed.
8. Inspect the air release nozzle, clean it with some water and replace it if needed.
9. Inspect on the lower float's seal against to the air release nozzle, clean it with some water and replace it if needed. It is suggested to be changed every semi-annual for normal operation.
10. Check the body inside chamber to see if foreign matters or dirt prevent floats from seating properly inside the valve body. Clean if necessary.
11. Inspect all connections of linkage for excessive wear.
12. Clean all surfaces before re-assembly.

Reassembly

Install the parts in order per the following steps:

1. Before reinstall all parts, clean all where inside the body, clean all parts.
2. Put the lower float, mid float and top float in order into the valve body, make sure all floats can freely fall down onto the body plate ring.
3. Install the seal ring under the top flange.
4. Put the top flange on the body.
5. Tighten the bolts, to lock tight the body and the top flange.
6. Install the 4 bolts around the screen outside circle.
7. Put the screen back onto the top flange.
8. Put back the top cap and the 4 nuts screwed onto the 4 bolts, tighten them to make sure the top cap fix the screen properly.

