VACUVENT

VE SERIES CATALOGUE

October 2018

"the airbag for water pipelines"

The Triple Function Air Valve

Vacuvent offers a tri-function air valve that not only breaks vacuum, but also reduces surge on pipeline filling and releases air under operating conditions

Materials

The housing is made out of stainless steel and FBE coated mild steel. The floats are made of HDPE and the nozzle is made of PET-P, a strong polymer that fairs well under operating conditions with elevated temperatures

Construction

With solid HDPE floats, rest assured that the internal mechanisms will not deform under pressure.

The cylindrical design also increases the effectiveness of the valve's operation during vacuum conditions.

The fabricated tubular body construction allows for cost effective use of corrosion resistant materials.

Operation

The valve has three operating modes, venting during pipeline fflling, vacuum break and air release under operating conditions.

The valve operates automatically, with the diflerent modes being triggered by the fioat system contained inside.

Pipeline Filling

On fflling, the valve is in the fully open position, venting air until the critical surge velocity is met. This velocity is when the given surge at valve closure can cause damage to the valve and the pipe, it is just before this velocity that the anti-shock fioat engages, causing a restriction on the venting of the air, creating an air bag in the water pipeline, and reducing surge.

Pressurized Air Release

During operation any pipeline will have air accumulating in the pipeline, this can cause lower volumetric fiow rates and strain on the pumps. It is for this reason that air needs to be released, which is where the bleed nozzle comes in play on this Vacuvent Air valve, releasing air at operating pressure.

Vacuum Break

When a pump trips, or the pipeline is being scoured, a vacuum develops inside the line, this can lead to catastrophic failure of the line. The Vacuvent VE series valves breaks vacuum and opens to the full bore.

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Design Parameters

We have manufactured and designed air release valves for 30 years. The Vacuvent design allowed us to look at various factors from manufacture, service, materials to performance. The process has been driven largely by the now prevalent use of hydraulic predictive programs. The subsequent software data together with actual testing has led us to a more optimized valve.

Intake with Coefficient of Discharge Applied (normal m^3/h)

	Valve Size (DN - mm)					
Pressure (Bar)	**25**	**50**	**80**	**100**	**150**	**200**
-0.05	64.4	257.7	659.7	1030.7	2319.2	4123.0
-0.1	87.3	349.0	893.5	1396.1	3141.2	5584.4
-0.2	115.0	460.0	1177.7	1840.1	4140.2	7360.4
-0.3	130.7	523.0	1338.8	2091.8	4706.6	8367.2
-0.35	**135.6**	**542.2**	**1388.0**	**2168.8**	**4879.9**	**8675.3**
-0.4	138.7	554.6	1419.8	2218.5	4991.5	8873.8
-0.5	140.4	561.4	1437.2	2245.7	5052.8	8982.7

The coefficient of discharge on intake is Cd=0.4
The recommended design intake should not exceed 0.35Bar
After a differential pressure of 0.5Bar the valve will be in the choke condition and where lower pressures will not increase intake capacity

Venting with Coefficient of Discharge Applied(normal m^3/h)

	Valve Size (DN - mm)					
	25	**50**	**80**	**100**	**150**	**200**
At PN	16	30	43	43	84	121

The coefficient of discharge on venting is Cd=0.8
The above values are at the valve design pressure

Sizes

	Valve Size (DN-mm)											
	25		50		80		100		150		200	
PN Bar	25	40	25	40	25	40	25	40	25	40	25	40
Anti-Shock mm	3.3	4.2	6.5	8.5	10.5	13.5	13.5	17	20	25.5	27	34
Small Orifice mm	1.1	0.9	1.5	1.2	1.8	1.4	1.8	1.4	3	2	3	2.4
Through Area mm^2	491		1963		5027		7854		17671		31416	

Subject to change without prior notice

Design Considerations

Sizing

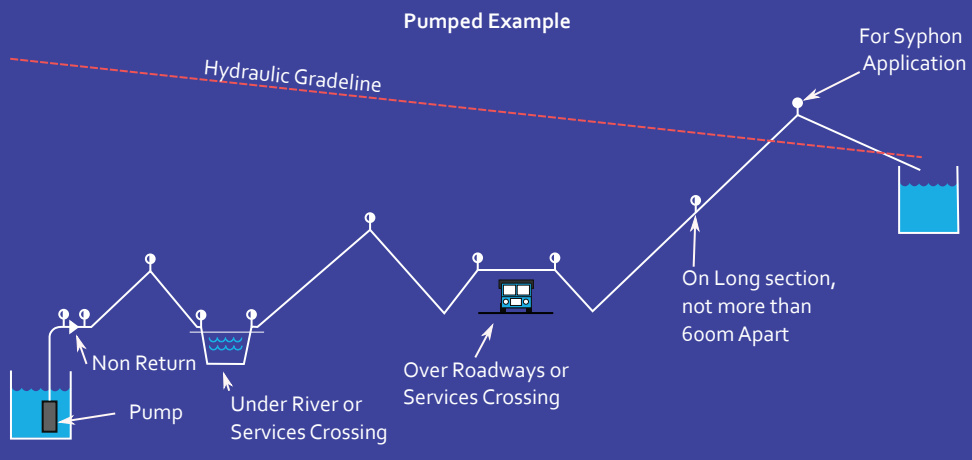
All Vacuvent valves are full have an intake area equal to the full bore of the valve. This means that the flow area at any given point is equal or greater than the specified nominal bore area.

Most sizing is based on the need to protect the pipeline from a negative pressure, vent the initial air, and to vent the pressurized air with the importance generally in that order. A good start is to select a scouring or drainage rate based on rupture or draining of 2-3 times the designed flow rate of that particular section.
Size the AV to protect the pipeline and seals from low pressure within the pipeline during draining or other
pipeline disturbances (eg pump trip). One accepted method is to limit the internal pressure to 3.5m Δ P (0.35Bar) below atmospheric @ sea level . The AV performance data in " Software Design Parameters page "indicates that point and the resultant inflow of air. For a more dynamic estimation see the Toolbox fly out on the web site which allows the user to check individual sections to size the AV dynamically and run some "what if" scenario's.

Positioning

Vacuum break valves should be located on every apex of a pipeline, should any pipe rupture, or scour be opened, the valve should allow air to enter the line from the highest point.

The graphic shows most of the common places where AV (air release valves) are fitted. High points are a natural start, also where the pipeline crosses obstacles like rivers and roads. Check for syphon application above the hydraulic grade line. To control pump start and pump trip, AV should be placed before and after the check valve.



VE Series

Vacuum Break and Air Release Valves for Potable Water DN25 and DN50 Standard Body Construction

Cover Plate
AISI 304 Stainless Steel

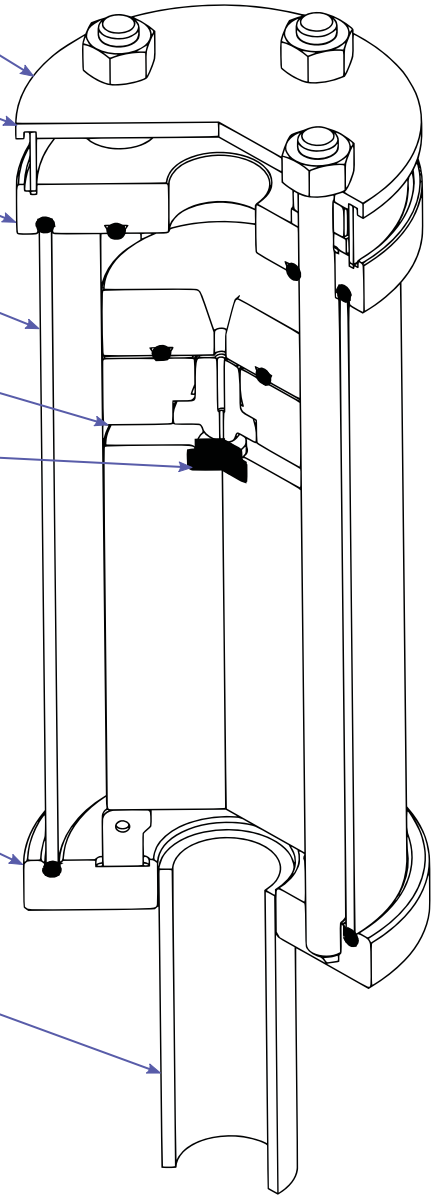
Screen
AISI 304 Stainless Steel

Upper Flange
AISI 304 Stainless Steel

Barrel
AISI 304 Stainless Steel

Floats
HDPE

Seals and O-rings
EPDM



Lower Flange
AISI 304 Stainless Steel

Threaded Mounting End
AISI 304 Stainless Steel, BSP

Optional Extras

Venting Only
To allow for syphon applications a syphon cover can be added to the valve, preventing vacuum break but still allowing for air release

Body Construction
The valve housing can be made of AISI 316 for that extra protection

Bleed Ports and Ball Valves
An optional bleed port and ball valve can be added for draining the valve and connecting instrumentation

Mounting
As standard DN25-DN50 valves have a BSP threaded connection. NPT is available on request. Also a fanged version can be made to any drilling required.

Coating
Valves can be coated with FBE or receive a top coat of polyurethane

VE Series

Vacuum Break and Air Release Valves for Potable Water DN80 and DN100 Standard Body Construction

Cover Plate
AISI 304 Stainless Steel

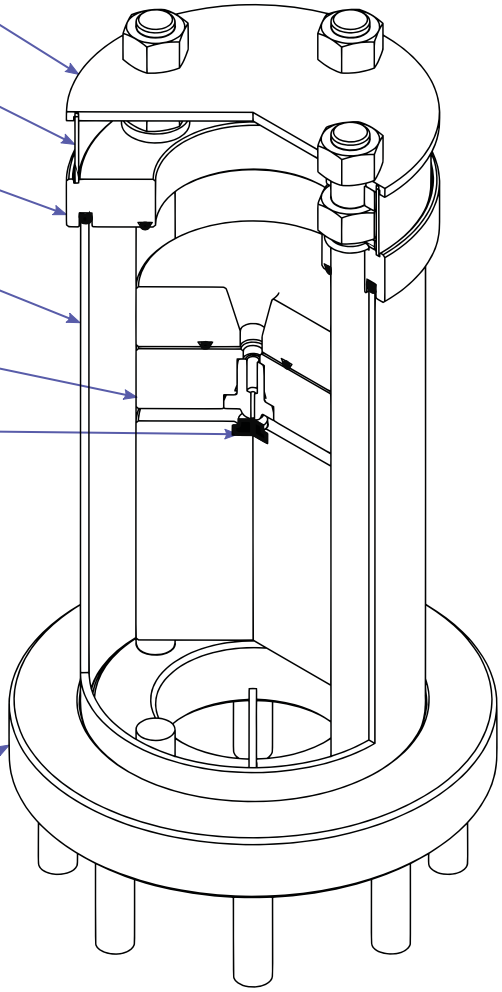
Screen
AISI 304 Stainless Steel

Upper Flange
AISI 304 Stainless Steel

Barrel
AISI 304 Stainless Steel

Floats
HDPE

Seals and O-rings
EPDM



Lower Flange
Mild Steel, FBE Coated

Studded Connection
Drilling to SABS 1123, supplied with studs

Optional Extras

Venting Only
To allow for syphon applications a syphon cover can be added to the valve, preventing vacuum break but still allowing for air release

Body Contruction
The valve housing can be made of AISI 316 for that extra protection

Bleed Ports and Ball Valves
An optional bleedport and ball valve can be added for draining the valve and connecting instrumentation

Mounting
As standard DN80-DN100 valves have studded connection, any drilling can be accomodated. A flanged version can be made to any drilling required.

Coating
Valves can be fully coated with FBE or receive a polyurethance top coat

VE Series

Vacuum Break and Air Release Valves for Potable Water DN150 and DN200 Standard Body Construction

Cover Plate
AISI 304 Stainless Steel

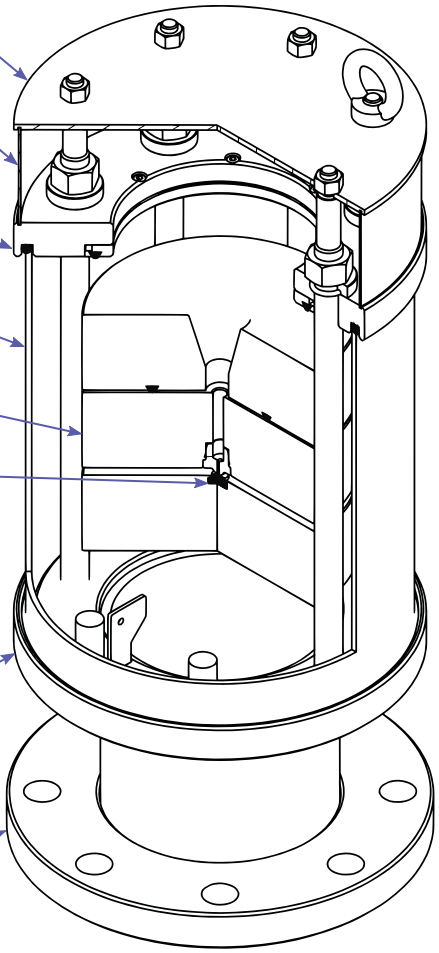
Screen
AISI 304 Stainless Steel

Upper Flange
AISI 304 Stainless Steel

Barrel
AISI 304 Stainless Steel

Floats
HDPE

Seals and O-rings
EPDM



Weld Assembly
Mild Steel, FBE Coated

Flanged Connection
Drilling to SABS 1123

Optional Extras

Venting Only
To allow for syphon applications a syphon cover can be added to the valve, preventing vacuum break but still allowing for air release

Body Contruction
The valve housing can be made of AISI 316 for that extra protection

Bleed Ports and Ball Valves
An optional bleedport and ball valve can be added for draining the valve and connecting instrumentation

Mounting
As standard DN100-DN150 valves have studded connection, any drilling can be accomodated. A flanged version can be made to any drilling required.

Coating
Valves can be fully coated with FBE or receive a polyurethance top coat

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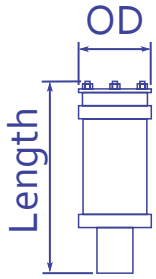
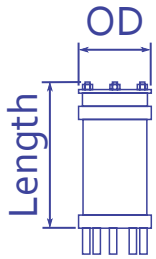
VE Series

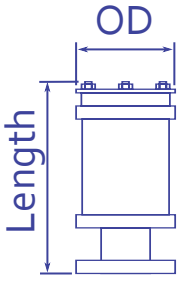
Overall Dimensions



DN	PN	OD	Length	Weight	Bleed Nozzle OD	Anti-Shock OD
mm	kPa	mm	mm	kg	mm	mm
25	25	100	328	5	1.1	3.3
	40	100	350	6	0.9	4.2
50	25	120	365	7	1.5	6.5
	40	120	380	8	1.2	8.5



DN	PN	OD	Length	Weight	Bleed Nozzle OD	Anti-Shock OD
mm	kPa	mm	mm	kg	mm	mm
80	25	200	344	16	1.8	10.5
	40	153	360	18	1.4	13.5
100	25	180	383	20	1.8	13.5
	40	180	400	24	1.4	17



DN	PN	OD	Length	Weight	Bleed Nozzle OD	Anti-Shock OD
mm	kPa	mm	mm	kg	mm	mm
150	25	290	620	60	3	20
	40	290	648	68	2	25.5
200	25	338	700	90	3	27
	40	338	748	104	2.4	34

Dimensions and weights dependent on chosen options

Operating Temperature: 4^{o}C to 85 ^{o}C
Low head sealing pressure: 0.5Bar
Hydro-static Test Pressure: 2xPN

Vacuvent Valves

VE- Series.
For potable water, an air release and vacuum break combination air valve with anti-shock functionality

VA- Series.
For potable water, an air release and vacuum break combination air valve with anti-shock functionality and high discharge at operating pressure

VH- Series.
For raw water, the reliable choice, an air release and vacuum break combination air valve with anti-shock functionality

VG- Series.
For sewage and raw water, an air release and vacuum break combination air valve with anti-shock functionality and a dual chamber for an easily maintainable valve

VN- Series.
For highly corrosive environments, the body is made of nylon, an air release and vacuum break combination air valve with anti-shock functionality

Contact

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