CLA-VAL PACIFIC

AQUA B70-516

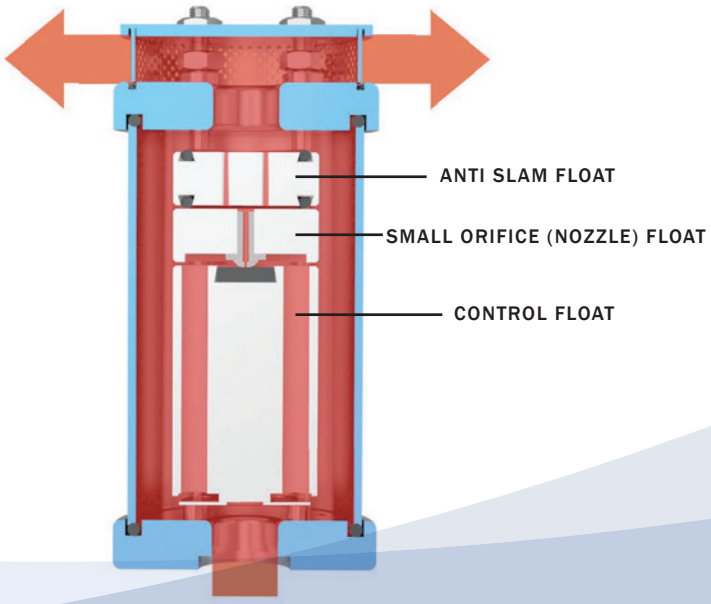
FOR POTABLE WATER

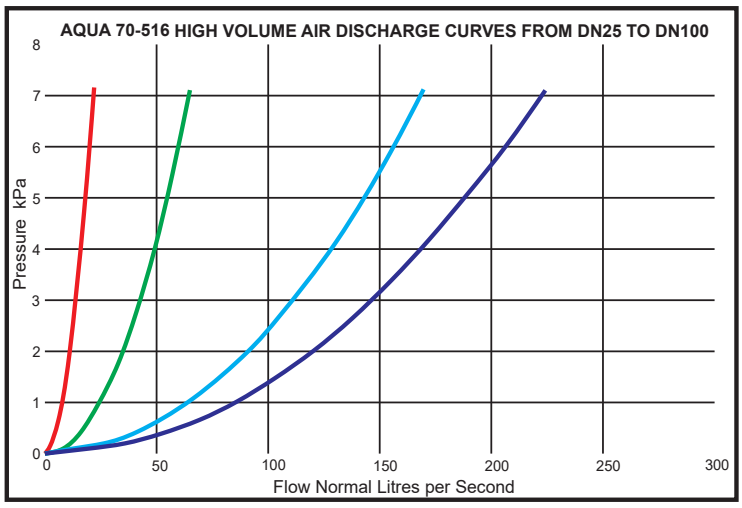
ANTI SLAM, AIR RELEASE & VACUUM BREAK AIR VALVES

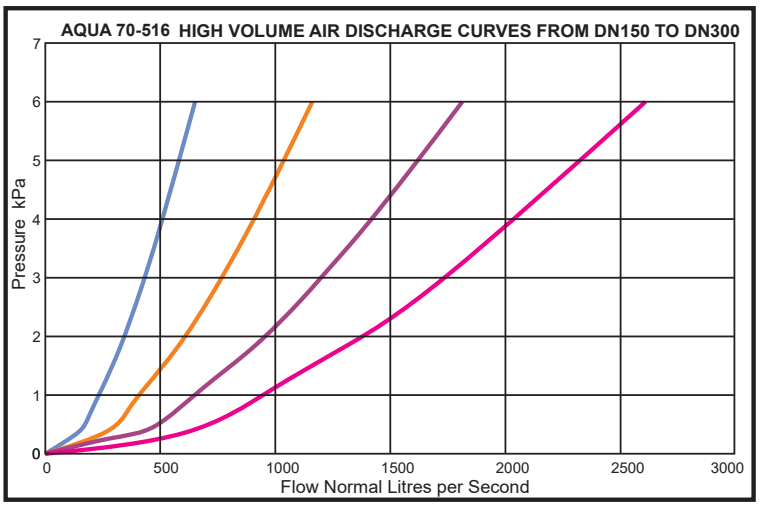
CONTENTS

HIGH VOLUME AIR DISCHARGE

During filling of the pipeline, air passes through the air valve at the same flow rate as water in the pipeline, the floats remain in the open position allowing air to pass freely through the valve. When water enters the valve the floats are buoyed and the valve closes.





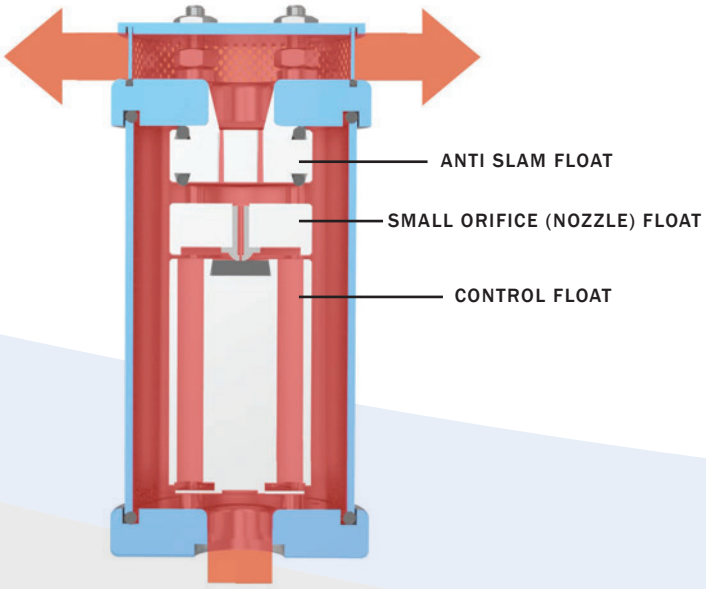


ANTI SLAM AIR DISCHARGE

During rapid filling, pump trip, rapid valve closure and other surge events. The valve will switch into anti slam mode. Switching from the larger orifice to a smaller anti slam orifice.

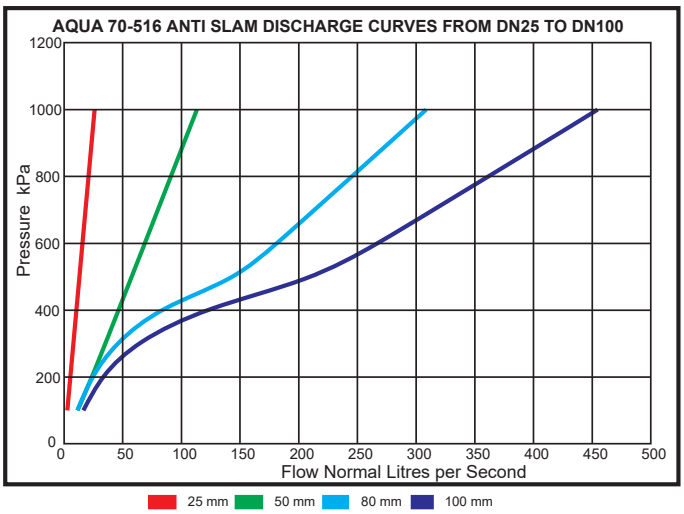
The smaller orifice will restrict the rate at which air can escape the pipeline and as a result slow the flowrate of water through the pipeline.

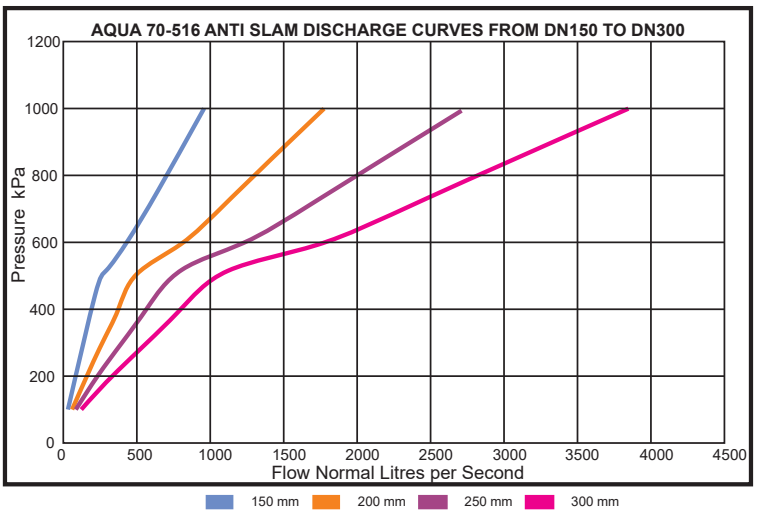
Air passes around the lower float and small orifice float through the anti slam orifice to atmosphere.



ANTI SLAM AIR DISCHARGE CAPACITY

ANTI SLAM SWITCHING POINTS & INPUT DATA FOR SURGE PROGRAMS						
	25mm	50mm	80mm	100mm	150mm	200mm
Anti-Shock Orifice Size (mm)	4	9	14	17	25	34
Inlet Size (mm)	25	50	80	100	150	200
Outlet Size (mm)	25	50	80	100	150	200
Switching Pressure (kPa)	7.15	7.11	7.11	7.11	6	6
Switching Velocity (m/s)	44.81	33.1	33.7	33.7	36.95	36.95
Switching Flow (l/s)	22	65	169	265	653	1160

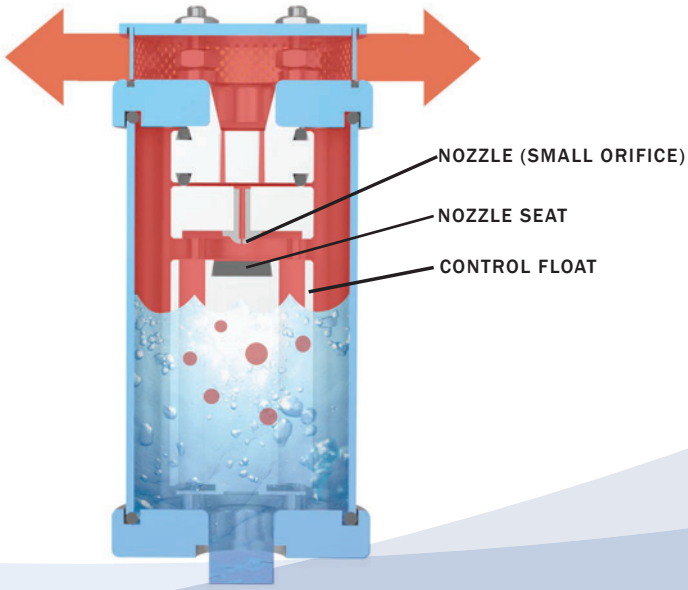




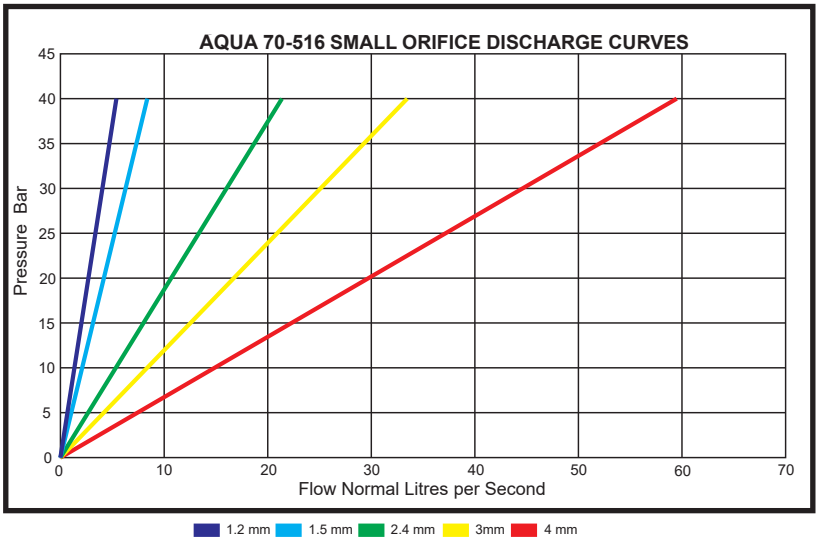
PRESSURISED AIR RELEASE

During normal operation, while the pipeline is fully charged, disentrained air will accumulate at many air valve locations.

When the quantity of air is sufficient to displace the control float, the float will drop away from the small orifice (nozzle) and release the accumulated air. The control float will then buoy back into place and seal off the small orifice.



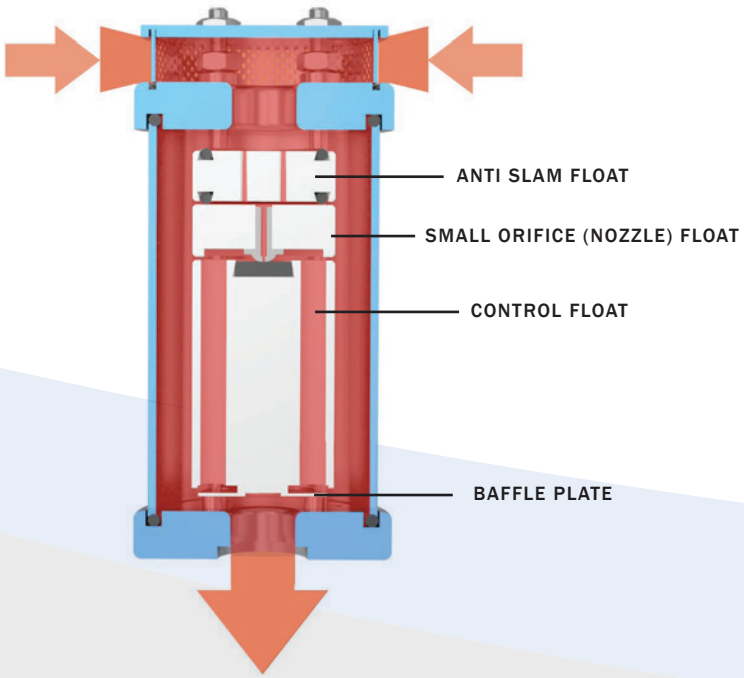
SMALL ORIFICE AIR DISCHARGE CAPACITY AND SIZES



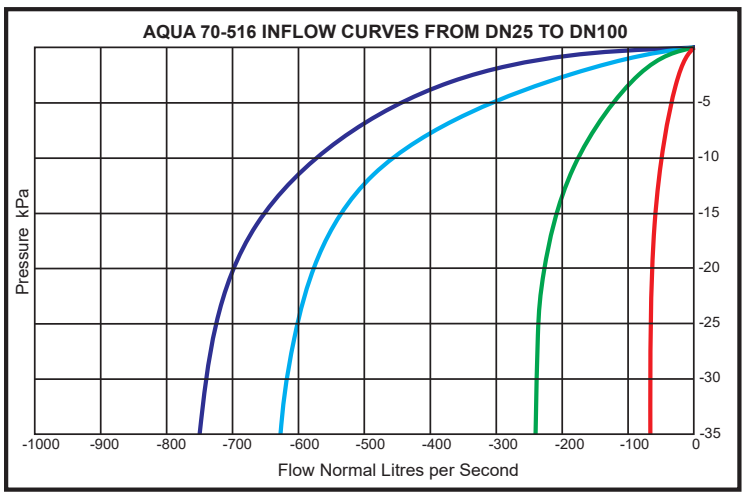
SMALL ORIFICE SIZES	
Valve Series	Small Orifice Size
25 mm	1.2
50 mm	1.2
080 mm	1.5
100 mm	1.5
150 mm	2.4
200 mm	2.4
250 mm	3
300 mm	4

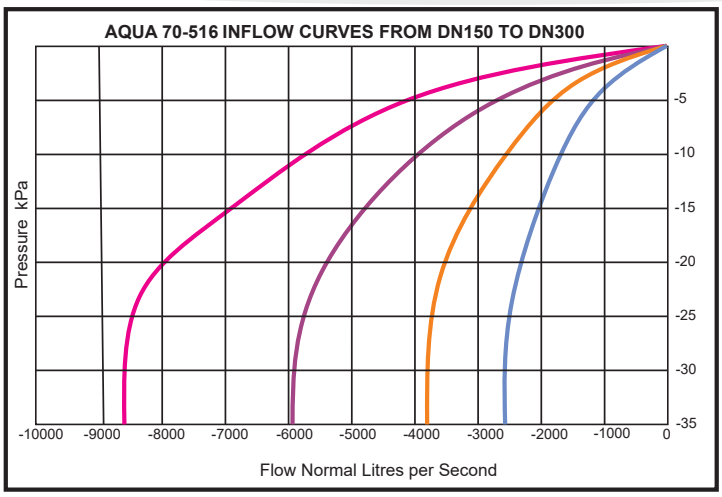
VACUUM BREAK

During the draining, pump stoppage or pump trip, the floats will gravitate towards the baffle plate. Air will travel through the large orifice, past the floats and through the intake orifice into the pipeline.

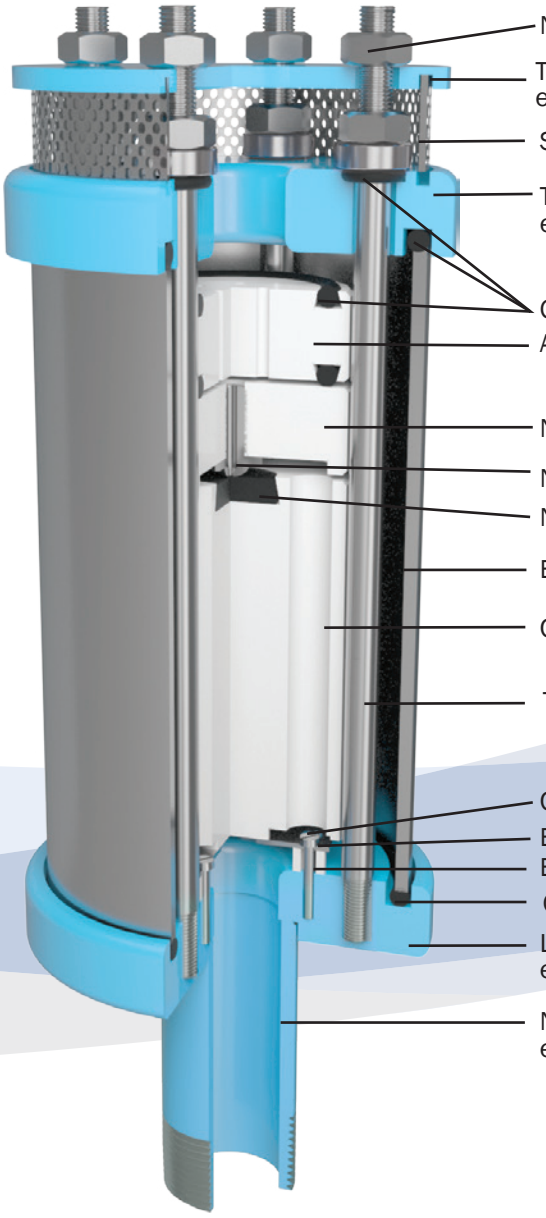


VACUUM BREAK CAPACITY





DN25 & DN50 AQUA B70-516



Double-Acting with Anti Slam orifice (triple-acting/three stage)

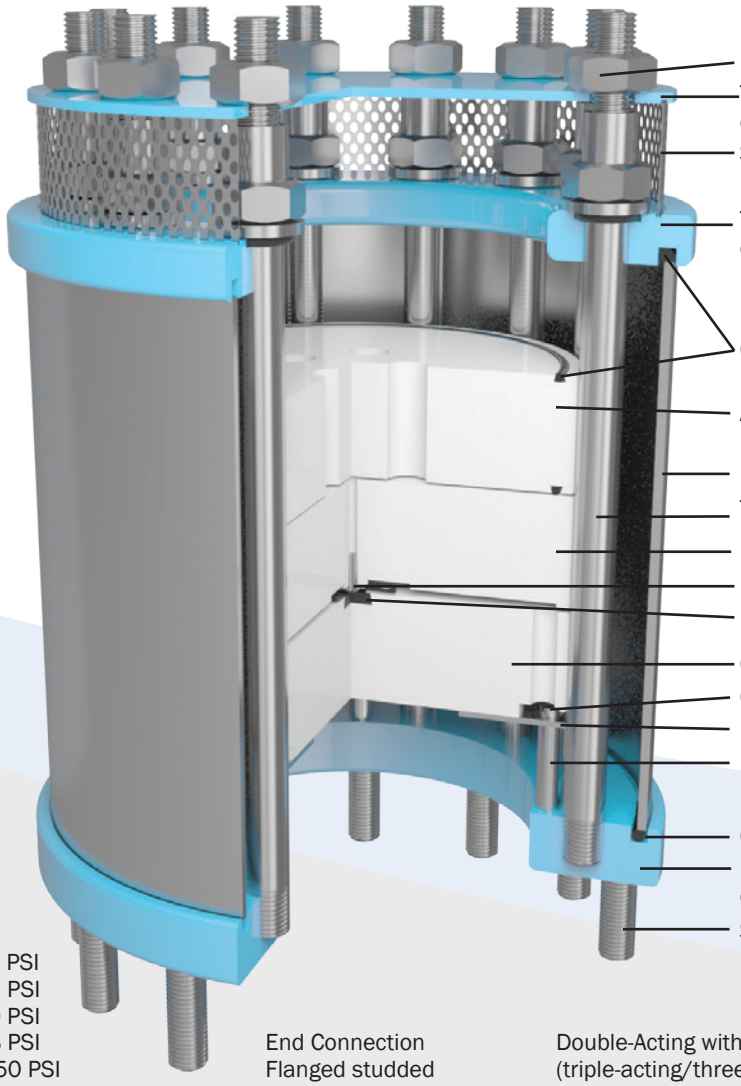
End Connection
Screwed BSP/NPT

Operating Pressure
0.5 - 25 bar / 7.2 - 363 PSI
0.5 - 40 bar / 7.2 - 580 PSI
0.5 - 64 bar / 7.2 - 928 PSI
0.5 - 100 bar / 7.2 - 1450 PSI

Operating Temperatures
0 - 80° C / 32 - 176° F

Size	Model no.	Pressure Rating	Overall Height	Overall Diameter	Weight
25mm / 1"	AQUA B70-516	25 Bar / 363 PSI	252mm / 9.92"	100mm / 4"	4 Kg /9 lbs
	AQUA B70-516	40 Bar / 580 PSI	302mm / 11.88"	100mm / 4"	5 Kg / 10.8 lbs
50mm / 2"	AQUA B70-516	25 Bar / 363 PSI	301mm /11.85"	130mm / 5.12"	7Kg / 15 lbs
	AQUA B70-516	40 Bar / 580 PSI	351mm / 13.81"	130mm / 5.12"	8.5Kg / 18.51 lbs

DN80 to DN200 AQUA B70-516



0.5 - 16 bar / 7.2 - 232 PSI
0.5 - 25 bar / 7.2 - 363 PSI
0.5 - 40 bar / 7.2 - 580 PSI
0.5 - 64 bar / 7.2 - 928 PSI
0.5 - 100 bar / 7.2- 1450 PSI

End Connection
Flanged studded

Double-Acting with Anti Slam orifice
(triple-acting/three stage)

Operating Temperatures
0 - 80° C / 32- 176° F

Size	Model no.	Pressure Rating	Overall Height	Overall Diameter	Weight
80mm / 3"	AQUA B70-516	16 Bar / 232 PSI	284mm / 11.2"	200mm / 8"	15.85 kg / 35 lbs
	AQUA B70-516	25 Bar / 363 PSI	284mm / 11.2"	200mm / 8"	15.85 kg / 35 lbs
	AQUA B70-516	40 Bar / 580 PSI	317mm / 12.5"	200mm / 8"	22.5 kg / 49 lbs
100mm / 4"	AQUA B70-516	16 Bar / 232 PSI	284mm / 11.2"	235mm / 9.25"	22 kg / 48 lbs
	AQUA B70-516	25 Bar / 363 PSI	284mm / 11.2"	235mm / 9.25"	22 kg / 48 lbs
	AQUA B70-516	40 Bar / 580 PSI	318mm / 12.5"	235mm / 9.25"	27 kg / 60 lbs
150mm / 6"	AQUA B70-516	16 Bar / 232 PSI	464mm / 18.27"	285mm / 11.22"	50 kg / 102 lbs
	AQUA B70-516	25 Bar / 363 PSI	464mm / 18.27"	285mm / 11.22"	50 kg / 102 lbs
	AQUA B70-516	40 Bar / 580 PSI	464mm / 18.27"	285mm / 11.22"	50 kg / 102 lbs
200mm / 8"	AQUA B70-516	16 Bar / 232 PSI	503mm / 19.8"	340mm / 13.4"	60 kg / 147 lbs
	AQUA B70-516	25 Bar / 363 PSI	503mm / 19.8"	340mm / 13.4"	60 kg / 147 lbs
	AQUA B70-516	40 Bar / 580 PSI	503mm / 19.8"	340mm / 13.4"	60 kg / 147 lbs
250 mm / 10"	AQUA B70-516	16 Bar / 232 PSI	573 mm / 22.5"	425 mm / 16.7"	110 kg / 243 lbs
	AQUA B70-516	25 Bar / 363 PSI	573 mm / 22.5"	425 mm / 16.7"	110 kg / 243 lbs
300 mm/ 12"	AQUA B70-516	16 Bar / 232 PSI	625 mm / 24.6"	530 mm /20.9"	160 kg / 353 lbs
	AQUA B70-516	25 Bar / 363 PSI	625 mm / 24.6"	530 mm /20.9"	160 kg / 353 lbs

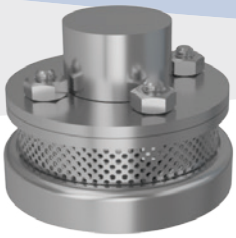
Larger sizes are available on request up to 450NB / 18".

SMART SERIES / OUTLET CONNECTIONS

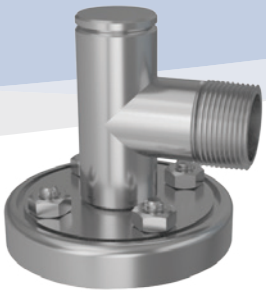
The Cla-Val Smart Valve integrates the best in air valve technology with the best in logging and data transmission technology. The marriage of these technologies, allows you to gain all the features of a logging system built right into the air valve. No need to shut down and drain pipelines and drill, tap and weld ports for transducers and loggers. Simply isolate the existing air valve and replace with the Cla-Val Smart Valve and you're ready to go.

Right from commissioning, consultants and end users can see the accuracy of calculated data, update existing surge models with real time data to more accurately predict the behaviour of pipelines in surge situations. Track the accuracy and amend modelled hydraulic grade line data. Accurately track usage trends on new lines and implement pressure management strategies to save water on existing lines.

- Compact integral logging and communication built right into the CLA-VAL air valve
- Makes use of existing CLA-VAL air valve fittings
- Suitable for new and existing pipelines
- No need to alter pipeline or introduce ports or connections
- Built in Memory in case of broadcast failure
- Able to transmit data via GSM
- Data able to be retrieved via web interface
- Capable of sending preset alarms based on pressure drop or pressure increase



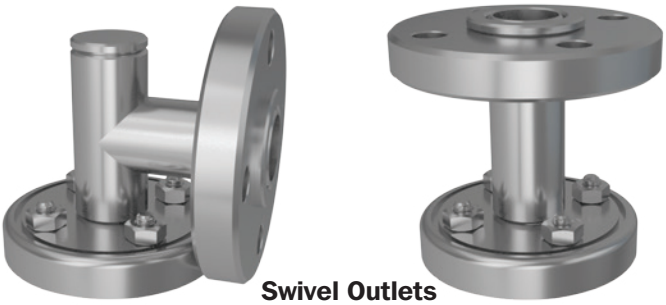
Smart Valve Telemetry Housing
Contains a compact integral data logging and communication feature.



Screwed T Outlet
The valve outlet is tapped to either BSP or NPT to allow connection to piping off systems, this type of connection can be used with controlled air release configuration.

Gooseneck Outlet
The valve outlet is fitted with a gooseneck. This is often requested in desert applications.

Screwed Outlet
The valve outlet is tapped to either BSP or NPT to allow connection to piping off systems.



Swivel Outlets
Can be supplied in two formats T outlet and straight outlet to connect to desired flanged piping.

CLA-VAL TEST PROCEDURES

Every CLA-VAL Air Valve is subjected to testing before departing the factory. Testing procedures are in accordance with, or exceed the procedures laid out in AWWA C-512-15.

Low Head Leak Test

The valve is attached to the test rig, water from an elevated tank flows under gravity into the valve buoying the floats, the floats seal once a pressure of 0.5 bar is achieved. Any excess water that has gathered during the priming of the valve is then cleared off the valve and the valve is inspected for leakages. Any sign of leakage at this point is a failure of the low head leak test.

Hydrostatic Testing

Once the valve is determined to have passed the low head leak test, it remains connected to the test rig and the pump is activated, the valve is then subjected to a pressure of 1.5 times the rated operating pressure (i.e. if the valve is rated at 25 bar it will be tested to 37.5 bar). Once this pressure is achieved, the valve will then be held at this pressure and be inspected for any leaking or weeping. Any evidence of leakage or weeping at the said test pressure will be cause for failure.

Additional Testing

Drop Testing

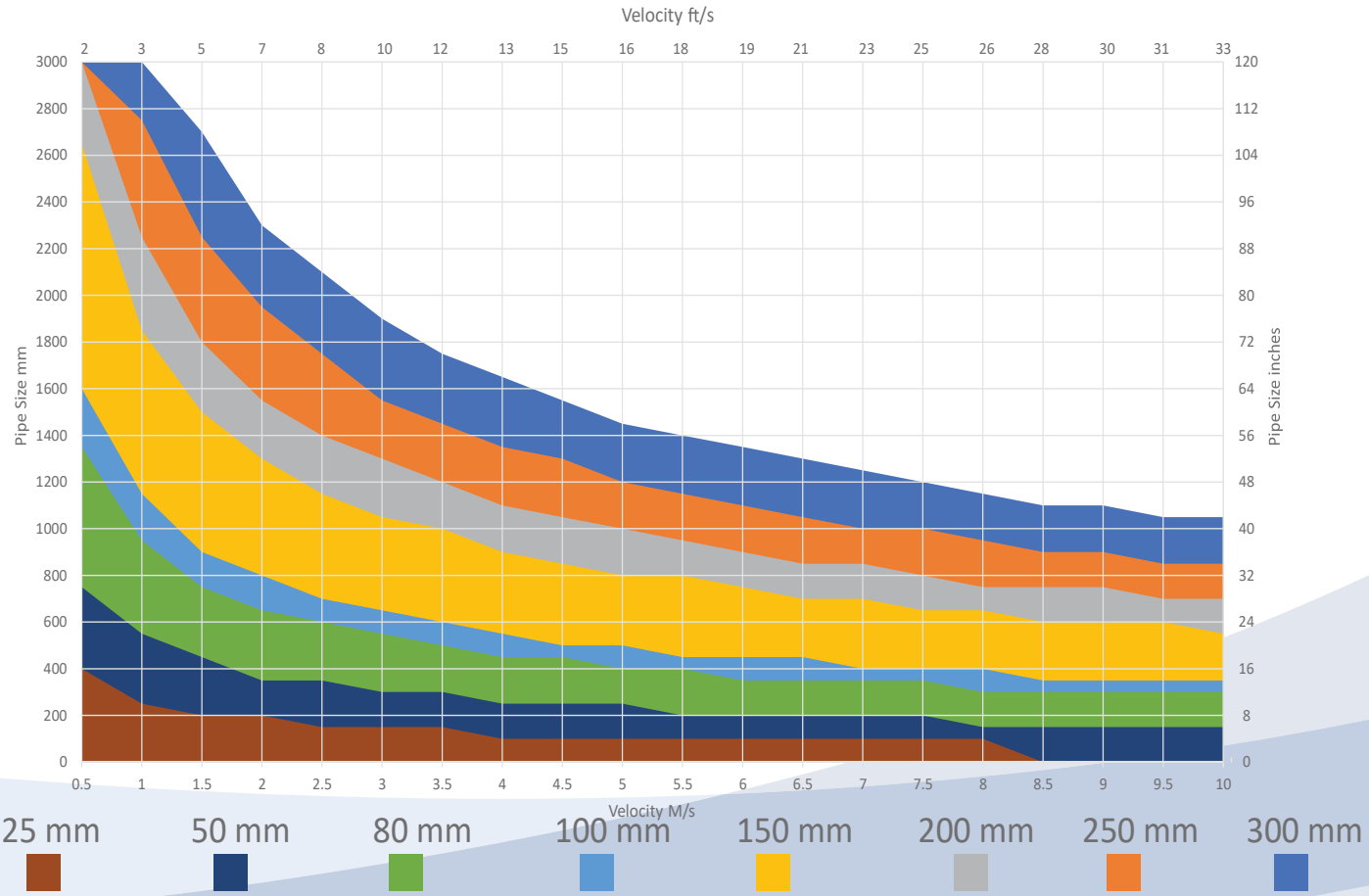
Drop testing is the test conducted to ensure that the valve will open and release disentrained air, when the valve is operating at the full rated pressure of the valve, (see pressurised air release page 3 for more information). Drop testing is governed by specific physical laws and is extensively tested during the development of the valve, to make sure the valve conforms to these necessary laws. Thereafter it is not necessary to test every valve or even every 10th valve in a run. Once the specific masses and orifice sizes are correct, the normal QC process of checking the components to the correct dimensions, ensures that the valve will breathe up to the rated pressure of the valve. As a result, this test is only performed on request or as part of a third-party test that specifically states a requirement for a drop test.

The valve is placed on the test rig and pressurised to slightly above the rated pressure of the valve. Nitrogen is then introduced into the valve at a pressure higher than the rated pressure. The valve is then slowly drained of liquid, if the valve releases air before or at the rated pressure of the valve, the valve is deemed to have passed the drop test. If air is released below the rated pressure of the valve, or does not release air at all it is deemed to have failed the test.

Failure of Testing

Any valve that fails any of the above tests, is marked and later inspected for the cause of failure. The issue is rectified and the valve is retested. No valve will be allowed to leave the factory until such time as it has successfully passed all the required testing procedures.

SIZING AND POSITIONING



How To Use the chart

Select the pipe size and velocity, use either maximum flow velocity or calculate drainage velocity based on drainage or expected potential rupture. Where the pipe size and velocity intersect, there will be a colour band. Match the colour band to the valve size in the legend below. This will give you the valve size of an air valve capable of drawing in sufficient air to match the drainage rate. All values are based on maintaining a minimum negative pressure of 0.35 Bar in the pipeline . It is not safe practice to allow the negative differential pressure to drop below 0.6 bar in the pipeline. Be aware when sizing, that the upper part of the band is closer to the minimum negative differential of 0.35 bar. The lower part is closer to 0.1 bar negative differential pressure. If you are quite close to the higher part of the band, one should then switch to the next size of air valve, to assure the safety of the pipeline.

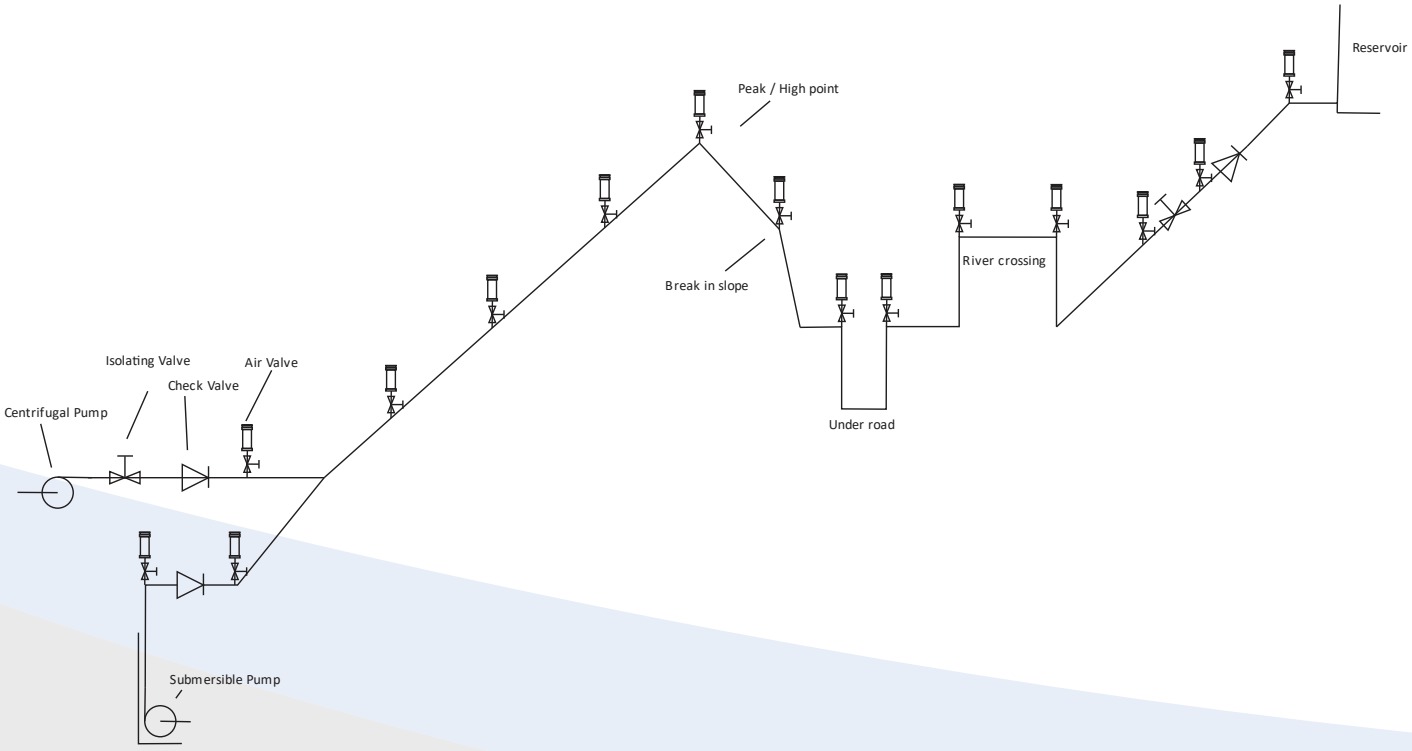
	Convert flow in litres per second into velocity in m/s						
Pipeline Size in mm	3000	7069	14137	21206	28274	35343	42412
	2800	6158	12315	18473	24630	30788	36945
	2600	5309	10619	15928	21237	26546	31856
	2400	4524	9048	13572	18096	22619	27143
	2200	3801	7603	11404	15205	19007	22808
	2000	3142	6283	9425	12566	15708	18850
	1800	2545	5089	7634	10179	12723	15268
	1600	2011	4021	6032	8042	10053	12064
	1400	1539	3079	4618	6158	7697	9236
	1200	1131	2262	3393	4524	5655	6786
	1000	785	1571	2356	3142	3927	4712
	800	503	1005	1508	2011	2513	3016
	600	283	565	848	1131	1414	1696
	400	126	251	377	503	628	754
	200	31	63	94	126	157	188
	100	8	16	24	31	39	47
		1	2	3	4	5	6
	Pipeline velocity in m/s						

This table will help you calculate your velocity, based on flow and pipe size. Select your pipe size in the left hand blue column. Run your finger to the right until you find the flow rate closest to your pipelines maximum demand rate. Drop your finger to the bottom blue column and it will give you your flow velocity in metres per second(m/s). Should your pipe size not be available you can calculate your velocity using this calculation:

$$V = \frac{Q}{A}$$

Where
V= Velocity m/s
Q=flow in m^3/s
A= Area in m^2

SIZING AND POSITIONING



Peaks / High points
The most important areas to place air valves are at high points or peaks along the pipeline. Air willalways rise to these points when filling and when the pipeline is operating. Water will also always drain from the peaks first when draining or in the event of a burst.

Breaks in slope
A break in slope is defined as any point, where under gravity, water will drain away from a point faster than it reaches that point causing column separation. These points can also be a point of turbulence where air can be released from solution.

Long ascending and descending sections
Air valves on long ascending and descending sections should be placed at every 600 m

Other places where air valves should be considered
In Pump Stations
Centrifugal pumps after check valves, preferably six times the pipeline diameter away from the check valve
Turbine and Submersible Pumps before and after the check valve. If only one is possible, then before the check valve in these instances. All Air valves in pump stations should be of the AQUA B70-516BI type of air valves.

Isolation and Check Valves.
Air valves should be placed with any isolation or inline check valve that will, as a result of closure have water running away from the valve. The air valve should be placed on the side of the valve that water will drain from. In the case of isolation valves or check valves placed on peaks an air valve should be placed either side of the valve.

Cla-Val Pacific
45 Kennaway Road, Woolston, Christchurch
Tel: +64 (0)3 964 4860
Email: aspacsales@cla-val.com
www.cla-valpacific.com