



SURESEAL

Water Hammer
Control Solutions



JASH ENGINEERING LTD.

*Ensuring pipe line safety
in more than 5200 rising
mains since last 40 years.*



60 years of innovation and leadership in water control

Jash Engineering Limited is an ISO 9000 : 2008 company manufacturing a wide range of products for water and waste water industry. Established in the year 1948, Jash is now a market leader in India with over 70% market share in Water control gates, Fine & Coarse Screening equipment and Knife Gate Valves. Jash is exporting these products to over 25 countries worldwide and exports contributes more than one third to the company turnover.

Jash has invested in a very modern manufacturing facility to turn out superior quality products. This together with over 60 years of experience through every conceivable application and state of the art designing and testing techniques has resulted into our offering products, which are technically superior, long lasting and virtually trouble free. As a result of this, Jash has become a leading choice for these equipments in water and waste water industry.



SURESEAL

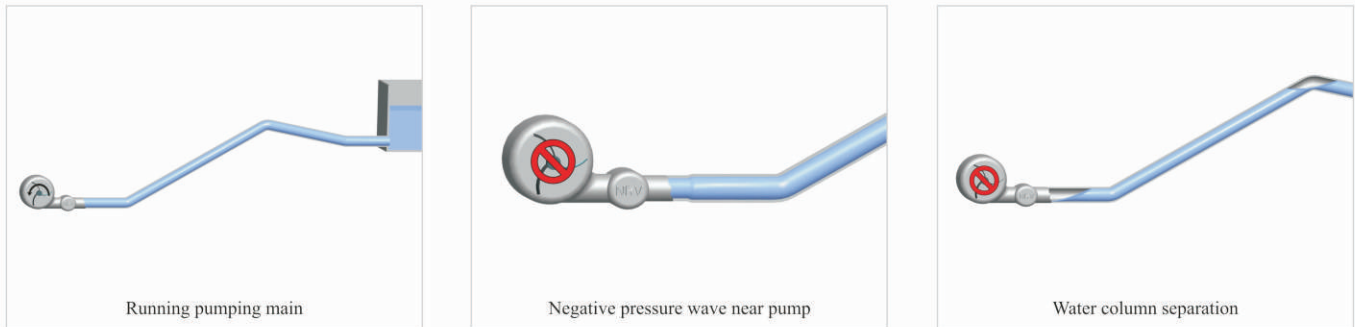
Over 40 years in water hammer control

Sureseal introduced the Zero Velocity valves and Air Cushion valves for surge control in pumping mains in India. Sureseal held the patent for this technology and through its experience and engineering excellence in carrying out surge analysis, has been the name behind major pumping mains projects in India over last 40 years. Sureseal has supplied this solution to more than 5200 water supply schemes, lift irrigation schemes and rising main schemes in India and is acknowledged as the industry leader in this business.

Jash took over Sureseal in 2009 with an aim to strongly promote this proven technology using its team of experienced engineers in India and abroad. In this endeavor Jash will be supported by the inventors of these products in the coming years.

Water Hammer / Pressure Surge / Hydraulic Transient in pumping mains:

When power failure occurs or when all pumps stop at the same time, water supply to the pipeline stops. However, the water which is already in the pipeline still keeps on moving forward due to inertia and gives rise to two phenomenon as under:



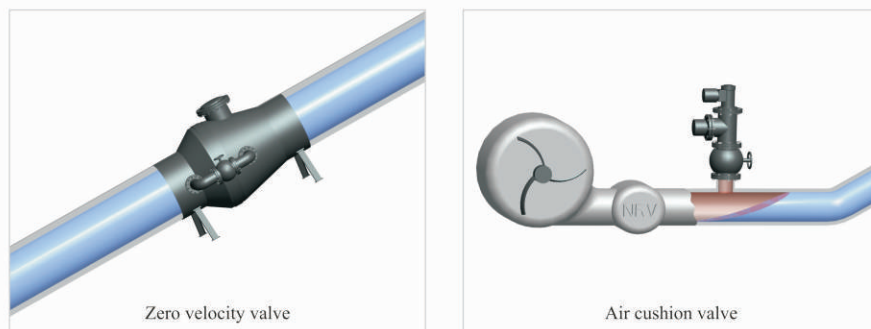
a. The forward movement of water gives rise to a drop in pressure near the pump, inducing stresses in the water and in the pipe material. If the pressure drops below the vapor pressure of water, a physical separation of water column takes place, generating vacuum. This low-pressure stress travels through the length of the pipe in form of -ve pressure wave. Similar physical separation may also take place at other locations, based on the undulations and gradient changes in the main.

To break this vacuum it is necessary to bring in / take in air in the pipeline.

b. The forward moving water column comes to a rest after some travel and depending upon gradient, starts returning back towards the pump. Since this is a free flowing column moving under gravity, it gains a very high velocity and in turn momentum. When the momentum of this water column approaching the pump is destroyed by the NRV or reflux valve, it gives rise to a very high and impulsive positive pressure.

Preventing the water column from gaining the momentum or returning velocity will prevent development of this impulsive high surge of pressure.

The Zero Velocity valves and Air Cushion valves are used in combination to take care of above problem. The Air Cushion valve breaks the vacuum arising due to separation of water column by taking in air and also uses this air as a cushion to reduce the inertia of returning water column. The Zero Velocity valve breaks the energy of returning water column by stopping it just before returning i.e. when its forward velocity reduces to near Zero on tripping of pump and prevent it from returning.



This system is self-actuating on water velocity, therefore requires no attention, no electricity and no external power. Hence it can be installed at any remote location. This solution takes care of bursting of pipelines due to positive surges as well as collapsing due to vacuum / negative pressure.

To arrive at a correct solution so as to prevent problems in pipeline, it is important to carryout surge analysis of the pumping mains. Jash undertakes surge analysis of pumping mains to determine the location, pressure rating and quantity of Zero Velocity valves and Air Cushion valves required.

SURESEAL Zero Velocity valve:

To break the energy of returning water column by stopping it just when its forward velocity reduces to near Zero

Construction and Working Principle of Zero Velocity valve

Constructional features:

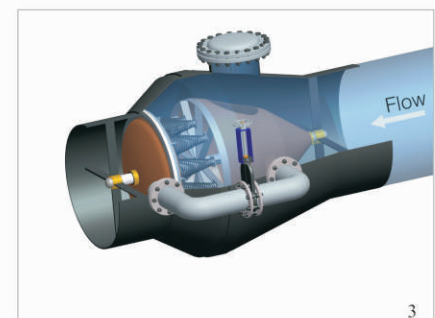
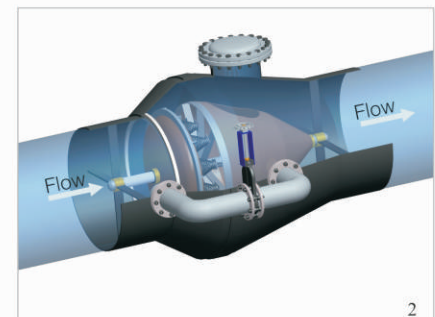
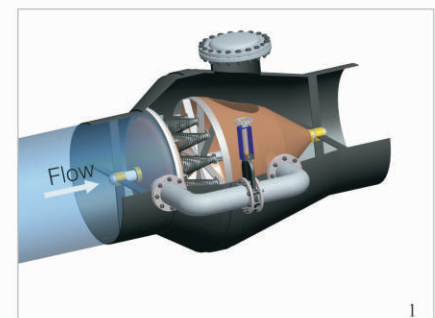
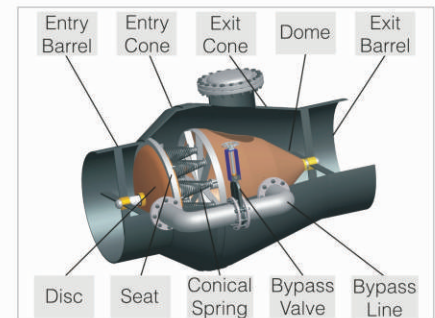
- Offered in 100 to 2350 mm NB.
- Offered in flanged and barrel end construction for piping connection.
- Dome profile designed for steady flow.
- Stainless Steel conical springs for high sensitivity and low head loss.
- For inspection and maintenance, small valves below 1200 mm NB are provided with hand hole and larger than 1200 mm NB are provided with manhole.
- Bypass circuit to break the vacuum arising upstream due to closure of valve.

Forward flow condition:

- The water pushes the disc away from the seat on the sensitive conical springs (Fig. 1).
- This design is made such that it allows the water to flow even when the flow is as low as 25% of the designed flow. The dome of the valve is designed for steady state flow and low head loss (Fig. 2).

Returning water column condition:

- As the forward velocity of water reduces to near zero, the springs close the disc on the seat and breaks the returning water column to prevent positive pressure surge (Fig. 3).
- Bypass valve allows required water to flow upstream to fill the vacuum arising due to closure of valve.



Sizes, material of construction and pressure rating:

Size 100 to 300 mm NB	MATERIAL OF CONSTRUCTION			
	CAST IRON	CARBON STEEL AS PER IS 2062		
Body Test Pressure	10 kg/cm ²	15 kg/cm ²	20 kg/cm ²	25 kg/cm ²
Size 350 to 2300 mm NB	MATERIAL OF CONSTRUCTION			
	CARBON STEEL AS PER IS 2062			
Body Test Pressure	10 kg/cm ²	15 kg/cm ²	20 kg/cm ²	25 kg/cm ²

Higher pressure ratings can also be offered on request.

SURESEAL Air Cushion valve:

To break the vacuum where separation takes place and to reduce the inertia of returning water column by using air taken in as cushion.

Construction and Working Principle of Air Cushion valve

Constructional features:

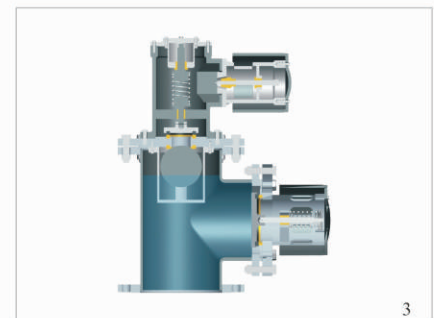
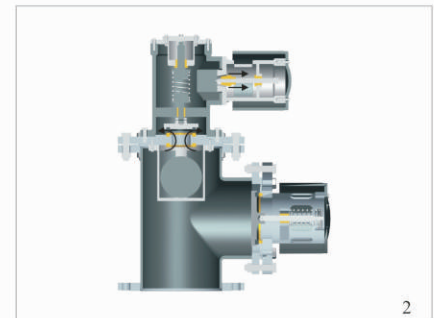
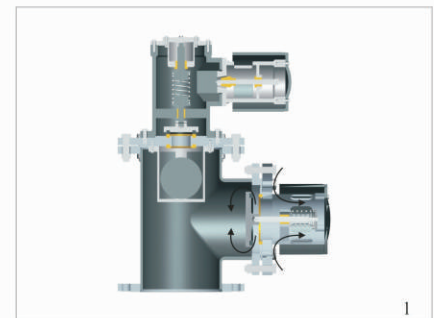
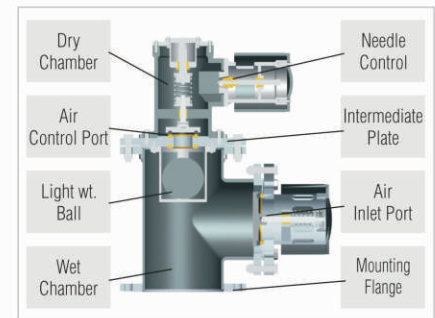
- Offered in 100, 150, 200 and 300 mm NB.
- Rugged and sturdy construction.
- Flange mounted on the tee of a pipe.
- Very light weight ball for effective control of water outlet.
- SS 304 Springs for long life.
- MS epoxy painted body.

When the pumps trip:

- As the separation occurs, air is taken in through air inlet port at low differential head.
- The air can be taken in even in presence of water at low pressure to prevent development of negative pressure (Fig. 1).

When the water column returns:

- Air escape port allows exit of air only when predetermined pressure is reached (Fig. 2).
- The compressed air offers a 'cushion' to the returning water column.
- Controlled release of air ensures that the velocity of the returning column is reduced.
- Once all the air has escaped, the ball closes the passage and prevents water from leakage (Fig. 3).



Sizes, material of construction and pressure rating:

Size 100, 150 and 200 mm NB	MATERIAL OF CONSTRUCTION			
	CAST IRON	CARBON STEEL AS PER IS 2062		
Body Test Pressure	10 kg/cm ²	15 kg/cm ²	20 kg/cm ²	25 kg/cm ²

Air Cushion valve of 300 mm size will be in MS Fabricated construction only.

Mounting flanges of Air Chushion valves will be as per IS: 6392: 1971 unless specifically asked for.

Isolation valve should be installed between pipe and Air Cushion valves.

Credentials:

More than 5200 schemes are running successfully with Sureseal Zero velocity Valves and Air Cushion Valves, throughout India. Details of some of the prestigious projects working with Sureseal water hammer control solutions is given hereunder :

Year of Supply	Size (mm)	Qty (Nos.)	Oper. Head (m)	Flow (lps)	Project
2010	1600	1	29	735	Wagholi Buti Lift Irrigation scheme, Chandrapur, (Mah.)
2010	1500	2	60	3160	55 MGD Water supply scheme, Dwarka, Package 1A - DJB, (Delhi)
2009	1300	2	75	1557	Nakkagudem LIS, Miryalaguda division, Nalgonda, (A.P.)
2006	2350	16	76 - 89.5	8496	Narmada Main Canal to Sujalam Suphalam spreading canal - Jaludra, Adundra, Modhera and Khorsam GWRDC (Guj.)
2006	2150	9	53 - 78	5664,	Hathmati Guhai Irrigation / Water Supply Project 4 stages (Guj.)
2005	2150	9	75 - 88	5664	Modhera Dharoi Project 3 stages GWRDC (Guj.)
2005	2150	3	63	5664	Narmada Main Canal to Saraswati Barrage GWRDC (Guj.)
2004	1850	2	45	3482	Gandhinagar Water Supply Project of GWIL (Guj.)
2003	2150	9	63 - 90	5664	Piyaj Dharoi Irrigation Project of Narmada Water Supply Dept. (Guj.)
2001	1600	1	28	4175	Khadakpura LIS Amrawati (Mah.)
2000	1950	2	35	2997	Saurashtra Pipe line Project II (Guj.)
2000	1650	2	125	2600	Saurashtra Pipe line Project III (Guj.)
2000	1500	1	35	2000	Saurashtra Pipe line Project VI (Guj.)
1999	2150	2	41	3780	Ahmedabad Water Supply Scheme Ahmedabad (Guj.)
1999	1300	1	45	1300	Gurgaon Water Supply Scheme of HUDA Gurgaon (Har.)
1998	1200-1800	10	21 - 28	750-5340	Lower Terna LIS Project 5 stages Osmanabad (Mah.)
1999	1400	1	35	1250	Agra Water Supply Scheme U.P. Jal Nigam Agra (U.P.)
1996	1600	8	19, 29, 55	1754	Jodhpur Water Supply (IGNP) Project 3 stages Jodhpur (Raj.)
1995	1200	1	45	1250	Main Unit 30 Varanasi Water Supply Scheme UP Jal Nigam (U. P.)
1991	1600	2	17	2832	Chinnamaroor LIS (A. P.)
1988	1500	1	18	2280	Tarakarana Ramavarapu LIS, Rajamundhri (A. P.)
1987	1200	2	12	1095	Pimpri Chinchwad Drainage Scheme - Pune (Mah.)
1987	1200	4	16	1000	Khaparkhera Thermal Power Station, BHEL Project (Mah.)
1986	1200	5	55, 61	1250	Bhima Water Supply Scheme - Solapur (Mah.)
1986	1200	2	46	1300	Parvati Main Water Supply Scheme Pune (Mah.)
1985	1000	1	75	835	Singrauli Coal Fields Water Supply Scheme Singrauli. (M.P.)
1983	1500	6	70	1100	Majira Water Supply Scheme Stage 1 and 2 , Hyderabad, (A. P.)
1982	1000	12	52, 58	650	Parali Thermal Power Station MSEB (Mah.)
1980	1200	2	36	1570	Head Regulator LIS Malaprabha Project (Karnataka)
1973	1200	5	170	3230	BWSSB's Bangalore Water Supply Sheme Phase I (Karnataka)

37 Zero Velocity valves of dia 1200 to 2200 mm size are installed in prestigious Narmada Canal Projects (NC1 to NC23 having operating head from 30 to 109 meters) of Gujarat Water Infrastructure Limited (GWIL), supplying water to rural and urban population of almost entire Gujarat.

Manufacturing Facility:

Jash has one of the best manufacturing facility in the industry. Jash employs over 75 engineers and 500 workers in its facility to manufacture a range of equipments for the water industry. The plant covers a built-up area of over 1,50,000 sq. feet and uses state of art facility like CNC Water jet cutting, bending, shearing, machining, welding, shot blasting & painting to produce best equipments in Indian Industry.

Fabrication



Bending & Shearing

- Team of welders qualified as per ASME Boiler & Pressure Vessel code section 9:1962.
- In-house physical and chemical testing facility.
- In-house availability of positive material identification facility.
- Dye Penetration and MPI testing for all critical weld joints.



Welding

Machining



Water-jet cutting machine

- Battery of small and large CNC and conventional machines to machine jobs upto 7000 x 3200x1600 mm size.
- CNC Water-jet cutting machine for heatless cutting of steel plates upto 50 mm thickness.



CNC machine

Assembly & Testing



Sluice gate testing facility

- Assembly facility suitable for over 10,000 valves & gates per year.
- Hydrostatic pressure testing facility for valves up to 3000 mm diameter & gates up to 3500 by 5000 mm size.



Valve assembly plant

Painting



Shot blasting room

- In-house shot blasting facility for large size components.
- State of the art airless painting facility.
- Fusion bonded epoxy painting for small valves.
- Coating thickness, paint adhesion and pinhole testing facility.



Paint shop

Composite solution for water & waste water industry

Sluice
Gates



Coarse and
Fine Screens



Knife Gate Valves



Water Hammer
Control Solutions



Energy Dissipating
Valves



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