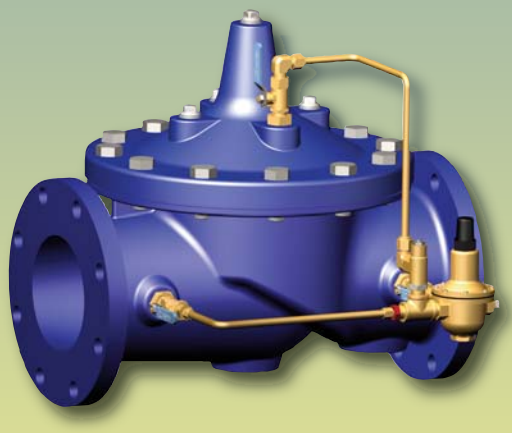
CLA-VAL

Cavitation Solutions



KO Anti-Cavitation Control Valves

Understanding Cavitation

When subjected to high-pressure differentials or high flow rates, valves often exhibit excessive noise and vibration. This is usually attributable to cavitation, which can eventually damage valves and related piping.

Cavitation occurs when the velocity of the fluid at the valve seating area becomes excessive, creating a sudden severe reduction in pressure that transforms the fluid into a vapor state, resulting in the formation of literally thousands of minute bubbles. The subsequent decrease in velocity and pressure rise that occurs after the valve seating area, when the pressurized condition resumes, causes these vapor bubbles to collapse at the rate of many times per second. Should this occur in close proximity to any metal surface, damage can take place. Over time, this can lead to valve failure.

Cavitation's Damaging Effects

- Excessive noise
- Erosion of valve body
- Damaged internal components
- Loss of flow capacity
- Pressure fluctuations
- Diminished performance
- High maintenance costs
- Valve failure
- Costly valve replacements

Preventing Cavitation

The CLA-CAV Advantage:

- CLA-CAV identifies when damaging cavitation will occur in addition to the onset of critical cavitation.
- CLA-CAV helps to identify which valve or equipment combination will be the most effective means to eliminate potential cavitation damage.
- CLA-CAV helps to lower system maintenance costs by predicting cavitation damage before it happens.

Cla-Val Cavitation Analysis Software

Understanding the circumstances under which cavitation noise and damage occurs in valves is critical to effectively operating and maintaining water distribution systems, particularly in those with high capacity operating requirements. To help achieve this understanding, Cla-Val offers Specifying Engineers and Maintenance Personnel a complete analysis of their distribution systems, utilizing our own in-house, state-of-the-art cavitation analysis software -- CLA-CAV.

Based on data and methodology developed by an independent test laboratory, the CLA-CAV program analyzes customer-provided parameters such as valve size, maximum and minimum flow rate, static/dynamic inlet and outlet pressure, typical water temperature and elevation above sea level to accurately predict if and when a valve will experience critical, damaging or choking cavitation.

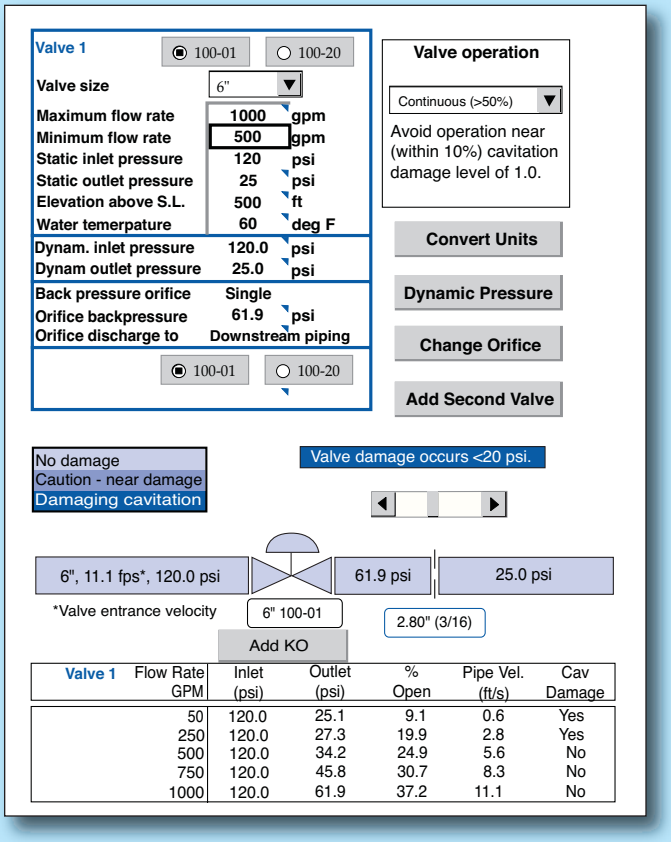
Armed with this data, our application specialists can advise which valve or valve combination will be best suited to handle a given system's flow control requirements.

For Engineers

Utilizing the CLA-CAV cavitation analysis program is an important first step in designing a water distribution system that will withstand the extreme conditions of high pressure drops and flow rates, while helping to ensure long, trouble-free operation of your control valves and the system as a whole.

For Operators

In many cases, installing Cla-Val's anti-cavitation valve or retrofitting an existing valve with anti-cavitation trim will be the preferred method to eliminate the potential for noise and damage. In other scenarios, our experts may make alternate recommendations such as multiple valves installed in series as the most cost-effective means to combat cavitation while providing optimum performance.



Valve 1 Flow Rate GPM	Inlet (psi)	Outlet (psi)	% Open	Pipe Vel. (ft/s)	Cav Damage
50	120.0	25.1	9.1	0.6	Yes
250	120.0	27.3	19.9	2.8	Yes
500	120.0	34.2	24.9	5.6	No
750	120.0	45.8	30.7	8.3	No
1000	120.0	61.9	37.2	11.1	No

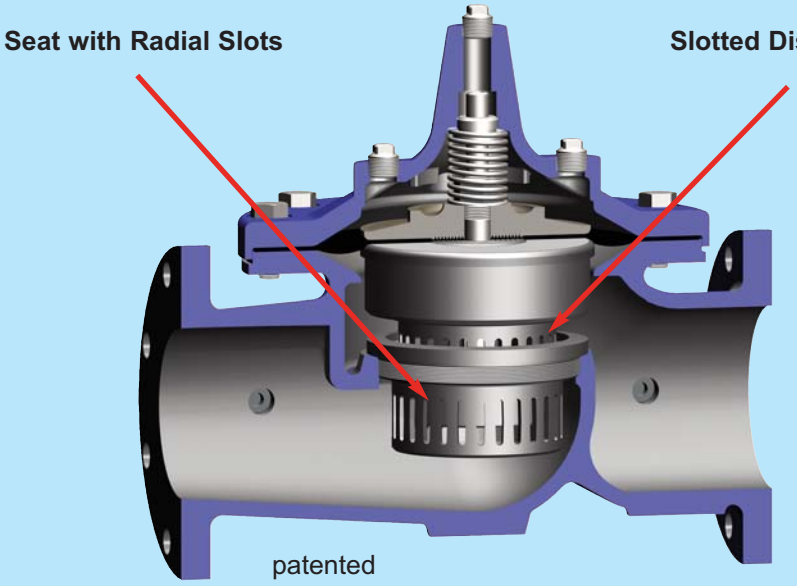
visit www.cla-val.com to download technical data sheets for the 100-01 KO Anti-Cavitation Valve

Model 100-01KO Anti-Cavitation Control Valve

KO Anti-Cavitation Trim

Cla-Val's KO anti-cavitation trim represents a dramatic departure from the standard approaches usually employed to fight cavitation in valves that are required to undergo extreme pressure differentials and high velocity flow conditions.

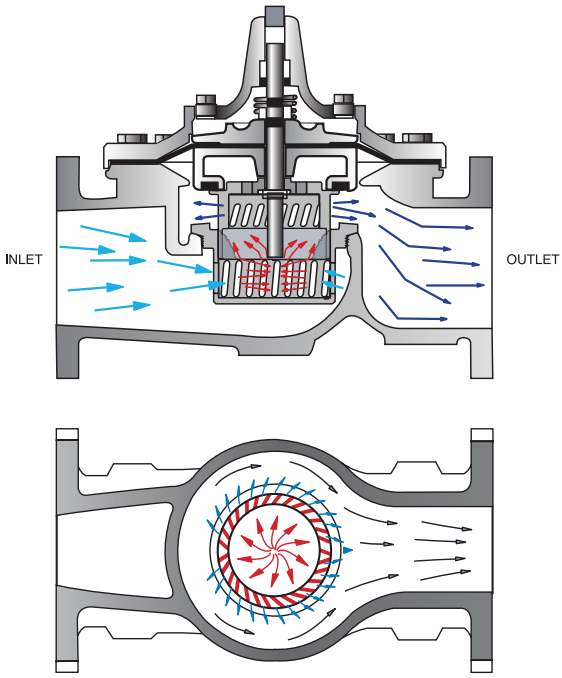
Constructed of 316 Stainless Steel, the seat and disc guide feature dual interlocked sleeves containing cast radial slots that deflect internal flow to impinge upon itself, harmlessly dissipating potential noise and cavitation damage. The cast radial slots create a larger flow path than is possible with the standard drilled holes typically employed by other anti-cavitation valves currently available in the market place. The uniquely designed radial slots in the seat and disc guides also lessen the possibility of fouling if small particles are present in the water.



Typical Applications

- Pressure Reducing Valve Stations
- Tank Fill Valve Applications
- Noise Reduction in High-Rise Building Valve Stations
- Reservoir Level Control Valve Applications
- Booster Pump Bypass Stations
- Offshore Fire Pump Relief Valve Protection
- Applications with discharge to atmosphere
- Any application where valves are subjected to extreme pressure differentials or high velocity flow conditions

Cla-Val KO Anti-Cavitation Valve Principals of Operation



First Stage Pressure Reduction

- Flow enters through seat slots and reduces pressure

Second Stage Pressure Reduction

- Flow impinges upon itself within the seat and disc guide assembly to dissipate cavitation and further reduce pressure

Third Stage Pressure Reduction

- Flow exits through disc guide for final pressure reduction
- Diagonal disc guide slots direct flow away from surfaces

World-Class Operations

Since 1936, Cla-Val has produced the world's highest quality automatic control valves for a diverse array of applications and market places. Our special blend of engineering expertise, craftsmanship, quality materials and sophisticated manufacturing processes has earned Cla-Val a reputation for excellence throughout the United States and around the world.

With manufacturing facilities and offices in the US, Canada, Switzerland, the United Kingdom and France, Cla-Val has what it takes to provide world-class products and solutions that meet our customers' most critical operational requirements.

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