CLA-VAL

Intelligent valves
for **Smart Water**
systems

contents

We live in a world where everything is getting smarter. Homes, cities, cars, even children's toys! The demand for our products to become smarter has increased and Cla-Val is prepared. We are pleased to share with you some of the areas where we have met this challenge and are ready to meet the needs of our customers with our intelligent valves for smart water systems.

In this booklet we are going to show you some of our award-winning solutions
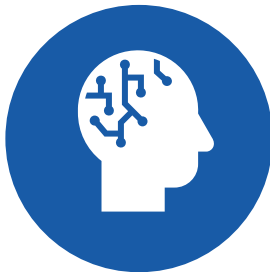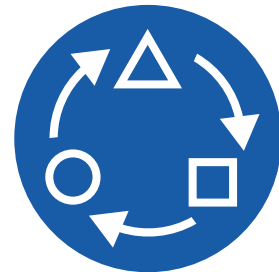
Intelligent   **Advanced**   **Adaptive**

1 Flow & Data Acquisition

Control valves are no longer just "dumb" pipeline appurtenances that we use to open and close to control water movement. By adding pressure transmitters to provide real time pressures, along with digital valve position transmitters showing the exact position of the valve stem during it's open and close cycle, we can accurately calculate the real time flow passing through the valve in our on-board computer module.

- Instantaneous Flow
- Totalized Flow
- Inlet Pressure
- Outlet Pressure
- Valve Position

This application can be added to any of our control valves, giving a much smarter solution to valve control.

2 Electronic Control

Historically, control valves were controlled with hydraulically actuated, mechanical pilot controls. Typically using springs to adjust pressure settings or mechanical floats for level control. However, smarter control utilizing dual electronic solenoid controls allows for any valve operation you could possibly think of utilizing solenoids and our stand-alone Electronic Valve Controller. So, by adding pressure transmitters we now have a valve that could be used for pressure sustaining or pressure relief or pressure reducing applications. Having a level signal from either an ultrasonic, radar or conductive level transmitter, we can turn this same valve into a highly accurate level control solution. The amazing thing about this new smarter control philosophy is that this valve could be all of these things at the same time, with the order of importance selected by the needs of the system!

3 Valve Control Automation

All hydraulically operated control valves require a "pilot" or solenoid to operate the main valve. Typically, these are mechanical pilots, with pressure or flow settings controlled by manually adjusting the setting on a spring inside the pilot control.

To add functionality and remote operating capabilities, these pilots can be installed with electrically actuated motors that can be adjusted either locally or remotely using SCADA systems or another type of communication system. This improves the efficiency of any network by allowing setpoint changes throughout the day to suit demands and system requirements.

These types of controllers are often used in pressure management systems, either time based or demand based, where pressure is reduced to combat system leakages and non-revenue water.

Combining a controller with motor operated pilot gives you a multitude of control options through one single pilot.

Calm Networks 4

Transients in networks are typically caused by piping material, air in the pipelines and the starting and stopping of pumps. These concerns create operational issues for system personnel across the world. Line breaks, surges and equipment failures can occur and some of the traditional solutions for this are not without their own problems. Variable frequency drives on pumps, pump control valves, soft starts, soft stops and specialty check valves are all methods to combat these issues. The new Cla-Calm solution is a bespoke application that utilizes a smart controller along with a control valve to fully customize and control the opening times, closing times, valve speeds and timings of each stage, to ensure that we are fully controlling flow and pressures into the system to ensure a calm network. This solution is future proof as it is fully adaptable to any system changes that may occur, without the need for additional equipment.

5 Smart Software Solutions

Not only does Cla-Val manufacture world class valves, we also produce best in class software to assist designers in the selection of products for each application. Cla-Tools is our family of custom software, centered around Cla-Val products, ensuring that the design engineer has full confidence in the program recommendations.

This software includes:

Cla-Cav, a program designed to analyze flow and pressure through your valves for the potential of cavitation or cavitation damage. The program allows the designer to see the benefits of adding specialized anti-cavitation trim to the valves, protecting both the valve and system piping.

Cla-Reg is a design tool for sizing direct acting and pilot operated pressure reducing valves for buildings. Well established rules are followed to prevent problems of cavitation damage and noise as well as excessive velocity.
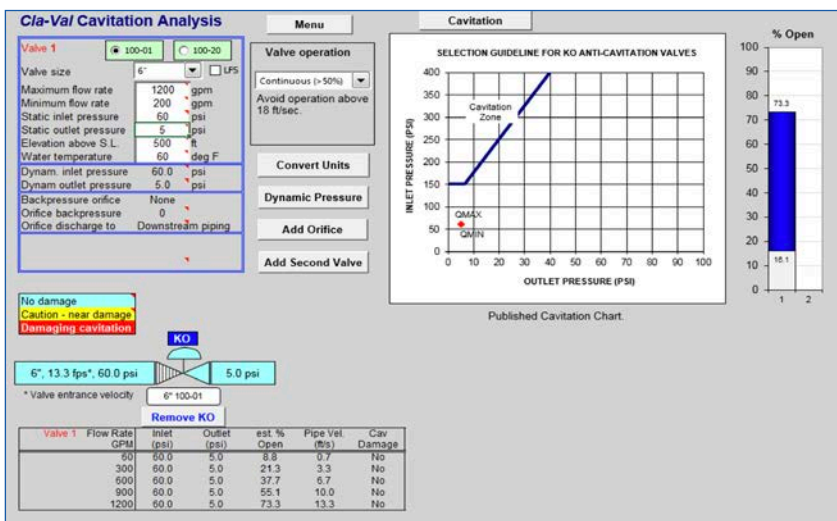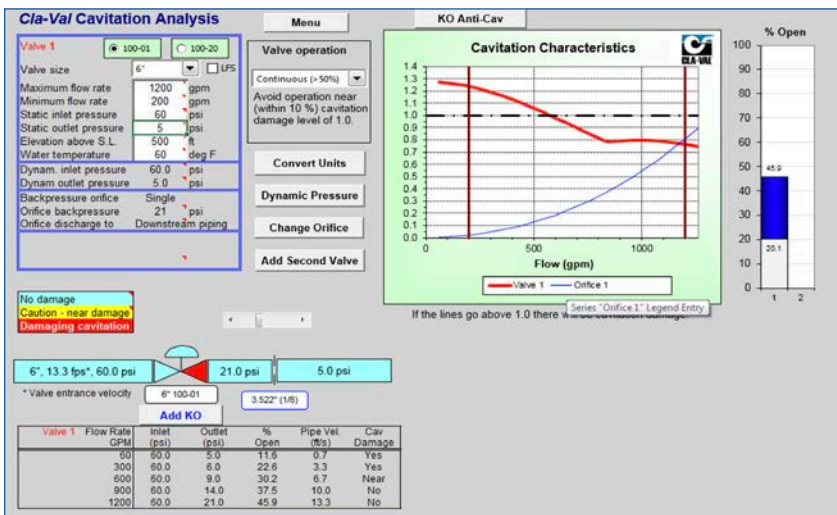
This program will also calculate noise levels the valve will experience at operating conditions.

Cla-AV Analysis - Fill + Drain

AV Location Rules

HP	High Point
HHP	High High Point (vent restriction)
DU	Decreasing Uphill slope
ID	Increasing Downhill slope
LA	Long Ascent
LH	Long Horizontal
LD	Long Descent
DVx	Drain Valve or Rupture Point

Project:	Test Pipeline
Analysis by:	John Smith
Design Flow	7000 gpm
Velocity	5.1 ft
Pipe Material	Steel

Collapse Vacuum

Pipe 1	2.3	psi
Pipe 2	2.3	psi

Cla-AV Analysis - Fill + Drain

☐ Show Surge HGL

Chart Navigation - Labels

<	>	^
Marker	Label	Down
Pics	Model	

Chart Scaling

	Lower	Range	Shift
X	0	80000	10000
Y	450	300	50

AV Press. (psi)	Dist. (ft)	Elev. (ft)	AV Rule	Air Flow (scfs)	AV Model	AV Size	AV Summary AV Size	# 33A	# 33AWS	Comments or Adjustments
210.0	0	535	HP	9.3	33A	3"	1"			
220.4	300	510	DV1		DV1		2"	16		
205.4	1700	540	HP	9.3	33A	3"	3"	10	2	
209.2	2050	530					4"	19	8	
202.2	2400	545	DU	9.6	33A	3"	6"	1		
199.5	2750	550	HP	10.0	33A	3"	8"		1	
198.9	3150	550					10"			
179.9	4300	590	HP	25.6	33A	4"	12"			
183.8	4600	580								
179.1	4850	590	HP	25.7	33A	4"				
195.8	5250	550					Total	46	11	
192.9	5750	555	HP	9.4	33A	3"				
197.9	6800	540	ID	7.2	33A	3"	Ratio	Comb.		
204.0	7050	525	DV2		DV2		of 12"	33A		
192.8	7300	550	HP	9.4	33A	3"	0.89	8" + 8"		
201.1	7600	530					1.03	12" + 3"		

Cla-Av is the air valve design program that goes above and beyond most air valve sizing programs. Pipe profiles, pipe characteristics, drain and rupture locations, as well as indicating where damaging surges could occur due to power failures, are shown.

Cla-Check is a program designed to give full analysis of Cla-Val check valve pressure loss across a valve, velocity, position and closing times.

Cla-Station is our newest software member that takes valve station design to the next level. It will allow a designer to analyze the flow through a typical municipal valve station, and will recommend where a transition device is required to ensure that the velocities in the bypass valve do not exceed the recommended rates. This is an industry first and gives the network designer smarter options for station design!
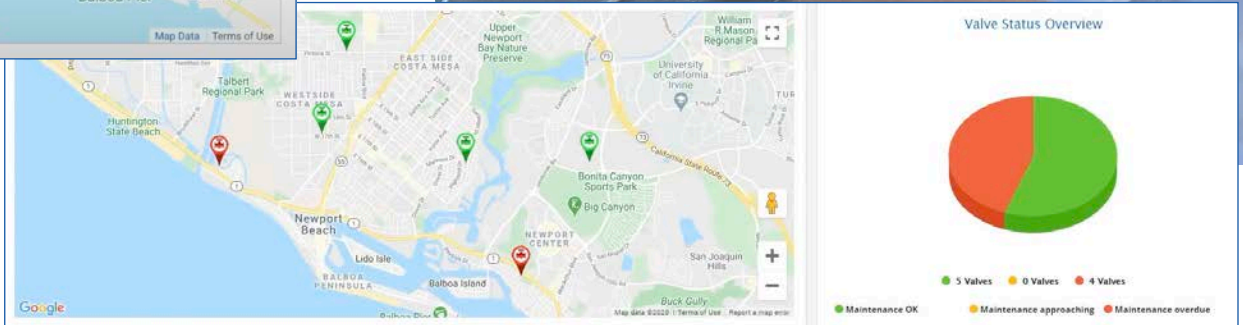
All of the Cla-Val Software Solutions are available at no charge
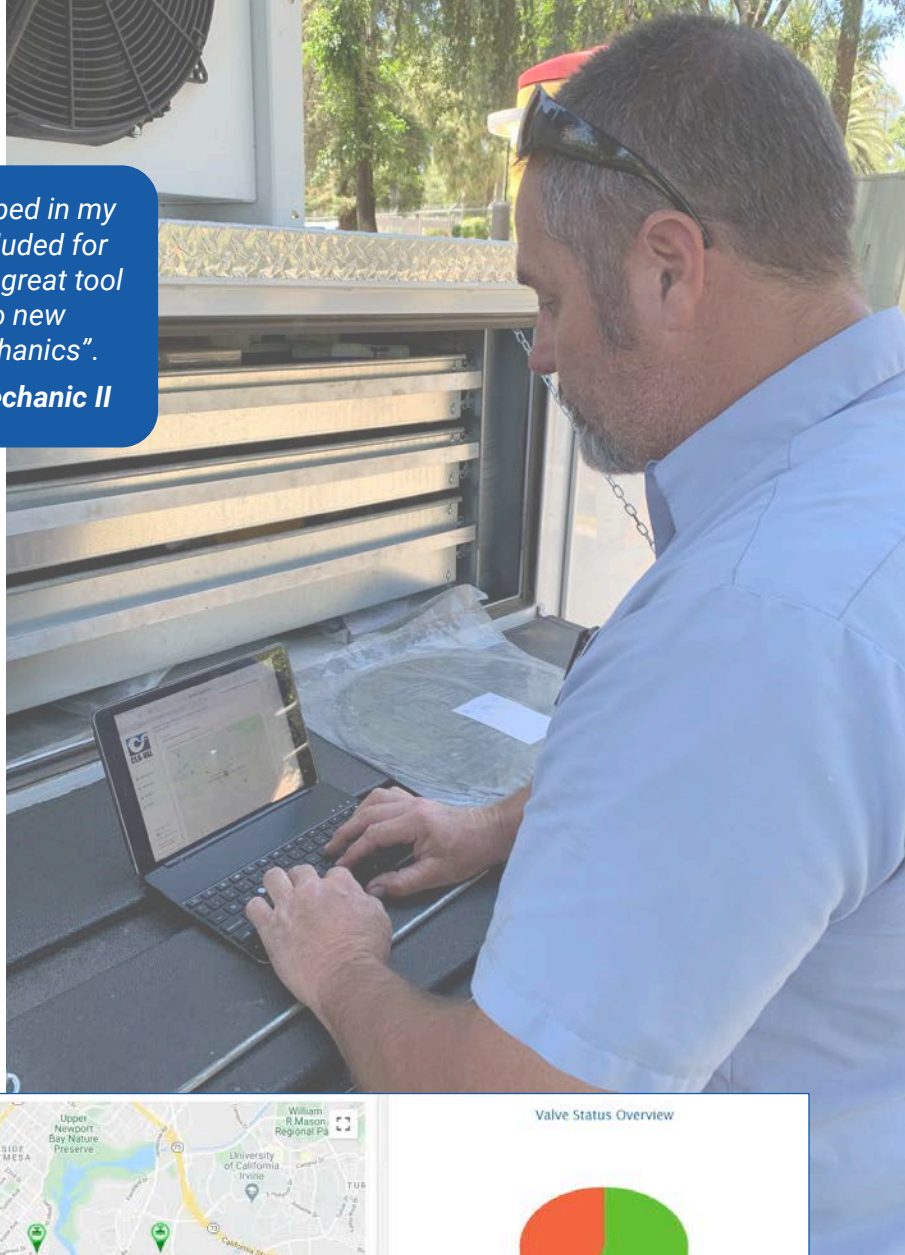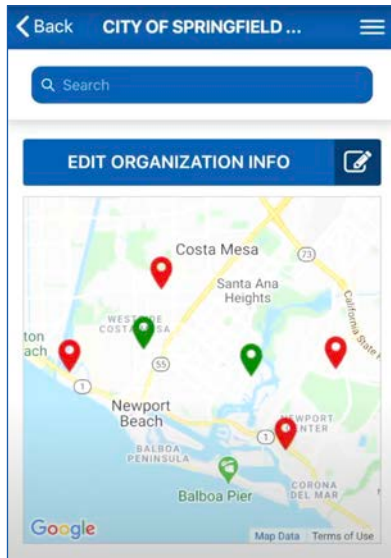
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Link2Valves™

A well-managed network is only as efficient as the components in the system. Ensuring that each piece of equipment is operating at peak performance can be a full-time job. Link2Valves software takes the guesswork out of maintenance and is a very effective tool to manage each of the automatic control valves in the system. The full valve details, locations, settings, and full-service history is recorded on a secure internet portal, accessible to authorized users only and can also be accessed and used on a custom smart phone app. Just another way to ensure that your system is running smartly.

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