



Positioning versus direct flow control valves ... which do you choose?

"After the contractor finished with the electronic flow control we're not satisfied with the valves performance." Curious about the setup, I asked the water district operator where the flow meter signal went. "The PLC" he replied. And what is the feedback signal to the Cla-Val 131VC-1 controller? "The position transmitter".

We occasionally receive these types of calls from customers who have just installed a SCADA upgrade to their water distribution system. The controls company in charge of the installation is very familiar with motorized positioning valves commonly used at treatment plants. They are less familiar with Cla-Val hydraulically operated diaphragm control valves used in water distribution systems. The controls company designates the 131VC-1 as a position controller and uses the PLC to make decisions to position the Cla-Val in order to control flow. The results however are often not what the customer expects. In many cases the accuracy and stability are not satisfactory.

Although the 131VC-1 series electronic valve controllers are perfectly good position controllers, they are equally good flow controllers. That is, they accept a 4-20 mA flowmeter signal as a controlled (or "process") variable and modulate the Cla-Val main valve to achieve a desired setpoint flow. This is comparable to the 40 series hydraulic pilot control system, which modulates the Cla-Val control valve to whatever position is required to match setpoint with actual flow rate. The Cla-Val VC series controllers incorporate powerful tuning capabilities to ensure accurate and stable flow control under all operating conditions. The result is accurate flow control without hunting or surging in the distribution system.

"What do you suggest we do to improve our flow control?" asked the water district operator. Our recommendation in this case was to wire the 4-20 mA flowmeter signal into the 131VC-1 as the controlled process variable and send the valve position signal directly to the PLC for remote monitoring purposes only. Fortunately, this modification required no additional hardware and little software changes for the district. One week later we received a call from the district operator after the rewiring changes were made. The valve was working much better and only required a simple tuning adjustment to completely satisfy their requirements.

The result was not only better and more stable flow control but the district operator was more in charge of the process. He was no longer dependent on outside help to keep the valve operating successfully. The same scenario applies for other fast changing processes such as pressure control.

Position Proportioning Level Control... steady as she goes.

In our last part we discussed applications where position control is not necessary. This does not imply that position control is inevitably the wrong choice. Level control is often a slow changing process, which sometimes requires two inputs to the VC-1 controller. The comparable hydraulic pilot control system is the 427 modulating level control valve. This valve has both a float pilot sensing device and a stem valve directly connected to valve position.

The electronic version requires 4-20 mA level and valve position signals in order to modulate the valve within a position proportion level band. That is, the 131VC-1 is programmed to position a valve at 100% at a low level (for a filling valve) and 0% at a high level. And in between the low and high levels the valve is positioned proportionally for ultra-stable and accurate level control. The low level and high level points are fully programmable as well as the width of the band.

For instance, a reservoir-filling valve may be programmed to control level to 13 feet in an underground reservoir, which is 15 feet deep. The band of position proportionality may be programmed to be 1 foot such that at 12 feet the valve is fully open and at 13 feet the valve is fully closed. Within this band the valve will be positioned proportionally. All of these parameters are fully adjustable including the bandwidth. This makes the Cla-Val 131VC-1 a versatile controller for all types of flow, pressure, and level control. By the way, other slow changing processes such as temperature, pH, or conductivity may be controlled in this manner.

Want to know how to setup this electronic control in your water level control application? Call your local Cla-Val representative for details. They're trained to assist you with selecting the right electronic valve control.