Valve application News...
January 2003
Orifice Plate Flowmeters
Volume 18-3

Electronic Flow Control with Orifice Plate Flow Meters

"I need help starting up this 131VC-1 flow controller. The contractor is anxious to finish this project." I asked the sales agent what was the flowmeter. "It's a Cla-Val X52A orifice with DP sensor" was the reply.

We all get nervous when we must go to a valve startup we've never done before; it's only natural. In this case there was no need to be nervous because controlling flow based on differential pressure (DP) across an orifice is a well-proven and accurate method. It's a simple physical principle; flow rate through an orifice is proportional to the square root of the differential pressure. By maintaining a constant differential pressure across an orifice plate, flow rate is held constant as well.

Traditionally the Cla-Val 40 series control valves use a differential pressure sensing CDHS pilot control to modulate the main valve and maintain constant flow. This type of control works well over a range of 30 to 480 inches of water differential pressure or 4:1 flow range.

With today's accurate and wide-ranging differential pressure sensors, it is possible to extend this range using the electronic 131VC-1 controller. The Cla-Val DP sensor is capable of sensing well beyond these mechanical limits of the pilot control, and are accurate from less than 1 to more than 1000 inches of water differential pressure. This means that a flow range of 10:1 is quite possible. The main restriction is available pressure since the orifice itself creates some permanent pressure drop.

The Cla-Val DP sensors are versatile for sensing and displaying differential pressure in all types of units. In addition they are capable of sending and displaying flow. This is actually a "square root output" since flow is proportional to the square root of DP. But in our sales agents case it was not necessary. The 131 VC-1 controller is also capable of linearizing the DP signal and can be internally scaled for flow units.

The recommendation to our sales agent was to program the DP sensor maximum range to match the highest expected flow rate or 1500 gpm. This flow produced 250 inches of differential with the existing orifice bore size. Then the VC-1 was programmed to linearize the DP 4-20 mA signal by taking its square root. The VC-1 was also programmed to display flow with maximum range of 1500 gpm. The 8" Cla-Val 131 series valve then modulated to control flow to the local or remote setpoint. With only minor tuning adjustments the valve responded flawlessly, accurately delivering the desired flow to the water district without overshoot or instability.
For more information about the Cla-Val 131 electronic flow control with orifice plates contact your nearest Cla-Val representative.

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