The OMNI Transmitter

FEBRUARY 2018 NEWSLETTER

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FIVE COMMON CONTROL VALVE PROBLEMS

Some control valve problems can be relatively easy to detect, but others are more difficult to identify without performing specific tests. Before attempting to tune a control loop to improve loop performance, here are five of the most common control valve problems to look for:

Deadband is a range of input values that result in zero output. For a control valve, a controller signal fails to trigger a direction change within this range, and additional output results in the valve overshooting its target. Deadband leads to increased dead time, creates load disturbance errors, increases oscillations in the control loop, and can damage pressure relief discs or vessels. Hysteresis is a similar condition that can create process cycling around the setpoint, slow controller response, and increased control variance.

Stiction is static friction that can cause a valve to stick in position. When the valve breaks free, excess pressure causes it to overshoot its target position, rendering the controller incapable of reaching its desired setpoint. Common causes are over-tightened valve stem seals, sticky valve internals, undersized actuator, media viscosity, and sticky positioner, among others.

Oversized control valves can lead to poor control performance. Full flow should be obtained at 70-90% depending on conditions, and if valves are sized too large, small changes can significantly affect flow. (Undersized control valves can cause various issues, as well, but this condition is less common.) If other valve positioning problems exist, oversized valves will further amplify the negative effects.

Finally, nonlinearity can lead to tuning problems. If a control valve's flow characteristic is nonlinear, control loops tend to become sluggish or unstable when the valve position moves away from its operating point.

OMNI INSTRUMENTATION SERVICES, INC.

Omni
112A Sylvania Place
South Plainfield, NJ 07080
PH - 908.412.7130
FX - 908.412.7131
www.omniinst.com

OMNI TECH TALK: Selecting A Pressure Transmitter

Selecting the correct pressure transmitter is not a simple task, and choosing the wrong one can make the operation of your equipment inaccurate, and possibly even dangerous. Here are a number of important things to consider when choosing the proper device for your application:

1) Determine your measurement requirements and the type of transmitter you will need. Are you measuring positive pressure or negative pressure? Are you taking stand-alone measurements, or pressure differentials?

2) Assess the operating conditions where the pressure transmitter is to be installed. What is the medium being measured, and are exposed parts compatible, or capable of withstanding, this medium? Steam, refrigerants, chemicals, etc., require special considerations. Also take into account whether your device will be exposed to vibration, shock, moisture, electrical interference, or extreme temperatures.

3) Carefully determine the correct pressure range before selecting a transmitter. Choosing a device with the wrong range can significantly throw off your readings.

4) Choose the proper location for your transmitter, and determine whether it should be blind or indicating. It should be accessible and must have proper vertical and horizontal clearances so it can be calibrated and serviced easily.

5) If your transmitter is to be installed outdoors or in a corrosive environment, make sure it appropriately sealed and protected.

6) Check and double check your make and model number numbers to avoid the major headaches that can result if errors are discovered late in the game. This might seem like a no-brainer, but it is one of the most commonly occurring problems.

7) Choose your communication protocol and hardware wisely. Make sure your pressure transmitter is capable of communicating critical information and operates optimally over your chosen data highway.

Remember that instruments require ample lead time, and a mistake can throw a wrench into a schedule and delay system startup. These are just a few basic considerations when choosing a pressure transmitter. Contact Omni to help you with this complicated process at (908) 412-7130.

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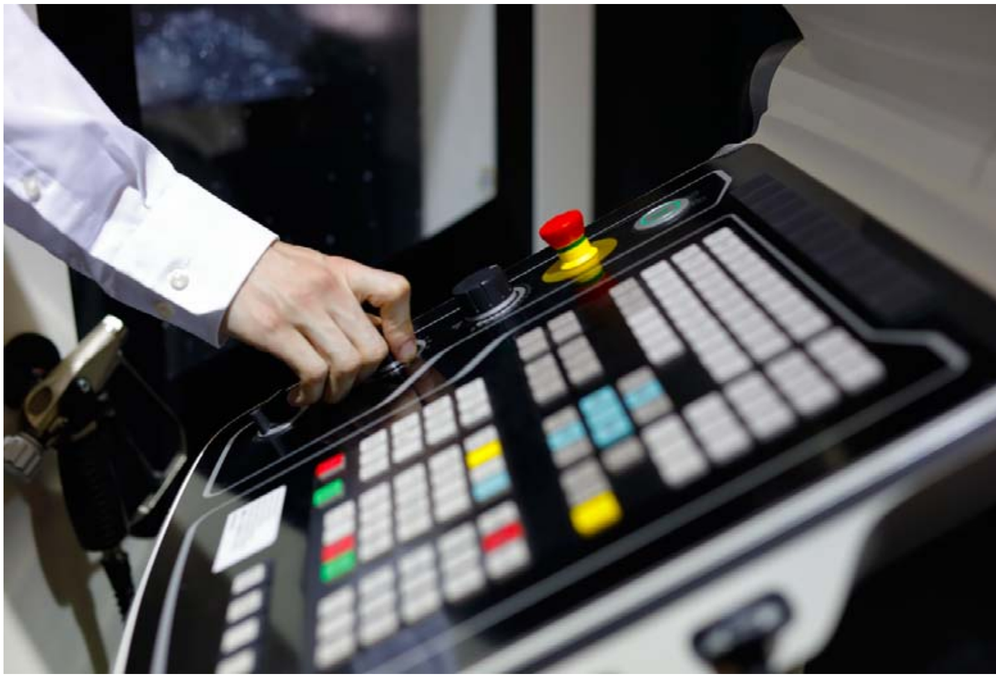
FROM THE PANEL SHOP: HMI's - Human Machine Interface

A human-machine interface, or HMI, is a graphic interface that provides remote access to industrial process control and monitoring systems. Basically an operator's "dashboard", the HMI analyzes and translates complex real-time process information, like valve and motor status, tank levels, etc., into visual graphics that allow operators to control, monitor, and manage processes and address problems as soon as they arise.



HMIs come in a variety of sizes, memory options, and configurations ranging from simple displays to sophisticated high-resolution panels. HMIs can be hand-held, panel-mounted, or located in a centralized control room. Because they are commonly used in industrial settings and harsh environmental conditions, HMIs are built to endure rough treatment of varying degrees. Most HMIs feature scratch-resistant screens and protected keypads, and there are a variety of options designed to withstand different levels of vibration, heat, cold, moisture, chemicals, dust, etc. HMIs rated for the most extreme environments, such as refineries, chemicals, and mining, can operate in temperatures as low as -20F and as high as 160F and are able to endure snow, ice, wind, and rain.

Omni is expert in HMI selection, installation, and repair. For assistance or more information, contact us at (908) 412-7130.

Elevators Generate Electricity Through Gravity

Building owners are always looking for ways to lower utility bills by reducing energy consumption. With regenerative elevator drives, buildings can actually recapture energy that otherwise would be lost

A conventional cable elevator consists of a car, a motor, and a counterweight designed to equal the weight of a half-full car. The balance created allows the elevator to utilize gravity to travel up with a light load, or descend with a heavy load. This creates energy that is dissipated as heat, increasing waste-heat loads in the building. Regenerative elevator drives capture this lost energy, allowing the motor to act as a generator during periods of low load and transfer it back into the building's electrical grid. Compared to a conventional elevator, regenerative drives can reduce elevator electricity consumption by 20-40% and reduce equipment room cooling needs, and they can be used toward LEED Certification.