

● Doing business differently: digital positioners

Digital-positioner technology has enabled improved levels of set-up efficiency, integration and ease of diagnostic work in process-control systems. Now the technology is set to unleash its full power.

Twenty years ago, microprocessor-based field equipment was introduced to the controls industry. Acceptance of this new concept was immediate, due to enhanced performance and reliability. Field-maintenance personnel soon determined that microprocessor-based controls provided greater accuracy and stability while eliminating the drift in calibration. This resulted in considerable time-saving in the set-up and tuning processes.

Process-control engineers soon found that using digital-based devices provided better production throughput and increased process uptime. Some first-generation devices were based on open protocols. These protocols included HART, Modbus, FoundationFieldbus, and ProfiBus. Other companies used manufacturer-specific protocols. End users soon realised that open protocols provided them with a sense of freedom to select the correct device for an application, without the worry of control-system integration.

Impact on process-control quality

The introduction of digital positioners began a new era of control-valve information and diagnostics. Engineers now had the ability to gather critical valve information and establish a diagnostic capability for the final element, the control valve. The control valve is the device that has the biggest impact on the quality of process control in a loop.

Adding a digital positioner, such as one of the SVI family from Masoneilan, to a control valve immediately transforms the control valve into a 'mini-server' of valuable information. Using diagnostic information gathered in the non-volatile memory, it becomes possible to monitor cycle count, travel accumulation and online clocks. This information determines if the valve in use is the correct size and predicts premature trim wear. In addition, the information collected by the control valve provides a method of calculating the lifespan of the valve, determines the packing maintenance cycle, and predicts future process-control issues. Predicting and preventing failures has a positive effect on uptime and enables stringent environmental regulations to be met.

Digital-positioner technology allows the viewing of important diagnostic information by running a test that moves a valve within a specified range, while acquiring critical parameters from the positioner. Powerful user-interface software such as ValVue

can initiate a diagnostic routine that computes the friction in a valve assembly, bench range, stroking speed and more.

Graphical data gathered during a test is called the signature. Signatures contain a wealth of information about a valve's operational health. However, data interpretation is complex and requires a detailed understanding of valve mechanics, physics, instrumentation and their interactions with the process-control system. Conversely, successful signature interpretation is highly valuable and can provide a synopsis of the effects of 'in service' conditions. This can result in predictive maintenance mechanisms that can ultimately reduce process down time and increase process yield.

Until now, the digital positioner's most tangible benefits have been an improvement in positioning performance; ease of installation, and a reduction in mechanical moving parts. Unfortunately, the diagnostic capabilities of the positioner have been put aside due to a lack of knowledge relating to valve-signature interpretation.

Realising the potential

Masoneilan is taking the next step by unleashing the full capability of the digital positioner. The three most important factors involved in accessing that capability are as follows:

- + Adoption of the HART protocol by control-system vendors
- + Ease of information integration using the versatility of HART multiplexors and HART I/O cards
- + Standardisation of the OLE for process control (OPC) protocol, providing easy integration of various software packages

Taking the next step

It is now possible to have the best view, ever, of the entire process. Process-control systems have evolved to capture all the valuable information produced by today's digital positioners. The technology is available. The timing is now and the monetary benefits are substantial. The time has come to move ahead. +

● AUTHOR PROFILE

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