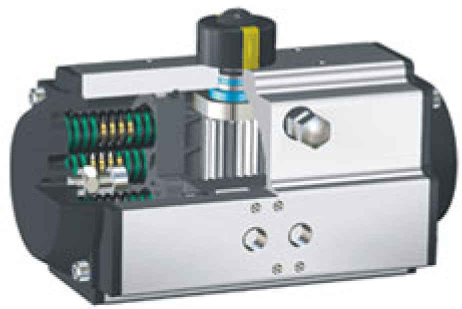
Understanding Valve Diagnostics



Constant diagnostic evaluation of valves has become an important tool for asset management, predictive maintenance programs, troubleshooting, and scheduled periodic maintenance. Predictive functionality allows your maintenance personnel to be proactive in servicing valves, while limiting costly failures and unscheduled plant process shutdowns. During scheduled downtime, maintenance personnel are given the information they need to prioritize valve and actuator maintenance to make best use of scarce opportunities.

Valve diagnostic parameters

Valve-specific diagnostics allow you to monitor the health of all valves and actuators in a plant or process. By gathering, analyzing, you can monitor a valve's health. A valve warning prior to a critical failure gives your maintenance personnel time to repair the valve without unscheduled shutdowns and loss of productivity.

Many operating parameters can serve as indicators of a valve's health, including:

- The actuator's torque trend during valve travel;
- Capturing the valve cycle count; and
- Monitoring the valve's span of travel.
- When evaluating the actuator's torque trend, a nominal base-line is established and then an ongoing comparative analysis is performed.

A low-torque condition will prompt warnings and/or alarms normally associated with a broken valve stem or plug, seat leaking, flashing, packing wear, sheared key, or damaged stem-to-stem nut interface.

A high-torque situation reveals valve issues such as seat wear, obstruction, gumming, extreme vibration, inadequate stem lubrication, excessively tightened packing, or other mechanical issues.

Capturing the valve cycle or operation count allows maintenance to assess usage, while prompting a service reminder after a user-assigned count set point has been reached. This quickly helps the maintenance engineer determine if excessive wear conditions exist and service is required.

Diagnosing the span of valve travel over a period of time validates important attributes associated with the valve, including correct sizing and range of performance. For optimum modulating performance, the majority of valve operation should be positioned near 50% open. Naturally, open/close valve applications should reveal a normal distribution between 0% and 100% open. Skewed data in one direction or the other suggests a valve that may not be optimally sized for the application. Typical flow conditions are as important as pipe size for valve selection.

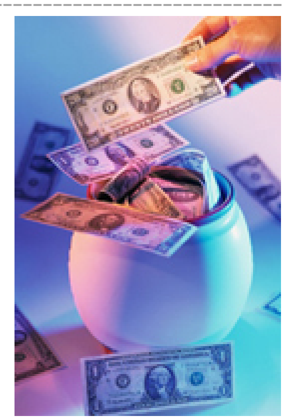
Improvements in diagnostics

Diagnostic testing of valves began nearly 30 years ago to validate the operability of safety-related MOVs in the nuclear power industry. Since this periodic, manually-initiated form of diagnostic testing could identify problems in both the valve and actuator, it became not only a tool to verify MOV operation, but also for troubleshooting and preventive maintenance. In recent years, innovations within electronic smart actuation devices created a highly sophisticated but labor-intensive troubleshooting effort for plant personnel.

Today, electric valve actuators served by digital communication networks are commonplace among new plant installations. This is partly due to recent advances in electric actuators that allow them to process more diagnostic information than comparable pneumatic models. Much of the current innovation effort of electric actuators is aimed at providing more diagnostic information to the end user.

Saving time, money

There are countless diagnostic-testing techniques that can be performed for valves, including partial stroke and emergency shutdown tests. Valves and actuators should be equipped with the core requirements for continuous embedded-device testing while installed in industrial applications.



As plant asset management systems continue to expand, safety and reliability will take precedence over price and low cost manufacturing in the years to come.

Speak to a specialist in KFEL for all your valve and actuator needs.