

Pneumatic and hydraulic actuators routinely operate damper drives, flow valves, vacuum controls and other devices in countless process applications. However, there can be a sizeable performance gap between conventional open-loop positioners and closed-loop digital positioners used in such tasks. The problem is that open-loop controllers apply a single control command without the benefit of feedback so the user can only assume accurate results. There is no assurance that the actuator moved to the desired position. On contrary, Kytronics closed-loop controls continually provide actuator position in a feedback loop from the actuator. The “measure-decide-actuate” sequence begins the moment a controlled variable changes and doesn’t stop until the desired process condition is met. KyTronics closed-loop digital positioners operate pneumatic and hydraulic rotary or linear actuators, such as cylinders or diaphragm operators. They use external, solenoid valves to control pressurized fluid flow to the actuator. This eliminates the cams, springs, flapper valves and orifices that cause maintenance problems in conventional electropneumatic positioners. An electronic module compares controller and position signals and, in the event of a mismatch, opens the solenoid valve to supply flow and quickly move the actuator to the setpoint position. Reliable performance results because the actuator shaft always moves to the same position in response to the same signal, not a force-balance position as in conventional positioners. Thus, KyTronics positioners are unaffected by adverse conditions such as “stiction” in the actuator or variation in air pressure. Open-loop positioners, are essentially proportional controllers where a slide valve opens in proportion to a signal change. Actuator movement doesn’t begin until sufficient air bleeds into the actuator to reach the breakaway force. This can lead to noticeable delays, controller signal ramping, overshoot and oscillation—all of which can hurt system performance. The ability to quickly attain and lock at the specified position also holds an advantage in hydraulic applications because the positioner prevents actuator shaft movement despite dynamic changes (usually pressure) due to fluid flowing in the system. On the other hand, conventional positioners may let valve position deviate from intended in response to external forces. Operating fluid does not enter the positioner, so dust or water does not foul operation. Conventional positioners require a continuous air bleed for operation, even when the positioner is not moving an actuator. Conventional positioners continually bleed air which contains entrained water, oil and dirt which can foul these elements and require maintenance.

IS YOUR ACTUATOR DOING WHAT YOUR CONTROLLER IS TELLING IT TO DO?

CHARTS BELOW SHOW IT IS IF YOU ARE USING A KYTRONICS SOLID STATE DIGITAL POSITIONER

Actual, in process, operation of a **Kytronics** positioner is demonstrated below. The chart at the left is a trace of the controller signal change and continuous immediate precise response. The chart at the right was made with a dual pen recorder, with a small offset, demonstrates precise and rapid actuator response to every controller signal change

