

ADVANCED CONTROL OPTIONS

The REXA Xpac calibration routine has available four additional features to augment actuator operation — 0.05% deadband, minimum control point, water hammer (two speed) and flow characterization. On certain applications, these features can improve performance and increase valve life.

0.05% Deadband

The 0.05% deadband option will increase the standard precision and provide resolution within one half the thickness of a piece of paper on a 2 inch rated stroke. The control of an Xpac actuator with this setting is remarkable. The positioning is smooth and continuous without resolution hop.

Minimum Control Point

Most specialized anti-cavitation or low noise valves reduce the fluid energy by staged pressure reduction within a labyrinth cage. These designs are only effective if there is sufficient flow through the resistive element. At plug lifts below a minimum control point, pressure reduction will occur between the plug and seat ring which may cause damage to the valve.

The Minimum Control Point feature allows the setting of a point below which the actuator will not modulate. Any control signal that specifies a position below the minimum control point will result in the actuator moving to the fully closed position. Normal operation of the actuator will occur for control signals specifying a position above this point.

Water Hammer (two speed operation)

The phenomenon known as "Water Hammer" will occur in a pipeline when the flow of a liquid is suddenly stopped. A pressure pulse (exceed-

ing the static process pressure) will propagate upstream from the blocking point. Considerable damage to piping and equipment may result. The magnitude of the pulse will depend upon the initial fluid velocity, the rapidity of the fluid stopping, the piping configuration and the fluid density.

The rapid closing of a control valve is a common cause of Water Hammer. During normal control it is often desirable for a control valve to behave in a quick responsive manner. As the valve is closed, this type of motion may abruptly stop the fluid flow and cause damaging pulsations. The REXA two-speed operation allows the actuator to reduce speed as the valve plug nears its seat. The normal speed, the low speed near the seat and the point to change from low to normal speed can all be configured to meet a particular application.

Flow Characterization

The Xpac is designed to have an inherent linear relationship between Control Signal and stroke (10% CS, 10% stroke, etc.) The ability to modify this characteristic can assist in loop tuning or linearizing a control scheme. Changing the Xpac's characteristic can have a profound effect on the behavior of the control loop and should only be undertaken with a thorough understanding of the effect.

An 11 point, 10 line segment characterization provides the ability to simulate most common control curves or to linearize the actuator to within .05%. The stroke position can be modified at 10% control signal intervals. The only restriction is that each stroke position must be at least 2.5% from its neighbors.