



VALVE ACCESSORIES & CONTROLS, INC.

## Principle of Operation

### V200E-EX **Explosion-Proof Electropneumatic Positioner**

A simple design and concept equals a simple operation of these components:

A pneumatic positioner

A close-coupled I/P converter

**Note:** Principle of operation assumes proper calibration of the unit has been made.

Supply pressure up to 145 PSI is connected to the supply port of the unit (marked S on the gauge block side), and the actuator ports (marked C+ and C-) are connected to either a double or single acting (spring return actuator-rotary or linear) actuator. The C+ port is the positioners opening port. An instrument signal (generally 4-20 mA) is then connected to the I/P connection block. The pneumatic Ip port (located on the 1/4" porting side) should be plugged. With no electronic signal on the unit, the positioner is stable, but no actuator movement has occurred. The I/P is directly coupled with the pneumatic positioner; either internally mounted or externally mounted (EX and FF units) with a custom designed adapter. Air supply for the I/P (up to 145 psi) is provided through the positioners supply port. The I/P converter will convert the 4/20 mA signal to a 3-15 psi signal sent internally to the positioner diaphragm. A milliamp change causes the I/P to respond and sends a pneumatic signal (internally) to the positioner diaphragm, causing the diaphragm to move and the spool valve (air shuttle valve) to move, sending air to the actuator. As the actuator moves, feedback to the positioner is provided through the actuator linkage and the positioner spindle/cam assembly. As the actuator moves the spindle/cam rotates and turns to the desired "set point" based on the mA input signal. Once the set point is achieved a steady state position is maintained, and the supply air is "balanced" between ports.

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