



VALVE ACCESSORIES & CONTROLS, INC.

Principle of Operation

V200E-FF “Fail Freeze” Electropneumatic Positioner

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

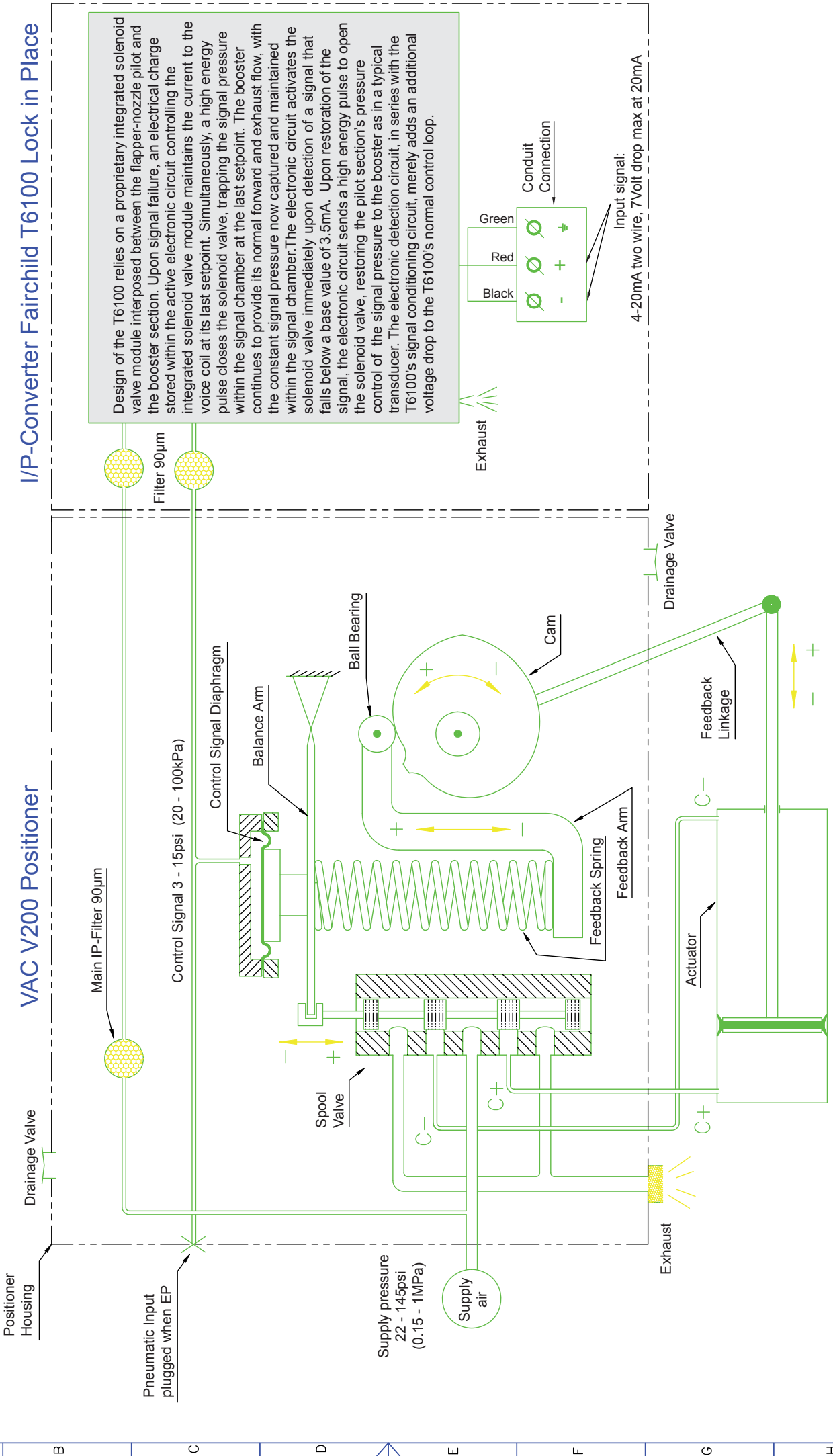
- A pneumatic positioner
- A close-coupled Fail Freeze I/P converter

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 external FF I/P. The Fail Freeze I/P is directly coupled with the pneumatic positioner; with a custom designed adapter. Air supply for the I/P (up to 145 psi) is internally supplied from the positioners supply air pressure. The I/P converter will convert the 4/20 mA signal to a 3-15 psi signal 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 rotate and turn to the desired “set point” based on the mA input signal. Once the set point is achieved a steady state position is maintained. Should this unit loose electrical power, (<2ma) the unit will “fail” in its current position, no matter what the actuator failure mode. It literally locks the actuator in it current position and will hold that position, with only a small leakage rate for several hours. Once power is restored, the unit will return to the original signal set point. Most electropneumatic positioners will fail to a zero position on loss of input signal, and will allow the actuator to take control of the failure mode. The V200E-FF acts like a normal 4-20 mA positioner, unless it looses power. It then fails the package in place. The most common application for this product is on damper control. However, critical process control valves could benefit with this feature.

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Principle of Operation V200FF



Design of the T6100 relies on a proprietary integrated solenoid valve module interposed between the flapper-nozzle pilot and the booster section. Upon signal failure, an electrical charge stored within the active electronic circuit controlling the integrated solenoid valve module maintains the current to the voice coil at its last setpoint. Simultaneously, a high energy pulse closes the solenoid valve, trapping the signal pressure within the signal chamber at the last setpoint. The booster continues to provide its normal forward and exhaust flow, with the constant signal pressure now captured and maintained within the signal chamber. The electronic circuit activates the solenoid valve immediately upon detection of a signal that falls below a base value of 3.5mA. Upon restoration of the signal, the electronic circuit sends a high energy pulse to open the solenoid valve, restoring the pilot section's pressure control of the signal pressure to the booster as in a typical transducer. The electronic detection circuit, in series with the T6100's signal conditioning circuit, merely adds an additional voltage drop to the T6100's normal control loop.