PUMP CONTROL VALVE with RATE-OF-FLOW FEATURE

01/06

980 Series

Model 984 / 684

Operation

The AMES Model 984 / 684 Pump Control Valve with Rate-of-Flow Feature is designed to minimize the surges associated with the starting and stopping of pumps. The valve slowly opens and closes as required to control pumping related surges, and throttles to maintain a maximum flow rate during the pumping cycle. The pump starts and stops against a closed valve.

Pump Start Up: When the pump is signaled to start, the 3-Way Solenoid is energized, directing pressure into the cover chamber of the 3-way Accelerator Pilot. The Accelerator Pilot allows the main valve cover chamber to be vented downstream, causing the valve to open at a controlled rate, gradually admitting pumping pressure into the distribution system. The rate of opening is controlled by the adjustable opening speed control, which restricts the speed of fluid and pressure evacuating the main valve cover chamber. The valve remains open during the pumping cycle.

Rate-of-Flow Feature: During the pumping cycle, the valve acts as a Rate-of-Flow Control Valve. Throttling (Flow Control) action is controlled by a normally open, differential control pilot designed to: 1) Open (allowing fluid out of the main valve cover chamber) when the differential pressure across the orifice plate is below the adjustable set point, and, 2) Close (allowing fluid to fill the main valve cover chamber through the integral orifice of the Accelerator Pilot) when the differential pressure across the orifice plate is above the adjustable set point. A decrease in differential pressure causes the valve to modulate towards an open position, increasing flow rate. An increase in differential pressure causes the valve to modulate towards a closed position, decreasing flow rate.

The Orifice Plate Assembly should be installed three to five pipe diameters downstream of the Pump Control Valve, and field connected with 3/8” minimum copper tubing in accordance with factory piping schematic. Please specify desired flow rate prior to ordering.

Pump Shutdown: When the pump is signaled to turn off, the 3-Way Solenoid is de-energized, venting the cover chamber of the 3-way Accelerator Pilot. The Accelerator Pilot allows the main valve cover chamber to be connected to upstream pressure, causing the valve to close at a controlled rate. The valve slowly begins to close while the pump continues to operate. The closing rate of the valve is controlled by the adjustable closing speed control, which restricts the speed of fluid and pressure entering the main valve cover chamber. When the valve reaches the closed position, the limit switch is actuated, turning the pump off.

Hydraulic Check Feature: When the pump is turned off and downstream pressure is greater than upstream pressure, downstream pressure is admitted to the main valve cover chamber through a check valve in the pilot control system, closing the valve, preventing reversal of flow.

Manual Operation: Engaging the Solenoid Manual operator simulates power to the solenoid, manually opening the main valve. Disengaging the Solenoid Manual operator returns the valve to the closed position.

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Installation Guidelines

- Prior to installation, flush line to remove debris.
- Install valve horizontally “in line” (cover facing UP), so flow arrow matches flow through the line. Avoid installing valves 6” and larger vertically. Consult factory **prior** to ordering if installation is other than described.
- Install inlet and outlet isolation valves. **NOTE:** When using butterfly valves, insure disc does not contact control valve. Damage or improper valve seating may occur.
- Provide adequate clearance for valve servicing and maintenance.
- Install pressure gauges to monitor valve inlet and outlet pressure.
- Install Orifice Plate Assembly (provided) 3 to 5 pipe diameters downstream of the 984 / 684 with the sensing connections offset from top of pipeline to avoid air accumulation. The Orifice Plate Assembly should not be installed next to a butterfly valve.
- Connect Orifice Plate Assembly to Rate-of-Flow Pilot using 3/8” diameter minimum copper tubing (field installed) in accordance with factory piping schematic.
- Connect Solenoid and Limit Switch to appropriate pump control panel locations and power source in compliance with local electrical codes.

Other AMES Pump Control Valves

980-16 / 680-16	Pump Control Valve
980-16-19 / 680-16-19	Pump Control Valve with High Capacity Pilot System
981 / 681	Pump Control Valve with Pressure Reducing Feature
982 / 682	Pump Control Valve with Backpressure Feature
985 / 685	Deep Well Pump Control Valve
985-20 / 685-20	Deep Well Pump Control Valve with Pressure Relief Feature
986 / 686	Pump Control Valve

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