

Series 2000 (continued)

Operation - Main Valves with Pneumatic Temperature Pilots

The air pilot and pneumatic temperature pilot combination is used to control temperature in systems with rapid changes in the required heat load. An air PRV is used to limit the pressure of air supplied to the pneumatic temperature pilot. Limiting this supply pressure limits the air pilot loading force and hence the main valve downstream pressure.

When the pneumatic temperature pilot senses a temperature below the set point, it delivers an air signal to the air pilot based on the sensed temperature. This air signal becomes the air pilot loading force. If the pressure downstream from the main valve is below the air pilot loading force, the pilot valve diaphragm pressure is no longer balanced. The pilot valve opens and inlet steam is passed through the air pilot to the signal line. Steam flowing through applies pressure on the lower side of the main valve diaphragm. This force from the steam compresses the main valve spring and the main valve opens.

Under constant steam demand, the pilot and main valve remain relatively motionless. As temperature rises to the pneumatic temperature pilot set point, the temperature pilot lowers the loading force to the air pilot. When the loading force decreases below the force produced by the downstream pressure, the air pilot begins to close. Less steam flows through the air pilot and signal line to the underside of the main valve diaphragm. The steam trapped under the main valve diaphragm bleeds off through an orifice, allowing the main valve to close.

Operation with the GT610-IP Electro-Pneumatic Transducer is similar with the exception that the sensed temperature is represented by an electronic signal which the transducer converts to a pneumatic control signal for the air pilot.

These arrangements give rapid response for heat load changes and it also limits main valve downstream pressure.

