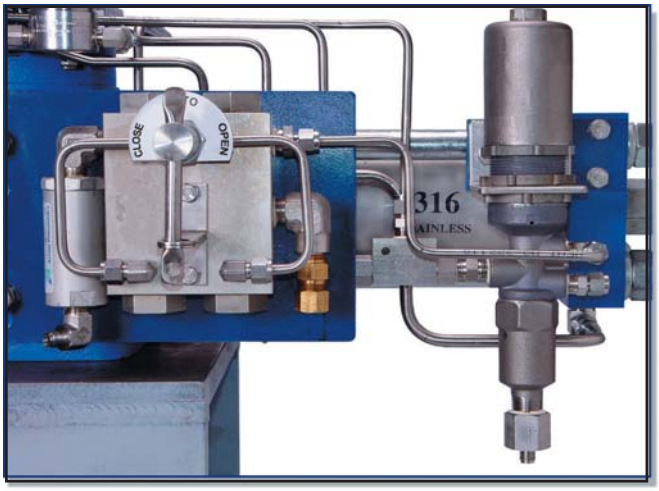
Emergency Shutdown Control

The Gevalco "Emergency Shutdown Control" ontrol module is designed to provide reliable self-contained automatic control of pipeline valves based on low or high pressure at the sensing point. This control module can be set up for automatic valve opening or closing depending on operational requirements.



Many customers utilize this control module in conjunction with the Gevalco "Automatic Line Break Control" module to provide a redundant shutdown function. Pressure is sensed and control action initiated through the use of a diaphragm operated hi-pressure pilot valve. The pilot valve trip setpoint can be adjusted over a wide range of operating pressures. Once the line pressure exceeds the setpoint, the diaphragm pilot valve opens to apply pilot pressure to the "poppet" valve and the appropriate valve action is initiated. Utilizing the pipeline gas itself, for both the pilot gas and power media, makes the control system independent of regulator and other power source failure.

The simplicity of design, utilizing minimal components, ensures the valve operates only when required. This control module can be integrated with other control modules, such as, the "Remote Electric Control" module to achieve various operational control strategies.

The Gevalco Advantage

- Hi-pressure construction - no regulator, relief valve, or mechanical switching valve.
- All components constructed of corrosion resistant marine-grade, hard-anodized aluminum or stainless steel.
- No mechanical linkages, which are subject to environmental failure.
- Limit valve ensures complete opening or closing of the valve.

Sequence of Operation

The Gevalco "Emergency Shutdown" module is designed to provide reliable self-contained automatic control of pipeline valves based on emergency conditions.

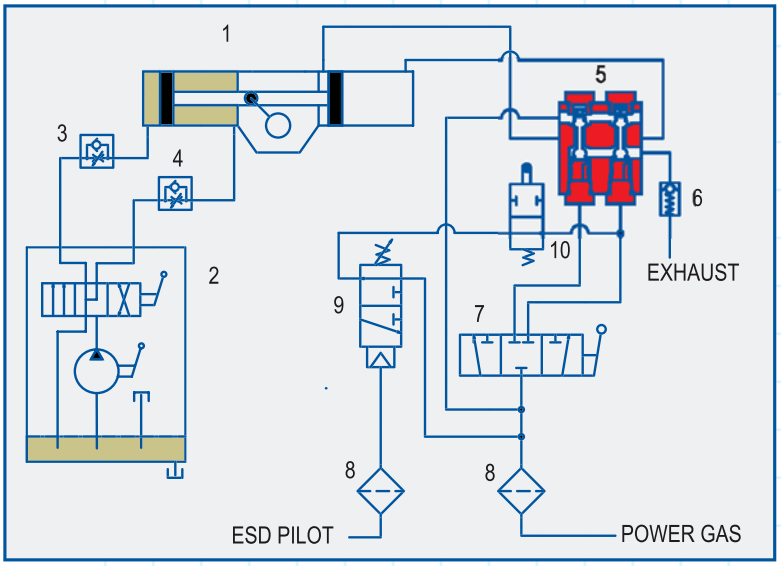


Diagram depicts a low pressure ESD to open configuration.

1. The ESD control circuit is interfaced to the normal local "Auto/Manual" control circuit (Reference: Auto/Manual Sequence description) by connection to the "open" pilot port of the poppet control valve (5). With the manual selector valve (7) in the "auto" position, the system is ready to react to a shutdown signal. In the configuration shown for a low pressure shutdown, the ESD signal flows thru a filter (8) to the pilot of the adjustable pilot valve (9). Under normal conditions, the ESD pressure is above the setpoint of the pilot valve (9), which keeps the valve energized and the gas flow blocked. When the ESD pilot pressure falls below the setpoint of the pilot valve (9), the valve is de-energized and pressure is introduced to the "open" pilot of the poppet valve. This causes the poppet valve to open and power gas flows to the open side of the actuator cylinder (1), moving the pipeline valve to the open position.

2. When the valve reaches the fully open position, the limit valve (10) closes to block the pressure to the pilot of the poppet valve. When the poppet pilot pressure bleeds off, the poppet resets, and vents the actuator cylinder. The valve cannot be closed until the ESD pressure is restored to re-energize the pilot valve (9). Once the ESD pressure is restored, the valve can be closed using the "open/auto/close" manual selector valve (7) or the hydraulic hand pump (2).

3. By simply changing the various connection sequences, this system can be configured to implement a wide variety of Emergency Shutdown control strategies.

GEVALCO

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