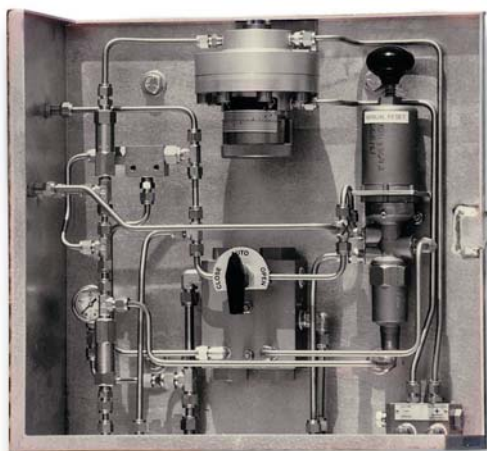




Automatic Line Break Control

The Gevalco "Automatic Line Break Control" module is designed to automatically close main pipeline valves in the case of a major leak or break. By quickly and reliably closing the main pipeline block valves, gas loss can be minimized to prevent fires and other catastrophic losses.

The Gevalco "Automatic Line Break Control" module senses a pipeline break or major leak through a unique "Rate-of-Drop" circuit. This "Rate-of-Drop" circuit consists of a dif-



ferential pilot valve, which senses pipeline pressure and compares it with the gas in a reference tank at the normal pipeline pressure. When the pressure in the pipeline decreases, the pressure in the reference tank also decreases, but at a rate dictated by a calibrated orifice. This establishes a differential pressure between the reference tank and the pilot connected directly to the pipeline. The rate of pressure differential drop is indicative of the severity of pipeline gas loss. The differential pilot valve, set at a calibrated setpoint, senses this "Rate-of-Drop". When the pilot valve trips, the actuator is activated to close the main

pipeline valve. This "Rate-of-Drop" circuit eliminates inadvertent shutdowns on short duration pressure bumps. Utilizing the pipeline gas itself, for both the pilot gas and power media, makes the "Automatic Line Break Control" system independent of regulator and other power media failure.

The calibration of the control module is done with the Gevalco "Rate-of-Drop" (R.O.D.) Test Kit, which monitors the pressure levels in the pipeline, the reference tank, and the differential pressure across the orifice. This kit also includes the valves required to simulate a line break for testing and calibration of the control unit.

The Gevalco Advantage

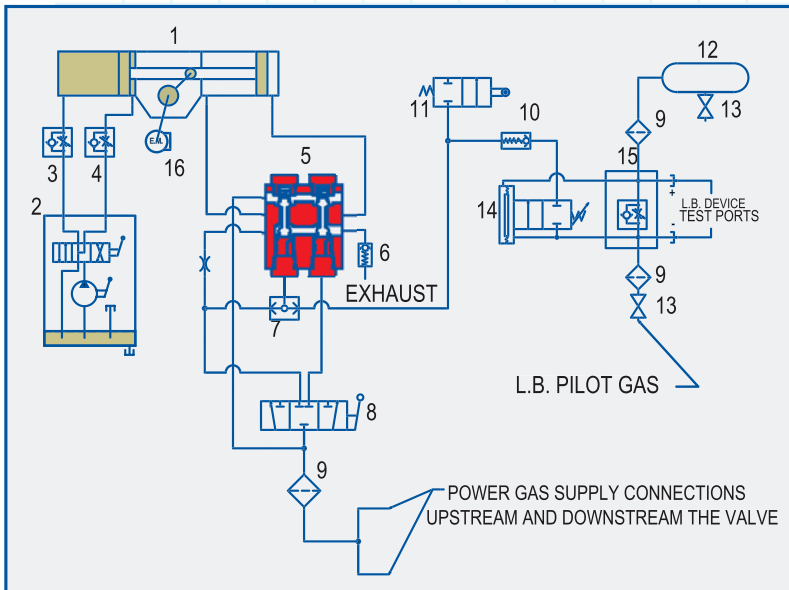
- Hi-pressure construction - no regulator, relief valve, or mechanical switching valve.
- Differential pilot valve utilizes a stainless steel diaphragm for accuracy and repeatability.
- Marine-grade, hard-anodized aluminum body for both poppet and differential pilot valve.
- Easily adjusted rate-of-drop trip setpoint (10 psi/min to 150 psi/min).
- No mechanical linkages, which are subject to environmental failure.
- Limit valve ensures complete closing of valve.
- Single unit design - Diaphragm unit and directional control valve are a single unit resulting in a shorter diaphragm stroke and lower hysteresis.



Sequence of Operation



The Gevalco "Automatic Linebreak Control" module senses a pipeline break or major leak through a unique "Rate-of-Drop" circuit.



1 The Line Break Control system is interfaced to the normal local "Auto/Manual" control circuit (Reference: Auto/Manual Sequence description) by connection to the "close" pilot port of the poppet control valve (5) thru a shuttle valve (7). The shuttle valve (7) acts as a signal selector between the Line Break shutdown signal and the local manual "close" signal.

2 With the manual selector valve (8) in the "auto" position, the system is ready to react to a shutdown signal. Utilizing a separate connection downstream, pipeline gas is introduced to the Line Break Control module thru a filter to one side of the differential pilot switching valve (14). The same pipeline gas signal also flows freely thru the check valve/orifice assembly (15) into the reference tank (12), as well as, to the opposing side of the diaphragm in the differential valve (14). Under normal conditions, the pressure on both sides of the diaphragm is equal and the switching valve remains closed. The differential valve will remain closed during normal fluctuations of pipeline pressure.

3 When there is a drop in pipeline pressure, the diaphragm immediately senses that pressure drop on the side connected directly to the incoming signal. The pressure on the other side of the diaphragm also decreases, but only as the pressure in the reference tank decreases. The rate of pressure decrease in the reference tank is controlled by the adjustable orifice (15). This time lag in pressure drop creates a differential pressure across the switching valve (14) diaphragm. The magnitude of the differential pressure is directly related to the rate of pressure drop in the pipeline. When the differential exceeds the set-point, the switching valve opens and pressurizes the "close" pilot port of the poppet valve (5). The poppet valve opens and provides power gas to the actuator to close the main line valve. The differential switching valve can be set at any desired rate of pressure drop from 10 psi/min. to 150 psi/min.

4 When the valve reaches the fully closed position, the limit valve (11) opens to vent the shutdown pilot signal, which resets the poppet valve and vents the actuator. The valve will remain closed until opened manually with either the local manual selector valve (8) or the hydraulic hand pump.

GEVALCO

PIPELINE VALVE AUTOMATION
PRODUCTS AND SERVICES

AN ATI COMPANY

Automation Technology, Inc.
email: sales@atiactuators.com
web: www.atiaactuators.com

Design and Fabrication
17654 Fordtran Blvd.
Industry, TX 78944

tel 979.357.2570
fax 979.357.2571

Assembly and Sales
4950 Cranswick
Houston, TX 77041

tel 713.934.0171
fax 713.934.9099