SHAFER™

Electro-Hydraulic Power Unit

- Actuator power source for natural gas pipeline applications
- This closed system will not exhaust any gas to the atmosphere

Design Philosophy

Emerson's electro-hydraulic power unit as an alternative to gas/hydraulic powered actuators for environmentally sensitive applications.

The electro-hydraulic power units are designed to take advantage of the available gas pressure in the pipeline. However, unlike the conventional gas/hydraulic systems, the electro-hydraulic power units are totally closed systems and do not exhaust natural gas into the atmosphere.

Existing actuators with gas over oil type power supply may be converted, in the field, with an electro-hydraulic power unit. Corrosive or detrimental atmospheric conditions.

Applications

- Actuator power source on natural gas pipeline applications
- Alternate actuator power source to gas over oil applications where 120 VAC, single phase electrical power is available
- For new or existing equipment

EMERSON™

PRINCIPLE OF OPERATION

The electro-hydraulic power unit is a totally sealed system with its own internal hydraulic reservoir. The hydraulic pump is driven by a fractional horsepower electric motor. The explosion proof/weather proof motor operates on 120 VAC, single phase power which simplifies electrical hookup.

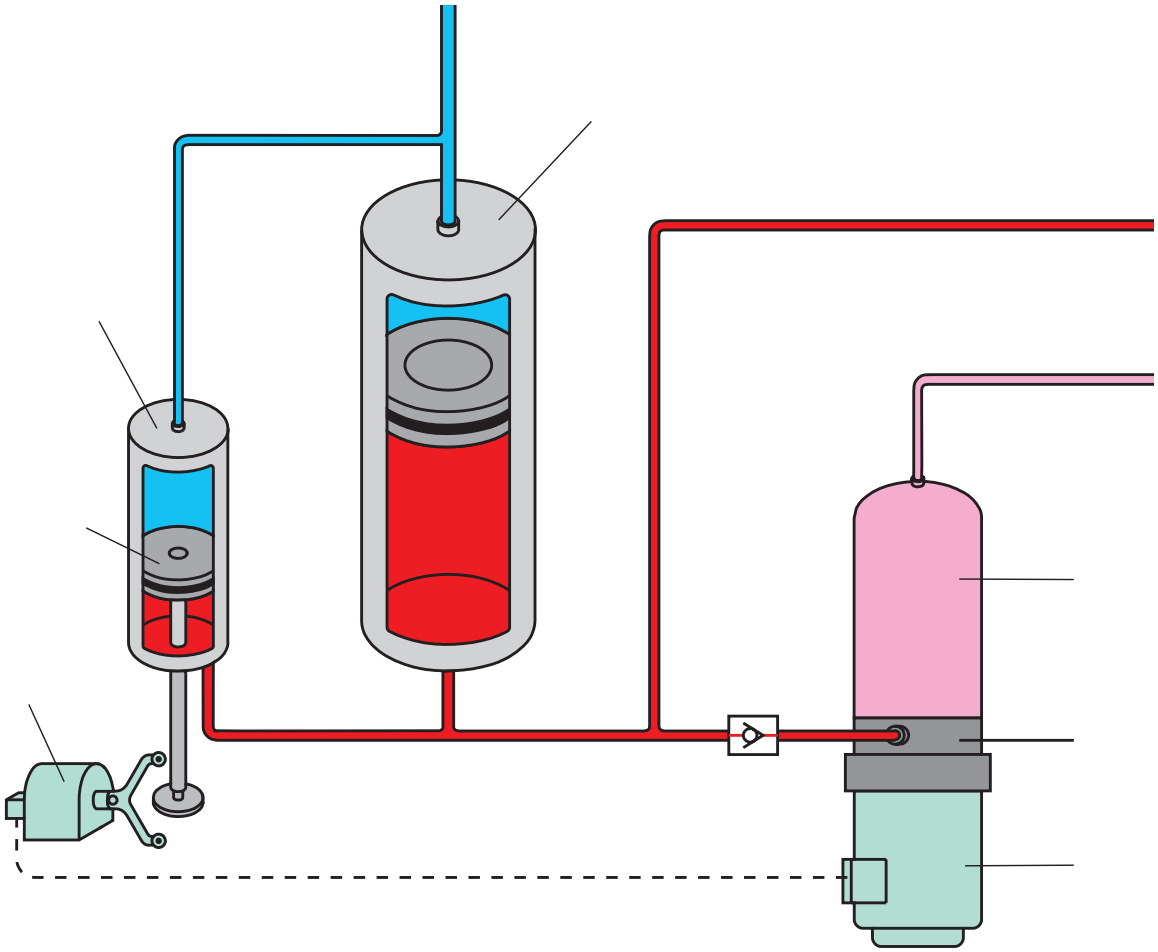
A hydraulic accumulator holds supplemental power to supply the specified number of valve strokes. The accumulator head pressure is provided by the natural gas in the pipeline which eliminates the need for additional pressure vessels.

The patented thermal volume control protects the circuit components from damage due to thermal expansion within a closed system. The thermal volume control also functions to start/stop the electric motor which eliminates the need for pressure switches.

When the system is first energized, the motor/pump will begin to fill the working accumulator. Once the working accumulator is completely topped-out with fluid, the piston/rod in the thermal volume accumulator will begin to move upward as pressure continues to build. At the point the thermal volume accumulator fills to a designated level, the actuating disc on the piston/rod will trip the motor/pump switch which shuts off the motor.

While the motor is off, the piston/rod will shift a small amount to compensate for thermal changes in the fluid volume. Once the working accumulator is required to stroke the valve actuator, the piston and rod move downward to restart the motor/pump.

The hydraulic pressure in the power unit will always stabilize at a pressure level equal to the pressure in the pipeline. The power units will automatically adjust to changes in the pipeline pressure. This system does not require pressure switches or adjustments.



FEATURES

Completely Closed System

The power unit utilizes the available natural gas pressure without exhausting any gas into the atmosphere.

Fast Operation Without Shock

The hydraulic accumulator provides smooth operation even at rapid stroking speeds. Separately adjustable speed control valves may be used to provide a broad range of opening and closing times.

Fail-Safe Reserve Power

In the event of electrical power failure, the accumulator will maintain reserve hydraulic power for a specified number of valve strokes.

Manual Hydraulic Hand Pump

For emergency operation, a hydraulic hand pump may be used to directly stroke the actuator or to recharge the accumulator.

CONTROLS AND ACCESSORIES

The electro-hydraulic power unit is very versatile and does not limit the control capability for the valve actuator. The valve actuator may be operated locally, remotely, or automatically by a variety of sensory and control devices.

Typical Control Systems

- Local manual
- Remote two-way electric
- Linebreak protection - sensing rate of pressure drop
- Emergency shutdown or fail-safe
- High/low pressure shutoff

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