ECAT - Emissions Controlled Actuator Technology

Features and Benefits

Feature
Analogous to a gas-over-oil actuator, the ECAT uses the high pressure gas in the pipeline as the power source for the actuator.

Benefit
Gas-over-oil systems have been proven highly reliable in decades of service. Gas pressure is always present to power the actuator's open or close stroke and power storage tanks are still an option with the ECAT.

Feature
After the pipeline gas is used to power the actuator, the ECAT will start automatically and then re-inject the power gas back into the pipeline and recharge itself for the next valve stroke.

Benefit
There is zero emissions of power gas with the ECAT system, unlike a gas-over-oil or direct gas actuator which must exhaust the gas to atmosphere at the end of a valve stroke. The ECAT represents a solid method to help comply with present-day climate action plans. The ECAT is also an effective means of eliminating odor from gas emissions.

Feature
The ECAT is strictly a mechanism to re-inject power gas back into the pipeline and does not affect the function or performance of the actuator control system. The actuator still preserves its conventional control system whether it is for local, remote or automatic controls.

Benefit
The conventional control system and components do not change so controls such as local manual, 2-way remote, electric failsafe, ESD, linebreak or low pressure shutoff remain as essentially the same field proven components.

Feature
The ECAT can be retrofitted to existing gas-over-oil actuators.

Benefit
Field upgrades of existing equipment is an option.

Feature
Actuator sizing is based on the minimum and maximum pipeline pressures in the exact manner used for a gas-over-oil system.

Benefit
The actuator muscle and size remains the same with respect to a given valve size and safety factor is never jeopardized.

Features and Benefits (continued)

Feature
The ECAT gas re-injection system can be powered by utility electrical power, solar power or a UPS system.

Benefit
The ECAT can be solar powered in remote areas where no utility power is available.

Feature
The gas re-injection accumulator can be sized for enough storage capacity for two consecutive actuator strokes.

Benefit
The ECAT system can be sized for two consecutive valve strokes in the event re-charge time was too long for the application.

Feature
The entire ECAT based valve operating system is weather proof and explosion proof (Class I, Div I) with a standard temperature rating down to -20°F or an optional -50°F.

Benefit
No special limitations are required for hazardous areas or environmental conditions.

Feature
Customers can easily monitor if the gas re-injection accumulator is in the re-charged or reset state through the valve position feedback limit switches and the motor control switch.

Benefit
Valve Control Room can easily verify that the actuator is in the “ready to stroke” state.

Feature
The ECAT system can be configured for both rotary vane and scotch yoke actuators.

Benefit
The ECAT is a versatile solution for both new actuators and upgrades of existing equipment.

Advantages over the Bettis EHO and conventional electro-hydraulic systems

A self-contained electro-hydraulic system will normally utilize a conventional hydro-pneumatic accumulator where compressed nitrogen gas becomes the energy storage medium. Nitrogen leakage is always a concern because any nitrogen leakage compromises the performance and torque output of the unit. The pressure in conventional accumulators decays during the actuator stroke which also reduces the torque output proportionately. This is not an ideal condition for ESD and critical applications.

With the ECAT system, the pipeline pressure provides the potential energy for the gas re-injection accumulator and due to the immense volume of the pipeline, the torque output will remain constant with virtually no risk of losing the energy source and the ability to stroke the valve.

The ECAT system will be much smaller than an electro-hydraulic system since isolated nitrogen storage is not required.

An electro-hydraulic actuator would require newly designed actuator controls to perform many of the typical actuator functions such as ESD, low/high pressure shutoff, station by-pass, linebreak etc. because the EHO is a completely different actuator platform best suited for liquid lines where sweet pipeline gas is not present.

The ECAT system utilizes all of the same time tested, field proven controls and also the same actuator type and size as a typical gas-over-oil system.

The EHO is not adaptable to existing gas-over-oil actuators so a field upgrade is not an option.

Emerson
Actuation Technologies
19200 Northwest Freeway
Houston Texas 77065
USA
T +1 281 477 4100
F +1 281 477 2809

Emerson
Actuation Technologies
Berenyi u. 72- 100
Videoton Industry Park
Building #230
Székesfehérvár 8000
Hungary
T +36 22 53 09 50
F +36 22 54 37 00

Emerson
Actuation Technologies
P. O. Box 17033
Dubai
United Arab Emirates
T +971 4 811 8100
F +971 4 886 5465

Emerson
Actuation Technologies
No. 9 Gul Road
#01-02 Singapore 629361
T +65 6777 8211
F +65 6268 0028