

# Reduce Your Actuation Emissions for Natural Gas Pipelines

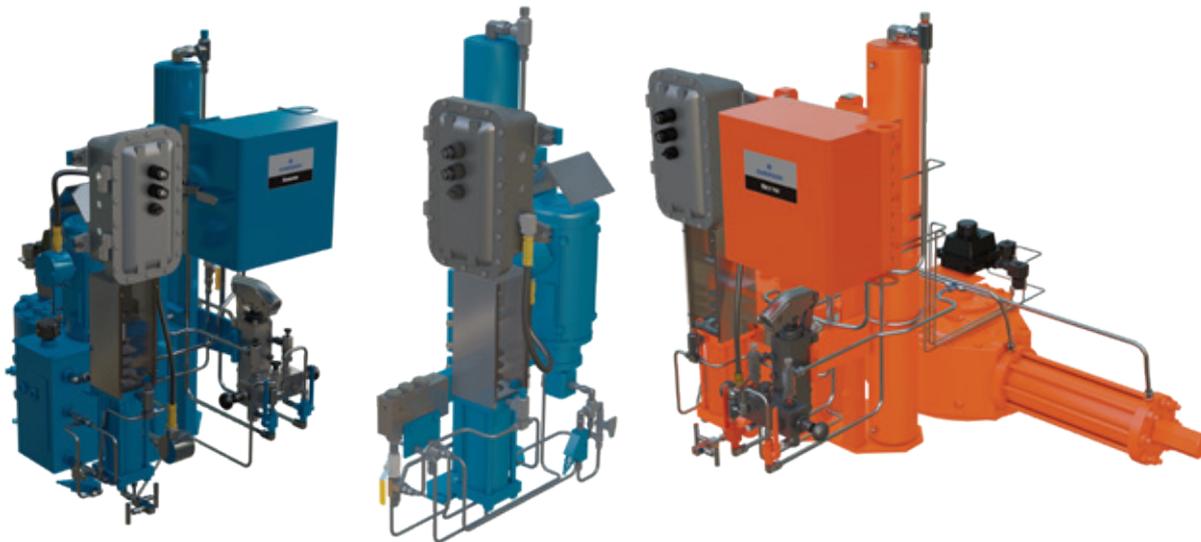


## **ECAT™ – Emissions Controlled Actuator Technology**

A versatile and reliable power system for high-pressure actuators with no associated gas emissions



## Meet your emissions reduction targets with Emissions Controlled Actuator Technology



Gas transmission companies use gas-powered valve operating systems for critical pipeline applications where dependability of the equipment is essential. As new regulations require operators to reduce natural gas emissions, users are challenged to find solutions that perform at the same level as gas-powered actuation. The ECAT will transform your valve operating systems into an emissions free solution delivering the same reliability, compatibility, and performance of your existing gas-powered actuators.





Reduce emissions without compromising performance by enhancing your high-pressure actuators with this easy-to-use and proven technology.

## Reduce emissions with groundbreaking technology

The ECAT is a patented, market-leading solution helping achieve your sustainability goals.

[Achieve Sustainability Goals ▶ p5](#)

## Transform traditional solutions with a compatible power system

The ECAT is a flexible and versatile design using familiar technology.

[Compatibility ▶ p7](#)

## Trust in a reliable design

The ECAT encompasses the time-tested performance of the Shafer and Bettis actuator and hydraulic power systems.

[Reliable Design ▶ p9](#)

## Maintain performance of your critical applications

The ECAT will not impact the operation of your high-pressure actuators.

[Performance ▶ p11](#)



## Reduce emissions with transformational technology

Like conventional gas-powered actuation, gas from the pipeline is used as the power source for the actuator. However, the ECAT will not exhaust the high-pressure gas into the atmosphere but re-injects gas back into the pipeline.

Emerson provides our customers the most innovative technologies with unprecedented performance needed for today's industrial environments. The ECAT system is unlike any other gas-powered technology on the market.

### What's your challenge?



The oil & gas industry has come under intense pressure to reduce methane emissions. Meeting emission reduction goals is a focus of industry leaders.

### What's your opportunity?



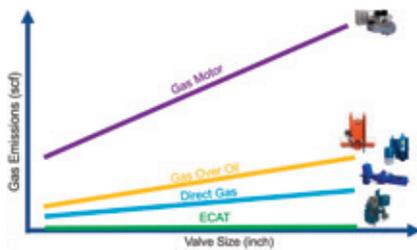
With the ECAT, your actuation system will have the capability to use high pressure pipeline gas to power the actuator and then re-inject the power gas back into the pipeline to eliminate emissions.

# Transformational technology

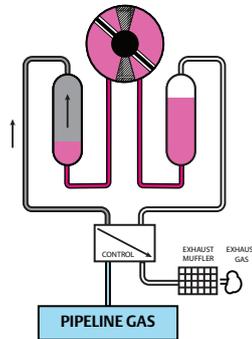


The **Emissions Controlled Actuator Technology** is a patented system harnessing the proven designs of Shafer controls and power systems into a novel, one-of-a-kind solution.

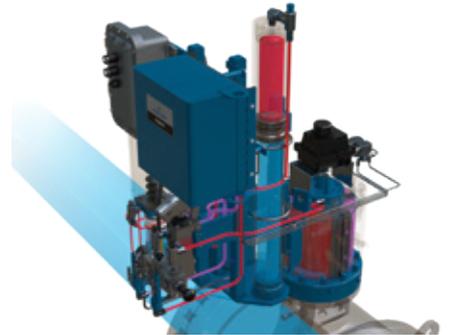
## Eliminate emissions



**Replace or re-purpose gas-powered actuation**  
Gas-powered actuation emits gas by design. Eliminate over 99% of actuation emissions using the ECAT.



**Eliminate high pressure vented emissions**  
Using pipeline gas to pressurize hydraulic fluid and actuate the valve, the ECAT eliminates high-pressure gas venting from the tanks through the control panel.



**Reduce fugitive emissions potential**  
By converting many of the typical gas connections into hydraulic, the ECAT reduces the potential for fugitive emissions.

## Power of hydraulics



**Unique gas-under-oil accumulator**  
The accumulator transforms pneumatic power from the gas pipeline into hydraulic power with 1 or 2 actuator stroke capacities.



**Electrically driven pump drives gas re-injection**  
Electrical power used to pump hydraulic fluid into the accumulator, pushing gas back into the pipeline. The thermal volume controller ensures all the gas is re-injected back into the pipeline.



**Control component emissions**  
Eliminate pneumatic control component venting with hydraulic controls and electrical devices achieving a true zero emissions valve operating system.



## Transform traditional solutions with a compatible power system designed for any high-pressure actuator

Over the last 75 years, gas-powered actuation has been the staple technology for local, remote, and automatic valve isolation for gas transmission. The ECAT is designed to be a universal power source that can be incorporated on new and existing high-pressure actuators and control systems.

The ECAT VOS (Valve Operating System) is factory built and includes the actuator, controls, and ECAT system.

### What's your challenge?



Gas-powered actuation is used throughout gas pipeline networks. In order to reduce emissions, actuation and control logic will have to be changed.

### What's your opportunity?



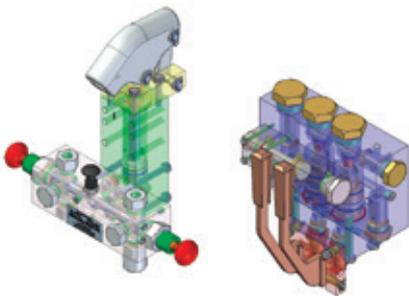
The ECAT system is a versatile solution that can be configured for both new actuators and retrofitting on existing.

## Compatible for any high-pressure actuator



The ECAT is a versatile solution that can be configured as an 'ECAT VOS' with actuator and controls and an 'ECAT' to convert existing gas-powered actuators.

## Intuitive design



### Familiar technology

ECAT VOS uses many of the same control components found on Shafer and Bettis gas over oil systems reducing operator learning curve.



### Address space constraints

ECAT is designed with a minimized footprint and can be mounted integral to the actuator or on a remote stand to address space constraints.



### Choose the electrical power

Options for the re-injection electrical power include DC and AC power with UPS or solar options for remote areas where utility power is unavailable or unreliable.

## Convert existing gas-powered actuation



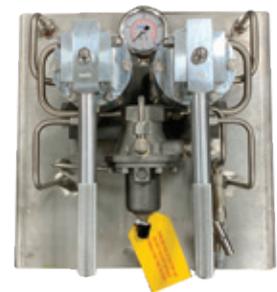
### Repurpose what you have

The ECAT is designed to maximize the use of your existing equipment in the field. Utilizing gas hydraulic tanks and controls will reduce overall project costs.



### Bolt-on design

Field conversion of existing equipment can be accomplished with minimum downtime utilizing the simple bolt-on design. ECAT systems include assembly instructions and drawings.



### Keep the same controls

ECAT can be installed without making changes to the controls or control room. Maintain your pneumatic control logic for a near zero emissions solution.



## Trust in a reliable design

We design, build, and test the complete system, including the actuator, controls and accessories. Our systems are robust and proven in the field.

The ECAT encompasses the time-tested performance of Shafer and Bettis actuators and hydraulic power systems.

### What's your challenge?



The technology to reduce emissions must operate dependably and function all the time, every time.

### What's your opportunity?



The ECAT ensures maximum reliability and safety even in the most demanding environments.

## From proven technologies installed globally



**Hydraulic power units**  
Accumulators, Thermal Volume  
Controllers, and Reservoirs



**Gas over oil**  
Actuators and Controls



**Electro-hydraulic power pack**  
Electrical Enclosures, Motors, and Pumps

## Tested and proven for tough environmental conditions



**Cold temp capable**  
The ECAT system has a working  
temperature range of -50°F to +150°F.



**Cycle tested**  
Repeatable in the most extreme  
conditions.



**Bad weather**  
Proven in the field through 2 hurricanes  
and a freeze, never affecting the  
functionality of the unit.

## Robust design



**Unique gas-under-oil re-injection  
accumulator**  
The innovative accumulator design  
facilitates the gas re-injection process and  
allows liquids to naturally gravitate back  
into the pipeline.



**Optimized accumulator sizing**  
Accumulator sized to guarantee 1 or 2  
complete actuator strokes



**Ensure the actuator is ready to stroke**  
The thermal volume controller design  
assures the accumulator will be full of  
hydraulic fluid and ready to stroke the  
valve when called upon.



## Maintain performance of your critical applications

The ECAT is a system for critical pipeline applications, where dependability of the equipment is essential. The system applies progressive technology to eliminate emissions without jeopardizing the performance of the actuator and controls.

### What's your challenge?



Implementing other actuator technologies will change our operation systems and control logic.

### What's your opportunity?



The ECAT system follows the same characteristics of gas-powered actuation delivering the same power and performance with no emissions.

## Unchanged actuator performance



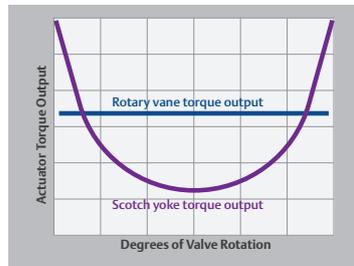
ECAT uses the same concept to gas over oil as it utilizes the available motive force of the pipeline gas pressure, and it offers the same inherent hydraulic benefits of small actuator size and long service life.

## Performance in critical conditions



### Actuator speed

The ECAT will operate at similar speed of operation as gas over oil technologies.



### Torque output

Keep your actuator envelope dimensions small using the same, proven sizing considerations as gas-powered actuation.



### Power source

Use the reliable pipeline gas as the source of power for the actuator.

## Control functionality



### Fail-safe reserve Power

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



### Control capability

Continue to have the same local, remote, and automatic modes of operating your actuator using both pneumatic and hydraulic control components.



### Manual hydraulic hand pump

For commissioning or emergency operation, a hydraulic hand pump may be used to directly stroke the actuator or to re-charge the accumulator.

# Reliable and Compatible Performance



**BETTIS™**  
**SHAFAER™**

For complete list of sales and manufacturing sites, please visit [www.emerson.com/actuationtechnologieslocations](http://www.emerson.com/actuationtechnologieslocations) or contact us at [info.actuationtechnologies@emerson.com](mailto:info.actuationtechnologies@emerson.com)

#### **NORTH & SOUTH AMERICA**

19200 Northwest Freeway  
Houston TX 77065  
USA  
T +1 281 477 4100  
  
Av. Hollingsworth  
325 Iporanga Sorocaba  
SP 18087-105  
Brazil  
T +55 15 3413 8888

#### **ASIA PACIFIC**

No. 9 Gul Road  
#01-02 Singapore 629361  
T +65 6777 8211  
  
No. 1 Lai Yuan Road  
Wuqing Development Area  
Tianjin 301700  
P. R. China  
T +86 22 8212 3300

#### **MIDDLE EAST & AFRICA**

P. O. Box 17033  
Jebel Ali Free Zone  
Dubai  
T +971 4 811 8100  
  
P. O. Box 10305  
Jubail 31961  
Saudi Arabia  
T +966 3 340 8650

#### **EUROPE**

Holland Fazor 6  
Székesfehérvár 8000  
Hungary  
T +36 22 53 09 50  
  
Strada Biffi 165  
29017 Fiorenzuola d'Arda (PC)  
Italy  
T +39 0523 944 411

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