Automate ESD Valves Confidently

Bettis™ EHO Electro-Hydraulic Operator
A complete, intelligent solution to handle all your ESD valve needs
It’s all about safety

You know the challenges you face when there are limits impacting your ESD (Emergency Shut Down) valve applications: Limited power. Limited space. Unrelenting, harsh environmental conditions.

Your application requires fast stroking, self-contained, resistant to extreme environmental condition, and ability to operate large valves requiring high output torques. All this demand while maintaining uncompromising reliability and safety.

To stay competitive, you need a trusted, reliable, robust solution.

“60% of all safety incidents occur when a maintenance job was performed reactively, versus proactively.”
– Handbook of Maintenance Management and Engineering

“Emergency maintenance costs 3 to 4 times as much as the same preventive maintenance task.”
– Plant Engineer Today

“A large plant can incur losses of $5,000 to $10,000 (USD) per day or more due to internal leakage.”
– ChemicalProcessing.com

“In remote locations, your ESD system must be able to operate reliably when power is scarce.”
Instead of worrying about ESD failure consequences, what if you knew your ESD system will perform in an emergency allowing you to focus on maximizing system performance and safety to protect the environment, your facility and your people.
Bettis™ EHO is your reliable ESD valve actuation solution

Using time-proven, final control innovation and combining it with the best in critical shutdown and process shutdown reliability, the Bettis Standard EHO for On/Off applications and SMART EHO for modulating applications are an affordable and effective way to maintain and operate shutdowns in severe, inaccessible and remote locations.

Seconds matter in isolating failures that can adversely impact people, environment and communities. The EHO utilizes a quick, dependable spring-return actuator for the fail safe stroke combined with an integral hydraulic power pack and electronic control module ideal for ESD valve operation.
Keep personnel safe

Designed to mitigate system risk, personnel injuries, and reduce negative environmental impacts, the EHO’s inboard spring design, relief valves, and safety features ensure problems are detected and reported well in advance of the problems becoming a safety issue. The Smart EHO also has more than 15 alerts and alarms that will trigger if any abnormal conditions are present.

Safety ▶ p06, p08, p10

Prevent costly damage

Reliable ESD solutions prevent bigger problems from developing into reputation damaging, expensive, emergency clean-up efforts. Reliable ESD solutions also help in reducing the interruption of production. Both the Standard and Smart EHO utilizes the Bettis G-Series hydraulic actuator for a quick, dependable spring-return actuator for the fail-safe stroke.

Prevention ▶ p08, p10

Low power usage

Remote and offshore ESD systems are typically designed for low power sourcing requiring maximum uptime. The EHO is built for low power design requirements, spring fail safe, low power motors, and optimally designed electronic circuitry.

Low Power ▶ p06

Modulation designed for efficiency

Modulation capability is key to keeping a system running at peak capacity. In large systems, even small adjustments to a valve’s position can help maximize efficiency and reduce costs, which can lead to an increase in profitability. The Smart EHO is designed for your valve modulation needs requiring less than 1% accuracy.

Modulation ▶ p08

“Emerson’s Bettis EHO product line offers reliable ESD actuation solutions. Complex and hazardous applications with limited power sources in remote, unmanned areas need uncompromising reliability. The EHO operates responsibly and effectively to help preserve and protect assets, personnel and the environment.”
– Eric Yen, Product Manager, Emerson
Avoid downtime and revenue loss with reliable ESD safety you can trust

Reliability is paramount to Emerson’s emergency shutdown solutions. The Standard and Smart EHO is designed to protect people, equipment, and the environment. It stops process flow as soon as a command signal is received or on loss of power. With over fifteen built-in alerts and alarms, the EHO continually monitors any abnormalities in your system and will alert you if one arises. It’s all about minimizing downtime and preventing loss of assets and revenue.

As part of Emerson’s commitment to safety, the Bettis EHO product line should be an integral part to your system’s safety initiatives.

The Bettis Electro-Hydraulic Operator is available in the Standard or Smart version.

• Safety: Certifications to worldwide hazardous zone safety standards
• Ease of Use: Field-proven hydraulic hand pump local control and display panel with clear indication of valve position
• Easy Installation: Self-contained and designed for compactness and is readily adaptable to new or existing valves
• Convenience: Fewer worries in hazardous environments, versatility regarding power options, and reliability directed for hostile environments with strict ESD requirements

What’s your challenge?

“What safety and environmental issues impact how we do business. We must follow strict federal and state regulations so we need to custom fit our ESD solutions.”

What’s your opportunity?

“Emerson’s Bettis™ EHO is designed to protect people, assets, and the environment by stopping the process flow as soon as a command signal is received.”
Self-contained operating power supply; allows for installation in remote locations where no external pneumatic or hydraulic power sources are available. Solar panels are available for areas without electrical power.

Low power motors; specifically designed for remote and power scarce environments.

High torque efficiency hydraulic actuators; based on proven technology of the Bettis G-Series hydraulic actuators, the Bettis EHO provides full direct power to the valve stem.

G-Series modular, reliable design enables safe field maintenance which reduces service time.

Non-intrusive design allows device configuration to be modified without exposing the electronics to the adverse elements and conditions.

No internal or external hydraulic leakage ensures the valve is held in its seated position without drifting.

Compact hydraulic power unit (HPU); integrated into the actuator eliminating the need for a remotely located hydraulic power source.

Built for limited space applications with a 25% smaller envelope compared to most competitive offerings.

Lightweight design weighing 47% less than other actuators making it ideal in offshore applications and saves money.

Optimize space

Energy source flexibility

For interactive experience, visit www.emerson.com/BettisEHO
### Bettis™ Standard EHO

#### Product Specifications:

**Quarter Turn Torque Output:**
- Spring Return: 1,264 to 707,696 in-lbs
- Double Acting: Up to 2,379,683 in-lbs

**Maximum Operating Pressure:**
- 3000 Psi (207 bar)

**Operating Temperature:**
- -20°F to +140°F (-29°C to +60°C)
- -40°F to +140°F (-40°C to +60°C) (optional)

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<tr>
<th>No.</th>
<th>Description</th>
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<tbody>
<tr>
<td>1</td>
<td>Hydraulic Manifold</td>
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<td>2</td>
<td>Local Open/Close Light Display</td>
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<td>3</td>
<td>Hand Pump</td>
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<td>5</td>
<td>Sight Level Gauge</td>
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<tr>
<td>6</td>
<td>Lockable (Local/Off/Remote) Selector Switch</td>
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<tr>
<td>7</td>
<td>Local Open/Close/Stop Push Buttons</td>
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<td>8</td>
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<td>9</td>
<td>Electric Motor</td>
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<tr>
<td>10</td>
<td>G-Series Hydraulic Spring-Return Actuator</td>
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**Input Power:**
- Multiple AC and 24V DC available

**Remote Operation:**
- **Input:** Discrete: open, close, stop, and ESD
- **Output:** Open, close position feedback
  - 4 – 20mA hydraulic pressure (optional)

**Limit Switches:**
- 2 SPDT – 4A @ 120VAC, 3A @ 24VDC
- 4 SPDT – 4A @ 120VAC, 3A @ 24VDC (optional)
Solenoids, speed controls, pressure transducers and pressure switches are integrated in a compact manifold block eliminating external tubing and connections.

Reliability is maximized by utilizing a spring-return actuator to stroke the valve after power failure or during an emergency event.

With the dual-sealed Separate Terminal Chamber (STC), installation wiring can be terminated and fuses can be replaced without exposing the internal control components to hostile environmental conditions.

Fast-closing or precise speed control is obtained through field-adjustable flow control valves to meet application requirements.

Environmental Protection:
- Control enclosure: IP68
- Hydraulic actuator: IP67M
- Motor: IP68
- Reservoir: IP54 (IP66 optional)

Hazardous Area Classification & SIL Certification
- CSA – Class I, Division I, Groups B (optional), C, and D
- FM – Class I, Division I, Groups B (optional), C, and D
- ATEX – EExd IIB T4
- IECEx – Ex d IIB T4
- SIL-2 Certification

Local Operation and Display:
- Local Open/Close/Stop push buttons
- Lockable (Local/Off/Remote) selector switch
- Local Open/Close light display
- Local physical position indicator
- Lockable manual emergency fail-safe control valve

Optional Features
- Accumulators
- Remote Display Module (RDM)
- Circuit breakers (close-coupled or remote mounted)
- Solar panels
- 4-20mA pressure transmitter
- Auxiliary internal pressure switches
- Low power ESD solenoids
- Redundant emergency shutdown
Bettis™ Smart EHO

Quarter Turn Torque Output:
Spring Return:
- 1,264 to 707,696 lbf-in.

Operating Temperature:
- -20°F to +140°F (-29°C to +60°C)
- -40°F to +140°F (-40°C to +60°C) (optional)

Input Power:
- Multiple AC available

Remote Operation:
Input:
- Discrete: open, close, stop, PST, and ESD
- Analog: 4-20mA positioning (1% accuracy)

Output:
- Discrete: 4 configurable, 1 ESD monitor
- Analog: 4-20mA hydraulic pressure feedback and position feedback

Communication Protocols:
- ModBus, HART™ and FOUNDATION™ Fieldbus
- DCMlink™ remote diagnostics, configuration and monitoring compatibility

Certifications:
- CSA - Class I, Division I, Groups B (optional), C, and D
- FM – Class I, Division 1, Groups B (optional), C, and D
- ATEX – EExd IIB T4
- IECEx – Ex d IIIB T4
- SIL-3 Certification

Limit Switches:
- 2 SPDT – 4A @ 120VAC, 3A @ 24VDC (optional)
Over fifteen alerts and alarms to keep you informed on failures and abnormal conditions.

≤1% guaranteed accuracy when the valve needs to be precisely positioned. 4-20mA analog input and output to provide both precise control and instantaneous feedback.

Partial stroke ensures rarely operated ESD valves function properly during an emergency situation.

≤1% guaranteed accuracy when the valve needs to be precisely positioned. 4-20mA analog input and output to provide both precise control and instantaneous feedback.

Configurable to integrate into your existing communication system.

Precise Hall-Effect position encoder; provides consistent and accurate position feedback with no loss of calibration during power failures.

Environmental Protection:
- Control enclosure: IP68
- Hydraulic actuator: IP67M
- Motor: IP68
- Reservoir: IP54 (IP66 optional)

Local Operation:
- Integrates with DCMlink™ remote monitoring diagnostics
- Lockable (Local/Off/Remote) selector switch
- Hydraulic hand pump manual override
- Lockable manual emergency fail-safe control valve

Diagnostics/Safety
- 15+ different alarms and alerts
- Self-calibration
- Partial stroke test
- Log jam
- Integral overpressure protection
- 4-20mA pressure transmitter
- Integrates with DCMlink™ remote diagnostics, configuration and monitoring software

Local Display
- 2 digit LED display
- LED alarm and alerts display
- Mechanical dial position indicator
- Sight level gauge
- Hydraulic pressure gauge

Optional Features
- Accumulators
- Remote Display Module (RDM)
- Circuit breakers (close-coupled or remote mounted)
- Solar panels
- Auxiliary internal pressure switches
- Low power ESD solenoids
- Redundant emergency shutdown

This product is only intended for use in large-scale fixed installations excluded from the scope of Directive 2011/65/EU on the restriction of the use of certain hazardous substances in electrical and electronic equipment (RoHS 2).
Optimize reliability, energy efficiency, lower operational cost and safety

The Bettis™ EHO Electro-Hydraulic Operator is designed for the toughest environments and critical emergency shutdown applications. With the EHO, you have a field-proven ESD system with one single source of accountability.

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