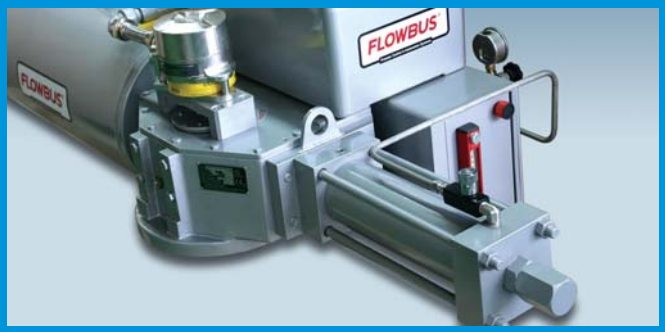
www.flowbus.com

FLOWBUS®

credibility

solutions



standards

SIL Applicable

CE 0036

ISO 9001:2008
ISO 14001:2004
OHSAS 18001:2007

Introduction

Complete Tailor-made Solutions

Flowbus works with you to provide a high quality, reliable solution, no matter how difficult or severe your application.

FLOWBUS®

Extensive Range of Models

Flowbus can offer the optimum choice of actuator for your duty from our extensive range. We are able to provide both symmetrical and canted torque output designs, meeting most quarter-turn valve torque requirements. The wide range of actuator models and torque outputs ensure the most economical actuator selection.

Complete Actuator Packages

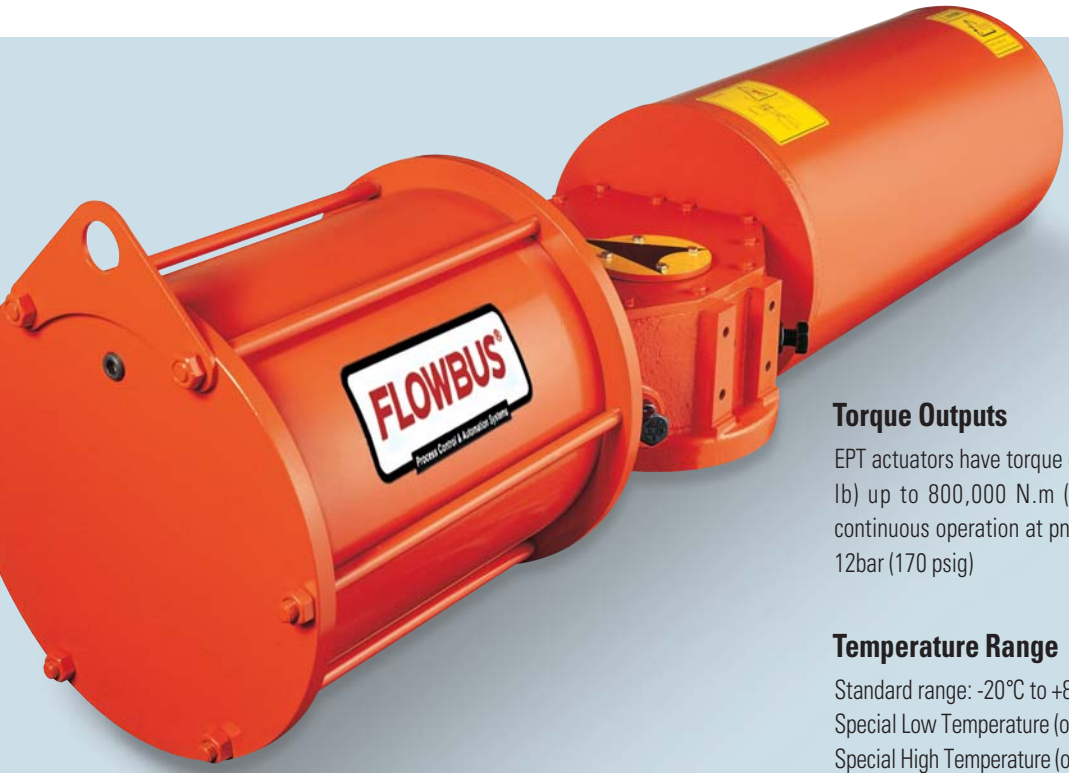
Our extensive knowledge of the valve and actuator industry enables us to offer a complete actuator unit fitted with ancillaries, controls and mounting kits, piped and wired ready for installation. From simple on/off duties with switches and solenoid valves to complete modulating packages with smart positioners, regulators and lock up relays, Flowbus is able to supply an actuator package to suit almost any duty or customer requirement.

Approvals and Industry Standards

Flowbus actuators are designed and manufactured in conformity with
CE certification to PED 97/23/EC
ATEX 94/9/EC
IP66/ IP67
ISO9001: 2008
Safety Integrity Level 3 & 4 applications in accordance with IEC61508, IEC61511

T-type

EP-Series
Pneumatic Actuators for Quarter-Turn Valves



External Tie Rods

Externally mounted tie rods secure the piston cylinder assembly. These tie rods are designed to maintain cylinder integrity in the case of over pressurization by the pneumatic supply. Also external tie rods help to protect the cylinder from accidental damage.

Simple Actuator Mounting

The EPT actuator yoke is designed with two full-length keyways. This not only simplifies assembly but also allows for ease of modification to the actuator orientation to accommodate last minute pipe work changes, in addition to providing easier visual confirmation of alignment, thus reducing maintenance and assembly time.

Wear Resistance

The EPT actuator guide rod has an advanced surface treatment, which, combined with self-lubricating bearings, provides superior wear resistance and extends the life of all sliding components.

ISO or MSS Mounting

EPT actuators have valve mounting pads in accordance with MSS SP -101 or ISO 5211 standard.

Torque Outputs

EPT actuators have torque outputs ranging from 416 N.m (3682 inch-lb) up to 800,000 N.m (7,088,000 inch-lb) and are rated for continuous operation at pneumatic pressures from 3 bar (40 psig) to 12bar (170 psig)

Temperature Range

Standard range: -20°C to +80°C (-4°F to +176°F)
Special Low Temperature (optional): -40°C to +80°C (-40°F to +176°F)
Special High Temperature (optional): -10°C to +177°C (14°F to +350.6°F)

Advanced Sealing Compounds

EPT actuators utilize both PTFE and rubber seals. The PTFE seal offers a high level of sealing performance and is self-lubricating, ensuring smooth operation of moving parts. The rubber seal offers long term, high performance sealing with no tendency to set or creep.

Piston Guide Ring

The EPT actuator has a guide ring fitted to the piston to prevent lateral deflection, and ensure smooth and steady operation.

Replaceable Bearing

Low friction, permanently lubricated, high performance bearings protect all components, extending actuator life by ensuring smooth operation. Bearing replacement is simple and instructions can be found in the operating & maintenance manual.

Optional Manual Override

Optional manual overrides such as jackscrew, gear and hydraulic override can be incorporated in accordance with customer's requirements. The specially designed hydraulic override cylinder is installed inside the spring module; this standardizes actuator overall length and isolates the hydraulic fluid to eliminate contamination

A-type

EP-Series
Pneumatic Actuators for Quarter-Turn Valves

Dual Valve Mounting Pads

Valve mounting interface on both sides of the actuator provide the ability to change the spring fail mode, from clockwise to anti-clockwise, by simply inverting the actuator and allow installation in any required orientation.

Modular Design

The EPA's modular design allows the actuator to be easily converted from double acting to single acting configuration, and provides for the simple addition of ancillaries such as manual override units.

Temperature Ranges

Standard EPA actuators are designed for operating temperature of -20°C to +80°C (-4°F to +176°F). Options are available for low -40°C (-40°F) and high +177°C (+350°F) temperatures, and special requirements can be supplied on request.

Cylinder Tube Coating

EPA actuators incorporate an electroless nickel internal coating to resist wear, corrosion, thermal and physical shock, while providing a low friction, lubrication interior finish. The coating ensures that no matter what corrosive elements are drawn in from the surrounding atmosphere the cylinder tube is fully protected. To ensure long life, the coating bonds to the cylinder surface eliminating the problems of cracking or flaking experienced with inferior solutions.

Replaceable Sliding Bearings

EPA actuators have permanently lubricated, long lasting, sliding bearings. The soft nitride finish provides superior corrosion and wear resistance for longer life.

External Tie Rods

EPA's external tie rods protect the cylinder tube from accidental damage during installation or piping work. Also by removing the tie rod nuts a spring return unit can be simply added or removed to change the actuator configuration.

Inherently Safe Design

The EPA actuator has been designed with an inherently safe spring return unit. The actuator spring rod is connected to both the spring end cover and retainers so that the spring is fully retained during assembly or disassembly. This prevents accidental release of the spring force, and ensures that installation or maintenance can be performed in complete safety.

Torque Outputs

The EPA double acting actuator torque output ranges from 59 to 3440 N.m (522 to 30447 ins.lbs.), while the spring return actuator produces spring end torques from 37 to 2737 N.m (327 to 24225 ins.lbs.). The actuators are rated for continuous operation at pneumatic supply pressures from 3 to 10 bar (40 to 150 psig).

ISO5211 Standard Valve Pad

The EPA actuator is designed to the latest ISO5211 valve interface standards, for optimum strength and standardized dimensions.

NAMUR Standard Interface

For ancillary equipment such as positioners and switchboxes a VDI/VDE 3845 mounting interface is provided to allow simple and quick mounting.

R-type, RY-type

EPR-Series
Pneumatic Actuators for Quarter-Turn Valves

Various Designs

EPR actuators are available with both rack and pinion and scotch yoke mechanisms with both designs incorporating an aluminium body with an advanced hard anodized exterior protection. They are compact and lightweight actuators whose design produces a significant saving in the use of compressed air with less stroke volume

High Quality, Cost Effective Actuator

By incorporating engineering excellence and the latest precision manufacturing techniques, the EPR actuator is constructed to the highest quality standards and offers efficient, reliable performance in a cost effective package. The corrosion resistant, hard anodized treatment on both internal and external surfaces combined with permanently lubricated, replaceable bearings and guide plates ensures reliable operation and extended actuator life. To reduce installation space and increase flexibility, the housing length is identical for both spring return and double acting actuators.

Hard Anodized Body

The extruded aluminum body incorporates an advanced, hard anodizing treatment on the internal and external surfaces. This provides reduced friction, increased durability and corrosion protection. The body can also be provided with a number of optional finishes including PTFE coated, electroless nickel plated and a variety of polyester powder coated colors.

Temperature Range

Standard EPR actuators are designed for operating temperatures of -20 to 80℃ (-4℉ to +176℉). Options are available for low -40℃ (-40° F) and high +150℃ (+302℉) temperatures, and special requirements can be supplied on request.

ISO5211 Valve Interface

The EPR-Series has valve mounting pads in accordance with ISO5211 standard, providing standardized mounting for quarter-turn valves with ISO compatibility.

Torque Outputs

The EPR double acting torque output ranges from 11.5 to 5877 N.m (99 to 52003 ins.lbs.) and the spring return actuator produces spring end torques from 2.1 to 3538 N.m (18 to 32614 ins.lbs.) 2.1 to 3538 N.m (18 to 32614 ins.lbs.) 2.1 to 3538 N.m (18 to 32614 ins.lbs.)

NAMUR Standard Interfaces

For ancillary equipment such as positioners and switchboxes, the latest VDI/VDE 3845 mounting interface is provided to allow quick and simple mounting with direct pinion drive. A NAMUR solenoid mounting pad allows direct mounting of solenoid valves to the actuator.

Travel Adjustment

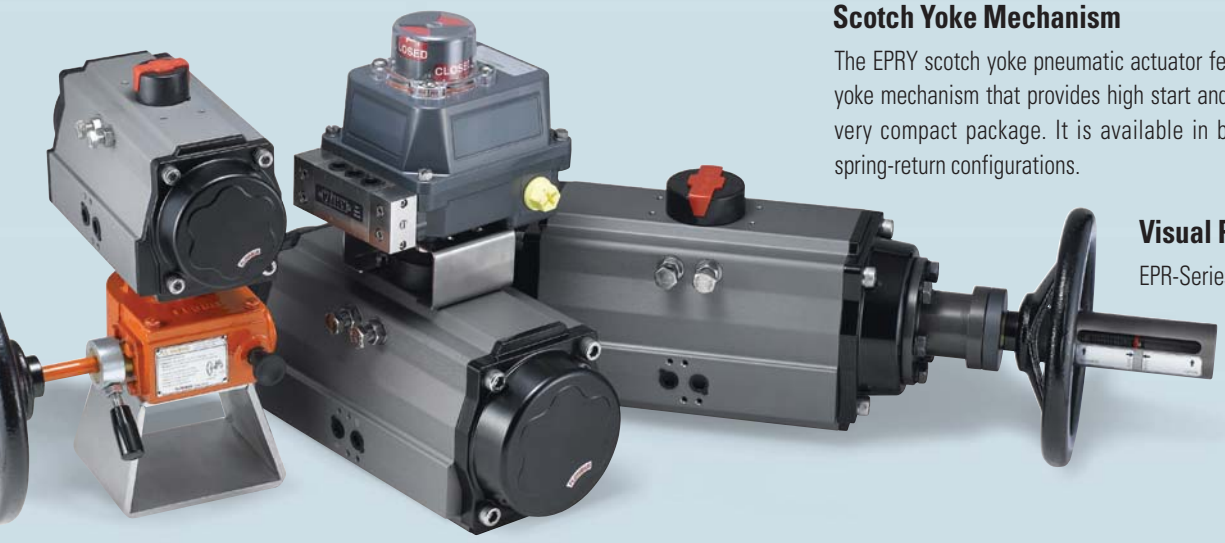
EPR actuators provide two external travel stops allowing for ±5° (rack & pinion mechanisim), ±4° (scoth yoke mechanisim) adjustment in both open and closed positions. This allows accurate valve alignment and provides actuator travel adjustment from 80° to 100°. Optional bolts fitted to the end caps can provide additional travel adjustment, for the open position. The externally adjusted bolts can provide open position travel from 0° to 100°.

Advanced Rack and Pinion Design

A compact, rugged construction, with dual rack and pinion, guarantees stable torque output throughout the EPR Rack & Pinion actuator's travel. The design is also suitable for high-cycle, high-speed duties.

Scotch Yoke Mechanism

The EPRY scotch yoke pneumatic actuator features a modern scotch yoke mechanism that provides high start and end torque output in a very compact package. It is available in both double-acting and spring-return configurations.

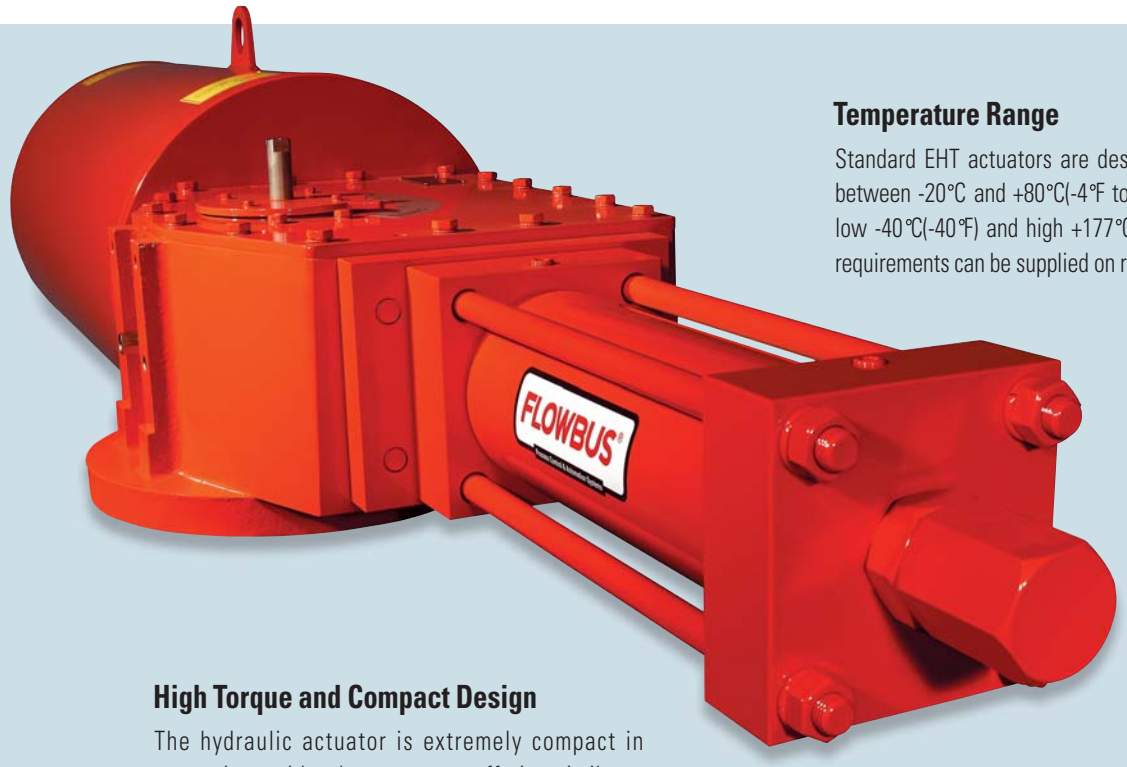


Visual Position Indicator

EPR-Series actuators are supplied as standard with a visual position indicator.

EHT-Series

Hydraulic Actuators for Quarter-Turn Valves



Temperature Range

Standard EHT actuators are designed for operating temperatures between -20°C and +80°C(-4°F to +176°F). Options are available for low -40°C(-40°F) and high +177°C(+350°F) temperature, and special requirements can be supplied on request.

Travel Adjustment

The EHT actuator offers bi-directional travel stops, which allow ±5° degrees of adjustment, giving a travel range of 80 to 100 degrees. Both the stops are externally accessible, for easy adjustment. For a greater range of adjustment, optional extended travel stops are available on request.

High Torque and Compact Design

The hydraulic actuator is extremely compact in comparison with other actuators offering similar torque outputs. This reduces the overall valve package envelope providing a more compact design.

Versatile Modular Design

The EHT actuator is designed to be flexible and to meet the ever changing requirements of today's applications. The modular design is easily field converted from spring return to double acting without the need for special tolls or equipment. The spring module can be stocked to allow quick change over and has been designed so that the spring is not under tension until fitted to the actuator. This prevents loss of power due to spring "set". A hydraulic manual override can be also retrofitted.

Torque Outputs

EHT double acting actuators have torque outputs range from 522N.m (4,620 inch-lbs) up to 268,486N.m (2,376,302 inch-lbs) while the spring return actuators produce spring end torques from 468N.m (4,142 inch-lbs) to 110,883N.m (981,397 inch-lbs). The actuators are rated for continuous operating at hydraulic pressure up to 210 bar (3,045 psig).

ISO 5211 or MSS Valve Interface

The EHT actuator has valve mounting pads in accordance with ISO5211 or MSS SP-101.

Compact Piston Seals

The EHT actuator has compact piston seals which guide the piston in the power module and absorb side-loads. This unique design provides high levels of static and dynamic sealing, smooth operation and extended piston life. Optional seals for low and high temperatures are available on request.

Scotch-Yoke Mechanism

The scotch yoke mechanism delivers optimum torque outputs from linear movement of the piston. This is ideal for quarter turn valve applications. EHT actuator scotch yokes are available in symmetrical and canted designs to suit specific valve characteristics.

Spring Unit

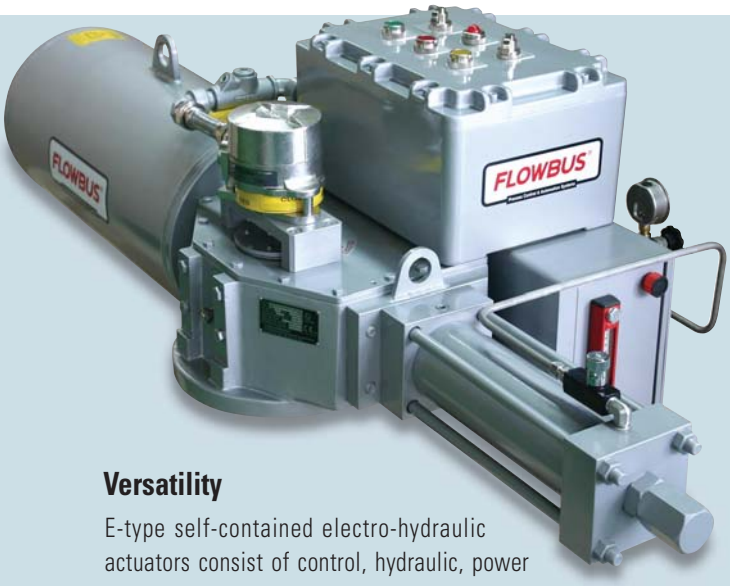
To avoid accidental release of spring force, the spring units are supplied as fully welded modules. The spring and spring retainer are self-centered and bearing guided within the spring module, ensuring accurate alignment and extending spring life.

Standard Visual Indicator

A high visibility position indicator is provided as a standard.

E-type

EHT-Series
Electro Hydraulic Actuators for Quarter-Turn Valves



Versatility

E-type self-contained electro-hydraulic actuators consist of control, hydraulic, power modules, incorporating a motor driven pump with an integral hydraulic cylinder for minimum installation and maintenance costs. They are available in both double acting and spring return (clockwise or anticlockwise) configurations for quarter turn movement such as ball, butterfly, plug valves and dampers

Customization

EEH actuators offer a complete tailor-made solution to suit a client application such as emergency shutdown (ESD), on/ff or modulating control, partial stroking test with minimal affect on the process.

Various Power Options

Single-phase, three-phase, or 24VDC power supply are available in accordance with customer's requirements

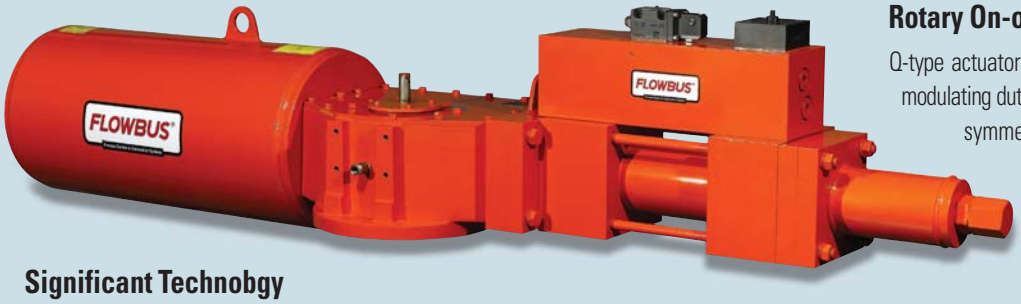
Bus Communications

They are available with bus communications via all major protocols, and can be customized to suit the application.

Manifold Control Systems

actuators provide local open/close selector switches, local position indication, pressure indication, and manifold control piping as standard.

Q-type



Rotary On-off or Modulating Duty

Q-type actuators are suitable for rotary on-off or modulating duty. They can be provided with either symmetrical or canted yoke, producing torque outputs suitable for the duty requirements of a wide variety of valve designs.

Significant Technobgy

Incorporating Flowbus latest technology and extensive knowledge of the valve and actuator industry, Q-type spring return actuators provide reliability and high performance in severe service applications. For example, the Q-type can operate in less than one second to the valve fail safe position.

Accurate Selection of Control Valves

Depending on customer requirements and process conditions, various ancillaries such as limit switches, solenoid valves, servo valves, poppet solenoid valves etc. are optimally selected to ensure the perfect valve operation.

Manifold Control System

The Q-type actuator specially designed manifold control system produces a very short operating time typically required in emergency conditions, it is also very compact, saving piping space.

Partial Stroke Test Device

Partial stroke test devices are available on request to ensure the proper operation of final control elements such as valves, actuators and controllers in Emergency Shut Down (ESD) applications.

FLOWBUS®

Manual Overrides

Compact and Flexible

By installing the FB override between the actuator and the valve/damper the overall valve package envelope is minimized, reducing the space required for installation. The override can be fitted to any quarter turn valve/actuator combination and can be retrofitted if required.

ISO 5211 Mounting Pad

The gearbox is designed to the latest ISO5211 interface standards, for optimum strength and standardized dimensions.

Safe & Simple Operation

A simple quarter turn lever controls the gearbox clutch action. To ensure safe operation, a spring loaded locking pin must be manually disengaged before the clutch lever can be operated.

Torque Outputs

The FB-Series is available for torque output ranges from 225 to 9700 N.m

Precision Gear Design

High precision, self-locking gears provide safe, positive manual positioning and extend gearbox life.

External Coating

The standard FB-Series paint specification is as follows
Sand blast to grad SA 2.1/2 (SSPC-SP50), Polyurethane primer, Polyurethane topcoat
Flowbus also offers special paint specifications and coatings for any environment, from offshore and high
temperatures to chemical atmospheres.

Travel Stops

The FB-Series offers bi-directional travel stops allowing ±5° of travel adjustment to give ranges from 80° to 100°.

Wide Range of Manual Override Options

Flowbus offers various manual override configurations for all Flowbus pneumatic, hydraulic and electro hydraulic actuators dependant on customer's requirements and actuator size. The unique designed manual overrides such as jackscrew, handwheel or hydraulic pump allows quick and simple operation of the highest torques valves when the air or power supply fails. The specially designed hydraulic override cylinder is installed inside the spring module; this standardizes actuator overall length and isolates the hydraulic fluid to eliminate contamination and spillage.

Jackscrew override

Gear override

Hydraulic override

Fire Proofing Solutions

Our extensive knowledge of the valve and actuator industry in oil and gas, refinery, petrochemical applications enables us to provide various fire protection solutions to allow the critical actuator and related control systems to continue operating for a period of time in fire temperatures of 1000 deg C in accordance with UL1709.

By installation various fire protection systems such as a flexible & semi-rigid enclosure jacket, rigid enclosure, removable covers and intumescing coating or any other requirements, the critical valve actuation systems can be protected efficiently from danger and damage from fire. Flowbus is able to offer the fire proofing systems in both new and existing actuators and its controls systems.

Flexible & Semi-Rigid Enclosure Solutions

Our flexible enclosure is a compact and lightweight solution to protect actuators and their related control systems from damage by fire. They are easily installed and removed without the need for special tools which reduces the time required for inspection on site. Our semi-rigid enclosure consists of a steel frame or panel enclosed in a body of ceramic fibre. Both designs protect both the actuator and controls from the effects of fire or the weather.

UL 1709

Rigid Enclosure Solution

The rigid enclosure allows Flowbus actuator to maintain operating for the period of 30 minutes protection at 1000℃ in accordance with UL1709. By incorporation of the frame, panel and high thermal performance material, the rigid enclosure provides easy installation and maintenance without any special tools. Flowbus experience in refinery, petrochemical and oil & gas applications help to offer various fire protection soulutions in order to meet customer specifications.

UL 1709

Intumescent Coating Solution

The intumescing coating is the direct bonding to the actuators and the related control systems in order to protect the corrosion or fire damage while providing the rugged and compact soulution and minimum maintenance. This solution allows Flowbus actuator to maintain operating for the period of 30 minutes protection at 1000℃ in accordance with UL 1709.

UL 1709

FLOWBUS®

ESD (Emergency Shut Down Applications) & Partial Stroke Systems

Flowbus ; A Complete Valve Actuation Technology

Flowbus can supply not only an actuator but a complete tailored solution to meet our customer's applications. From basic ancillaries such as solenoids, through the ESD (Emergency Shut Down) solutions and partial stroke systems, Flowbus is able to use their years of valve and actuator experience to enhance performance and provide the perfect solution to client's requirements.

Emergency Shut Down (ESD) Systems

A shut down valve (also referred to an Emergency shutdown valve) is an actuated valve designed to stop the flow of a hazardous fluid upon the detection of a dangerous event. This provides protection against possible harm to people, equipment or the environment. The process of providing automated safety protection upon the detection of a hazardous or emergency event is called functional safety. Based on Flowbus's experience and the latest innovations in technology, Flowbus is able to offer a high quality, reliable and economical ESD systems, utilizing tried and tested methods of operation.

Partial Stroke Systems

A periodic partial stroke system ensures the safety of Emergency Shut Down Valve performance when required and increase the amount of time between plant shutdowns for full functional testing. By incorporating Flowbus's valve actuation know-how, various partial stroke systems can be provided to travel the Emergency Shut Down valve to the failsafe position approximately 15~20% stroke according to the customer requirements and return to its normal position without interruption the production. The partial stroke systems can be provided various methods with such as solenoid valve, positioner, mechanical gear operator or any other customer requirements.

Flowbus ; Suitable for use in SIL 3 & 4 applications

Safety Integrity Level (SIL) is defined as a relative level of risk reduction provided by a safety function, or to specify a target level of risk reduction. In simple terms, SIL is a measurement of performance required for a Safety Instrumented Function (SIF). Four SILs are defined, with SIL4 being the most dependable and SIL 1 being the least.

When you request a final control element for the safety systems, Flowbus offer the ability to perform according to the IEC61508 and 61511 standards. The EP Series actuators are certified to SIL 3 without the partial stroke systems and SIL 4 with periodic proof testing device.

FLOWBUS® Corporation

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