

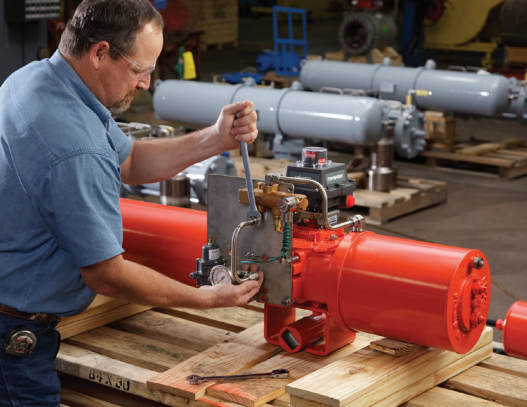
Bettis Product Selection Guide

A Complete Offering of Valve Automation Solutions



BETTIS[™]


EMERSON[™]



Bettis actuators and controls have been global leaders in their industry applications for more than 55 years.

Bettis' broad range includes quarter-turn scotch yoke, rack and pinion, electric, linear and helical spline options.

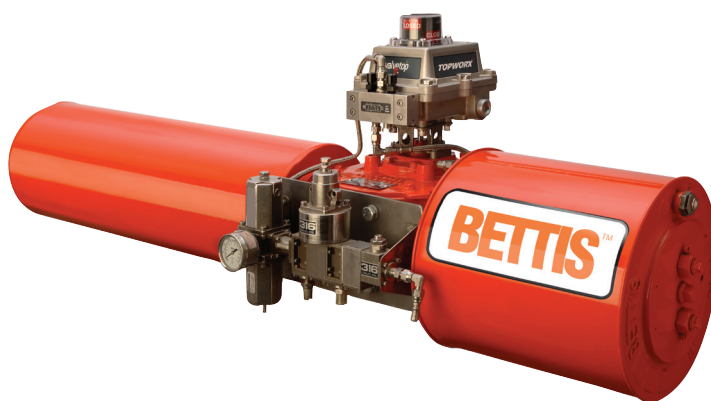
Bettis actuators can be powered by compressed gas, hydraulics or electricity to satisfy a vast range of automation requirements.



Bettis™ is a leading brand in the broad offering of Emerson – Actuation Technologies. The actuators and controls are used in almost every energy-related industry, including oil and gas transmission, petrochemical and petroleum refining. Other significant markets include chemical; power industry including nuclear; pulp and paper; food and beverage; pharmaceutical; HVAC and water systems. To serve its customers with the latest technology and complete valve operating systems, Emerson has established a global presence for its Bettis products with strategically located World Area Configuration Centers and a knowledgeable worldwide sales force that is unmatched in the industry. Bettis products are specifically engineered for their intended application, are guaranteed for minimum torque and thrust values, and undergo thorough testing and quality checks before being shipped.

G-Series (Robotarm II™) Pneumatic & Hydraulic Scotch-Yoke

- PED 97/23/EC compliant.
- Five-year standard warranty.
- Compact, optimum center of gravity, shorter and lighter than models of equal torque output.
- Meets IP66 and IP67M for water ingress protection and corrosion resistance.
- Powr-Swivel™ — compensates for side load deflection, reducing wear and increasing cycle life.
- Tension-Lok™ — a safety feature that positively locks the spring module in place under load.
- Acculine™ Shaft Drive — eliminates misalignment damage, helping to ensure classification integrity.
- Shaft-driven accessory interface conforms to NAMUR standard. One size fits all.
- Interchangeable modules - an advantage for inventory and service.
- Available with either symmetric or canted yokes to suit your requirements.
- Modular construction for online maintenance without valve removal.
- Output torques (guaranteed minimum):
 - Double-acting models — to 6,000,000 lb-in (678,000 Nm)
 - Spring-return models — to 3,000,000 lb-in (339,000 Nm) End
- Standard operating pressure:
 - Pneumatic: 40 to 200 PSIG (3 to 14 BAR)
 - Hydraulic: 500 to 5,000 PSIG (34 to 345 BAR)
- Standard operating temperature is -20°F to +200°F (-29°C to +93°C) with high and low temperature optional trims available.



CBB and CBA-300 Series Pneumatic Scotch-Yoke

- PED 97/23/EC compliant.
- Five year standard warranty.
- IP66 and IP67M for water ingress protection as per IEC 60529.
- Pneumatic output torques:
 - CBB Double-acting models
 - to 11,515 lb-in (1,301 Nm) Break
 - CBB Spring-return models
 - to 4,269 lb-in (482 Nm) Spring End
 - CBA-300 Double-acting models
 - to 20,337 lb-in (2,333 Nm)
 - CBA-300 Spring-return models
 - to 10,457 lb-in (1,182 Nm) Spring End
- Standard pneumatic operating pressures to 150 PSIG (10 BAR).
- Standard operating temperature is -20°F to +200°F (-29°C to +93°C) with optional high and low temperature trims available.
- Economical jackscrew manual override available to ensure reliable valve control in the event of the power loss.
- CBB symmetrical mounting pads allows field reversal of spring return actuator failure mode with no disassembly required (CW or CCW).
- CBA-300 standardizations
 - ISO/DIN bottom mounting for close or direct coupling to the valve topworks.
 - NAMUR standardization allows direct or close coupling of accessory hardware.



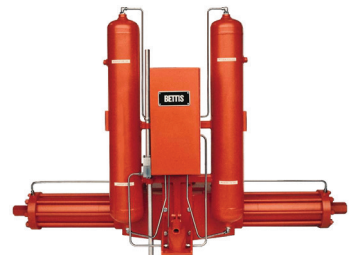
D-Series Pneumatic Rack and Pinion

- Unique three-point suspension system to counteract side-loading forces.
- Dual stroke adjustment range from 65 to 96 degrees.
- Exclusive two-component coating, standard for corrosion resistance.
- Modular spring design to facilitate 40 to 120 PSIG supply air (3 to 8 BAR).
- Output torques
 - Spring-return 7,939 lb-in (897 Nm)
 - Double-acting 14,874 lb-in (1,676 Nm)
- Standard operating temperatures -4°F to +176°F (-20°C to +80°C)



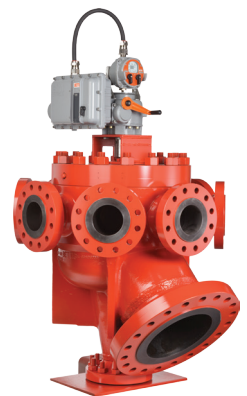
Gas/Hydraulic Series Scotch-Yoke and Linear

- Sour gas trim optional.
- Quarter-turn output torques to 6,000,000 lb-in (678,000 Nm).
- Standard operating pressure to 1,440 PSIG (100 BAR).
- Standard operating temperature is -50°F to +150°F (-46°C to +66°C).
- Features include: zero-leakage piston and rod seals; manual pump for emergency operation.
- Many control system options are available including remote control, high/low shutoff and linebreak.



Multiport Flow Selector

- Allows diversion of fluids from a single flow line to a test outlet or sampling device.
- Can manifold as many as seven simultaneous flow lines.
- Can be operated manually or electrically.
- Microprocessor-based Bettis actuator controls and monitors status of Multiport.
- Economical and compact compared to 2-way and 3-way valve manifolds.
- Constructed to applicable parts of ANSI B 16.34 & ASME Sec VIII Div I.
- Optional sour trim.
- Available in various line flange sizes and ANSI ratings.
- Available with a variety of materials to protect in adverse conditions.



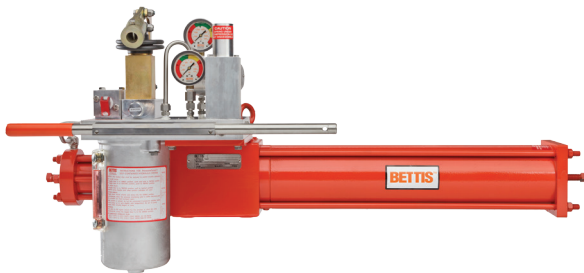
GVO Linear Series Pneumatic and Hydraulic

- Automates most types of rising stem valves- slab, wedge, knife and expanding gate, globe, rising stem ball and dampers.
- Extended stroke for each model, +/- 2".
- External tie bars allow contained energy release in event of over-pressure.
- Optional materials of construction for sour service.
- Adjustable travel stop for the rod retract position.
- Options include limit switches, relays, solenoids, pressure pilots, dampeners and manual overrides.



PressureGuard™

- Self-contained remote hydraulic emergency shutdown system for wellheads and pipelines.
- Adaptable to quarter-turn or linear operated valves.
- Provides reliable valve operation when external power source is undependable or unavailable.
- Modular design for easy maintenance.
- Adaptable for use with SCADA systems.
- Field proven in extreme climates.



BHH/BL Helical Spline Hydraulic

- Smallest footprint-to-torque ratio.
- High water ingress protection IP68.
- Quarter-turn and linear, double-acting and spring-return configurations.
- Balanced design eliminates side loading on valve assembly and stem.
- Compact and concentric design.
- Integrated crossover valve (double-acting).
- Standard operating pressure to 3,000 PSIG (207 BAR).



TEC2000 Electric Actuators

- Microprocessor-based Total Electronic Control – Absolute position detector uses Hall-Effect devices – no batteries needed to maintain limit settings.
- Local control elements do not penetrate enclosures – Hall-Effect devices.
- Largest, easiest-to-read LCD in the industry.
- Full function remote display module can be mounted up to 1,200m (4,000 ft.)
- Separate terminal chamber for field wiring – user-replaceable fuses accessible without opening controls compartment.
- Standard housing construction for hazardous locations – SIRA/ATEX or FM and CSA.
- Modular construction – Over 60% of mechanical parts are common. Control modules are same for multi-turn and quarter-turn actuators.
- Discrete, analog and Controlinc™ digital control – Profibus, FOUNDATION™ fieldbus, Device Net and Modbus RTU.
- Standard Operating Temperature: -20°C to +60°C (-4°F to +140°F)



TorqPlus™ Quarter-Turn Electric

- Five models with Guaranteed output torques from 100 lb-in to 20,000 lb-in (11 Nm to 2,260Nm).
- Maximum duty cycle – standard for torques as low as 350 lb-in through 10,000 lb-in torques is 100%. No less than 50% in all available motor voltages.
- Spring-return units with torque outputs between 300 and 1,400 lb-in for fail-safe applications.
- Compact design in weatherproof and explosion-proof housings.
- Modular design readily accommodates controls and accessories such as heaters, motor brakes, positioners, transmitters and control stations.
- Permanent lubrication reduces the need for scheduled maintenance.
- High-strength gearing run in needle bearings for smooth energy transfer and long service life.





Bettis actuators are supported by ISO9001 designations, indicating full compliance with global quality and documentation standards.

Bettis quarter-turn actuators reliably operate ball, butterfly and plug valves and other 90° rotating mechanisms.

Many Bettis products are suited for operation in demanding SIL environments.



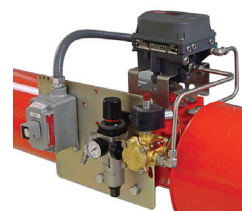
LineGuard™ Electronic Linebreak Detection System

- Self-contained monitoring and linebreak detection device providing SCADA of a single actuator.
- Continuous pressure monitoring to record rate of pressure drop, low pressure and high pressure.
- Four types of archival logs are stored in battery-backed memory.
- Has a combination of fixed and configurable I/O to best fit the application.
- Two-line or four-line x 20 character per line LCD display (depending on base model).
- Compact, NEMA 4x weatherproof and corrosion-proof enclosure.
- Deltamatic™ pneumatic linebreak detection system also available.



Valve Operating Systems (VOS)

Emerson Actuation Technologies offers complete valve operating systems for final valve control solutions. Emerson has the capability to combine Bettis actuators with controls and a selected valve into an integrated system, designed for a specific application and through a single source. The systems can be pre-engineered and documented using approved, standard components and uniformly assembled at any of Emerson's World Area Configuration Centers (WACC). The valve operating systems reduce lead times and simplify purchasing, installation, startup and field service.



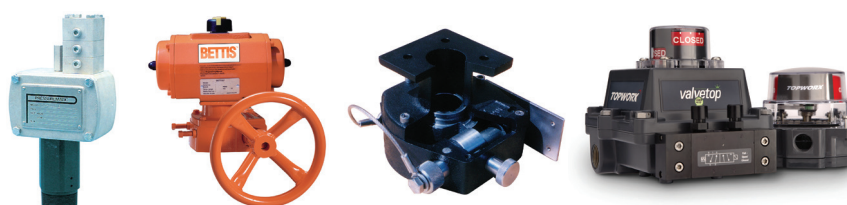
Safety Integrated Systems

- Actuation Technologies solution for safety systems.
- Integrates G, CBB, D or CBA-300 actuators with Fisher® FIELDVUE® digital controller and valve in a single package.
- Failure Modes and Effects Diagnostics Analysis (FMEA) report performed for SIL1, 2 and 3 suitability.
- PED 97/23/EC compliant.
- Allows on-line partial stroke testing and diagnostics.



Accessories

Bettis provides a complete offering of controls and accessories for its actuators. They provide increased functionality to the actuators for positional control, speed control and fail-safe operation. Included are pneumatic positioners, high/low pressure pilots, gear operators, partial stroke test devices and overrides.



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