CBB-Series Scotch-Yoke Pneumatic Actuators

Improved design - compact, lightweight to suit all applications and environment

BETTIS™

EMERSON™
Process Management

Bettis is the global leader in providing safe, reliable, rugged actuators and automation solutions for the oil & gas, process, nuclear and other industries.

CBB with a newly improved design has many features which will benefit customers in various applications and conditions.

With an improved torque shaft seal design, CBB is suitable for most environments.

Protection against leakage to the environment is made possible with a separate weather and pressure seal design - providing dual redundancy in the actuator. Further enhancements with improvement are made in the travel stop design.

Overall enhanced performance and reliability - suited for tough environments.

Easy field upgrade to high temperature trim with ductile iron piston as standard.

Design and Construction

As a manufacturer, Emerson Process Management - Valve Automation realizes that performance of our actuators is vitally important to your production process. An actuator that does not function properly can have serious consequences for the outcome of the process, costing you dearly in down-time and loss of production. That is why for over 50 years Bettis has been the manufacturer of choice for providing a wide range of actuators to meet the demanding performance requirements of our customers. Many process industries including Oil and Gas, Chemical, Refining, Power Generation, Pulp & Paper and Pharmaceuticals rely on Bettis for meeting their stringent performance requirements.

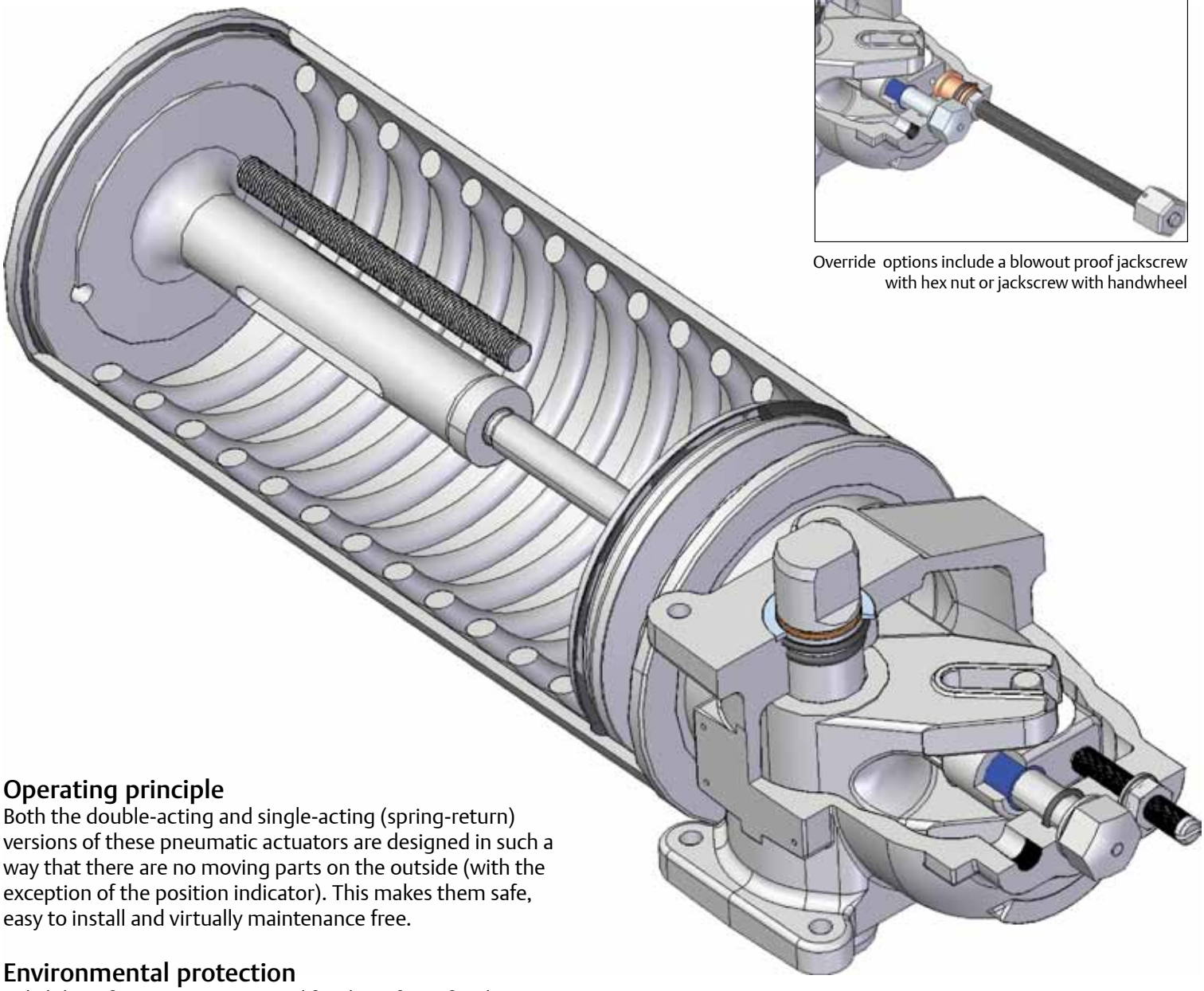
The Bettis CBB line represents the latest generation of pneumatic scotch-yoke actuators. They draw from the best features of earlier versions – CB and CBA – and incorporate cutting edge features that add to its ruggedness and dependability in the field. Because it has the same envelope dimensions and mounting interfaces as previous CB versions, the CBB allows for mounting interchangeability and many replacement parts from the earlier models.

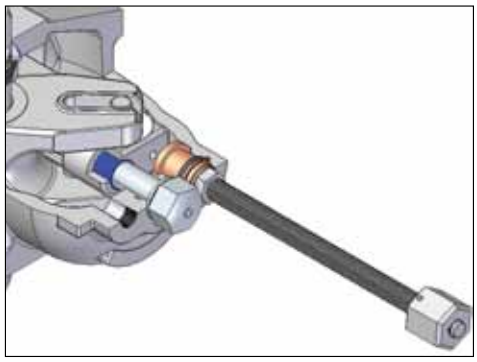
The Bettis CBB-Series pneumatic actuators are compact, lightweight and ideally suited for automating ball, butterfly and non-lubricated plug valves, or any quarter-turn (90 degree) rotating mechanism. These economical, low maintenance actuators provide a reliable means of automating your valve and are available with optional features and controls to meet your most demanding automation needs. The CBB-Series, available in double-acting and spring-return models, are independently certified to IEC 60529 IP66 and IP67M for water ingress protection.

Bettis quarter-turn rotary actuators utilize a ductile iron housing, advanced water ingress prevention design, and a two component polyurethane paint finish to ensure years of reliable performance in harsh environmental conditions. In addition to these standard features, Bettis CBB-Series actuators are available with optional proven accessories to meet the demanding requirements for valve automation.

CBB SERIES APPLICATION AND FEATURES

- For use in automating ball, butterfly and non-lubricated plug valves, or any quarter-turn (90 degree) rotating mechanism
- PED 97/23/EC compliant to meet the stringent requirements of pressure retaining vessels.
- Compact, lightweight, and economical scotch-yoke design. The scotch-yoke mechanism provides optimum torque curves for quarter-turn operation.
- Choice of 29 sizes with guaranteed minimum torque outputs up to 11,515 lb-in (1,301 Nm) for double -acting and 4,269 lb-in (482 Nm) spring-return configuration
- Standard dual valve mounting interface provides flexibility for installation in a fail-open or fail-close application without the need of actuator disassembly. Installation is possible in any position, parallel or at right angles to the flow line, in the vertical or horizontal plane.
- Ductile iron housing and piston provide more strength per pound, increased durability and corrosion resistance.
- Increased actuator efficiency and corrosion resistance are possible with a Xylan fluoropolymer coating on the interior of the power cylinder. The permanently-bonded coating is highly resistant to abrasion, thermal shock and provides excellent lubricity and low friction properties.





Override options include a blowout proof jackscrew with hex nut or jackscrew with handwheel

Operating principle

Both the double-acting and single-acting (spring-return) versions of these pneumatic actuators are designed in such a way that there are no moving parts on the outside (with the exception of the position indicator). This makes them safe, easy to install and virtually maintenance free.

Environmental protection

Reliability of an actuator is crucial for the safety of a plant's automation process and personnel. The Bettis CBB-Series actuator is independently certified to IEC 60529 IP66 and IP67M water ingress protection to prevent corrosion within the actuator. To help achieve this rating, CBB-Series actuators incorporate a proven design for preventing water ingress on the torque shaft by using a separate pressure seal and weather resistance between the torque shaft and housing body.

Temperature extremes require different solutions to maintain actuator operational integrity and reliability. Each model actuator is available in three different temperature trims. The standard trim is suitable for -20°F to +200°F (-29°C to +93°C). Optional high temperature trim +350°F (-18°C to +177°C) and cold temperature trims -40°F to +150°F (-40°C to +66°C) can be supplied on factory built actuators or upgraded at the distributor or end user level.

Multiple spring packages

Spring-return, single-acting actuators are used in the majority of systems as a fail-safe method of either closing or opening the valve to suit the application. Their ability to automatically return the valve to its failsafe position upon air failure provides the vital link for ultimate system safety and shut down. Bettis CBB-Series spring-return actuators are available in 4-four-spring configurations to cover a wide range of torque requirements under different supply pressures and operating parameters. Each of the carbon steel springs are protected by Tactyl 50, a pliable self-healing coating, for extending the CBB's life cycle.

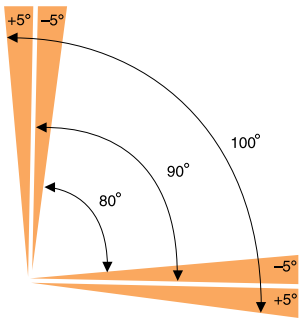
Flexible Configurations

Requirements for process automation sometimes vary within a facility. To meet industry demands for product standardization with adaptability, Bettis offers many options for the CBB Series.

Override modules used to reposition a valve in the event of a power loss can be supplied with a jackscrew and hex nut adaptor or a jackscrew with handwheel. Optional temperature trims to meet harsh temperature extremes, extended travel stops for continuous adjustability for each direction of travel, and various spring configurations to meet torque and pressure requirements are some of most common options chosen.

Travel Stops

Instrumentation for valve automation requires repeatable positioning and position indication. Bettis CBB-Series actuators include bi-directional travel stops as an integral part of the actuator. These travel stops are adjustable from 80° to 100° of total valve travel. This feature, with its unmatched travel range, assists in prolonging valve seat integrity. Applications requiring greater adjustment of valve travel can be supplied with the optional extended travel stops for full valve stroke travel adjustment.



Long Life Span

The rugged and dependable construction of the CBB actuator is backed by Bettis' industry leading five year warranty on materials and workmanship. With the use of superior design and materials throughout the construction, CBB spring-return actuators and double action actuators will have a long cycle life when properly maintained and sized.

Safety Integrity Level (SIL)

Bettis CBB-Series actuators are suitable for use within the demanding applications of a SIL environment. The actuators have a Failure Modes and Effects Diagnostics Analysis (FMEDA) report performed by Exida.com™ for SIL suitability. They can be combined with other SIL-rated components such as solenoid valves, switches, and regulators. When Fisher's TÜV-certified FIELDVUE® controller is added the CBB, it is capable of partial stroke testing and of providing continuous monitoring of supply pressure, valve position and pressure values to the actuator to verify its proper working condition. The CBB then becomes an integral component in controlling the final control element in SIL1, 2 or 3 applications.

For more detailed technical information see our online documentation under **www.Bettis.com/technical-data**
Document number **[DOC.DSB.CBB.US]**

BETTIS HAS BROAD PRODUCT OFFERING

Bettis is not limited in its technology offering for selecting the best configuration for use in automated service.
Bettis has a wide range of hydraulic and pneumatic technologies for meeting critical customer requirements.
These include:

- Scotch-Yoke
- Linear
- Rack & Pinion
- Direct Gas
- Gas Hydraulic
- Electric
- Self-Contained MultiPort
- Controls
- Accessories
- Trims – include N(Nuclear) trim

Actuator / Accessory interfaces

Bettis CBB with Topworx Positioner

Bettis CBB with Wireless Transmitter

STANDARDS AND CERTIFICATIONS

Bettis CBB pneumatic actuators are manufactured to meet the following worldwide quality and safety standards:

CE

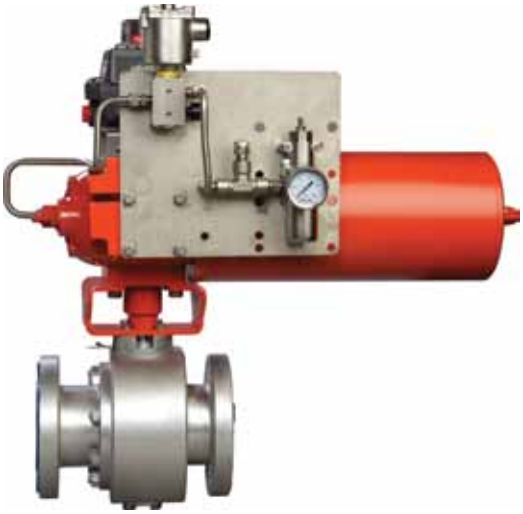
ISO-9001

ABS

PED/97/23/EC – Pressure Equipment Directive

Bettis Automated Packages

Bettis offers complete valve operating system as a solution for final valve control. Bettis has the capability to combine the CBB actuator and controls with the selected valve into a single system at various international Valve Automation World Automation Configuration Centers (WACC) – perfect for large international projects.



Through the use of Valve Automation World Automation Configuration Centers, Bettis can integrate its products with a complete offering of control options, including world-class PlantWeb® digital plant architecture and the entire range of Emerson automation solutions.

BettiSystems™

To assist with valve automation solutions, Bettis has pre-engineered and documented a series of commonly required control systems. These approved systems utilize standard components, reduce lead times, and simplify purchasing, installation and start-up.

Please consult the factory for additional information.

Emerson brands for most common control accessories:

Digital Valve Controllers:	Fisher®
Positioners:	Fisher®
Regulators:	Fisher®
Switch boxes:	TopWorx
Wireless position monitor:	TopWorx
Solenoid valves:	ASCO Numatics™