

# 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.

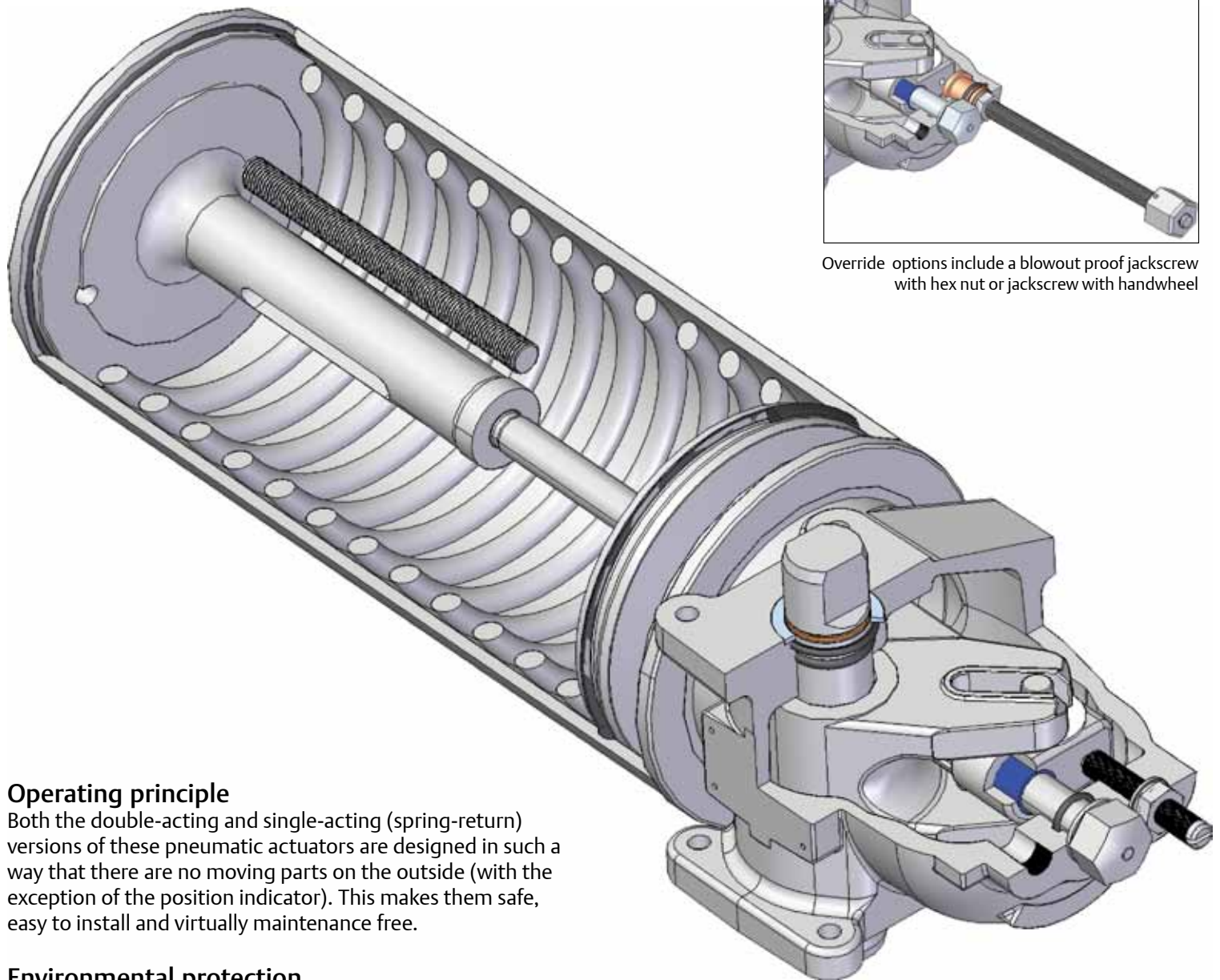
The Bettis CBB line represents the latest generation of pneumatic scotch-yoke actuators. They draw from the best features of earlier versions – CB and CBA – and incorporate cutting edge features that add to its ruggedness and dependability in the field. Because it has the same envelope dimensions and 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.

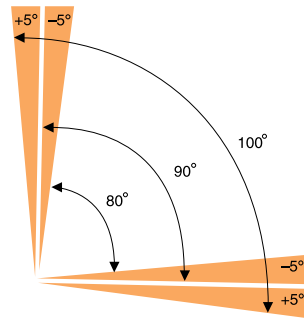
## Flexible Configurations

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.

## 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



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

# Actuator / Accessory interfaces

## 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 CBB with Topworx Positioner

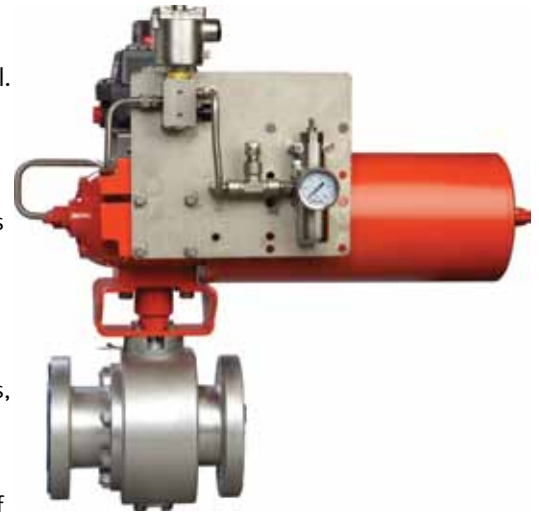


Bettis CBB with Wireless Transmitter

### 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:

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

**Contact Us: Emerson Process Management, Valve Automation facilities at your nearest location:**

**NORTH & SOUTH AMERICA**

18703 GH Circle  
PO Box 508  
Waller, TX 77484  
USA  
T +1 281 727 5300  
F +1 281 727 5353

2500 Park Avenue West  
Mansfield, OH 44906  
USA  
T +1 419 529 4311  
F +1 419 529 3688

9009 King Palm Drive  
Tampa, FL 33619  
USA  
T +1 813 630 2255  
F +1 813 630 9449

13840 Pike Road  
Missouri City, Texas 77489  
USA  
T +1 281 499 1561  
F +1 281 499 8445

Av. Hollingsworth,  
325, Iporanga Sorocaba,  
SP 18087-105  
Brazil  
T +55 15 3238 3788  
F +55 15 3228 3300

**MIDDLE EAST & AFRICA**

P. O. Box 17033  
Dubai  
United Arab Emirates  
T +971 4 811 8100  
F +971 4 886 5465

P. O. Box 105958  
Abu Dhabi  
United Arab Emirates  
T +971 2 697 2000  
F +971 2 555 0364

P. O. Box 3911  
Al Khobar 31952  
Saudi Arabia  
T +966 3 814 7560  
F +966 3 814 7570

P. O. Box 10305  
Jubail 31961  
Saudi Arabia  
T +966 3 340 8650  
F +966 3 340 8790

P. O. Box 32281  
Doha  
Qatar  
T +974 4 576777  
F +974 4 315448

2 Monteer Road, Isando  
Kempton Park, 1600  
South Africa  
T +27 11 974 3336  
F +27 11 974 7005

**EUROPE**

Asveldweg 11  
7556 BR Hengelo (O)  
The Netherlands  
T +31 74 256 1010  
F +31 74 291 0938

Siemensring 112  
47877 Willich  
Germany  
T +49 2154 499 660  
F +49 2154 499 6613

25, Rue de Villeneuve  
Silic – BP 40434  
94583 Rungis  
France  
T +33 1 49 79 73 00  
F +33 1 49 79 73 99

Via Montello 71/73  
20038 Seregno (Milan)  
Italy  
T +39 0362 2285 207  
F +39 0362 2436 55

6 Bracken Hill  
South West Industrial Estate  
Peterlee SR8 2LS  
United Kingdom  
T +44 191 518 0020  
F +44 191 518 0032

2A Szturmowa Str  
02-678 Warsaw  
Poland  
T +48 22 4589237  
F +48 22 45 89 231

C/ Francisco Gervás, 1  
28108 Alcobendas – Madrid  
Spain  
T +34 0913 586 000  
F +34 0913 589 145

Letnikovskaya Str. 10-2  
115114 Moscow  
Russia and FSU  
T +7 495 981 98 11  
F +7 495 981 98 10

**ASIA PACIFIC**

No. 9 Gul Road  
#01-02 Singapore 629361  
T +65 6501 4600  
F +65 6268 0028

9/F Gateway Building  
No. 10 Ya Bao Road  
Chaoyang District  
Beijing 100020  
P.R.China  
T +86 10 5821 1188  
F +86 10 5821 1100

No.15 Xing Wang Road  
Wuqing Development Area  
Tianjin 301700  
P.R.China  
T +86 22 8212 3300  
F +86 22 8212 3308

Lot 13112, Mukim Labu  
Kawasan Perindustrian Nilai  
71807 Nilai, Negeri Sembilan  
Malaysia  
T +60 6 799 2323  
F +60 6 799 9942

471 Mountain Highway  
Bayswater, Victoria 3153  
Australia  
T +61 3 9721 0200  
F +61 3 9720 0588

Delphi B Wing, 601 & 602  
6th Floor, Central Avenue  
Powai, Mumbai – 400 076  
India  
T +91 22 6662 0566  
F +91 22 6662 0500

NOF, Shinagawa Konan Bldg  
1-2-5, Higashi-shinagawa  
Shinagawa-ku, Tokyo  
140-0002 Japan  
T +81 3 5769 6873  
F +81 3 5769 6902

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