

# N-Series Pneumatic Actuators

Proven for Nuclear Service



**BETTIS**

  
**EMERSON**  
Process Management

## Your Nuclear Power Partner

- **EQ-Qualified Actuators**
- **More Than 35 Years Nuclear Experience**
- **Pioneers in Scotch-Yoke Valve Actuation**
- **Complete Product Range**

Bettis® valve actuators have been the standard for many industrial and energy-related applications for more than 50 years. In nuclear service, Bettis actuators were perhaps the first ever qualified through independent accreditation to meet the IEEE 382 standard when it was first drafted in 1969. Since then, Bettis actuators have been an industry standard by maintaining environmental qualification from the 1980 IEEE specifications, to the current 1996 criterion, and pending final notification, will meet the IEEE 382-2006 standard.

Bettis quality standards continue to be its hallmark. Our quality assurance program for nuclear service conforms to the specifications of 10 CFR 21 and 10 CFR 50 Appendix B.

The N-Series Environmentally Qualified (EQ) and safety-related actuators are uniquely constructed and have undergone a rigorous testing and qualification program to validate and document product performance for use within the containment and safety-related areas. This actuator series has been subjected to environmental qualification testing and are aged to the service life required by the IEEE specifications through thermal aging, radiation aging, Loss of Coolant Accident (LOCA), Main Stream Line Break (MSLB), seismic simulations, and other functional tests.

Bettis currently has a global installed base of more than 5,500 actuators in more than 75 nuclear power plants, many of which are the environmentally qualified NT, NHD, NCB models. These models were tested and qualified in 1980 to the current IEEE standards and are still available today. The new generation NCBB, NCBA300, and NG actuators which are available in double-acting and spring-return configurations are currently undergoing qualification testing against published nuclear power plant design criteria and the current IEEE standards:

IEEE Std 382-2006

IEEE Std 344-2004

IEEE Std 323-2003

We offer numerous advantages for this critical service.

Among them are:

- Modular design for parts interchangeability
- Five-Year materials and workmanship warranty
- IP66 and IP67M water ingress protection
- PED/97/23/EC compliance
- ATEX certification
- Compact footprint
- Guaranteed torque outputs
- Complete torque range



# Proven Products for Nuclear Application

Emerson Process Management Valve Automation has a continuous presence in the nuclear industry of more than 35 years. It has a broad product offering for environmentally qualified use within the containment dome or in non-containment areas of the facility. Each of the valve actuators is rugged and specifically designed to perform with complete reliability in critical applications.

The Bettis Waller, Texas facility and select sales channels have been successfully audited by the Nuclear Procurement Issues Committee (NUPIC) and Nuclear Industry Assessment Committee (NIAC) as a supplier of products to the nuclear industry.



All Bettis N-Series actuators are distributed and serviced by the most experienced technicians in the industry, trained to operate in containment areas and with a solid understanding of the regulatory requirements so that compliance is assured.

Bettis actuators are backed by Emerson Process Management and its extensive worldwide distribution network. This capability provides you with the assurance that spare parts inventory is always available and that you have a fully supportive nuclear partner.

## NG-Series

NG-Series actuators are reliable spring return or double acting compact actuators with an optimized center of gravity and lighter weight than others of equal or less torque output. With advanced corrosion resistance, water ingress protection, high wear resistance, this actuator series provides a long service life. The design of the NG-Series facilitates ease of service while the actuator is valve-mounted. NG-Series actuators provide up to 900,000 lb-in of torque output in a double-acting configuration.

## NCBB-Series

The NCBB-Series actuators are available in spring return or double acting configurations, compact, lightweight, with superior sealing for water ingress and corrosion resistance. They come with a dual-mounting valve interface to be installed in any position – parallel or at right angles to the flow line, in a vertical or horizontal plane. NCBB-Series actuators provide up to 11,500 lb-in of torque output in a double-acting configuration.

## NCBA300-Series

The NCBA300-Series actuators are available in spring return or double acting configurations and have advanced water ingress and corrosion protection, with superior sealing. The model has no gaskets, and its all-bearing design helps enhance its total cycle life capabilities. NCBA300-Series actuators provide up to 20,000 lb-in of torque output in a double-acting configuration.





## Emerson brings solutions to nuclear power

Familiar Emerson brands have been standards in the nuclear power industry for decades. Fisher, Rosemount, Micro Motion, Dietrich Standard and PI Components are just a few. Our offerings include:

- Control Valves
- Pressure Measurement
- Flow Measurement
- Temperature Measurement
- Process Automation Systems
- Analytical Instruments
- Maintenance and Configuration Software

**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**

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

30/36 Allee du Plateau  
93250 Villemomble  
France  
T +33 1 48 12 26 10  
F +33 1 48 12 26 18

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

ul. Konstruktorska str 11A  
02-673 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**

19 Kian Teck Crescent  
Singapore 628885  
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 13111, 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

301 Solitaire Corporate Park  
151 M.V.Road, Andheri (E)  
Mumbai – 400093  
Maharashtra, India  
T +91 22 6694 2711  
F +91 22 2825 3394

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

© 2010 Emerson Process Management. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. "Brand mark listing" are marks of one of the Emerson Process Management family of companies. All other marks are property of their respective owners.

The contents of this publication are presented for information purposes only, and while every effort has been made to ensure their accuracy, they are not to be construed as warranties or guarantees, express or implied, regarding the products or services described herein or their use or applicability. All sales are governed by our terms and conditions, which are available on request. We reserve the right to modify or improve the designs or specifications of our products at any time without notice.

The color orange, U.S. Reg. No. 2,739,393, is a registered trademark of the Bettis Corporation.

**BETTIS**

[www.Bettis.com](http://www.Bettis.com)

**EMERSON**  
Process Management