

GH BETTIS

OPERATING & MAINTENANCE INSTRUCTIONS

DISASSEMBLY & ASSEMBLY

FOR THE

NT-5XX-SRX SPRING RETURN

NUCLEAR SERIES ACTUATORS

PART NUMBER 65039

REVISION "D"

DATE: AUGUST, 1989

REPLACES NUCLEAR-004 (JULY, 1984)

ECN	DATE	REV LTR		By *	Date
8609	10/28/85	A	Compiled	BSC	08-22-89
8689	01/23/86	B	Checked	LD	08-22-89
C9126	03/27/87	C	Approved	RRK	08-22-89
10207	06/20/89	D	Approved		

1.0 INTRODUCTION

- 1.1 In order to assure and maintain the present level of qualification, and auditable to the Bettis Qualification Report Number 37274, the following is required:
 - 1.1.1 All maintenance or service work must be performed by a certified technician.
 - 1.1.2 Maintain a service interval of six hundred twenty-five cycles or five years which ever occurs first.

**COMPLETE ACTUATOR REFURBISHMENT
REQUIRES THAT THE ACTUATOR BE
DISMOUNTED FROM THE VALVE**

- 1.2 This service procedure is offered as a guide to enable general maintenance to be performed on GH Bettis NT5XX-SRX nuclear actuators. When the actuator model number has "-S" as a suffix then the actuator is special and may have some differences that are not included in this procedure.

2.0 BASIC TOOLS

All tools are American Standard inch. Large adjustable wrench, two each large standard screwdrivers, small standard screwdriver with sharp corners rounded, strap wrench, putty knife, 1-3/8" crowfoot wrench, pipe wrench, 1/4" drift punch, 24 oz. ball peen hammer, allen wrench set, pry bar, 1/2" drive socket set, torque wrench (up to 5000 inch pounds or 690 kg-m), commercial leak testing solution and non-hardening thread sealant.

3.0 REFERENCE GH BETTIS MATERIALS

- 3.1 Assembly Drawing 41168 for NT5XX-SRX (CW) actuator failing closed.
- 3.2 Assembly Drawing 69974 for NT5XX-SRX (CCW) actuator failing open.
- 3.3 Exploded Detail Drawing Part Number 68144.

4.0 GENERAL

- 4.1 Numbers in parenthesis, (), indicate the bubble number (reference number) used on the GH-Bettis Assembly Drawing, Exploded Detail Drawing, and actuator parts lists.
- 4.2 This procedure is written using the stop screw side of the housing (1-10-10) as a reference and this side will be considered the front side of the actuator and the housing cover as the top of the actuator.
- 4.3 Refer to Chart number 1 (Page 10) for approximate actuator weights.
- 4.4 To ensure correct re-assembly; that is, with spring on same end of housing as was, mark or tag right (or left) and mark mating surfaces (see 4.2).
- 4.5 When removing seals from seal groove, use a small standard screwdriver with the sharp corners rounded off or use a commercial seal removing tool.
- 4.6 Use a non-hardening thread sealant on all pipe threads.

- 4.7 Disassembly should be done in a clean area on a work bench.
- 4.8 LUBRICANT REQUIREMENTS: Dow Corning Molycote 44, medium grade.

5.0 GENERAL DISASSEMBLY

- 5.1 Remove all operating pressure from actuator power cylinder (2-10), allowing the spring to stroke. The spring will rotate the yoke to the fail position.
- 5.2 Remove all piping and any accessories mounted on the actuator.
- 5.3 Measure the exposed length of right and left stop screws (1-50) and record each before loosening for removal.
- 5.4 Remove actuator from valve and valve mounting bracket.
- 5.5 Remove socket cap screws (1-180) from position indicator (1-170) yoke weather cover (3-130) and remove position indicator/yoke weather cover.
- 5.6 Remove the snubber (1-190) from the housing cover.

6.0 SPRING CARTRIDGE REMOVAL

- 6.1 When the spring cartridge is installed on the actuator the spring is under compression. DO NOT remove the spring cartridge until the actuator has the "pre-load" removed.
- 6.2 Remove spring cartridge "pre-load" as follows: Apply nominal operating pressure to the pressure inlet port located in the outer end cap (2-30). Locate the stop screw (1-50) that is on the opposite side of the housing from the spring cartridge assembly (4-10). Loosen stop nut (1-100). Unscrew and remove the stop screw (1-50) and the gasket seal (3-110). Remove pressure from the pressure inlet port.
- 6.3 WARNING: Under no circumstances should the spring cartridge be cut open as the spring is pre-loaded and then the end caps and cylinder are welded around the loaded spring.
- 6.4 Remove the heavy hex nuts (1-130) from the back side of the spring brace (1-10-60). The remaining heavy hex nuts (1-130) will be left on the brace rods (4-80). The brace rods (4-80) will not be removed from the spring cartridge assembly (4-10).
- 6.5 Remove socket head cap screw (4-60), lockwasher (4-50), and nut retainer (4-40) from between large hex nuts on outboard end of the spring cartridge (4-10).
- 6.6 Alternately loosen the two large hex nuts on the outboard end of the spring cartridge (4-10). These nuts are welded to the tie bars that extend through the spring cartridge and screw into the spacer plate (1-10-70). Unscrew the tie bars until the spring cartridge is free from the spacer plate (1-10-70). Care should be taken so that the tie bars are not pulled back into the spring cartridge.
- 6.7 To keep from inadvertently pulling the tie bars back into the spring cartridge use two each one inch -8 UNC hex nuts and thread them on to the spring cartridge tie bars. Place the spring cartridge (4-10) to one side. Use two nuts (1-130) removed at step 6.4.
- 6.8 Remove the ferry cap screws (1-10-90) and socket screws (1-10-100) from the spacer plate (1-10-70).

7.0 PRESSURE CYLINDER DISASSEMBLY

- 7.1 Remove breather (4-30) and bushing (102) from inner end cap (2-40).
- 7.2 Remove socket cap screw (2-120), washer (2-110) and nut retainer (2-100) from the outer end cap (2-30) of pressure cylinder (2-10).
- 7.3 Remove heavy hex nuts (2-90) from tie bars (2-60).
- 7.4 Remove outer end cap (2-30). The fit between the cylinder (2-10) and the outer end cap is very tight. Break the outer end cap free by tapping with a breaker bar on the lip provided on the end cap. Do not damage o-ring groove on end cap.
- 7.5 Pry inner end cap (2-40) away from the housing (1-10). Break the inner end cap free from the cylinder (2-10) by tapping with a breaker bar on the lip provided on the end cap.
- 7.6 Remove the cylinder (2-10). When sliding the cylinder off of the piston, tilt the cylinder 15^o to 30^o to the piston rod.
- 7.7 Remove the split ring retainer (2-80) and the split ring (2-70) from the outboard side of the piston (2-20).
- 7.8 Remove the piston (2-20) from the piston rod (2-170). The piston will slide off of the piston rod and tie bars (2-60).
- 7.9 Remove the split ring retainer (2-80) and the split ring (2-70) from the piston rod (2-170).
- 7.10 Slide the inner end cap (2-40) off the tie bars (2-60) and piston rod (2-170).
- 7.11 Remove rod bushing (2-50). The bushing will slide off of the end of the piston rod.
- 7.12 Unscrew the tie bars (2-60) from the housing (1-10-10). Flats are provided on the outboard end of the tie bars for wrench placement. DO NOT use a pipe wrench on the tie bars as it will mark the bar and cause seal leakage. This step is optional as the tie bars can be left in the housing.

8.0 HOUSING GROUP DISASSEMBLY

- 8.1 Unscrew push rod (4-20) from yoke pin nut (1-20) and remove from housing.
- 8.2 Unscrew piston rod (2-170) from yoke pin nut (1-20) and remove. Flats are provided on the outboard end of the piston rod for wrench placement. DO NOT use a pipe wrench on the piston rod as it will mark the rod and cause seal leakage.
- 8.3 Remove four cover/spring brace hex cap screws (1-10-80) and gasket seals (3-100).
- 8.4 Remove six cover hex cap screws (1-80) and gasket seals (3-100).
- 8.5 Remove two cover hex cap screws (1-10-30) and gasket seals (3-100). Items (1-80) and (1-10-30) are the same part, however, due to manufacturing assembly, carry different item numbers.

- 8.6 Remove the housing cover (1-10-20). Spring brace (1-10-60) and spacer plate (1-10-70) will come off with cover as cover pins (1-10-40) and (1-10-50) hold the items together. Cover will have a very tight fit. It is not necessary to remove cover pins (1-10-50) and (1-10-40) or separate housing cover (1-10-20) from spring brace assembly (1-10-60)/(1-10-70).
- 8.7 Remove top two yoke rollers (1-40) and roller spacers (1-120) from the top of the yoke pin (1-30).
- 8.8 Remove the yoke pin (1-30).
- 8.9 Remove the yoke pin nut (1-20).
- 8.10 Remove the bottom two yoke rollers (1-40) and roller spacers (1-120) from the housing.
- 8.11 Remove the yoke (1-160) by lifting it from the housing.
- 8.12 Using putty knife, remove the end cap gasket (3-10) and the cover gasket (3-20).
- 8.13 Remove the remaining stop screw (1-50), stop nut (1-100), and gasket seal (3-110).
- 8.14 It is not necessary to remove the grease fittings (1-60) or the pipe plug (1-70) for general service.

9.0 GENERAL RE-ASSEMBLY

- 9.1 Remove all old seals and gaskets, taking care not to scratch or damage seal grooves.
- 9.2 All parts should be thoroughly inspected. Particular attention should be directed to threads, sealing surfaces and areas that will be subjected to sliding motion. Sealing surfaces must be free of deep scratches, pitting, corrosion and blistering or flaking coating.
- 9.3 After inspection, the parts should be carefully cleaned to remove all dirt, and gasket material.
- 9.4 Coat all moving parts with lubricant.
- 9.5 Coat all seals with lubricant, before installing into seal grooves.
- 9.6 T-seal set installation - The T-seal is composed of one rubber seal and two split skive-cut back-up rings.
 - 9.6.1 Install the T-seal into the seal groove.
 - 9.6.2 Install a back-up ring on each side of the T-seal.
 - 9.6.3 When installing the back-up rings, do not align the skive-cuts.
 - 9.6.4 If the back-up rings are too long and the rings overlap beyond the skive-cuts, then the rings must be trimmed with a razor-sharp instrument.

10.0 CENTER HOUSING GROUP RE-ASSEMBLY

- 10.1 If removed, install drain plug (1-70) in actuator housing (1-10-10).
- 10.2 Take all the yoke rollers (1-40) and check to see if they will run (move) freely thru the tracks in the bottom of the housing and the housing cover.

- 10.3 Install one of the yoke o-ring seals (3-50) into the housing (1-10-10).
- 10.4 Inside the housing (1-10-10) apply lubricant to the tracks and yoke bore and arrange the housing with the yoke bore nearest you.
- 10.5 Apply lubricant to the slots in the upper/lower yoke arms and the lower bearing surface of yoke (1-160).
- 10.6 Install the yoke (1-160) into the housing (1-10-10) as follows: Arrange the yoke arm to approximately a 45° position in either direction and lower into the housing. The hub with tapped holes faces up. Rotate the yoke back to approximately the mid-stroke (center) position.
- 10.7 Apply lubricant to all surfaces of two of the yoke rollers (1-40) and two roller spacers (1-120). Place one yoke roller in the track in the bottom of the housing and position it under the slot in the yoke arm. Place a roller spacer (1-120) on top of the yoke roller in the slot in the lower yoke arm. Place another roller spacer (1-120) on top of the second yoke roller (1-40) and align the holes in the roller spacers and the yoke rollers.
- 10.8 Coat the upper and lower surfaces of the yoke pin nut (1-20) with lubricant and insert into position between the yoke arms, parallel to the track in the housing. Align the hole in the nut with the holes in the yoke rollers and roller spacers.
- 10.9 Lubricate the yoke pin (1-30) and insert through the yoke pin nut (1-20), the two yoke rollers (1-40) and the two roller spacers (1-120).
- 10.10 Apply lubricant to all the surfaces of the two remaining yoke rollers (1-40) and two remaining roller spacers (1-120). Place one roller spacer on top of the yoke pin nut (1-20) then install the third yoke roller (1-40). Place the last roller spacer on top of the third yoke roller (1-120). Place the fourth and final yoke roller on to the yoke pin. The top roller will remain above the yoke arm and will engage the cover track when cover is installed.
- 10.11 Lubricate the piston rod (2-170) and slide into the proper side of the housing and screw into the yoke pin nut (1-20). (DO NOT TIGHTEN). Refer to step 4.4 (Page 1). Flats are provided on the outboard end of the piston rod. These flats should be used to put a wrench on to tighten the piston rod. DO NOT use a pipe wrench on the piston rod, to prevent seal leakage.
- 10.12 Lubricate the push rod (4-20) and slide into the other side of the housing and screw into the yoke pin nut (1-20).
- 10.13 Place gaskets (3-110) and jam nuts (1-100) onto the stop screws (1-50). Install both assemblies into the housing. Refer to Step 5.3 (Page 2).
- 10.14 Place the housing cover gasket (3-20) onto the housing (1-10-10).
- 10.15 Install the remaining yoke o-ring seal (3-50) into cover (1-20).
- 10.16 Apply lubricant to the bore for the yoke and the track in the housing cover (1-10-20).
- 10.17 Apply lubricant to the upper bearing surface on the yoke hub.
- 10.18 Install the housing cover (1-10-20) and spring brace (1-10-60)/(1-10-70) being careful not to damage the gasket (3-20) or yoke o-ring seal (3-50).

- 10.19 Do this step only if you have pulled cover pins (1-10-50) or if you are replacing the cover pins. Place the spring brace assembly (1-10-60)/(1-10-70) into position and drive the two pins (1-10-50) thru the brace and cover, into the housing.
- 10.20 Install and tighten two ferry cap screws (1-10-90), four socket cap screws (1-10-100), and install finger tight, four hex cap screws (1-10-80) with seal gaskets (3-100) to retain brace assembly (1-10-60)/(1-10-70).
- 10.21 Install the cover screws (1-80)/(1-10-30) and seal gaskets (3-100). LEAVE FINGER TIGHT - DO NOT TIGHTEN.
- 10.22 Do this step only if you have pulled the cover pins (1-10-40) or if you are replacing the cover pins. Drive the two pins (1-10-40) thru the cover (1-10-20) and into the housing until the pin is flush with the cover. The pins are deeply grooved at one end, tapering to a smooth diameter at the other end. The pin should be INSTALLED SMOOTH END FIRST.
- 10.23 Tighten the cover screws (1-80)/(1-10-30) and brace cover screws (1-10-80), torque to 21.5 foot pounds or 3.0 kilogram-meters.
- 10.24 Apply lubricant to the rod bushing (2-50), install it over the piston rod and slide it up into the housing.
- 10.25 Tighten the piston rod (2-170) to a torque of approximately 150 foot pounds or 20.7 kilogram-meters. Flats are provided on the outer end for wrenching purposes.
- 10.26 Tighten the push rod (4-20) securely with a strap wrench.
- 10.27 Rotate the yoke to a position that will leave a minimum of the piston rod (2-170) protruding from the actuator housing.

11.0 PRESSURE CYLINDER RE-ASSEMBLY

- 11.1 Install the rod seal (3-70), lip first, into the recess provided in the inner end cap (2-40).
- 11.2 Install the end cap gasket (3-10) over the piston rod and rod bushing.
- 11.3 Install two tie bar o-ring seals (3-30) into the inner end cap (2-40).
- 11.4 Slide the inner end cap (2-40) over the piston rod (2-170) and the rod bushing (2-50), protruding from the housing. Install with the large raised boss toward the housing (flat side outward). The breather port should be toward the top of the actuator. Align the tie bar holes with holes in the housing.
- 11.5 Install the end cap o-ring seal (3-60) onto the inner end cap (2-40).
- 11.6 Install two sets of rod T-seals (3-80) into two tie bar holes in the piston (2-20).
- 11.7 Install the piston o-ring (3-40) onto the piston rod (2-170).
- 11.8 Coat the ends of the piston rod (2-170) with lubricant.
- 11.9 Install the two halves of the split ring (2-70) into the inner-most groove in the piston rod and retain with one of the split ring retainers (2-80), retaining ring groove away from piston.
- 11.10 Slide the piston (2-20) onto the piston rod against the split ring (2-70). Ribbed side of piston must face away from housing.

- 11.11 Install the two halves of the remaining split ring (2-70) onto the piston rod and retain with the split ring retainer (2-80).
- 11.12 Install the piston T seal components (3-90) into the external groove of the piston (2-20).
- 11.13 If removed, apply lubricant to the threads and end of the tie bars (2-60), end without wrench flat, and install by carefully threading tie bars through the piston (2-20) and inserting through the inner end cap (2-40) and screwing into the housing (1-10-10). Re-lubricate all exposed surfaces of piston rod and tie bars.
- 11.14 Apply a very light coat of lubricant to the bore of the cylinder (2-10). **CAUTION:** Excess lubricant in the cylinder bore may cause erratic or jumpy/jerky operation.
- 11.15 Slide the lubricated cylinder (2-10) over the piston (2-20) and onto the inner end cap (2-40). When sliding the cylinder over the piston seal, tilt cylinder 15° to 30° to piston rod, make certain the back-up rings (components of the piston seal) are seated into the seal groove. Should the back-up rings or seal member be pinched between the piston and cylinder, the components could be damaged, becoming a potential source of leakage. **DO NOT** hammer on ends of the cylinder.
- 11.16 Install two end cap tie bar o-ring seals (3-30) into the outer end cap (2-30).
- 11.17 Install the outer end cap cylinder o-ring seal (3-60) onto the outer end cap (2-30).
- 11.18 Install the outer end cap (2-30) onto the tie bars and into the end of cylinder (2-10).
- 11.19 Install the two tie bar nuts (2-90) onto the tie bars (2-60), using them to draw all of the cylinder components into position. Torque alternately, in 50 ft.lb. increments until a final torque of 100 foot pounds plus or minus 10% has been achieved.
- 11.20 Install the nut retainer (2-100), securing in place with the retainer screw (2-120) and lockwasher (2-110). It is necessary that the flats on the hex nuts (2-90) be aligned and parallel before the nut retainer can be installed. It is permissible to exceed the 100 foot pound figure to align the hex nut flats.
- 11.21 Apply 10 psig air pressure to the breather port in the inner end cap (2-40) and stroke the actuator. Remove the air pressure from the breather port.

12.0 SPRING CYLINDER RE-ASSEMBLY

- 12.1 Make sure that the stop screws (1-50) have not been screwed in to the point that "pre-load" will be created on the spring cartridge (4-10).
- 12.2 Place the spring cartridge (4-10) on to the push rod (4-20) and align the spring cartridge tie bars with the holes in the spacer plate (1-10-70).
- 12.3 Screw the tie bars into the spacer plate. Alternately tighten tie bar nuts until the spring cartridge is firmly against the spacer.
- 12.4 Tighten the tie bars to 100 foot pounds plus or minus 10%. Install the nut retainer (4-40), securing in place with the socket cap screw (4-60) and washer (4-50). It is necessary that the flats on the hex nuts be aligned and parallel before the nut retainer can be installed. It is permissible to exceed the 100 foot pound figure to align the hex nut flats.
- 12.5 Replace the hex nuts (1-130), that were removed in step 6.4, onto the brace rods (4-80).

12.6 POSITION INDICATOR INSTALLATION

- 12.6.1 For spring to close actuators (clockwise) rotate the yoke to the full clockwise (CW) position (as shown on the clockwise assembly drawings), position the yoke weather cover (3-130)/position indicator (1-170) onto the yoke with the pointer facing the front and perpendicular to the piston rod (2-170). Secure with the socket head cap screws (1-180).
- 12.6.2 For spring to open actuators (counterclockwise), rotate the yoke to the full counterclockwise (CCW) position (as shown on the counterclockwise assembly drawings), position the yoke weather cover (3-130)/position indicator (1-170) onto the yoke with the pointer facing the right and parallel with the piston rod (2-170). Secure with the socket head cap screws (1-180).

13.0 ACTUATOR TESTING

- 13.1 All areas, where leakage to atmosphere may occur, are to be checked using a leak testing solution.
- 13.2 All leak testing will use the nominal operating pressure (NOP) as listed on the actuator nametag or from Chart number 2 of this procedure (Page 10).
- 13.3 Before testing for leaks, alternately apply and release NOP pressure, to the pressure side of the pistons to stroke the actuator fully. Repeat this cycle approximately five times. This will allow the new seals to seek their proper working attitude.
- 13.4 Apply NOP pressure to the pressure port in the end of cylinder (2-10).
- 13.5 Apply a leak testing solution to the following areas:
 - 13.5.1 The breather port in the cylinder adapter (2-30), checks piston to cylinder and piston to piston rod seals.
 - 13.5.2 Joint between the outer end cap (2-30) and the cylinder (2-10). Checks cylinder to end cap o-ring seals.
 - 13.5.3 Around the tie bar nuts on the cylinder end cap (2-30). Checks tie bars to end cap o-ring seals.
 - 13.5.4 The breather port hole in the inner end cap (2-40). Checks piston to cylinder, piston to tie bar, and piston to piston rod seals.
- 13.6 Remove pressure from pressure inlet port in the outer end cap (2-40).
- 13.7 If excessive leakage across the piston is noted (generally a bubble which breaks three seconds or less after starting to form), the actuator must be disassembled and the cause of leakage must be determined and corrected.
- 13.8 If an actuator was disassembled and repaired, the above leakage test must be performed again.
- 13.9 Operation test the actuator to verify proper function of the actuator. This test is to be done off of the valve or when the valve stem is not coupled to the actuator yoke.
- 13.10 Adjust the pressure regulator to the pressure rating indicated in Column "B" of Chart 2 (Page 10) for the model actuator being tested.
- 13.11 Apply the above pressure to the actuator pressure inlet ports and allow the actuator to stabilize. The actuator should stroke a full 90° travel.

- 13.12 Any jumpy or jerky operation, not attributed to seal drag or limited flow capacity, must be corrected and the above test performed again.
- 13.13 Remove pressure from the pressure inlet port(s).

14.0 RETURN TO SERVICE

- 14.1 Install breather (4-30) in the inner end cap (2-40). A new breather is provided in the service kit. Use this breather if it is the same or larger NPT size as the original breather.
- 14.2 If supplied in the service kit, replace the software components of the snubber (1-190) and then install the snubber in the housing.
- 14.3 Re-install actuator to valve mounting bracket and valve.
- 14.4 Adjust both stop screws (1-50) back to settings recorded in section five step 5.3.
- 14.5 Tighten both stop nuts (1-100) securely, while holding stop screw (1-50).
- 14.6 All accessories, including solenoid valves, positioners, pressure switches, etc., should be hooked up and tested for proper operations and replaced, if found defective.

CHART 1

WEIGHTS FOR NT5XX-SR MODELS

<u>ACTUATOR MODEL</u>	<u>APPROXIMATE WEIGHT (LBS)*</u>
NT516-SR1	1409
NT516-SR2	1181
NT516-SR3	1015
NT516-SR4	1029
NT520-SR1	1524
NT520-SR2	1296
NT520-SR3	1130
NT520-SR4	1144

*Weights listed for early models are for bare actuators without valve mounting brackets and accessories.

CHART 2

PRESSURE REQUIREMENTS & LIMITATIONS
FOR NT-5XX-SRX SPRING RETURN
NUCLEAR SERIES ACTUATORS

<u>ACTUATOR MODEL</u>	<u>NOMINAL OPERATING PRESSURE (NOP)</u>	<u>MAXIMUM OPERATING PRESSURE (MOP)</u>	<u>MAXIMUM HYDROSTATIC TEST PRESSURE</u>	<u>MAXIMUM AIR ASSIST PRESSURE (MAAP)</u>	<u>COLUMN B SPRING SELECTION PRESSURE</u>
NT-516-SR1	187	240	250	32	117
NT-516-SR2	135	220	250	85	85
NT-516-SR3	78	180	250	108	49
NT-516-SR4	66	175	250	114	43
NT-520-SR1	118	150	150	20	75
NT-520-SR2	85	135	150	53	55
NT-520-SR3	49	115	150	68	32
NT-520-SR4	42	115	150	71	28

World Area Configuration Centers (WACC) offer sales support, service, inventory and commissioning to our global customers. Choose the WACC or sales office nearest you:

NORTH & SOUTH AMERICA

19200 Northwest Freeway
Houston, TX 77065
USA
T +1 281 477 4100
F +1 281 477 2809

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

ASIA PACIFIC

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

No.1 Lai Yuan Road
Wuqing Development Area
Tianjin 301700
P.R.China
T +86 22 8212 3300
F +86 22 8212 3308

MIDDLE EAST & AFRICA

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

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

24 Angus Crescent
Longmeadow Business Estate
East P.O. Box 6908; Greenstone
1616 Modderfontein, Extension 5
South Africa
T +27 11 451 3700
F +27 11 451 3800

EUROPE

Berenyi u. 72- 100
Videoton Industry Park,
Building #230
Székesfehérvár 8000
Hungary
T +36 22 530 950
F +36 22 543 700

For complete list of sales and manufacturing sites, please visit
www.emersonprocess.com/valveautomationlocations
Or contact us at info.valveautomation@emerson.com

www.emersonprocess.com/bettis

©2016 Emerson Process Management. All rights reserved.

The Emerson logo is a trademark and service mark of Emerson Electric Co. Bettis is a mark 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.

BETTIS™



EMERSON™
Process Management