

# JAMESBURY® VALVCON I-SERIES ACTUATOR 115VAC AND 230VAC

## GENERAL

Metso is a leading designer and provider of compact, reliable, electronically controlled electric actuators for valves and dampers. We offer a complete line of Valvcon electric actuators for accurate positioning of dampers and valves in the aerospace, automotive, consumer services, discrete manufacturing, energy, environmental, oil/pipeline, petrochemical, power/utilities, process, recreation, transportation, and water/wastewater industries.

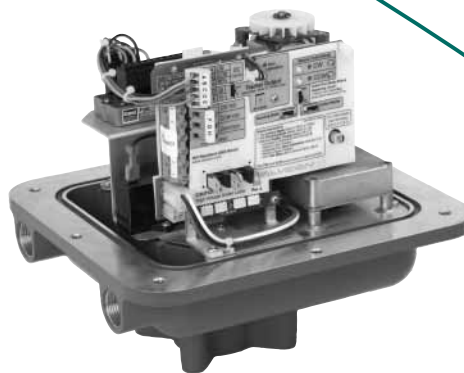
Metso has developed and introduced the industry's most innovative electric actuator features, including simple "set and go" calibration, intelligent processor-based digital electronics, "plug-in" accessory boards, back-up power, as well as electric actuators designed for remote control, solar-powered applications and two-wire network applications.

Metso has built its reputation and success on the ability to envision, implement, and deliver innovative Valvcon actuator technology products and services to support emerging market requirements. As emerging technologies and market needs continue to evolve, Metso will lead the way with high quality *Jamesbury* Valvcon electric actuators that exceed industry expectations and further refine the valve actuation process.

## FEATURES AND BENEFITS

### Motor

The motor will be capable of running continuously at full torque for up to 15 minutes at ambient temperatures at or below 104°F. Subsequently, the motor must be capable of 75% duty cycle. Motors will be split phase, capacitor driven with an auto reset thermal sensor, and will provide high starting torque and be totally enclosed within the actuator's housing cover.



### Lubrication

All rotating power train components will be coated with a multi-purpose grease. Lubricants will be suitable for ambient conditions of -40° F to 150° F. For operation in temperatures between 32° F and -40° F an optional heater and thermostat assembly must be included.

### Gearing

The powertrain will be comprised of hardened steel, machine cut spur gears. Non-metallic, aluminum, cast or stamped gearing will not be permitted.

### Manual Operation

A wrench-operated override shaft will be provided for manual operation. As an option, a metallic hand wheel may also be provided. The override device will be engaged through a declutching mechanism, which separates the final output drive from the motor output.

### Limit Switches

Actuators will have two standard end of travel switches, single pole double throw, rated at 11 amps at 250 VAC. The limit switches will be activated by metal cams mounted on the actuator drive shaft. At the end of travel, the power will be routed through the limit switches to a terminal strip location for pilot or position indication applications. The limit indicator outputs will be fuse protected with auto-resetting polyfuses, with a working limit of 0.25 amps, to protect the limit switches and internal circuitry from possible overloads originating outside of the actuator. To simplify maintenance, these polyfuses will be permanent and do not need to be replaced. They reset automatically, shortly after the overload condition is corrected — in approximately 3 minutes. Two additional limit switches may be added to the actuator, adjustable to operate at any position, as required by the process application.

## The I-Series from Metso

With the innovative Jamesbury Valvcon electric actuators, Metso pioneered the concept of plug-in, modular electronics in valve automation. This concept redefined and simplified the entire valve actuation process—upgrades and modifications can now be done in the field, in a matter of minutes, with no hard wiring, soldering or factory returns.

For years, the I-Series has set the standard for high quality, rugged and reliable electric actuators. Metso uses its proven technology to vastly simplify actuator set-up and calibration and to enhance actuator performance. I-Series electric actuators are designed to offer highly efficient operation in a compact package. Ideally suited for most quarter-turn valves and dampers, they are designed for a wide range of service, from on-off duty, to modulating or proportional control, to two-wire networks.

### Flexible, Reliable Actuation

The Metso reputation for success is also built on the ability to meet the needs of its customers with high quality, reliable, “leading edge” actuator technology, products and services. We strive to anticipate and exceed your application needs. Engineered with a modular approach, Valvcon actuation systems allow you to modify or upgrade actuators in the field—giving you the flexibility to actuate new valves or to retrofit existing valves with amazing ease.

### Extended Duty Cycle for Continuous Cycling

Metso conservatively rates its AC motors at 75% duty cycle. Motors can operate continuously at full rated torque for up to 15 minutes without pausing. After running continuously for 15 minutes, motors need to rest for only 1/3 of the cycle time between each cycle. That is, if the cycle time is 30 seconds, they must rest for 10 seconds between each cycle. In constantly modulating applications, all *Jamesbury Valvcon* I-Series actuators can handle up to 30 starts per minute.

### Break-away Torque

Designed for efficiency and reliability, all *Jamesbury Valvcon* actuators deliver the power you need when and where it is needed. With efficient gear trains and motors these actuators are rated at breakaway torque. Immediately upon power up, the actuator supplies the rated torque — when it is needed to break the valve away from its seat. Other manufacturer’s actuators may be rated at running torque, but actually deliver significantly less breakaway torque.

## Features at a Glance!

- Electronics are simple to use, with a clearly labeled terminal strip and easy access to user wiring
- Plug-in electronics for simple upgrades and modifications, with coded connectors to make internal miswiring impossible
- Standard extended 75% duty cycle at ambient temperatures up to 104°F
- Visual position indicator is part of the cover (no removal necessary) and clearly shows valve position
- Dual conduit openings make wiring easier, and keep power and control wiring separate
- “Captive” cover bolts are permanently attached to the cover and simplify installation in awkward locations (small enclosure only)
- Stall protection stops the motor if excessive torque or stop is encountered, providing protection from stall conditions (modulating applications only)
- Thermal overload cutout protects the motor from damage caused by over duty cycle applications
- Split-phase, capacitor run motors provide long-life and high duty cycles with very low power consumption

## I-SERIES PROTOCOL OPTIONS

### (Order Code AS) AS-i (Actuator Sensor interface)

AS-i networks up to 31 field devices onto a single pair of wires that delivers both signal and bus power. AS-i control schemes interface very conveniently with most popular PLCs and DCS systems.

### (Order Code DN) DeviceNet™

DeviceNet integrates up to 63 devices on a 4-wire trunk network. DeviceNet interfaces conveniently with many popular DCS/PLCs.

### (Order Code FF) Foundation™ Fieldbus

Foundation Fieldbus is designed for use in the process industries. Foundation Fieldbus offers multi-drop capabilities (up to 32 devices per network), long trunk length and compatibility with intrinsically safe circuits. Foundation Fieldbus interfaces conveniently with many popular DCS/PLCs.

### (Order Code MB) Modbus

Modbus networks integrate up to 32 devices on a 4-wire network. Modbus interfaces conveniently with most popular DCS/PLCs.

## OTHER I-SERIES OPTIONS

### (Order Code H) Tropical Heater/Thermostat

Recommended in all high humidity applications where condensation may accumulate inside the actuator. For 115VAC applications the heater consumes 15 watts, for 230VAC applications the heater consumes 40 watts.

### (Order Code I) ISO 5211 Output

ISO 5211 Standard mounting configuration and output coupling.

150-600 in-lb models with "I" options are supplied with a 14mm female square. (note: without option "I" the female square is 3/4 inch).

1000 in-lb models with "I" options are supplied with a 19mm female square and 1500-3000 in-lb models are supplied with a 22 mm female square. (note: without option "I" the female square is 1inch).

### (Order Code K) Brake

A brake prevents the actuator from being backdriven. Required for all dampers, butterfly valves, PVC ball valves, and resilient seated valves.

### (Order Code S2) Additional Limit Switches

Up to two additional limit switches may be added for position indication or as dry contacts to operate other devices. Single pole, double throw switches rated for 1/2 HP, 11 amps @ 250VAC, CSA certified.

### (Order Code T) Heater/Thermostat

Required in all applications where the temperature may drop below 32°F. For 115VAC applications the heater consumes 15 watts, for 230VAC applications the heater consumes 40 watts.

### (Order Code Y) Keyed Output

150 - 600 in-lb actuators are supplied with a 3/4" female square output coupling; when the "Y" option is selected they are supplied with a 15mm female keyed output.

1000 - 3000 in-lb models are supplied with a 1" female square output coupling; when the "Y" option is selected they are supplied with a 20mm female keyed output.

### (Order Code Z) Handwheel

For manual operation when power is not available. The handwheel is disengaged from the geartrain and does not turn during normal operation. When the handwheel is pushed down, it disengages the motor from the geartrain and allows manual operation.

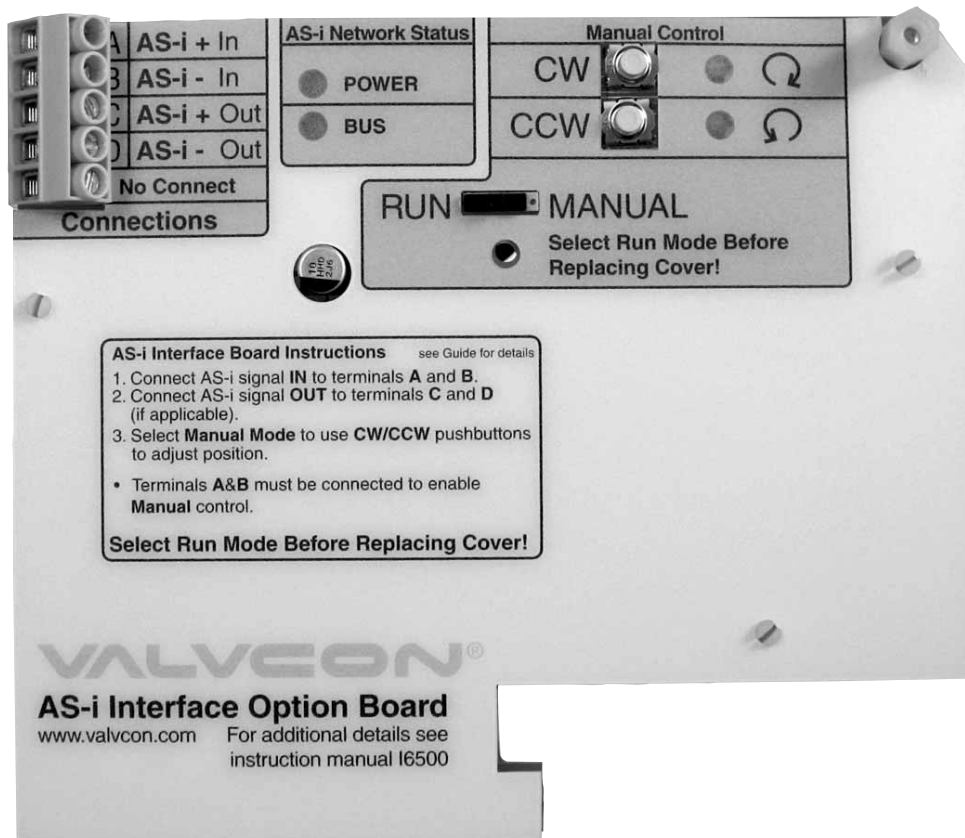
### (IWX and LIWX) Hazardous Location Enclosures

The standard enclosures (IW and LIW) are rated for NEMA 4/4X (weather tight and corrosion resistant). The Hazardous Location enclosures (IWX and LIWX) are rated for NEMA 4/4X/7 & 9, Class I, Div 1, Groups C&D; Class II, Div. 1, Groups E, F, & G; Class III.

### (CSA) Certifications (C US)

Certification by the Canadian Standards Association of either hazardous or weatherproof locations is standard on I-Series models with the AS-i or DeviceNet options.

## AS-i BOARD—VALVCON AS-i BOARD FOR 115VAC AND 230VAC APPLICATIONS



### 115VAC AND 230VAC MODELS\*

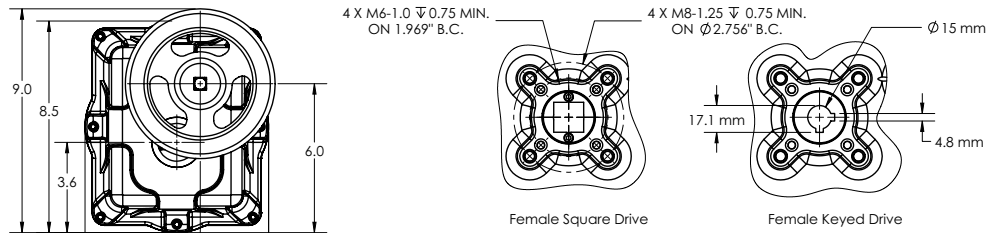
| Torque Output (breakaway) | Speed (seconds per 90° rotation) | Duty Cycle | VA Rating |        | Max Running Current at Full Load (True RMS) |         | Max Effective Peak Inrush Current (= .66 x peak inrush) |           |
|---------------------------|----------------------------------|------------|-----------|--------|---|---------|---|-----------|
|                           |                                  |            | 115VAC    | 230VAC | 115VAC                                      | 230VAC  | 115VAC  | 230VAC    |
| 150 in lb                 | 8                                | 75%        | 70VA      | 115VA  | .6 amps                                     | .5 amps | 1.25 amps   | .924 amps |
| 300 in lb                 | 15                               | 75%        | 70VA      | 115VA  | .6 amps                                     | .5 amps | 1.25 amps   | .924 amps |
| 600 in lb                 | 30                               | 75%        | 70VA      | 115VA  | .6 amps                                     | .5 amps | 1.25 amps   | .924 amps |
| 1000 in lb                | 25                               | 75%        | 92VA      | 161VA  | .8 amps                                     | .7 amps | 1.66 amps   | 1.29 amps |
| 1500 in lb                | 40                               | 75%        | 92VA      | 161VA  | .8 amps                                     | .7 amps | 1.66 amps   | 1.29 amps |
| 2000 in lb                | 55                               | 75%        | 92VA      | 161VA  | .8 amps                                     | .7 amps | 1.66 amps   | 1.29 amps |
| 2500 in lb                | 70                               | 75%        | 92VA      | 161VA  | .8 amps                                     | .7 amps | 1.66 amps   | 1.29 amps |
| 3000 in lb                | 75                               | 55%        | 92VA      | 161VA  | .8 amps                                     | .7 amps | 1.66 amps   | 1.29 amps |

**\*Notes:**

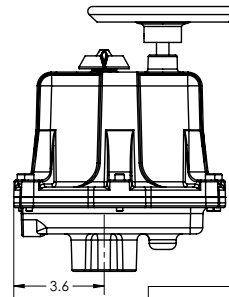
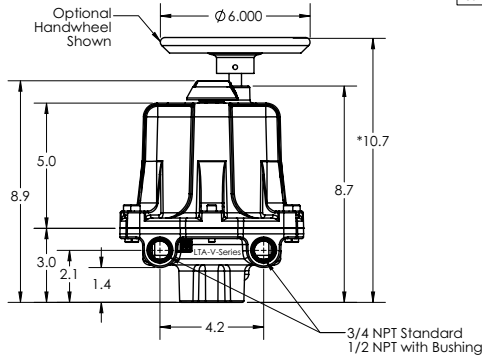
1. The Maximun Current stated above includes all options. If the brake and/or heater & thermostat are not installed, the actual current draws will be less.

### I-SERIES ENCLOSURES

#### Mounting Flange, ISO 5211 F05/ F07



| Actuator Size | Drive Option | Drive Type | Drive Size   | Depth         |
|---------------|--------------|------------|--------------|---------------|
| 150-600 lb-in | Standard     | Square     | 0.750 (19mm) | 0.90 (22.9mm) |
| 150-600 lb-in | Option "T"   | Square     | 0.551 (14mm) | 0.90 (22.9mm) |
| 150-600 lb-in | Option "Y"   | Keyed      | 0.591 (15mm) | 1.40 (35.6mm) |



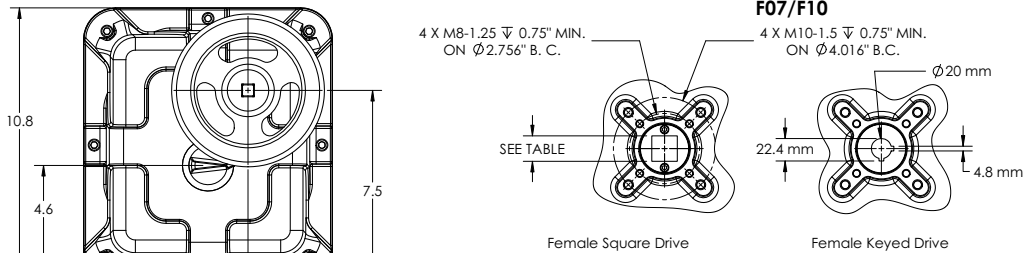
|                           |       |
|---------------------------|-------|
| <b>Approximate Weight</b> | 17 lb |
|---------------------------|-------|

\*9.7 WITHOUT HANDWHEEL  
TO REMOVE COVER REQUIRES AN ADDITIONAL 4.75"

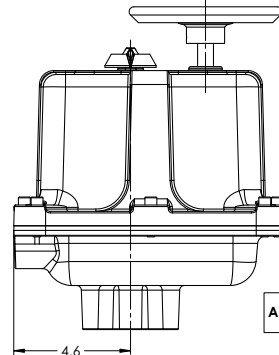
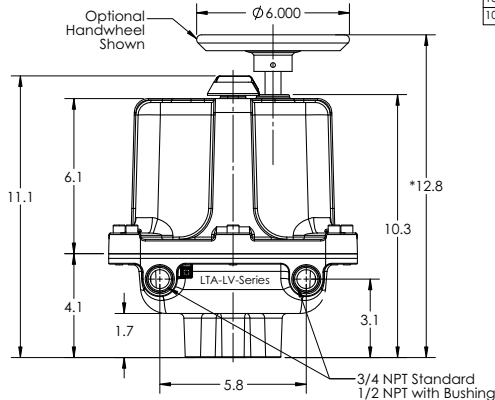
All Dimensions in inches unless otherwise stated

### LI-SERIES ENCLOSURES

#### Mounting Flange, ISO 5211 F07/F10



| Actuator Size   | Drive Option | Drive Type | Drive Size   | Depth         |
|-----------------|--------------|------------|--------------|---------------|
| 1000-3000 lb-in | Standard     | Square     | 1.000 (25mm) | 1.20 (30.5mm) |
| 1000 lb-in      | Option "T"   | Square     | 0.748 (19mm) | 1.20 (30.5mm) |
| 1500-3000 lb-in | Option "T"   | Square     | 0.866 (22mm) | 1.20 (30.5mm) |
| 1000-3000 lb-in | Option "Y"   | Keyed      | 0.787 (20mm) | 1.50 (38.1mm) |



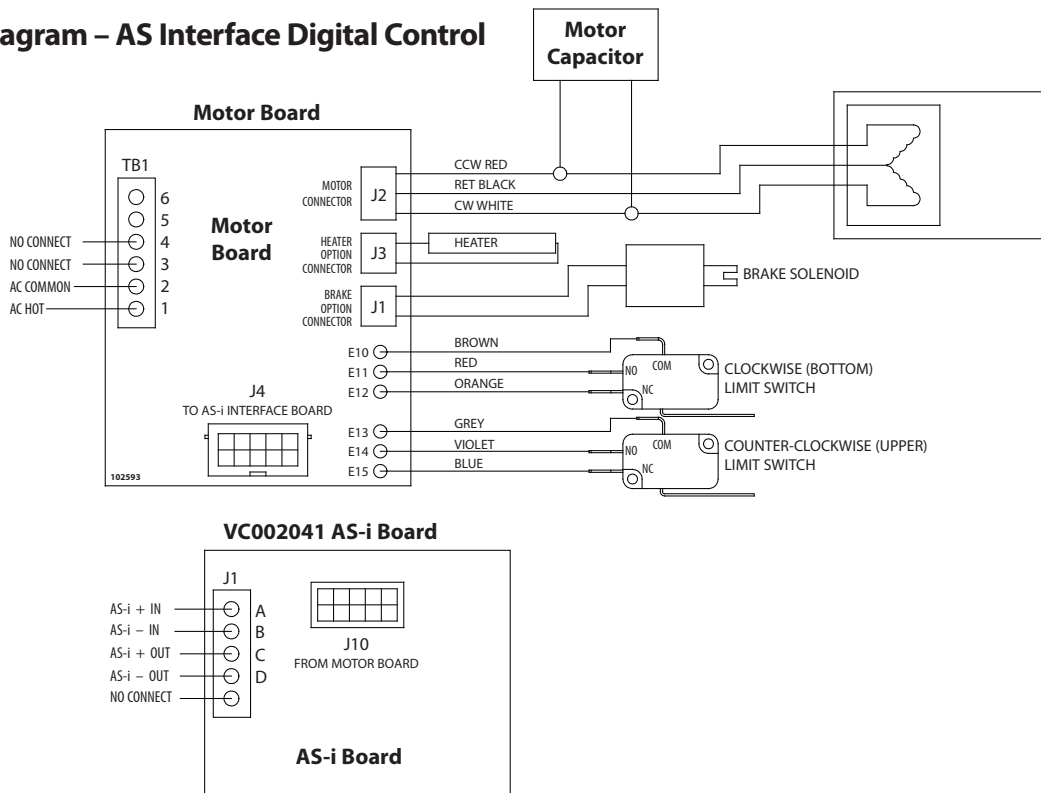
|                           |       |
|---------------------------|-------|
| <b>Approximate Weight</b> | 31 lb |
|---------------------------|-------|

\*11.7 WITHOUT HANDWHEEL  
TO REMOVE COVER REQUIRES AN ADDITIONAL 5.75"

All Dimensions in inches unless otherwise stated

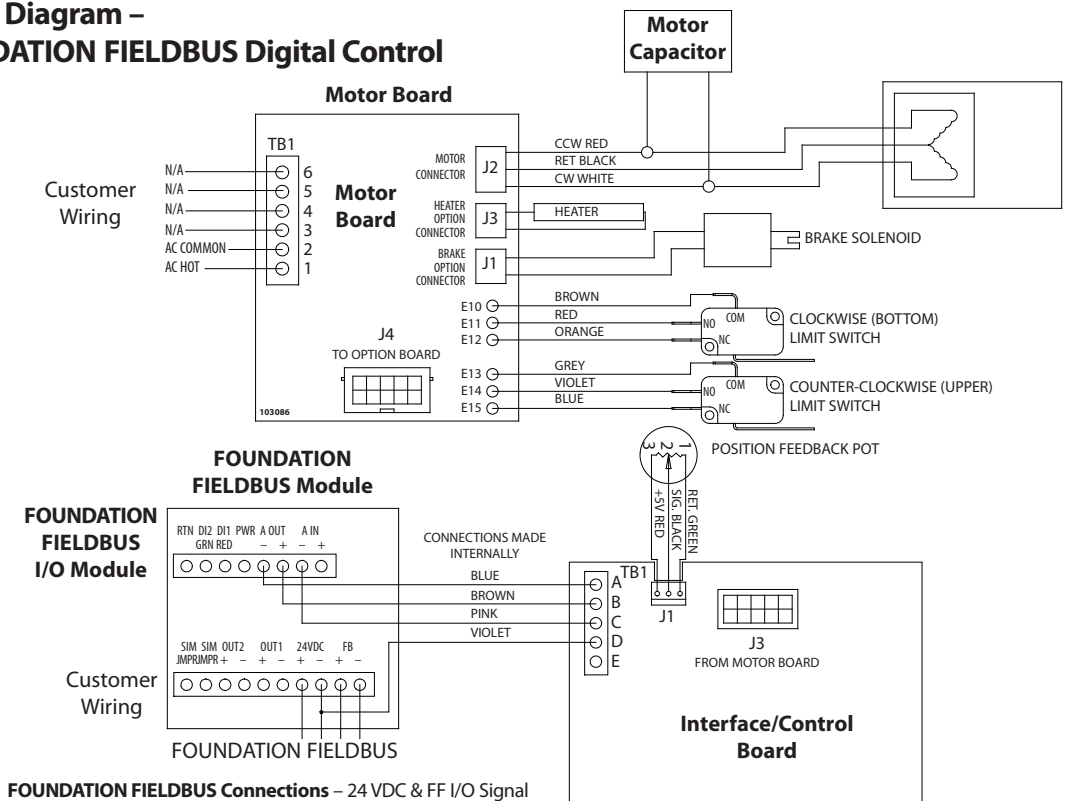
### 115VAC AND 230VAC ACTUATORS WITH AS-i PROTOCOL OPTION

#### Wiring Diagram – AS Interface Digital Control



### 115VAC AND 230VAC ACTUATORS WITH FOUNDATION FIELDBUS PROTOCOL OPTION

#### Wiring Diagram – FOUNDATION FIELDBUS Digital Control



Diagrams depict typical installations. See individual product IMOs for wiring diagrams of I-Series actuators with other protocol options.

## HOW TO ORDER - I & LI-SERIES ELECTRIC ACTUATORS

### Example:

Sample model code:

LI WX 1500 AS HIKS2 N230AC

| 1  | Series |
|----|--------|
| I  | I      |
| LI | LI     |

| 2  | Enclosure                                       |
|----|---|
| W  | Weathertight (NEMA 4/4X)                        |
| WX | Weathertight & Explosionproof (NEMA 4/4X/7 & 9) |

| 3    | Torque (in lbs) |
|------|-----------------|
| 150  | 150             |
| 300  | 300             |
| 600  | 600             |
|      | I-Series Only   |
| 1000 | 1000            |
| 1500 | 1500            |
| 2000 | 2000            |
| 2500 | 2500            |
| 3000 | 3000            |
|      | LI-Series Only  |

| 4               | Protocol Options <sup>1</sup> |
|-----------------|-------------------------------|
| AS              | AS-i                          |
| DN              | DeviceNet                     |
| FF <sup>6</sup> | Foundation Fieldbus           |
|                 | LI-Series Only                |
| MB <sup>6</sup> | MODBUS                        |
|                 | LI-Series Only                |

| 1  | 2  | 3    | 4  | 5        | 6      |
|----|----|------|----|----------|--------|
| LI | WX | 1500 | AS | H,I,K,S2 | N230AC |

| 5               | Other Options               |
|-----------------|-----------------------------|
| —               | No Entry If Standard        |
| H <sup>2</sup>  | Tropical Heater/Thermostat  |
| I <sup>3</sup>  | ISO 5211 Compliant Output   |
| K               | Brake                       |
| S2 <sup>4</sup> | 2 Additional Limit Switches |
| T <sup>5</sup>  | Heater/Thermostat           |
| Y <sup>7</sup>  | Keyed Output                |
| Z               | Handwheel                   |

| 6      | Operating Voltage |
|--------|-------------------|
| N115AC | 115VAC            |
| N230AC | 230VAC            |

### Notes:

- Select only one protocol option.
- This heater option activates at or below 90°F and deactivates at 110°F; it is recommended high-humidity applications.
- 150-600 in-lb models with option "I" are supplied with a 14mm female square. (note: without option "I" the female square is 3/4 inch). 1000 in-lb models with option "I" are supplied with a 19mm female square and 1500-3000 in-lb models are supplied with a 22mm female square. (note: without option "I" the female square is 1inch).
- These switches have gold contacts for use in Network applications.
- This heater option activates at or below 40°F and deactivates at 60°F; it is recommended in applications where temperature may drop below 32°F.
- This option only available in the LI-Series enclosure.
- 150 - 600 lb-in models with "Y" option are supplied with a 15mm female keyed output. 1000 - 3000 lb-in models with "Y" option are supplied with a 20mm female keyed output.

## JAMESBURY VALVCON – COMMITTED TO CUSTOMER SERVICE, QUALITY & SUPPORT

### Committed to Customer Service

Metso worldwide web site: [www.metso.com/valvcon](http://www.metso.com/valvcon), provides 24 hour a day access to all technical support material—from sales brochures to instruction manuals to installation and troubleshooting tips. For local support, our network of trained stocking distributors/representatives are industry leading experts in valve automation. Contact the Metso, *Jamesbury* Valvcon product web site to locate the nearest stocking distributor/representative.

### Timely Technical Support

Metso Product Support is on call to answer your engineering or application questions, and to quickly repair or upgrade your actuators. These highly trained support engineers offer a broad range of expertise, with the combined experience to assist specifying engineers and contractors with information on feasibility and special applications.

### A Tradition of Quality

Metso is dedicated to producing superior-quality products that are second to none. Our development laboratory and manufacturing facilities exemplify our total commitment to producing quality products.

Subject to change without prior notice.

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