

# VALVCON® QX-SERIES ELECTRIC ACTUATOR 12VDC AND 24VDC

Metso is a leading designer and provider of *Valvcon* compact, reliable, electronically controlled electric actuators for valves and dampers. We offer a complete line of 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.

We have developed and introduced the industry's most innovative Metso *Valvcon* electric actuator products, including simple "set and go" calibration, intelligent processor-based digital electronics, "Plugin" accessory boards, Back-Up Power actuators, as well as electric actuators designed for remote control, solar-powered applications and two-wire network applications.

## FEATURES AND BENEFITS

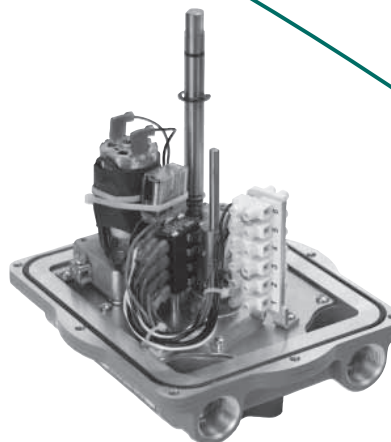
The QX-Series actuator is an economical DC powered explosionproof actuator. The low current draw DC motor and NEMA 4/4X/7&9 enclosure make this product suitable for use in oil and gas fields, offshore rigs, remote skids, and many other applications and locations. The actuator is available as 12VDC and 24VDC and has a torque range up to 3,000 in-lb (250 lb-ft).

### Isolation and Electrical

The heavy-duty terminal block has clearly marked terminals for Power and Option connections to prevent mis-wiring. An internal relay provides ease of directional control; eliminating the need for external voltage-polarity reversal. All connections are hardwired to simplify field repairs. No maintenance is required.

### Motor

The internal electric motor is a brushed DC type, capable of 80% duty cycle at full torque, at ambient temperature at or below 104° F.



### Lubrication

All rotating power train components are coated with a multi-purpose grease. Lubricants are suitable for ambient conditions of -40°F to 150°F.

### Gearing

The power train is comprised of hardened steel, machine cut spur gears. Non-metallic, aluminum, cast or stamped gearing is not used.

### Additional Limit Switches

Two additional limit switches are included, for position indication or as dry contacts to operate other devices. Single pole, double throw switches rated for 1/2 HP, 11amps at 250VAC, CSA certified. (Standard on all QX-Series models)

### On/Off (Open/Close) Operation

The default position/direction of travel is clockwise, power must be applied to terminals 1 (NEG/-) and 2 (POS/+). To drive in the counter-clockwise direction, an additional "control signal" must be applied to terminal 3 (POS/+); when this "control signal" is de-energized, (and power is still present at terminals 1 and 2) the actuator will return to the clockwise position. The actuator will continue to drive in the "powered" direction until power is removed or a cam trips an end-of-travel switch. Power may be removed mid-stroke to position the final drive device. Once the actuator reaches an end-of-travel switch, power and the "control signal" may be removed or left applied without damaging the actuator.

### Breakaway Torque

Designed for efficiency and reliability, all Metso *Valvcon* actuators deliver the power you need when and where it is needed. With efficient gear trains and motors the 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.

### Holding Brake

A brake prevents the actuator from being backdriven. Required for all dampers, butterfly valves, PVC ball valves, and resilient seated valves. (Standard on all QX-Series models)

### Hazardous Location Enclosures

The standard enclosure is 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

Certification by the Canadian Standards Association, to both Canadian and U.S. (C US) standards, is standard on all QX-Series models.

### COMMON FEATURES AT A GLANCE!

- Low current draw
- Heavy-duty Terminal Block
- Holding Brake
- Two auxiliary limit switches
- ISO 5211 Mounting
- CSA Approved

### QX-SERIES OPTIONS

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

Recommended in all high humidity applications where condensation may accumulate inside the actuator. For 12VDC and 24VDC applications the heater consumes 15 watts.

#### (Order Codes I1, I2, I3, and I4) ISO 5211 Metric Output

The actuator is equipped with an ISO 5211 compliant mounting configuration.

The standard drive output for 150-600 lb-in models is a 3/4" female square. The standard drive output for 1000-3000 lb-in models is a 1" female square. We offer several female metric drive output options, consult the "How to Order" section for available sizes for a given actuator model.

#### (Order Code T) Heater/Thermostat

Recommended in all applications where the temperature may drop below 32°F. For 12VDC and 24VDC applications the heater consumes 15 watts.

#### (Order Codes Y1, Y2, and Y3) Keyed Output

The actuator is equipped with an ISO 5211 compliant mounting configuration.

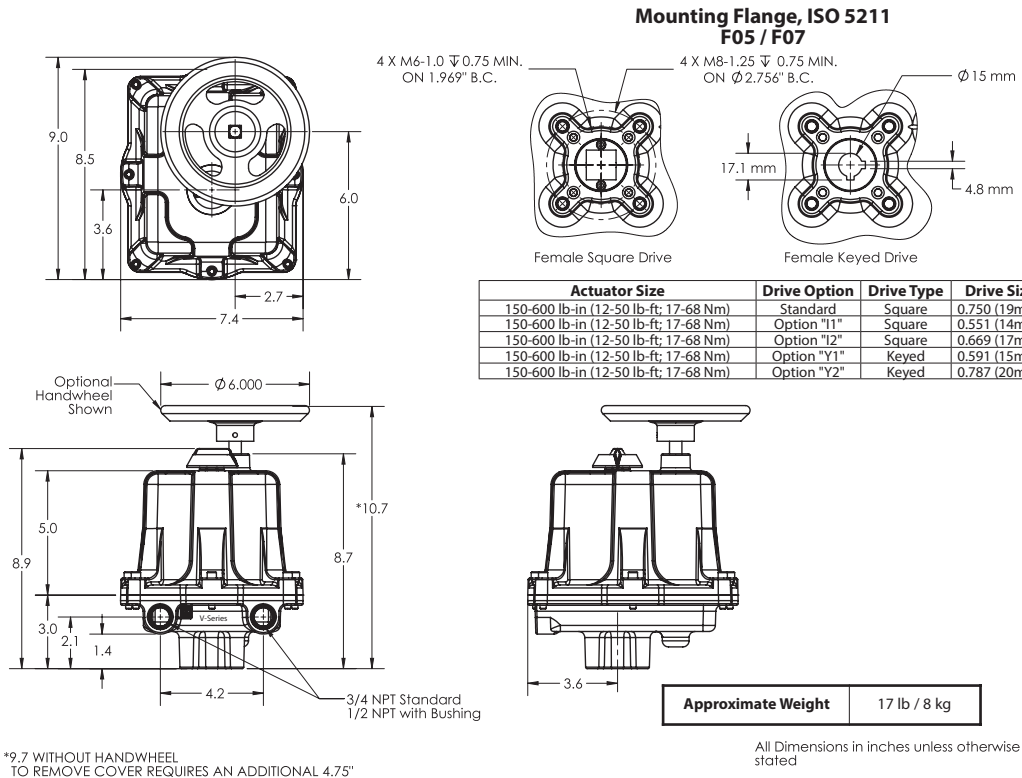
The standard drive output for 150-600 lb-in models is a 3/4" female square. The standard drive output for 1000-3000 lb-in models is a 1" female square. We offer several female keyed drive output options, consult the "How to Order" section for available sizes for a given actuator model.

#### (Order Code Z) Handwheel

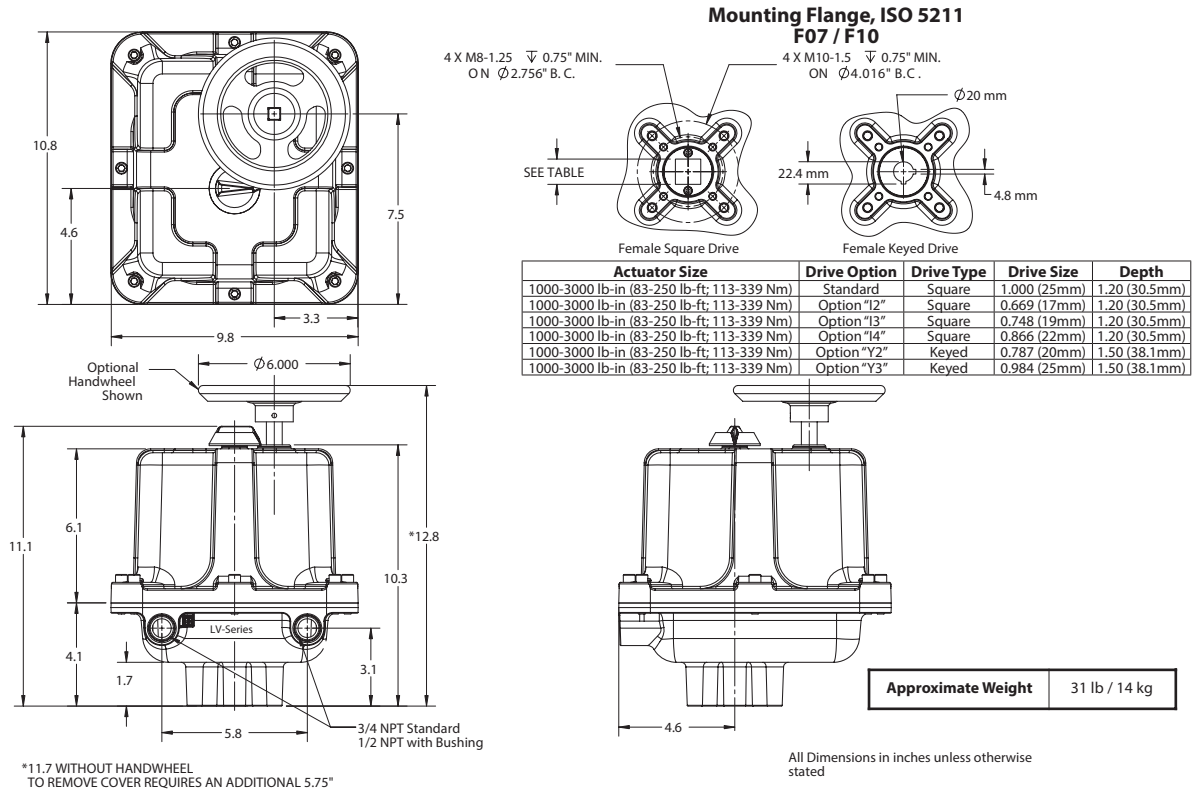
For manual operation when power is not available. The handwheel is disengaged from the geartrain and does not turn during normal operation. When the handwheel is pushed down, it disengages the motor from the geartrain and allows manual operation.

Torque Output	Cycle Time (seconds per 90°)		Duty Cycle	Max Running Current at Full Load	
	12VDC	24VDC		12VDC	24VDC
150 lb-in; 12 lb-ft; 17 Nm	5	3	80%	1.9	2.4
300 lb-in; 25 lb-ft; 34 Nm	10	5	80%	1.9	2.4
600 lb-in; 50 lb-ft; 68 Nm	15	8	80%	1.9	2.4
1000 lb-in; 83 lb-ft; 113 Nm	15	15	80%	3.5	3.5
1500 lb-in; 125 lb-ft; 169 Nm	20	20	80%	3.5	3.5
2000 lb-in; 167 lb-ft; 226 Nm	25	25	80%	4.8	4.8
2500 lb-in; 208 lb-ft; 282 Nm	30	30	80%	4.8	4.8
3000 lb-in; 250 lb-ft; 339 Nm	30	30	80%	4.8	4.8

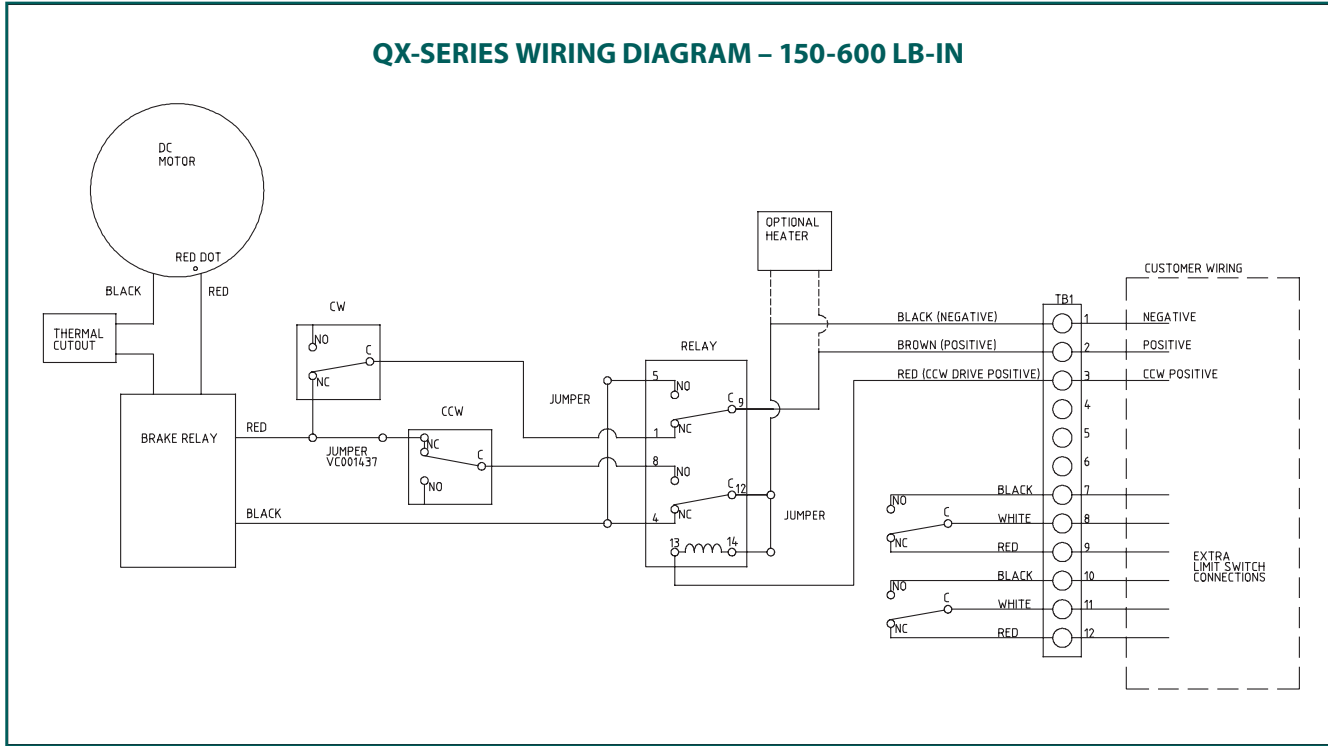
**QX-SERIES ENCLOSURES (150-600 LB-IN)**



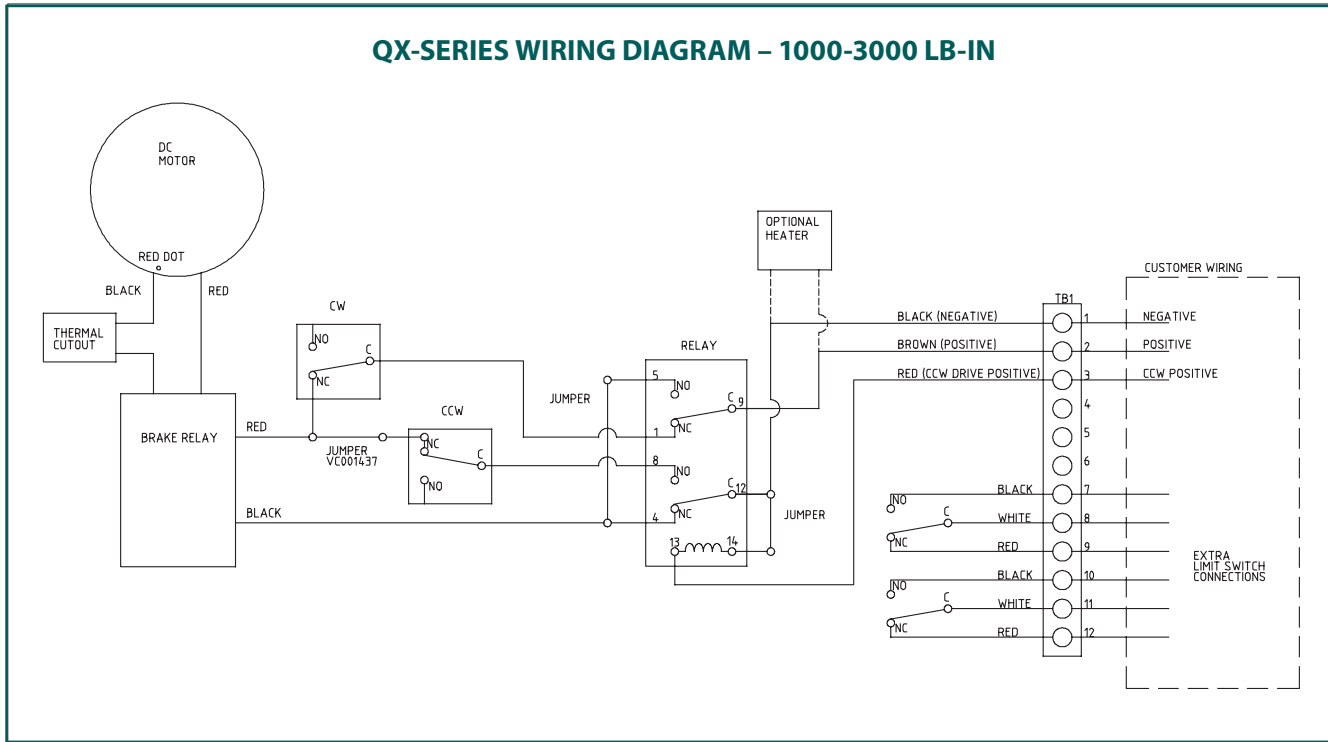
**QX-SERIES ENCLOSURES (1000-3000 LB-IN)**



### QX-SERIES WIRING DIAGRAM – 150-600 LB-IN



### QX-SERIES WIRING DIAGRAM – 1000-3000 LB-IN



**WARNING:** As the use of the actuator is application specific, a number of factors should be taken into account when selecting an actuator for a given application. Therefore, some of the applications in which the actuators are used are outside the scope of this document. If you have questions concerning the use, application or compatibility of the actuator with the intended service, contact Metso Flow Control for more information.

### HOW TO ORDER – QX-SERIES ELECTRIC ACTUATORS (150-600 LB-IN)

**Example:**

Sample model code: QX300HY1ZS12DC

1	Series <sup>(1)</sup>
<b>QX</b>	Weathertight & Explosion proof (NEMA 4/4X/7&9)

2	Torque
<b>150</b>	150 lb-in (12 lb-ft; 17 Nm)
<b>300</b>	300 lb-in (25 lb-ft; 34 Nm)
<b>600</b>	600 lb-in (50 lb-ft; 68 Nm)

1	2	3	4
QX	300	H, Y1, Z	S12DC

3	Other Options
-	No entry if standard
<b>H<sup>(2)</sup></b>	Tropical Heater/Thermostat
<b>I1<sup>(3)</sup></b>	14mm Female Square Output
<b>I2<sup>(3)</sup></b>	17mm Female Square Output
<b>T<sup>(4)</sup></b>	Heater/Thermostat
<b>Y1<sup>(3)</sup></b>	15mm Female Keyed Output
<b>Y2<sup>(3)</sup></b>	20mm Female Keyed Output
<b>Z</b>	Handwheel

4	Operating Voltage
<b>S12DC</b>	12DC
<b>S24DC</b>	24DC

### HOW TO ORDER – QX-SERIES ELECTRIC ACTUATORS (1000-3000 LB-IN)

**Example:**

Sample model code: QX2000I4ZS24DC

1	Series <sup>(1)</sup>
<b>QX</b>	Weathertight & Explosion proof (NEMA 4/4X/7&9)

2	Torque
<b>1000</b>	1000 lb-in (83 lb-ft; 113 Nm)
<b>1500</b>	1500 lb-in (125 lb-ft; 169 Nm)
<b>2000</b>	2000 lb-in (167 lb-ft; 226 Nm)
<b>2500</b>	2500 lb-in (208 lb-ft; 282 Nm)
<b>3000</b>	3000 lb-in (250 lb-ft; 339 Nm)

1	2	3	4
QX	2000	I4, Z	S24DC

3	Other Options
-	No entry if standard
<b>H<sup>(2)</sup></b>	Tropical Heater/Thermostat
<b>I2<sup>(3)</sup></b>	17mm Female Square Output
<b>I3<sup>(3)</sup></b>	19mm Female Square Output
<b>I4<sup>(3)</sup></b>	22mm Female Square Output
<b>T<sup>(4)</sup></b>	Heater/Thermostat
<b>Y2<sup>(3)</sup></b>	20mm Female Keyed Output
<b>Y3<sup>(3)</sup></b>	25mm Female Keyed Output
<b>Z</b>	Handwheel

4	Operating Voltage
<b>S12DC</b>	12DC
<b>S24DC</b>	24DC

Notes:

1. All QX-Series actuators include a holding brake, two auxiliary limit switches, visual position indication, a wrench-operated manual override, a NEMA 4/4X/7&9 enclosure and CSA (C US) Certification as standard features.
2. This heater option activates at or below 90°F and deactivates at 110°F; it is recommended in high-humidity applications.
3. The standard drive output for 150 - 600 lb-in actuators is a 3/4" female square; the standard drive output for 1000 - 3000 lb-in actuators is a 1" female square.
4. This heater option activates at or below 40°F and deactivates at 60°F; it is recommended in applications where the temperature may drop below 32°F.

## COMMITTED TO CUSTOMER SERVICE, QUALITY & SUPPORT

### Committed to Customer Service

Metso worldwide web site: [www.metso.com/electricactuators](http://www.metso.com/electricactuators), 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, *Valvcon* product web site to locate the nearest stocking distributor/ representative.

### Timely Technical Support

Metso Flow Control 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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