



Model 710

**Water Tight  
Quarter Turn  
Electric Actuators**

**SERIES 33**

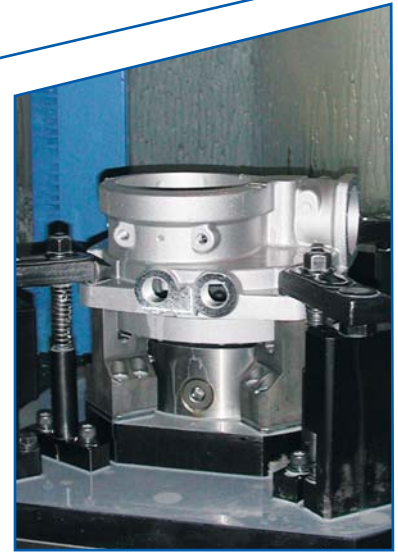


## RELIABLE PERFORMANCE

The Electra actuators can be found worldwide in industries such as chemical processing, heating and air conditioning, water and sewage, and steel manufacturing. For over 25 years we have given our very best to make the most reliable electric actuator on the market today. From our light and compact 600 series to the heavy duty 700 series, each actuator incorporates the same quality construction features developed from years of industry experience.

## THE LATEST TECHNOLOGY

The Electra actuators proven design is manufactured by the latest technology. The entire enclosure is die cast at our aluminum die cast foundry then machined at our CNC horizontal and vertical machining center. Our time tested products are balanced by our continued investment in research and development. Through innovation and cutting edge technology we lead the valve automation industry today.



## QUALITY ASSURANCE

Our success is based on our ability to provide high quality actuators. Improved quality through computer controlled measuring instrumentation is just part of our assurance. Strict quality control in all stages, starting from the purchase of materials up to the shipment of actuators guarantee that the designed quality is maintained. Electra actuators are manufactured under ISO 9001 certification that ensures not only high quality today but the commitment to improvement in the future.



## PROFESSIONAL SERVICE

The success of Electra actuators is based on service after the sell. Our technicians work with you, using their years of technical experience and problem solving to help you detect the problem and find the right solution. Whatever the reason start-up, maintenance, trouble shooting, modification or spare parts our service department can help you with all of your actuator requirements.



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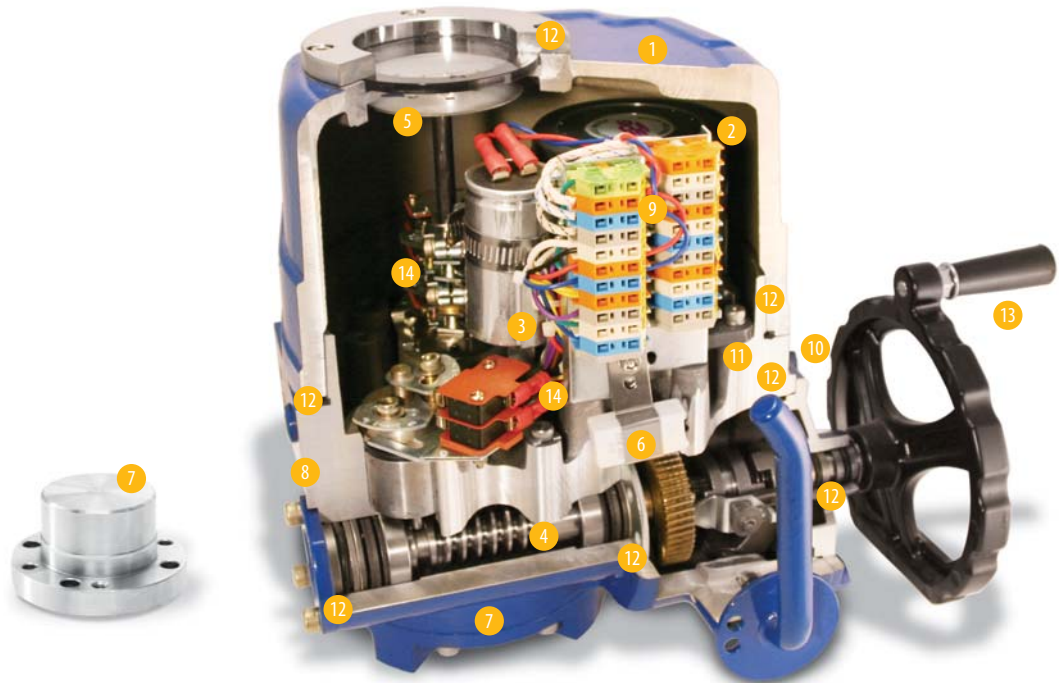


Model 710

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# Model 710 Features



## DESIGN FEATURES

### ► 1. Enclosure

Die cast high grade aluminum alloy housing is light, compact and durable. The housing is hard anodized inside and out, then polyester coated on the exterior for superior corrosion protection in all environments. The die cast housing is engineered with overlaying lips that form a barrier ring that allows the water to shed off and not enter the housing. The rugged sealed watertight enclosure is rated NEMA 4, 4x, 6 protected from ingress of any dirt or moisture.

### ► 2. Motors

Motors are engineered for high-torque, low current draw, and high duty cycle ratings. Single phase squirrel cage capacitor run motors are F class insulated, and protected from overload by a thermostat with automatic reset.

### ► 3. Capacitors

The capacitor is custom engineered for each single phase motor. Each capacitor is peak motor voltage rated for maximum service life.

### ► 4. Self Locking Gearing

High efficiency, self locking double reduction gearing consists of a worm and segment gear output mechanism. Precision cut steel worm and bronze segment are engineered to withstand locked rotor conditions. When electrical power is off, the gearing provides exact and stable positioning of the actuator without a brake. All gearing is greased and lubricated for life.

### ► 5. Position Indicator

The position indicator is mechanically driven by the output drive shaft for reliable opening and closing status of the valve. The movement of the valve can be easily viewed from the top of the actuator. The lens is permanently sealed to guard against condensation.

### ► 6. Heater

Guards against condensation, see page 4 for details

### ► 7. Actuator Mounting

Drilling is in accordance with ISO 5211 allowing easy installation of the actuator directly to other ISO flanged valves. Each actuator is supplied with a blank drive insert, machining by others.

### ► 8. Mechanical Travel Stops

Externally adjustable stainless steel mechanical travel stops are provided to permit precise travel adjustment of actuator movement. The settings of the mechanical stops provides travel limitation for both electrical and manual operation.

### ► 9. Terminal Strip

Highly visible labeling for every connection to help avoid wiring mistakes. Maximum 22 points are standard. Spring loaded terminal strip is proven reliable to keep a tight wiring connection.

### ► 10. Dual Conduit Entrance

Allows full electrical code access of all wiring through two entrances. Conduit entrances are 3/4" NPT connections.

### ► 11. Captive Bolts

Cover bolts are specifically designed to prevent loss during servicing of the actuator. All external captive bolts are stainless steel for corrosion protection.

### ► 12. Weather Seals

Seals the actuator housing against moisture and debris. Every compartment uses radial seals to ensure moisture does not enter the actuator.

### ► 13. Manual Override with Spinner

For manual cycling of the valve, see page 4 for details.

### ► 14. Travel Limit / Torque Switch

SPDT switches with adjustable cams, see page 4 for details.

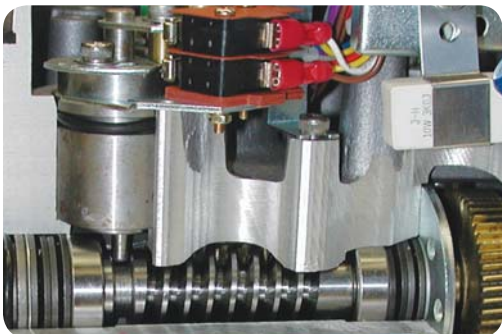
# Model 710 Features



Actuator shown in auto mode

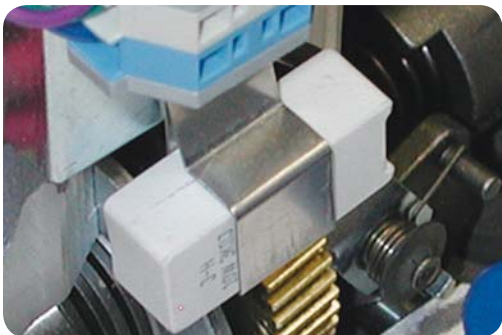
## 1.0 Manual Operation

Allows the valve to be rotated when power is not present. The hand/auto declutch lever makes manual valve operation simple, no cheater bar is needed even for tightly sealed valves. With very low effort the lever pulls towards the handwheel and locks perpendicular. The casting marks on the handwheel show rotation direction of handwheel. Once power is applied to actuator the internal clutch mechanism automatically returns to the original position. The clutch ensures that the handwheel cannot be rotated by the motor. The hand lever can be pad locked in either auto or hand mode for safety.



## 2.0 Torque Limit Switches

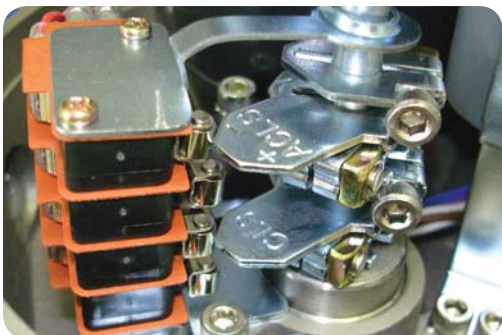
(2) Torque switches are factory calibrated and provided standard with each actuator. One each for the open and close ends of travel. The torque limit switches independently respond, and are used to stop the travel of the valve if the output torque of the actuator exceeds a preset amount. The switches sense the movement of the worm shaft, and interrupts electrical power to the motor, this allows for protection of the valve and actuator.



## 3.0 Heater and Thermostat

The pre-wired space heater is installed in every actuator to prevent damage caused by condensation inside the actuator. The heater is equipped with a thermostat to prevent overheating.

- On/Off actuators need to be wired to supply power to the heater and thermostat.
- Modulating actuators are pre-jumpered so when power is hooked up to the actuator the heater and thermostat will function properly.



## 4.0 Travel Limit Switch

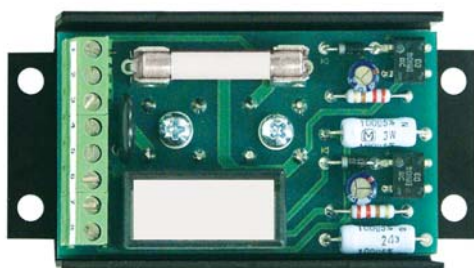
The 710 series actuator comes standard with (2) SPDT travel limit switches open/closed, and (2) auxiliary switches open/closed. The (2) travel limit switches are used to shut the motor down at end of travel. The (2) auxiliary switches are used to communicate with other appliances. Cams for each of the four switches are intermittently adjustable by hand with an allen wrench. Each cam is color coded and labeled for simple field calibration. Once the cam is set it locks in place and is engineered to withstand plant induced vibration.

# Model 710 Control Boards



## Log Rate Controller

The log rate controller (LRC) is designed for continuous modulating applications. The LRC extends the actuator life by averaging the rapidly changing input signals, thus reducing unnecessary hunting for position. The LRC includes a red LED indicator for the open output and a green LED indicator for the closed output, with an onboard fuse for protection. With loss of command signal in the 1-5V or the 4-20ma input range, options are fail in place, fail open or fail close. All input and output signals are easily field configurable with jumper plugs. The log rate feature can be turned off by a jumper. Set points are calibrated with zero and span pots.



## AC to DC Voltage Converter

The AC to DC motor converter modules are electronic interface units that allow a 24 VDC motor to be powered and controlled in the same manner as a 24 VAC split phase motor. Its compact size allows it to be mounted inside the actuator housing. The converter module allows a 24 VDC actuator to directly replace a 24 VAC actuator. This module also features dynamic braking which provides a more stable control platform that allows better resolution.



## Two Wire Control

Relays provide a means of opening and closing a valve with a 24 VAC maintained control signal. The relays can be used in a fail open or fail closed application upon loss of the control signal. The spring loaded relay is continuously energized and maintains the open signal to the actuator. When the signal is removed, the coil releases, causing the actuator to close.

# Model 710 Construction

## PERFORMANCE *Sample model number: 710-01 (24 VAC Electric, Output Torque of 1302 IN-LB)*

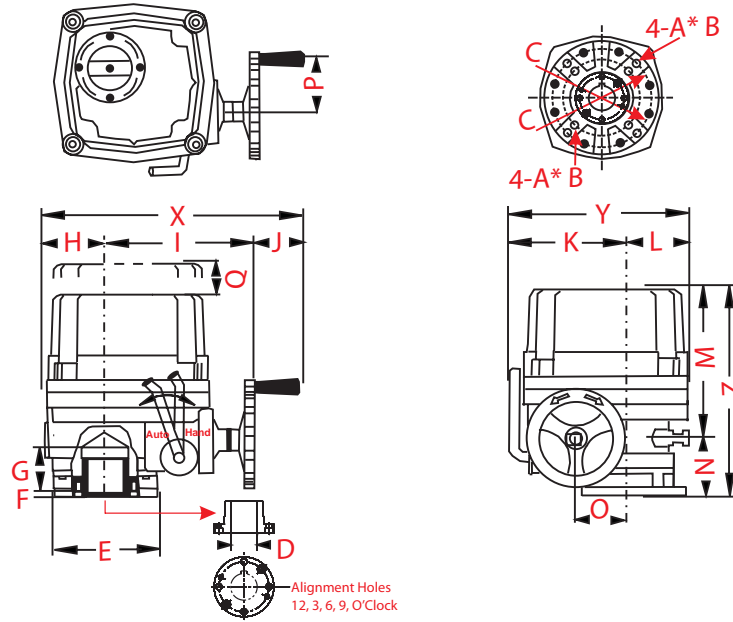
Torque		Model / Amp Draw Series 33 Model 710 24 VAC	Number of Actuator	Speed of Actuator 60Hz	Number of Handwheel Turns 90°	Duty Cycle	Weight lbs
In-Lb	NM						
1302	150	19.0	01	22	12	70%	33
1736	200	19.0	01	22	12	70%	33
2604	300	20.0	03	26	14	70%	44

## SPECIFICATION

Enclosure	Weather proof enclosure IP67 NEMA 4, 4x, (IP67)	Standard
Power supply	24 VAC, single phase 50 / 60 Hertz ±10%	Standard
Control power supply	24 VAC, single phase 50 / 60 Hertz ±10%	Standard
Duty cycle on/off	70%	Standard
Duty cycle modulating	70%	Standard
Motor	Squirrel caged induction motor	Standard
Limit switches	2 SPDT open and closed, 250 VAC 10 Amp rating	Standard
Auxiliary limit switches	2 SPDT open and closed, 250 VAC 10 Amp rating	Standard
Torque switches	Open / close, SPDT, 250 VAC 10 Amp rating	Standard
Thermal overload protection	Open 302°F ±40°F / close 206°F ±59°F	Standard
Rotation	90° ±10° (0° - 110°)	Standard
Indicator	Continuous position indicator	Standard
Manual override	Declutching mechanism	Standard
Self locking gears	Provided by double reduction worm gearing	Standard
Mechanical stop	(2) external adjustable hex head bolts	Standard
Space heater	5-7 Watt for anti-condensation	Standard
Conduit entries	(2) 3/4" NPT tapped entrances	Standard
Lubrication	Grease moly (EP type)	Standard
Terminal strip	Spring loaded push lever type	Standard
Operating temperature	-40°F to +158°F (on/off) -40°F to + 140°F (modulating)	Standard
Humidity	90% RH maximum non-condensing	Standard
Anti vibration	X Y Z 10g, 0.2-34 Hz, 30 minute	Optional
External coating	Anodized treated, and polyester powder coated	Optional
Explosion proof enclosure	EX D 11C & B T6, equal to class 1, groups C & B, Div 1	Optional
Submersible enclosure IP68	Temporary submergence IP68 35 ft. head 100 hours	Optional
Log rate control board	For continuous modulating applications	Optional
Digital control board	High performance, high resolution modulating board	Optional
Fire proofing actuator	For extreme high temperatures	Optional

# Model 710 Outline Drawing

Models: 710-00,01,02,03



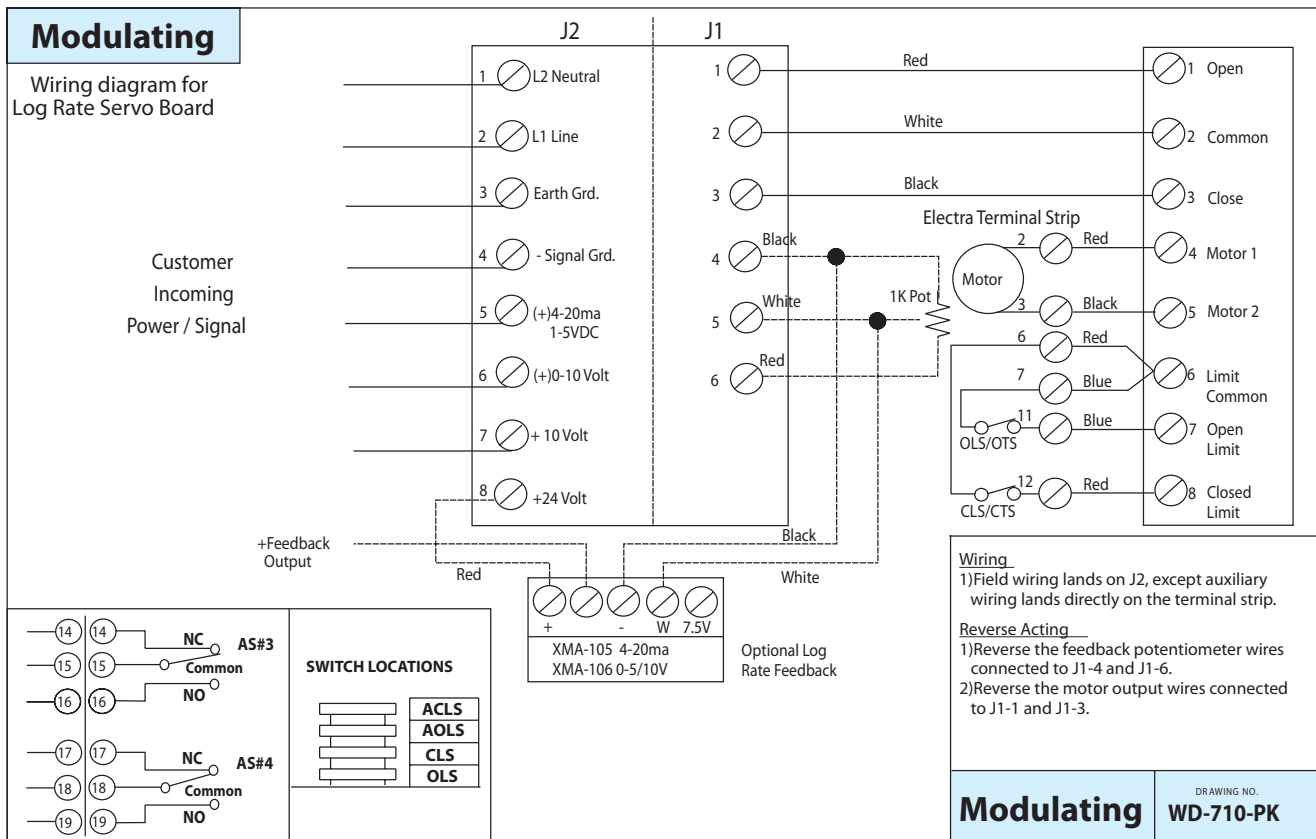
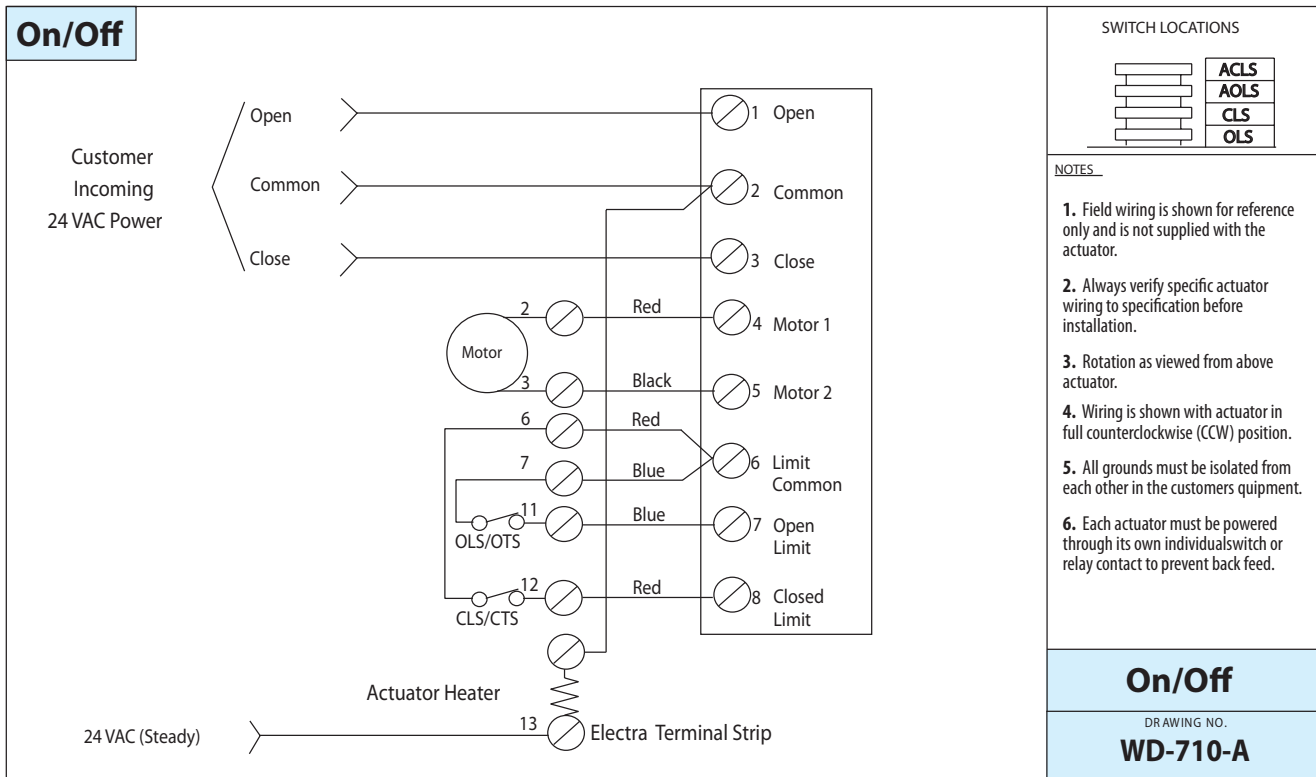
Model	Base ISO 5211	A	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R	S	X	Y	Z
	Ø C	B																			
710-01	F07/F10	M8/M10	.98	4.92	.12	2.24	2.87	7.857	2.55	5.59	3.43	7.56	2.68	2.13	3.07	6.30	-	-	13.31	9.02	10.24
	2.76/4.02	14/17																			
710-02	F10/F12	M8/M10	.98	4.92	.12	2.24	2.87	7.87	2.55	5.59	3.43	7.56	2.68	2.13	3.07	6.30	-	-	13.31	9.02	10.24
	4.02/4.92	14/17																			
710-03	F10/F12	M10/M12	1.57	5.82	.12	2.44	3.23	8.70	2.55	6.30	3.90	8.70	2.72	2.56	3.07	7.09	-	-	14.49	10.20	11.42
	4.02/4.92	17/21																			

D = Max bore

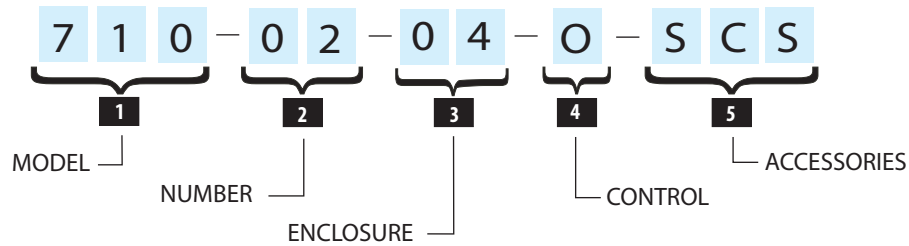
Note: The "D" dimension is the maximum allowable bore that can be machined into the insert.  
The machining is done by others, as the standard insert is blank.



# Model 710 Electrical

**TYPICAL 24 VAC WIRING DIAGRAM.** For other voltages please consult factory



# Part Numbers



Item	Code	Description
<b>1</b> 	710	24 VAC Single Phase
<b>2</b> 	01 02 03	1302 In-Lb Torque 1736 In-Lb Torque 2604 In-Lb Torque

Item	Code	Description
<b>3</b> <b>Enclosure</b> Weather proof	04	NEMA 4, 4x, 6 Housing
<b>4</b> <b>Control</b> On / Off Mod. Standard	O E	Open / Close Operation Log Rate Board
<b>5</b> <b>Accessories</b>		
<b>Feedback</b>	F K	4-20 MA or 0-10 VDC 1k pot feedback
<b>Other</b>	01	Two wire relay

## A) Warranty

We warrant all products to be free from defects in materials and workmanship under normal conditions of use and service. Our obligation under this warranty is limited to repairing or replacing at our option at our factory any product which shall within two years after delivery to original buyer be returned with transportation charges prepaid, and which our examination shall show to our satisfaction to have been defective.

## B) Storage

The actuator must be stored in a clean, dry, temperature controlled area. The unit shall be stored with the cover installed and with the conduit openings sealed. Storage must be off the floor, covered with an unsealed dust protector that will allow side and bottom ventilation. Care must be taken to guard the actuator from condensation in extreme temperature variations. If actuators sit for an extended period of time it is recommended that the heaters be hooked up.

## C) Moisture Warning

**Series 41 actuators are rated NEMA 4. The only way moisture can enter the actuator is through the conduit entrance. Extra precaution should be used to stop moisture from entering the actuator. Seal tight fittings as well as drip legs and potting compounds should be installed to protect the actuator against condensation. If moisture migrates up through the conduit entrance and damages components, the parts are not covered under warranty.**

**VALVE**

**VT**

**TECK**

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