



# Value Valves USA

Electric Actuator  
DOUBLE ACTING  
SPRING RETURN





## VALUE VALVE U.S.A. ELECTRIC ACTUATORS



# QUARTER-TURN ELECTRIC ACTUATOR FEATURES

## FEATURES

### Enclosure:

- IP 67 (Nema 4, Nema 4X) waterproof and dust-proof enclosures.
- Material : Dry powder coated aluminum alloy.
- Conduit entrance (1/2"NPT).

### Motor:

- Standard duty cycle 30%.
- Extended duty cycle available.
- H insulation class for EOM-1 and EOM-A : F class for EOM-2 to EOM-12.
- Built-in thermal protection (275°F) prevents motor burnout.

### Position Indicator:

- All models have a position indicator beacon on the actuator cover.

### Manual Override:

- Non-clutch design, the manual operator can be operated without any lever, clutch or brake upon power outage.
- When electric motor is operating, manual hand-wheel does not rotate.

### Gear Train:

- High alloy steel gear trains provide self-locking function.
- Gear trains lubricated with high temperature lubricant at the factory.

### Working conditions:

- Ambient temperature : -23°F~140°F.

### Standard Features (noted) and Options:

- Space heater/Thermostat (Standard).
- Additional limit switches (Standard on EOM 2-13).
- Potentiometer unit (1K Ohm).
- Local control unit (local/remote, on/off).
- Torque switches.
- Current position transmitter (output 4-20mA).
- Modulating controller.
- Various voltages.
- Nylon coated enclosure.

### Certificates:

- ISO 9001.
- CE.
- CSA.
- ISO 5211.



## Quarter-turn Electric Actuator

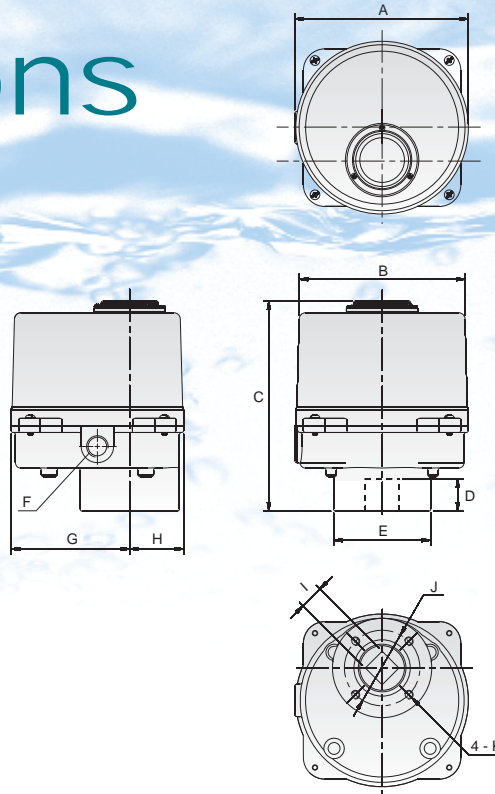


Model No.	Power (Watts)	Torque (In.Lbs)	Speed (Sec/ 90°)	Weight (Lbs)	Manual Override	Mounting Flange (ISO 5211)
EBM-2	40W	1062	8	9.9	N/A	F07
EOM-A	10W	443	20	6.6	N/A	F07
EOM-1	10W	310	12	4.4	Lever	F03/F05/F07*
EOM-2	40W	797	15	24.23	Hand-wheel	F07
EOM-3	40W	1329	22	24.23	Hand-wheel	F07
EOM-4	120W	3543	16	48.46	Hand-wheel	F10
EOM-5	120W	4429	22	48.46	Hand-wheel	F10
EOM-6	120W	5757	28	48.46	Hand-wheel	F10
EOM-7	180W	8857	46	79.30	Hand-wheel	F12 / F14
EOM-8	220W	13286	46	79.30	Hand-wheel	F12 / F14
EOM-9	180W	17714	58	123.35	Hand-wheel	F16
EOM-10	220W	22143	58	123.35	Hand-wheel	F16
EOM-11	250W	26571	58	123.35	Hand-wheel	F16
EOM-12	300W	31000	58	123.35	Hand-wheel	F16
EOM-13	300W	39825	80	178.2	Hand-wheel	F25

\*(Two holes only)

# Quarter-turn Electric Actuator

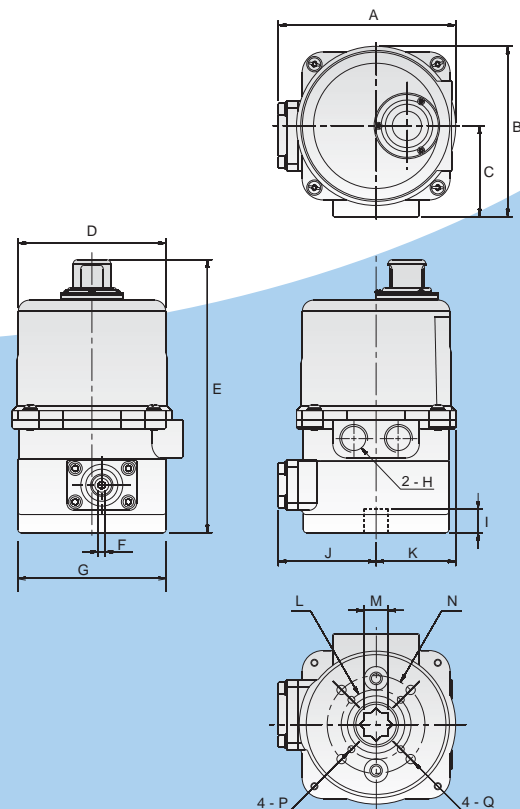
# Dimensions



- Plastic cover.
- No manual override.
- No mechanical stops.
- No certificates.

Unit:Inches

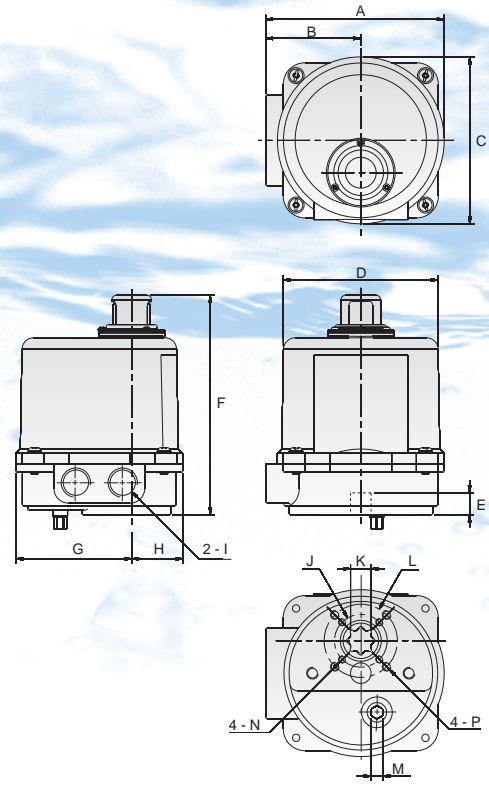
Dimension Model No.	A	B	C	D	E	F	G	H	I	J	K	Flange Type
EBM-2	6.34	6.06	7.68	1.18	3.54	1/2"	4.33	1.97	0.87	2.76	M8 x1.25	F07



- With modulating card E = 9.00
- No mechanical stops.

Unit:Inches

Dimension Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	Flange Type
EOM-A	4.49	4.80	2.56	4.17	7.72	N/A	4.17	1/2"	0.67	2.24	2.24	1.97	0.67	2.76	M6 x1.0	M8 x1.25	F05 or F07(std)
EOM-A-M	4.49	4.80	2.56	4.17	7.72	0.20	4.17	1/2"	0.67	2.24	2.24	1.97	0.67	2.76	M6 x1.25	M8 x1.25	F05 or F07(std)

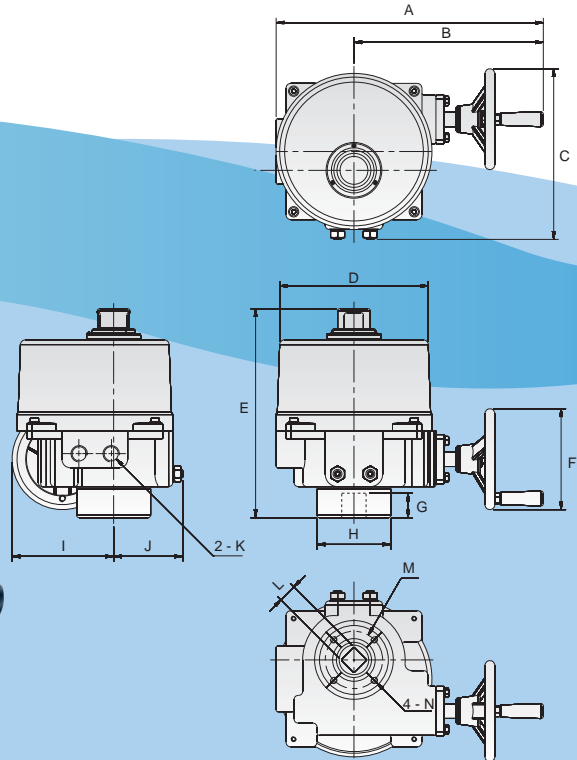


- With modulating card F=7.20
- No mechanical stops.

Unit:Inches

Dimension Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Flange Type
EOM1	4.80	2.56	4.49	4.17	0.59	5.91	3.11	1.38	1/2"	1.42	0.55	1.97	0.31	M5 x.8	M6 x1.0	F03/F05/F07*

\*2-Holes Only



- With DC motor E= 11.37  
(apply to DC model or 75% duty cycle)
- Note: with torque switch A = 14.20

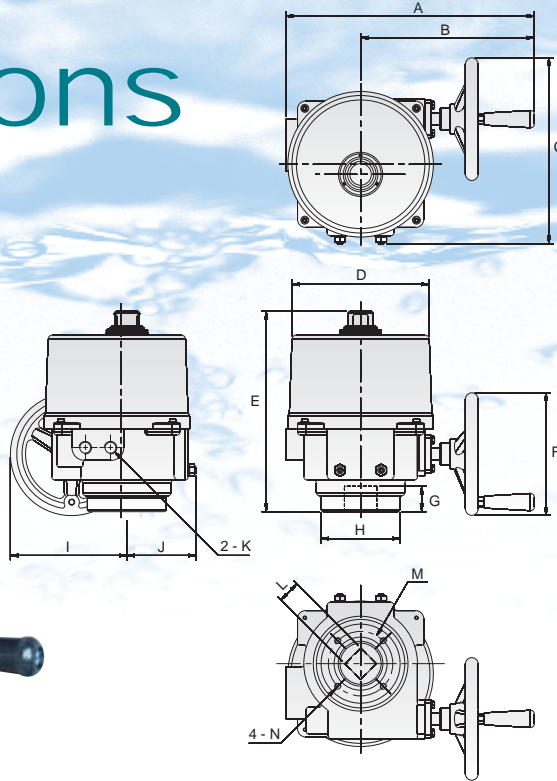
Unit:Inches

Dimension Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Flange Type
EOM2-EOM3	12.83	9.09	8.19	7.13	10.04	4.84	1.18	3.54	4.88	3.31	1/2"	0.87	2.76	M8 x1.25	F07



# Quarter-turn Electric Actuator

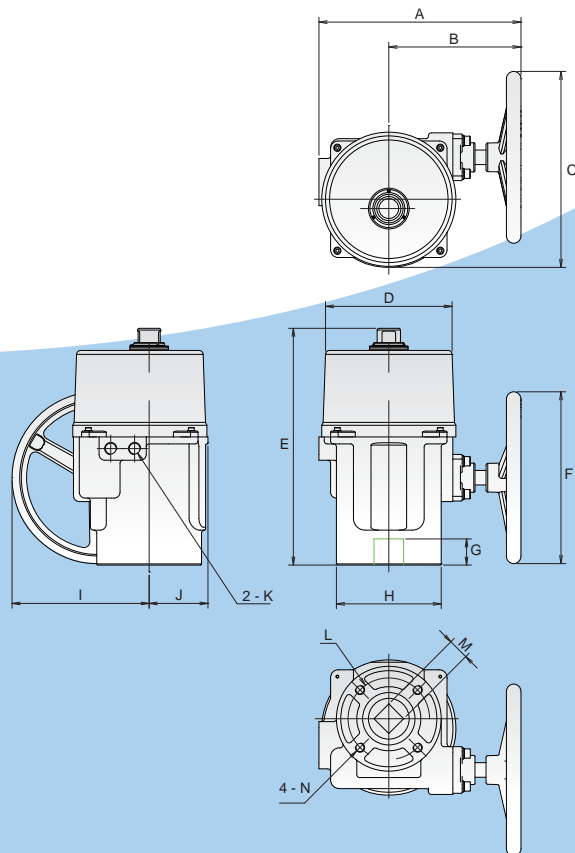
# Dimensions



•Note : with torque switch A=18.10

Unit:Inches

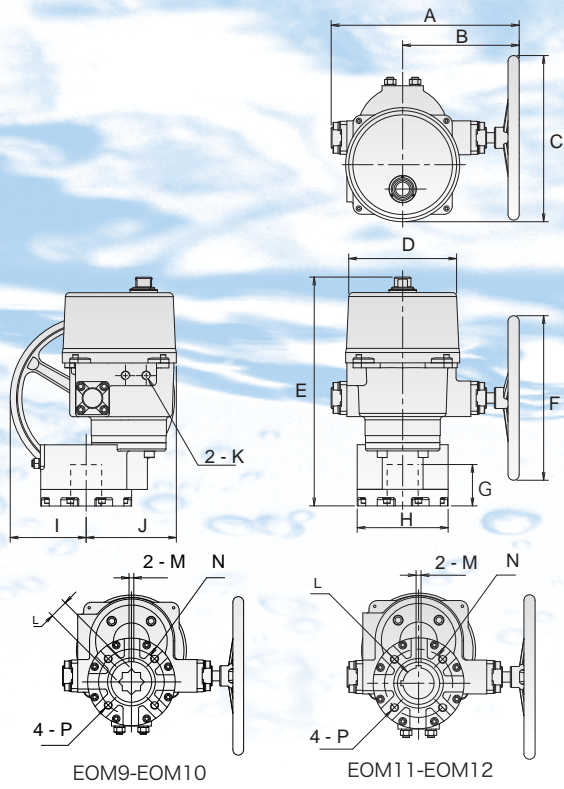
Dimension Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Flange Type
EOM4-EOM6	15.51	10.83	11.57	8.54	12.48	7.64	1.57	4.92	7.24	4.33	1/2"	1.42	4.02	M10 x1.50	F10



•Note : with torque switch A=17.12

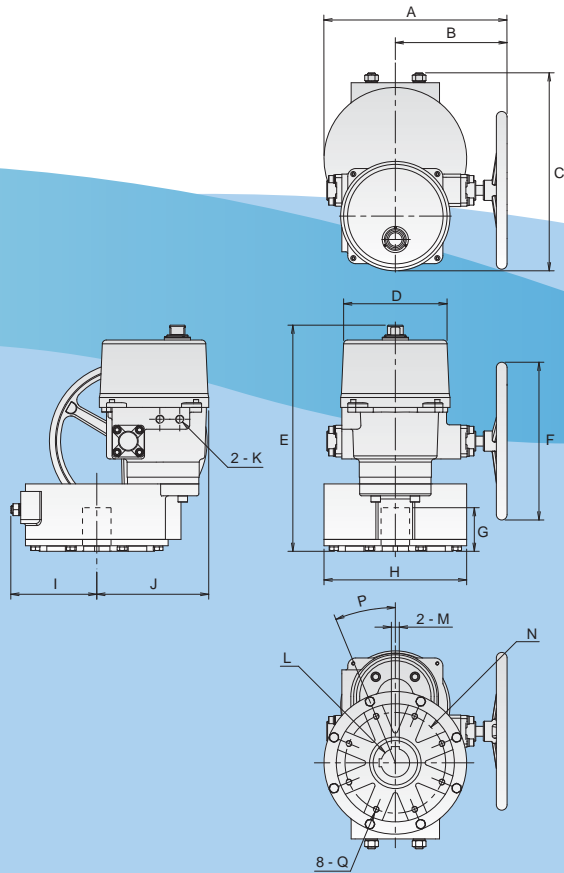
Unit:Inches

Dimension Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	Flange Type
EOM7	13.66	8.94	13.23	8.54	15.98	11.61	2.36	7.09	9.25	3.98	1/2"	4.92	1.42	F14/F12(std)
EOM8	13.66	8.94	13.23	8.54	15.98	11.61	2.36	7.09	9.25	3.98	1/2"	4.92	1.42	F12/F14(std)



Unit:Inches

Dimension Model No.	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Flange Type
EOM9-EOM10	17.91	11.10	15.83	10.28	21.81	15.67	3.94	8.66	7.24	8.58	1/2"	1.81	0.47	6.50	M20x2.5	F16
EOM11-EOM12	17.91	11.10	15.83	10.28	21.81	15.67	3.94	8.66	7.24	8.58	1/2"	2.95	0.47	6.50	M20x2.5	F16



Unit:Inches

Dimension Model No.	A	B	C	D	E	F	G	H	I	J	K	L*	M	N	P	Q	Flange Type
EOM-13	18.19	11.10	19.68	10.28	22.48	15.67	4.33	14.17	8.54	11.14	1/2"	2.83	0.78x0.47	10.00	0.89	M16x2.0	F25

\* Requires Bracket/Coupling



# OPTION ITEMS

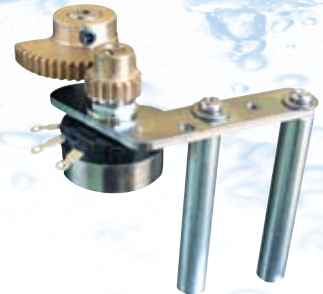


## TORQUE SWITCHES

Adjustable cam activated torque switches to provide over-load protection. It can only apply to EOM-2 ~ 13.



EOM-1, EOM-A & EOM-A-M  
(1K $\Omega$  or 5K $\Omega$ )



EOM-2 ~ 13  
(1K $\Omega$  or 5K $\Omega$ )

## POTENTIOMETER UNIT

It is synchronous turn with transmission shaft, and it can provide feedback signal for position indicator.



(with lock)



(without lock)

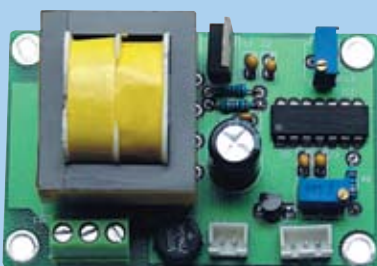
## LOCAL CONTROL UNIT

Local / Remote selection switches.  
Open / Close selection switches.  
It can only apply to EOM-2 ~ 13.



## MODULATING CONTROLLER FOR EOM-2~13

Modulating actuator: 30% or 75% duty cycle for EOM-2~8 ,  
50% duty cycle for EOM-9~13.  
It is a board inside actuator and supplied for EOM-2 ~ 13.  
Input signal: 4-20mA, 1-5V, 2-10V. Output signal: 4-20mA, 2-10V.



EOM-2 ~ 13

## CURRENT POSITION TRANSMITTER

It works with potentiometer unit and provides 4-20mA output signal for position indicator.



## MODULATING CONTROLLER FOR EOM-1, EOM-A & EOM-A-M

It is a board inside actuator and supplied for EOM-1 & EOM-A. Input signal: 4-20mA, 1-5V, 2-10V. Output signal: 4-20mA, 2-10V.

# Value Valve Electric Actuator Ordering Matrix

MODEL NUMBER MATRIX - EXAMPLE PART NUMBER - EOM- 4 - A - 0 - 2 - 9				
EOM- 4	§	A	§	0 - 2 - 9
MODEL	§	VOLTAGE	§	OPTIONS
3543 in lbs	§	120	§	ON-OFF / SINGLE PHASE / 2 EXTRA LIMIT SWITCHES
EOM-2	§	A = 120 VAC	§	0 = ON-OFF (EOM1-EOM12)
EOM-1	§	B = 220 VAC	§	1 = MODULATING (EOM1-EOM12)
EOM-A	§	C = 380 VAC	§	2 = 1 PHASE (EOM1-EOM12)
EOM-2	§	D = 460 VAC	§	3 = 3 PHASE (EOM2-EOM12)
EOM-3	§	E = 12 VAC ( EOM1 - EOM6)	§	4 = 3 PHASE WITH LOCAL-REMOTE CONTROL (EOM2-EOM12)
EOM-4	§	F = 12 VDC ( EOM1 - EOM6)	§	5 = 3 PHASE / MODULATING / LOCAL-REMOTE CONTROL (EOM2-EOM12)
EOM-5	§	G = 24 VAC (EOM1 - EOM12)	§	6 = 1K OHM POTENTIOMETER (EOM2-EOM12)
EOM-6	§	H = 24 VDC (EOM1 - EOM12)	§	7 = TORQUE SWITCHES (EOM2-EOM12)
EOM-7	§	I = 240 VAC	§	8 = SINGLE INPUT
EOM-8	§	J = 340 VAC	§	9 = 2 EXTRA LIMIT SWITCHES (EOM1-EOM12)
EOM-9	§		§	10 = EXTENDED DUTY CYCLE (EOM2-EOM13)
EOM-10	§		§	11 = CURRENT POSITION TRANSMITTER (EOM2-EOM12)
EOM-11	§		§	12 = Not Used
EOM-12	§		§	13 = 1 PH., LOCAL-REMOTE CONTROL, W/LOCAL-REMOTE STATUS FEEDBACK
EOM-13			§	13ED = 1 PH., LOCAL-REMOTE CONTROL, WITH LOCAL-REMOTE STATUS FEEDBACK RELAY AND EXTENDED DUTY MOTOR
			§	14 = HARD ANODIZING AND NYLON COATED HOUSING (EOM1-EOM12)
			§	15 = 1 PHASE, 50 HERTZ (EOM2-EOM12)
			§	16 = 3 PHASE, 50 HERTZ (EOM2-EOM12)
SEE ELECTRIC OPERATOR BROCHURE FOR COMPLETE OPTIONS				

REV. 3/2010

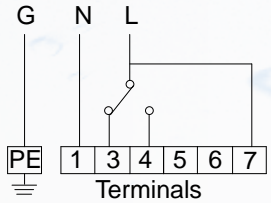


# Simplified Operation Manual

EOM-1 ~ EOM-13, EOM-A, EOM-A-M, BM-2 110/220/24V Actuator (ON/OFF, 3 Point Control)

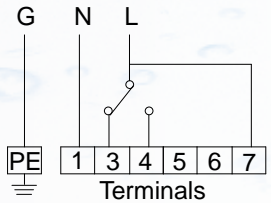
## Wiring Diagram

110/220V a.c.  
30% duty cycle



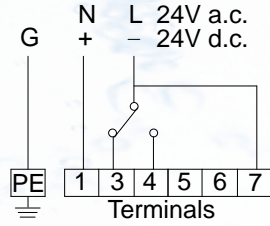
L to	Actuator
3	Open
4	Close
7	Heater

110/220V a.c.  
75% duty cycle



Power to	1, 7
L to	Actuator
3	Open
4	Close

24V a.c./d.c. Auxiliary Switches (SPDT Relay)



Power to	1, 7
L to	Actuator
3	Open
4	Close

A	B	C	E	F
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EOM-1, EOM-A

A	B	C	D	E	F
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EOM-2~13, BM-2

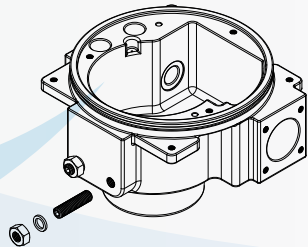
Actuator Position	EOM-1 EOM-A	EOM-2~13 BM-2
Fully open	A - B	A - C
Fully Close	A - E	D - F

Details refer to Travel switches adjustment.

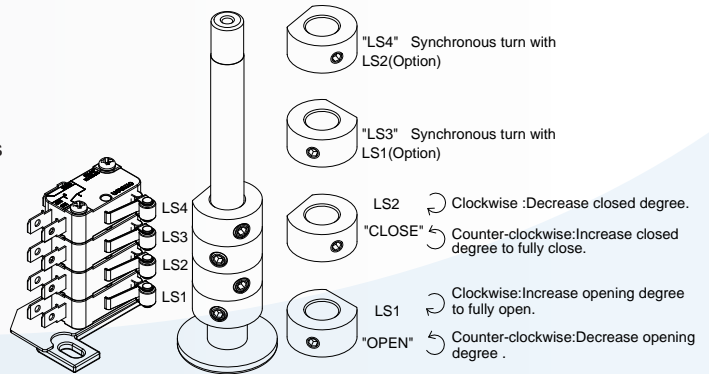
The quarter-turn actuator is provided with a limiting of manual rotation device to avoid over-travel with the hand-wheel.

Before setting the limit switches, please adjust the mechanical stops.

### Mechanical Stops adjustment

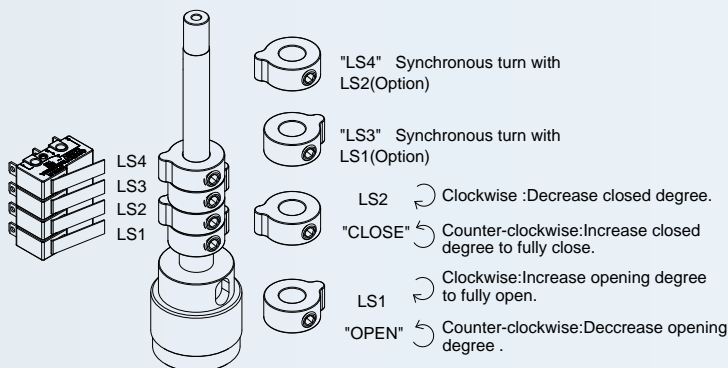


1. To loosen the screws
2. To adjust limit switches & travel cams.
3. To adjust the screws
4. To reverse one cycle



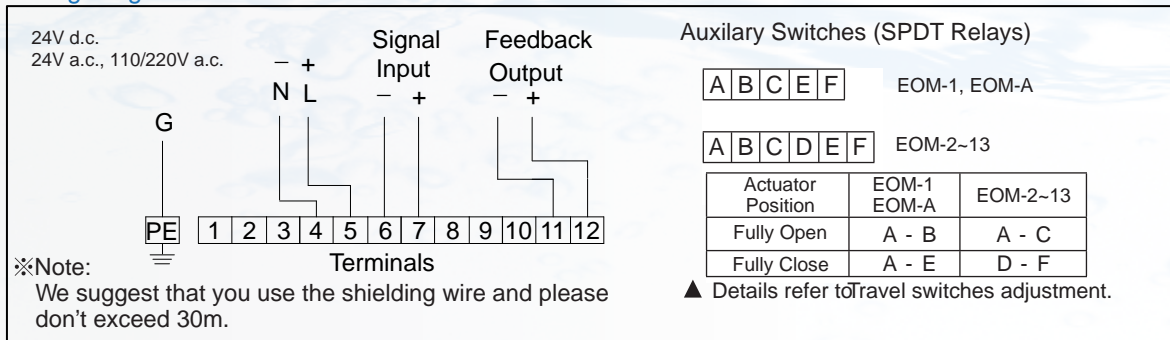
【OPEN】【CLOSE】

### Travel switches adjustment for EOM-1 & EOM-A,



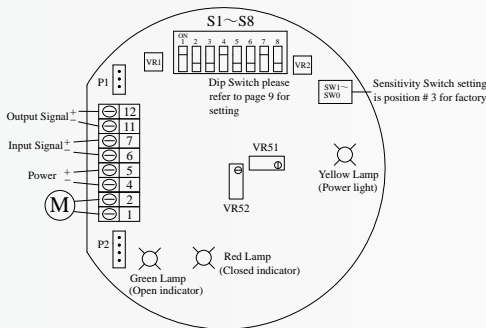
# EOM-1~ EOM-13, EOM-A, EOM-A-M 110/220/24V Actuator (Modulating , 30% & 75% duty cycle)

## Wiring Diagram

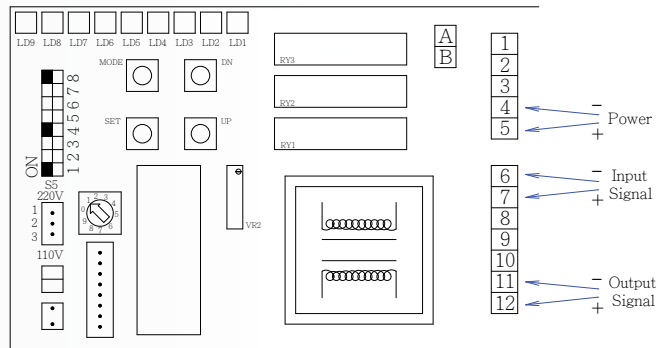


## Modulating Board Set Up

EOM-1 & EOM-A, EOM-A-M



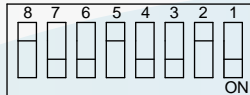
EOM-2 ~ EOM-13



▲ Disconnect power supply before changing the following settings.

## Dip Switch setting

\* S1~S8



\* S3, S4 & S5 for out put signal

Output Signal	S3	S4	S5
2-10V	ON	OFF	ON
4-20mA	OFF	ON	OFF

\* S1, S2 for input signal

Input Signal	S1	S2
2-10V	OFF	ON
4-20mA	ON	OFF
1-5V	OFF	OFF

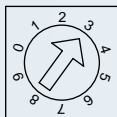
\* S7 & S8-Actuator response to the loss of control signal.

When signal fails	S7	S8
Full closed	OFF	ON
Full open	ON	OFF
Stops	ON	ON

\* S6 - Direction of travel in response to the control. ( Factory setting is OFF. )

S6	Symbol
OFF	90° Signal
ON	90° Signal

sensitive switch: (Factory setting is position "3")



Position "0" : Lowest Sensitive, 0-90 divided into 17 steps.

Position "1" : Highest Sensitive, 0-90 divided into 70 steps.

## Setting for OPEN and CLOSE

- Keep pressing "SET" for 3 seconds, then LED9 comes on, it will enter the manual mode.
- Keep pressing "UP" until LED2 comes on (fully-open), then supplies the input signal (5V or 10V or 20mA) and presses "MODE" once.
- Keep pressing "Down" until LED1 comes on (fully-close), then supplies the input signal (1V or 2V or 4mA) and presses "MODE" once.
- After finishing the above settings, press "SET" once.  
To reset and return to the original status – Please power off and get troubleshooting, then power on.

LED1 : Fully - Closed	LED6 : Motor Thermostat Turn Off
LED2 : Fully - Open	LED7 : Input Signal Short Circuit
LED3 : Power	LED8 : Motor Current Overload
LED4 : Abnormal Voltage	LED9 : Manual Control
LED5 : Wrong Input Signal	





# Spring Return Actuator

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

2010  
April

# Spring Return Actuator

In addition to the normal function, these actuators are designed to provide fail-safe positioning of valves and dampers upon loss of supply voltage. A mechanical spring set is utilized to position the controlled device to either the fully OPEN or fully CLOSED position without any external power source. A mechanical **BUFFER** employed at the end of the spring stroke reduces the dynamic effects of the spring return system. A Clutchless, leverless manual override design provides full-time manual positioning of the controlled device. The design has already won the new Patent in Taiwan, U.S.A, Japan and China.

## Specification

Model	Max Torque (In.Lbs)	Weight (Lbs)	Flange Size (ISO 5211)
ES 500	443	60	F07
ES 1300	1150	126	F10
ES 2000	1770	209	F12
ES 2600	2299	209	F12

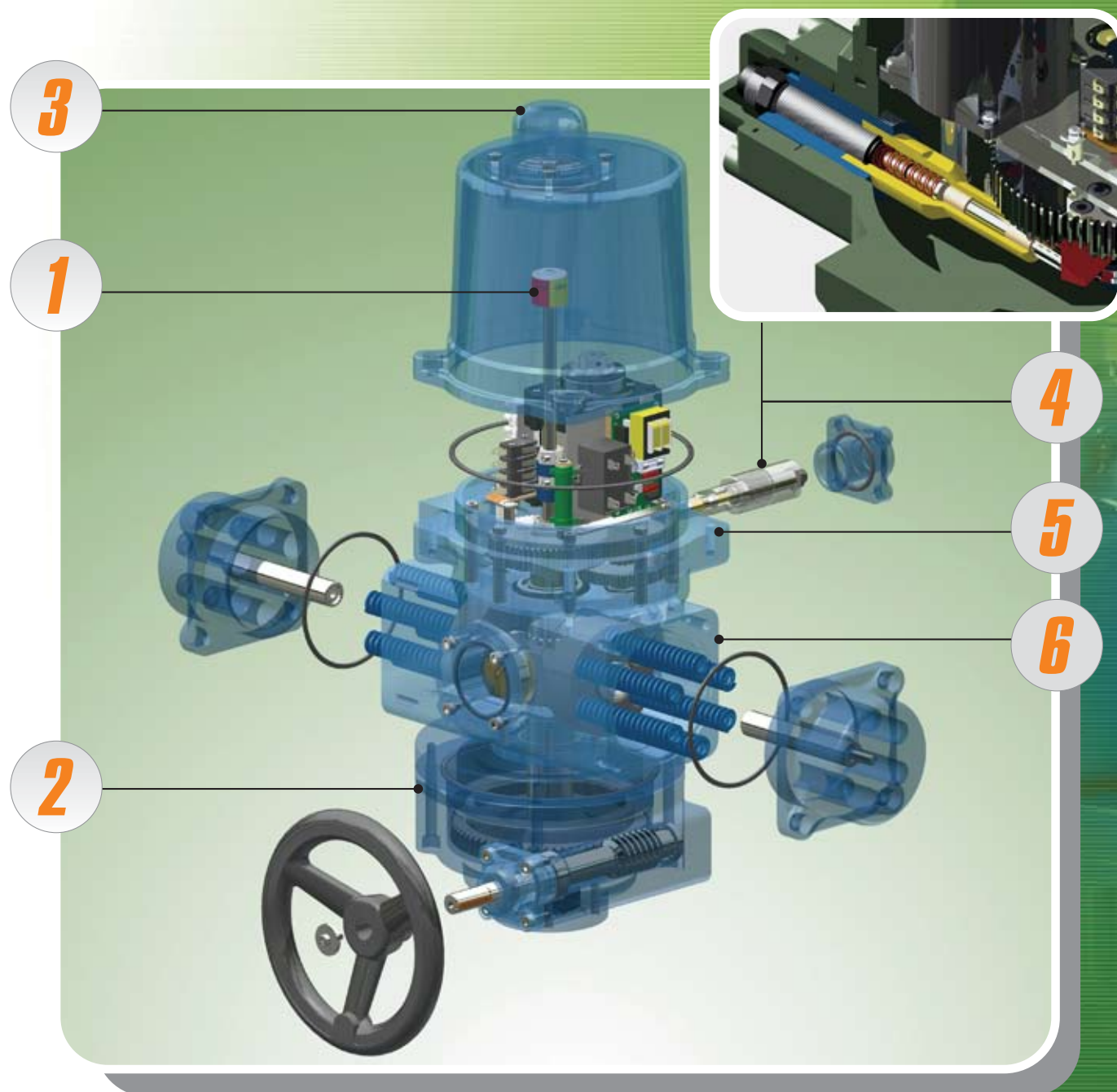
## Model Selection Table





# MAJOR Components

Spring Return actuators are suitable for ball valves, butterfly valves, damper systems, or any quarter-turn application requiring mechanical fail-safe positioning.



**1** Position Indicator

**4** Buffer Structure

**2** Manual Override

**5** Main Housing

**3** Windows Protection Cover

**6** Spring & Rack Gear Structure

# General Information and Options

## Standard Capability

- Duty Cycle Rating : 50% (compliance to IEC standard)
- Two - Position Control

## Ambient Temperature Range

- Temperature : -22°F ~ +149°F
- Humidity : 30% ~ 95%

## Enclosure

- Material : aluminum alloy, powder coated

## Lubrication

- The gear train has been factory lubricated for life under normal operating conditions.

## Position Indicator

- All models are equipped with a direct - drive position indicator on the top of actuator cover.

## Various Options

- Manual Override
- Modulating Controller
  - Input Signal : 4 - 20mA, 1 - 5V , 2 - 10V
  - Output Signal : 4 - 20mA, 2 - 10V
  - Modulating Type is Without "Buffer"**
- Floating Control
- Space Heater
- Heater Thermostat
- Additional Limit Switches (2 Units)
- Potentiometer Unit (1K Ohm or 5K Ohm)
- Current Position Transmitter
- Operating Direction
  - Standard : Fails Clockwise
  - Optional : Fails Counter - Clockwise
- Conduit Entrance
  - Standard : 1/ 2"NPT
  - Optional : 3/4"NPT, M20
- Various Voltage
  - 110 / 220V AC, 24V AC / DC, 380VAC, 440VAC
- Nylon Coated Enclosure Material

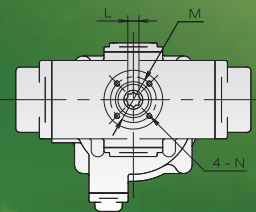
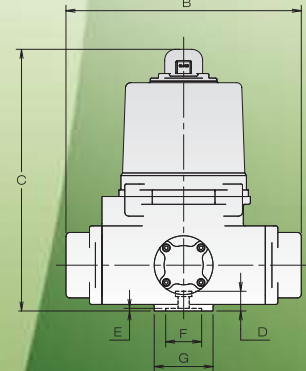
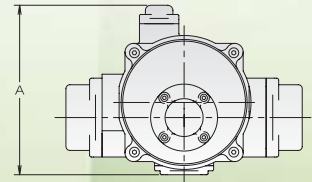
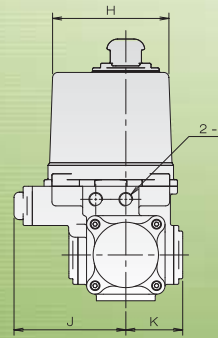


## Notes

- Direction of rotation is based on viewing actuator from top.
- Drawing shows actuator output shaft in power fail clockwise position.
- Standard unit fails clockwise.
- Optional unit fails counter-clockwise.

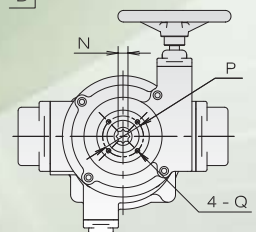
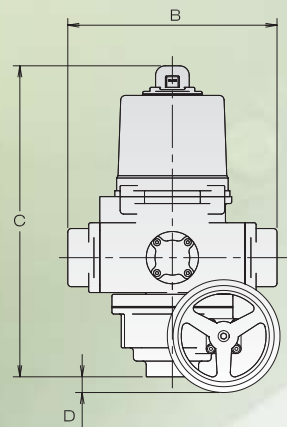
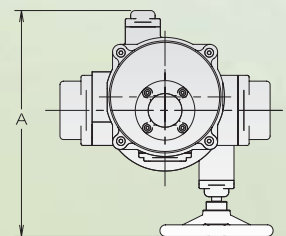
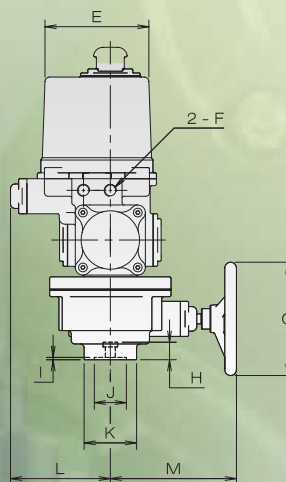


## Standard



Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	Flange Type
ES500	10.16	14.17	15.75	1.18	0.16	2.17	3.54	7.01	1/2"	6.73	3.43	0.67	2.76	M8 x 1.25	F07
ES1300	14.37	18.19	18.82	1.54	0.20	2.76	4.92	10.31	1/2"	9.72	4.65	0.87	4.02	M10 x 1.5	F10
ES2000	17.24	23.62	21.57	1.77	0.20	3.35	5.91	11.97	1/2"	12.01	5.24	1.06	4.92	M12 x 1.75	F12
ES2600	17.24	23.62	21.57	1.77	0.20	3.35	5.91	11.97	1/2"	12.01	5.24	1.06	4.92	M12 x 1.75	F12

## With Manual Override



Model	A	B	C	D	E	F	G	H	I	J	K	L	M	N	P	Q	Flange Type
ES500	15.24	14.17	21.06	1.06	7.01	1/2"	7.64	1.18	0.16	2.17	3.54	6.73	8.50	0.67	2.76	M8 x 1.25	F07
ES1300	19.02	18.19	25.31	2.28	10.31	1/2"	11.65	1.54	0.20	2.76	4.92	9.72	9.29	0.87	4.02	M10 x 1.5	F10
ES2000	23.19	23.62	29.06	3.94	11.97	1/2"	15.75	1.77	0.20	3.35	5.91	12.01	11.18	1.06	4.92	M12 x 1.75	F12
ES2600	23.19	23.62	29.06	3.94	11.97	1/2"	15.75	1.77	0.20	3.35	5.91	12.01	11.18	1.06	4.92	M12 x 1.75	F12

**110/120V AC, 1 PHASE**

Run - Full Load Ampere

Lock - Locked Rotor Ampere

Model	Operating Time ( Sec / 90° ) ( 60Hz / 50Hz )		Current ( 60Hz / 50Hz )			
			110V AC / 1PHASE		120V AC / 1PHASE	
	Motor	Spring	Run	Lock	Run	Lock
ES500	7 / 9	3	1.0 A / 1.3 A	2.0 A / 2.2 A	1.5 A / 2.5 A	2.8 A / 3.0 A
ES1300	7 / 9	8	2.6 A / 4.5 A	10 A / 10.5 A	3.8 A / 6.9 A	11 A / 11.5 A
ES2000	11 / 13	12	2.6 A / 4.5 A	10 A / 10.5 A	3.8 A / 6.9 A	11 A / 11.5 A
ES2600	14 / 17	12	2.6 A / 4.5 A	10 A / 10.5 A	3.8 A / 6.9 A	11 A / 11.5 A

**220/240V AC, 1 PHASE**

Model	Operating Time ( Sec / 90° ) ( 60Hz / 50Hz )		Current ( 60Hz / 50Hz )			
			220V AC / 1 PHASE		240V AC / 1 PHASE	
	Motor	Spring	Run	Lock	Run	Lock
ES500	7 / 9	3	0.6 A / 0.7 A	1.0 A / 1.2 A	0.7 A / 0.8 A	1.3 A / 1.5 A
ES1300	7 / 9	8	1.5 A / 2.2 A	5.0 A / 5.1 A	2.1 A / 3.8 A	5.6 A / 5.7 A
ES2000	11 / 13	12	1.5 A / 2.2 A	5.0 A / 5.1 A	2.1 A / 3.8 A	5.6 A / 5.7 A
ES2600	14 / 17	12	1.5 A / 2.2 A	5.0 A / 5.1 A	2.1 A / 3.8 A	5.6 A / 5.7 A

**380/440V AC, 3 PHASE**

Model	Operating Time ( Sec / 90° ) ( 60Hz / 50Hz )		Current ( 60Hz / 50Hz )			
			380V AC / 3 PHASE		440V AC / 3 PHASE	
	Motor	Spring	Run	Lock	Run	Lock
ES500	7 / 8.5	3	0.4 A / 0.4 A	0.5 A / 0.6 A	0.3 A / 0.4 A	0.5 A / 0.6 A
ES1300	7 / 8.5	8	1.0 A / 1.5 A	2.8 A / 3.0 A	0.7 A / 1.0 A	2.1 A / 2.2 A
ES2000	11 / 13	12	1.0 A / 1.5 A	2.8 A / 3.0 A	0.7 A / 1.0 A	2.1 A / 2.2 A
ES2600	14 / 17	12	1.0 A / 1.5 A	2.8 A / 3.0 A	0.7 A / 1.0 A	2.1 A / 2.2 A

**24V AC / DC, 1 PHASE**

Model	Operating Time ( Sec / 90° ) ( 60Hz / 50Hz )		Current ( 60Hz / 50Hz )	
			24V AC / DC	
	Motor	Spring	Run	Lock
ES500	7	3	3.0 A	4.0 A
ES1300	8	3	9.0 A	19.0 A
ES2000	11	3	9.0 A	19.0 A
ES2600	17	3	9.0 A	19.0 A



# ASSEMBLIES





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