



# emtork

YOUR QUALIFIED PARTNER IN ACTUATOR TECHNOLOGY



**ELECTRIC ACTUATORS FOR  
VALVES & DAMPERS**

# emtorK Electric Actuators for Valves & Dampers.

The "Emtork" Electric Actuators are electromechanical units used for operating the final control elements like valves or dampers to control the flow of fluids flowing thru the pipes or ducts. The specific advantages of using these units are :

- Ease of operation.
- Remote control facility.
- Proportional action of final control element in close loop system.
- Attaining & holding the desired preset position of the valve/damper.
- Various indications & alarms are available on the remote control panel & also on the unit.
- Emergency manual operation possible in case of power failure.
- Works on most convenient & easily available source of energy i.e. electricity.
- Models available to cover wide range of valves & dampers.
- Units with Integral starter will save cost of cables.
- Units with Electronic controller will facilitate field programming.

application

The Basic design of the Emtork Actuator consists of an electric motor, reduction gear unit and control compartment.

Various models have been developed to suit operating torque, speed, process parameters, area of operation etc.

Additional supplementary spur and worm gear boxes are offered to get higher operating torques and quarter turn motion.

Linear motion actuators have been developed to impart the required thrust to operate globe valves.

The models are available for on / off and regulating duty and also for hazardous area application.

## Modes, Types & Models of Emtork Actuators :

On/Off-Isolating Modulating/ Regulating Safe Area Flame/Explosion Proof	}	Multiturn Quarterturn Linear	_____ M30, M60, M80, M120, M150, M200, M250, M300 M500, M600, Also with supplementary spur gear boxes. _____ QM0, QM1, Rotary actuator with supplementary worm gear boxes Also TM0/WG & TM1/WG _____ LM0,LM1 & Rotary actuator with attachment for linear motion
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## Features of Emtork Actuators : Standard Features

- Electric motor TEFC, 3ph, S-1 Duty
- Insulation class 'F'
- Travel limits switches -2 Nos (1NO + 1 NC)
- Torque limits switches -2 Nos(1 NO + 1 NC)
- Continuous type local position indicator
- Handwheel with clutch mechanism
- Protection class IP 65
- Various types of output couplings viz A/B/C/D/E as per DIN 3210
- Hammer-blow effect

## Optional Features

- Electric motor- TESC,3ph,S2 OR S4 Duty
- Better class of insulation for motor
- Travel limits switches 2 NO+2 NC in place of 1 NO+1 NC-2 Nos
- Torque limits switch 2 NO + 2 NC in place of 1NO+1NC-2Nos
- Additional Travel limit switches (1 NO + 1 NC)-4Nos(Extra) -or 2No. +2NC - 2 Nos. extra
- Feed back potentiometer
- Remote position indicators-Analogue / Digital / Bar graph
- Space heater
- Electromagnetic, Electronic brake for the motor
- Protection class IP67/IP68
- Various types of local & remote panels
- Foot mounting brackets
- Set of linkages
- Tailor made accessories to suit customer's specific requirements
- Thermostats in motor winding
- Field / Panel mounted source to Convert 220VAC to 24 VDC required for transmitter
- Supplementary Spur Worm gear boxes
- Attachment for linear motion
- Retrofitting

design

## Details of features of actuators

### Drive motor :

Emtork actuators are equipped with three phase, squirrel cage induction motor having high starting torque. These motors comply with IS-325 specifications.

Supply condition : 415 VAC, 3ph /  
380VAC, 3ph /  
2 20 VAC, 1ph  
Enclosure : TEFC/ TESC  
Class of insulation : std.'F'  
Class of protection : IP55 / 65/67/68  
Duty : std.S1/optional  
S2 or S4  
Ambient temp - 50<sup>o</sup> c

### Travel limit switches :

These switches are provided to cut off the actuator supply at the end of the preset travel in either direction. These switches are operated by cams which can be reset at site. Additional travel switches can be provided to get feed back of various valve positions

### Torque limit switches :

These switches cut off the actuator supply in case the torque developed in the system is more than the desired preset value, in either direction. Torque switch in closing direction can also be set to achieve leak-proof / tight shut off of the valve.

### Local indicator :

A continuous type mechanical local position indicator is provided on the actuator to show the actual mechanical position of the final control element.

### Handwheel with motor overriding feature :

Emtork actuator is provided with a handwheel for emergency manual operation. The selector fork lever when put on to 'hand-position', disconnects the motor drive and connects to hand wheel drive so that desired operation can be done by hand wheel. When the motor is switched on, the hand wheel connection gets disengaged automatically and the operation is carried out by electric power.

### Weather protection :

The emtork actuators are supplied with IP65/IP67/IP68 class of protection as per IS-4691 & IS-2147 duly certified by concerned authorities. The ingress of dust and water is prevented to protect the inside mechanism.

### Output shaft designs :

The basic rotary actuators are supplied with output shaft couplings types A,B,C,D,E as per DIN 3210.

### Hammer blow effect :

An inbuilt feature of the 'emtork' actuator and is achieved thru "lost motion principle" and by using higher starting torque motor.

### Feed back potentiometer / transmitter :

A feed back signal, in terms of change in resistance or current proportional to the valve position, is available thru potentiometer or transmitter. A non-contact LVDT type transmitter can also be provided.

### Remote indicators :

The signal coming from potentiometer is converted thru stabilised power source and read by analogue/digital on remote panel

### Space heater :

An anti-condensation heater can be provided in the switching compartment while using the actuator in humid/damp environment.

### Brake :

Electromagnetic or electronic brake can be provided for the motor to stop the actuator instantly

### Control panels :

Various types of control panels can be provided for local, remote and combined local plus remote operations of the actuator.

### Positioner :

Panel or field mounted electronic positioner can be supplied which can accept a control command of 4-20mA and position the final control element accordingly, 4-20 mA feed back signal is also available from the positioner.

### Integral panel - electrical hardware logic - model LP 601 :

A reversing starter consisting of push buttons, indicating lamps, contactors, O/L relay etc. can be supplied as an integral part of the actuator. This will save a major cost of cabling. A parallel operation & monitoring from remote station is also possible. A field mounted valve positioner unit can also be supplied in the integral panel. ( refer separate catalogue for integral panel)

### Integral panel - electronic PCB logic - model LP 602 :

Field programming thru electronic logic is possible by this integral panel. In addition to the electrical hardware various PCBs are provided to select the parameters such as inching / noninching operation, closing by torque switch etc. Parallel functions from remote station are also possible.

### Blinker transmitter:

An actuator mounted transmitter can be supplied which will indicate that the actuator is in running condition, thru a blinking lamp on control panel.

### Foot mounting brackets & set of linkages :

These items can be supplied to suit various site conditions so that the final control element can be operated from a distant location.

### Thermostats in motor :

These are embedded in the motor winding so as to protect the motor from burning due to overheating of motor winding.

### Source :

A field / panel mounted source can be supplied for converting 220 VAC to 12/24/36 VDC supply, which is normally required to energize a two wire transmitter.

### Supplementary spur gear boxes :

To increase the output torque of rotary actuators various types of spur gear boxes can be supplied. These gear boxes have variety of reduction ratios & output couplings viz A/B/C/D/E as per DIN 3210.

### Supplementary worm gear boxes :

Worm gear boxes can be supplied to convert the output motion of rotary actuator in to quarter-turn movement to suit the operations of butterfly, ball & plug valves. Various models are available with different reduction ratios. Out put coupling for these models will be normally 'E' for direct mounting & 'D' for mounting thru brackets & linkages.

### Linear attachment :

To convert rotary motion into linear to suit globe valves, a linear attachment is provided for the actuator. Various thrust values are available to suit the applications.

### Retrofitting :

To convert the existing manually operated valves into " motor-operated", retrofitting services are offered; which includes, site study, selection of equipment, spot measurement, designing & manufacturing mounting brackets, couplers, cabling etc. and installation and commissioning of equipment on turnkey basis. This will also cover the services of comparing / synchronizing the system with control parameters of other instruments.

## Ordering Specifications :

### I) Basic models with supplementary spur & worm gear boxes

M		S	G	W	G			
M30	OUTPUT SPEED	SUPPLEMENTARY SPUR GEAR BOXES		SUPPLEMENTARY WORM GEAR BOXES		OUTPUT COUPLING TYPE		
M60		NOT REQD	SG00	NOT REQD	WG000	A		
M80(M0)	RPM	REQD	SG02	REQD	WG030	B		
M120	010		SG04		WG050	C		
M150	015		SG06		WG075	D		
M200 (M1)	020		SG08		WG100	E		
M250	030		SG12		WG200			
M300	040				WG250			
M500	065				WG400			
M600	090				WG700			
	120				WG1000			
	150				WG1500			

### II) Technical and ordering specifications for QMO & QM1 Quarterturn actuators :

Model	Output torque Nm	Output speed RPM	Time of operation Sec/90°	Motor Details	
				Rated power Kw	Rated speed RPM
QM0/001/E	200	1.2	12	0.75	1405
QM0/002/E	200	2.1	7	0.75	1405
QM1/001/E	350	0.4	38	0.75	1405
QM1/002/E	350	0.7	22	0.75	1405

### III) Technical & ordering specifications for LMO & LM1 Linear actuators :

Model	Output Thrust Kgs	*Output Speed of basic unit-RPM	Linear speed of operation mm/sec	stroke Length mm	Motor Details
LM0 /*-/75	3000	10 TO 365	1 TO 36.5	75	Refer motor details of basic MO & M1 models for respective speeds
LM1 /*-/100	4000	10 TO 120	1 TO 12	100	

- Notes :
- 1) LMO models are available with all the output speeds of basic MO model.
  - 2) LM1 models are available with all the output speeds of basic M1 model.
  - 3) The linear travel in both the models is 6mm/ revolution.
  - 4) Attachment for linear motion is available for other rotary models

### IV) Flame / Explosion Proof Actuators :

- Add the prefix 'F' to all the above model specifications when ordering for Flame / Explosion proof units.

Example : FM1 / 010 / SG00 / WG030 / E.



Torque Switch arrangement



Travel Switch arrangement

## Technical Specifications of basic actuator models

Model	Output Data			Actuator Self Locking	Motor Data					Mounting Base As per IS 9334
	Output Speed RPM (Aprox.)	Output Torque Nm Rated	Adj Range		Rated Power HP	No. of Poles	Rated Current AMP (Aprox.)	Power Factor FL	Effi. % (FL)	
M30	10,15,20	30	10-30	Yes	0.16	4	0.42	0.75	53	F10
	30,40			Yes	0.25	2	0.57	0.76	58	
	65, 90			Yes	0.35	2	0.71	0.79	62	
	120, 150			No	0.50	2	1.00	0.78	67	
M60	10,15,20	60	20-60	Yes	0.16	4	0.42	0.75	53	F10
	30,40,			Yes	0.25	2	0.57	0.76	58	
	65, 90			Yes	0.50	2	1.00	0.78	67	
	120, 150			No	1.00	2	1.70	0.82	75	
M80 (M0)	10 to 70	80	25-80	Yes	1.00	4	1.80	0.78	76	F10
	80 to 140			Yes	3.00	2	4.55	0.83	81	
	190 to 365			No	3.00	2	4.55	0.83	81	
M120	10,15,20	120	40-120	Yes	0.25	4	0.58	0.75	58	F10
	30,40			Yes	0.50	2	1.00	0.78	67	
	65, 90			Yes	1.00	2	1.70	0.82	75	
	120, 150			No	1.50	2	2.40	0.82	79	
M150	10,15,20	150	50-150	Yes	0.35	4	0.77	0.74	61	F10
	30,40			Yes	0.75	2	1.33	0.79	73	
	65, 90			Yes	1.50	2	2.40	0.82	79	
	120,155			No	2.00	2	3.10	0.86	78	
M200 (M1)	10 to 30	200	60-200	Yes	1.00	4	1.80	0.78	76	F14
	40 to 60			No	2.00	4	3.30	0.80	78	
	80 to 120			No	3.00	2	4.55	0.83	81	
M250	10,15,20	250	80-250	Yes	0.50	4	1.04	0.72	69	F14
	30,40			Yes	1.00	2	1.70	0.82	75	
	65, 90			Yes	2.00	2	3.10	0.86	78	
	120, 150			No	3.00	2	4.55	0.83	81	
M300	10,15,20	300	100-300	Yes	0.75	4	1.40	0.78	72	F14
	30,40			Yes	1.50	2	2.40	0.82	79	
	65, 90			Yes	3.00	2	4.55	0.83	81	
	120, 150			No	5.00	2	7.20	0.87	82	
M500	10,15,20	500	160-500	Yes	1.00	4	1.80	0.78	76	F14
	30,40			Yes	2.00	2	3.10	0.86	78	
	65, 90			Yes	5.00	2	7.20	0.87	82	
	120, 150			No	7.50	2	10.20	0.89	84	
M600	10,15,20	600	200-600	Yes	1.50	4	2.50	0.81	76	F14
	30,40			Yes	3.00	2	4.55	0.83	81	
	65, 90			Yes	5.00	2	7.20	0.87	82	
	120, 150			No	7.50	2	10.20	0.89	84	

- Note :
- 1] At higher speeds the rated output torque may get reduced slightly.
  - 2] For regulating Duty models the output speed of the actuator should be restricted up-to 40RPM to avoid inertia problems
  - 3] Additional details for regulating duty models will be available on request



□ 'QMO' Actuator with linkage



□ Actuator with Spur gear box



□ Actuator with worm gear box



□ Actuator with Integral Starter



□ Flame proof actuator



□ Actuator on butterfly valve



□ Actuator on Globe valve



□ Actuator on sluice valve



**marsh automation pvt. ltd.**

**Office & Works :**  
98A/25A, Hadapsar Ind. Estate,  
Pune - 411013 (INDIA)

**Tel.:** 0091-20-26875424/26879475/26877185  
**Fax:** 0091-20-26879475

**Email :** marshautomation@eth.net  
**Web Site :** www.marshautomation.com

Details Subject to change

