

## MANUAL GEAR ACTUATORS

Type M Series and MA manual gear actuators are recommended for use on JAMESBURY® ball and butterfly valves. For the sake of convenience, and where lever-handles present space problems, gear actuators are the ideal choice.

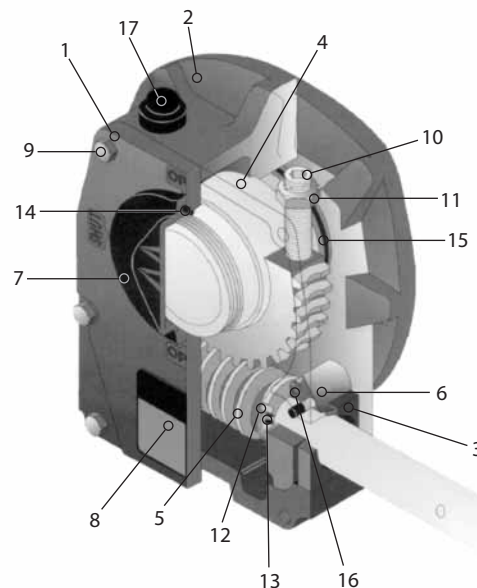
Type M Series and MA actuators are fully enclosed weather-proof, all-cast-iron, and carbon-steel construction. They are factory lubricated for their lifetime, requiring no future lubrication, and each unit includes a pointer to indicate valve position.

Standard M units are temperature rated from -40°F to +176°F (-40°C to +80°C). Standard MA units are temperature rated from -40°F to 212°F (-40°C to 100°C). Units with lower or higher temperature ratings are available on application (See How To Order section).

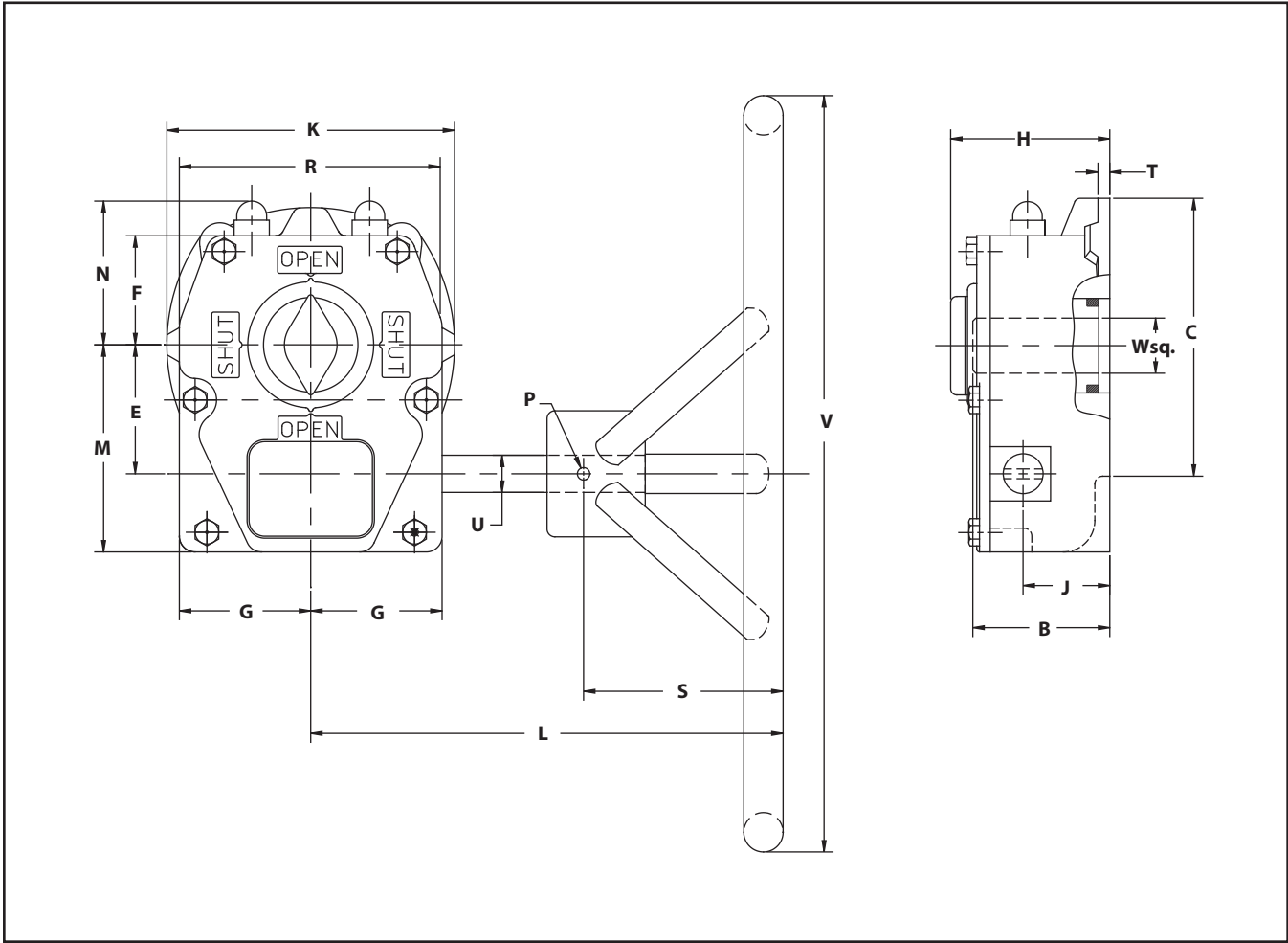
Type M Series and MA gear actuators are available factory-mounted on valves or separately for field installation.



Item	Components	Material Description	Material Specification
1.	Cover	Grey cast iron	BS1452 grade 260
2.	Gearcase	Grey cast iron	BS1452 grade 260
3.	Wormshaft oilseal	Injection moulded plastic	Hytrel 5526
4.	Quadrant	S.G. cast iron	BS 2789 grade 500/7
5.	Wormshaft	Nitempered steel	BS970 606M36
6.	Wormshaft bearings	Sintered iron copper	FC025 40
7.	Indicator cap	Injection moulded plastic	Acetal Kematal WR90
8.	Nameplate	Self adhesive aluminum	Black on bright background
9.	Cover screws	Hex head set screws	BS3692 grade 8.8
10.	Stop screws	Socket set screws	BS4168 part 2
11.	Locknut	Hex locknut	BS3692
12.	Bearing thrust washers	Needle thrust washer	Type AS
13.	Thrust bearings	Needle thrust bearing	Type AXK
14.	Indicator O-ring	Medium Nitrite	60-80 Shore hardness
15.	Quadrant O-ring	Medium Nitrite	60-80 Shore hardness
16.	Dowels	Hardened & ground steel	BS7055 type A
17.	Locknut protection caps	Injection moulded plastic	Low density polyethylene



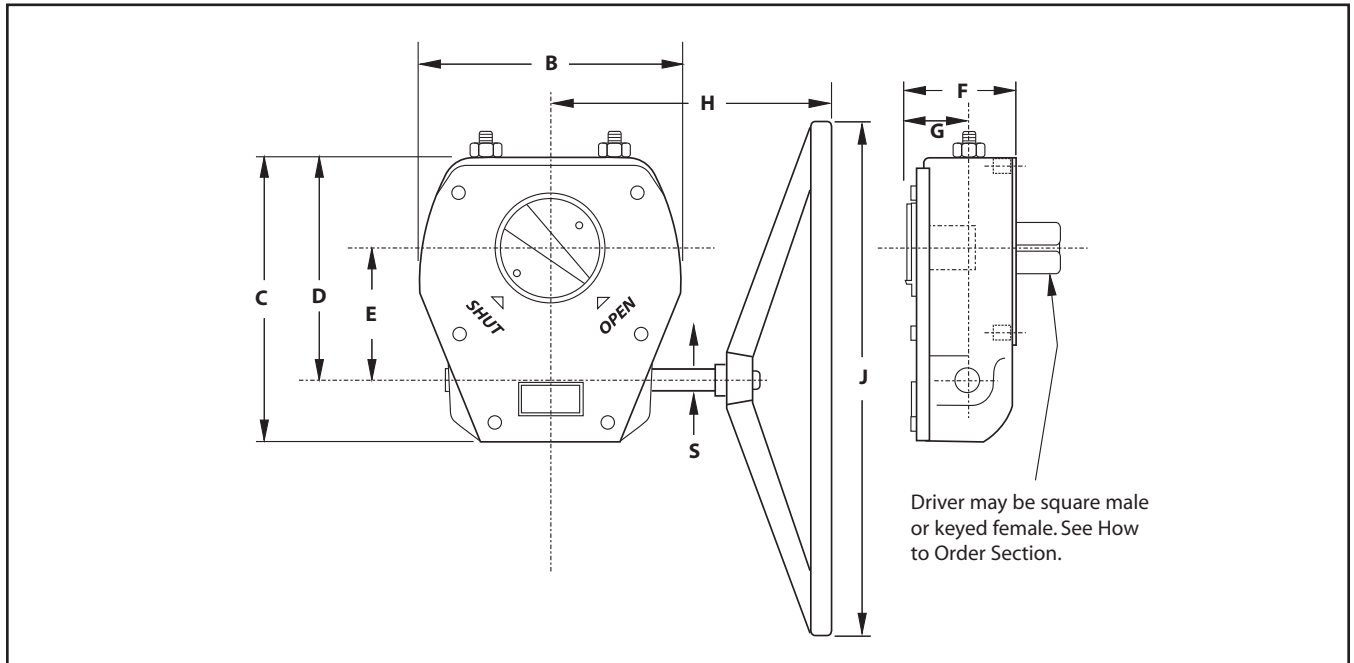
## DIMENSIONS



Approximate Dimensions - inches																			Approx. Weight lb.
Actuator	B	C	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	
M5/Q	2.01	3.46	1.52	1.28	1.65	2.28	1.04	3.46	5.23	2.44	1.77	0.16	3.31	1.29	N/A	0.47	6	0.55	6
M7/Q	2.01	3.46	1.52	1.28	1.65	2.28	1.04	3.46	5.23	2.44	1.77	0.16	3.31	1.29	N/A	0.47	6	0.75	6
M10/Q	2.24	4.41	2.05	1.73	2.09	2.64	1.38	4.57	7.77	3.29	2.28	0.20	4.21	3.44	0.18	0.59	12	0.87	10
M12/Q	2.83	5.91	2.63	2.20	2.60	3.19	1.65	5.91	10.30	4.13	2.95	0.24	5.25	4.94	0.30	0.79	18	1.42	18
M14/Q	3.19	7.56	3.52	2.60	3.25	3.68	1.97	7.80	12.21	5.16	3.39	0.24	7.24	6.19	0.30	0.79	24	1.81	32
M15/Q	3.62	9.25	4.84	3.44	4.37	4.15	1.97	9.92	15.76	7.01	4.49	0.31	9.76	7.69	0.37	1.18	30	1.81	60
M16/Q	4.45	11.42	6.06	3.31	4.92	5.00	1.97	12.41	17.75	8.23	4.61	0.31	8.34	8.69	0.39	1.18	36	2.17	103

Approximate Dimensions - mm																			Approx. Weight kg.
Actuator	B	C	E	F	G	H	J	K	L	M	N	P	R	S	T	U	V	W	
M5/Q	51	88	39	33	42	58	26	88	133	62	45	4	84	33	N/A	12	152	14	2.7
M7/Q	51	88	39	33	42	58	26	88	133	62	45	4	84	33	N/A	12	152	19	2.7
M10/Q	57	112	52	44	53	67	35	116	197	84	58	5	107	87	5	15	305	22	4.5
M12/Q	72	150	67	56	66	81	42	150	261	105	75	6	133	125	8	20	457	36	8.1
M14/Q	81	192	89	66	83	93	50	198	310	131	86	6	184	157	8	20	610	46	14.5
M15/Q	92	235	123	87	111	105	50	252	400	178	114	8	248	195	9	30	762	46	27.2
M16/Q	113	290	154	84	125	127	50	315	451	209	117	8	313	221	10	30	914	55	46.6

### DIMENSIONS



Approximate Dimensions - inches										Approx.
Actuator	B	C	D	E	F	G	H	J	S	Weight lb.
MA060	11.25	12.06	6.75	2.38	4.56	2.44	17.31	24.00	1.00	125
MA070	12.25	12.06	6.50	2.11	5.01	2.44	17.94	24.00	1.00	173
MA080	14.00	15.38	12.63	7.13	6.25	3.75	21.06	24.00	1.25	260
MA090	18.25	19.75	16.22	9.31	6.41	3.66	21.94	24.00	1.25	377

Approximate Dimensions - mm										Approx.
Actuator	B	C	D	E	F	G	H	J	S	Weight kg.
MA060	285	306	171	60	116	62	440	610	25	56.8
MA070	311	306	165	54	127	62	456	610	25	78.6
MA080	355	391	321	181	133	95	535	610	32	118.2
MA090	464	502	412	236	163	93	557	610	32	171.4

### ACTUATOR SELECTION

To select the proper actuator for a particular valve and service, first determine the maximum operating torque that will be required for the valve from the valve torque chart in the appropriate valve bulletin, taking into consideration valve size, seat material, maximum pressure differential, and service. Then refer to the tables on page 4 and select the actuator that will provide a torque output no less than the required operating torque for the valve.

**Note:** Full MA manual gear actuator designations carry two additional numbers after the above identifying designations, i.e. MA060-01. These two numbers indicate the output drive square or socket dimensions and will normally be determined by Metso or its distributors. Drive dimensions are shown in the How to Order section on page 5.

## ACTUATOR SELECTION TABLE

Actuator	Handwheel (inches)	Turns to Open	Max. Rim Pull (LBS)	Max. Input Torque (FT•LBS)	Max. Output Torque (FT•LBS)
M5/Q	6	10	40	10	92
M7/Q	6	10	67	17	184
M10/Q	12	10	67	30	369
M12/Q	18	11	76	57	644
M14/Q	24	15	100	100	1500
M15/Q	30	17	100	125	2563
M16/Q	36	22	100	150	4000
MA060	24	43	100	100	4200
MA070	24	45	112	112	5830
MA080	24	113	90	90	9000
MA090	24	180	90	90	15000

Actuator	Handwheel (mm)	Turns to Open	Max. Rim Pull (N)	Max. Input Torque (N•m)	Max. Output Torque (N•m)
M5/Q	152	10	178	14	125
M7/Q	152	10	298	23	250
M10/Q	305	10	262	40	440
M12/Q	457	11	338	77	874
M14/Q	610	15	445	136	2035
M15/Q	762	17	445	170	3477
M16/Q	914	22	445	204	5393
MA060	610	43	445	136	5695
MA070	610	45	498	152	7908
MA080	610	113	400	122	12204
MA090	610	180	400	122	20340

## HOW TO ORDER

To order a manual gear actuator, simply specify the appropriate model from the Actuator Selection Table on Page 4.

To specify a complete manual gear actuator simply make a selection from the code boxes below.

**EXAMPLE:** An M12/Q (644 FT•LBS [874 N•m] output) actuator with padlock flange.

1	2
M12/Q	PF

### M-SERIES

1	Actuator Series
	Size and Configuration
<b>M5/Q</b>	F05/14 mm (.55") Female Square
<b>M7/Q</b>	F07/19 mm (.75") Female Square
<b>M10/Q</b>	F10/22 mm (.87") Female Square
<b>M12/Q</b>	F14/36 mm (1.42") Female Square
<b>M14/Q</b>	F16/46 mm (1.81") Female Square
<b>M15/Q</b>	F16/46 mm (1.81") Female Square
<b>M16/Q</b>	F25/55 mm (2.17") Female Square

2	M Series Options
<b>PF</b>	Padlock flange on input
<b>HT</b>	High temperature +77°F to 392°F (+25°C to 200°C)
<b>MA</b>	Marinized / buried service

### MA-SERIES

1	Actuator Series
	Size and Configuration
<b>MA060-01</b>	1-5/8" (43 mm) Male Square
<b>MA060-02</b>	3" (80 mm) Female Key
<b>MA060-03</b>	3-1/4" (88 mm) Female Key
<b>MA070-05</b>	3" (80 mm) Female Key
<b>MA070-07</b>	3-1/2" (90 mm) Female Key
<b>MA070-10</b>	3-1/4" (88 mm) Female Key
<b>MA080-02</b>	3-1/2" (90 mm) Female Key
<b>MA080-05</b>	4" (100 mm) Female Key
<b>MA090-02</b>	3-1/2" (90 mm) Female Key
<b>MA090-06</b>	6" (150 mm) Female Key
<b>MA090-07</b>	5" (125 mm) Female Key

2	MA Series Options
<b>PF</b>	Padlock flange on input
<b>LT</b>	Low temperature -75°F to +212°F (-59°C to +100°C). Includes stainless steel components
<b>HT</b>	High temperature to 390°F (199°C)
<b>MA</b>	Marinized / buried service
<b>SS</b>	Sea Water submersible – Service to 82 ft. (25 m) depth
<b>HO</b>	Handwheel omitted

Special Epoxy, Handwheel Extension, Mitre Box, Drives – Contact Factory.

Subject to change without prior notice.

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