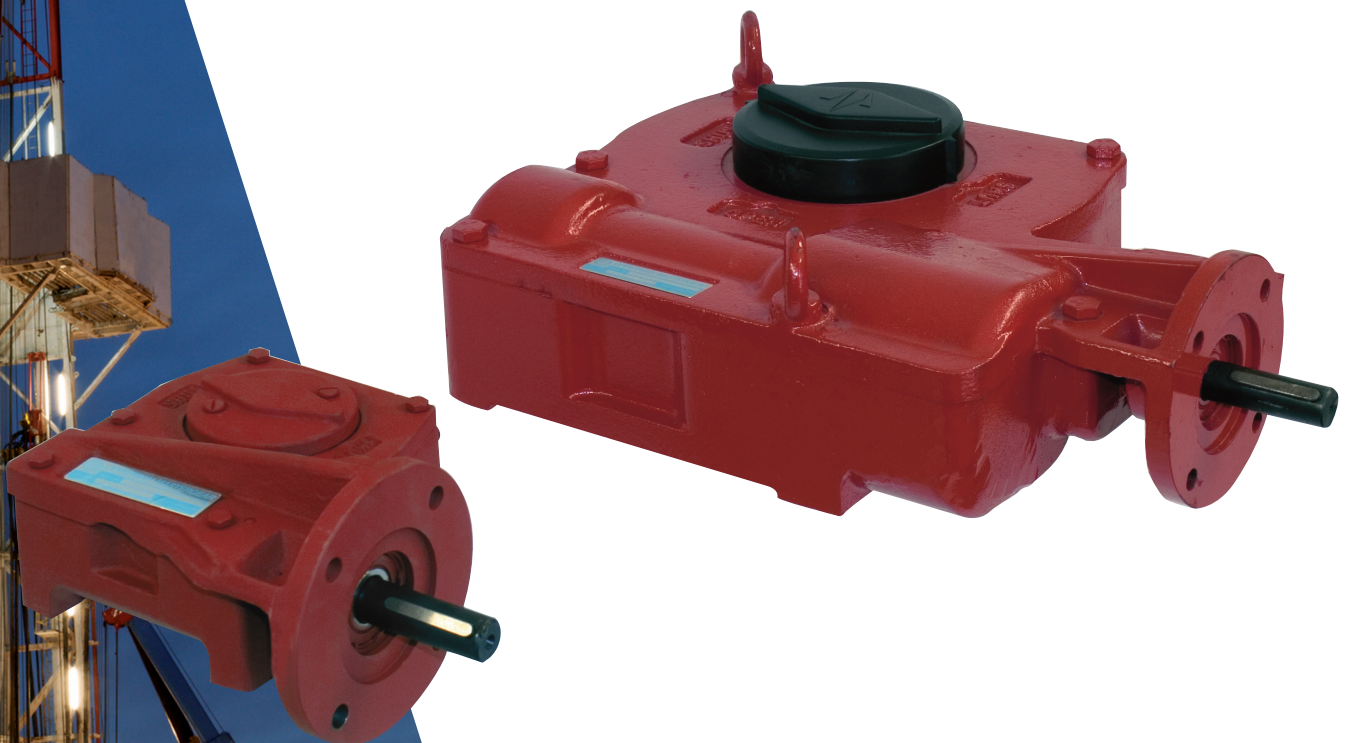


MASTERGEAR
WORLDWIDE



MF SERIES
MOTORIZABLE VALVE ACUATORS



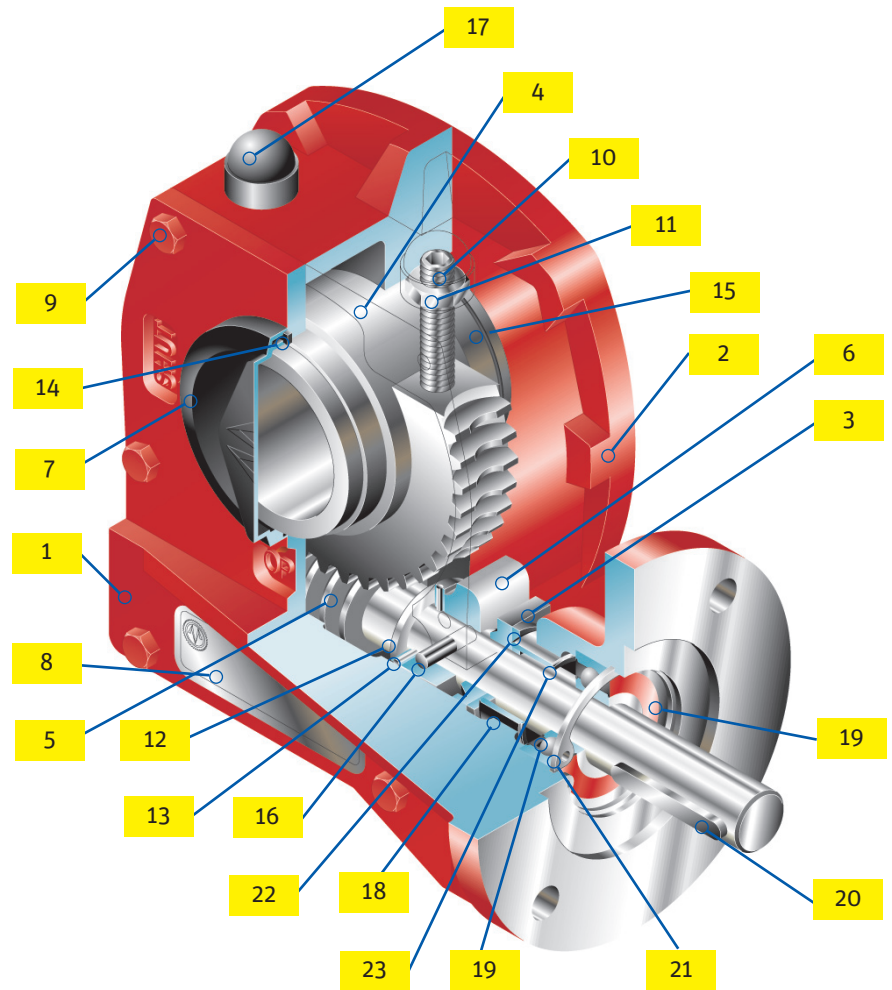
A Regal Brand

REGAL



General description

The MF series of 1/4 turn actuators provide a second stage gear reduction for multi turn actuator drives to meet torques and operating times required by the industry. Applications for buried service or remote drive can also be satisfied by utilizing the input flange feature. The cast iron construction and rugged design of the Mastergear "MF" range of valve actuators has been engineered to meet the arduous requirements demanded of industrial environments. Through corrosion resistant treatment of bore metal surfaces and the use of lip seals, the "MF" range is sealed to IP67. All models use high performance axial needle bearings which, combined with a one piece wormshaft, maximises the available mechanical advantage and overall unit efficiency.



Features & general specifications:

- Sealed to IP67
- Maintenance free
- Input flanges to ISO5210 & DIN3210 with keyed input shaft
- Available for buried service
- Optional output drive bushes
- Self locking
- High mechanical advantage
- Cast iron enclosure
- 90°±5° (adjustable) travel
- Up to 4500 Nm output torque
- 5 frame sizes
- 50% grease fill for life
- Capability to withstand an overload of twice the maximum torque rating
- -20°C to +80°C temperature range for continuous operation
- Unrivalled versatility for direct fixing to valves

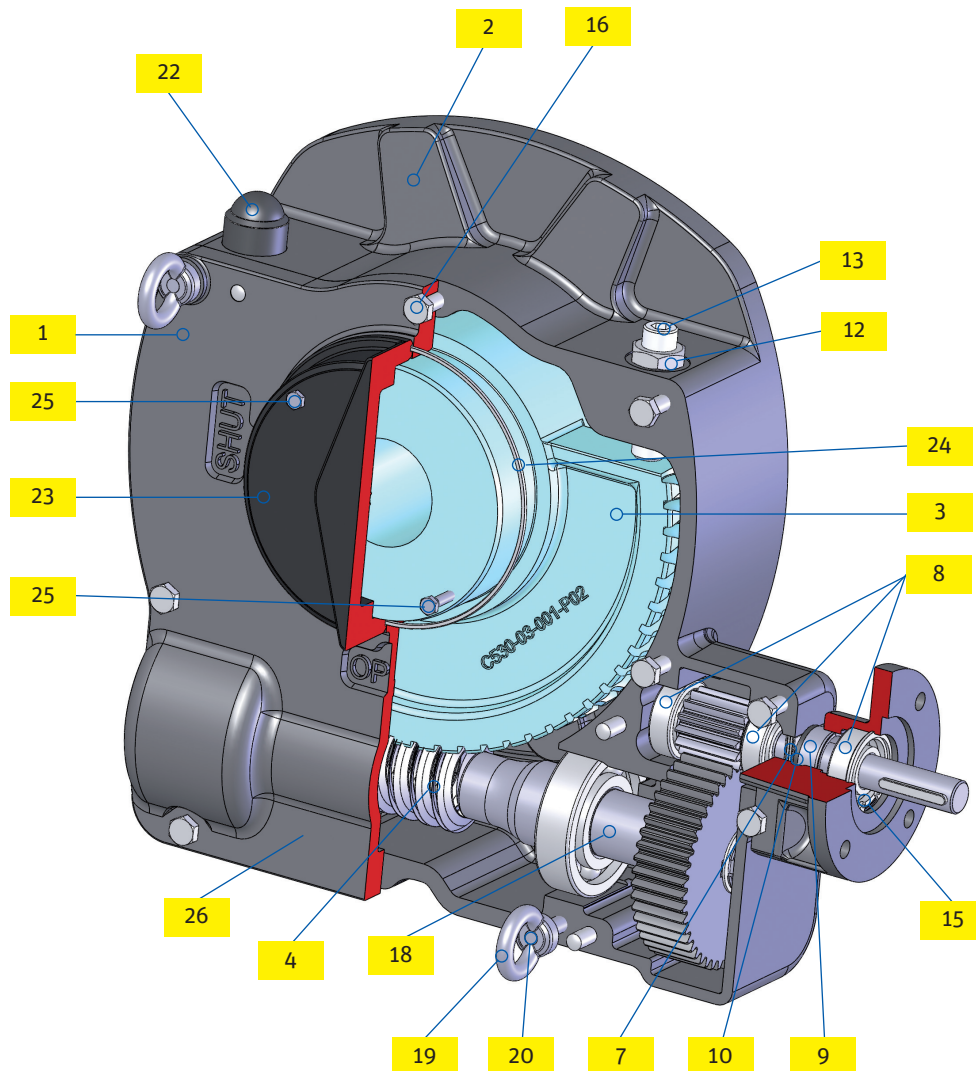
Item	Component	Material Description	Material Specification
1	Cover/input flange	S.G. cast iron	BS2789 grade 420/12
2	Gearcase	Grey cast iron	BS1452 grade 260
3	Wormshaft oilseal	Injection moulded plastic	HYTREL 5526
4	Quadrant	S.G. cast iron	BS2789 grade 500/7
5	Wormshaft	Nitempered steel	BS970 606M36
6	Wormshaft bearings	Sintered iron copper	FC025 40
7	Indicator cap	Cast iron	BS1452 grade 260
8	Nameplate	Inox	Aisi 316
9	Cover screws	Hex. head set screws	BS3692 grade 8.8
10	Stop screws	Socket set screws	BS4168 part 2
11	Locknuts	Hexagonal locknut	BS3692
12	Bearing thrust washers	Needle thrust washer	Type AS
13	Thrust bearings	Needle thrust bearing	Type AXK
14	Indicator O-ring	Medium nitrile	60-80 Shore hardness
15	Quadrant O-ring	Medium nitrile	60-80 Shore hardness
16	Dowels	Hardened & ground steel	BS7055 type A
17	Locknut protection cap	Injection moulded plastic	Low density polyethylene
18	Protection sleeve	Steel	BS970 220M07
19	Bearing	Deep groove ball bearing	Double seal type
20	Key	Key steel	BS4235
21	Circlip	Carbon steel	Type D1300
22	Sealing ring	Rubber	Neoprene
23	Protection sleeve retainer	Carbon steel	Type VH light duty

A Regal Brand

REGAL

General description

To extend the MF-Serie to higher torques than 4.500 Nm, it was necessary to design units with double reduction and more. The result are the M20 to M70 units, this line will be extended in the future to higher torques. The advantages of the smaller sizes have been incorporated in the bigger sizes too.



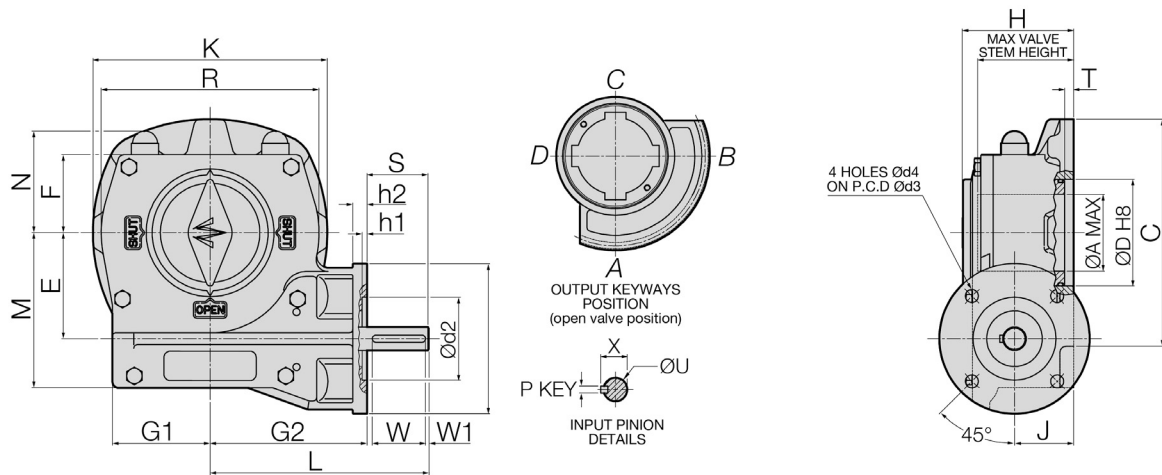
Item	Component	Material Description
1	MF Cover with Input flange	Ductil Iron
2	Gearcase	Grey cast iron
3	Quadrant	Ductil iron
4	Wormshaft	Steel harden
5	Input pinion	Steel harden
6	Spur wheel	Steel harden
7	Oilseal	Injection moulded plastic
8	Ball Bearing	Steel
9	Protection-sleeve	Steel
10	Sealing Input	Rubber
11	Circlip	Carbon steel
12	Hexagon nut	8.8
13	Socket set screw	8.8

Item	Component	Material Description
14	O-ring for quadrant	Medium nitril
15	Circlip	Steel
16	Hexagon screw	8.8
17	Circlip	Steel
18	Ball Bearing	Steel
19	Eye nut	Steel
20	Socket set screw	8.8
21	Dowel	Steel harden
22	Protection cap	Injection moulded plastic
23	Indicator cap	Cast iron
24	O-ring for indicator cap	Nitril rubber
25	Pan head screw	8.8
26	Name plate	Inox Aisi 316

A Regal Brand

REGAL

Performance specification and dimensions

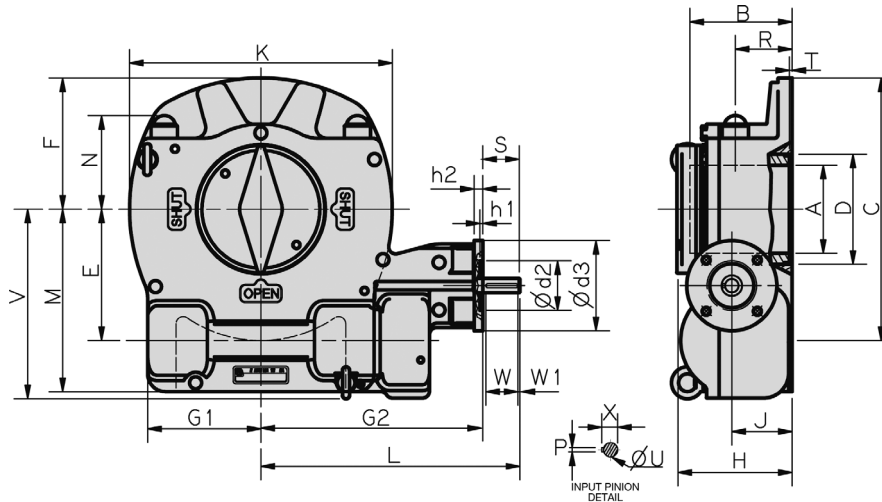


Unit size	MF10	MF12	MF14	MF15		MF16	
ISO 5211 Input Flange	F10	F10	F10	F10	F14	F10	F14
Max Output Torque (Nm)	500	1000	1800	3400		4500	
Mechanical Advantage	11.0	11.3	16.2	20.5		26.5	
Input Torque (Nm)	45.5	88.5	111	166		170	
Ratio	40:1	42:1	60:1	68:1		88:1	
Turns to Close	10	10.5	15	17		22	
ISO 5211 Valve Mounting	F07,F10	F10,F12,F14	F12,F14,F16	F14,F16		F16,F25	
A Max Valve Stem Diameter Without Drive Bush	32	45	65	86		92	
A Max Valve Stem Diameter With Drive Bush	25	32	45	70		75	
B Max Valve Stem Height	57	72	81	92		113	
C	112	150	192	235		290	
D	50	65	90	115		120	
E	52	66.7	89.5	123		154	
F	44	56	66	87.5		116	
G1	53	66	82.5	111		125	
G2	100	115.5	132.5	197.5	180	222.5	205
H	67	82	94	106		127	
J	35	42	50	50		50	
K	116	150	198	252		315	
L	152.5	168	185	250		275	
M	83.5	105	131	178		209	
N	58	75	86	114		117	
P	6x6	6x6	6x6	6x6	8x7	6x6	8x7
R	107	136	184	248		312.5	
S	52.5	52.5	52.5	52.5	70	52.5	70
T Without Drive Bush	4.5	7.5	7.5	9.5		9.5	
T With Drive Bush	0	0	0	0		0	
U	19.98 19.94	19.98 19.94	19.98 19.94	19.98 19.94	29.98 29.94	19.98 19.94	29.98 29.94
W	45	45	45	45	63	45	63
W1	3	3	3	3	3	3	3
X	22.50 22.40	22.50 22.40	22.50 22.40	22.50 22.40	33.00 32.80	22.50 22.40	33.00 32.80
h1	4	4	4	4	5	4	5
h2	12	12	12	12	15	12	15
d1	125	127	127	127	175	127	175
d2	70.045 70.000	70.045 70.000	70.045 70.000	70.045 70.000	100.054 100.000	70.045 70.000	70.045 70.000
d3	102	102	102	102	140	102	140
d4	11	11	11	11	18	11	18
Unit Weight (kg)	7.5	12	17	30.5	33.5	45	48.5

A Regal Brand

REGAL

Performance specification and dimensions



Unit size	MF20	MF30	MF40	MF50	MF55	MF60	MF70
ISO 5211 Input Flange	F10	F10	F10/F14	F10/F14	F10/F14	F10/F14	F10/F14
Max Output Torque (Nm) 2)	6.600	10.800	20.000	41.670	79.000	113.000	170.500
Mechanical Advantage	57	99	188.7	384.6	346	346	735,1
Ratio 3)	183 : 1	309,1 : 1	615 : 1	1219,8 : 1	1219,8 : 1	1102,2	3408:1
Input Torque (Nm) I	140	131	127	130	346	1102,2	735,1
Input Torque (Nm) II	115	109	106	108	228,32	135	231,26
Turns to Close	45,76	77,3	153,75	304,95	304,95	852	852
ISO 5211 Valve Mounting	F16,F25	F25,F30	F25,F30 F40	F25,F30 F40,F48	F25,F30 F40,F48	F40,F48	F40,F48
A Max. Bore in Quadrant (mm)	92	124	165	180	180	241	241
B Max Valve Stem Height (mm)	116	144	203	250	250	342	342
C	300	370	458	540	540	557	557
D	120 H8	155 H8	205 H8	225 H8	225	309,372	309,372
E	146	185	235	305	305	361,95	361,95
F	150	185	229	270	270	269,24	269,24
G1	133	159,5	212	270	270	282,702	282,702
G2	278	312,5	419	475	475	765/-	765/-
H	130	162	224	271	271	373,126	373,126
J	60	85	108	135	135	223,52	223,52
K	300	370	486	614	614	700	700
L	330,5	365	469	525	525	817/-	817/-
M	211	257	329	423	423	476	476
N	123	132	159	187	187	222,504	222,504
P	6 x 6	6 x 6	6 x 6	6 x 6	6 x 6	6x6/8x7	6x6/8x7
R	58	80	95	115	115	175	175
S	50	50	50	50	50	50	50
T	4	4	5	5	5	5	5
U	20 H8	20 H8	20 H8	20 H8	20	20/30	20/30
V	221	267	340	433	433	527	527
W	45	45	45/63	45/63	45/63	45/63	45/63
W1	3	3	3/3	3/3	3/3	3/3	3/3
X	22,4 22,5	22,4 22,5	22,4 22,5	22,4 22,5	22,4 22,5	22,4 22,5	22,4 22,5
d2	70	70	70/100	70/100	70/100	70/100	70/100
d3	127	127	127/175	127/175	127/175	127/175	127/175
h1	4	4	4/5	4/5	4/5	4/5	4/5
h2	12	12	12/15	12/15	12/15	12/15	12/15
Unit Weight (Kg)	46	87	181,5	294,3	294,3	800	800

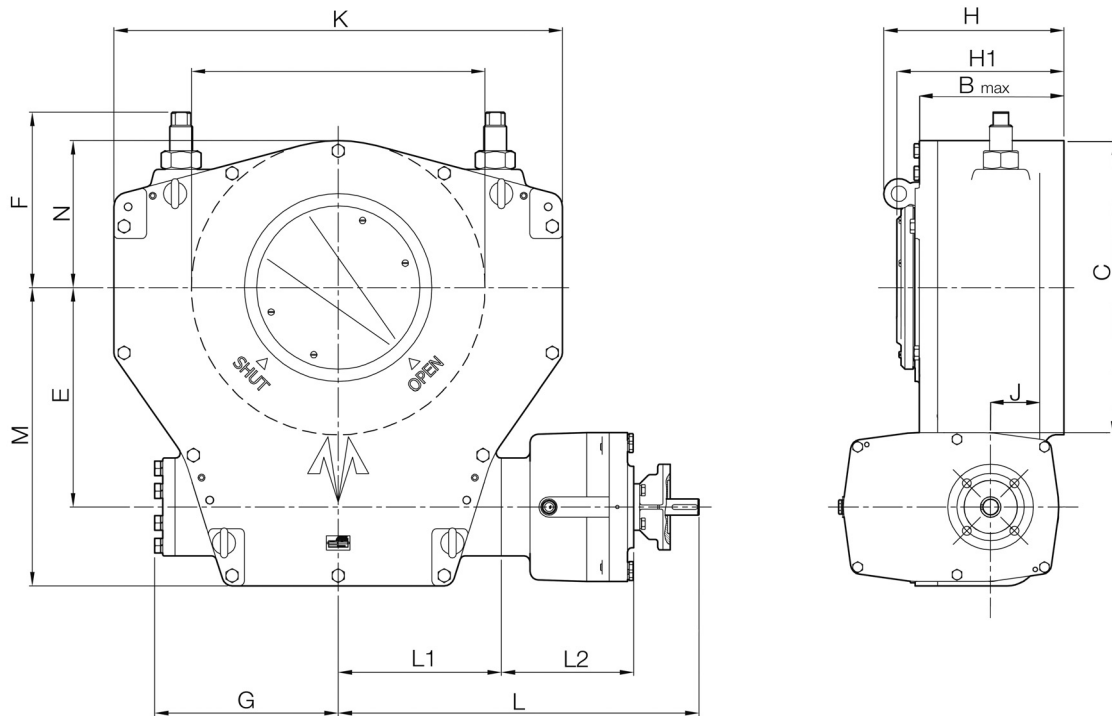
2) Output torque for a lifetime of 1000 cycles with twice overload capacity.

3) Available different ratios.

A Regal Brand



Performance specification and dimensions



Unit Size	M80/F16	M90/F16	M100 F16/F25
Max Output Torque (Nm) 1*			
Max Output Torque (Nm) 2*	217,500	271,500	337,500
Mechanical advantage	956,6	1195,8	1485,9
Input torque (Nm) 1*	227	227	227
Rim pull (Kg/hand) 1*	18	18	18
Input torque (Nm) 2*			
Rim pull (Kg/hand) 2*	23	23	23
Ratio	2479,7:1	3099,6:1	3852,4:1
Turns to close	619,9	774,9	963,1
Valve mounting flange ISO 5211	F48/60	F48/60	F60
A max valve shaft diam.	275	310	350
A max valve shaft square	195	220	248
B max valve shaft height	330	365	403
C	771,5	897	1052,7
D	350	400	450
E	441,5	537	652,7
F	420	430	430
G	400	450	530
H	406,75	442	481
H1	370	410	456
J	150	180	215
K	900	1,100	1,340
L	834	884	964/975
L ₁	674,5	725	805
L ₂	160	160	160/171
M	608	730	840
N	330	360	400
P			
R			
S ₁			
S ₂			
T	10	9	9
U	40	40	40/50
Unit Weight (Kg)	1.160	1.520	2.130

NOTES:

- * max output/input torque 1 based on 5000 life cycles and 100% overload capability
- * max output/input torque 2 based on 500 life cycles and 100% overload capability
- * available different ratios.

A Regal Brand



Available ratios

Unit size				Motorizable				Manual				Cycle Life (Manual)	
				Imperial		Metric		Imperial		Metric			
	Overall ratio : 1	Number of input turns to close	MA of actuator	Input torque in-lbs	Output torque in-lbs	Input torque Nm	Output torque Nm	Cycle Life (Motorizable)	Input torque in-lbs	Output torque in-lbs	Input torque Nm		Output torque Nm
M20.1	96.9	24.2	30.2	1,941	58,650	219.3	6,627	5,000 Cycles	2,353	71,100	265.9	8,034	1,000 Cycles
M20	183.0	45.8	57.1	1,028	58,650	116.1	6,627		1,246	71,100	140.8	8,034	
M30.1	191.3	47.8	60.8	1,578	96,000	178.3	10,848		1,899	115,500	214.6	13,052	
M30.2	228.3	57.1	72.6	1,322	96,000	149.4	10,848		1,591	115,500	179.7	13,052	
M30	309.1	77.3	98.3	976	96,000	110.3	10,848		1,175	115,500	132.8	13,052	
M40.1	270.8	67.7	83.1	2,139	177,702	241.7	20,080	2,500 Cycles	2,567	213,240	290.1	24,096	750 Cycles
M40.2	299.2	74.8	96.7	1,838	177,702	207.7	20,080		2,206	213,240	249.2	24,096	
M40.3	369.0	92.2	119.3	1,490	177,702	168.4	20,080		1,788	213,240	202.1	24,096	
M40.4	556.8	139.2	170.8	1,040	177,702	117.6	20,080		1,248	213,240	141.1	24,096	
M40	615.2	153.8	188.7	942	177,702	106.4	20,080		1,130	213,240	127.7	24,096	
M40.5	758.7	189.7	232.8	763	177,702	86.3	20,080	916	213,240	103.5	24,096		
M50.1	327.7	81.9	132.9	2,786	370,242	314.9	41,837	2,500 Cycles	3,343	444,250	377.8	50,200	750 Cycles
M50.2	593.2	148.3	196.8	1,882	370,242	212.6	41,837		2,258	444,250	255.1	50,200	
M50.3	673.8	168.4	229.0	1,617	370,242	182.7	41,837		1,940	444,250	219.2	50,200	
M50	1219.8	305.0	384.6	963	370,242	108.8	41,837		1,155	444,250	130.5	50,200	
M55.1	327.7	81.9	119.6	5,853	700,000	661.4	79,100		7,024	840,000	793.7	94,920	
M55.2	593.2	148.3	177.1	3,953	700,000	446.6	79,100	4,743	840,000	536.0	94,920		
M55.3	673.8	168.4	206.1	3,396	700,000	383.7	79,100	4,075	840,000	460.5	94,920		
M55	1219.8	305.0	346.2	2,022	700,000	228.5	79,100	2,427	840,000	274.2	94,920		
M60.1 / F16	523.8	131.0	174.6	5,704	996,000	644.6	112,548	1,000 Cycles	6,844	1,195,000	773.3	135,035	500 Cycles
M60.2 / F16	681.6	170.4	227.2	4,384	996,000	495.4	112,548		5,260	1,195,000	594.3	135,035	
M60.3 / F14	1047.6	261.9	338.8	2,940	996,000	332.2	112,548		3,527	1,195,000	398.5	135,035	
M60.4 / F14	1363.1	340.8	440.9	2,259	996,000	255.3	112,548		2,711	1,195,000	306.3	135,035	
M60.5 / F14	1571.4	392.9	508.2	1,960	996,000	221.5	112,548		2,351	1,195,000	265.7	135,035	
M60.6 / F14	2044.7	511.2	661.3	1,506	996,000	170.2	112,548		1,807	1,195,000	204.2	135,035	
M60.7	2726.3	681.6	881.7	1,130	996,000	127.6	112,548		1,355	1,195,000	153.1	135,035	
M60	3407.8	852.0	1102.2	904	996,000	102.1	112,548		1,084	1,195,000	122.5	135,035	
M70.1 / F16	523.8	131.0	116.5	12,879	1,500,000	1455.3	169,500	1,000 Cycles	15,455	1,800,000	1746.4	203,400	500 Cycles
M70.2 / F16	681.6	170.4	151.5	9,898	1,500,000	1118.4	169,500		11,877	1,800,000	1342.1	203,400	
M70.3 / F14	1047.6	261.9	226.0	6,637	1,500,000	750.0	169,500		7,965	1,800,000	900.0	203,400	
M70.4 / F14	1363.1	340.8	294.1	5,101	1,500,000	576.4	169,500		6,121	1,800,000	691.7	203,400	
M70.5 / F14	1571.4	392.9	339.0	4,425	1,500,000	500.0	169,500		5,310	1,800,000	600.0	203,400	
M70.6 / F14	2044.7	511.2	441.1	3,401	1,500,000	384.3	169,500		4,081	1,800,000	461.1	203,400	
M70.7	2726.3	681.6	588.1	2,550	1,500,000	288.2	169,500		3,061	1,800,000	345.8	203,400	
M70	3407.8	852.0	735.2	2,040	1,500,000	230.6	169,500		2,448	1,800,000	276.7	203,400	

1) The worm gear with this ratio, open the valve with clockwise rotation.

A Regal Brand



Available ratios

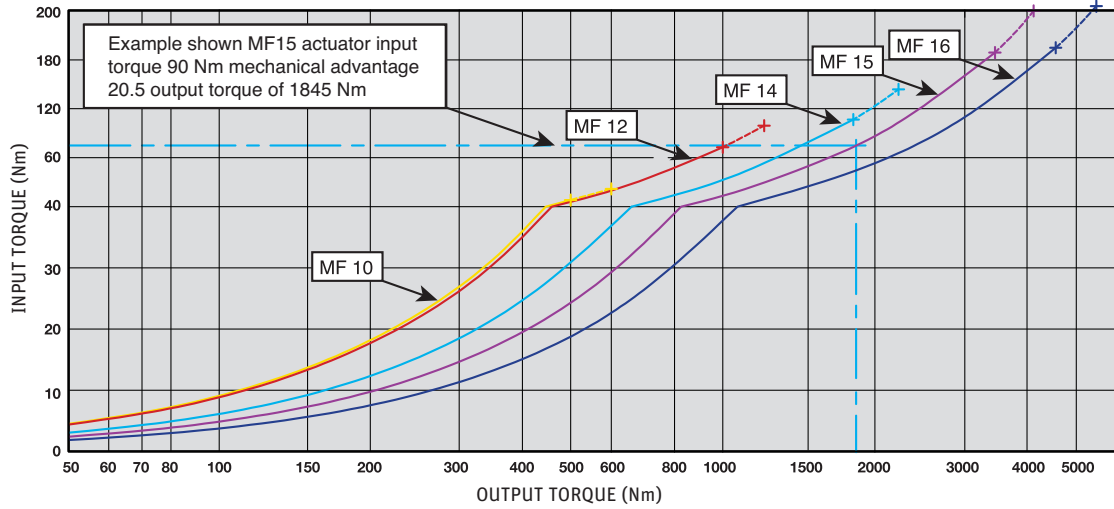
Unit size				Motorizable				Cycle Life (Motorizable)	Manual				Cycle Life (Manual)
				Imperial		Metric			Imperial		Metric		
	Overall ratio : 1	Number of input turns to close	MA of actuator	Input torque in-lbs	Output torque in-lbs	Input torque Nm	Output torque Nm		Input torque in-lbs	Output torque in-lbs	Input torque Nm	Output torque Nm	
M80.1 / F25	286.2	71.5	110.4	17,436	1,925,000	1970.1	217,500	17,436	1,925,000	1970.1	217,500	1,000 Cycles	
M80.2 / F25	322.7	80.7	124.5	15,465	1,925,000	1747.3	217,500	15,465	1,925,000	1747.3	217,500		
M80.3 / F25	381.0	95.2	147.0	13,098	1,925,000	1479.9	217,500	13,098	1,925,000	1479.9	217,500		
M80.4 / F25	429.6	107.4	165.7	11,617	1,925,000	1312.5	217,500	11,617	1,925,000	1312.5	217,500		
M80.5 / F25	521.3	130.3	201.1	9,572	1,925,000	1081.6	217,500	9,572	1,925,000	1081.6	217,500		
M80.6 / F25	587.8	146.9	226.7	8,490	1,925,000	959.2	217,500	8,490	1,925,000	959.2	217,500		
M80.7 / F16	699.4	174.9	269.8	7,134	1,925,000	806.1	217,500	7,134	1,925,000	806.1	217,500		
M80.8 / F16	788.6	197.2	304.2	6,328	1,925,000	714.9	217,500	6,328	1,925,000	714.9	217,500		
M80.9 / F16	1094.5	273.6	422.2	4,559	1,925,000	515.1	217,500	4,559	1,925,000	515.1	217,500		
M80.10 / F16	1234.1	308.5	476.1	4,044	1,925,000	456.9	217,500	4,044	1,925,000	456.9	217,500		
M80.11 / F16	1527.3	381.8	589.2	3,267	1,925,000	369.2	217,500	3,267	1,925,000	369.2	217,500		
M80.12 / F16	1722.0	430.5	664.3	2,898	1,925,000	327.4	217,500	2,898	1,925,000	327.4	217,500		
M80.13	2199.3	549.8	848.4	2,269	1,925,000	256.4	217,500	2,269	1,925,000	256.4	217,500		
M80.14	2479.7	619.9	956.6	2,012	1,925,000	227.4	217,500	2,012	1,925,000	227.4	217,500		
M90.1 / F25	357.7	89.4	138.0	17,412	2,403,000	1967.2	271,500	17,412	2,403,000	1967.2	271,500	1,000 Cycles	
M90.2 / F25	403.4	100.8	155.6	15,443	2,403,000	1744.8	271,500	15,443	2,403,000	1744.8	271,500		
M90.3 / F25	476.2	119.1	183.7	13,079	2,403,000	1477.7	271,500	13,079	2,403,000	1477.7	271,500		
M90.4 / F25	537.0	134.2	207.2	11,600	2,403,000	1310.6	271,500	11,600	2,403,000	1310.6	271,500		
M90.5 / F25	651.6	162.9	251.4	9,559	2,403,000	1080.0	271,500	9,559	2,403,000	1080.0	271,500		
M90.6 / F25	734.7	183.7	283.4	8,478	2,403,000	957.9	271,500	8,478	2,403,000	957.9	271,500		
M90.7 / F16	874.3	218.6	337.3	7,124	2,403,000	804.9	271,500	7,124	2,403,000	804.9	271,500		
M90.8 / F16	985.8	246.4	380.3	6,319	2,403,000	713.9	271,500	6,319	2,403,000	713.9	271,500		
M90.9 / F16	1368.2	342.0	527.8	4,553	2,403,000	514.4	271,500	4,553	2,403,000	514.4	271,500		
M90.10 / F16	1542.6	385.7	595.1	4,038	2,403,000	456.2	271,500	4,038	2,403,000	456.2	271,500		
M90.11 / F16	1909.1	477.3	736.5	3,263	2,403,000	368.6	271,500	3,263	2,403,000	368.6	271,500		
M90.12 / F16	2152.5	538.1	830.4	2,894	2,403,000	326.9	271,500	2,894	2,403,000	326.9	271,500		
M90.13	2749.1	687.3	1060.6	2,266	2,403,000	256.0	271,500	2,266	2,403,000	256.0	271,500		
M90.14	3099.6	774.9	1195.8	2,010	2,403,000	227.0	271,500	2,010	2,403,000	227.0	271,500		
M100.1 / F25	444.6	111.2	171.5	17,417	2,987,000	1968.0	337,500	17,417	2,987,000	1968.0	337,500	1,000 Cycles	
M100.2 / F25	501.3	125.3	193.4	15,448	2,987,000	1745.4	337,500	15,448	2,987,000	1745.4	337,500		
M100.3 / F25	591.9	148.0	228.3	13,083	2,987,000	1478.3	337,500	13,083	2,987,000	1478.3	337,500		
M100.4 / F25	667.4	166.8	257.4	11,604	2,987,000	1311.1	337,500	11,604	2,987,000	1311.1	337,500		
M100.5 / F25	809.9	202.5	312.4	9,562	2,987,000	1080.4	337,500	9,562	2,987,000	1080.4	337,500		
M100.6 / F25	913.2	228.3	352.2	8,481	2,987,000	958.2	337,500	8,481	2,987,000	958.2	337,500		
M100.7 / F16	1086.6	271.7	419.1	7,127	2,987,000	805.2	337,500	7,127	2,987,000	805.2	337,500		
M100.8 / F16	1225.2	306.3	472.6	6,321	2,987,000	714.2	337,500	6,321	2,987,000	714.2	337,500		
M100.9 / F16	1700.5	425.1	655.9	4,554	2,987,000	514.6	337,500	4,554	2,987,000	514.6	337,500		
M100.10 / F16	1917.3	479.3	739.5	4,039	2,987,000	456.4	337,500	4,039	2,987,000	456.4	337,500		
M100.11 / F16	2372.7	593.2	915.2	3,264	2,987,000	368.8	337,500	3,264	2,987,000	368.8	337,500		
M100.12 / F16	2675.3	668.8	1031.9	2,895	2,987,000	327.1	337,500	2,895	2,987,000	327.1	337,500		
M100.13	3416.7	854.2	1317.9	2,267	2,987,000	256.1	337,500	2,267	2,987,000	256.1	337,500		
M100.14	3852.4	963.1	1485.9	2,010	2,987,000	227.1	337,500	2,010	2,987,000	227.1	337,500		

A Regal Brand



Actuator selection data

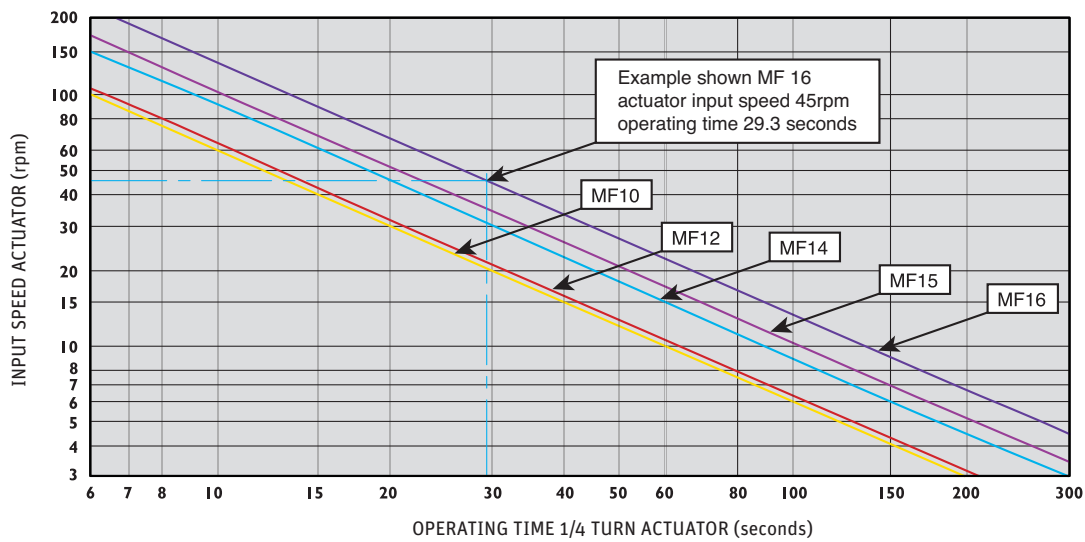
Input torque/Output torque (Based on 5000 cycles life)



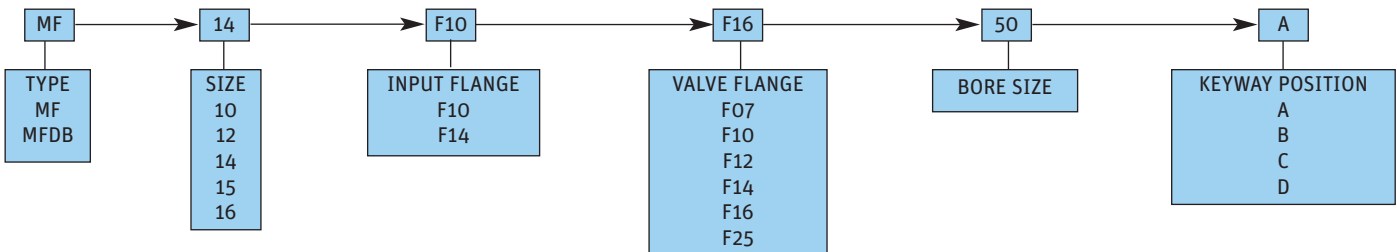
Notes:

- 1) For 1000 life cycles maximum allowable Torques are shown (+-----+).
- 2) Input overload or stall torque must not exceed 200% of 1).

Input speed/operating time



Actuator designation



Example:

- a) MF14-F10-F16-50-AC size 14 actuator, F10 input flange, F16 valve mounting flange, 50 mm bore and keyways positions A and C.
- b) MFDB10-F10-F10-20-B size 10 actuator, drive bush, F10 input flange, F10 valve mounting flange, 20 mm bore and keyway position B.

A Regal Brand

REGAL



MASTERGEAR WORLDWIDE

STAND ALONE SPUR GEAR VALVE ACTUATORS

A Regal Brand

REGAL



MASTERGEAR WORLDWIDE

M SERIES MANUAL VALVE ACTUATORS

A Regal Brand

REGAL



MASTERGEAR WORLDWIDE

HIGH EFFICIENCY BEVEL GEARS OPERATORS

A Regal Brand

REGAL



MASTERGEAR WORLDWIDE

SD SERIE MANUAL OVERRIDE GEARBOXES

A Regal Brand

REGAL



MASTERGEAR

The Stainless Steel Gearbox Range.

Built to withstand the World's most extreme environments.

www.mastergearworldwide.com



MASTERGEAR

Sub Sea Geared Actuator and Bevels, with integral intelligent compensation.

Designed for extreme deep sea applications

www.mastergearworldwide.com

MASTERGEAR *Italy*
 COSTRUZIONI MECCANICHE LEGNANESE S.r.l.
 unipersonale

Via Del Brugo, 5
 20025 LEGNANO (MI)
 ITALY
 Phone: (39) 0331-548-847
 Fax: (39) 0331-592.800
 cml@cml-mastergear.it

MASTERGEAR *U.S.A.*

P.O. Box 298 Beloit, WI 53512-0298
 5560 E. Buss Road,
 Clinton, Wisconsin 53525
 Phone: 1-608-361-5600
 Fax: 1-608-365-6812
 sales@mastergearworldwide.com

A Regal Brand

REGAL