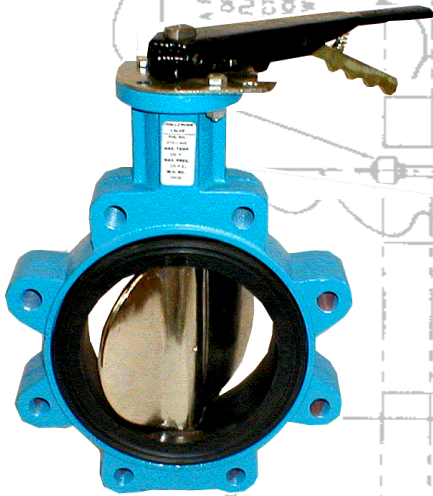


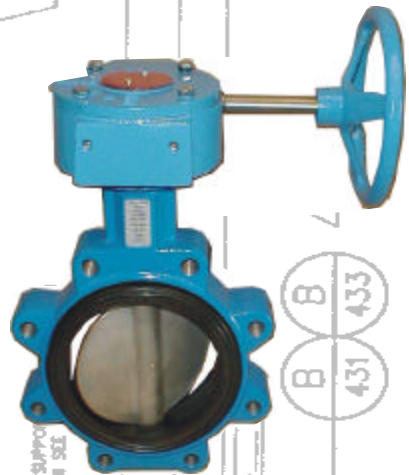
<u>DESCRIPTION</u>	<u>BULLETIN NO.</u>
Cover Page - Manual Actuators and Accessories	MA-100
Mechanical Accessories	MA-101
Series LH Lever Handles	MA-102
Series DG Worm Gear Actuator Selection Chart	MA-103 R1
Series DG Worm Gear Actuator Dimensions (Inches)	MA-104 R1
Series DG Worm Gear Actuator Dimensions (Millimetres)	MA-104M R1
Series MOA Declutchable Manual Override Design/Operation	MA-105
Series MOA Declutchable Manual Override Specs/B.O.M.	MA-106R1
Series MOA Declutchable Manual Override Dimension (Inches)	MA-107R1
Series MOA Declutchable Manual Override Dimension (Millimetres)	MA-107MR1

CHALLENGER

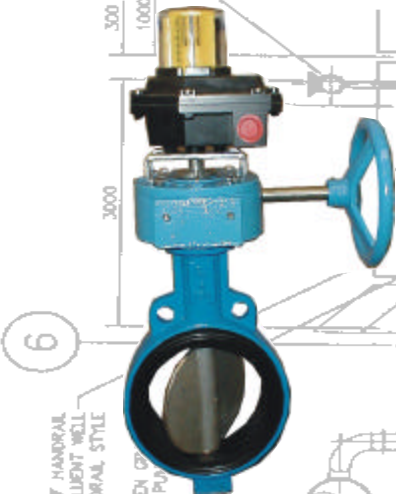
MANUAL ACTUATORS & ACCESSORIES



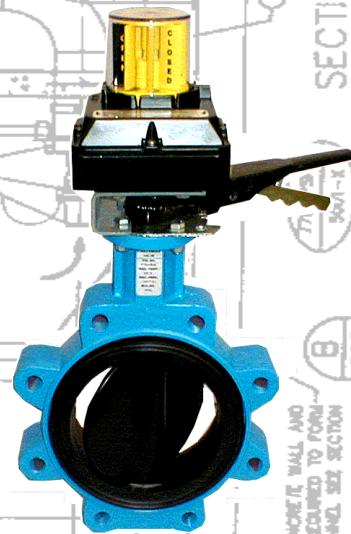
Lever Handle c/w 10 Position Notch Plate.



DG5 Worm Gear Actuator.

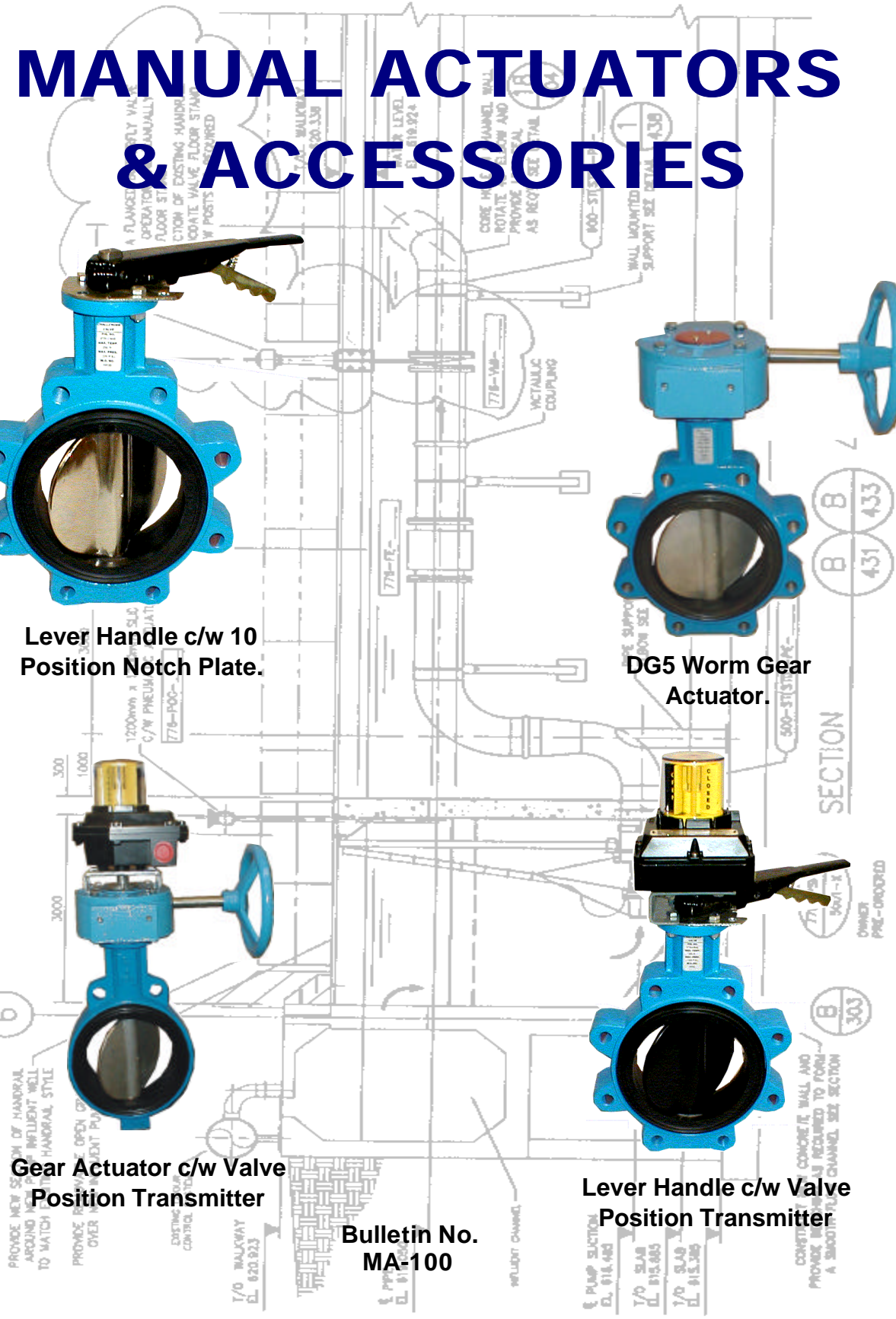


Gear Actuator c/w Valve Position Transmitter



Lever Handle c/w Valve Position Transmitter

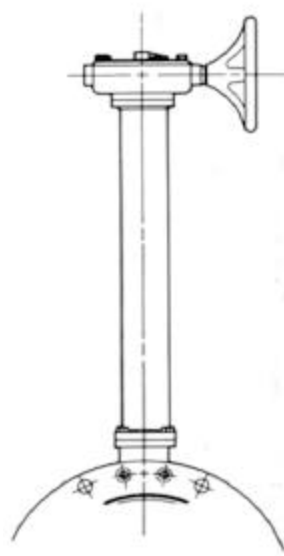
Bulletin No. MA-100



MECHANICAL ACCESSORIES



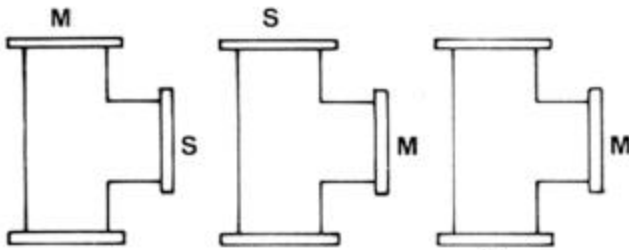
CHAIN WHEELS



VALVE STEM
EXTENSION
WITH BONNET
HOUSING



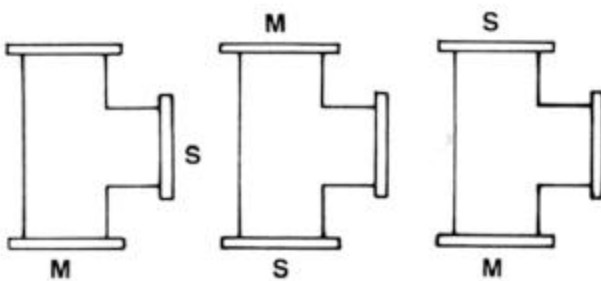
GEARBOX
INPUT STEM
EXTENSION,
AND FLOOR
STAND



STYLE 1

STYLE 2

STYLE 3



STYLE 4

STYLE 5

STYLE 6

M = Master
S = Slave

**Note: Specify if master is normally open
or normally closed.**

3 Way Linkage Assemblies

Two valves mounted on a tee actuated by a single actuator; gear, pneumatic or electric.

Applications:

On-Off change over valves for heating and cooling.

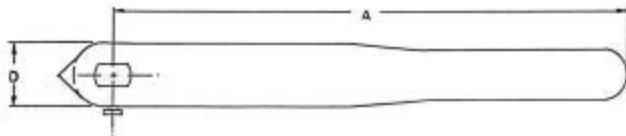
Modulating for blending or temperature control.

SERIES LH LEVER

Selection and Dimensional Information

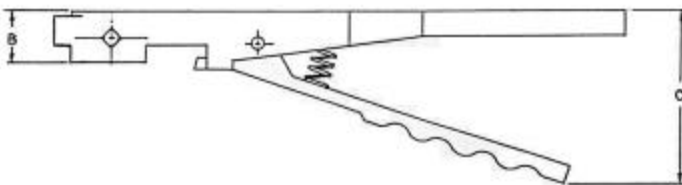
Series No.	Valve Size	Eff. Lever Length	Dimensions (in./mm)				Weight Lbs./Kgs.
			A	B	C	D	
LH-A	2" - 3"	10.00"	10.5"	1.00"	3.00"	1.62"	2.5
	50 - 80	254	267	25.4	76	41	1.1
LH-B	4" - 5"	10.00"	10.5"	1.00"	3.00"	1.62"	2.5
	100 - 125	254	267	25.4	76	41	1.1
LH-C	6"	10.00"	10.5"	1.00"	3.00"	1.62"	2.5
	150	254	267	25.4	76	41	1.1
LH-D	8"	11.00"	11.5"	1.00"	4.00"	2.00"	3.5
	200	279	292	25.4	102	50.8	1.6
LH-E	10" - 12"	13.25"	13.75"	1.00"	4.00"	2.00"	5.0
	250 - 300	337	349	25.4	102	50.8	2.3

Note: Challenger Valve Manufacturing recommends gear actuators for valves 8" (200 mm) and over.



Standard Features

Unique self locking trigger prevents the handle from falling off when installed upside down.



10 position notch plate padlockable fully open, fully closed or in any of the other 8 positions.

Options:

Infinite position plate.
Valve Position Transmitter.

Materials of Construction

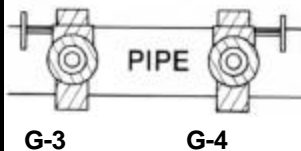
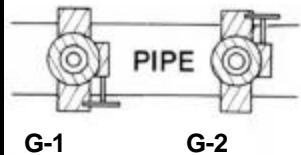
Handle: Ductile Iron
 Trigger: Steel/Plated
 Spring: Stainless Steel
 Notch Plate: Steel/Plated

SERIES DG WORM GEAR ACTUATOR

ACTUATOR SELECTION

Series	Valve Size	Gear	Handwheel Dia.	Output Torque at 100 Lb. (445 N) Rim Pull	Weight c/w H.W.
No.	in./mm	Ratio	in./mm	in/ lbs./N.m	Lbs./Kgs.
DG5-B**	2" to 5" 50 - 125	24:1	6.0" 150	1,120 125	7.5 3.4
DG10-C/D	6" to 8" 150-200	30:1	8.0" 200	6,600 750	21.5 9.8
DG10-E	10" to 12" 250 - 300	30:1	10.0" 250	6,600 750	21.5 9.8
DG15-F	14" 350	50:1	12" 300	8,800 1000	44 20
DG20-G	16" 400	80:1	16" 400	12,800 1,446	83 38
DG25-H	18" 450	290:1	12" 300	34,800 3,932	119 54
DG25-J	20" 500	290:1	12" 300	34,800 3,932	119 54
DG25-K	24" 600	290:1	12" 300	34,800 3,932	119 54
DG30-L	30" 750	350:1	24" 600	84,000 9,492	421 191
DG35-M	36" 900	450:1	30" 750	135,000 15,254	488 221
DG40-N	42" 1,050	618:1	30" 750	186,400 20,949	646 293
DG45-P	48" 1,200	910:1	30" 750	273,000 30,847	954 433

Note: **DG5-B requires an "A" to "B" shaft adapter when mounting to Challenger Valve sizes 2" to 3" (50 mm to 80 mm).



ACTUATOR ORIENTATION (SEE NOTE BELOW)

Options:

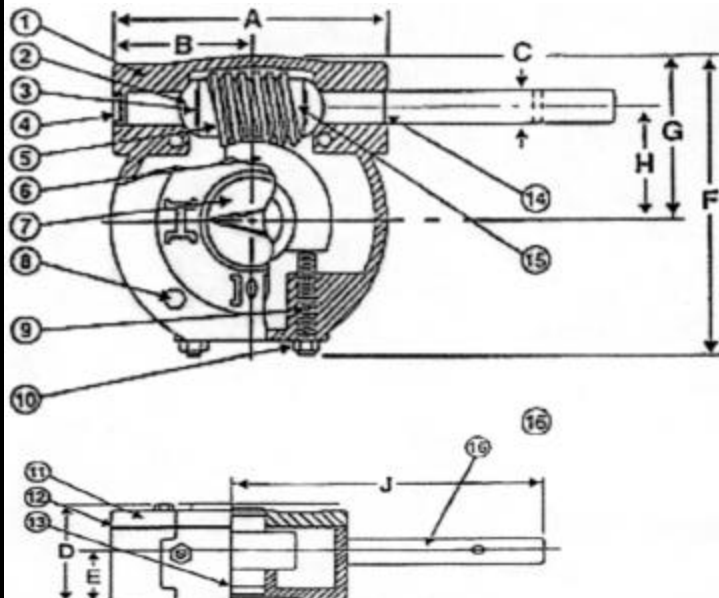
- Chainwheel & Sprocket
- Valve Position Transmitter
- Grease Packed for Submerged Service

Note:

- Positions G-1 & G-2 are standard
- Positions G-3 & G-4 can be provided at additional cost

SERIES DG ACTUATOR DIMENSIONS - INCHES (Imperial)

Model No.	Gear Ratio	A	B	C	D	E	F	G	H	J	Weight Lbs.
DG5	24:1	3.50	1.75	0.62	2.40	1.05	5.00	2.90	1.78	6.00	5.5
DG10	30:1	4.67	2.34	0.74	3.12	1.56	7.00	4.00	2.75	8.50	17.5
DG15	50:1	6.50	3.25	0.74	3.75	1.88	6.25	4.50	3.00	11.75	33
DG20	80:1	10.19	5.10	1.00	4.75	2.38	11.63	6.13	4.25	10.00	71
DG25	290:1	13.25	6.63	0.99	6.00	3.00	12.00	5.00	4.63	12.50	110
DG30	350:1	14.70	7.35	1.00	6.80	3.20	17.50	10.50	7.10	21.40	396
DG35	450:1	17.90	8.95	1.25	7.70	3.50	23.50	12.60	8.90	25.90	458
DG40	618:1	19.70	9.85	1.25	10.00	4.10	28.70	18.90	9.80	27.20	616
DG45	910:1	24.20	12.10	1.50	11.70	5.60	37.80	21.70	12.40	32.20	924

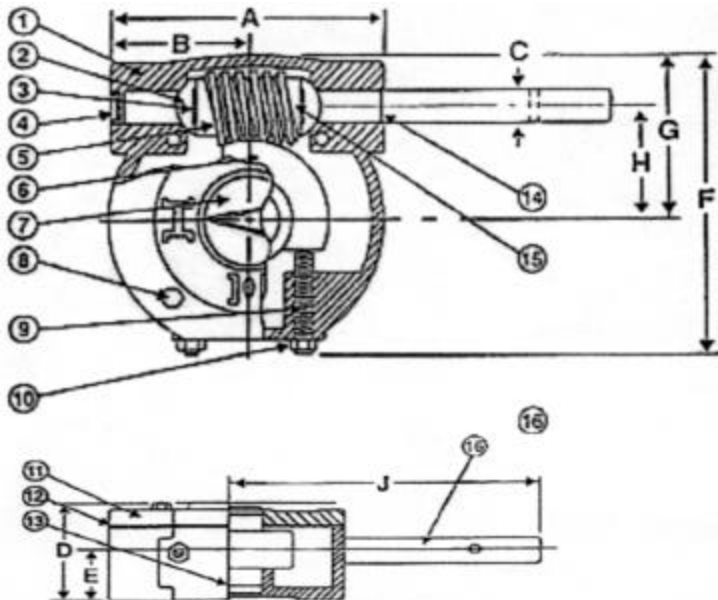


ITEM	COMPONENT	MATERIAL	NO. REQ'D.
1	Housing	Cast Iron	1
2	Shaft Bearing	Bronze	2
3	Bearing Washer	Steel	2
4	Shaft Plug	Steel	1
5	Worm Gear	Steel	1
6	Segment Gear	Ductile Iron	1
7	Indicator Cap	Aluminum	1
8 *	Cover Bolt	Steel	4
9 *	Stop Adjusting Screw	Steel	2
10 *	Stop Adjusting Nut	Steel	2
11	Cover	Cast Iron	1
12	Cover Gasket	Fibre	1
13	Segment O-Ring	BUNA-N	1
14	Input Shaft Seal	BUNA-N	1
15	Worm Roll Pin	Steel	1
16 *	Input SHaft	Steel	1
17	Handwheel	Cast Iron	1

Above is typical for models DG15 -DG45

SERIES DG ACTUATOR DIMENSIONS - MILLIMETRES (Metric)

Model No.	Gear Ratio	A	B	C	D	E	F	G	H	J	Weight Kgs.
DG5	24.1	90	45	15.8	61	27	127	74	45	152	2.5
DG10	30:1	119	55	18.8	79	40	178	102	70	216	7.9
DG15	50:1	165	83	19	95	48	159	114	76	298	15
DG20	80:1	259	130	25	121	60	295	156	108	254	32
DG25	290:1	337	168	25	152	76	305	127	118	318	50
DG30	350:1	373	187	25	173	81	445	267	180	544	180
DG35	450:1	455	227	32	196	89	597	320	226	658	208
DG40	618:1	500	250	32	254	104	729	480	249	691	280
DG45	910:1	615	307	38	297	142	960	551	315	818	420



ITEM	COMPONENT	MATERIAL	NO. REQ'D.
1	Housing	Cast Iron	1
2	Shaft Bearing	Bronze	2
3	Bearing Washer	Steel	2
4	Shaft Plug	Steel	1
5	Worm Gear	Steel	1
6	Segment Gear	Ductile Iron	1
7	Indicator Cap	Aluminum	1
8 *	Cover Bolt	Steel	4
9 *	Stop Adjusting Screw	Steel	2
10 *	Stop Adjusting Nut	Steel	2
11	Cover	Cast Iron	1
12	Cover Gasket	Fibre	1
13	Segment O-Ring	BUNA-N	1
14	Input Shaft Seal	BUNA-N	1
15	Worm Roll Pin	Steel	1
16 *	Input SHaft	Steel	1
17	Handwheel	Cast Iron	1

Above is typical for DG15-DG45.

SERIES MOA - DECLUTCHABLE MANUAL OVERRIDE

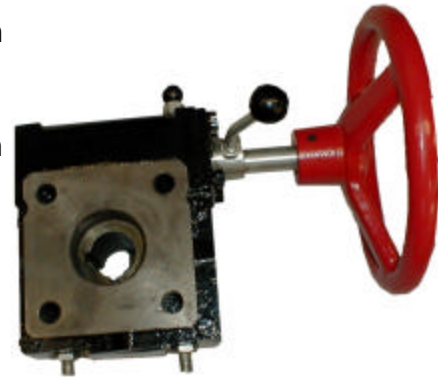
DESIGN FEATURES

The Challenger Series MOA Manual Override units employ a declutchable worm and worm wheel mechanism, and are specifically designed for use with double acting or spring return pneumatic/hydraulic actuators.

The MOA Series feature a rugged cast iron enclosure hardened carbon steel worm and ductile segment.

All units are grease packed, lubricated for life and sealed to IP65.

Input shaft plunger travel stops and all exterior fasteners are stainless steel for maximum corrosion resistance.



OPERATION

Normal operation is with the lever in the “OFF” position. In this position, the worm is in the declutch mode and the actuator is free to operate the valve.

To engage the clutch, pull the spring loaded locking pin and rotate the lever clockwise to the “ON” position.

To declutch the gear, reverse the above procedure by rotating the lever to the “OFF” position.

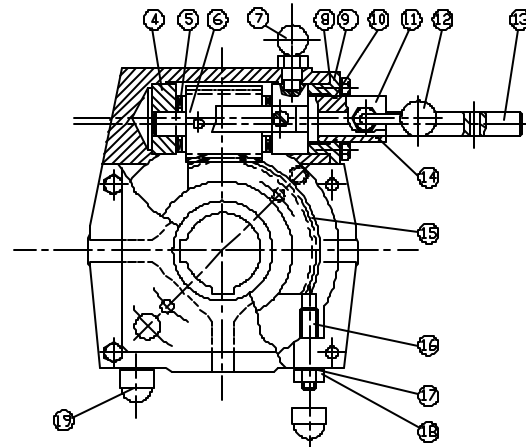
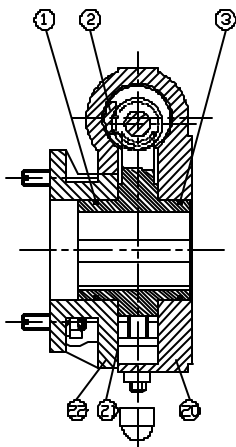
Note: Slight movement on the handwheel may be required to align the worm and segment when positioning the engagement lever.



SERIES MOA - DECLUTCHABLE MANUAL OVERRIDE SPECIFICATIONS

SERIES	GEAR RATIO	TURNS TO CLOSE	OUTPUT TORQUE IN LBS	STEM BORE	KEYWAY	MOUNTING PATTERN TO ISO-5211 SPECIFICATION VALVE - ACTUATOR			H.W. DIA.	WEIGHT LBS
MOA-1	30:1	7.5	2,200	0.875"	0.250"	F07	-	F07	6"	14
MOA-2	38:1	9.5	6,200	1.250"	0.250"	F07/F10	-	F10	8"	22
MOA-3	54:1	13.5	11,000	1.75"	0.375	F10	-	F10	12"	28
MOA-4	80:1	20	32,000	2.500"	0.500"	F14	-	F16	16"	96
MOA-5	80:1	20	32,000	3.00"	0.750"	F16	-	F16	24"	96

BILL OF MATERIAL

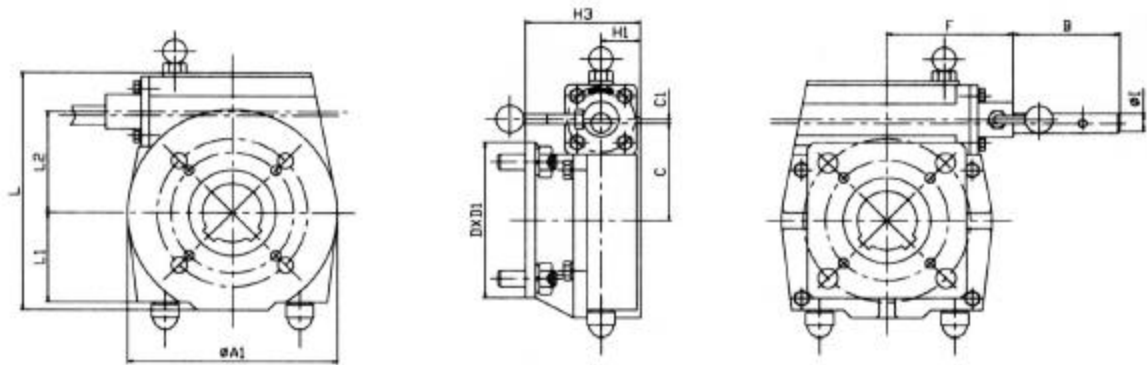


No	Part Name	Qty	Standard Material	No	Part Name	Qty	Standard Material
1	Quadrant O-Ring	1	Rubber	12	Lever	1	316 SS
2	Cam Bridge	1	Carbon Steel AISI 1045, Hardened	13	Input Shaft	1	316 SS
3	Quadrant O-Ring	1	Rubber	14	O-Ring	1	Rubber
4	Cam	1	Carbon Steel AISI 1045, Hardened & Galvanized	15	Worm Wheel	1	Ductile Iron ASTM A536 65-45-12
5	Needle Thrust Bearing	2	AXK-AS	16	Adjusting Screw	2	18-8 SS
6	Worm	1	Carbon Steel AISI 1045, Hardened	17	Gasket	2	Moulded Rubber
7	Locking Pin	1	316 SS	18	Lock Nut	2	18-8 SS
8	Gasket	1	Rubber	19	Protection Cap	2	Moulded Rubber
9	Bearing Block	1	Grey Cast Iron ASTM A126 Class B	20	Gear Housing	1	Grey Cast Iron ASTM A126 Class B
10	O-Ring	1	Rubber	21	Gasket	1	Rubber
11	Cam	2	Carbon Steel AISI 1045, Hardened & Galvanized	22	Integral Top Flange	1	Grey Cast Iron ASTM A126 Class B

SERIES MOA - DECLUTCHABLE MANUAL OVERRIDE

DIMENSIONS - INCHES (IMPERIAL)

SERIES	A1	B	C	C1	DxD1	F	H1	H3	ØI	L	L1	L2
MOA-1	4.09	3.25	2.13	0.12	2.52 x 2.52	3.17	1.24	2.80	0.67	5.12	1.85	2.01
MOA-2	4.92	4.31	2.46	0.12	3.94 x 2.76	3.41	1.12	3.11	0.67	6.14	2.13	2.60
MOA-3	7.00	3.75	3.31	0.12	4.40 x 4.40	4.25	1.12	3.45	0.67	8.00	3.35	3.15
MOA-4	10.86	3.70	5.51	0.20	6.14 x 6.14	5.55	1.57	4.59	0.98	12.60	5.04	5.59
MOA-5	10.86	3.70	5.51	0.20	6.14 x 6.14	5.55	1.67	4.59	0.98	12.60	5.04	5.59



SERIES MOA - DECLUTCHABLE MANUAL OVERRIDE

DIMENSIONS - MILLIMETRES (METRIC)

SERIES	A1	B	C	C1	DxD1	F	H1	H3	ØI	L	L1	L2
MOA-1	104	82.5	54	3	64 x 64	80.5	31.5	71	17	130	47	51
MOA-2	125	109.5	62.5	3	100 x 70	86.5	28.5	79	17	156	54	66
MOA-3	178	95	84	3	112 x 112	108	29	88	17	203	85	80
MOA-4	276	94	140	5	156 x 156	141	42.5	116.5	25	320	128	142
MOA-5	276	94	140	5	156 x 156	141	42.5	116.5	25	320	128	142

