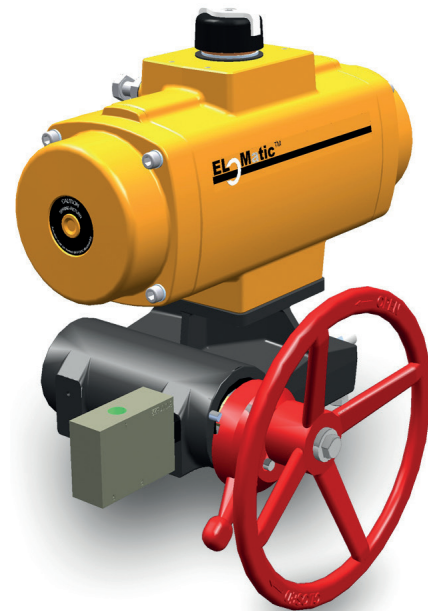


MO Declutchable Manual Override Gearbox

EL-O-Matic F-Series Actuators option

- Light weight aluminum design and suitable for indoor and outdoor use.
- Easy operation.
- Suitable for quarter turn applications.
- Available in 5 sizes ranging up to maximum output torque of 6000 Nm (53100 lbf.in)
- Standard equipped with stroke adjustment limit stops.
- Dual ISO5211 mounting patterns on top and bottom flange.
- Optional available with vent valves and/or valve adaptors.



Description:

The MO Declutchable Manual Override Gearboxes offer simple and reliable manual positioning of valves, dampers and other quarter-turn devices when overriding, existing pneumatic or hydraulic rotary actuators. All EL-O-Matic MO-units are suitable for indoor and outdoor use and combine rugged construction, light weight and modular design to provide the most efficient and cost effective solution to a full range of manual override requirements.

The self-locking worm gear design means safe and easy operation, positive manual positioning and extremely long life. For extra ease of operation the MO-600 is equipped with an extra gear box to reduce the forces on the hand wheel.

The EL-O-Matic MO-units can be adapted to any quarter-turn actuator and may even be installed in the field on existing valves.

Easy Operation:

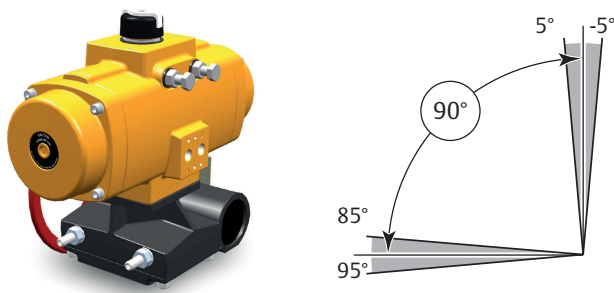
To engage manual operation, first pull out the spring loaded clutch lever, then rotate the clutch lever clockwise until engagement takes place. Counter clockwise lever movement disengages manual operation and returns the system to automatic operation.

Note: When under manual control, the valve remains locked in the last set position.

Stroke adjustment

The EL-O-Matic MO-unit is equipped with two stroke adjustment bolts. These must be set for accurate valve positioning and to avoid damage to the actuator or valve spindle during manual operation.

Figure 1. Rotation angle and adjustable range MO gear box



Note:

The limit stops on actuators are redundant in combination with MO-gearboxes. For stroke angle less than 80° please consult our engineering department.

MO Gearbox sizing

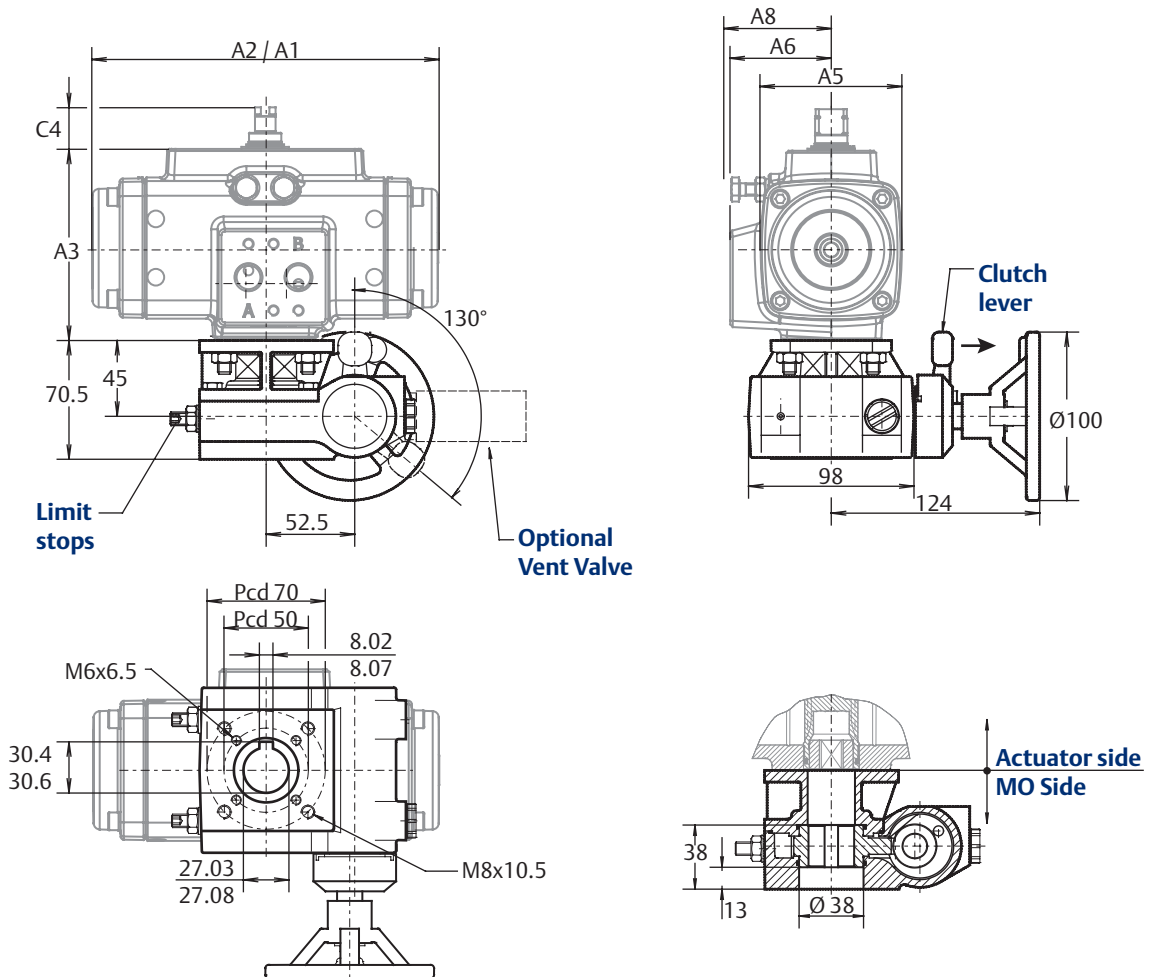
EL-O-Matic Manual Override gear boxes are available in five (5) models. Table 1 show the MO Gearbox to EL-O-Matic F-Series actuator sizing.

Model overview

Model	Actuator size	
	Double acting	Single acting (Spring Return)
MO-10	FD25-FD40-FD65	FS25-FS40-FS65
MO-50	FD100-FD150-FD200	FS100-FS150-FS200
MO-160	FD350-FD600-FD950	FS350-FS600-FS950
MO-520	FD1600, FD2500, FD4000	FS1600, FS2500
MO-600		FS4000

EL-O-Matic F-Series Actuator

With MO-10 Declutchable Gear Box (Metric)



MO-10 Specifications

Input / Output		MO-10
At hand wheel	No of turns	9.5
	Max input force	82 N
At output shaft	Max output torque	100 Nm
Weight		1.5 kg.
Part	Material	
Body	Cast aluminium.	
Gear quadrant	Aluminium bronze.	
Worm shaft	High grade aluminium / hard anodized.	
Temperature	-20°C to +80°C.	
Stroke adjustment	+5° and -5° at each end.	
Movement	0° - 90°.	
Finish	Two part polyurethane coating.	
Fasteners	Stainless steel.	

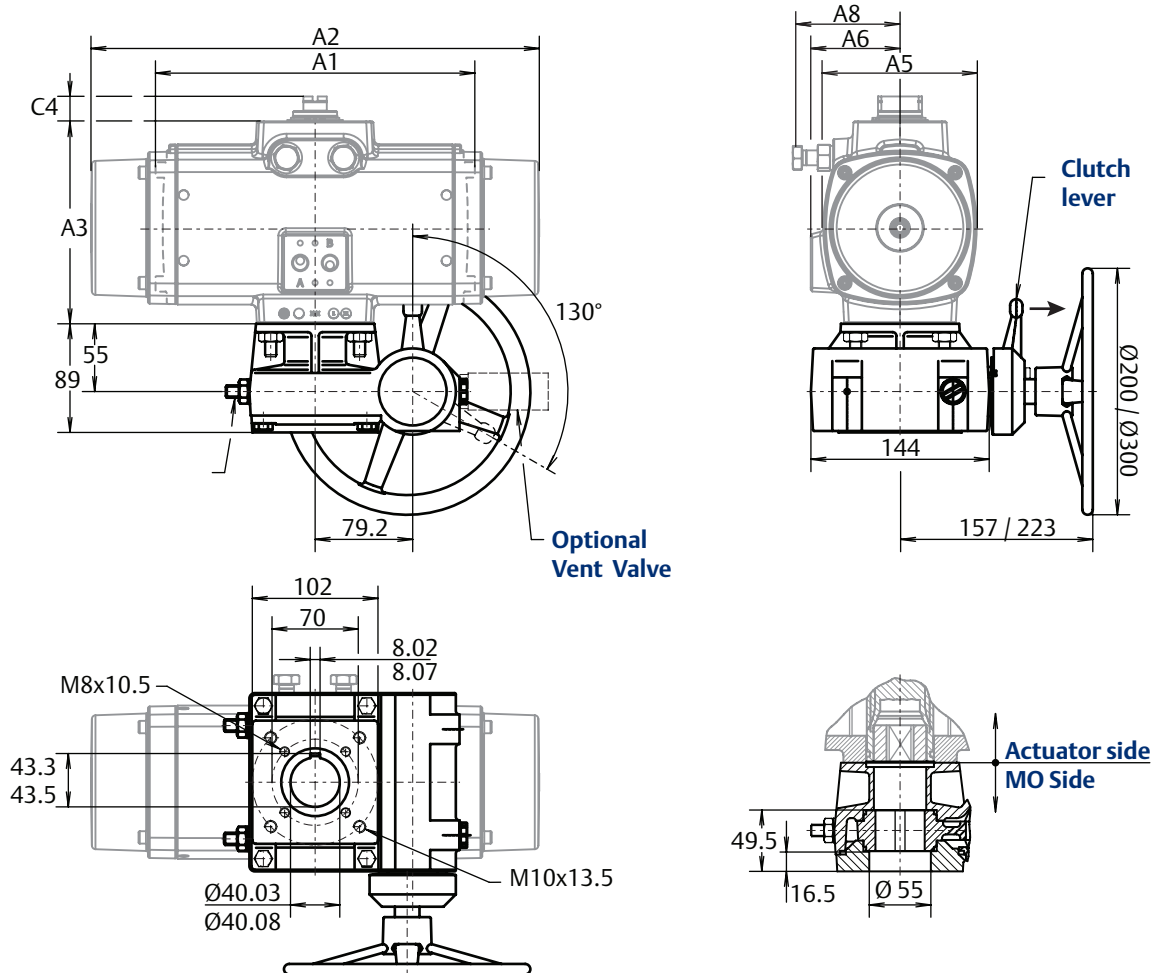
Dimensions Actuator with MO-10

Dimensions in mm.	Actuator size		
	F25	F40	F65
A1 (SR)	166	192	217
A2 (DA)	166	192	217
A3	91	112	124
A5	68	82	92
A6	49	55	58
A8	48	58	69
C4	20	20	20

Note: Top and bottom flange mounting patterns are according ISO5211. Drilling depths deviates from ISO5211.

EL-O-Matic F-Series Actuator

With MO-50 Declutchable Gear Box (Metric)



MO-50 Specifications

Input / Output		MO-50
At hand wheel	No of turns	10
	Max input force	400 N
At output shaft	Max output torque	500 Nm
Weight		4.4 kg.
Part	Material	
Body	Cast aluminium.	
Gear quadrant	Aluminium bronze.	
Worm shaft	High grade aluminium / hard anodized.	
Temperature	-20°C to +80°C.	
Stroke adjustment	+5° and -5° at each end.	
Movement	0° - 90°.	
Finish	Two part polyurethane coating.	
Fasteners	Stainless steel.	

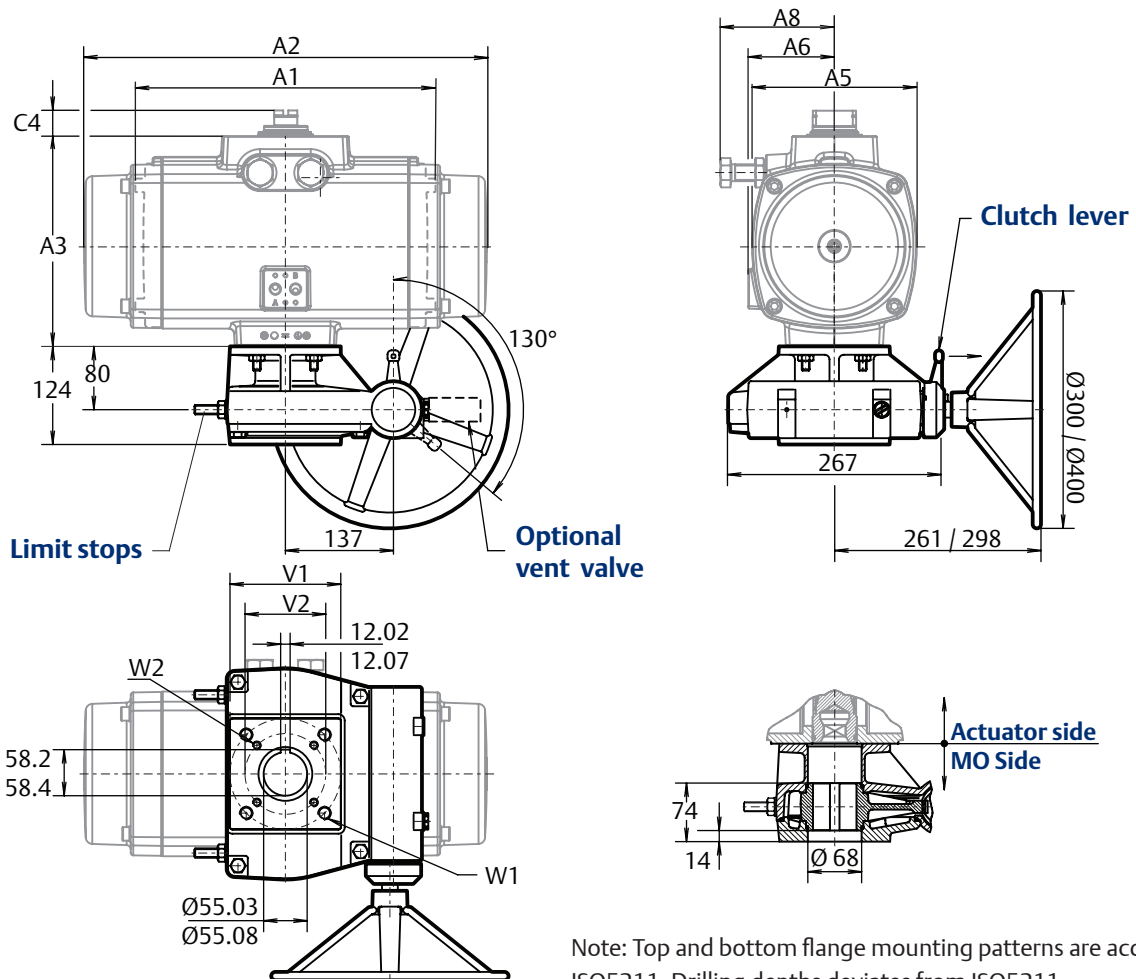
Dimensions Actuator with MO-50

Dimensions in mm.	Actuator size		
	F100	F150	F200
A1 (SR)	247	304	362
A2 (DA)	247	235	265
A3	131	157	163
A5	103	116	124
A6	64	69	72
A8	69	75	87
C4	20	20	20
Ø Handwheel	200	200	300

Note: Top and bottom flange mounting patterns are according ISO5211. Drilling depths deviates from ISO5211.

EL-O-Matic F-Series Actuator

With MO-160 Declutchable Gear Box (Metric)



Note: Top and bottom flange mounting patterns are according ISO5211. Drilling depths deviates from ISO5211.

MO-160 Specifications

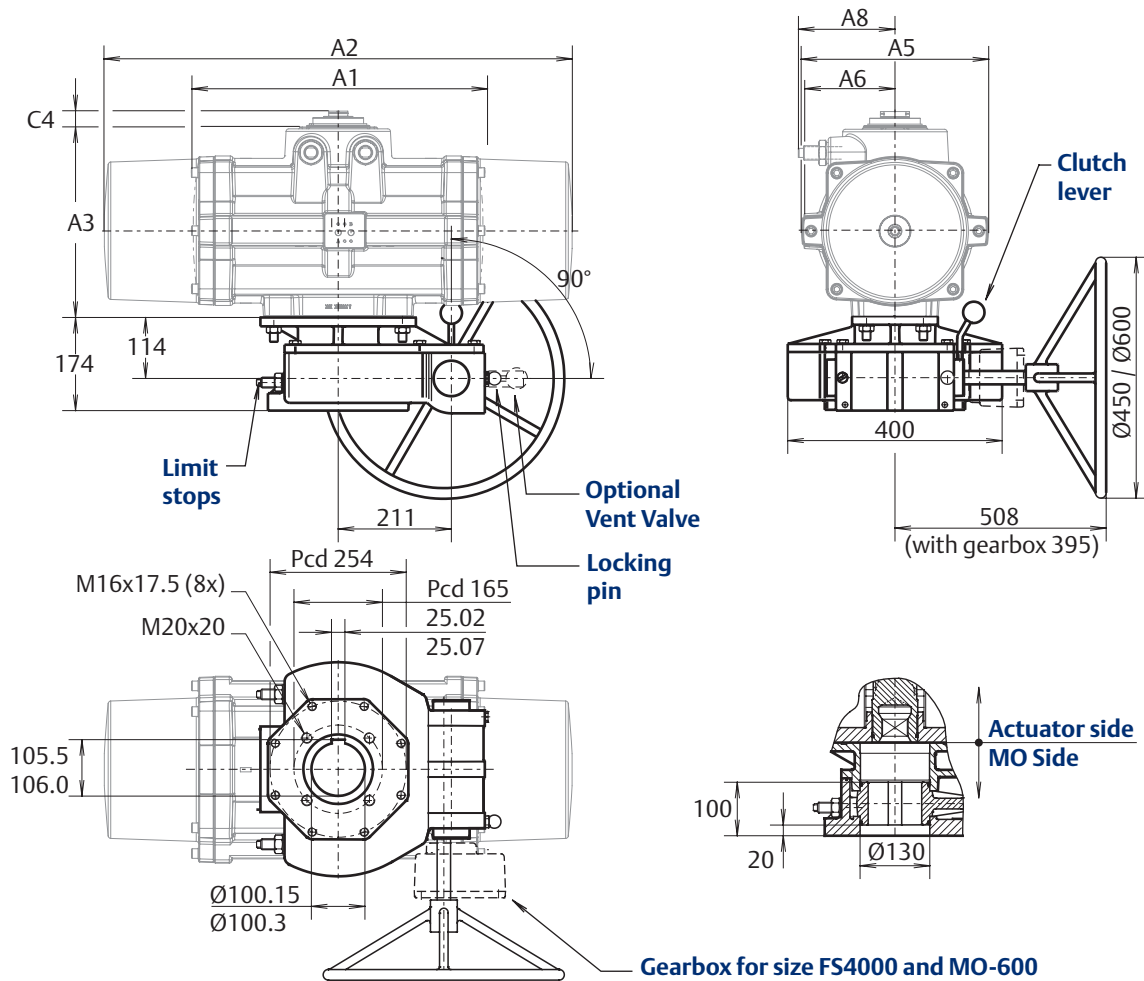
Input / Output		MO-160
At hand wheel	No of turns	20
	Max input force	400 N
At output shaft	Max output torque	1600 Nm
Weight		10.2 kg.
Part	Material	
Body	Cast aluminium.	
Gear quadrant	Aluminium bronze.	
Worm shaft	High grade aluminium / hard anodized.	
Temperature	-20°C to +80°C.	
Stroke adjustment	+5° and -5° at each end.	
Movement	0° - 90°.	
Finish	Two part polyurethane coating.	
Fasteners	Stainless steel.	

Dimensions Actuator with MO-160

Dimensions in mm.	Actuator size		
	F350	F600	F950
A1 (SR)	385	476	658
A2 (DA)	284	356	400
A3	201	248	267
A5	161	195	239
A6	85	102	131
A8	109	132	131
C4	20	30	30
Pcd V1	140	125	140
Pcd V2	102	-	102
W1	M16x15.5	M12x15	M16x15.5
W2	M10x13.5	-	M10x13.5
Ø Handwheel	300	400	400

EL-O-Matic F-Series Actuator

With MO-520 or MO 600 Declutchable Gear Box
(Metric)



MO-520 / MO-600 Specifications

Input / Output		MO-520	MO-600
At hand wheel	No of turns	22	48
	Max input force	400 N	180 N
At output shaft	Max output torque	5200 Nm	6000 Nm
Weight		36 kg	38 kg
Part	Material		
Body	Cast aluminium.		
Gear quadrant	Cast iron / bronze.		
Worm	Steel		
Worm shaft	Stainless Steel (AISI 430F)		
Temperature	-20°C to +80°C.		
Stroke adjustment	+5° and -5° at each end.		
Movement	0° - 90°.		
Finish	Two part polyurethane coating.		
Fasteners	Stainless steel.		

Dimensions Actuator with MO-520 / MO-600

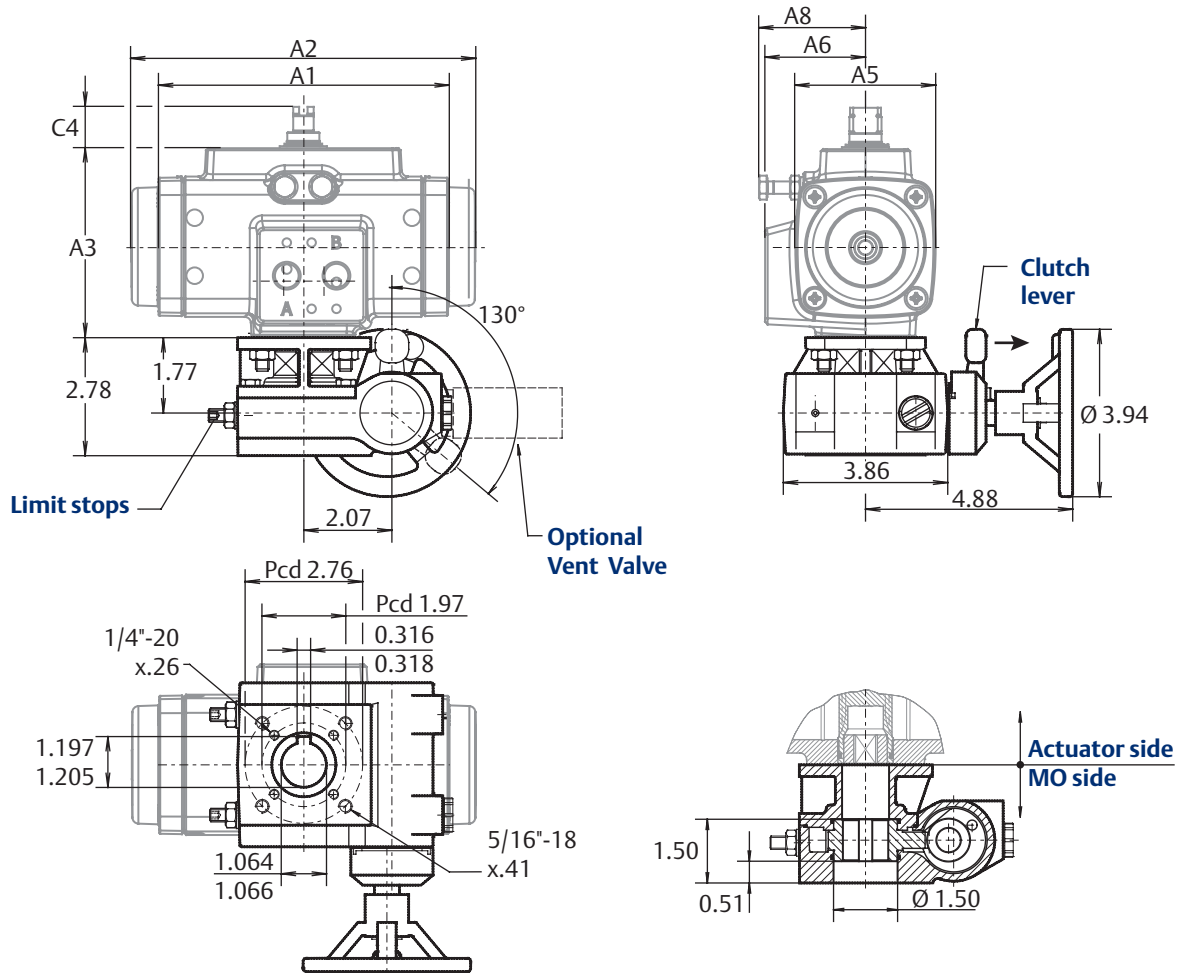
Dimensions in mm.	MO-520			MO-600
	FS1600 FD1600	FS2500 FD2500	FD4000	FS4000
A1 (SR)	732	877	-	959
A2 (DA)	462	550	649	-
A3	301	353	389	
A5	306	350	400	
A6	149	170	196	
A8	156	181	175	
C4	30	30	30	
Ø Handwheel	450	450	600	450

Note: Top and bottom flange mounting patterns are according ISO5211. Drilling depths deviates from ISO5211.

EL-O-Matic F-Series Actuator

With MO-10 Declutchable Gear Box

(Imperial)



MO-10 Specifications

Input / Output		MO-10
At hand wheel	No of turns	9.5
	Max input force	18.4 lbf
	Max output torque	885 lbf.in
Weight		3.3 lbf
Part	Material	
Body	Cast aluminium.	
Gear quadrant	Aluminium bronze.	
Worm shaft	High grade aluminium / hard anodized.	
Temperature	-4°F to +176°C.	
Stroke adjustment	+5° and -5° at each end.	
Movement	0° - 90°.	
Finish	Two part polyurethane coating.	
Fasteners	Stainless steel.	

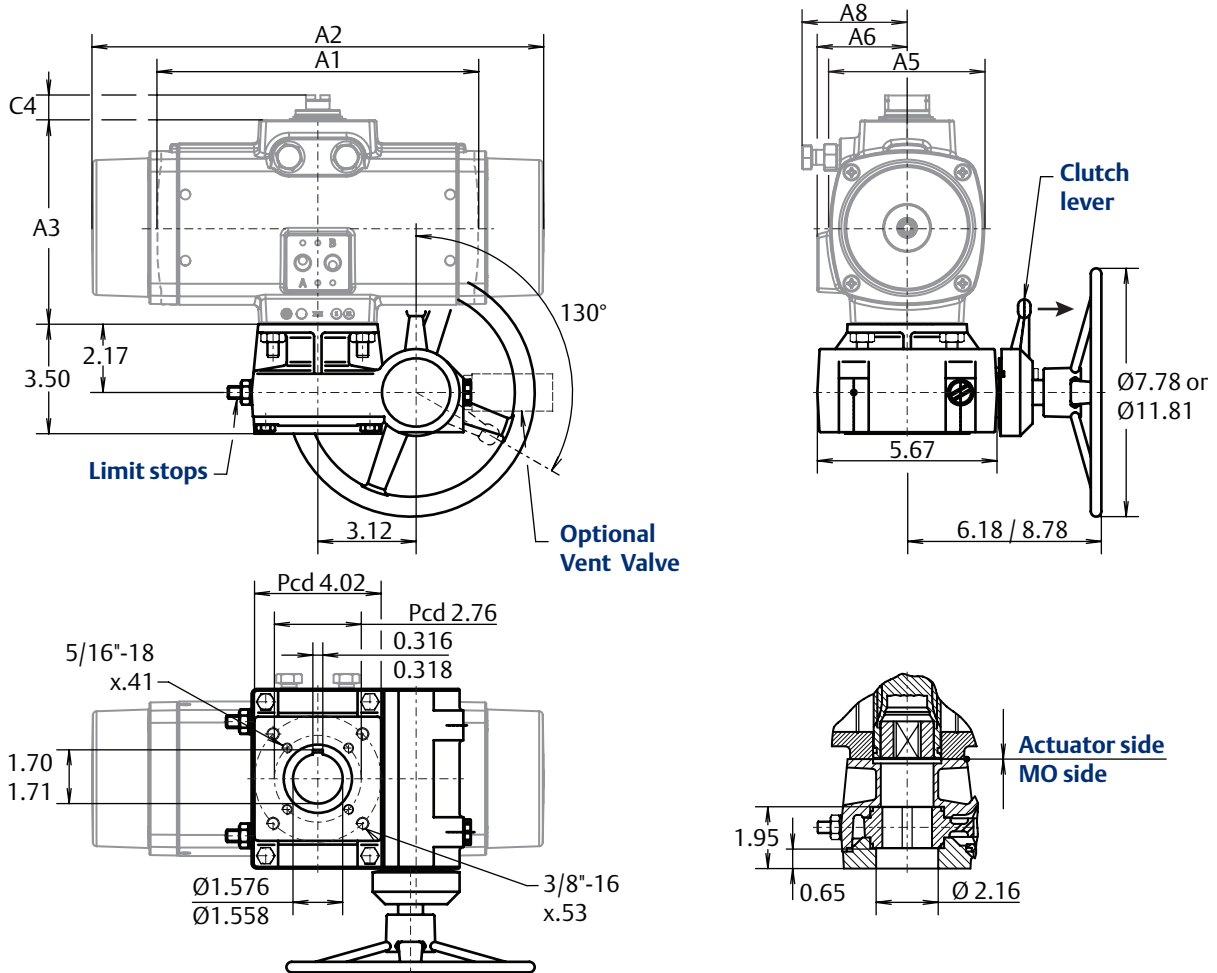
Dimensions Actuator with MO-10

Dimensions in inches	Actuator size		
	F25	F40	F65
A1 (SR)	6.54	7.55	8.53
A2 (DA)	6.54	7.55	8.53
A3	3.59	4.39	4.86
A5	2.68	3.23	3.62
A6	1.91	2.15	2.28
A8	1.89	2.28	2.72
C4	0.79	0.79	0.79

Note: Top and bottom flange mounting patterns are according ISO5211. Drilling depths deviates from ISO5211.

EL-O-Matic F-Series Actuator

With MO-50 Declutchable Gear Box (Imperial)



MO-50 Specifications

Input / Output		MO-50
At hand wheel	No of turns	10
	Max input force	90 lbf
At output shaft	Max output torque	4425 lbf.in
Weight		9.7 lbf
Part	Material	
Body	Cast aluminium.	
Gear quadrant	Aluminium bronze.	
Worm shaft	High grade aluminium / hard anodized.	
Temperature	-4°F to +176°C.	
Stroke adjustment	+5° and -5° at each end.	
Movement	0° - 90°.	
Finish	Two part polyurethane coating.	
Fasteners	Stainless steel.	

Dimensions Actuator with MO-50

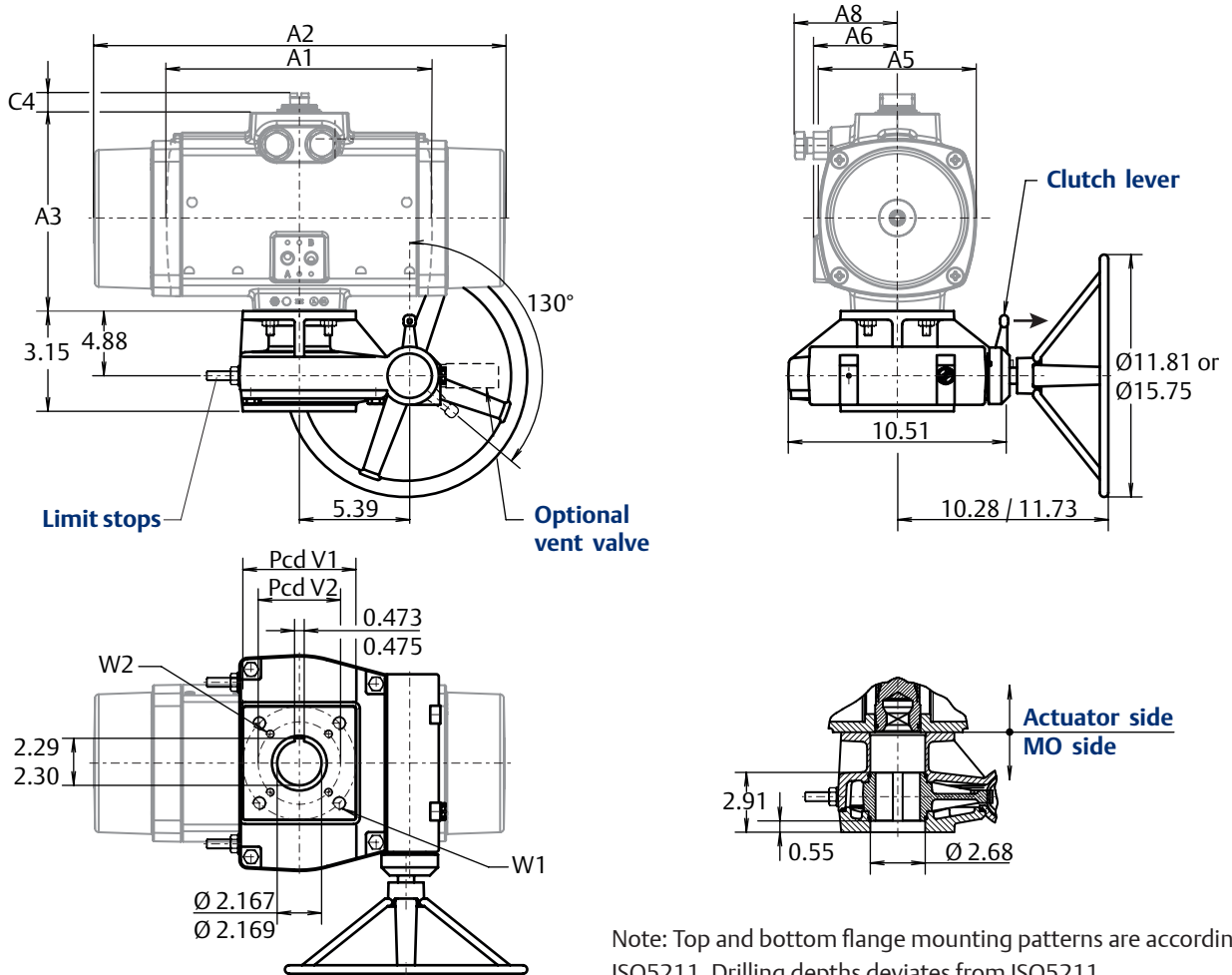
Dimensions in inches	Actuator size		
	F100	F150	F200
A1 (SR)	9.72	11.97	14.23
A2 (DA)	9.72	9.25	10.43
A3	5.14	6.19	6.42
A5	4.06	4.57	4.88
A6	2.50	2.72	2.83
A8	2.72	2.95	3.43
C4	0.79	0.79	0.79
Ø Handwheel	7.9	7.9	11.8

Note: Top and bottom flange mounting patterns are according ISO5211. Drilling depths deviates from ISO5211.

EL-O-Matic F-Series Actuator

With MO-160 Declutchable Gear Box

(Imperial)



Note: Top and bottom flange mounting patterns are according ISO5211. Drilling depths deviates from ISO5211.

MO-160 Specifications

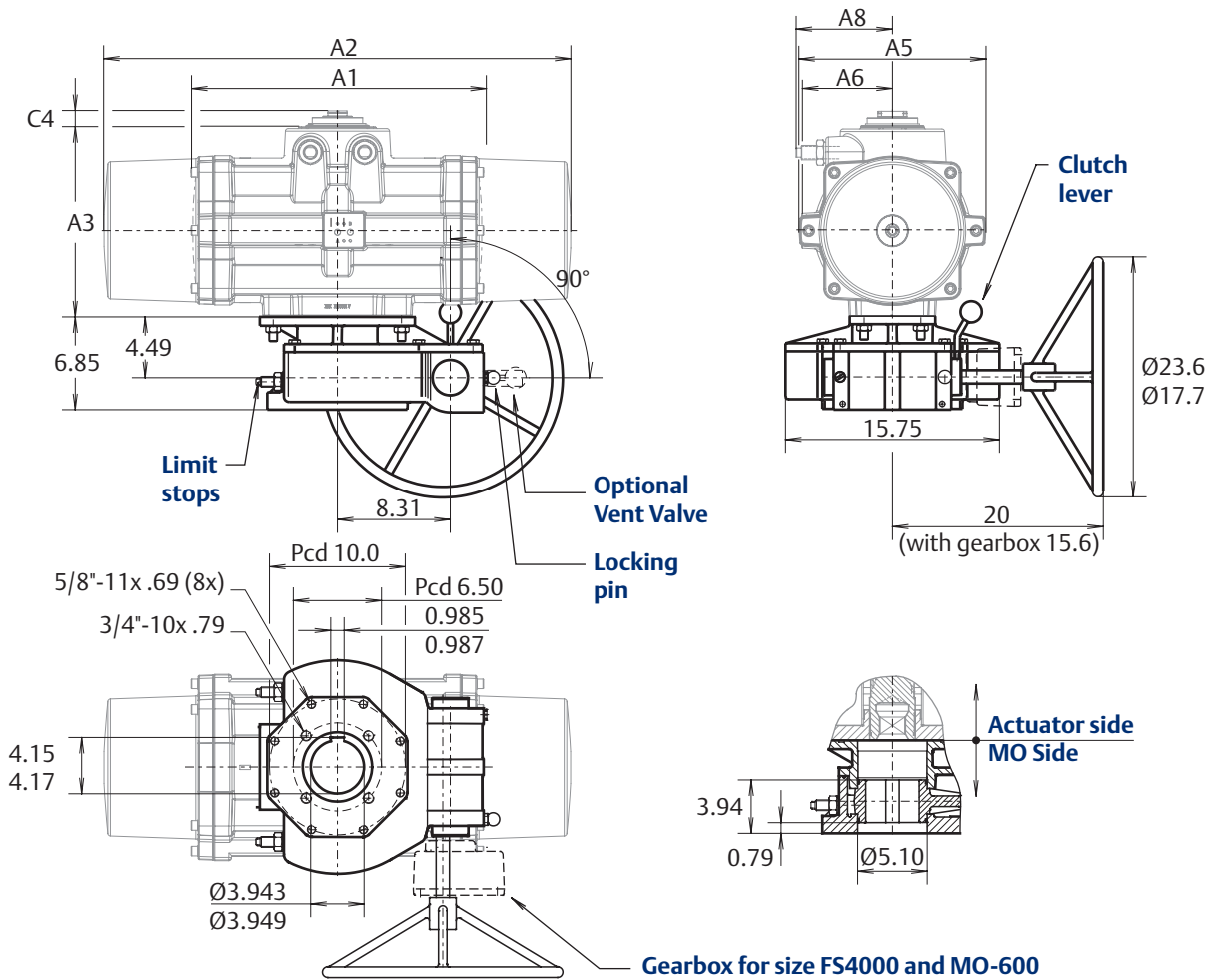
Input / Output		MO-160
At hand wheel	No of turns	20
	Max input force	90 lbf
At output shaft	Max output torque	14161 lbf.in
Weight		22.5 lbf
Part	Material	
Body	Cast aluminium.	
Gear quadrant	Aluminium bronze.	
Worm shaft	High grade aluminium / hard anodized.	
Temperature	-4°F to +176°C.	
Stroke adjustment	+5° and -5° at each end.	
Movement	0° - 90°.	
Finish	Two part polyurethane coating.	
Fasteners	Stainless steel.	

Dimensions Actuator with MO-160

Dimensions in inches	Actuator size		
	F350	F600	F950
A1 (SR)	15.15	18.73	25.91
A2 (DA)	11.18	14.02	15.75
A3	7.92	9.77	10.51
A5	6.34	7.68	9.41
A6	3.35	4.02	5.16
A8	4.29	5.20	5.16
C4	0.79	1.18	1.18
Pcd V1	5.512	4.921	5.512
Pcd V2	4.016	-	4.016
W1	5/8"-11 x.61"	1/2"-13 x.59"	5/8"-11 x.61"
W2	3/8"-16 x.63"	-	3/8"-16 x.63"
Ø Handwheel	11.8	15.7	15.7

EL-O-Matic F-Series Actuator

With MO-520 Declutchable Gear Box (Imperial)



MO-520 / MO-600 Specifications

Input / Output		MO-520	MO-600
At hand wheel	No of turns	20	48
	Max input force	90 lbf	40.5 lbf
At output shaft	Max output torque	46024 lbf.in	53104 lbf.in
Weight		79.4 lbf	83.8 lbf
Part	Material		
Body	Cast aluminium.		
Gear quadrant	Cast iron / bronze.		
Worm	Steel		
Worm shaft	Stainless Steel (AISI 430F)		
Temperature	-4°F to +176°C.		
Stroke adjustment	+5° and -5° at each end.		
Movement	0° - 90°.		
Finish	Two part polyurethane coating.		
Fasteners	Stainless steel.		

Dimensions Actuator with MO-520 / MO-600

Dimensions in mm.	MO-520			MO-600
	FS1600	FS2500	FD4000	FS4000
	FD1600	FD2500		
A1 (SR)	28.82	34.53	-	37.76
A2 (DA)	18.19	21.65	25.55	-
A3	11.85	13.90	15.31	
A5	12.05	13.78	15.75	
A6	5.87	6.69	7.72	
A8	6.14	7.13	6.89	
C4	1.18	1.18	1.18	
Ø Handwheel	17.7	17.7	23.6	17.7

Note: Top and bottom flange mounting patterns are according ISO5211. Drilling depths deviates from ISO5211.

MO Gear box Vent Valve option

Description

The optional MO Vent Valve isolates pneumatically the actuator by venting the actuators air chambers. Venting the actuators air chambers makes "manual operation" of the MO Gear box and actuator assembly more easy because it reduces the required forces at the hand wheel. Therefore we strongly recommend the use of vent valves on MO Declutchable Gear Boxes.

Two version of vent valves are available:

- 3/2 Single Acting Vent Valve.
Used with spring return actuators.
- 5/2 Double Acting Vent Valve.
Used with double acting actuators.

Operation

1. With the clutch lever in the OFF position the hand wheel is dis-engaged and the valve is under remote control.
2. When in ON position, the hand wheel is engaged and air is exhausted via the vent valve. The valve will remain locked in this last position until operated with the clutch lever to OFF position again.

Part numbers:

Actuator type	Connections	Part number
Double acting	1/4" NPT	310.00.622
	G1/4"	310.00.612
Single acting	1/4" NPT	310.00.322
	G1/4"	310.00.312

Specifications

- Body material : Aluminium alloy
- Temperature range: -20°C to +80°C / -4°C to +176°C
- Finish: Anodized
- CV: 0.8

Dimensions:

Vent Valve	units	A	B	C
3/2	mm	25	72	50
	Inch	0.98	2.83	1.97
5/2	mm	30	97	60
	Inch	1.18	3.82	2.36

