

Electromechanical Rotary Actuator

Model 250

TYPICAL APPLICATIONS

- Axis motion control for gimbal and pedestal systems
- Azimuth, elevation, fold / unfold, leveling control
- Suitable for airborne and ground based systems

FEATURES

- 1,400 lb-in peak torque
- Rugged design
- Assembly integrates:
 - High performance DC brushless motor
 - Resolver
 - Planetary gearbox
 - Power-off brake
- High output torque per volume or weight
- Low inductance for maximum dynamics
- Low mechanical backlash for precise positioning
- Supports high radial and axial loading

BENEFITS

- Can be operated in limited rotation or full 360° continuous operation
- Mounting plate and output shaft can be modified for specific applications
- Use of brushless motor allows for higher peak torque and longer life as compared with a brush-type motor
- Rugged design and construction allows assembly to be operated under adverse environmental conditions



The Model 250 Rotary Electromechanical Actuator that develops up to 1400 lb-in of stall torque with a 48 VDC input at 25°C. It integrates a high performance brushless DC motor with Hall Effect devices, a highly accurate planetary gearbox, commutation resolver and power-off brake. Model 250 is designed to meet challenging environmental conditions, and can operate in both continuous and limited angle motion profiles. The spur gear output shaft can withstand heavy axial and radial forces, allowing the actuator to be adapted to a variety of applications.

For more information about how this model can be tailored to your specific application, please contact our Business Development and Application Engineering departments.

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Electromechanical Rotary Actuator

SPECIFICATIONS

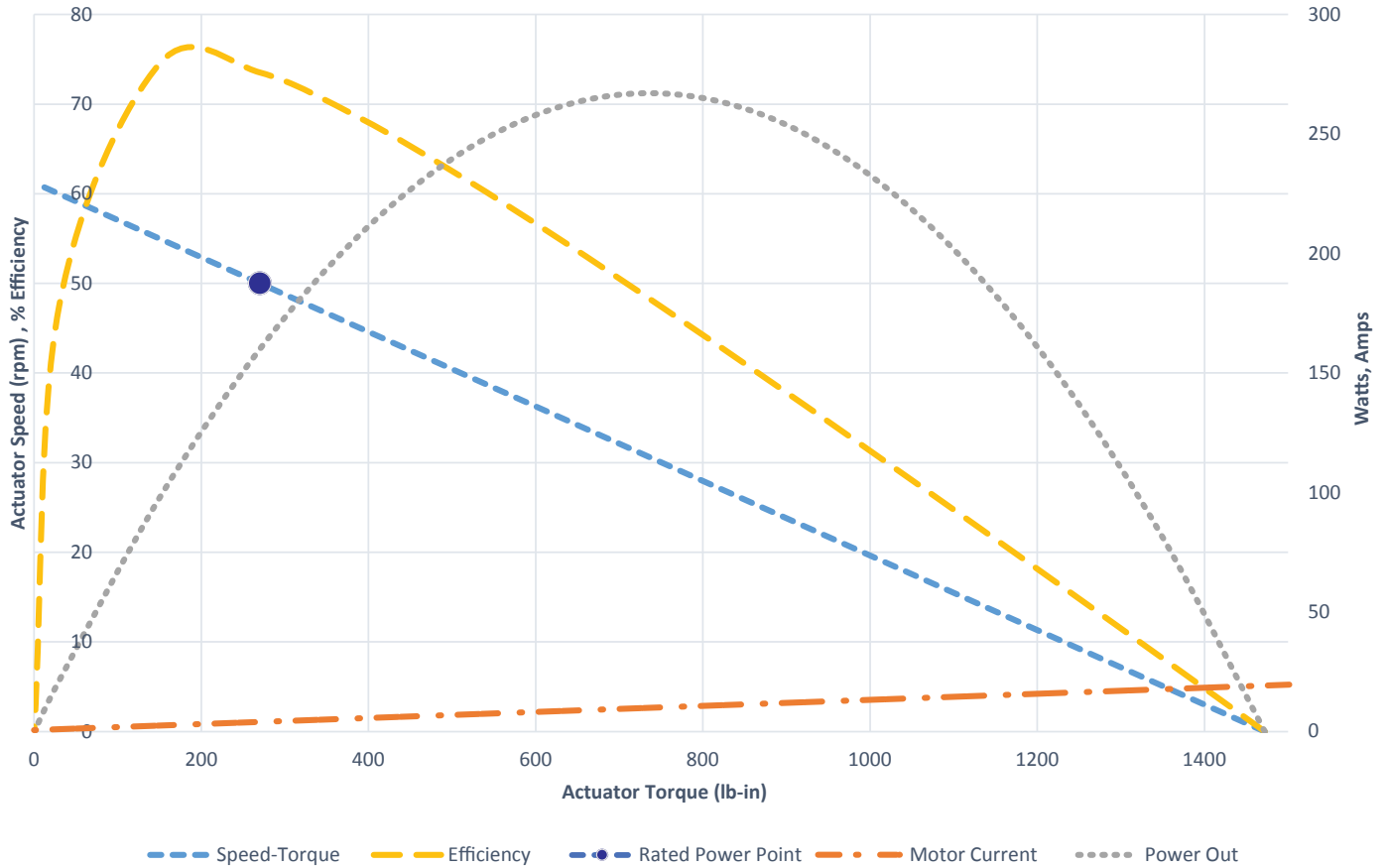
Performance and Environmental Characteristics

Actuator Characteristics @ 25°C	
Typical Voltage	48 VDC
Motor Commutation	Hall Effect standard, resolver optional
Torque Sensitivity	64 lb-in / amp ±10%
BEMF Constant	0.78 V / rpm ±10%
DC Resistance	0.93 OHMS ±12%
Inductance	1.85 mH ±30%
Max Winding Temperature	155°C
Number of Poles	8
No Load Speed @ 48 VDC	61.1 rpm
No Load Current @ 48 VDC	< 750 mA (for motor only)
Rated Speed	50 rpm
Rated Torque	270 lb-in
Rated Power	160 Watts
Rated Current	4.6 amps
Torsional Stiffness	13.3 lb-in / arcmin
Backlash	< 10 arcmin
Output Shaft Radial Load	90 lbf maximum
Output Shaft Axial Load	72 lbf maximum
Brake Holding Torque	550 lb-in minimum
Brake Current	330 mA
Weight	8.5 lbs maximum
Resolver Characteristics @ 25°C	
Input Voltage / Frequency	7 Vrms @ 5 KHz
Input Current	70 mA maximum
Input Power	0.31 W maximum
Transformation Ratio ± 10%	0.5
Phase Shift	17° ±3°
DC Resistance	
	Rotor 40 Ohms
	Stator 77 Ohms
Null Voltage	20 mV maximum

Spur Gear Data	
Number of Teeth	24
Diameter Pitch	16
Pressure Angle	20
Pitch Diameter	1.5000
AGMA Quality Class	10
Maximum TCE	0.0010
Tooth-to-Tooth Composite Error	0.0005
Center Distance Readings to Be Within Nominal And	0.0016
Testing Pressure	32 oz ±1/2
Tooth Thickness at STD PD	0.0982
Measurement Over Wires (REF)	1.6500
Wire Diameter	0.1080
Environmental	
Operating Temperature	-40°C to +95°C
Altitude	20,000 ft maximum
Vibration	MIL-STD-810F method 514.5 PROC 1 random - 0.04 G ² / Hz; 20-2000 Hz
Shock Operational	MIL-STD-810F method 516.20 GPK - 11 milliseconds, half sine
Bench Handling	MIL-STD-810F method 516.5 PROC VI
Transportation	MIL-STD-810F method 516.5 PROC IV
Humidity	5 - 100% RH condensing

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Performance Curves (@ 48 VDC and @ 25°C)

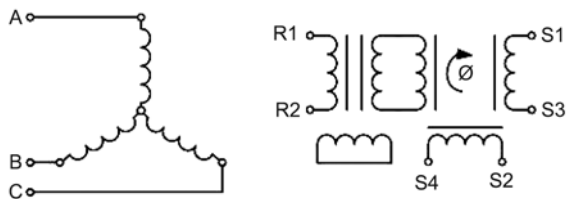


Note: Curves based on six step commutation

Timing Diagram for Hall Switches (8 Pole) CCW Rotation

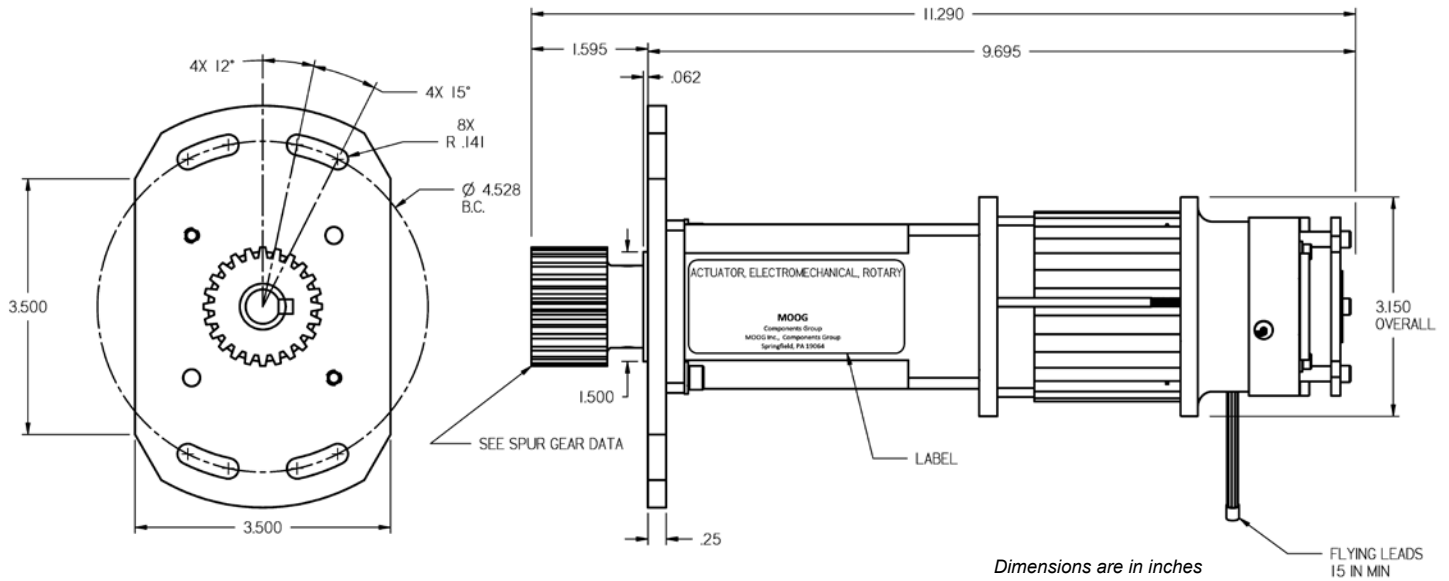
DEGREES	ELEC												
	0	60	120	180	240	300	360	60	120	180	240	300	360
	MECH												
	0	15	30	45	60	75	90	105	120	135	150	165	180
S1 OUT	High	High	High	High	High	High	High	High	High	High	High	High	High
S2 OUT	High	High	High	High	High	High	High	High	High	High	High	High	High
S3 OUT	High	High	High	High	High	High	High	High	High	High	High	High	High
A COIL	-	0	+	+	0	-	-	0	+	+	0	-	-
B COIL	+	+	0	-	-	0	+	+	0	-	-	0	+
C COIL	0	-	-	0	+	+	0	-	-	0	+	+	0

Motor and Field Director Schematic

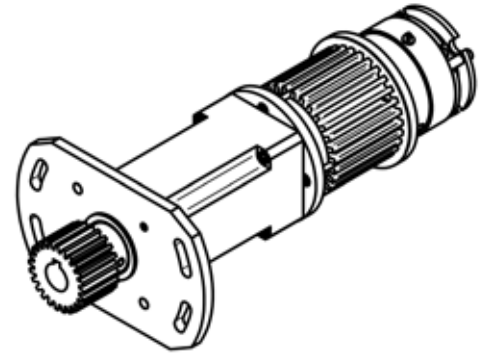
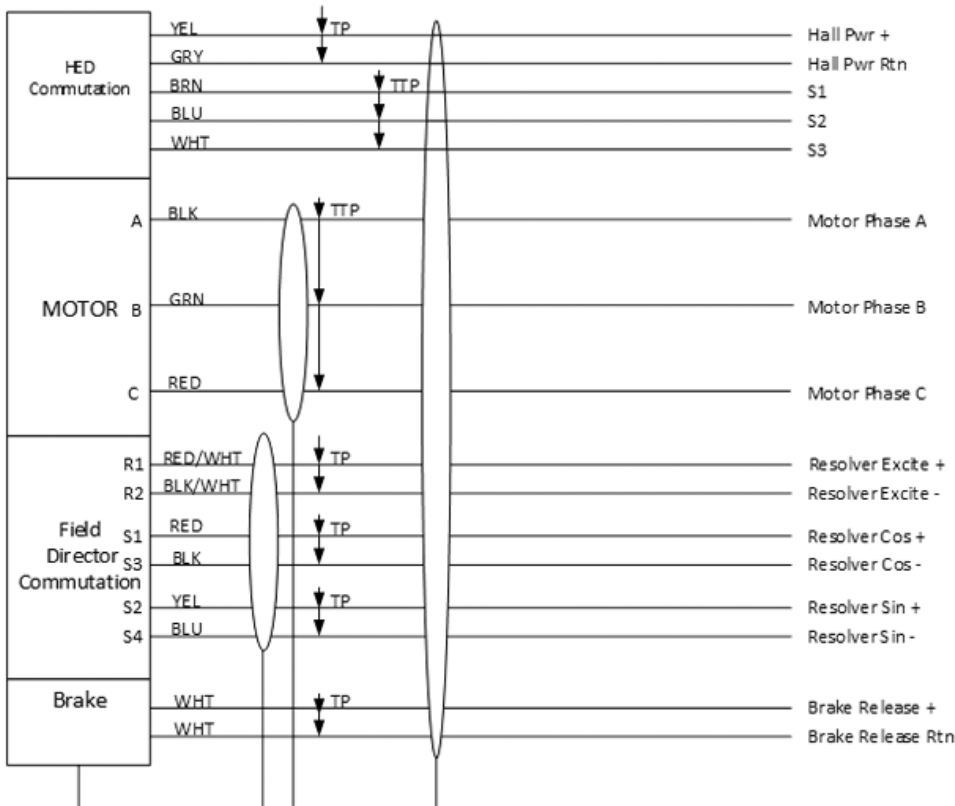


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Typical Outline



Wiring Diagram



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