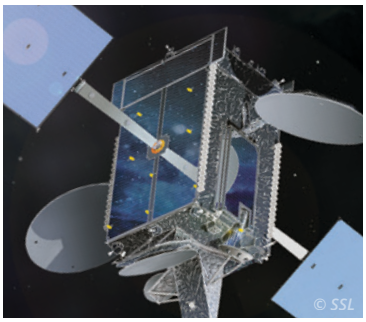
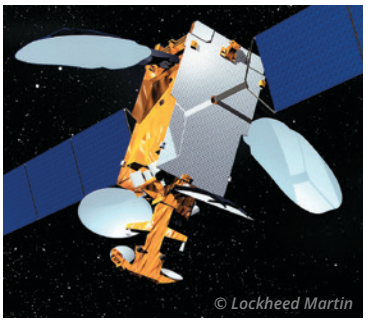
ROTARY ACTUATOR FAMILY

Moog's Rotary Incremental Actuator family provides a range of compact, closely integrated motion control units designed for precise positioning in demanding spacecraft applications. Each actuator combines a permanent magnet stepper motor with a high-performance transmission, either a Harmonic Drive® speed reducer or a multi-stage reduction system, to deliver high holding torque, zero backlash, and excellent torsional stiffness in a low-profile package. Coaxial nesting of the motor and transmission elements enables efficient use of space, supports large-capacity output bearings, and minimizes overall mass while maintaining high load capability.

Across the family, Moog offers actuator configurations optimized for different size, torque, and interface requirements, including the M8, Type 1, 2, 3, 5, Micro3 and HT-1 family of products. These actuators share a common design philosophy emphasizing low weight, high stiffness, and reliable stepper-motor performance. Optional features such as potentiometer or resolver position feedback and 2, 3 or 4-phase motor configurations allow tailoring to mission-specific needs. With proven actuator heritage and consistent mechanical architecture, the Moog rotary incremental actuator family provides a scalable, flight-ready solution for precision spacecraft mechanisms.





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SPECIFICATIONS

Parameter	 M8 Rotary Incremental Actuator	 Micro3 Rotary Incremental Actuator	 Type1 Rotary Incremental Actuator	 HT-1 Rotary Incremental Actuator
Physical Characteristics				
Dimensions (inches/mm)	1.75 x 1.75 x 2.735 (44.5 x 44.5 x 69.5)	4.75 X 4.75 x 5.055 (120.7 x 120.7 x 128.4)	3.15 x 3.15 x 2.756 (80.0 x 80.0 x 70)	3.52 x 3.52 x 5.5 (89.4 x 89.4 x 139.7)
Total Mass (Lbm/Kg)	0.77/0.35	3.7/1.7	1.0/0.454	2.10/0.955
Mechanical				
Motor Step Size (Degrees)	5, 7.5 or 15	7.5	3.75	3.75
Output Step Size (degrees)	0.050, 0.075 or 0.150	0.003	0.0375	0.0039
Slew Rate (deg/sec)	20, 30 or 60	1.8	15	1.56
Max. Output Step rate (pulses/sec)	400	600	400	400
Range of Travel (degrees)	360 continuous or defined	360 continuous or defined	360 continuous or defined	360 continuous or defined
Unpowered Holding Torque, minimum (lb-in/Nm)	14/1.58	178/20	20.0/2.26	300/33.9
Output Torque (lb-in/Nm)	25/2.82	124/14	70.0/7.9	480/54.2
Torsional Stiffness (lb-in/rad/Nm/rad)	3800/430	150,000/17,000	20,000/2,260	125,000/14,123
Moment Stiffness (lb-in/rad/Nm/rad)	45,000 (5,084)	250,000/28,245	75,000/8,474	250,000/28,245
Electrical				
Motor Type	2 or 3 Phase Stepper	3-Phase Stepper	3-Phase Stepper	3-Phase Stepper
Operating Voltage, Nominal (VDC)	29	22	28	32
Motor Winding Phase Resistance @ 23C (Ohms)	32.5	104	37.5	51
Power, Nominal (Watts)	14.8	3.0	4.5	10
Position Sensor / Accuracy	None	None	Potentiometer ±1.0˚ Max.	Potentometer +/- 0.1% of 180°
Environmental				
Operating Temperature Range	-45˚C to +85˚C	-45˚C to +85˚C	-50˚C to +80˚C	-70˚C to +105˚C

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