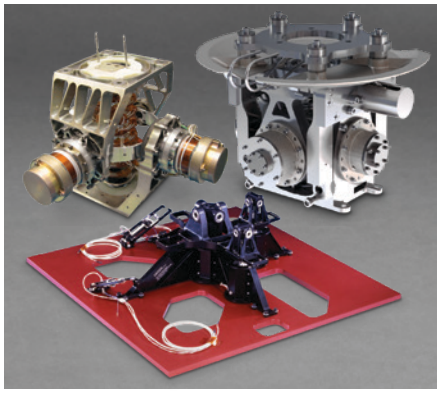
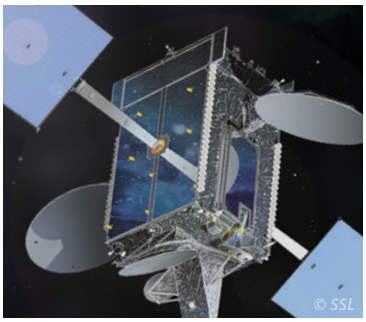
THRUSTER GIMBAL ASSEMBLY FAMILY

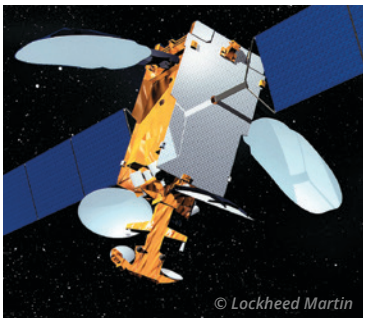


The Moog Electric Propulsion Thruster Gimbal Assembly family provides a complete range of dual-axis gimbal mechanisms designed to position electric propulsion thrusters with high accuracy and long-term reliability.

Designed and manufactured by Moog, Chatsworth Operations, these gimbals support a wide variety of propulsion technologies, including xenon ion engines, arc-jet thrusters, and NTO/MMH systems, and address the growing demand for dedicated, flight-qualified vector-pointing solutions. The family incorporates proven Moog actuator technology and has accumulated significant flight heritage on missions such as MUSES-C (Hayabusa), Advanced Extremely High Frequency (AEHF) and multiple commercial satellite platforms.

All gimbals in the family are configured for precise cross-axis positioning using either linearly actuated or rotary actuated dual-axis architectures. High-reliability space-qualified stepper motors, Harmonic Drive® gear transmissions and/or lead-screw linear transmissions, and integrated position-sensing potentiometers provide the resolution and accuracy required for long-duration missions. Propellant line accommodation, including xenon and bipropellant feed systems with heaters, is available across the product line, along with optional MLI blankets. With demonstrated 15-year on-orbit design life and a range of sizes from small ion-thruster gimbals to large EP assemblies, the Moog gimbal family delivers a scalable, flight-proven solution for electric propulsion vector control.

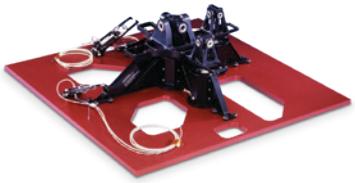




MOOG

THRUSTER GIMBAL ASSEMBLY FAMILY

SPECIFICATIONS

Parameter	 Model-T	 ION Thruster	 S-TGA
Physical Characteristics			
Dimensions (inches/mm)	5.0 x 5.0 x 8.75 (127 x 127 x 222.25)	24.41x 24.41 x 6.8 (620 x 620 x 172.72)	9.75 x 9.75 x 6.75 247.7 x 247.7 x 171.5
Mass (Lbm/Kg)	11.0/5.0	8.14/3.70	4.8/2.18
Payload Weight (lbm/Kg)	(50.0/22.73) externally supported	(55.25/25.1) well balanced mass	(8.25/3.75)
Mechanical			
Output Step Size (degrees)	0.01125	0.0005	0.0375
Slew Rate (deg/sec)	3	1	3.75
Output Step rate (pulses/sec)	267	128	100
Range of Travel (degrees)	±36˚ in both X & Y Axis	±5.0˚ in both X & Y Axis	±18˚ in both X & Y Axis
Unpowered Holding Torque, minimum (lb-in/Nm)	150/16.9	15/1.7	20/2.26
Electrical			
Motor Type	4-Phase Stepper	3-Phase Stepper	3-Phase Stepper
Operating Voltage, Nominal (VDC)	74	17.3	28
Motor Winding Resistance, Nominal (Ohms)	285 ±15 per phase	32 per phase	37.5 per phase
Power, Nominal (Watts)	22 W per Axis	4.6 W per Axis	4.5 W per Axis
Position Sensor / Accuracy	Potentiometer ±0.03˚ Max.	HED ± 0.5° Max.	Potentiometer ±1.0˚ Max.
Environmental			
Operating Temperature Range	-20˚C to +80˚C	-20˚C to +80˚C	-35˚C to +80˚C

MOOG

space@moog.com
moog.com/space