

H25 Bi-Axis Gimbal, 4-Phase

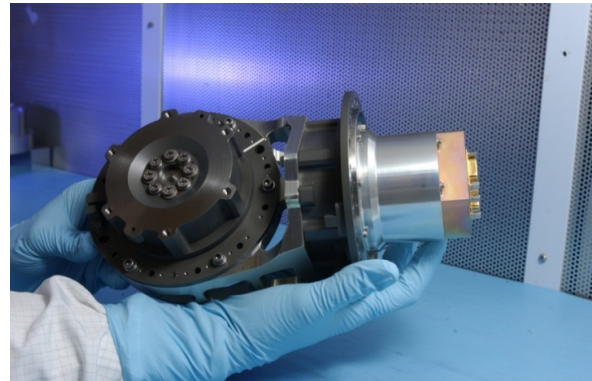
Design Description

Sierra Nevada Corporation's (SNC) Space Systems H25 Gimbal features very fine pointing resolution, position telemetry precise to within a single step, adjustable hard stops, and extremely long-life capability.

The gimbal actuator features a state-of-the-art hybrid transmission consisting of a planetary gearbox that is designed to fit completely within a high stiffness, zero backlash harmonic drive. The combined transmission provides high internal torque margins throughout the operational range and enables optimal performance.

Telemetry is provided by redundant potentiometers that have been treated using an SNC proprietary process, yielding previously unattainable potentiometer life in a spaceflight environment. Redundant potentiometers monitor motor and output shaft position with sufficient accuracy to resolve position within a single step over the full operating range.

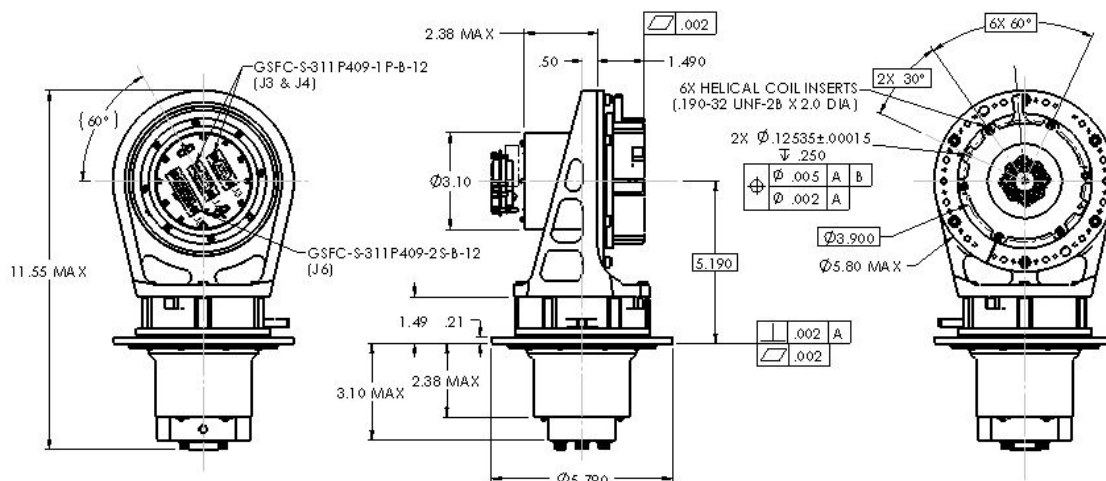
The gimbal structural components are fabricated from lightweight high stiffness titanium and high strength aluminum alloys. Careful selection of materials and precision-machined components ensure consistent performance over a broad temperature range. Oversized 440C stainless steel ABEC 7 ball bearings support the output shaft for maximum stiffness and life. The gimbal actuators are capable of full 360-deg rotation and adjustable hard stops are available to limit gimbal travel to any customer requirement.



H25 Bi-Axis Antenna Gimbal, 4-Phase

Features	
• High stiffness and load capacity	• Long life, qualified for more than 1 million dithering cycles
• Fine pointing resolution, 0.003° per step	• Redundant, accurate, potentiometer telemetry
• 200% minimum torque margin motor design	• Space-qualified Pennzance lubricant
• Motor available as 2- or 4-phase stepper	• Extreme environmental capability
• Low power consumption	• Full rotation, removable hard stops
• High powered and unpowered torque capability	

Dimensions



Note: All dimensions above are in inches

Applications	
<ul style="list-style-type: none"> Antenna pointing mechanisms for very fine pointing resolution 	<ul style="list-style-type: none"> Deployment mechanisms
<ul style="list-style-type: none"> Camera pointing mechanisms 	<ul style="list-style-type: none"> Robotics applications
<ul style="list-style-type: none"> Solar array drives 	

Heritage Programs	
<ul style="list-style-type: none"> Clio Satellite 	<ul style="list-style-type: none"> Mobile User Objective System (MUOS-1-5)
<ul style="list-style-type: none"> Vietnam Satellite (Vinasat-1 and -2) 	<ul style="list-style-type: none"> Americom Communications Satellite (AMC-14)
<ul style="list-style-type: none"> EchoStar X 	<ul style="list-style-type: none"> PAN (USA-207)
<ul style="list-style-type: none"> Broadcasting Satellite System (BSAT-3C) 	<ul style="list-style-type: none"> Jabiru
<ul style="list-style-type: none"> Geostationary Operational Environmental Satellite R-Series (GOES-R) 	<ul style="list-style-type: none"> Japanese Communications Satellites (JCSAT-9 through -12)
<ul style="list-style-type: none"> Space-Based Infrared System (SBIRS) Geosynchronous Earth Orbit (GEO) 	

Product Specifications		
	U.S.	SI
Mechanical		
Envelope dimensions	11.6 in x Ø5.8 in	295 x Ø147 mm
Mass (excluding stops)	10.7 lb	4.9 kg
Unpowered holding torque	> 650 in•lb	> 70 N•m
Torsional stiffness of two-axis gimbal	100,000 in•lb/rad, min.	11,300 N•m/rad, min.
Load inertia	266,000 lbf-in-sec2	30,000 kg-m2
Gear ratio	1246.75:1	
Output resolution (step)	0.003°	
Life	15 x 1.5 years, 55,000 cycles, 775,000 motor revs	
Electrical		
Motor Type	4-phase, wye wound, redundant, 3.75-deg stepper	
Voltage, nominal	70 Vdc	
Resistance	323 Ω	
Power, nominal	15 W	
Fine potentiometer (redundant)	350-deg electrical travel, 10 kΩ	
Coarse potentiometer (redundant)	350-deg electrical travel, 10 kΩ	
Environmental Qualification		
Operating temperatures	-13 °F to +207 °F	-25 °C to +97 °C
Nonoperating temperatures	-47 °F to +212 °F	-44 °C to +100 °C
Random vibration	27 grms	
Sine vibration	20 g	
Note: This data is for information only and subject to change. Contact SNC's Space Systems, Space Technologies for design data.		