

SMA Actuator

Smart material-based release actuator

MODEL GFB-06

TRL 4–5 · TRL 5 IN PROGRESS

AMS 4965 COMPLIANT FASTENERS

OVERVIEW

SMA Actuator is a simple, reliable, cost-effective smart-material actuator for support-and-release mechanisms, rated to hold and release loads up to **80 kN**. It works on the principle of Shape Memory Alloy (SMA) cylinders that elongate under electric heating to fracture a bolt, separating two or more components with a low-shock, non-pyrotechnic actuation.

SMA technology gives the actuator reusability and easy resettability. SMA Actuator scales efficiently with fastener sizes from **3–10 mm**, covering a wide range of hold-release applications.



Non-pyrotechnic & resettable

- No safety concerns
- Reusable across multiple test cycles
- User resettable with reset tool

Simple, proven design

- Reliable operation
- Technology with space heritage
- Easy to assemble, reset, and monitor

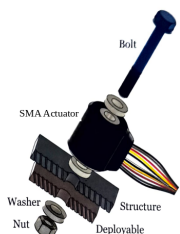
Built-in redundancy

- Heater & sensor redundancy
- Cost-effective at scale

TECHNICAL SPECIFICATIONS

ACTUATOR	
Mass	30 g
Power	65 W @ 32 VDC
Operating voltage	24 – 32 VDC
Current drawn	2 A @ 32 VDC
Resistance	15.7 ± 0.5 Ω
Temperature sensor	RTD PT1000
RTD resistance	1000 Ω @ 0°C
Actuation time	30 s @ 23°C
Operating temperature	–65°C to +80°C
Life	50 cycles

FASTENER	
Bolt size	M6×1
Bolt material	Ti6Al4V*
Max. load capacity	10,000 N
Preload	6,000 N
Bolt fracture load	18,000 N
Nut	Ti6Al4V*
Washer	Ti6Al4V*



HOW IT WORKS

The bolt passes through the deployable structure and fixed structure, torqued to preload through the SMA Actuator body. On command, internal SMA cylinders heat and elongate, fracturing the bolt at a defined groove and releasing the joint cleanly — with no explosive charge, gas, or particulate release.

Stack order: **Bolt** → **SMA Actuator** → **Washer** → **Structure** → **Deployable** → **Washer** → **Nut**

Application examples: solar array, mast, and antenna deployment · launch locks for instruments · optic covers · payload hold-down and release

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* Ti6Al4V fasteners compliant with AMS 4965.
Specifications customizable to application requirements. Values shown are verified test data for the GFB-06 configuration.