

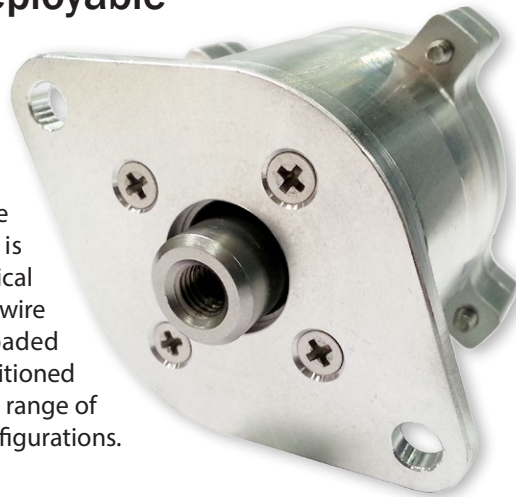


SERIES 06

Hold-Down Release Mechanism Technology

High-reliability, non-explosive electromechanical release mechanism technology for dependable stowage and release of deployable space systems

Glenair HDRM device technology is optimized for reliability with built-in mechanical and electrical redundancy. The planned release of the deployable system is activated by a pre-determined value of electrical current to a fuse-wire system which causes the wire to break under tension and allow the pre-loaded mechanical bolt to actuate. Glenair is now positioned to incorporate HDRM technology into a broad range of customer-defined housing and mounting configurations.



- Electromechanical (non-explosive) technology
- Immune to electromagnetic interference
- User-serviceable and reusable
- Scalable design, up to 40,000 lbs. preload
- Ultra-low-shock release



Glenair®

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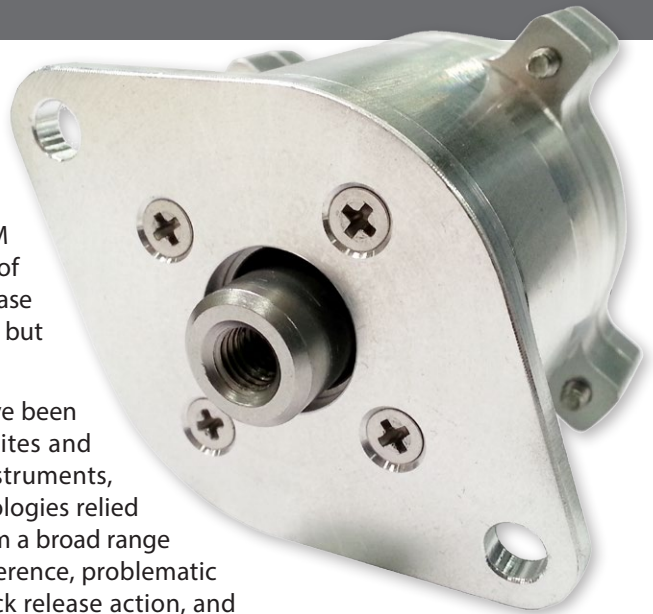
Resets in minutes

Glenair hold-down release mechanism (HDRM) technology is based on a fusible wire-actuated separation nut design. Increasingly popular for its reliability and non-pyrotechnic action, fusible wire-actuated nut technology has the added benefit of being partially reusable and refurbishable post-deployment. Glenair HDRM technology is immune to all forms of EMI or ESD, and is capable of easily sustaining launch loads as well as defined preloads—with release deployment times comparable to conventional explosive actuators, but with low-shock and low power input.

A broad range of hold down release mechanism technologies have been historically used to hold secure and subsequently deploy satellites and other appendages (solar arrays, antenna reflectors, radiators, instruments, doors, sensors, booms, and so on) in space. Most of these technologies relied on non-reusable (explosive/pyrotechnic) designs that suffered from a broad range of deficiencies, including susceptibility to electromagnetic interference, problematic synchronization of release with mission requirements, high-shock release action, and significantly, the inability to reuse or refurbish the device during test. Historically, actuators and release devices of this type have included:

- Explosive release nuts
- Bolt cutters
- Separation nuts
- Wire and pyro cable cutters

Glenair has taken a different path in the development of a non-explosive HDRM with a consumable initiator which, post-actuation, allows the device to be refurbished and reset on-site, or at the factory. Glenair fusible wire-actuated nut technology solves all of the problems associated with conventional explosive HDRM devices. In addition, the three key components of the Glenair HDRM (preloading assembly, release actuator, and load-carrying structure) may be packaged according to specific customer requirements including the addition of connectors to replace wire leads, cylindrical or rectangular housings, lightweight materials, package size and profile, mounting dimensions and so on. Consult the Glenair HDRM team at our Glendale factory for more information.



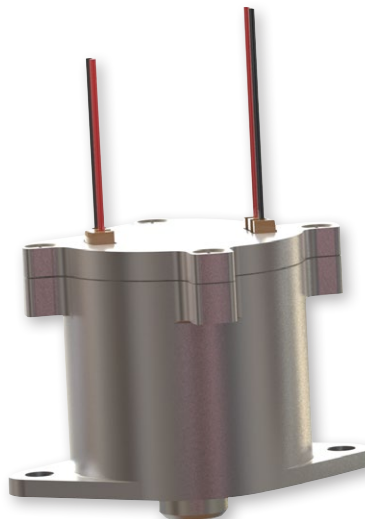
Glenair HDRM devices offer quick release time, low shock, relatively low power input, and almost no temperature sensitivity, in addition to higher preload carrying capacity compared to similar devices.

GLENAIR HDRM REUSABILITY

- End users require reusable HDRMs in order to optimize cost and convenience during test
- Glenair HDRM technology delivers the ability to reset in minutes instead of weeks
- Mechanical Release available upon request



7/16 inch unit with 35,000 pound preload and connectorized interface



1/4 inch unit with 5,000 pound preload and conventional wire lead interface

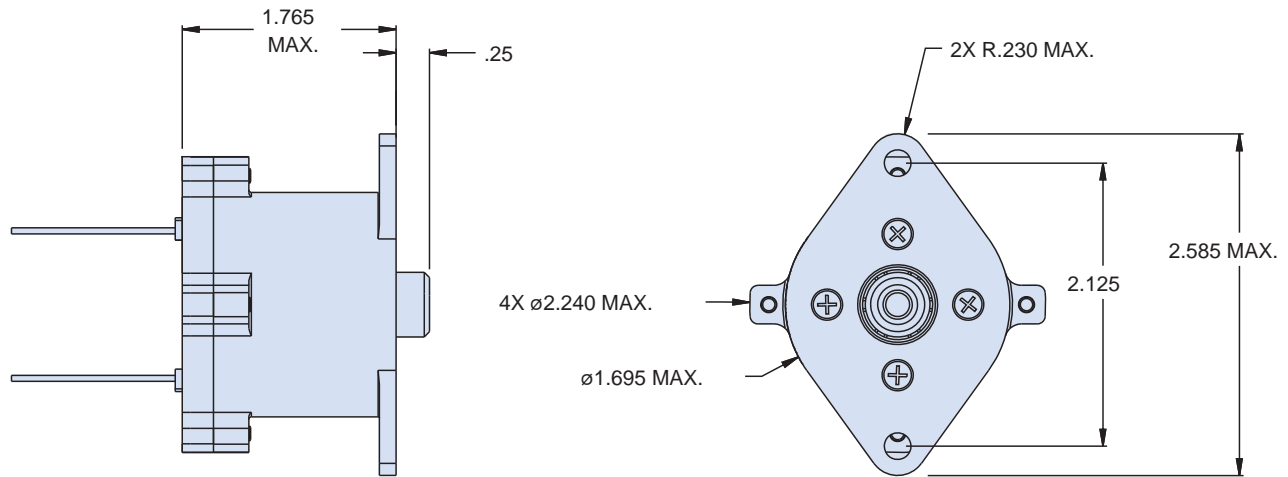


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U.S. CAGE code 06324

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Materials and design

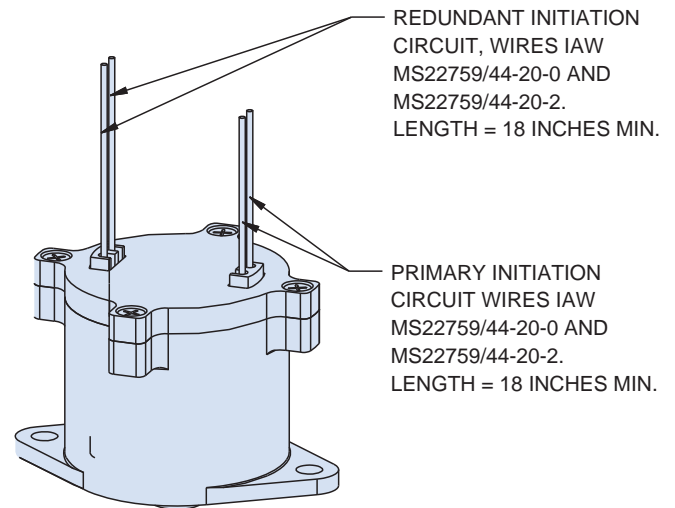


Physical characteristics for 1/4 inch unit

Mass	241 grams nominal weight with 18 inch lead wire included
Bolt	1/4-28 UNJF-3B*
Material list	IAW MSFC-STD-3029
Epoxy	Outgassing requirements per GSC19384

Device features for 1/4 inch unit

Redundant initiation	2 initiation points
Field refurbishable	Initiator can be replaced in less than 15 minutes by trained personnel
Reliability prediction	0.9999995
Packaging	External housing typically supplied with two mounting points. Custom housings and mountings available
Connectorization	Standard design supplied with wire inputs. Connectorized versions available
Scalable bolt size	Bolt size determines preload and can be scaled to accommodate a wide range of requirements



*The size callout is based off the bolt size that is to be used. Metric thread can also be called out. Complete test report available upon request

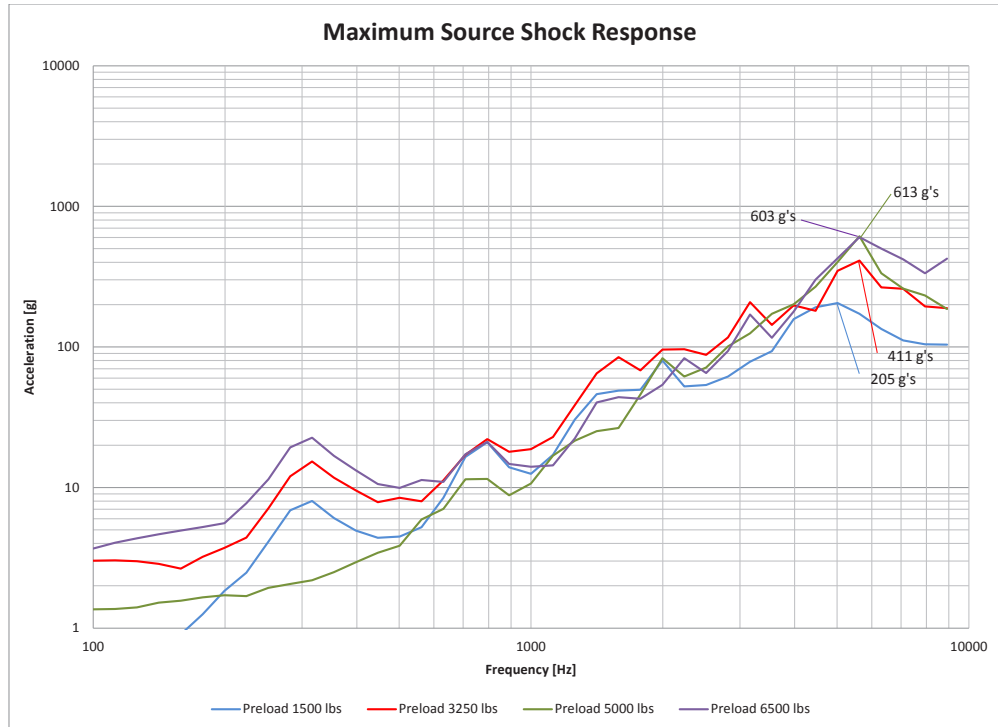


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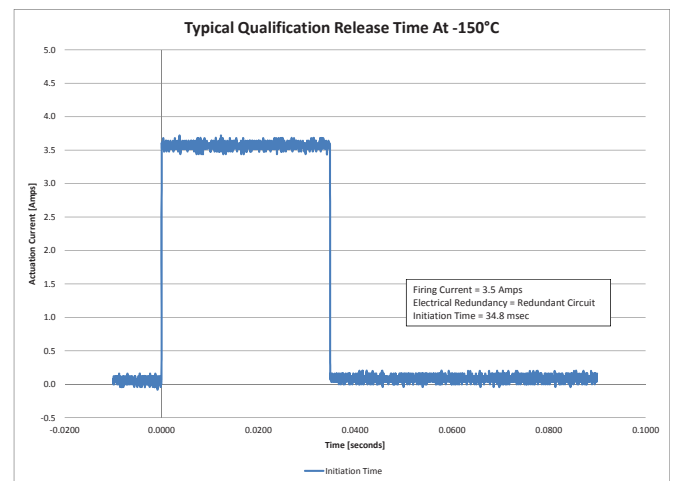
Hold-Down Release Mechanism Technology

Summary of test results



Tested capability for ¼ inch unit*

Rated preload capacity	5,000 pounds
Maximum rated preload capacity	6,500 pounds
Ultimate released load	8,000 pounds
Electrical resistance	1.50 ohms Max
Random vibration: 3 orthogonal axes	50.9 G _{rms}
Sine vibration: 3 orthogonal axes	25 G's
Actuation time	Under 45 ms @ 3.5 Amps
Source shock	Under 625 G's @ 5,000 pounds
Life test	10 refurbishments during qualification and an expected continued usage
Temperature	-150°C to +150°C released in a vacuum (1x10 ⁻⁶ Torr)



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