

NEA Model 9103 Hold Down & Release Mechanism

Global Leader

NEA® Electronics, Inc. is a global leader in spacecraft mechanisms. Our low shock release devices are relied upon for spaceflight applications more than any other device.

Reliable

Our designs are reliable, simple, insensitive to adverse environments and backed up by years of heritage and loyal customers.

Quality Assured

NEA, a trusted supplier of mission critical components, is certified to ISO 9001:2008 and AS9100:2009 C

Model 9103 Product Data Sheet

NEA is the global leader in non-pyrotechnic Hold Down & Release Mechanisms (HDRM) for the spacecraft market. Hold Down & Release Mechanisms, also sometimes referred to as Separation Nut Release Mechanisms, are offered in a range of sizes. The NEA Model 9103 supports ultimate loads as high as 52 kN (11,690 lbf).

Applications

Typical applications include:

- Antennas
- Scientific instruments
- Solar arrays
- Reflectors
- Satellite, spacecraft and payloads
- Booms and masts
- Launch locks for gimbals, thrusters
- Stage separation
- Caging mechanisms

Principle of Operation

The NEA HDRM is an electrically initiated, one-shot release mechanism that has the ability to carry a very high tensile preload until commanded to release. The preload is applied through a release rod held in place by two separable spool halves which are in turn held together by tight winding of restraining wire. The restraint wire is held in place by redundant electrical fuse wires; actuation of either circuit allows release, assuring maximum reliability. When sufficient electrical current is applied, the restraint wire unwinds allowing the spool halves to separate releasing the release rod and the associated preload.

The actuation is simple and reliable and forms the basis of actuation for many of NEA's other products including Pin Pullers, Battery Cell Bypass Switches, and Non-Pyrotechnic Valves.

NEA Electronics has the capability to pair our HDRMs with other hardware such as custom release rods, preload nuts, extractors, bolt catchers, mounting brackets, springs, connectors and electrical

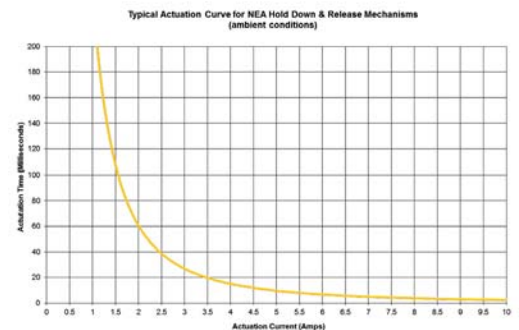


harnessing to provide low-shock, high reliability release assemblies.

Key Features

- Extremely low release shock
- Redundant or non-redundant circuit
- Near simultaneous release of multiple hold-down points
- Internal torque containment
- Extended operating temperature range
- Can be operated with pyrotechnic initiation circuitry
- Range safety friendly
- Space-rated materials
- Factory refurbishment

Actuation Time



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Model 9103 Technical Specifications

Parameter	Capability
Ultimate Load Rating	52 kN (11,690 lbf)
Proof Load	41 kN (9,217 lbf)
Release Load Rating	35 kN (7,868 lbf)
Shock @ Preload ¹	<350 g's @ 35 kN (7,868 lbf)
Fuse Wire Resistance	1.2 to 2.0 Ω @ 25°C
Actuation Current ²	4 Amps for 25 ms
No-Fire Current ³ (continuity)	250 mA
Release Time ⁴	<50 ms
Qualification Temperature Range ⁵	-135°C to +135°C
Maximum Angular Misalignment	6° Cone
Mass ⁶	170 g (0.37 lb)

Notes:

¹Shock is preload dependent, contact applications engineering for shock at other preloads.

²Actuation can be achieved using a range of current, the value in the table is the value used for qualifying this device.

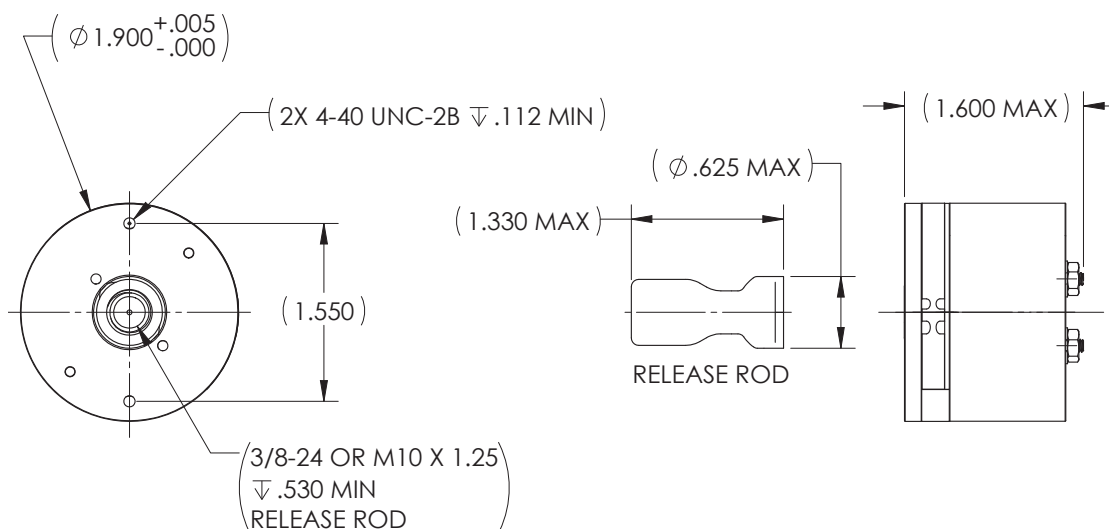
³No-fire current for 5 minutes or less as ambient temperature, consult NEA applications engineers for other no-fire current requirements.

⁴Release time is dependent on actuation current, contact applications engineering for more specific information on actuation time as a function of current.

⁵The values presented for qualification temperature range are not a measure of the limits of the device.

⁶Mass does not include harnessing and lead wires.

Model 9103 Mechanical Interface Drawing



Note: Model 9103 Release Mechanism shown. Different configurations available with alternate release rods, mounting features, and connectors. Metric configurations are also available.

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Mission Success

NEA® Electronics, Inc. is dedicated to building mankind's legacy in space by supporting our customers in the aerospace industry through on time delivery of innovative products that exceed expectations and assure mission success.