

REACT R01B v2.2 – EM

HOLD-DOWN & RELEASE MECHANISMS – HDRM

ARQUIMEA's REACT devices are low-shock Hold-Down and Release Actuators which function is to firmly fix a payload during transport or launch and later release it by electrical activation. REACT implements a redundant trigger motorized by proprietary high temperature Shape Memory Alloy (SMARQ®) that provides reset capability to the end user. REACTs are used in several systems such as solar arrays, experimental payloads, antennas, cover doors, shutter mechanisms, booms, large structures, etc. ARQUIMEA's devices are ITAR free.

OPERATION

REACT actuators are based on a two-stage mechanism: structural and trigger. The Structural assembly are responsible of holding the high external loads in a safe and reliable way, while the trigger is responsible of transforming the system into an unstable structure that is self motorized to effectively release the main bolt.

REACT are electrically activated with a customizable interface. The total amount of energy is effectively transformed into heat to induce the transformation of the Shape Memory Alloy thus motorizing the system with a redundant trigger. Cold or Hot redundancy can be considered for activation.

	Standard Operation Temperature	Extended Operation Temperature
Ultimate Load Rating	7.5 KN	
Proof Load	6.5 KN	
Release Load	5 KN	
Shock @ Preload ¹	< 1,000 g's @ 5 KN	
Mechanical I/F (main Bolt)	M5 x 0.8 ↓10.8	
Misalignment	± 2.5°	± 2.5°
Electrical Interface ²	4A ⁽²⁾	20 V ^{(2),(4)}
Bridge Resistance ²	Initiator: 0.76 Ω ± 10% With 1m leads : 0.93Ω ± 10%	24 Ω ± 10%
Operating Temp.	-60 / +70°C	-60 / +125°C
Non-Operating Temp.	Pre-Act: -120 / +70°C Post-Act: > ±150°C	±120°C
Life Cycles (min)	10 cycles on ground + 1 in orbit	
Mass ³	220 g	
Part Number	ARQ.REAC.S02.053S.EM	ARQ.REAC.S02.053E.EM
<ul style="list-style-type: none"> Redundant SMA trigger (two independent initiators). Can operate simultaneously Resettable by end user (manual reset) Custom configurations available 		

- (1) Shock emission dependent of Preload level and support structure
- (2) Release can be achieved using a wide range of currents. Custom I/F can be implemented on demand
- (3) Mass does not include harnessing and lead wires
- (4) Electrical I/F compatible with Thermal Knife

LIFETIME

ARQUIMEA's actuators are designed to meet their requirements after a maximum on-ground lifetime of 3 years including up to 2 years in storage. Device has been designed to be actuated and reset up to 10 times on ground, plus one actuation in Space (more than 50 cycles applied during test campaigns).



(*): Illustrative: REACT 5KN V2.1

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