



REACT 15KN v2

RESETTABLE HOLD-DOWN & RELEASE ACTUATOR – HDRA

ARQUIMEA's REACT devices are low-shock Hold-Down & Release Actuators which function is to firmly fix a payload during transportation or launch and later release it by electrical activation. REACT implements a redundant trigger with two different motorization options based on Shape Memory Alloys (TiNi and SMARQ®) covering wide actuation temperature ranges and providing manual reset capability to the end user.

Typical applications of REACT include: solar arrays, antennas, booms and masts, reflectors, cover doors, scientific instruments, shutter mechanisms, large structures, launch locks for gimbals, thrusters, stage separation, caging mechanisms, etc.

OPERATION

REACT actuators are based on a two-stage mechanism: structural and trigger. The Structural assembly is 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 is 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.

KEY FEATURES

- Low shock
- Manually resettable by the end user. No refurbishment required
- Redundant SMA trigger (two independent initiators)
- Compatible with pyro electrical interface
- Near simultaneous release of multiple hold-down points
- Three standard mechanical interfaces available
- Space-qualified parts and materials
- Custom configurations available under request
- Full solar array deployment system available: HDRM + cup-cone + hinge
- ITAR free

ABOUT ARQUIMEA

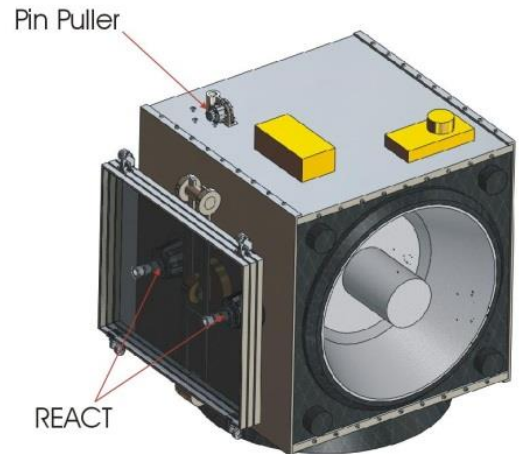
ARQUIMEA is a fabless company founded in 2005, with Headquarters in Madrid (ES) and a Sister Company in Frankfurt Oder (DE), specialized in design, development and commercialization of systems and components qualified for space and hi-rel applications, including actuators and mechanisms, electronic systems and integrated circuits. ARQUIMEA's working processes and Quality Management System are compliant with and certified according to ISO 9100 Aerospace Series.

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Passion for Technology



Illustrative: ARQ.REAC.153x.22D.EM



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TECHNICAL SPECIFICATIONS

	Standard Operation Temp.	Extended Operation Temp.
SMA material	Nitinol	SMARQ®
Ultimate Load Rating	22.5 KN	
Proof Load	18.7 KN	
Release Load	15 KN	
Shock @ Preload ¹	< 1,300 g's @ 15 KN	
Mechanical I/F (main Bolt)	M8 x 1.25 \downarrow 15.5	
Misalignment at release	$\pm 2.5^\circ$	$\pm 2.5^\circ$
Electrical Interface ²	4A ⁽²⁾	20V ^{(2),(4)}
Bridge Resistance ²	1.4 $\Omega \pm 10\%$	24 $\Omega \pm 10\%$
Operating Temp.	-90 / +70°C	-90 / +125°C
Non-Operation Survival Temp.	Pre-Act	-120 / +70°C
	Post-Act	> $\pm 150^\circ\text{C}$
Life Cycles (min)	10 cycles on ground + 1 in orbit	
Mass ³	300 g	
Part Number	ARQ.REAC.153S.22x	ARQ.REAC.153E.22x

REACT standard set includes:

- REACT (hold-down & release actuator)
- Reset tool (1 tool provided per each 4 REACTs)

The following accessories can be procured apart:

- Rod. Different configurations available
- Screws for the REACT assembly to the spacecraft

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

QUALITY LEVELS

EM

EM acceptance tests include:

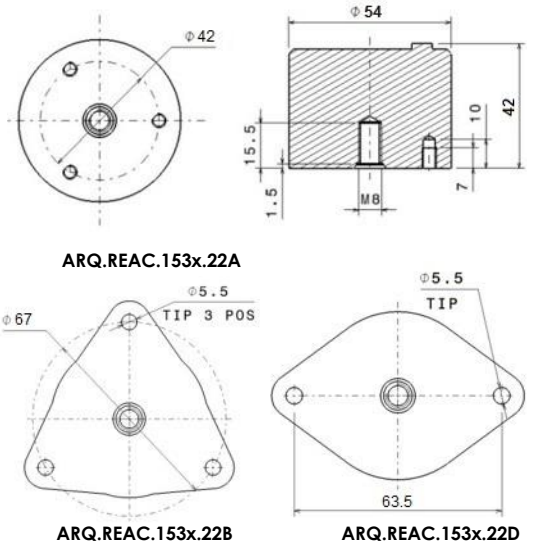
- Physical Measurements (envelop dimensions, mass)
- Electrical Measurements (input resistance, grounding, insulation, dielectric)
- Actuation Test (applied preload, voltage consumption and supplied current)
- Actuation Test with Redundant Initiator (applied preload, voltage consumption and supplied current)

FM

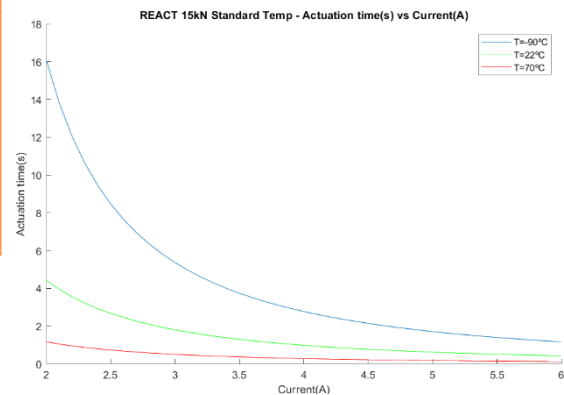
FM acceptance tests include EM acceptance tests plus:

- Vibration (acceptance levels)
- Thermal Vacuum Activation (actuation time, applied preload, voltage consumption and supplied current)

MECHANICAL INTERFACE



ACTUATION TIME (Vacuum)



LEGAL WARNING AND EXCLUSION OF LIABILITY

The information herein contained is subject to variation depending on the use and environmental conditions. Under this document, the Company assumes no obligation towards third parties, liability or guarantee whatsoever.

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