

Paraffin actuator-based Hold Down and Release Unit

U R Rao Satellite Centre (URSC) of Indian Space Research Organisation (ISRO) has developed Paraffin actuator-based Hold Down and Release Unit. The Paraffin actuators work on the principle of converting the volumetric expansion of wax on melting to do work by moving the actuator shaft with a large force. The actuators provide a high force to a low mass advantage. These actuators are suitable for use near contamination sensitive payloads. These actuators are easily resettable and have no expendables.

The Hold Down and Release Mechanism (HDRM) employs a paraffin actuator to release a preloaded hold down bolt. The system consists of a special linkage mechanism which provides a high mechanical advantage to release a higher preload with a smaller release force. The mechanism is very compact and is easily resettable.



Salient Features

- ✦ Paraffin Actuator : Low mass, high force.
- ✦ Non explosive type actuator.
- ✦ Resettable and reusable.
- ✦ Low shock.
- ✦ HDRM : Preload to release force ratio (14:1).
- ✦ Inbuilt telemetry.
- ✦ Compact.

Major Specifications

Paraffin Actuator Specifications		HDRM Unit Specifications	
Output Force	200 N	Pre-Load capability	1000N
Stroke Length	12 mm	Mass	180 g
Operating Time	< 180 seconds	Size without actuator	40 mm x 40 mm x 44 mm
Size	19 mm dia X 75 mm		
Voltage	28-33 V D.C.		
Heating Source	Foil Heater		
Actuation Temp	>50 °C		
Mass	75 g		
Life (Number of Operations)	100 cycles		

Technology Transfer

URSC-ISRO offers to transfer this technology of Paraffin actuator-based Hold down and Release Unit developed by URSC to industries in India with adequate experience and facilities. Industries interested in obtaining knowhow may write giving details of their present activities, infrastructure and facilities.

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🌐 <https://www.ursc.gov.in/industry/index.jsp>