

## SP-5025 High Output Paraffin (HOP) Actuator

### Design Description

Sierra Nevada Corporation's (SNC) Space Systems Shut-off Pin Puller (SP-5025) High Output Paraffin (HOP) actuator is an auto shut-off pin puller. The SP-5025 uses a redundant external heating element to melt the paraffin charge in the actuator. When melted, the paraffin expands and creates hydrostatic pressure which is transformed into a gentle, high-force pin retraction. The SP-5025 includes fully redundant internal circuit interrupts that can discontinue power to the actuator once full retraction has been reached. Alternatively, the circuit interrupts can provide a switch signal to allow the user to power off the actuator, depending upon the chosen wiring configuration.

This design reduces overall system cost by simplifying control requirements. The SP-5025 may be powered by a single timed power pulse to one of the fully redundant heater circuits. The dual heaters and dual circuit interrupts can be wired by the user to provide for autonomous or interactive control system designs.

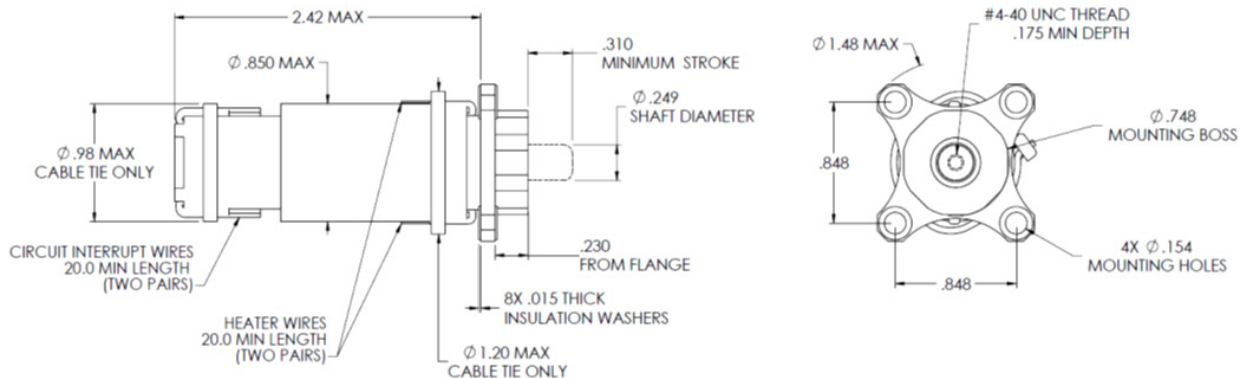
The pin puller is resettable in place using the appropriate reset tool. The overall function time is dependent upon load, power input, and environmental conditions.



**SP-5025 High Output Paraffin (HOP) Actuator**

Features	
• Integral circuit interrupts	• Resettable without refurbishment
• Simple control system	• Nonexplosive
• Gentle, high-force retraction	• Minimal safety requirements
• Fully redundant heaters	• Includes thermal isolation washers

### Dimensions



**Note:** All dimensions above are in inches.

Applications	
<ul style="list-style-type: none"> <li>Spacecraft launch locks</li> </ul>	<ul style="list-style-type: none"> <li>Solar array hold down and release</li> </ul>
<ul style="list-style-type: none"> <li>Release of spacecraft instrument doors and covers</li> </ul>	<ul style="list-style-type: none"> <li>Used in a broad number of applications as linear motors in spacecraft mechanical systems</li> </ul>

Heritage Programs	
<ul style="list-style-type: none"> <li>Thermal Emission Spectrometer (TES)</li> </ul>	<ul style="list-style-type: none"> <li>Cassiope</li> </ul>
<ul style="list-style-type: none"> <li>Space-Based Infrared System (SBIRS) Highly Elliptical Orbit (HEO)</li> </ul>	<ul style="list-style-type: none"> <li>Republic of China Satellite-2 (ROCSAT-2) (renamed FORMOSAT-2)</li> </ul>
<ul style="list-style-type: none"> <li>SBIRS Geosynchronous Earth Orbit (GEO)</li> </ul>	<ul style="list-style-type: none"> <li>GeoEye 1</li> </ul>
<ul style="list-style-type: none"> <li>Galaxy Evolution Explorer (GALEX)</li> </ul>	<ul style="list-style-type: none"> <li>OrbView-3 &amp; -4</li> </ul>
<ul style="list-style-type: none"> <li>H2 Transfer Vehicle (Hypersonic Transfer Vehicle, HTV)</li> </ul>	

Product Specifications		
	U.S.	SI
Mechanical		
Mass	2.82 oz	80.0 g
Response time in air (50 lb, 28 Vdc)	~150 s @ +75 °F	~150 s @ +24 °C
Stroke	0.310 in	0.787 cm
Maximum retraction force	140 lbf	623 N
Maximum reset force required	15 lbf	66.7 N
Shear load capability	350 lbf quasi-static	
Reset tools needed	Manual reset tool EP-7032 or Pneumatic tool EP-7056	
Reset time	<10 min	
Lifetime (nominal load)	500 cycles	
Electrical		
Power	15 W @ 28 V	
Voltage range	22 Vdc to 34 Vdc	
Heater resistance	2x 52.3 ± 5% Ω	
Wiring/insulation	8 leads 26 AWG in accordance with Mil-W-22759/33	
Redundancy	Heaters and circuit interrupts	
Thermal		
Operating temperatures	-85 °F to + 176 °F	-65 °C to +80 °C
Nonoperating temperatures	-319 °F to +176 °F	-195 °C to +80 °C
Nonactuation temperatures	+176 °F	+80 °C
Note: This data is for information only and subject to change. Contact SNC's Space Systems, Space Technologies for design data.		