

Motorised Telescope cover mechanism

U R Rao Satellite Centre (URSC) of Indian Space Research Organisation (ISRO) has developed motorized telescope cover mechanism which helps to protect the sensitive payload elements (optics) from particulate and molecular contaminants from the external environment during the ground/launch and in-orbit operations. The cover mechanism provides for a labyrinth type of sealing. The mechanism opens along a hinge line by the required angle. The hinges are motorized and are driven by a space qualified stepper motor. To take care of the launch loads the cover is held in position by means of a Frangi actuator shape memory (SMA) based hold down and release mechanism (HRDM). The cover can be remotely opened closed many time in orbit.

There is telemetry indication switch to indicate the HRDM release and extreme positions of cover. The table below shows the salient features of the motorized telescope cover mechanism.

Salient Features	
Cover Size	Type-1: ϕ 240 mm, Type-2: 180 mm *
Drive	Stepper motor
Opening angle	185 degree*
Telemetry	Stowed and Deployed microswitch indication
Hold Down	Frangi Actuator based
Cover Sealing	Labyrinth
<ul style="list-style-type: none"> These values can be custom built 	



Major Specifications

Sl. No	Description	Specifications	
1	Motorised Hinge Mechanism	No. of Hinge Points	2
		Deployment Angle	185°
		Drive Torque margin (on orbit)	>5
		Telemetry to indicate open/close positions	Microswitch
2	Hold down release mechanism	No. of Hold downs	1
		Telemetry to indicate first motion status	Contact switch
		Release Mechanism- single point release on command	
3	Cover seal	Labyrinth Type	
4	General cover elements	TML	<1%
		Total CVCM	< 0.01%
		Operation Temperature	-35 to +75°C
		Vacuum Limits (Functional)	10 ⁻⁶ torr
		Quasi-static Loads on cover	30g all axes
		All material and parts used have prior flight heritage and are space qualified.	

Note: The values presented in the table are indicative generic values and are to be discussed with SMG before being used in any design.

Technology Transfer

URSC-ISRO offers to transfer this technology of Telescope motorized cover mechanism developed by URSC to industries in India with adequate experience and facilities. Industries interested in obtaining the above technology may write giving details of their present activities, infrastructure and facilities.

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