

Rotary piezo actuator RPA

Description

The Rotary Piezo Actuator (RPA) is a Resonant Rotary Piezoelectric Motor that displays the known advantages of a piezo motor (e.g. a standstill torque at rest of 0.1N.m without any power supply, a high positioning accuracy in the range of 10 μ rad ...). The RPA principle is patented by CEDRAT TECHNOLOGIES and has been developed and space evaluated in the frame of an ESA TRP contract.

The RPA uses ultrasonic vibrations to move the rotor through frictional forces. The friction material is bonded onto the rotor and displays a low wear rate, a high friction coefficient similar in the air and in vacuum: a polymer solution, already known and experienced by CEDRAT TECHNOLOGIES onto the Linear Piezo Motor is used.

References	Unit	RPA
Notes		Space product
Normal vibration displacement	μ m (pk-pk)	2,5
Tangential vibration displacement	μ m (pk-pk)	1,5
Operating frequencies	kHz	55,5
Voltage max.	Vrms	13
Electrical power (per electrical port)	W	6
Diameter	mm	69
Height (axial direction)	mm	24
Mass	g	330
Capacitance (per electrical port)	μ F	0,3
Stroke	$^{\circ}$	360
Standstill torque	N.m	0,15
Maximal driving torque	N.m	0,05
No-load speed	rpm	140
Lifetime	hours	100
Electrical interfaces		6 PTFE insulated AWG39 wires 500 mm long with subD9 connector



RPA motor.

Space evaluation program

The RPA followed a space evaluation program including

- Functional tests,
- Lifetime test (100 hours),
- Thermal vacuum test (-15 / 65 $^{\circ}$ C).



RPA motor - CAD view.