



Bending Actuators

Ring Benders

Features

- Free displacement up to +/- 198 μm
- Blocking force up to 41.4 N
- High stiffness for short response times (<1ms)

Applications

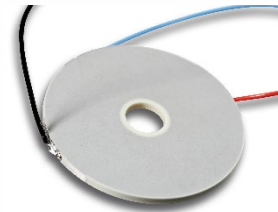
- Optical communication
- Valves
- Industrial equipment
- Haptic feedback

Description

CTS tape cast multilayer piezoelectric bending actuators are ideal for a wide range of applications requiring precise and fast movement. CTS multilayer piezo ring benders are produced with a stroke up to +/- 198 μm and provide higher force than plate benders. The piezo ring benders are used in a wide range of applications due to the robustness and easy integration of a ring.

Standard Product, add-ons or Custom Solution

This document contains information about the CTS standard multilayer ring benders and available add-ons. All the CTS multilayer products can be custom designed to match specific requirements – find more information on www.ctscorp.com or contact your local sales representative.

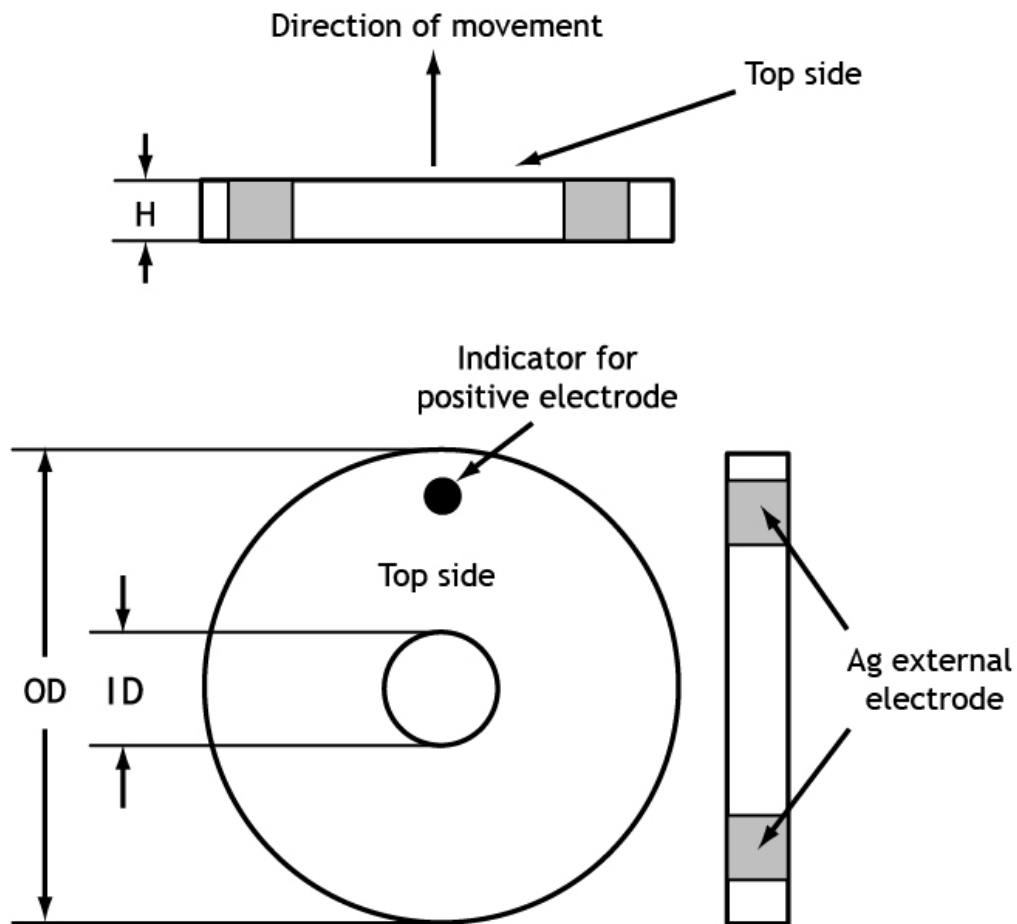


Specifications

Specifications are given for room temperature use, clamping on 0.5mm wide ring, 0.5mm from the outer edge.

Product	NAC2322	NAC2323	NAC2324	NAC2325	NAC2327	NAC2328	Unit
Outer Diameter (OD)	20 +/- 0.60		30 +/-0.90		40 +/- 1.20		mm
Inner Diameter (ID)	4 +/- 0.15		6 +/- 0.20		8 +/- 0.25		mm
Height (H)	1.25 +/- 0.10	1.8 +/- 0.10	0.7 +/- 0.10	1.25 +/- 0.10	0.7 +/- 0.10	1.25 +/- 0.10	mm
Operating Voltage, V_{max}	200						V
Free Stroke (+/- 15%)	+/- 28.8	+/- 22	+/- 112	+/-83.4	+/- 198	+/- 150	μ m
Blocking Force, 0 to V_{max} (+/- 20%)	22.3	23.9	11.8	30.4	12.7	41.4	N
Capacitance (+/- 15%)	2x400	2x670	2x470	2x940	2x800	2x1740	nF
Large Signal Axial Stiffness, typical	0.77	1.09	0.11	0.36	0.06	0.28	N/ μ m
Unloaded Resonance Frequency, typical	8.0	8.2	3.1	4.2	1.45	2.3	kHz
Maximum Operating Temperature	150						$^{\circ}$ C
PZT material	NCE51F						-
External electrodes	Silver						-

Drawing



Mounting, connecting and driving

Please refer to our online tutorials for recommendations about mounting, connecting and driving ring benders.

Add-ons

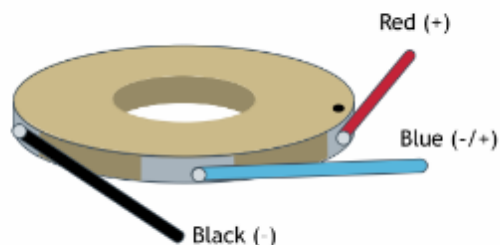
Wire Options

Two standard wire options are available for ring benders:

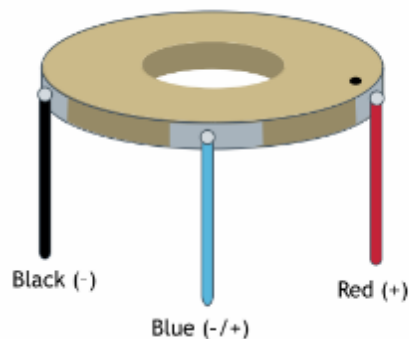
		Option A01	Option A02
Wire type	NAC2324, NAC2327	32 AWG MIL-W-16878/6, 7 strands	
	NAC2322, NAC2323, NAC2325, NAC2328	28 AWG MIL-W-16878/4, 7 strands	
Length		200mm +/-10mm	
Position		Middle of the actuator	
Direction		Perpendicular to the height	Toward the top

We solder a red wire to the positive electrode, black to the negative and blue to the control terminal.

Type A01



Type A02



UHV preparation

Ultra high vacuum (UHV) is the vacuum regime characterized by pressures lower than about 10^{-7} pascal or 100 nanopascals ($\sim 10^{-9}$ torr). Extreme cleanliness and low outgassing are essential parameters in sustaining the vacuum level in such systems. Elevated temperature compatibility is often needed since water vapour and other trace gases are removed from the system during a "bake-out".

CTS piezoceramic components are designed to support system development and integration of piezo technology in UHV applications. Among many technical capabilities, CTS is competent in producing piezoelectric actuators meeting the demands on temperature compatibility and out gassing levels set by UHV operation.

For low outgassing, Kapton-insulated wires are recommended. In addition, with the UHV preparation the products will undergo a specific cleaning process and be packaged in sealed pouches.

Bending Actuators Product Families

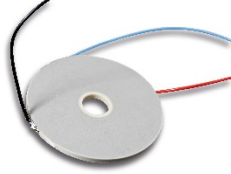


Plate and Ring Benders



2D and Special Benders

Learn more about the different bending actuator product families on www.ctscorp.com.