queensgate
a brand of PRIOR

More to Prior than meets the eye

MTP15/30/45/75/105

Open Loop Actuator

The MTP is an internally preloaded piezoelectric open loop translation device capable of moving up to 105µm with very high resolution. The actuators offer a very stiff design that is capable of generating blocking forces as high as 1000N (MTP-15). This characteristic enables the actuator to drive demanding loads of up to a maximum10kg (MTP-15) in the Z-axis. Driving the MTP actuator over nominal range simply requires a 0V to 120VDC HV amplifier. However, if required, it is possible to achieve additional range by using a -20V to 120VDC capable HV amplifier. If a small form factor and closed loop performance is required the MTP can be used in conjunction with a Queensgate Instruments position measurement system. This provides capacitive position sensing for sub-nanometre precision with the benefit of independent sensor placement from the actuator. This allows the freedom to mount the sensor plates at any convenient point on the host fixture.

General Specifications

- Metal case for protection
- Maximum load of up to 10Kg
- 15, 30, 45, 75 or 105 µm travel options with sub-nanometer resolution
- Internal preload
- Reliable with a long lifetime
- Simple to install and compact for OEM applications
- Supported by a full range of accessories

Applications

- Optical cavity tuning
- Micromanipulation
- Fine position control
- Custom nanopositioning devices

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Technical Specifications

Parameter	Symbol	Value	Units	Comments
Static Physical				
Variant		15 30 45 70 105		
Material		Stainless Steel		
Length		30 50 70 110 150	mm	
Diameter		10	mm	
***Range**	$d_{xp \cdot max}$	>15 >30 >45 >70 >105	µm	
Maximum load		10	kg	Note 1
Stiffness		50 25 16 10 7	N/µm	
Stack capacitance		1.8 3.6 5.4 9.0 12.6	µF	
Dynamic physical (Typical values)				
Operating voltage		-20 to +120	VDC	
Operating temperature		+10 to +50	°C	
Storage temperature 0 to +70 °C				
Relative humidity		5 to 95 (non-condensing)	%	
Error terms				
***Hysteresis (peak to peak)**	$\delta xp \cdot hyst$	≤13	%	Note 2
***Linearity error (peak)**	$\delta xp \cdot lin$	≤6	%	Note 2

Notes

*These parameters are measured and supplied with each mechanism

1. This is the maximum load for gravity acting in the Z-direction to avoid damage to the stage mechanism.
2. Percent error over the full range of motion.

PRIOR Scientific

bsi. ISO 9001 Quality Management FM 83854

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