



Open loop actuator

MTP15/30/45/75/105

The MTP is an internally preloaded piezoelectric open loop translation device capable of moving up to $105\mu\text{m}$ 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 maximum 10kg (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.

Key features

- Metal case for protection
- Maximum load of up to 10Kg
- 15, 30, 45, 75 or $105\mu\text{m}$ 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
- Micro manipulation
- Fine position control
- Custom NanoPositioning devices

Suggested controller

- NPS2100



MTP-30



MTP-45





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Specification

Parameter	Symbol	Value					Units	Comments
Static physical								
Variant		15	30	45	75	105		
Material		Stainless steel						
Length		30	50	70	110	150	mm	
Diameter		10					mm	
Cable length		2000					mm	
*Range	d_{xp-max}	>15	>30	>45	>75	>105	μm	
Maximum load		10					Kg	Note 1
Stiffness		50	25	16	10	7	$N/\mu m$	
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)	$\delta_{xp-hyst}$	≤ 13					%	Note 2
*Linearity error (peak)	δ_{xp-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.

