

MTP Open Loop Actuator Series

MTP-15/30/45/75/105

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 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-nanometer 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 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

Typical applications

- Optical cavity tuning
- Micromanipulation
- Fine position control
- Custom nan positioning devices

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						
Stage Mass		28						
*Range	d_{xp-max}	>15	>30	>45	>70	>150	mm	
Maximum Load		10						
Stiffness		50	25	16	10	7	N/ μ m	
Stack Capacitance		1.8	3.6	5.4	9.0	12.6	μ F	
Dynamic physical (Typical values)								
Operating Voltage		-20 to +120						
Operating Temperature		+10 to +50						
Storage Temperature		0 to +70						
Relative Humidity		5 to 95 (non-condensing)						
Error Terms								
*Hysteresis (peak to peak)	$\delta xp-hyst$	≤ 13					%	Note 3
*Linearity error (peak)	$\delta xp-lin$	≤ 6					%	Note 4

Notes

*These parameters are measured and supplied with each mechanism

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

UNITED KINGDOM

Prior Scientific Instruments Ltd.
Units 3-4 Fielding Industrial Estate
Wilbraham Road, Fulbourn
Cambridge, CB21 5ET
United Kingdom
Email: inquiries@prior.com
Phone: +44 (0)1223 881711

U.S.A.

Prior Scientific, Inc.
80 Reservoir Park Drive
Rockland, MA. 02370
U.S.A.
Email: info@prior.com
Phone: +1 781.878.8442

GERMANY

Prior Scientific Instruments GmbH
Maria-Pawlowna-Str. 4
D-07743, Jena, Germany
Email: jena@prior.com
Phone: +49 (0) 3641 24 20 10

JAPAN

Kayabacho 3rd Nagaoka Bldg 10F,
2-7-10, Nihonbashi Kayabacho, Chuo-Ku,
Tokyo103-0025, Japan
Email: info-japan@prior.com
Phone: 03-5652-8831

CHINA

Prior Scientific Instruments (Suzhou) Ltd.
Room 1812, Honghai Building,
72 Xingdu Street, Suzhou Industrial Park,
Suzhou, 215000 China
Email: info-china@prior.com
Phone: +86 (0)512 6617 5866

