PENTOR – 5-axis system

The PENTOR a piezo-electric stage was developed to meet the requirements of linear movement in three axes while at the same time being able to provide tip and tilt motion.

With 5 different degrees of freedom, 100 µm in XYZ axes, and ±2 mrad in θX and θY axes, the PENTOR provides a spatial positioning flexibility to fulfill complex tasks.

The PENTOR is equipped with a 17mm diameter open aperture that makes it ideal for optical setups.

Due to the high stiffness, this element is able to offer a high resonant frequency. Therefore the PENTOR is very suitable for dynamic applications.

The 5-axes piezo stage is available in both open and closed loop versions. The closed loop version is equipped with strain gage sensors to overcome drift and hysteresis.

Vacuum and low temperature versions are also available upon request.

PENTOR 100 SG

Product highlights:

- combination of a three axis translation system and a two axis tilting system
- free center hole with 17 mm diameter
- integrated preload
- translation each axis: 100 µm
- tilt each direction: ±2 mrad
- solid state flexure hinges in parallelogram design without mechanical play
- optional measurement system
- vacuum and low temperature versions available

Application examples:

- scanning system
- micro and nano positioning
- dynamical applications
- laser tuning
- life science

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Technical Data

PENTOR series part number		unit	PENTOR T-450-00	PENTOR T-450-01	PENTOR T-450-01D
axes		-	x, y, z, Θx, Θy		
voltage range		V	-20 … +130		
central aperture		mm	17		
max. load		N	50		
temperature range		°C	-20 … +80 (-4°F … 176°F)		
dimensions (length, width, height)		mm	69 x 68 x 40 (2.7“ x 2.7“ x 1.6“)		
weight		g	450 (0.99 lbs)	480 (1.06 lbs)	
PENTOR translation stage					
motion (± 10%) x,y,z	**open loop**	µm	100		
motion (± 0.2%) x,y,z	**closed loop**	µm	-	80	
resolution	**open loop**	nm	0,2		
	closed loop	nm	-	2	
capacitance (per axis) ±20%		µF	1,7		
resonant frequency (unloaded)	**x-axis**	Hz	680		
	y-axis	Hz	750		
	z-axis	Hz	580		
stiffness (per axis)		N/µm	0,5		
typ. non-linearity		%	-	x: 0.05, y: 0.06, z: 0.02	
typ. repeatability		nm	-	x: 5, y: 4, z: 5	
PENTOR tilting stage					
tilt (± 10%) Θx, Θy	**open loop**	mrad	±2		
tilt (± 0.2%) Θx, Θy	**closed loop**	mrad	-	±1,6	
voltage range		V	-20 … +130		
number of axes		-	2		
capacitance (per axis) ±20%		µF	2 x 0,85		
typ. non-linearity		%	-	Θx: 0.18, Θy: 0.13	
typ. repeatability		µrad	-	Θx: 0.44, Θy: 0.48	

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Control electronics

We recommend the electronic d-Drive (E-751-000) and 5 x EVD 50 (CL)