piezosystemjena
incredibly precise

TRITOR 100

Compact 3-D translation stage

image: TRITOR 100

Concept:

With the TRITOR series, **piezosystem jena** was the first company to offer 3D piezo-nanopositioning stages worldwide. The dimensions of 40 x 40 x 34 mm^3 and the motion range of 100 µm per axis make the TRITOR 100 one of the smallest 3D stages available on the market with integrated feedback sensors for closed loop control. The unique design of the flexure hinges allow for excellent usability with zero friction. High stiffness, in combination with excellent straightness of motion, make the TRITOR series ideal for high precision in the nano meter range for optics, laser-technique, and any other type of high resolution positioning application.

Specials:

Piezo electrical actuators can act much faster, and with a higher accuracy to a signal change, than any motorized drive available. The resolutions of piezo electrical actuators are only limited by the signal noise of the control system. Therefore, these systems are an excellent choice for positioning applications in fiber alignment, optics, wafer handling, medical equipment, etc. Each axis can be controlled separately in closed loop mode. An integrated sensor system is an available option that guarantees accuracy in the nano meter range. Dynamic scan applications are a typical utilization of the elements of the TRITOR series. The simultaneous motion, available in X, Y, and Z directions, offers a large degree of freedom during use. All stages of the TRITOR series can be made with special materials for extraordinary applications such as vacuum or cryogenic applications.

Interfaces:

All stages are constructed with a top and a bottom plate. Through holes are used for fixing the stage which is important for all dynamic applications. On the top plate there are several pin holes and threaded holes available for the mounting of external components. The 3D elements are built with reliable piezo stack actuators, with a flexible insulation that is well suited for a high dynamic burden.

Product highlights:

- 3D nano positioning stage
- compact design with integrated feedback sensors option
- flexure hinge design without mechanical play
- motion range up to 100 µm
- ultra precise translation based on FEA-optimized parallelogram design
- highest positioning resolution

Applications:

- AFM and SFM microscopy
- fiber alignment
- beam steering/ optical technology
- semiconductor technology

TRITOR 100

Technical data:

series TRITOR		unit	TRITOR 100	TRITOR 100 SG	TRITOR 100 CAP
part no.		-	T-403-00	T-403-21	T-403-06
axes		-		X, Y, Z	
motion in open loop (±10%)*		µm	100	100	100
motion in closed loop *		µm	-	80	80
electrical capacitance per axis		µF	1.8	1.8	1.8
integrated measurement system		-	-	SG	CAP
resolution***		nm	0.2	2	1
typ. repeatability		nm	-	30	20
resonant frequency x/y/z		Hz		500/550/480	
stiffness		N/µm		1/1/1	
max. force generation x/y/z	**pull**	N		10/10/10	
	push			100/100/100	
voltage range		V		-20…+130	
connector******	**voltage**	-		LEMO 0S.302	
	sensor	-	-	LEMO 0S.304	LEMO 0S.650
cable length		m	1.2	1.2	1.6
material		-		stainless steel/ aluminum	
dimensions (LxWxH)		mm	40 x 40 x 34	40 x 40 x 34	60 x 60 x 41
weight		g	165	160	550

* typical value measured with NV 40/3 CLE amplifier

** typical value for small electrical field strength

*** the resolution is only limited by the noise of the power amplifier and metrology

****Additional Variations:

Product name	Description	Specials	Part. No Suffix.
TRITOR 100 SG Digital TRITOR 100 CAP Digital	Version for digital controller series d-Drive and NV40/3 controller in combination with additional functionalities: Interchange ability, ASI	Connector Sub-D 15	T-403-21D T-403-06D
TRITOR 100 SG Extern TRITOR 100 CAP Extern	Version with sensor pre-amplifier for the use of additional functionalities: Interchange ability, ASI	Connector sensor ODU 4pin	T-403-21E T-403-06E
TRITOR 100 Vacuum	Compatible for vacuum application down to 10^-7hPa	60 cm cable length vacuum side; 2m cable length air side	T-403-02