piezosystemjena
incredibly precise

compact multi dimensional translation stages

TRITOR 50 CAP

- **highly compact design with integrated feedback sensor**
- **accurate parallel motion by parallelogram design**
- **high reliability and linearity due to solid state hinges**
- **motion without mechanical play**
- **high resolution in nm and sub-nm range**
- **motion up to 50 µm**
- **precision pin holes**

applications:
- optics, laser tuning, fiber positioning
- micromanipulation, biology
- scanning systems

fig.: TRITOR 50 CAP

Concept

piezosystem jena was the first to introduce the compact XYZ nanopositioning stage TRITOR, and we can now stand behind this system as the only company to have over 10 years experience of designing and manufacturing such three axes stages.
The TRITOR 50 CAP combines the advantages of a very compact size with the positioning accuracy of a capacitive regulated system. The system offers motion of 50 µm in all three axes.
TRITOR elements can be easily combined with other mechanical positioning systems.

Specials

Outstanding feature of the TRITOR 50 CAP is its compact design. It has very small dimensions and an integrated capacitive feedback system. Due to FEA-optimization of these stages you meet highest dynamical performance and excellent guiding accuracy. The TRITOR 50 CAP features very high positioning accuracy and repeatability.
Parallel motion is achieved without play because of the mechanical design.
Due to the integrated feedback sensors the effects of drift and hysteresis are eliminated.
Piezoactuators can also function in cryogenic environments. The only specification that is affected is an decrease in total motion.

Mounting/Installation:

TRITOR elements consist of actuators integrated in a housing with an internal lever transmission. Since the lever mechanism works in both directions, forces between housing and top plate need to be avoided, as they could damage the stage.
The stage is attached by using two diagonal holes. Components can be mounted on the top plate by two diagonal tapped holes and can be accurately located by using the precision pin holes.

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Technical Data:

series TRITOR			unit	TRITOR 50 CAP
part no.			-	T-402-06D
axes			-	x, y, z
motion open loop (±10%)*		x/y/z	µm	50
motion closed loop (±0,2%)*		x/y/z	µm	40
capacitance (±20%)**		x/y/z	µF	1
feedback sensor			-	capacitive
resolution open loop***		x/y/z	nm	0.1
resolution closed loop ***		x/y/z	nm	1
typ. repeatability			nm	4
typ. non-linearity			%	0.008
resonant frequency		x/y/z	Hz	347 / 368 / 404
additional load = 15g		x/y/z	Hz	315 / 325 / 370
additional load = 50g		x/y/z	Hz	230 / 240 / 345
additional load = 100g		x/y/z	Hz	160 / 160 / 295
additional load = 300g		x/y/z	Hz	85 / 85 / 150
stiffness		x/y/z	N/µm	0.27 / 0.32 / 0.58
max. push/pull force open loop		x/y/z	N	13.5 / 13.5 / 13.5
max. push/pull force closed loop****		x/y/z	N	1.35 / 1.6 / 2.9
max. load			N	13.5
lateral force limit			N	13.5
rotational error	roll	x/y/z	µrad	3 / 23 / 7
	pitch	x/y/z	µrad	3 / 5 / 2
	yaw	x/y/z	µrad	4 / 4 / 20
dimensions (l x w x h)			mm³	55 x 42 x 35
voltage range			V	-20 … +130
connector	voltage		-	D-sub 15pin
	sensor		-	D-sub 15pin
cable length			m	2
min. bend radius of cable			m	>15
temperature range			°C	-20 … +80
material			-	stainless steel / aluminum
weight			g	215

* typical value measured with d-drive controller
** typical value for small electrical field strength
*** The resolution is only limited by the noise of the power amplifier and metrology.
****max. force at which the system operates in closed loop mode within the specification

recommended configuration:

actuator	**TRITOR 50 CAP**	T-402-06D
amplifier/controller	**3x EVD 50 CL**	E-720-300
casing for d-Drive		E-751-000

Please pay attention to our "notes for mounting", which are available as download on our homepage.