

## TRITOR 400

### Compact three-axis translation stages

As the first to introduce the compact XYZ nanopositioning stage TRITOR, **piezosystem jena** stands as the only one company with over 20 years of experience in designing and manufacturing three axis stages.

The unique TRITOR elements are extremely compact and offer a range of motion of up to 400  $\mu\text{m}$  in all three axes. TRITOR elements can be easily combined with other mechanical positioning systems that make those systems flexible and the first choice to find solutions for diverse tasks in the nanopositioning fields.

Due to FEA-optimization, the Tritor 400 series meets the highest dynamical performance and have excellent guiding accuracy. High loads can be moved with the elements keeping the demand for compact design. The parallel motion is achieved without play, friction due to the stage's special solid hinges. Integrated position control systems (strain gage and capacitive sensors) are available as an option for overcoming the effect of hysteresis and drift, allowing the actuator to reach high resolution and position stability. The Tritor series can be, as an option, be modified for cryogenic, vacuum and ultra-high vacuum environments.

For easy mounting of components and probes, the top plate is equipped with special threads; the stage can be accurately fixed on customer's setup by using the precision diagonal holes.

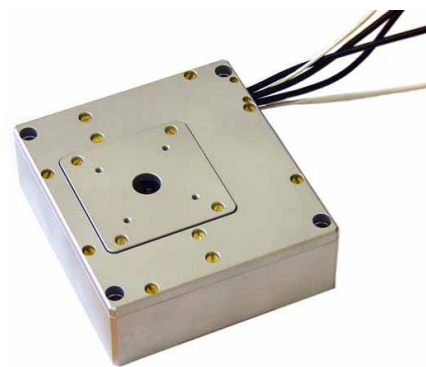


Image: TRITOR 400 CAP Vacuum

#### Product highlights:

- highly compact design
- accurate parallel motion by parallelogram design
- high reliability due to solid state hinges
- motion without mechanical play
- high resolution in nm and sub-nm range
- motion up to 400  $\mu\text{m}$
- precision pin holes for easy mounting

#### Applications:

- optics
- laser tuning
- fiber positioning
- micro manipulation
- biology
- scanning systems
- vacuum applications
- cryogenic applications

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### Technical data:

series TRITOR	unit	TRITOR 400	TRITOR 400 SG	TRITOR 400 CAP
<b>part no.</b>	-	T-406-00	T-406-01	T-406-06
<b>axes</b>	-		XYZ	
<b>motion open loop (<math>\pm 10\%</math>)*</b>	$\mu\text{m}$		400	
<b>motion closed loop (<math>\pm 0,2\%</math>)*</b>	$\mu\text{m}$	-		320
<b>capacitance (<math>\pm 20\%</math>)** x/y/z</b>	$\mu\text{F}$		14/14/14	6/6/14
<b>integrated measurement</b>	-	-	strain gage	capacitive
<b>resolution open loop***</b>	nm	0.8	0.8	0.8
<b>resolution closed loop***</b>	nm	-	35	1
<b>typ. repeatability</b>	nm	-	10/8/9	13/10/10
<b>resonant frequency x/y/z (unloaded)</b>	Hz		180/280/140	
with a load of 20g	Hz		178/236/193	
50g	Hz		162/218/167	
100g	Hz		143/153/142	
300g	Hz		105/115/135	
<b>stiffness x/y/z</b>	N/ $\mu\text{m}$		0.3/0.3/0.25	
<b>max. push force x/y/z</b>	N		120/120/100	
<b>max. pull force x/y/z</b>	-		12/12/10	
<b>max. load</b>	N	100	100	40
<b>voltage range</b>	V		-20...+130	
<b>connector</b>	<b>power (x/y)</b>	-	LEMO 05.302	ODU 3pin
	<b>power (z)</b>	-	LEMO 05.302	
	<b>sensor</b>	-	LEMO 05.304	LEMO 05.650
<b>cable length</b>	m	1.0	1.2	1.6
<b>body material</b>	-		stainless steel/ anodized aluminum	
<b>dimensions (l x w x h)</b>	mm	116x106x40	116.5x106.5x40	116x106x40
<b>aperture outside center</b>	mm		$\varnothing 12.5$	
<b>weight</b>	g	1050	1050	1100

\* typical value measured with NV 40/3 amplifier (closed loop NV 40/3 CLE)

\*\* typical value for small electrical field strength

\*\*\* Because of the ceramic's solid-state phenomena based extension and the striction- and friction-free guidance design the whole assembly's resolution is onl limited by the noise of the power amplifier and metrology.

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### *Recommended Configurations:*

<b>actuator</b>	<b>TRITOR 400</b>	<b>T-406-00</b>
<b>amplifier/controller</b>	3 X ENV 40	E-103-10
<b>power supply unit</b>	ENT 40	E-103-13
<b>PC interface</b>	EDA 4	E-202-40
<b>casing for all modules</b>	63 TE	E-103-97

<b>actuator</b>	<b>TRITOR 400 SG</b>	<b>T-406-01</b>
<b>amplifier/controller</b>	3 X ENV 40 SG	E-240-100
<b>power supply unit</b>	ENT 40	E-103-13
<b>PC interface</b>	EDA 4	E-202-40
<b>casing for all modules</b>	84 TE	E-103-91

**Please pay attention to our “notes for mounting”, which are available as a download on our homepage.:**

[http://www.piezosystem.com/piezo\\_actuator\\_nanopositioning/downloads\\_publications/technical\\_information/notes\\_for\\_mounting/](http://www.piezosystem.com/piezo_actuator_nanopositioning/downloads_publications/technical_information/notes_for_mounting/)

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