

compact one dimensional translation stages

PX 50 CAP

- highly compact design with integrated feedback sensor
- 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 50 μm
- precision pin holes

applications:

- fiber positioning, laser optics
- scanning systems
- micromanipulation



fig.: PX 50 CAP

Concept

The PX 50 CAP combines the advantage of a very compact size with the positioning accuracy of a capacitive regulated system. The system offers motion of 50 μm in the x-axis.

The PX 50 CAP is ideally suited for nm-precise positioning of small components such as mirrors and laser diodes, especially with applications requiring longtime stability.

The PX series stages can be easily combined with other mechanical positioning systems.

Specials

Outstanding feature of the PX 50 CAP is its compact design. It has very small dimensions and an integrated capacitive measurement system. Due to FEA-optimization of the stage you meet highest dynamical performance and excellent guiding accuracy.

The PX 50 CAP features a very high positioning accuracy and repeatability. Parallel motion is achieved without mechanical play due to its unique design.

Due to the integrated feedback sensors in connection with the equivalent controller electronics the effects of drift and hysteresis are eliminated. Piezo actuators also function in cryogenic environment, associated with a linear decreasing extension behavior.

Mounting/Installation:

The elements of the series PX 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 either the two diagonal tapped holes on the bottom side or the two diagonal through holes from top to bottom. Components can be mounted on the top plate by using the tapped holes on the top side.

Technical Data:

series PX	unit	PX 50 CAP
part no.	-	T-101-06
axis	-	x
motion open loop ($\pm 10\%$)*	μm	50
motion closed loop ($\pm 0,2\%$)*	μm	40
capacitance ($\pm 20\%$)**	μF	1.7
feedback sensor	-	capacitive
resolution open loop***	nm	0.1
resolution closed loop***	nm	1
typ. repeatability	nm	7
typ. non-linearity	%	0.016
resonant frequency	Hz	785
additional load = 15g	Hz	680
additional load = 50g	Hz	430
additional load = 100g	Hz	230
additional load = 300g	Hz	138
stiffness	N/ μm	0.4
rotational error	roll	μrad
	pitch	μrad
	yaw	μrad
dimensions (l x w x h)	mm^3	40 x 40 x 23
voltage range	V	-20 ... +130
connector	voltage	-
	sensor	-
		LEMO
		LEMO 0S.650
cable length	m	1.6
min. bend radius of cable	mm	>15
temperature range	$^{\circ}\text{C}$	-20 ... +80
material	-	stainless steel / aluminum
weight	g	180

* typical value measured with NV 40/1 CLE controller

** typical value for small electrical field strength

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

recommended configuration:

actuator	PX 50 CAP	T-101-06
amplifier/controller	NV 40/1 CLE	E-101-73

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