

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 |
| integrated measurement system | | - | capacitive |
| resolution open loop*** | | nm | 0.1 |
| resolution closed loop*** | | nm | 1 |
| typ. repeatability | | nm | ± 3.5 |
| typ. non-linearity | | % | 0.016 |
| resonant frequency | unloaded | 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 |
| max. push force | | N | 20 |
| max. pull force | | N | 2 |
| rotational error | roll | μrad | 1 |
| | pitch | μrad | 20 |
| | yaw | μrad | 1 |
| voltage range | | V | -20 ... +130 |
| connector**** | voltage | - | LEMO 0S.302 |
| | sensor | - | LEMO 0S.650 |
| cable length | | m | 1.6 |
| min. bend radius of cable | | mm | >15 |
| material | | - | stainless steel / aluminum |
| dimensions (l x w x h) | | mm | 40 x 40 x 23 |
| 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.

**** additional connector configurations

| Product name | Description | Specials | Part. No Suffix. |
|-------------------|---|----------------------------|------------------|
| PX 50 CAP Digital | Version for digital controller series d-Drive and 30DV50 in combination with additional functionalities: Interchangeability, ASI, ASC | Connector Sub-D 15 | T-101-06D |
| PZ 400 SG Extern | Version with sensor pre-amplifier for the use with „CLE“ amplifier units and with the additional functionalities: Interchangeability, ASI | Connector sensor: ODU 4pin | T-101-06E |

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