

compact multi dimensional translation stages

series PXY D12

- up to 200µm range of motion in xy
- high resonant frequency
- option: optimization for minimum z-motion

applications:

- scanning systems
- STM and AFM microscopy
- wafer handling
- micro electronics



fig.: PXY 80 D12

Concept

The elements of the PXY D12 series were developed for STM and AFM applications. These systems are optimized for high resonant frequency and high stiffness in both axes.

As an option for applications like AFM microscopy the systems can be equipped with a z-axis stage.

The PZ D12 element then provides a motion of 8µm or 20µm in z-direction. Equipped with a special adapter, it can be mounted directly on the PXY D12 element. The PZ8 D12 element has a superior resonant frequency of 3 kHz.

Specials

For special applications, the elements can be optimized for minimum z-motion of lower than 30nm while moving in x- and y- direction (part no. S-605-11).

The elements of the PXY D12 series can be equipped with an integrated measurement system. As a result, the effects of creep and hysteresis will be overcome.

Also, the systems may be specially prepared for vacuum and/or cryogenic applications.

Mounting/Installation

For stage mounting there are 4 through holes and 2 pin holes available.

Another 2 tapped holes are available to mount components.

Technical Data:

| series PXY D12 | | unit | PXY 40 D12 | PXY 80 D12 | PXY 200 D12 | PZ 8 D12 | PZ 20 D12 | |
|----------------------------------|--|--------------------|------------------|-------------|-------------|-----------|-----------|------|
| part no. | | - | S-605-37 | S-605-10 | S-605-20 | S-605-60 | S-605-63 | |
| axes | | - | x, y | | | z | | |
| motion open loop ($\pm 10\%$)* | | x, y | μm | 40 | 80 | 200 | 8 | 20 |
| capacitance ($\pm 20\%$ **) | | x, y | μF | 0.7 | 1.7 | 2.6 | 0.7 | 0.7 |
| resolution open loop*** | | x, y | nm | 0.08 | 0.16 | 0.4 | 0.01 | 0.06 |
| resonant frequency | | x, y | Hz | 1100 / 1300 | 900 / 1200 | 400 / 600 | - | - |
| | | z | Hz | - | 3 | - | 3000 | 1800 |
| stiffness | | x, y | N/ μm | 1.5 / 1.8 | 0.8 / 0.55 | 0.3 / 0.2 | 4.7 | 3.3 |
| dimensions | | length l | mm | 54 | 54 | 57.5 | 20.5 | 20.5 |
| | | width w | mm | 53.5 | 53.5 | 64 | 26 | 26 |
| | | height h | mm | 20 | 16 | 16 | 15 | 15 |
| voltage range | | V | -20 ... +130 | | | | | |
| connector | | voltage | - | LEMO 0S.302 | | | | |
| cable length | | m | 1.0 | | | | | |
| min. bend radius of cable | | mm | >15 | | | | | |
| temperature range | | $^{\circ}\text{C}$ | -20 ... +80 | | | | | |
| material | | - | stainless steel | | | | | |
| weight | | g | 90 | 90 | 160 | 15 | 20 | |

| series PXY D12 with integrated feedback sensor | | unit | PXY 80 D12 SG | PXY 200 D12 SG | PZ 8 D12 SG | PZ 20 D12 SG | |
|--|--|---------|---------------|----------------|-------------|--------------|----|
| part no. | | - | S-605-14 | S-605-21 | S-605-61 | S-605-64 | |
| motion open loop ($\pm 10\%$)* | | x, y | μm | 80 | 200 | 8 | 20 |
| motion closed loop ($\pm 0,2\%$)* | | x, y | μm | 65 | 160 | 6.4 | 16 |
| feedback sensor | | - | strain gauge | | | | |
| resolution closed loop *** | | x, y | nm | 35 | | | |
| typ. repeatability | | nm | 16 | 25 | 22 | 7 | |
| connector | | voltage | - | LEMO 0S.302 | | | |
| | | sensor | - | LEMO 0S.304 | | | |
| cable length | | m | 1.2 | | | | |
| weight | | g | 105 | 175 | 30 | 45 | |

| series PXY D12 with integrated feedback sensor | | unit | PXY 80 D12 CAP | PXY 200 D12 CAP | | |
|--|--|----------|----------------|-----------------|------|--|
| part no. | | - | S-605-16 | S-605-26 | | |
| motion open loop ($\pm 10\%$)* | | x, y | μm | 80 | 200 | |
| motion closed loop ($\pm 0,2\%$)* | | x, y | μm | 65 | 160 | |
| feedback sensor | | | capacitive | | | |
| resolution closed loop *** | | x, y | nm | 1 | | |
| typ. repeatability | | nm | 15 | 20 | | |
| dimensions | | length l | mm | 64 | 75.5 | |
| | | width w | mm | 63.5 | 69 | |
| | | height h | mm | 22 | 27 | |
| connector | | voltage | | LEMO 0S.302 | | |
| | | sensor | | LEMO 0S.605 | | |
| cable length | | m | 1.6 | | | |
| weight | | g | 155 | 225 | | |

* typical value measured with NV 40/3 amplifier (closed loop: 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.

recommended configurations:

| | | |
|----------------------|--------------------|----------|
| actuator | PXY 200 D12 | S-605-20 |
| actuator | PZ 8 D12 | S-605-60 |
| amplifier/controller | NV 40/3 | E-101-20 |

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