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Micro Piezo Slide MS 5

Omicron's patented fine positioning technology, developed for use under the stringent conditions of ultra-high-vacuum has proven its ability to perform with accuracy and reliability in countless exacting applications in laboratories throughout the world.



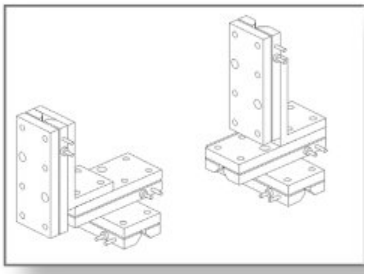
The MS 5 Micro Piezo Slide

The MS 5 is based on the principle of inertia drives employed in Omicron's Scanning Probe Microscopes. It provides a highly compact and effective means of achieving accurate positioning without the necessity for complex and sensitive mechanical couplings.

The MS 5 only requires electrical connections and thus minimises thermal and vibration isolation problems while allowing for user-friendly remote control of the device even under difficult boundary conditions. The MS 5 can also be used under ambient conditions in fields such as precision optics, micro-engineering, micro-structuring, nanolithography and other applications where a precise, backlash-free positioning of samples, detectors, apertures, shutters, lenses, scanners and other devices is essential.

The MS 5 piezo-electrically driven linear stepper motor incorporates specially designed guides and a pre-loaded construction to ensure guaranteed backlash-free movement with optimum repeatability. The MS 5 Micro Piezo Slide is fully UHV compatible and bakeable to 180°C.

The step size can be continuously varied between 40 nm and 400 nm, with a maximum travel of 5 mm. The load bearing capacity in the horizontal position is 300 g. The lifting capacity in the vertical orientation is approximately 50 g (tractive force 0.5 N). Extensive laser interferometer tests demonstrated a high repositioning accuracy with a lateral run-out of better than ±20 nm.
The MS 5 can be operated in any orientation. Up to three Micro Piezo Slide units can be easily combined to provide precise control of independent movement in three dimensions as an x/y/z-axis positioning device. Locating pins are utilised to ensure precise orthogonal alignment of the units.



Mounting three individual MS 5 Micro Piezo Slides to a 3D positioning unit.

The versatile MSCU control unit allows for easy and precise operation of up to three individual MS 5 units, using a remote control handset. Automatic control by means of a computer or an external signal generated by TTL logic modules is also possible.

The speed of movement of the Micro Piezo Slide can be controlled over a wide range, from a single 40 nm step to continuous movement operation driven at frequencies of 4, 3, 2, 1 or 0.5 kHz. The unit can be equipped with a UHV feedthrough and UHV compatible wiring. Electrical connections to the Micro Piezo Slide consist of one connection per axis plus an additional terminal for the ground wire.

Micro Piezo Slide components:

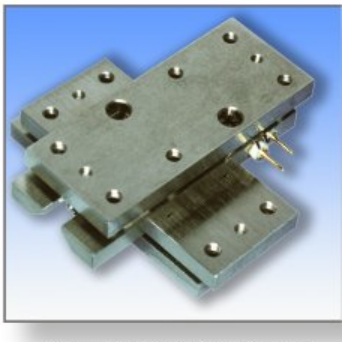
MS 5 Micro Piezo Slide with 0.5 m long UHV-compatible wires

MS CU Control unit for three axes with hand-held remote control (5 m cable)

MS IX X/Y-table mounting kit

MS BZ Z-axis mounting kit

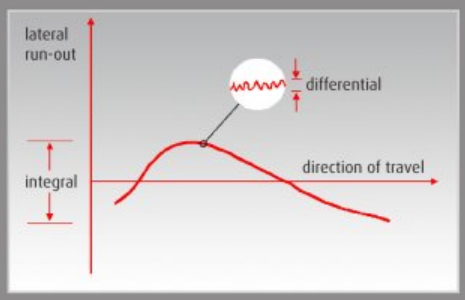
MS SC Atmospheric side cable with feedthrough



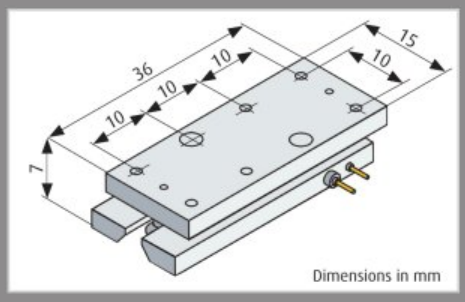
Two MS 5 units combined for independent 2D lateral positioning in Y and Y directions.

Technical Data / Features

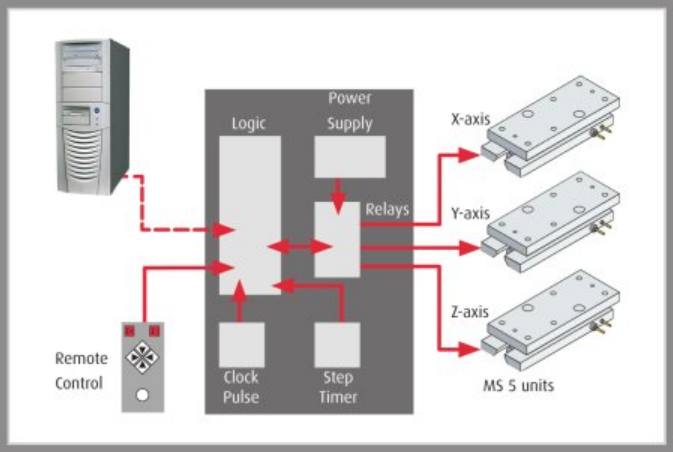
Fully UHV compatible	
Bakeable to 180°C	
Weight:	≈ 25 g
Total movement:	5 mm ± 0.2 mm
Tractive force:	> 0.5 N, slip < 50 %
Loading capacity (x, y):	≤ 300 g
Max. step size:	400 nm ± 15 %
Min, step size:	40 nm ± 15 %
Standard deviation of single step:	< ± 25 nm
Differential lateral run-out:	< ± 0.1 µm travel
Integral lateral run-out:	< ± 15 µm for 5 mm travel
Reposition accuracy:	± 15 % of travel; lateral, run-out better than ± 20 nm



Differential and integral lateral run-out of a MS 5 Micro Piezo Slide.



Dimensions of a MS 5 Micro Piezo Slide.



Connection of up to three MS 5 units with MSCU control unit and PC.

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