For Applications with High Demands on Dynamics and Linearity:  
Small, Fast Tip/Tilt Platforms

PRESS CONTACT

Doris Knauer  
Phone +49 721 4846-1814  
Fax +49 721 4846-1019

[d.knauer@pi.de](mailto:d.knauer@pi.de)

Physik Instrumente (PI)   
GmbH & Co. KG  
Auf der Roemerstrasse 1  
76228 Karlsruhe, Germany  
[www.pi.ws](http://www.pi.ws)

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Tip/tilt mirror systems control laser beams quickly and precisely in applications such as scanning microscopy or laser material processing and laser engraving. They are compact and offer high dynamics and linearity as well as short settling times. PI (Physik Instrumente) developed the piezo-based S-335 tip/tilt platform, which is suitable for applications with tip/tilt angles up to 35 mrad, optical deflection angles to 70 mrad and high demands on dynamics.

The parallel-kinematic design with two orthogonal tip/tilt axes act on a common platform and this ensures identical performance of each axis. The special design of the flexures allows friction-free motion, high stiffness, and operating frequencies of more than 100 Hz. The smallest step angle is 1 µrad. Integrated strain gauges ensure a high linearity of 0.05 % and a repeatability of 0.5 µrad (unidirectional in each case).

Compact, Robust, and Durable

With a surface of 34.5 by 34.5 mm and a height of 56.5 mm, the tip/tilt platform is very compact and requires very little space in the application. The PICMA® piezo actuators have all-ceramic insulation and are therefore superior to conventional, non-ceramic insulated actuators both in performance and lifetime. The monolithic piezoceramic block is protected against humidity and increased leakage current and therefore achieves high motion cycles even under extreme ambient conditions. In contrast to electric motorized drives, there are no rotating parts or friction. The piezo actuators are therefore free of backlash, maintenance, and wear. The digital multi-channel E-727 piezo controller is suitable for control. During start-up, the tip/tilt platform identifies itself to the controller via ID chip and the applicable operating parameters are then loaded automatically. As an option, the tip/tilt platform, which is suitable for mirrors with diameters of up to 25.4 mm, can also be supplied with a mirror.

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Image 1:

  
For applications with high demands on dynamics and linearity: Small, fast tip/tilt platform S-335. (Source: PI)

More information about S-335:

<https://www.physikinstrumente.com/en/products/z-tip-tilt-platforms/piezo-platforms/s-335-fast-tiptilt-platform-300711/>

About PI (Physik Instrumente)

Well-known for the high quality of its products, PI (Physik Instrumente) is one of the leading players in the global market for precision positioning technology. PI has been developing and manufacturing standard and OEM products with piezo or motor drives for 40 years. In addition to four locations in Germany, the PI Group is represented internationally by fifteen sales and service subsidiaries. [www.pi.ws](http://www.pi.ws)