Family of Fast and Compact Direct-Drive Micro-Positioning Stages
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PI PRESS RELEASE

Family of Fast and Compact Micro-Positioning Stages Powered by Ultrasonic Motors

Lightweight, fast and highly-stable, PI's new line of miniature precision positioning stages are easy to control and integrate into industry and research applications.

December 2017, Auburn, MA – Precision motion and nanopositioning leader PI (Physik Instrumente) delivers a family of compact linear and rotary stages driven by ceramic direct-drive motors. The patented ultrasonic motors provide smooth motion with high resolution and a high dynamic range. The self-clamping motor principle locks the stage into place, devoid of creep, once a target position has been reached. This intrinsic brake-like behavior comes at no extra cost, and provides advantages that are not available with classical electro-magnetic drive technologies.

Applications
Medical Devices, Optical Instrumentation, Photonics Alignment, Super-Resolution Microscopy

XY, Linear and Rotary Stages: Compact, Fast and Quiet, Wide Dynamic Range
Two linear stages with 18mm and 22mm travel are available, as well as an XY stage providing 22x22mm. Several encoder options, from 0.4µm to 10 nanometers, are standard. All stages achieve closed-loop peak velocities to 200mm/sec. The rotary stages come with turn-table diameters from 20 to 50mm, encoder resolution down to 17µrad, and maximum velocity of 720 degrees per second.

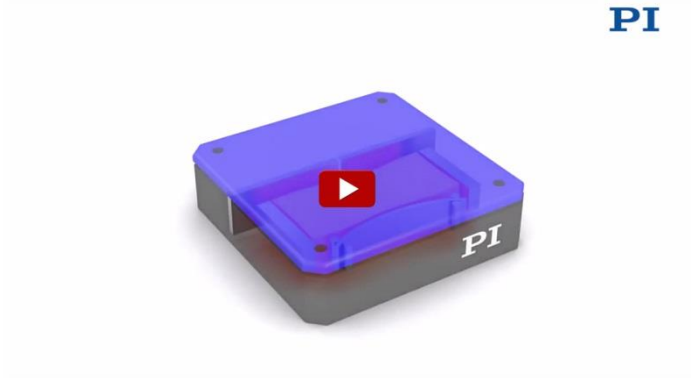
The low inertia direct drive (no gears and other mechanical components to convert motion) allows for a very dynamic start-stop behavior with settling times in the millisecond range. Based on the ultrasonic principle with drive frequencies >100kHz – way beyond the human hearing range – the motors are silent. Displacement is generated in continuous sub-nanometric increments, leading to extremely smooth motion with a wide dynamic range.

Multi-Axis Combinations

Linear and rotary stages can be combined to form multi-axis combinations.

Low Power Requirements
Due to the high efficiency of the ultrasonic motors, the miniature stages can be integrated into mobile measuring and medical devices. Vacuum compatible versions are also available.

Watch the Ultrasonic Motor Drive Principle!
https://www.youtube.com/embed/_CSQZqja79Y?rel=0



OEM and Bench-Top Motion Controllers, Software Package
To take advantage of the operating principle, providing superior dynamic performance with settling times in the millisecond range while maintaining high resolution and smooth operation, ultrasonic motors benefit from advanced control strategies, such as automatic switchover between several static and dynamic PID parameter sets and adaptive frequency tracking. PI offers a number of ultrasonic motion controllers available in desktop, rack-mount, and OEM configurations. An ASIC chip containing the motion control algorithms is also available for OEM customers. A comprehensive software package is included: drivers and example programs for LabVIEW, dynamic libraries for Windows and Linux, MATLAB are available. Interfaces include TCP/IP, USB, RS-232 and analog.

Specifications, Datasheets, More Information
http://www.pi-usa.us/products/Compact_Positioning_Stages/#Ultrasonic

Read Tech Article about Ultrasonic Motors
http://www.pi-usa.us/blog/positioning-capabilities-of-ultrasonic-motors/

Closed-Loop Controller, U-867
http://www.pi-usa.us/products/Motor_Controllers/Motor_Controller_Precision_Positioner.php#C867

Compact, Low Cost Controllers for Ultrasonic Motors, C-877, also comes in OEM version
http://www.pi-usa.us/products/Motor_Controllers/Motor_Controller_Precision_Positioner.php#PMCS

Standard and Custom
PI has in-house engineered solutions with over 4 decades of experience working with customers to provide products that meet application demands, and can quickly modify existing product designs or provide a fully customized OEM part to fit the exact requirements of the application.

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About PI
PI is a leading manufacturer of air bearing stages, piezoelectric solutions, precision motion control equipment, and hexapod parallel-kinematics for semiconductor applications, photonics, bio-nano-technology and medical engineering. PI has been developing and manufacturing standard & custom precision products with piezoceramic and electromagnetic drives for 4 decades. The company has been ISO 9001 certified since 1994 and provides innovative, high-quality solutions for OEM and research. The PI group employs more than 1,000 people worldwide in 15 subsidiaries and R&D / engineering centers on 3 continents.

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