Versatile in Travel Range, Drive, and Measuring System:  
Precision Linear Stage Adapts Itself to the Application

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Linear stages with magnetic direct drives have advantages over the classical motorized, spindle-based solutions in particular with respect to wear and dynamics. In addition, their outstanding features include large travel ranges, high velocities as well as longer lifetimes of the drives.

With the PIMag® V-508, PI (Physik Instrumente) has a new, very compact precision linear stage in its portfolio that is able to adapt itself to various different requirements thanks to its modular construction principle. With travel ranges of 80, 170, and 250 mm, different drives, and measuring systems with resolutions into the subnanometer range, the flexible linear stage is not only suitable for example, for laser engraving and high-resolution laser marking, but also for applications in measuring technology and photonics or for precision scanning in industry and research. The linear stages have a width of only 80 mm, a height of 25 mm and can also be combined to multi-axis systems if required.

Different Drives and Resolutions into the Subnanometer Range

Three-phase linear motors are the driving force behind this flexible linear stage. They dispense with mechanical components in the drivetrain and transfer the drive force directly to the motion platform without any friction. This makes velocities up to 1 m/s and accelerations up to 5 m/s² possible. Crossed roller bearings with anti-creep system ensure high guiding accuracy. Ironless motors are used for applications that require particularly jerk-free and smooth running. In contrast, motors with an iron core are suitable for high forces and acceleration.

Different measuring systems are used for detecting the position: Incremental linear encoders with a resolution of 10 nm or 0.2 nm as well as an absolute encoder with a resolution of 78 nm. Correspondingly, minimum incremental motion is 20 nm, 0.5 nm or 160 nm. In the case of simple solutions, the flexible linear axes are controlled via the PI C-891 controller and in the case of complex motion control applications, via industrial solutions from ASC motion control, a worldwide leading manufacturer of such solutions, who was taken over by PI at the beginning of 2017.

Adaptation to Customer Demand

The modular design of the linear stages also allows adaptation of the new series to special customer demand. Modifications to the travel range, integration of special measuring systems or for example, adaptation of a customer-specific third-party controller for OEM applications are possible and no problem at all.

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Figure:



Reliable, compact, and versatile: The V-508 precision linear stage adapts itself to the application (image: PI)

Find out more about the V-508 here:

<https://www.physikinstrumente.com/en/products/linear-stages-and-actuators/stages-with-linear-motors-friction-free-magnetic-direct-drive/v-508-pimag-precision-linear-stage-1200210/>

PI in Brief

Well known for the high quality of its products, PI (Physik Instrumente) has been one of the leading players in the global market for precision positioning technology for many years. PI has been developing and manufacturing standard and OEM products with piezo or motor drives for 40 years. By acquiring the majority shares in ACS Motion Control, a worldwide leading developer and manufacturer of modular motion controllers for multi-axis and high-precision drive systems, PI has made a major step forward in providing complete systems for industrial applications with the highest demand on precision and dynamics. In addition to four locations in Germany, the PI Group is represented internationally by fifteen sales and service subsidiaries.

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