PIFOC® Objective Scanner Systems

Image Faster

- Ultra-Fast Z-Steps with Patented Piezo Ceramic Drives
- 7 msec Step Time for Typical high-NA Immersion Objective
- System Includes Everything You Need:
  - Piezo-Mechanics, Controller, Adapters
- Compatible with all Major Image Acquisition Packages
- Legendary PI Performance, Reliability & Robustness
- Capacitive Position Feedback as used in NIST Reference Class Nanometerology Systems
- Moving Objective does not Disturb Sample
- From the Inventor of Piezo-Z Scanners
Fast Piezo Focus Systems: 100 µm - 400 µm PIFOC®
Affordable High Performance: With Digital Controller & Software

The PIFOC® piezo objective scanners (fast focus mechanisms) with QuickLock thread adapter and digital controller (objective not included)

- Complete System with Controller: Fast Digital Controller, Software-Configurable Servo Parameters
- Travel Ranges to 400 µm
- Scans and Positions Objectives with Sub-nm Resolution
- Frictionless, High-Precision Flexure Guiding System for Better Focus Stability
- Choice of SGS Sensor (Lower Cost) and Capacitive Feedback with Direct Metrology for highest Stability and Linearity
- Clear Aperture up to 29 mm Ø, QuickLock Adapter for Easy Attachment
- Interfaces: USB, RS-232 and analog
- Comprehensive Software Package, Compatible with MetaMorph Imaging Software

The PIFOC® piezo objective scanner systems include a high precision piezo mechanism and a custom-tuned compact digital controller. This combination provides higher performance at reduced costs. The integrated, frictionless and stiff piezo flexure drive ensures high stiffness and fast settling times, as well as an exceptional guiding accuracy and response. The settling time of less than 10 ms increases the throughput and allows rapid Z-stack acquisition.

Position Measurement with Highly Accurate Capacitive Sensors or Lower-Priced Strain Gauge Sensors

Capacitive sensors measure the position directly and without contact, they offer therefore a position resolution of far below one nanometer and excellent values in linearity. As an alternative, compact and lower-priced strain gauge sensors (SGS) with nanometer-level resolution can be used which are applied to appropriate places on the drive train and thus measure the displacement of the moving part of the stage. The linearity is improved considerably with the digital controller provided.

Simple Installation with QuickLock Thread Options

The PIFOC® is mounted between the turret and the objective with the QuickLock thread adapter. After threading the adapter into the turret, the QuickLock is affixed in the desired position. Because the PIFOC® body need not to be rotated, cable wind-up is not an issue. For applications which require a particularly large optical aperture a version with a 29 mm diameter threaded inserts is available.

Digital Controller for Automated Scans

Included in the delivery is a digital controller which opens up the possibilities of digital control for piezo-driven nanopositioning systems for the same price as analog controllers. The advantage: higher linearity, simple operation and access to advanced features.

Ordering Information

<table>
<thead>
<tr>
<th>Part Number</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>PD72Z1CAQ</td>
<td>Fast PIFOC® Piezo Nanofocusing Z-Drive, 100 µm, Capacitive Sensor, M25 QuickLock Thread Adapters, Digital Controller with USB, RS-232</td>
</tr>
<tr>
<td>PD72Z1CAA</td>
<td>Fast PIFOC® Piezo Nanofocusing Z-Drive, 250 µm, Capacitive Sensor, M32 Large Aperture QuickLock Thread Adapters, Digital Controller with USB, RS-232</td>
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Application Examples

- Microscopy
- Confocal microscopy
- 3D Imaging
- Screening
- Autofocus systems
- Surface analysis
- Wafer inspection
PIFOC® Objective Scanner Systems

Image Faster

- From the Inventor of Piezo-Z Scanners for Fast Z-Stack / Focus Control
- Choice of Travel Ranges / Controllers
  - 100 µm or 400 µm
  - Display Controller or Compact Controller
- Custom Tuning for Fastest Possible Speed (to 7 msec per Step)
- System Includes Everything You Need:
  - Mechanics, Controller, Adapters, Distance Cases
- Legendary PI Performance, Reliability & Robustness
- Compatible with all Major Image Acquisition Packages
- Capacitive Feedback as used in NIST Reference Class Nanometrology Systems
- ISO 9001 Quality from the Global Leader in Nanopositioning
- UL and CSA Certified

Z-Stack Imaging & Focusing: Faster with Piezo Z-Scanners

PIFOC® piezo-actuated Z-scanners achieve typically 10 times higher focusing speed & precision than motorized drives and thus provide higher-quality images faster.

Scanning the Objective

PIFOC® controllers come with a high-bandwidth analog interface for extremely fast response and compatibility with all major image acquisition packages.

Compatible with Imaging Software

PIFOC® 100D System

PIFOC® 400D System

PIFOC® 100 System

PIFOC® 400 System

PIFOC® Objective Scanner System Configurations:

Display Controller

Full featured E-665 PIFOC® controller with display and additional manual control. 36W piezo power.

Compact Controller

E-625 PIFOC® economical controller. 14W piezo power.

100 µm Scanning Range

P-721 PIFOC® scanner for ultra-fast Z-Stack imaging/focusing

400 µm Scanning Range

P-725 PIFOC® scanner for fast focusing/Z-stack imaging

All PIFOC® systems include the piezo objective scanner, a controller and two distance cases. To order, specify part number and objective thread (e.g. PIFOC® 100D, M25 x 0.75)

About PI

PI, the global leader in nanopositioning, has been ISO 9001 certified since 1994 and employs more than 400 people worldwide. PI's patented piezo technology provides longer lifetime and higher performance than any other piezo device on the market. PIFOC® was invented by PI 15 years ago and has since become the global standard in objective scanners, with thousands of units installed in the field.

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