

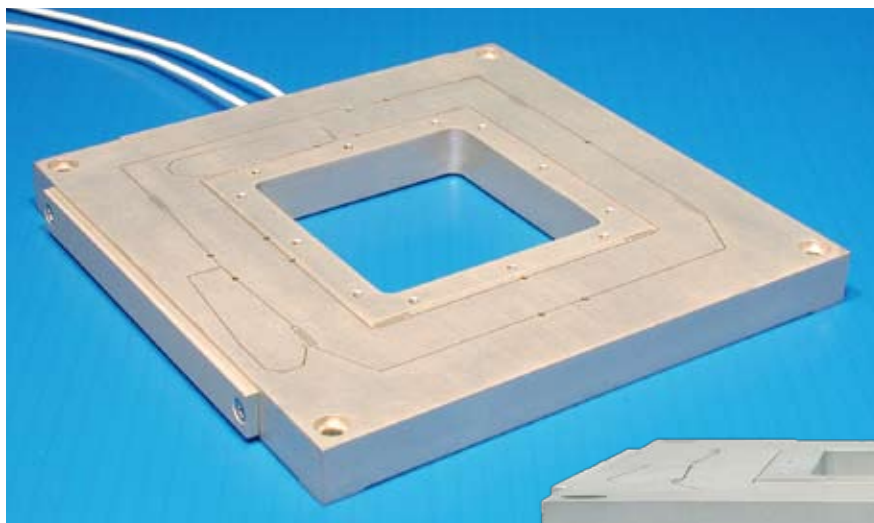
Nano-Bio Series

Features

- ▶ Lowest profile 2-axis nanopositioner available
- ▶ Large aperture
- ▶ 50 μm , 100 μm , 200 μm , or 300 μm ranges of motion
- ▶ **pico** sensor technology
- ▶ Closed loop control, high stability

Typical Applications

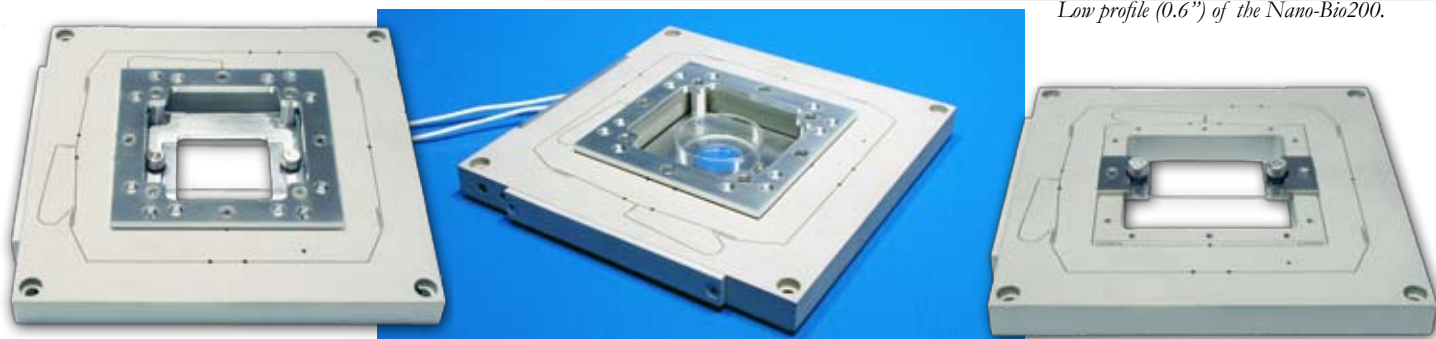
- ▶ Optical microscopy, easy to retrofit
- ▶ Fluorescence imaging
- ▶ Closed-loop AFM scanner
- ▶ Nanolithography
- ▶ Optical tweezers
- ▶ Super resolution microscopy



Nano-Bio200 (2-axis) constructed from aluminum.



Low profile (0.6") of the Nano-Bio200.



Nano-Bio200 with re-entrant slide holder (left), petri dish holder (center), and top surface slide holder (right).

Product Description

The Nano-Bio Series are ultra low profile, two axis nanopositioning systems. The low profile design allows the Nano-Bio Series to be easily integrated into existing inverted microscopes, AFM's and other instrumentation where space is limited. The large center aperture allows the Nano-Bio to accommodate the lenses of all major microscope manufacturers. The Nano-Bio Series includes internal position sensors with proprietary **pico** technology to provide absolute, repeatable position

measurement and picometer accuracy under closed loop feedback control. The Nano-Bio100, Nano-Bio200, and Nano-Bio300 are constructed from aluminum and are ideal for optical microscopy. The invar Nano-Bio2M has increased thermal stability, reduced overall size, and is an easily implemented closed-loop scanner upgrade for instruments using Veeco NanoScope controllers (needs a Nano-Drive® controller with the AR-10 option). See the Nano-LP Series for a low profile, 3-axis stage.

Compatible Software Packages



Examples, tutorial, and Nano-Route® 3D supplied with Nano-Drive® USB interfaces.



USB and analog motion control



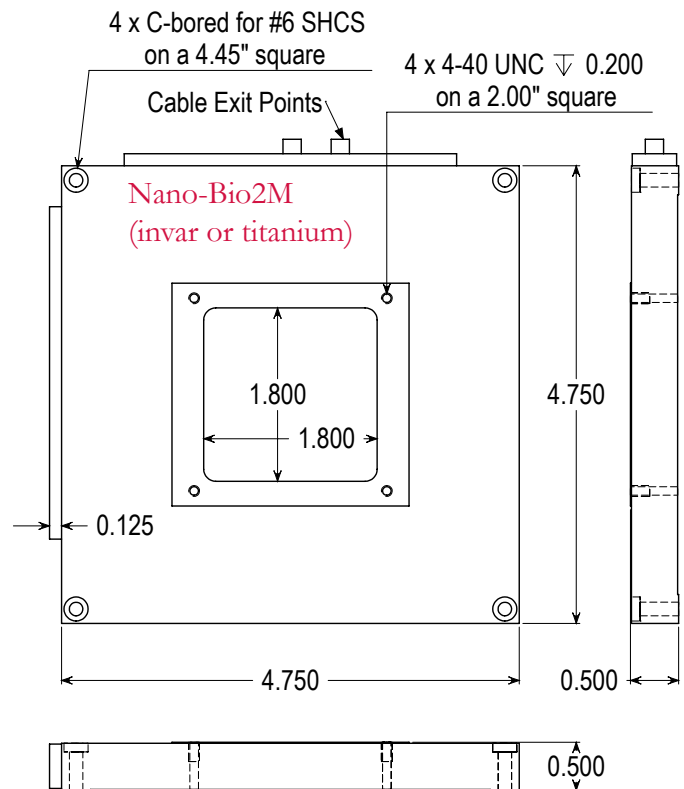
Analog motion control, 1 or 2 axes.

Technical Specifications

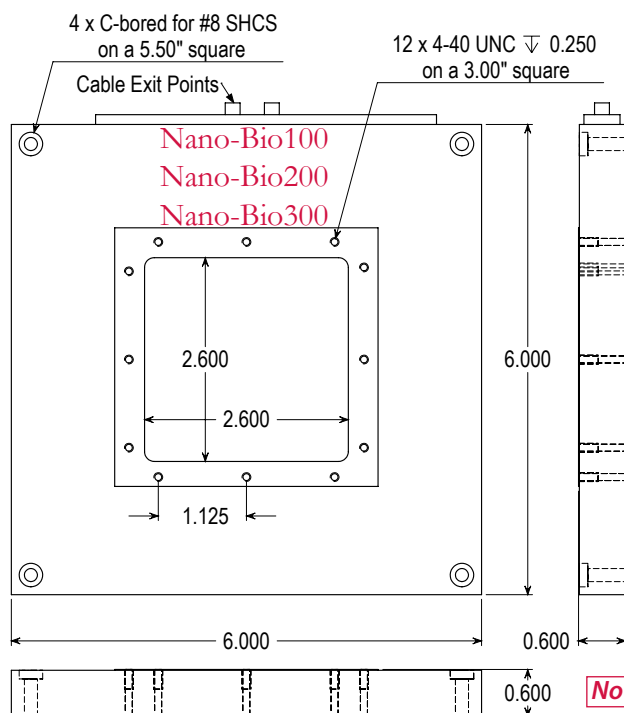
Range of motion (Nano-Bio2M)	50 μm x 50 μm
Range of motion (Nano-Bio100)	100 μm x 100 μm
Range of motion (Nano-Bio200)	200 μm x 200 μm
Range of motion (Nano-Bio300)	300 μm x 300 μm
Resolution (50/100/200/300 μm)	0.1/0.2/0.4/0.6 nm
Resonant Frequencies (Nano-Bio100, 200, and 300)	
X axis (100/200/300 μm)	450/400/260 Hz $\pm 20\%$
Y axis (100/200/300 μm)	350/300/200 Hz $\pm 20\%$
Resonant Frequencies (Nano-Bio2M)	
X axis	500 Hz $\pm 20\%$
Y axis	400 Hz $\pm 20\%$
Stiffness	1.0 N/ μm
θ_{roll} , θ_{pitch} (typical)	≤ 1 μrad
θ_{yaw} (typical)	≤ 3 μrad
Recommended max. load (horizontal)*	0.5 kg
Recommended max. load (vertical)*	0.2 kg
Body Material**	Al, Invar or Titanium
Controller	Nano-Drive®

* Larger load requirements should be discussed with our engineering staff.

** Material is aluminum for Nano-Bio300.

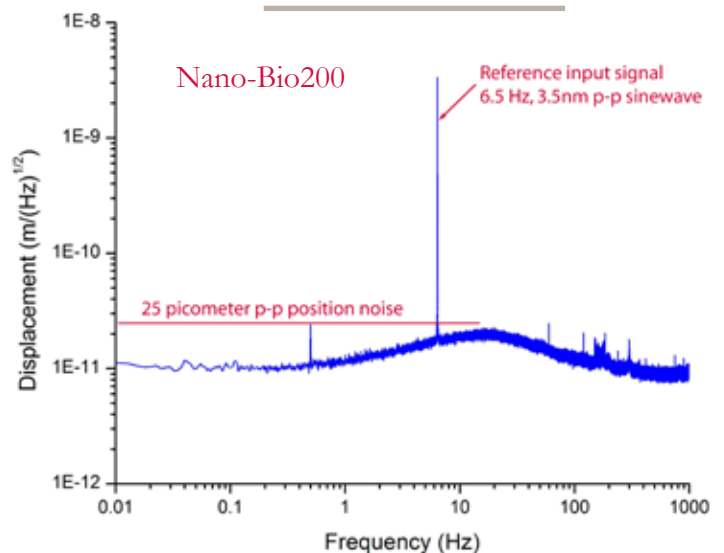


Note: All Dimensions in Inches



Note: All Dimensions in Inches

Low Position Noise



Nano-MET2 & Nano-MET3

Features

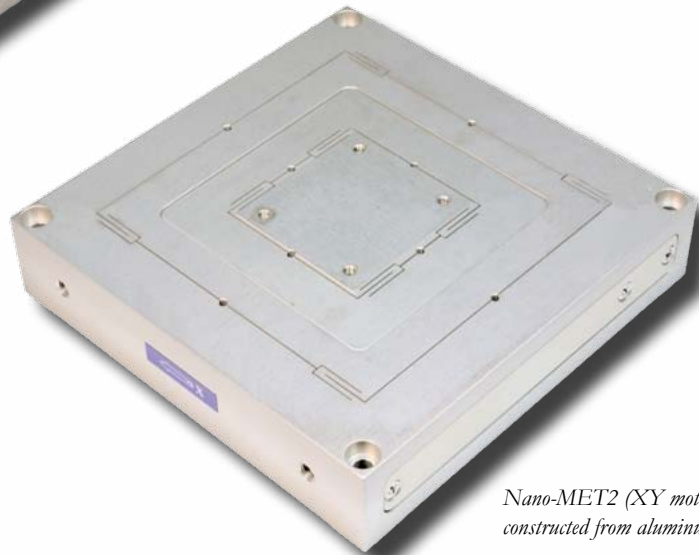
- ▶ High speed, multi-axis
- ▶ 2 axis and 3 axis configurations
- ▶ Closed loop control
- ▶ Ultra-low noise performance
- ▶ Picometer positioning resolution
- ▶ High stability
- ▶ **picoQ** sensor technology

Typical Applications

- ▶ High speed, high resolution positioning
- ▶ Metrology
- ▶ AFM
- ▶ SPM



Nano-MET3 (XYZ motion)
constructed from aluminum.



Nano-MET2 (XY motion)
constructed from aluminum.

LabVIEW Compatible USB Interfaces



Examples, tutorial, and
Nano-Route[®] 3D supplied
with Nano-Drive[®] USB
interfaces.

Product Description

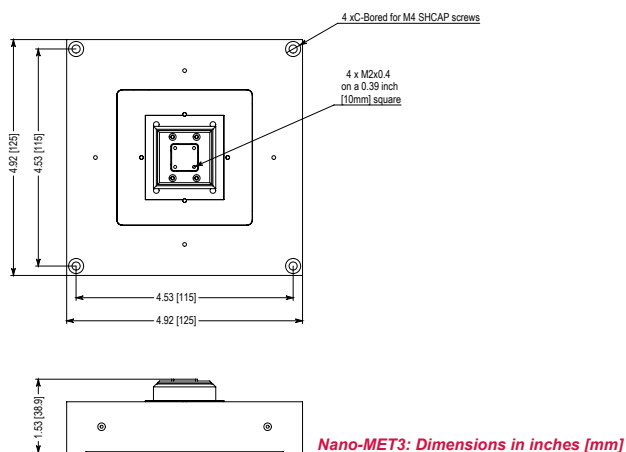
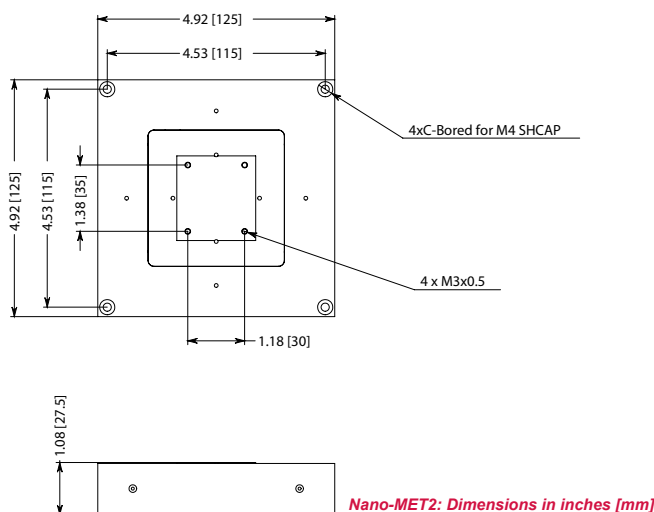
The Nano-MET2 and Nano-MET3 are ultra-low noise, high precision nanopositioning systems with picometer positioning resolution. Internal position sensors utilizing proprietary PicoQ[®] technology provide absolute, repeatable position measurement under closed loop control. The ultra-low position noise (4 picometers/Hz in XY and 400 femtometers/ $\sqrt{\text{Hz}}$ in Z)

of these nanopositioning systems make them ideal for demanding metrology applications. With a resonant frequency of 13.5kHz, the z-axis of the Nano-MET3 offers ultra-fast response needed for demanding AFM applications. Related products include the Nano-METZ, Nano-MET10 and Nano-MET20 nanopositioning systems.

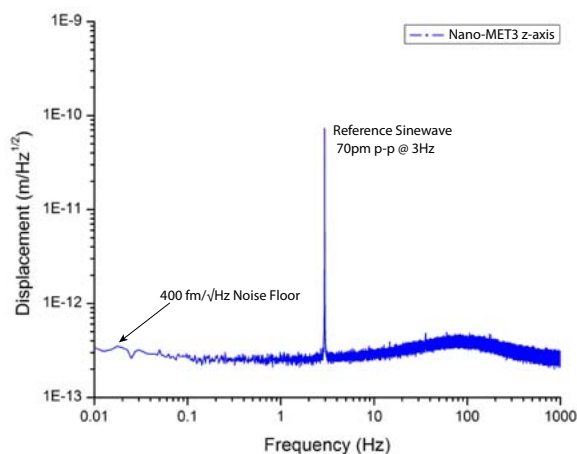
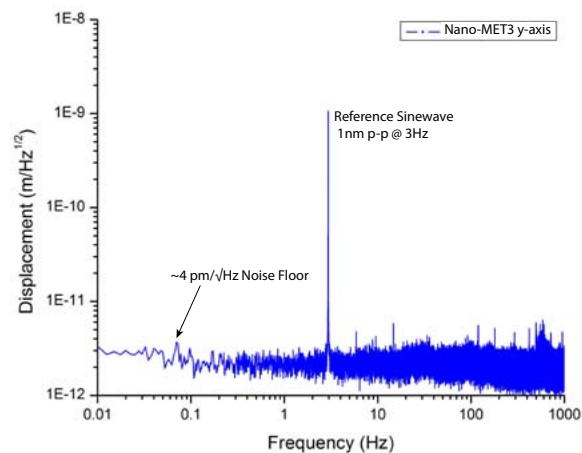
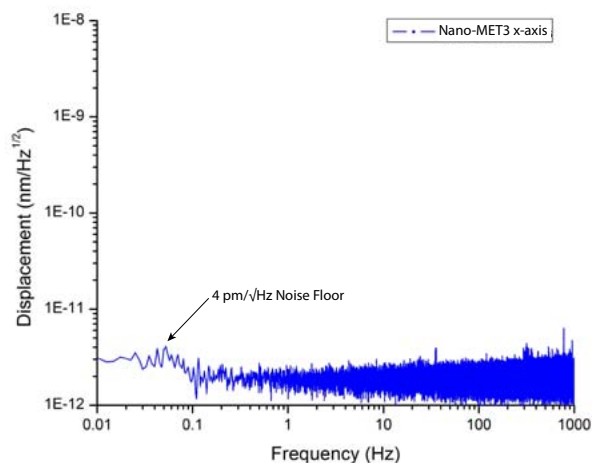
Technical Specifications

Range of motion (XY)	75 μm
Range of motion (Z)	5 μm
Resolution (XY)	0.15 nm
Resolution (Z)	0.005 nm
Resonant Frequency XY (MET2)	1.4 kHz
Resonant Frequency XY (MET3)	1.0 kHz
Resonant Frequency Z (MET3)	13.5 kHz
Recommended max. load (horizontal)*	100 g
Recommended max. load (vertical)*	100 g
Body Material	Aluminum
Controller	Nano-Drive®

* Larger load requirements should be discussed with our engineering staff.



Low Position Noise



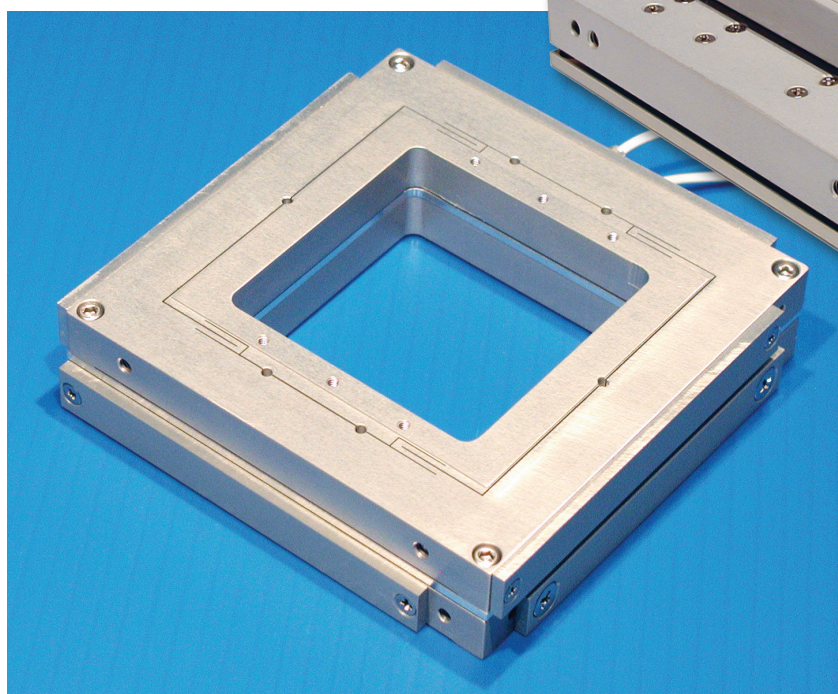
Nano-PDQ Series

Features

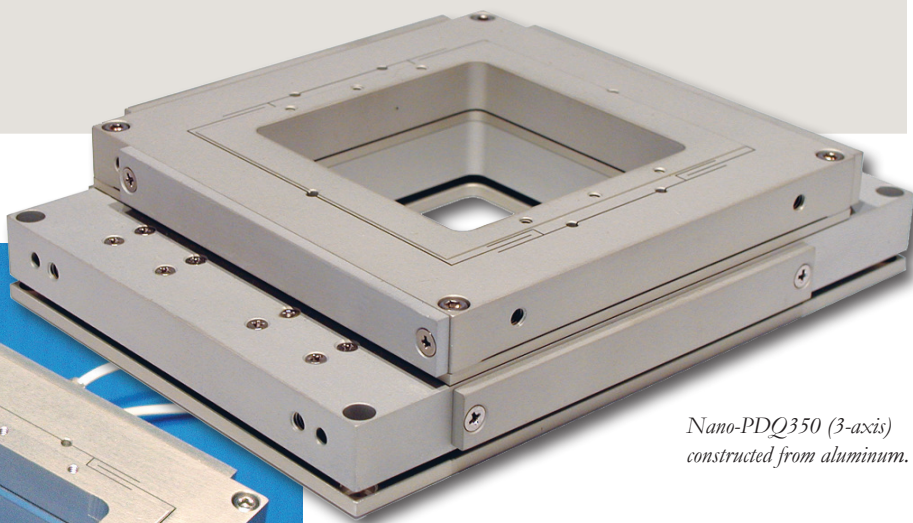
- ▶ High speed, direct drive
- ▶ Two or three axis motion
- ▶ 50 μm or 75 μm ranges of motion
- ▶ Large aperture
- ▶ Large load capacity
- ▶ **pico** sensor technology
- ▶ Closed loop control

Typical Applications

- ▶ Fast multi-axis scanning
- ▶ Optical trap calibration
- ▶ Particle tracking



Nano-PDQ250 (2-axis) constructed from aluminum.



Nano-PDQ350 (3-axis) constructed from aluminum.

Compatible Software Packages



Image-Pro
AMS
USB and analog motion control

µManager
THE OPEN SOURCE
MICROSCOPY SOFTWARE
USB motion control

Examples, tutorial, and
Nano-Route® 3D sup-
plied with Nano-Drive®
USB interfaces.



USB and analog
motion control



Analog motion control,
1 or 2 axes.

Product Description

The Nano-PDQ Series are high speed multi-axis precision nanopositioning systems. The Nano-PDQ Series offers a compact footprint with a large center aperture while still offering fast response and sub-nm precision. The Nano-PDQ Series are ideal for applications that demand high scan rates or large load capacities. The Nano-PDQ series may be ordered with the Nano-Drive® or Nano-Drive®85 controller to match to your application speed requirements. The Nano-PDQ Series features parallel, un-

coupled motion in up to three axes and fully integrated position sensors utilizing proprietary **pico** technology to provide absolute, repeatable position measurement and picometer accuracy under closed loop control. Another system to consider: the new low profile Nano-LPQ has similar 3-axis, high speed positioning performance but is sized to be more convenient when used on inverted research microscopes.

MCL



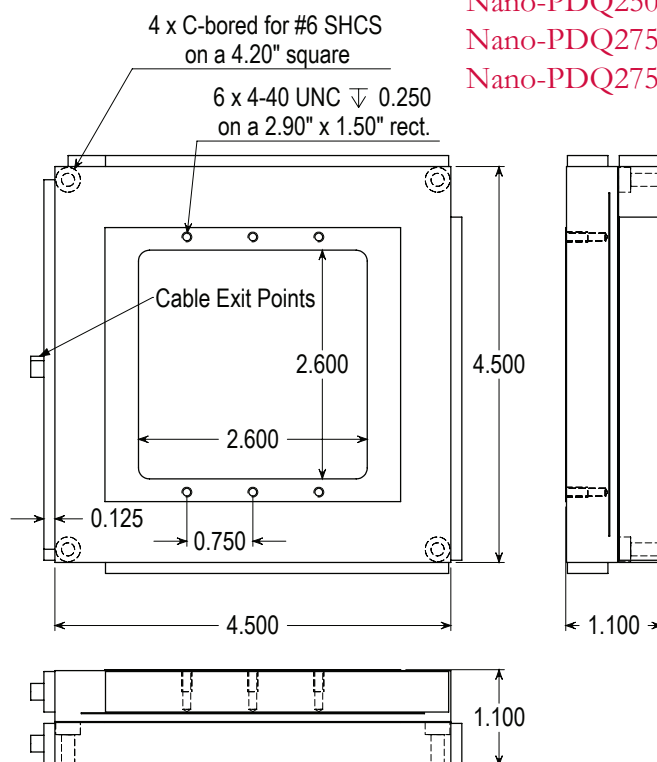
Technical Specifications

Range of motion (X)	50 μm /75 μm
Range of motion (Y)	50 μm /75 μm
Range of motion (Z)	50 μm
Resolution (50/75 μm)	0.1/0.15 nm
Resonant Frequency (X)	1080 Hz $\pm 20\%$
Resonant Frequency (Y)	840 Hz $\pm 20\%$
Resonant Frequency (Z)	265 Hz $\pm 20\%$
Scanning Speed	up to 400 Hz
Stiffness	3.0 N/ μm
$\theta_{\text{roll}}, \theta_{\text{pitch}}$ (typical)	$\leq 1 \mu\text{rad}$
θ_{yaw} (typical)	$\leq 3 \mu\text{rad}$
Recommended max. load (horizontal)*	0.5 kg
Recommended max. load (vertical)*	0.2 kg
Body Material	Al, Invar or Titanium
Controller	Nano-Drive® or Nano-Drive®85

* Larger load requirements should be discussed with our engineering staff.

2-Axis

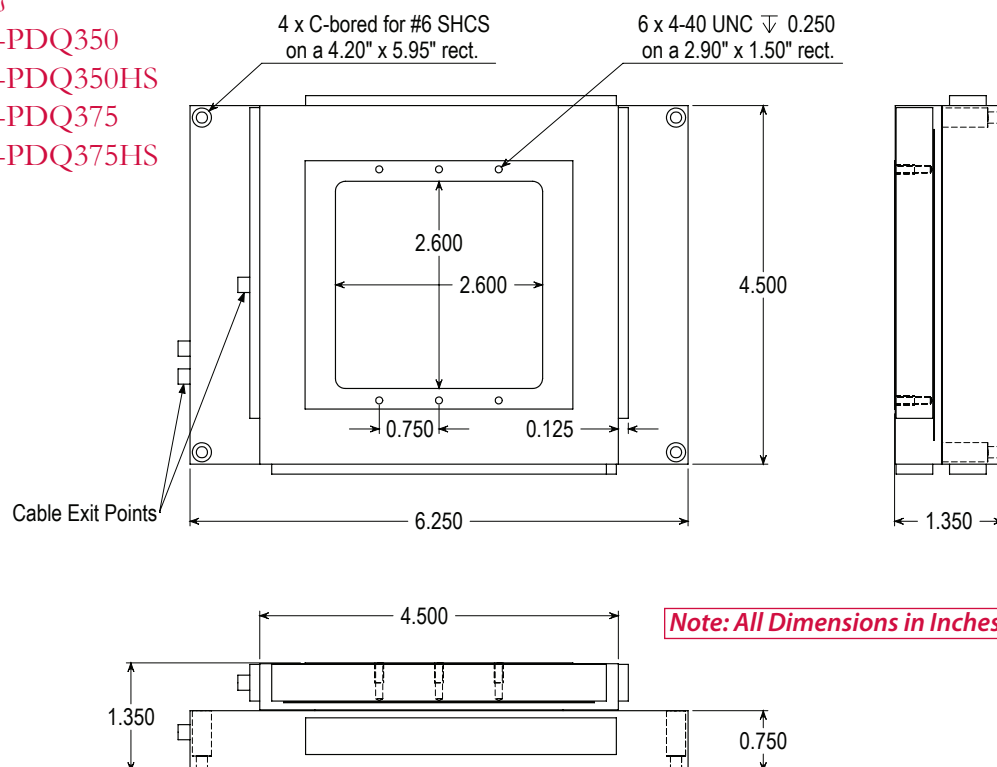
Nano-PDQ250
Nano-PDQ250HS
Nano-PDQ275
Nano-PDQ275HS



Note: All Dimensions in Inches

3-Axis

Nano-PDQ350
Nano-PDQ350HS
Nano-PDQ375
Nano-PDQ375HS



Note: All Dimensions in Inches



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