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NanoScan OP800

Nanopositioning Piezo Objective Scanner

The NanoScan OP800 provides fast step and settle times over an 800 µm range. Its market leading positioning accuracy and resolution originates from its unique mechanical design and integral capacitive feedback sensors. Compatible with most microscopes and objective lenses, the OP800 has user configurable settings optimized for different objective sizes, weights, and performance needs. You simply select the best setting for your particular application using the software provided.

Key features

- 800 µm closed loop travel range (950 µm open loop range typical).
- Rapid settling times even with large mass objectives.
- Stiff construction supports heavy objectives with standard settings.
- Friction free flexures deliver high stiffness and minimize off-axis motions for the highest repeatability and fastest cycle times.
- Tested to perform for more than 10 million full-range cycles.
- Capacitive positioning sensors used to give low nanometer positioning and the best resolution, stability (low drift) and repeatability.
- Can be used on both upright and inverted microscope.
- Connectors with built in stage calibration provide plug and play electronics which can be interchanged, minimizing system down times.
- Autocalibration centers the travel range ensuring full range scanning in all appropriate environments.

Applications

- Optical sectioning producing 3D images
- Autofocus systems for time lapse imaging
- High content screening
- Surface analysis
- Wafer inspection
- Scanning interferometry
- Multiphoton microscopy

Specifications for NanoScan OP800 Positioner:

Parameter	Specification
Material	Stainless Steel and Aluminum
Closed Loop Range	800 µm
Resolution*	2.5 nm under 250 g load
Linearity*	0.01%
Repeatability*	5 nm Slow PID, 100 µm step, 1SD
Max. Objective Load	500 g (higher loads on request)
Loaded Resonant Frequency 150 g/ 250 g/ 500 g load*	86/82/42 Hz
5% Settle 0.5 µm Step 150 g/250 g/500 g Load*	19 ms/17 ms/21 ms
0.5% (500nm) Settle 100um Step 150 g/250 g/500 g Load*	51 ms/ 59 ms/70 ms
Cable Lengh	2 m
Objective Clearance	40 mm
Optical Path Length Extension	13 mm; 12 mm with M32

*Typical specifications

Specifications for NPC-D-6110 Controller

Parameter	Specification
Mechanical	
NPC-D-6110 Controller Box	318 mm x 240 mm 90 mm
Weight of Controller Box	3.0 kg
Cooling	Convection cooled - temperature controlled fans
Electrical	
Power Input	100 to 240 VAC nominal 47 to 63 Hz
Connectivity	
USB - Type B Connector	2.0 compliant
Analog Input Command	BNC - 0 -10V (+/- 10V max)
Analog Position Monitor Output	BNC - 0-10V (+/- 10V max)
“TRIG” input/”TRIG” output “IN-POS” Output and Quadrature Interface	25 pin D-type socket - 5V TTL
Controller Synchronizing Signals	9 pin D-type socket
Enviromental - Operational	
Temperature	10 to 40C
Relative Humidity	5 to 80%

*Typical specifications

NanoScan OP800 System Ordering Information

Part Number	Description
QGOP-800-UP-D1	System incorporating NanoScan OP800 (0-500 g load) for upright microscopes using objective lenses and NPC-D-6110 controller
QGOP-800-INV-D1	System incorporating NanoScan OP800 (0-500 g load) for inverted microscopes using objective lenses and NPC-D-6110 controller

Microscope Thread Adapter Ordering Information

Part Number	Description
QG-OP-MIC-RMS	Microscope adapter RMS
QG-OP-MIC-M25	Microscope adapter M25 x 0.75
QG-OP-MIC-M32	Microscope adapter M32 x 0.75
QG-OP-MIC-M27	Microscope adapter M27 x 0.75
QG-OP-MIC-W26	Microscope adapter W26 (M26 x 1/36’’)

Objective Lens Adapter Ordering Information

Part Number	Description
QG-OP-OBJ-RMS	Objective adapter M32 x 0.75 to RMS
QG-OP-OBJ-M25	Objective adapter M32 x 0.75 to M25 x 0.75
QG-OP-OBJ-M27	Objective adapter M32 x 0.75 to M27 x 0.75
QG-OP-OBJ-W26	Objective adapter M32 x 0.75 to W26 (M26 x 1/36”)

Parfocal Objective Spacer and Microscope Adapter Ordering Information

Part Number	Description
QG-OP-SPACE-RMS	Objective lens spacer RMS
QG-OP-SPACE-M25	Objective lens spacer M25 x 0.75
QG-OP-SPACE-M32	Objective lens spacer M32 x 0.75
QG-OP-SPACE-M27	Objective lens spacer M27 x 0.75
QG-OP-SPACE-W26	Objective lens spacer W26 (M26 x 1/36’’)
QGOP-RAISE-KIT-M5-12	XY stage raiser kit for inverted setup of OP400/OP800 M5 12 mm

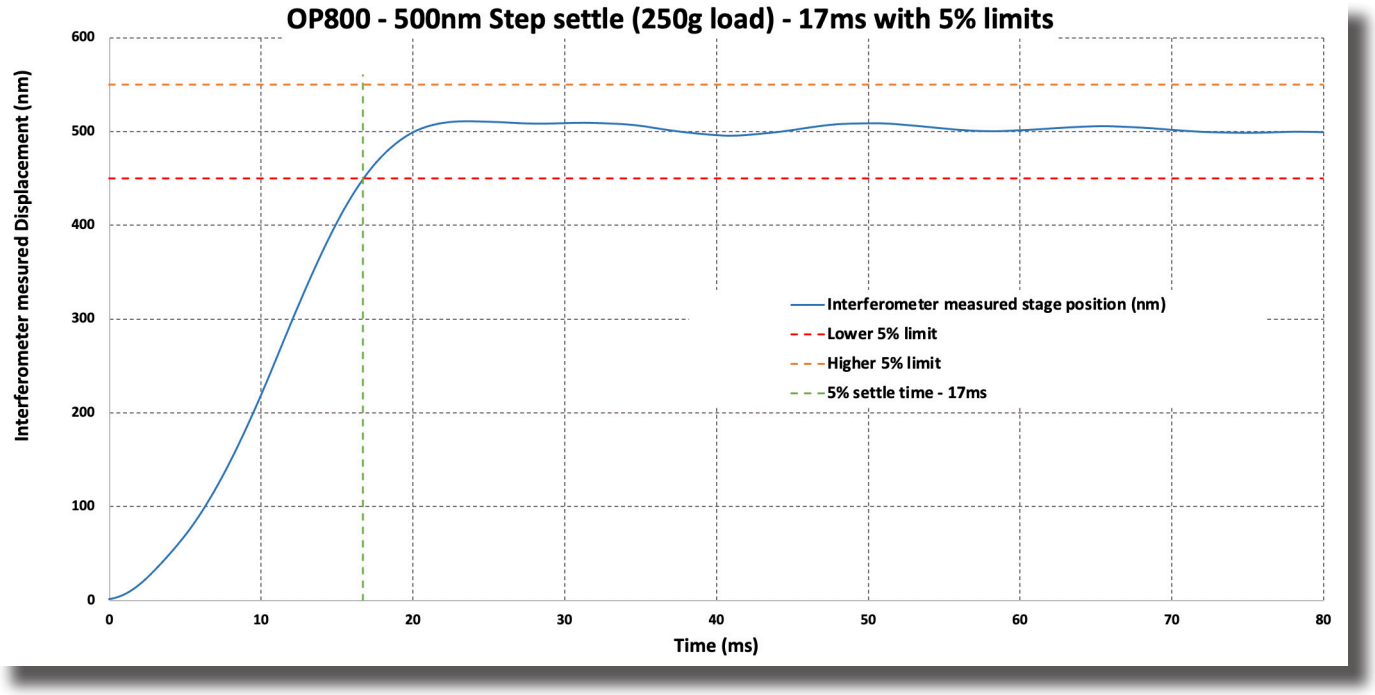
NPC-D-6110 Controller

- The powerful digital controller drives the OP800 at the fastest speeds possible.
- Motion control algorithms with acceleration/deceleration control and active damping reduce overshoot.
- Velocity control algorithm gives ultra-smooth ramps for applications such as focus stacking or focus bracketing.
- Market-leading 20 µs update rate.
- Fastest recovery time between z-stacks, providing enhanced time resolution.
- Software selectable tuning presets which optimize for step settle with different mass objectives.

Interfacing

- Analog command input and position output (0-10 V) for compatibility with existing systems.
- Digital commands over USB for maximum accuracy with a DLL interface for customer software. In-position digital outputs can be used to control camera imaging by providing rapid z-stacking.
- Digital quadrature/step-and-direction commands allow high-speed control with a standard 2-wire motion controller interface, without the need for expensive high-precision ADCs/DACs.
- Playback of custom-programmed waveforms such as constant-velocity profiles. Separate digital trigger outputs can be activated at custom-defined points to control external equipment such as camera imaging.
- Compatible with Queensgate Nanobench, Micro-Manager, Metamorph, Elements via RS232C, and other customer software using the DLL interface provided.
- Can be connected to Prior ProScan III for integrated fine z-control.

Step and Settle Time



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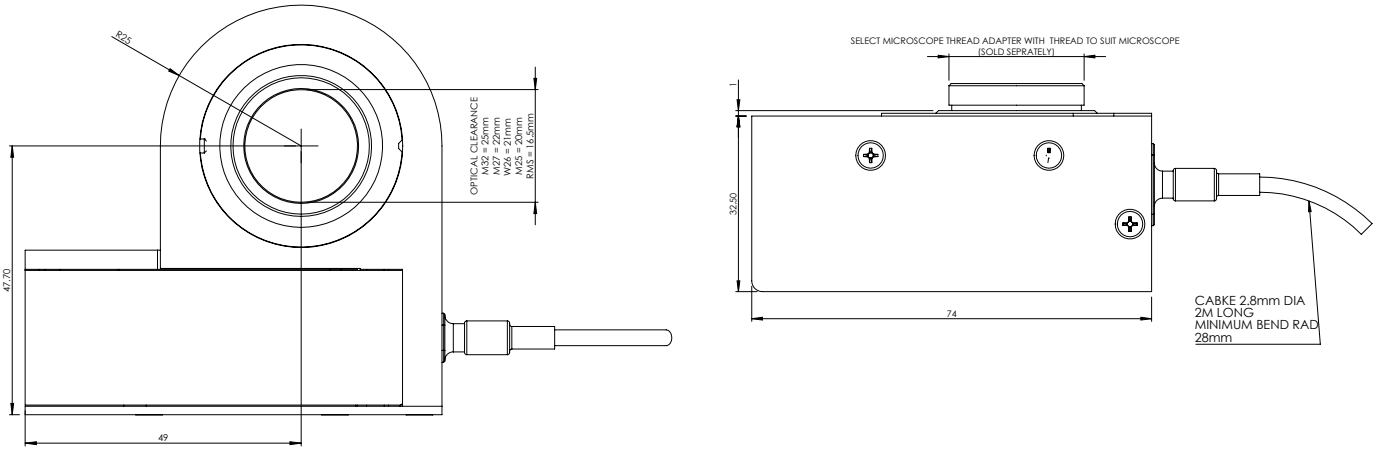
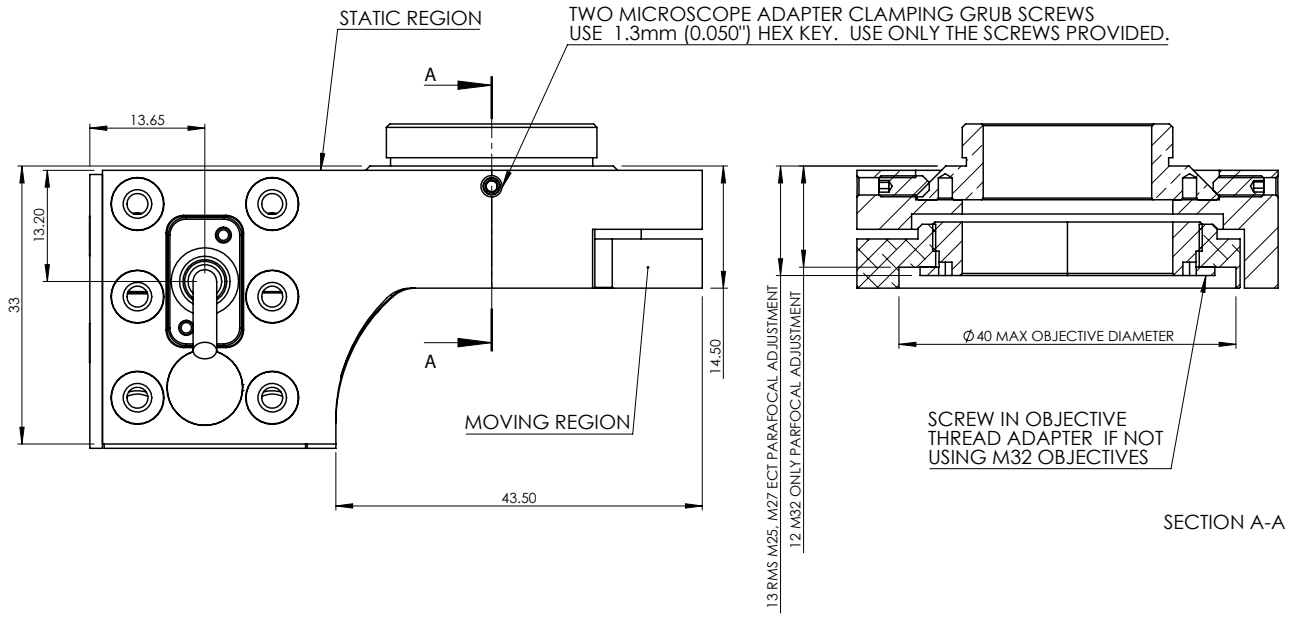
Dimensional Drawings





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