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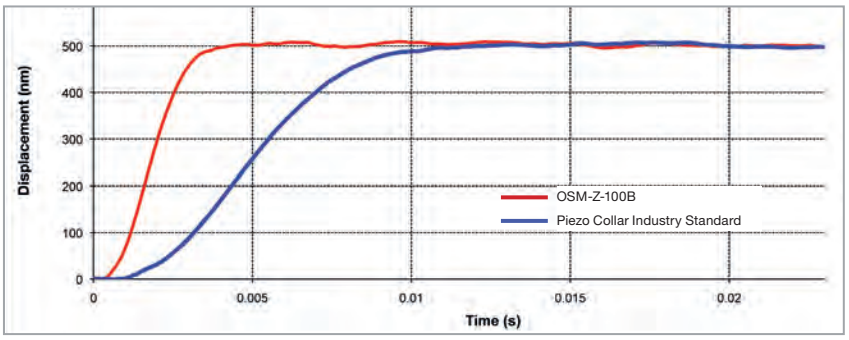
OSM-Z-100B

100μm Objective Scanning Mechanism with *Dual Sensor Technology*™

Features

- **3x Faster than the Industry Standard**
  - <4ms step settling times AND 100μm closed loop displacement
  - 600Hz Resonance Frequency
  - 1,5N/μm Stiffness
- **Dual Sensor Technology™ equipped**
  - No re-calibration between different loads
  - Superior mechanical bandwidth
- **Renowned Queensgate NanoSensors® Positioning Performance**
  - 0.1nm Position Noise
  - 0.01% Linearity
  - 0.005% Residual Hysteresis
- **Tool-Free Mounting Adaptors**
- **Super Invar Option for Higher Focus Stability**

OSM-Z-100B



Step and Settle performance of an OSM-Z-100B with NPC-A-1110DS vs Industry Standard: 500nm step with a 150g objective

Applications

- Surface structure analysis
- Autofocus systems
- Confocal Microscopy
- Scanning interferometry

Thread Size	Adaptor
W0.8" x 1/36"	OSM-Z-AW08
M25 x 0.75	OSM-Z-AM25
M26 x 0.75	OSM-Z-AM26
M27 x 0.75	OSM-Z-AM27
M28 x 0.75	OSM-Z-AM28
M29 x 0.5	OSM-Z-AM29

The OSM-Z-100B uses Queensgate's newest *Dual Sensor Technology*™ to achieve Industry-leading dynamics and precision in microscope objective focusing. **The OSM provides sub-nanometre positioning over 100 μm total displacement with an unbeaten step and settle time of less than 4ms.**

Our world leading non-contact position measuring system NanoSensors® guarantees outstanding resolution, repeatability and stability at nanometer level. Low off-axis errors and very high stiffness further enhance the performance of this advanced design. A range of analogue and digital controllers are available to drive the OSM-Z-100B including the newest NPC-A-1110DST analogue controller supporting patented *Dual Sensor Tecnhnology*™.

elektron technology

Queensgate Instruments
info@queensgate.com
www.nanopositioning.com

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OSM-Z-100B 100μm Objective Scanning Mechanism

Specification

Parameter	Symbol	Value			Units	Comments
Static physical						
		Minimum	Typical	Maximum		
Material		Stainless Steel				
Size		56 long x 46 diameter			mm	
Cable Length		2			m	
Connector		15 Pins Sub-D				
*Range	$d_{zp\cdot max}$		100		μm	
Static stiffness	k_z		1,5		N/μm	
Resonant frequency: 0g load	$f_{0\cdot 0}$		600		Hz	
150g load	$f_{0\cdot 100}$		400		Hz	
280g load	$f_{0\cdot 280}$		320		Hz	
500g load	$f_{0\cdot 500}$		270		Hz	
Maximum load				0.6	Kg	Note 1
Dynamic physical (Typical values)						
			Medium			Note 2
3dB Bandwidth	$B_{z.p}$		210		Hz	
*Small signal settle time	$t_{zs\cdot s}$		<4		ms	Note 3
*Position noise (1σ)	$\delta z_{p\cdot n}$		0.5		nm	Note 4
Slew rate	$u_{zp\cdot max}$		20		μm/ms	Note 5
Error terms						
		Minimum	Typical	Maximum		
*Residual hysteresis (peak to peak)	$\delta_{zp\cdot hyst}$		0.005	0.01	%	Note 6
*Linearity error (peak)	$\delta_{zp\cdot lin}$		0.01	0.1	%	Note 7
*Rotational error	$\delta\phi_z$		2	10	μradians	Note 8
*Rotational error	$\delta\gamma_z$		2	10	μradians	Note 8

Notes

*These parameters are measured and supplied with each mechanism.

1. Depends on orientation. 600g is the maximum load for gravity acting in the Z-direction. Loads greater than 0.6 Kg can cause damage to the flexure mechanism.
2. Dynamic operation servo-loop parameters depend on the payload. Fast means the fastest the stage can stably move with less than 20 grams load. Medium means the maximum stable speed for loads up to 150 grams. Slow means the speed at which the servo loop is stable for all masses up to the maximum allowed mass - equivalently low noise setting.
3. This is the 2% settle time. It is a function of the servo loop parameters which are user controllable. The test step size is 500 nm.
4. The actual position noise of the stage. The value refers to the use with analogue controller NPC-A-1110DS.
5. The highest rate of change of true position with time that can be achieved. It is limited by the closed loop parameters and driver power. The value refers to the use with analogue controller NPC-A-1110DS.
6. Percent of the displacement. Depends on controller type and displacement: the hysteresis specification for 1μm displacement is 0.1 nm.
7. Percent error over the full range of motion. Depends on controller type: digital controllers allow for 4th order linearization.
8. Angular motion over the full range of the stage. These rotational errors are rotational errors around the X and Y axes respectively.

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