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a brand of PRIOR

NPS-TG-7A

High performance tip tilt mirror steering stage

The Queensgate NPS-TG-7A tip tilt mechanism is designed for applications requiring high speed, ultra-high precision positioning of mirrors up to 40 mm.

Providing Tip/Tilt angles of up to 7 mrad, and optical deflection angles of 14 mrad.

Unique positioning performance due to closed loop operation with capacitive positioning sensors.

Market-leading dynamic performance with high servo loop bandwidths in excess of 1 kHz.

Key Features

- 7mrad range in each axis with sub micro-radian resolutions at > 1.2 kHz.
- Capacitance positioning sensors providing unrivalled resolution, linearity, repeatability and bandwidth.
- Dynamic performance: high loaded resonant frequencies as well as very high servo loop bandwidths in excess of 1 kHz.
- Invar 36 construction, its low thermal expansion closely matches most optics minimizing any thermal distortion.
- Enclosed mechanism for high stability and reliability.
- Step settle times <2 ms.
- Plug and Play: stage connector containing stage calibration data and reference sensor allowing easy controller interchangeability.

Applications

- Laser scanning
- Laser pointing
- Atmospheric compensation
- Image processing and stabilization
- Scanning microscopy
- Laser communication point ahead devices
- Optical filters/switches

Technical specifications

Parameter	Value			Units	Comments
Static physical					
Material	Invar 36				
Size	95 high x 40 diameter			mm	
Mass	550			g	Excluding cable
Cable length	2			m	1 cable per axis
Maximum load	70			g	
	Minimum	Typical	Specified		
*Closed Loop Range	7	7		mrad	
* Open Loop Range	7.7	8.8		mrad	
*Scale factor error (1σ)		0.002	0.1	%	
*Resonant frequency: 0 g load		2600		Hz	
15g load		2300		Hz	
Dynamic physical (Typical values)					
Loop setting	Extra fast	Fast	Slow		Note 1
*3dB Bandwidth	1200	800	50	Hz	
*Small signal settle time		1.5		ms	Note 2
*Position noise (1 σ)	0.5	0.36	0.08	urads	Note 3
Repeatability			0.2	urads	
Error terms					
Variant		Typical	Specified		
*Hysteresis (peak to peak)		0.05	0.15	%	Note 4
*Linearity error (peak)		0.03	0.1	%	Note 5
Distance of pivot point to platform surface		7		mm	X and Y axis

Notes

*These parameters are measured and supplied with each mechanism.

1. For dynamic operation the servo loop parameters are preset for different performances; the parameters are user settable via software control. Extra Fast means the fastest the stage can stably move with less than 20 g load. Slower settings allow higher loads or higher resolution.
2. This is the 5 % settle time. It is a function of the servo loop parameters which are user controllable.
3. The actual physical position noise of the stage.
4. Percent of the displacement.
5. Percent error over the full range of motion.

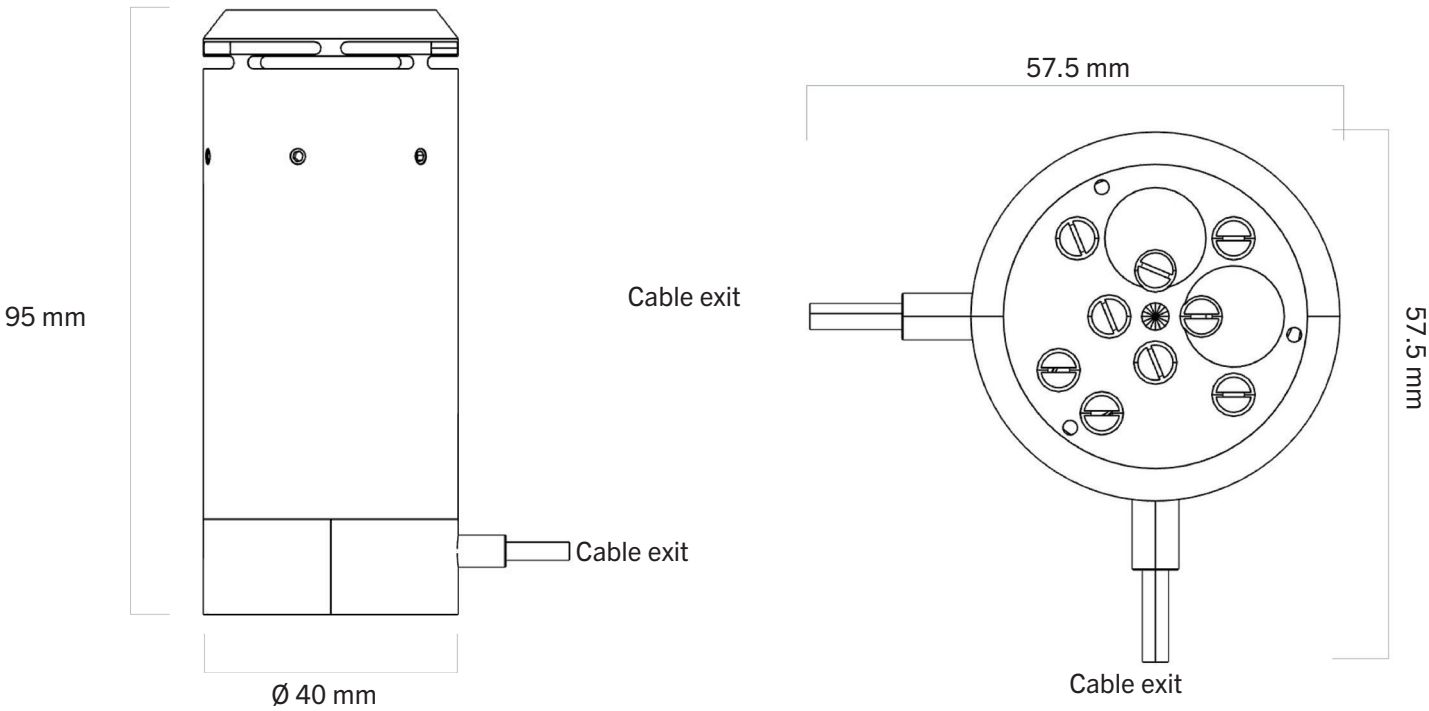
Suggested controllers

NPC-D-6330 Multi-channel Closed Loop Controller

Designed to control Queensgate's Nanometer Precision Mechanisms incorporating capacitance positioning sensors.

- Low noise, low drift, high power, high resolution and high position update rates (20 usec).
- Optimized acceleration/deceleration contributing to high speed positioning applications by reducing overshooting and settle time.
- User optimization of all operating parameters available through Nanobench PC Software
- Eight programmable slots including PID and notch filter set up, three are factory set to provide fast, medium and slow PID settings. The additional five slots are available for application specific settings.
- The calibration and dynamic settings are held in the actuator EEPROM which allows controllers (plug and play) to be interchanged with minimal performance changes.

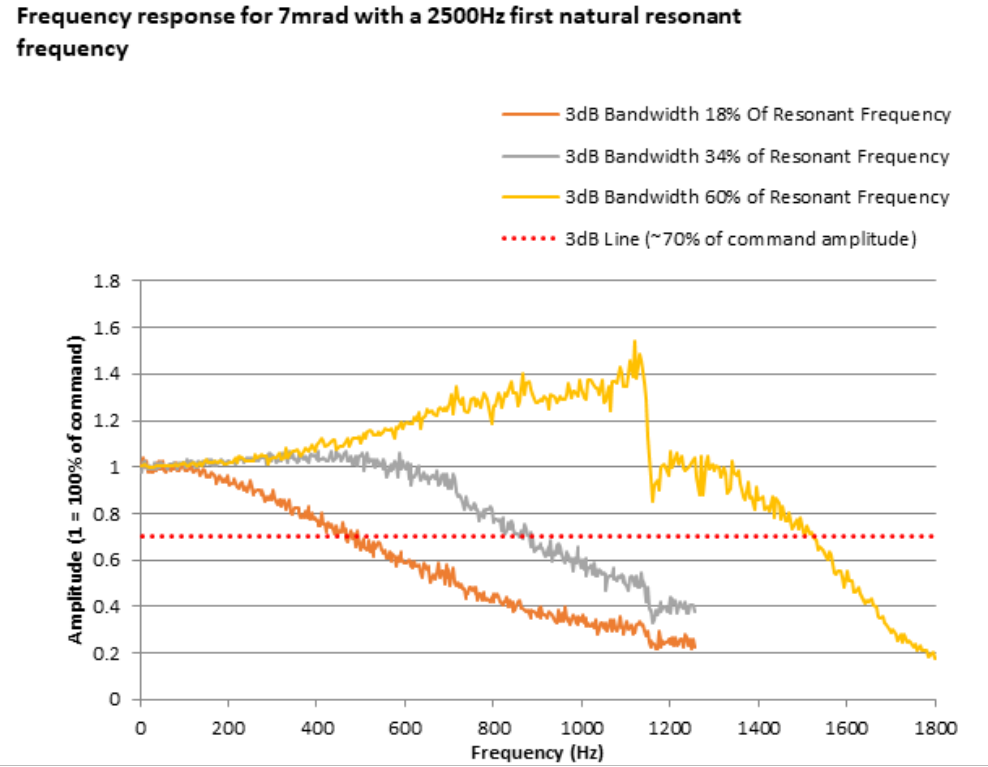
Dimensions



Please refer to the NPS-TG-7A Installation Drawing for complete dimensions and install guide.

Full installation drawings are also available on the Queensgate website. 3D CAD available on request.

System Performance



Ordering information

Product Ref	Description
QGNPS-TG-7A	QGNPS-TG-7A High Performance Tip Tilt
QGNPC-D-6330	NanoScan NPC-D-6330 Multi-Channel Closed Loop Controller

Owing to continuous development, we reserve the right to introduce improvements and modify specifications without prior notice.

Custom Options

For customization and OEM solutions please contact your local sales representative.

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