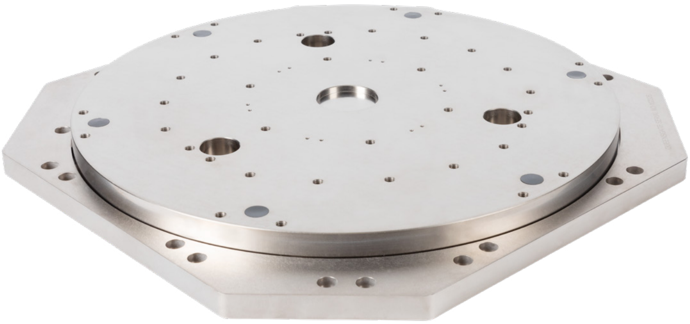
queensgate
a brand of PRIOR

WP120A

Low profile, high-load Z stage for 300 mm (12”) wafers



Millisecond response times and high bandwidth make the WP120A wafer positioning system ideal for applications where high throughput is essential. The stage is designed to hold 300 mm (12") wafers and delivers exceptional performance with loads of up to 8 kg suitable for heavy wafer chucks.

The stage uses capacitive positioning sensors to provide nanometre displacement measurement and closed-loop feedback. Flexure guidance offers friction-free, reliable motion over 120 µm closed loop range and achieves fast response and settle times with Queensgate’s digital closed-loop controllers.

Typical applications

- Wafer Inspection
- Electron Microscopes SEM/TEM
- Interferometry and metrology
- Microscopy
- Materials inspection
- Mirror positioning

Custom solutions

- Vacuum (HV) compatible version ideal for use in a vacuum chamber of an electron microscope.
- Ultra high vacuum (UHV) and UHV-RAD rad hard versions with low outgassing Kapton cabling.
- High load custom version for use up to 14 kg.
- Tip tilt Z custom version for platform levelling and scanning.
- 160 µm extended range.
- 200 mm wafer.
- Adaptor plate for use with Prior Scientific stage H112.

Technical Specification

Parameter	Value			Unit
Material	Aluminium			
Stage mass (excluding cables)	5.8			kg
Finish	Non Magnetic Nickel			
Size	375 L X 375 W x 30 H			mm
Platform Size	350 Diameter			mm
	Min	Typical	Max	
Open Loop Range		140		µm
Calibrated Range	120			µm
Resonant Frequency 0 kg		320		Hz
Resonant Frequency 5.2 kg		190		Hz
Resonant Frequency 8 kg		155		Hz
Linearity Error		0.1	0.3	%
Roll/Pitch/Yaw		29.5 / 18.6 / 2.1		+/- µrad
Dynamic (typical values)				
Test Load	0	5.2	8	kg
Step Settle 1 µm	9	13	14	ms
Step Settle 30 µm	16	22	24	ms
Noise	1.2	1.5	1.8	nm
Repeatability, 60 µm step		5.5		nm
3 dB Servo Loop Bandwidth	65	45	40	Hz

NPC-D-6110 Controller

Ultra-low noise digital controller with market-leading 20 µs update rate allows resolution to be maintained for high servo loop bandwidths and high loads. Motion control algorithms with acceleration/deceleration control reduce overshoot, providing the best step settle times. The system is provided with up to three factory set selectable tuning presets optimized for step settle and sample mass. Five additional custom presets are available for custom tuning. New velocity control algorithms give ultra-smooth ramps for applications such as focus stacking or focus bracketing.

Interfacing

Analog command input and position output –10 to +10 V or 0 – 10 V.

Digital commands are available over USB, RS232C or digital quadrature/ step and directions commands.

An optional high-speed RS422C digital interface for sample-accurate control and position feedback is available.

A DLL interface is provided to allow easy integration with the customer's software. Playback of custom-programmed waveforms such as raster scans or constant-velocity profiles are standard features. Separate digital trigger outputs can be activated at custom-defined points to control external equipment such as camera imaging.

Information for ordering and accessories

Part number	Description
QGWP120A-D1	300 mm (12") high speed low profile wafer piezo stage 120 µm Z with NPC-D-6100 digital controller.
QGWP120A-UHV-D1	300 mm (12”) high speed low profile wafer piezo stage 120µm Z high vacuum compatible with NPC-D-6100 digital controller.
Accessories	
QGWPADAPT1	H112 to WP120A adapter plate kit.
QGWP30	150, 200 and 300 mm (6, 8 & 12”) wafer chuck.
QGWP30V	150, 200 & 300 mm (6, 8 & 12”) vacuum hold wafer chuck.

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