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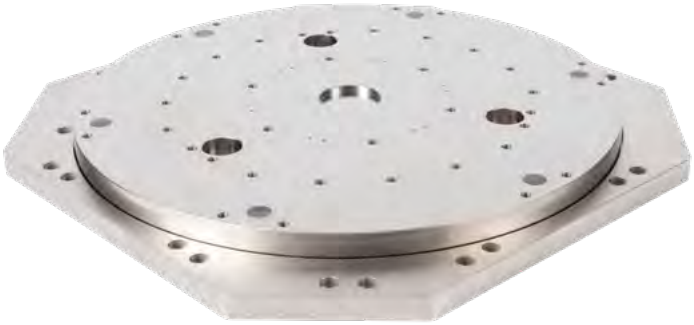
WP120B

Low profile Z , tip and tilt stage for 300 mm (12”) wafers



The WP120B wafer positioning stage utilizes a high-stiffness, parallel-kinematic tripod design allowing sample leveling (±50 µrad) while ensuring millisecond step-and-settle times when scanning over the 120 µm closed-loop Z range.

Sub-nanometer resolution capacitive displacement sensors directly measuring the moving platform, flexure guidance, and a high bandwidth closed-loop control provides exceptional flatness while scanning with pitch and roll error of less than 2 µrads.

The stage is designed to hold 300 mm wafers, with load capacity up to 8 kg. Through-holes allow access for wafer lift-pin systems.

Key features

- 120 µm travel in Z (±60 µm)
- Tip / tilt range of ± 50 µrad
- Load capacity up to 8 kg
- Customer selectable presets optimized for specific load requirements

Custom solutions

- Vacuum (HV) compatible version ideal for use in a vacuum chamber of an electron microscope.
- Ultra-high vacuum (UHV) version with low outgassing Kapton cabling.
- Adapter plate for use with Prior Scientific stage H112.

Typical applications

- Wafer inspection / defect detection
- Electron microscopy (SEM/TEM)
- Interferometry and metrology
- Bonding technology
- Surface structuring
- Wafer probing and chip verification

Technical Specification

Parameter		Value		Unit	Notes
Material		Aluminum			
Stage mass (excluding cables)		5.8		kg	
Finish		Nickel plated			
Size[1]		375 L X 375 W x 30 H		mm	
Platform size		350 Diameter		mm	
		Typical	Max		
Open loop range	Z	140		µm	Range is ±70 µm
Closed loop range	Z	120		µm	Range is ±60 µm
Closed loop range	Tip/Tilt	100		µrad	Range is ±50 µrad
Resonant frequency 0 kg		320		Hz	
Resonant frequency 5.2 kg		190		Hz	
Resonant frequency 8 kg		155		Hz	
Linearity error	Z	0.06	0.15	%	
Linearity error	Tip/Tilt	0.06	0.15	%	
Roll/Pitch/Yaw		2		µrad	While commanding Z axis only
Dynamic (typical values)					
Test load		5.2	8	kg	
Step settle 1 µm		13	14	ms	
Step settle 30 µm		22	24	ms	
Noise		1.5	1.8	nm	
Repeatability, 60 µm step		5.5		nm	
3 dB servo loop bandwidth		45	40	Hz	

Notes

1. Contact us for CAD or dimensional drawings.

Suggested Controller

NPC-D-6330 Multi-channel Closed Loop Controller

Designed specifically to control Queensgate's Nanopositioning stages, the fast update rate and Queensgate advanced control algorithms contribute to high speed positioning accuracy for dynamic applications that require high speed movement of the stage.

Velocity control provides high speed scanning suitable for the speed and resolution needed for high speed AFM.

The PC software allows optimisation of operating parameters, such as PID and notch filter set up.

There are eight programmable slots, three which are populated in the factory to provide fast, medium and slow PID settings, the addition five slots are available for application specific settings.

The calibration and dynamic settings are held in the stage EPROM which allows controllers to be interchanged with minimal performance changes.

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Information for ordering and accessories

Part number	Description
WP120B-D3	WP120B 120 µm Z Tip Tilt Z 3 Axis System with NPC-D-6330 Controller.
QGWP120B-VAC-D3	WP120B 120 µm Z Tip Tilt Z 3 Axis System for High vacuum, with NPC-D-6330 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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