WaferMaxZ

Mechanical-Bearing Direct-Drive Lift Stage

- Low profile for space-conscious applications
- Noncontact direct-drive
- High repeatability
- Integral pneumatic counterbalance
- Easily configured with WaferMaxT for multi-axis applications

The WaferMaxZ represents a significant breakthrough in vertical alignment of high-precision components in one compact package. Its superior noncontact linear motor drive employs a high-accuracy encoder for direct position feedback. When combined with Aerotech's MXH multiplier, it offers sub-nanometer resolution in addition to high speed and accuracy.

Superior Mechanical Design

Bearing elements are cross-roller style for maximum smoothness and reliability. These are mounted on an optimized base and wedge assembly for stiffness and low mass/inertia, enhancing dynamic performance.

All the critical elements of the WaferMaxZ were selected to operate in a 24/7 industrial environment and, unlike screw- or piezo-based vertical stages, the WaferMaxZ requires no maintenance and will ensure years of trouble-free operation.

Brushless Direct-Drive

To maximize positioning performance, the WaferMaxZ utilizes Aerotech's BLMUC-series brushless, slotless linear motor. This motor has all the advantages of a brushless direct-drive motor — no brushes to wear, no gear trains to maintain, and high acceleration and high speeds. Since it is a slotless, ironless design, there is zero cogging, meaning that there is absolutely no torque ripple. This makes the WaferMaxZ ideal for contoured motion, smooth scan velocity, or precise incremental steps.

Accurate Positioning

Performance is assured with a precision linear encoder that results in 0.8 nm resolution. The motor and high-performance linear encoder are directly coupled to increase accuracy.

Flexible Configurations

Aerotech manufactures a wide range of servo amplifiers and advanced controllers to provide a complete, integrated package.

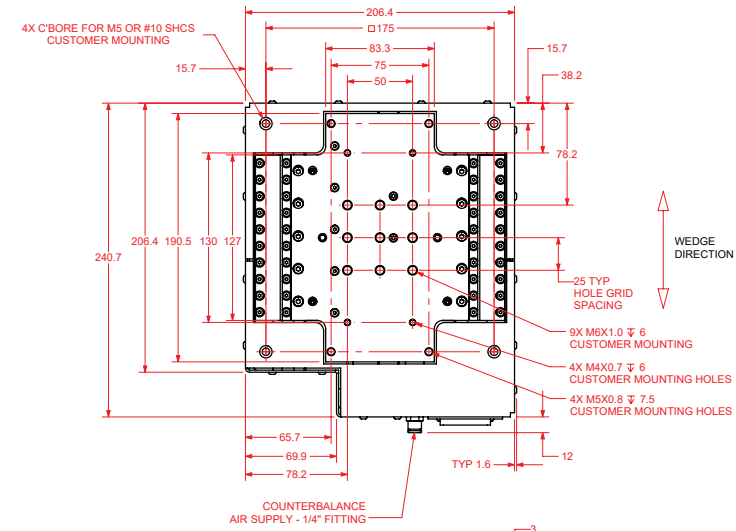
The WaferMaxZ easily combines with the WaferMaxT to provide a compact, 2-axis solution for alignment and focus.

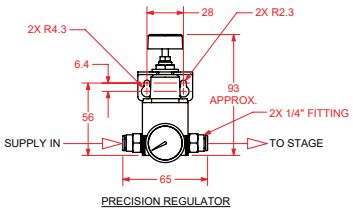
WaferMaxZ SPECIFICATIONS

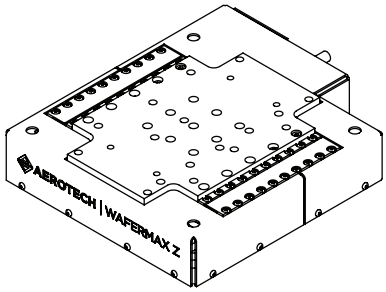
WaferMaxZ		
Travel		5 mm
Motor Type		Direct drive brushless linear servomotor
Bus Voltage		up to 160 VDC
Continuous Current	A_{pk}	2.9 A
	A_{rms}	2.1 A
Encoder		20 µm fundamental; amplified sine output
Resolution (Minimum Incremental Motion)		0.83 nm
Accuracy[1,3]		±1.5 µm
Bidirectional Repeatability[3]		±0.3 µm
Straightness[4]		±2 µm
Roll		20 arc sec
Pitch		20 arc sec
Yaw		20 arc sec
Maximum Speed		4 mm/s
Maximum Load[5]		10 kg (requires use of integral pneumatic counterbalance)
Moving Mass		1.0 kg
Wedge Ratio		12:1
Stage Mass		4.2 kg
Material		Aluminum
Finish		Black anodize hard cover; Hard coat (62 Rockwell Hardness) tabletop

Notes:
1. Requires Aerotech controller.
2. For inverted operation, consult factory.
3. Certified with each stage.
4. Measured perpendicular or parallel to wedge direction.
5. Higher maximum loads possible. Contact factory for details.
6. Specifications are per axis measured 25 mm above the tabletop without a payload. Performance is payload and work-point dependent. Consult factory for multi-axis or non-standard applications.

WaferMaxZ DIMENSIONS







DIMENSIONS: MILLIMETERS

Integration (Required)

Aerotech offers both standard and custom integration services to help you get your system fully operational as quickly as possible. The following standard integration options are available for this system. Please consult Aerotech if you are unsure what level of integration is required, or if you desire custom integration support with your system.

-TAS — Integration - Test as system
Testing, integration, and documentation of a group of components as a complete system that will be used together (ex: drive, controller, and stage). This includes parameter file generation, system tuning, and documentation of the system configuration.

-TAC — Integration - Test as components
Testing and integration of individual items as discrete components. This is typically used for spare parts, replacement parts, or items that will not be used or shipped together (ex: stage only). These components may or may not be part of a larger system.