Z-Theta Air Bearing Stage

Precision Z-Theta positioner head - Ideal for Flip Chip Bonders!



ABTech's *Z-Theta* positioning head combines precision rotary and linear motion in a compact single unit which can be mounted to X-Y gantries or other types of positioning systems, providing two additional axes of motion.

The compact 150mm (6.0") square unit contains the unique dual air bearing system. Both the Theta and Z air bearings are fully constrained for maximum stiffness and performance. One air supply feeds both bearings. The Theta features a 150mm (6.0") diameter thrust area and the Z axis is a 50mm (2.0") square precision rail. The Z rail provides better than $1.0\mu m (40\mu^{"})$ straightness over full travel, which ensures accurate work piece placement without the aid of control system compensation. The system can produce and support up to 45.4Kg (100lbs.) of force in the Z direction.

The Theta axis has 210° of travel available with electrical limits and hard stops. The Z axis travel is 50mm (2.0") with electrical limits and hard stops as well.

ABTech's modular design approach and full engineering services can respond quickly to provide a solution to your O.E.M. needs for ultra-precision motion.

Features:

- Fully constrained rotary air bearing Theta Axis
- Fully constrained within Theta, linear air bearing Z Axis
- Ultra-smooth dual motion
- 210° Theta rotation
- $1.0\mu m(40\mu)$ or less, Z Axis straightness in 50mm (2.0")
- Rotary DC brushless servo on Theta Axis
- Precision ball screw & stepper drive on Z-Axis
- Non-influence ball screw coupling
- High resolution encoder
- End of travel limits & hard stops
- Low air consumption
- Turn key systems available to O.E.M.s



Precision ball screw and stepper drive permits high loading and precision positioning for the Z Axis rail.

Motor turns the ball screw nut for pure linear translation.

Looking into head - at noninfluence ball nut mount, stepper motor, air feed and Theta encoder ring. Theta motor mounts below encoder ring.



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Specifications



Z - Theta Air Bearing Stage



	Theta Axis		Z - Axis
Motor Drive	Brushless DC Servo	Motor Drive	Stepper & Precision Ball Screw
Travel	±105° From Zero	Travel	2.00" (50mm)
Cont. Torque/Force	84.48 oz-in	Ball Screw Lead	0.157" (4mm)
Peak Torque/Force	160 oz-in	Speed	0 - 10 in./sec. (0 - 254mm/sec.)
Speed	0 - 90° / sec	Holding Torque	5.6 lb-in. (0.63 N-m)
Torque/Force Constant	42.24 oz-in/A	Step Angle	1.8°
Continuous Current	2.0 Amps	Amps / Phase	3.0 A
Encoder Resolutions	5.0, 1.0, 0.5, 0.2, 0.1 µm	Phase Resistance	0.6 Ohms
Radial/Axial Error Motion	5.0µ" (0.125µm)	Phase Inductance	2.0 mH
Angular Error Motion	1.0 arc-sec	Phase Voltage	1.8 Vdc
Axis Parallelism	10µ"/2.00" (0.25µm/50mm)	Straightness of Travel	< 40µ" (1.0µm)
Load Capacity	100lb (45.4Kg.)	Max. Linear Force	100lb (45.4Kg.)
Air Consumption		1.0 scfm @50psi	

Stage performance can be effected by method of mounting and loading. Consult ABTech's applications engineering. Specifications are at 50psi Consult ABTech's applications engineering for moment loading and stiffness considerations. Specifications are subject to change without notification. Special accuracies can be supplied.

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