

BAZ™ Ultra-Stiff Z-Elevator Unit



Ultra Stiff Z-Elevator

Features

- :: Ideal for use in applications which require low vibration during X-Y scans
- :: High natural frequency
- :: High load capacity

Our BAZ Z-Elevator Stage provides very stiff vertical motion with low angular errors and high resolution. Its unique design maintains a torsional stiffness of 4×10^5 N-m/rad and a lateral stiffness of 1×10^7 N/m, making it ideal for wafer positioning applications. Precision, crossed roller ways support user loads up to 50 kg and keep angular runouts to 5 arc-seconds or less over the full 5mm travel. Our BAZ stage incorporates a 23 frame motor (either stepper or servo), coupled to a leadscrew

or ballscrew which moves the center section horizontally. A 20:1 wedge provides high resolution. A flexure couples the top section to the base section, tightly constraining motion in the XY plane while allowing vertical motion. A linear encoder may be mounted vertically, to maximize positional accuracy, or horizontally, to provide a tighter servo loop and/or higher resolution. Please see page 55 for resolution calculation details.

SPECIFICATIONS		BAZ-5			
Travel (mm)		5			
Positional Accuracy (μm)	with linear encoder ¹	1			
	open loop	10			
Bidirectional Repeatability (μm)		2			
Flatness & Straightness (μm)		4			
Pitch/Roll & Yaw (arc-seconds)		10			
Stiffness	torsional (N-m/radian)	4×10^5			
	lateral (N/m)	1×10^7			
Load Capacity (kg) ²		50			
Maximum Speed (rps)	leadscrew	15			
	ballscrew	50			
Mass (kg)	Moving	7			
	Total	25			
CONFIGURATIONS ³					
Leadscrew	Lead (inch)	0.50	0.40	0.20	0.10
	Z Resolution (inch $\times 10^{-6}$) ⁴	12.5	10	5	2.5
	Lead (mm)	2			
	Z Resolution (μm) ⁴	0.05			
Ballscrew	Lead (mm)	5	2		
	Z Resolution (μm) ⁴	0.125	0.05		
Motor	Stepper (oz-in)	400 step/rev.	118	others available	
		200 step/rev.	53	100	others available
	Servo		brush	brushless	
OPTIONS					
Encoder	Rotary (counts/rev.)		2000	4000	
	Linear ($\mu\text{m}/\text{count}$)	vertical	5	1	0.5
horizontal		0.25	0.05	0.025	0.005

¹With 2 point slope correction.

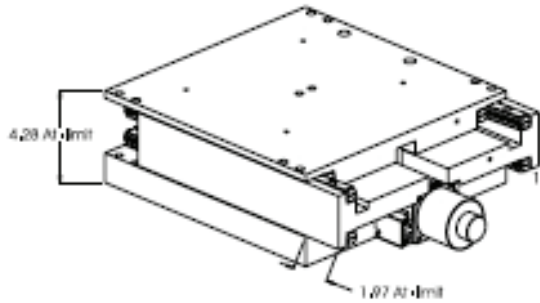
²Please contact our Application Engineers for loads exceeding 30kg.

³Standard configuration is highlighted.

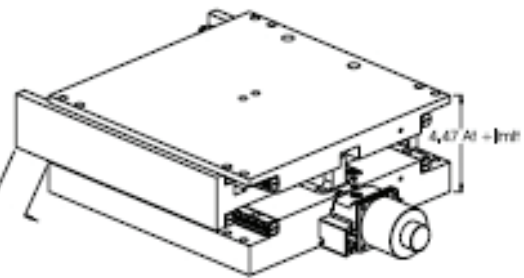
⁴Z Resolution assuming $\div 10$ microstep drive and standard 200 step/rev. stepping motor.

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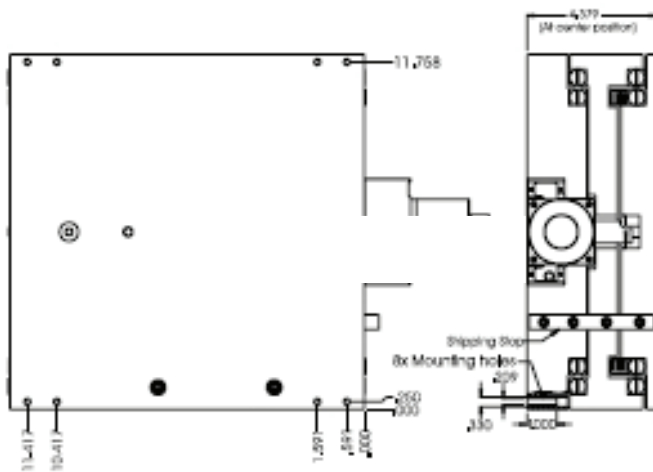
- End of Travel



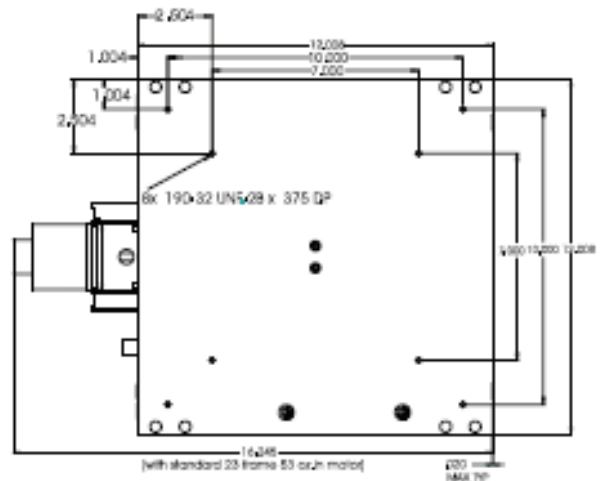
+ End of Travel



Bottom View



End View



Third Angle Projection
Note: All Dimensions in Inches