

M-850 Hexapod Platform: 6-Axis Parallel Kinematics System

High-Load Parallel-Kinematics Micropositioner with Controller, to 2000 N



- Six Degrees of Freedom
- Works in Any Orientation
- No Moving Cables for Improved Reliability and Precision
- Up to 250 kg Load Capacity (Vertical)
- Heavy-Duty, Ultra-High-Resolution Bearings for 24/7 Applications
- Repeatability to $\pm 1 \mu\text{m}$
- Encoder Resolution to 0.005 μm
- Significantly Smaller and Stiffer than Serial-Kinematics Systems, Better Dynamics
- Vacuum-Compatible Versions Available
- Linear and Rotary Multi-Axis Scans
- Virtual Pivot Point
- Sophisticated Controller Using Vector Algorithms
- MTBF 20,000 h

Technical Data

Model	M-850.11	M-850.50	Units
Active axes	X, Y, Z, θ_x , θ_y , θ_z	X, Y, Z, θ_x , θ_y , θ_z	
Motion and positioning			
*Travel range X, Y	± 50	± 50	mm
*Travel range Z	± 25	± 25	mm
*Travel range θ_x , θ_y	± 15	± 15	$^\circ$
*Travel range θ_z	± 30	± 30	$^\circ$
Actuator drive	DC-motor	DC-motor	
Integrated sensor	Rotary encoder	Rotary encoder	
Sensor resolution	2048	2048	cts./rev.
Actuator design resolution	0.005	0.05	μm
**Min. incremental motion X, Y, Z	1 (XY), 0.5 (Z)	1 (XY), 0.5 (Z)	μm (6-axis move!)
**Min. incremental motion θ_x , θ_y , θ_z	5	5	μrad (6-axis move!)
Repeatability X, Y	± 2	± 2	μm
Repeatability Z	± 1	± 1	μm
Repeatability θ_x , θ_y , θ_z	± 10	± 10	μrad
Max. velocity X, Y, Z	0.5	8	mm/s
Max. velocity θ_x , θ_y , θ_z	6	100	mrad/s
Typ. velocity X, Y, Z	0.3	5	mm/s
Typ. velocity θ_x , θ_y , θ_z	3	50	mrad/s
Mechanical properties			
Stiffness (k_x , k_y)	3	3	N/ μm
Stiffness (k_z)	100	100	N/ μm
Max. load (baseplate horizontal/any orientation)	250 / 50	50 / 20	kg
Max. holding force (baseplate horizontal/any orientation)	2000 / 500	250 / 85	N
Resonant frequency*** $F_{x,y}$	90	90	Hz
Resonant frequency*** F_z	500	500	Hz
Miscellaneous			
Operating temperature range	-10 to +50	-10 to +50	$^\circ\text{C}$
Material	Aluminum	Aluminum	
Mass	17	17	kg
Controller			
Controller included	M-850.502	M-850.502	
Operating voltage	100–240 VAC, 50/60 Hz	100–240 VAC, 50/60 Hz	

Technical data are specified at $20 \pm 3 \text{ }^\circ\text{C}$. Data for vacuum versions may differ.

*The max. travel of the several coordinates (X, Y, Z, θ_x , θ_y , θ_z) are interdependent. The data for each axis in this table shows its maximum

travel, where all other axes are at their zero positions. If the other linear or rotational coordinates are not zero, the available travel may be less.

**Six-axis move. No moving cables (unlike serial-kinematic stacked systems) to introduce bending forces, torque and friction which degrade positioning accuracy.

Example: The following position is in the workspace:

X: +20 mm θ_x : +10 $^\circ$

Y: +20 mm θ_y : +10 $^\circ$

Z: +5 mm θ_z : -2 $^\circ$

***Baseplate mounted horizontally with 10 kg load