

6-Axis Hexapod

LOW-PROFILE, PRECISION PARALLEL-KINEMATIC SYSTEM



H-824

- Load capacity to 10 kg, self-locking version
- Travel ranges to 45 mm / 25°
- Actuator resolution to 7 nm
- Min. incremental motion to 0.3 μm
- Repeatability to $\pm 0.1 \mu\text{m}$ / $\pm 2.5 \mu\text{rad}$
- Velocity up to 25 mm/s

Precision-class 6-axis positioning system

Parallel-kinematic design for six degrees of freedom making it significantly more compact and stiff than serial-kinematic systems, higher dynamic range, no moved cables: Higher reliability, reduced friction. Vacuum-compatible versions to 10^{-6} hPa are available

Low-profile due to folded drive design

H-824.G1x with DC gear motors
H-824.D1x with powerful DC motors for higher velocity

Powerful digital controller, open software architecture

User-defined, stable pivot point, software-selectable. Positions commanded in Cartesian coordinates. Macro programming. Open source LabVIEW driver set. Work space simulation software. Virtual Hexapod machine software. Optional: Collision avoidance software (external obstacles).

H-824.xx1 includes C-887.11, 6D vector motion controller plus 2 additional servo axes. Options:

- Analog interfaces/photometer cards for visible light (F-206.VVU) or the infrared light range (F-206.iiU)
- F-206.NCU fast piezo nano-alignment system for alignment with nanometer precision

H-824.xx2 includes C-887.21 compact 6D vector motion controller

Fields of application

Research and industry, standard and vacuum environments. For micromanipulation, laser and optics alignment, biotechnology, tool control

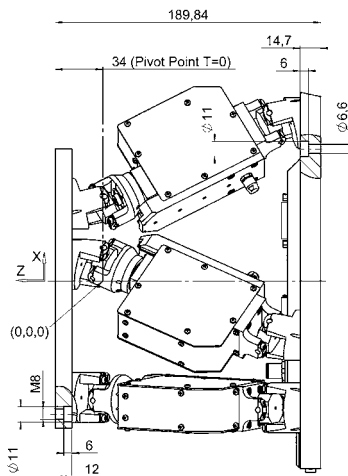
	H-824.G1x	H-824.D1x	Unit	Tolerance
	for higher resolution and load	for higher velocity		
Active axes	X, Y, Z, θ_x , θ_y , θ_z	X, Y, Z, θ_x , θ_y , θ_z		
Motion and positioning				
Travel range* X, Y	±22.5	±22.5	mm	
Travel range* Z	±12.5	±12.5	mm	
Travel range* θ_x , θ_y	±7.5	±7.5	°	
Travel range* θ_z	±12.5	±12.5	°	
Single-actuator design resolution	0.007	0.5	µm	
Min. incremental motion X, Y, Z	0.3	1	µm	typ.
Min. incremental motion θ_x , θ_y , θ_z	3.5	12	µrad	typ.
Backlash X, Y	3	3	µm	typ.
Backlash Z	1	1	µm	typ.
Backlash θ_x , θ_y	20	20	µrad	typ.
Backlash θ_z	25	25	µrad	typ.
Repeatability X, Y	±0.5	±0.5	µm	typ.
Repeatability Z	±0.1	±0.1	µm	typ.
Repeatability θ_x , θ_y	±2	±2	µrad	typ.
Repeatability θ_z	±2.5	±2.5	µrad	typ.
Max. velocity X, Y, Z	1	25	mm/s	
Max. velocity θ_x , θ_y , θ_z	11	270	mrads	
Typ. velocity X, Y, Z	0.5	10	mm/s	
Typ. velocity θ_x , θ_y , θ_z	5.5	55	mrads	
Mechanical properties				
Stiffness X, Y	1.7	1.7	N/µm	
Stiffness Z	7	7	N/µm	
Load (base plate horizontal / any orientation)	10 / 5	5 / 2.5	kg	max.
Holding force, de-energized (base plate horizontal / any orientation)	100 / 50	15 / 5	N	max.
Motor type	DC motor, gearhead	DC motor		
Miscellaneous				
Operating temperature range	-10 to 50	-10 to 50	°C	
Material	Aluminum	Aluminum		
Mass	8	8	kg	±5%
Cable length	3	3	m	±10 mm

Vacuum versions to 10^{-6} hPa are available under the following ordering number: H-824.xVx. Specifications for vacuum versions can differ.

Technical data specified at $20 \pm 3^\circ\text{C}$. Ask about custom designs!
* The travel ranges of the individual 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.



H-824, dimensions in mm

