

6-Axis Miniature Hexapod

FAST, COMPACT AND HIGHLY PRECISE



H-811

- Smallest Hexapod with vacuum option
- Travel ranges to 34 mm / 42°
- Load capacity to 5 kg
- Actuator resolution 40 nm
- Min. incremental motion to 0.2 μm
- Repeatability to $\pm 0.1 \mu\text{m}$
- Includes integrated scan algorithms for fiber optic alignment

Reference-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 version to 10^{-6} hPa available

Direct drive with brushless DC motors (BLDC) and long-life ball screws

High precision, velocity and lifetime

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-811.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-811.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

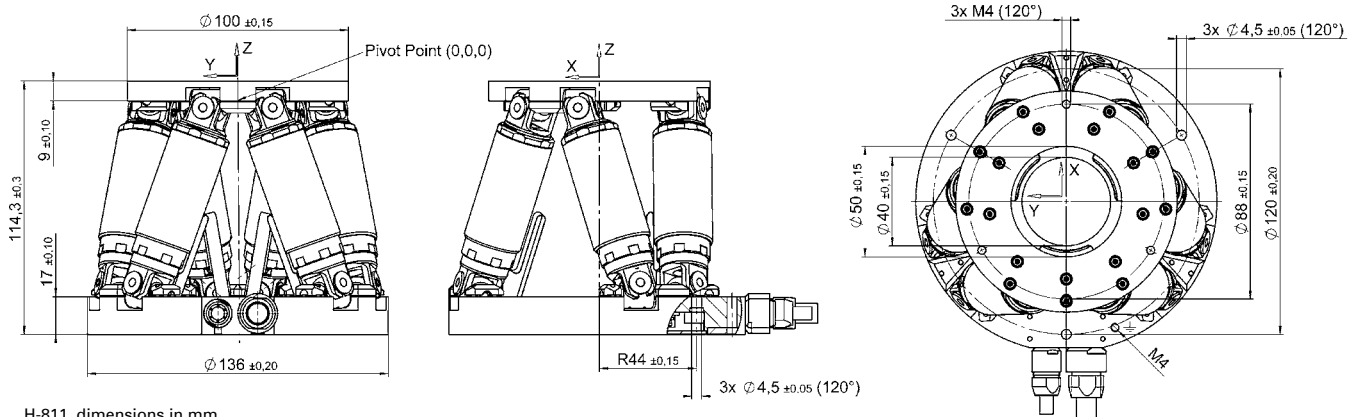
	H-811.D1x	Unit	Tolerance
Active axes	X, Y, Z, θ_x , θ_y , θ_z		
Motion and positioning			
Travel range* X, Y, Z	± 17 , ± 16 , ± 6.5	mm	
Travel range* θ_x , θ_y , θ_z	± 10 , ± 10 , ± 21	°	
Single-actuator design resolution	40	nm	
Min. incremental motion X, Y	0.5	μm	typ.
Min. incremental motion Z	0.2	μm	typ.
Min. incremental motion θ_x , θ_y , θ_z	3.5	μrad	typ.
Backlash X, Y	1	μm	typ.
Backlash Z	0.2	μm	typ.
Backlash θ_x , θ_y	10	μrad	typ.
Backlash θ_z	15	μrad	typ.
Repeatability X, Y	± 0.3	μm	typ.
Repeatability Z	± 0.1	μm	typ.
Repeatability θ_x , θ_y	± 4	μrad	typ.
Repeatability θ_z	± 8	μrad	typ.
Max. velocity X, Y, Z	10	mm/s	
Max. velocity θ_x , θ_y , θ_z	250	mrad/s	
Typ. velocity X, Y, Z	5	mm/s	
Typ. velocity θ_x , θ_y , θ_z	120	mrad/s	
Mechanical properties			
Stiffness X, Y	0.2	N/ μm	
Stiffness Z	3.6	N/ μm	
Load (base plate horizontal / any orientation)	5 / 2.5	kg	max.
Holding force, de-energized (base plate horizontal / any orientation)	15 / 2.5	N	max.
Motor type	Brushless DC motor		
Miscellaneous			
Operating temperature range	0 to 50	°C	
Material	Stainless steel, aluminum		
Mass	2.2	kg	$\pm 5\%$
Cable length	2	m	± 10 mm

Vacuum versions to 10^{-6} hPa are available under the following ordering number: H-811.DVx. 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-811, dimensions in mm