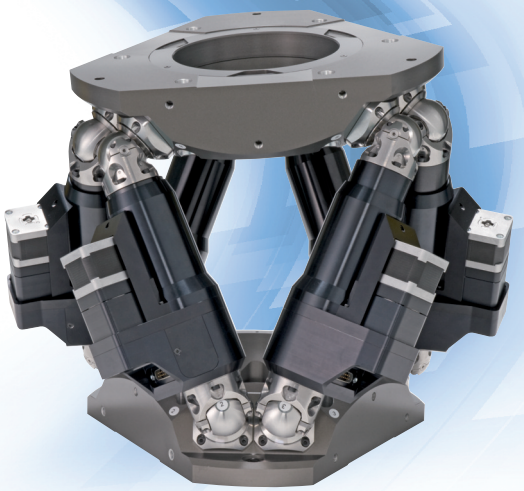
6-Axis-Parallel Kinematic Positioning System

HXP1000 HEXAPOD



The HXP1000 Hexapod is a high load capacity parallel kinematic motion device that provides six degrees of motion. It also features long travel ranges, fast speeds, high stiffness and stability as well as very easy to use and flexible coordinate systems or pivot points.

HXP1000 is driven by six DC servo motor actuators which provide precise MIM and fast speed. A critical design feature to the overall motion performance is the joints with which the actuators are attached to the base and the moving top plate. The preloaded and backlash-free, cardan joints enhance not only the repeatability and positioning performance of the HXP1000, but are also key to its position stability and stiffness.

The HXP1000-ELEC controller accurately masters the synchronized transformations from Cartesian input coordinates to the motion of the Hexapod legs. In addition, the HXP1000-ELEC has the capacity to drive up to two additional SingleAxis stages while also providing advanced features including instrument grade I/O's, hardware based input triggers, event triggers, high-speed on-the-fly data acquisition, fast TCP/IP communication, and integrated TCL programming language for on-board processes. All these make automating the application and programming much easier.

A requirement for many Hexapod motion applications is a virtual pivot point, allowing the user to freely choose the pivot point in space for all rotations. The two user-definable coordinate systems provided, called tool (moves with the Hexapod) and work (stationary coordinate system) are programmable and flexible. Imagine a machine tool where one can adjust the orientation of both the cutting tool and workpiece or in

- Integrated 6-axis positioner
- No moving cables
- High stiffness
- No accumulation of motion errors
- Virtual center of rotation, set by software
- RightPath™ trajectory control

APPLICATIONS

- Optics and satellite assembly and testing
- Alignment and bonding
- Biotechnology, surgery
- Material analysis
- Micromachining, micro-manipulation
- Sensor calibration and simulation

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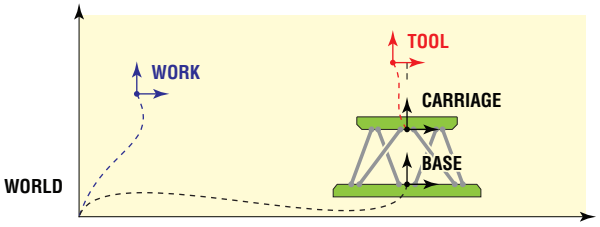
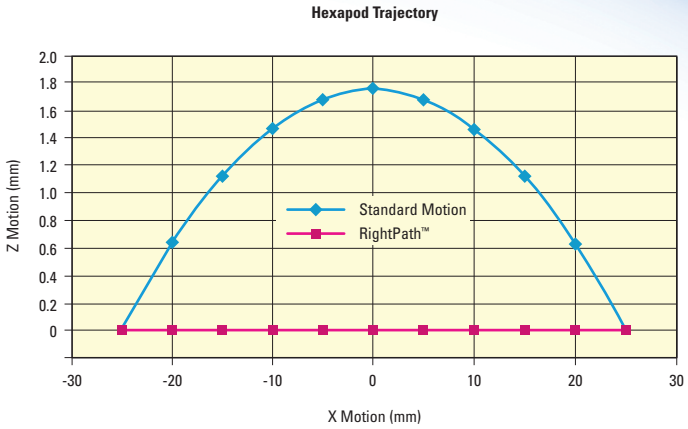
photonics, the optical beam and the sample. Incremental displacements are possible in either one in user-friendly Cartesian coordinates, and positions can be easily switched from one system to the other by a function call. These powerful functions are a completely new way of mastering Hexapod motions without the need for complex external coordinate transformations.



Absolute moves and positions are defined in the work coordinate system. Incremental moves can be done in the tool or in the work coordinate systems.



RightPath™ Trajectory Control enables minimal runout in linear and arc trajectories.

SPECIFICATIONS

	HXP1000-MECA
Travel Range X, Y, Z [1]	-62/+93, ±69, ±39.5 mm
Travel Range ΘX, ΘY, ΘZ	±11, ±10, ±19.5°
Minimum Incremental Motion X, Y, Z [2]	0.30, 0.30, 0.16 µm
Minimum Incremental Motion ΘX, ΘY, ΘZ	0.06, 0.06, 0.10 mdeg
Uni-directional Repeatability X, Y, Z, Typical	±0.15, ±0.15, ±0.08 µm
Uni-directional Repeatability ΘX, ΘY, ΘZ, Typical	±0.03, ±0.03, ±0.05 mdeg
Maximum Speed X, Y, Z	9, 9, 4 mm/s
Maximum Speed ΘX, ΘY, ΘZ	1.4, 1.4, 2.8 °/s
Rigidity X, Y, Z [3]	10,10, 100 N/µm
Centered Load Capacity [4]	4500 N
Weight	60 kg

[1] Travel ranges are interdependent. The listed values are max. travels per axis when all other axis are in their centered position.

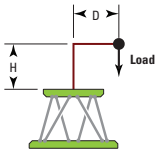
[2] Open loop values shown.

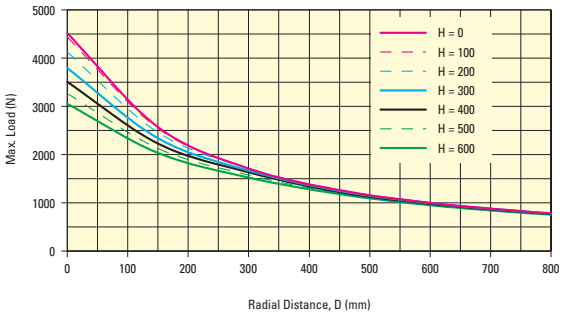
[3] Stiffness depends on Hexapod position. Values are given for all axis in their centered position.

[4] For Value shown for horizontal base plate. See graphs for maximum payload height and cantilever distance on next page.

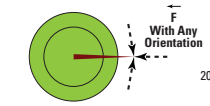
MAX. CANTILEVER DISTANCE OF THE LOAD

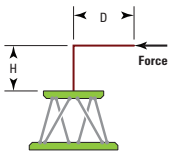
Horizontal Base Plate

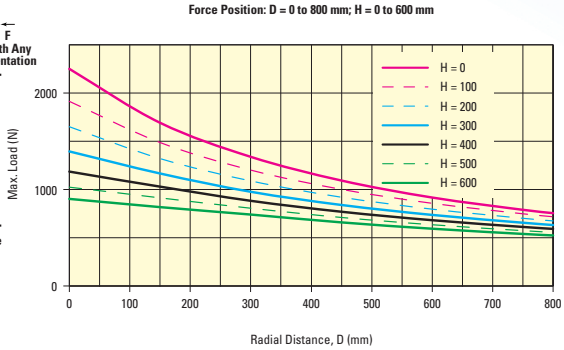




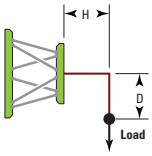
Horizontal Base Plate Lateral Force

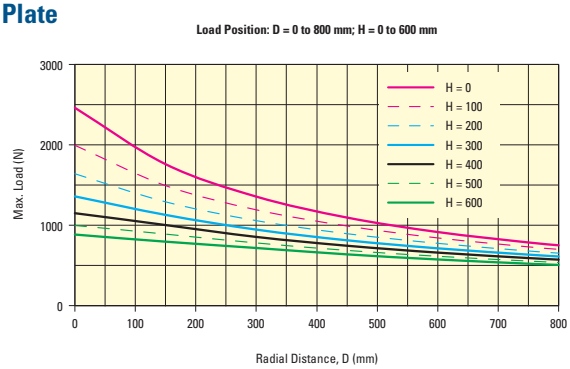




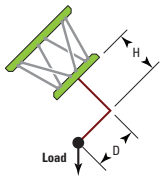


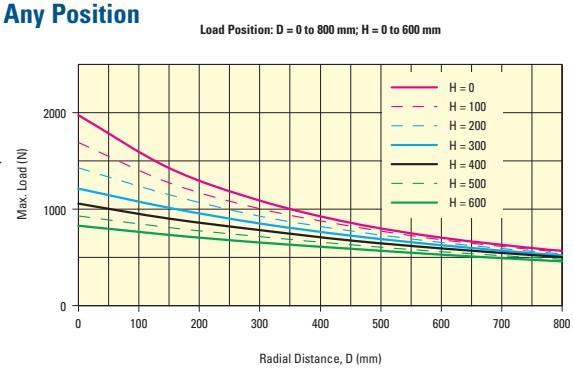
Vertical Base Plate



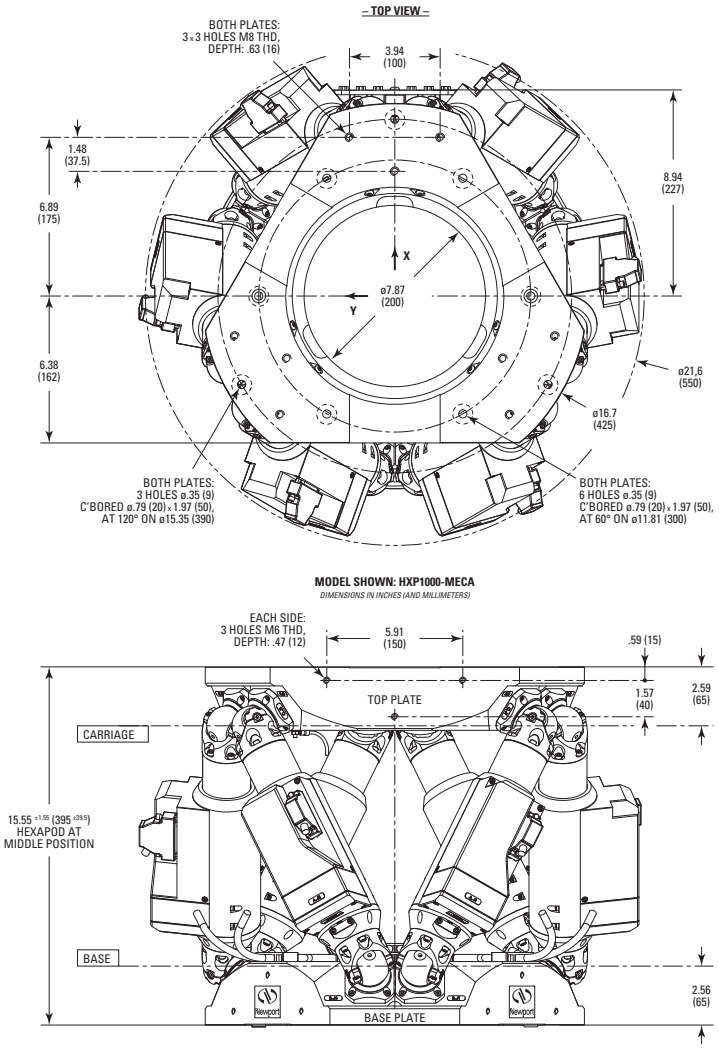


Base Plate at Any Position





DIMENSIONS



ORDERING INFORMATION

Model	Description
HXP1000-MECA	Hexapod, 4500 N load capacity
HXP1000-ELEC (1)	Hexapod controller for HXP1000-MECA

1) Contact Newport for the two additional SingleAxis drive capability.

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