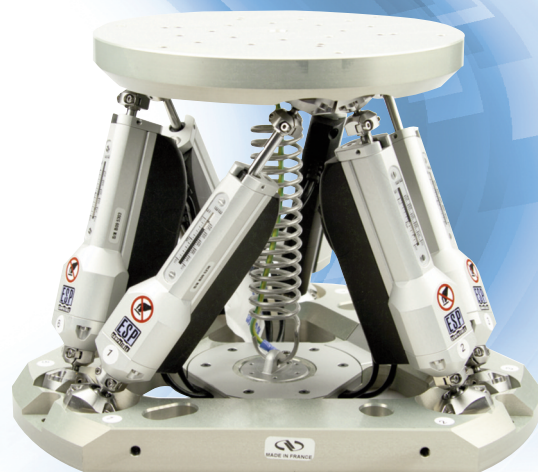


6-Axis-Parallel Kinematic Positioning Systems

HXP100 HEXAPODS



The HXP100-MECA 6-Axis Hexapod is a parallel kinematic motion device that provides six degrees of freedom: X, Y, Z, pitch, roll, and yaw. The HXP100 has long travel capability and is an effective solution to complex motion applications that demand high load capacity and accuracy in up to six independent axes. Contrary to the image of being complex and highly priced, the HXP100 hexapod is not only affordable but extremely easy to use. The HXP100 design also includes two programmable pivot points, enabling more flexibility to align a sample at a particular point or points of that sample.

To further ensure positioning performance, High Accuracy versions (HA) are available with guaranteed accuracy values. This enables the use of a Newport Hexapod in positioning applications, where position accuracy is required. In addition to accuracy along an axis, the Pitch and Yaw deviations during axial motion are also monitored and guaranteed. When the HA Hexapod is used with RightPath™, this combination achieves positioning performance close to standard Newport stages.

The HXP controllers have the capacity to drive up to two additional Single Axis 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. The HXP100 Series also takes advantage of low-runout, RightPath trajectory capability. All these features improve accuracy and throughput, making the programmer's life much easier.

The HXP100 design also includes two programmable pivot points, enabling more flexibility to align a sample at a particular point or points of that sample. The Newport Hexapod can not only relocate the pivot point, but through our advanced

- Integrated 6-axis positioner
- Light, compact and low-profile
- No moving cables
- High stiffness (in particular z)
- No accumulation of motion errors
- Two virtual centers of rotation, set by software
- RightPath™ trajectory control

APPLICATIONS

- Optics and satellite assembly and testing
- AED simulation
- Astronomy
- Biotechnology, surgery
- X-Ray diffraction
- Micromachining, micro-manipulation

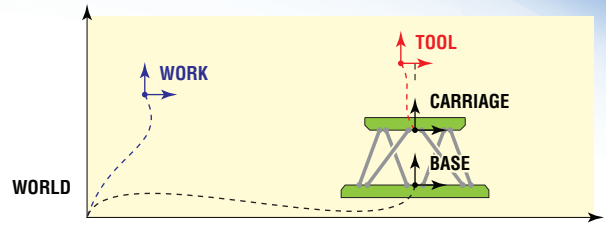


HXP100 HEXAPODS

technology, the entire coordinate system can be relocated. In addition, two user-definable coordinate systems are provided, called tool (moves with the Hexapod) and work (stationary coordinate systems). Incremental displacements are possible in either one of these systems in user-friendly Cartesian coordinates, and positions can be easily calculated from one system to the other by a function call, without the need for complex external coordinate transformations.

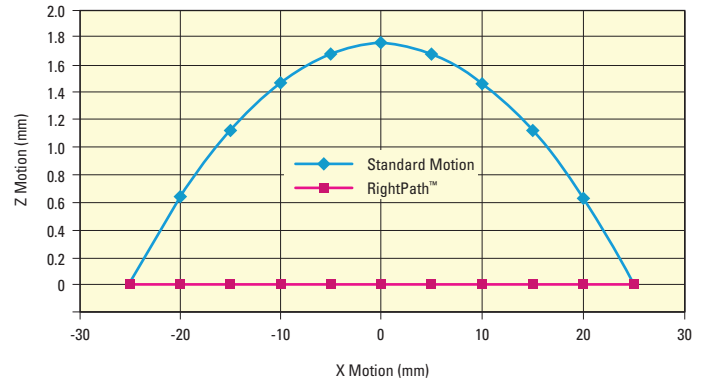


As a standard feature, the HXP controller allows the user to define a virtual pivot point in space for all rotations.



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.

Hexapod Trajectory



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

SPECIFICATIONS

HXP100-MECA & HXP100HA-MECA

	X	Y	Z	U (Rx)	V (Ry)	W (Rz)
Travel range ⁽¹⁾	±27.5 mm	±25 mm	±14 mm	±11.5°	±10.5°	±19°
MIM, Minimum incremental motion	0.5 µm	0.5 µm	0.25 µm	0.25 mdeg	0.25 mdeg	0.5 mdeg
Uni-directional repeatability, typical	±0.25 µm	±0.25 µm	±0.125 µm	±0.125 mdeg	±0.125 mdeg	±0.25 mdeg
Bi-directional repeatability ⁽²⁾ , typical	±2 µm (±0.5 µm)	±2 µm (±0.5 µm)	±1 µm (±0.25 µm)	±1 mdeg (±0.25 mdeg)	±1 mdeg (±0.25 mdeg)	±2 mdeg (±0.2 mdeg)
Max. speed	2.5 mm/s	2 mm/s	1 mm/s	1.8 °/s	1.7 °/s	3 °/s
Stiffness	5 N/µm	5 N/µm	40 N/µm	–	–	–
Centered load capacity ⁽³⁾	200 N					

HXP100V6-MECA⁽⁴⁾

	X	Y	Z	U (Rx)	V (Ry)	W (Rz)
Travel range ⁽¹⁾	±27.5 mm	±25 mm	±14 mm	±11.5°	±10.5°	±19°
MIM, Minimum incremental motion	1 µm	1 µm	0.5 µm	0.5 mdeg	0.5 mdeg	1 mdeg
Uni-directional repeatability, typical	±0.5 µm	±0.5 µm	±0.25 µm	±0.25 mdeg	±0.25 mdeg	±0.5 mdeg
Bi-directional repeatability ⁽²⁾ , typical	±2.5 µm (±0.075 µm)	±2.5 µm (±0.075 µm)	±1.5 µm (±0.5 µm)	±1.25 mdeg (±0.5 mdeg)	±1.25 mdeg (±0.5 mdeg)	±2.5 mdeg (±0.5 mdeg)
Max. speed	0.5 mm/s	0.5 mm/s	0.25 mm/s	0.2 °/s	0.2 °/s	0.4 °/s
Stiffness	2 N/µm	2 N/µm	25 N/µm	–	–	–
Centered load capacity ⁽³⁾	200 N					

HXP100P-MECA & HXP100PHA-MECA

	X	Y	Z	U (Rx)	V (Ry)	W (Rz)
Travel range ⁽¹⁾	±27.5 mm	±25 mm	±14 mm	±11.5°	±10.5°	±19°
MIM, Minimum incremental motion	0.1 µm	0.1 µm	0.05 µm	0.05 mdeg	0.05 mdeg	0.1 mdeg
Uni-directional repeatability, typical	±0.1 µm	±0.1 µm	±0.05 µm	±0.05 mdeg	±0.05 mdeg	±0.1 mdeg
Bi-directional repeatability ⁽²⁾ , typical	±0.25 µm	±0.25 µm	±0.125 µm	±0.125 mdeg	±0.125 mdeg	±0.25 mdeg
Max. speed	12 mm/s	10 mm/s	5 mm/s	8 °/s	8 °/s	16 °/s
Stiffness	3 N/µm	3 N/µm	24 N/µm	–	–	–
Centered load capacity ⁽³⁾	60 N					

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

²⁾ With standard compensation (with hysteresis compensation).

³⁾ For allowable cantilevered loads, see "Max. Cantilever Distance of the Load" next page.

⁴⁾ Vacuum version to 10⁻⁶ hPa.

Guaranteed Specifications

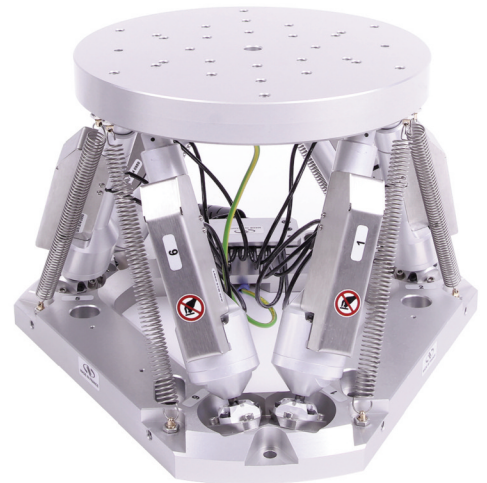
HXP100HA-MECA

HXP100PHA-MECA

	X	Y	Z	X	Y	Z
Uni-directional repeatability	±0.25 µm	±0.25 µm	±0.125 µm	±0.15 µm	±0.15 µm	±0.075 µm
Bi-directional repeatability	±3 µm	±3 µm	±2 µm	±0.5 µm	±0.5 µm	±0.25 µm
Absolute Accuracy	±10 µm	±10 µm	±5 µm	±5 µm	±5 µm	±2.5 µm
Pitch	±75 µrad	±75 µrad	±75 µrad	±37.5 µrad	±37.5 µrad	±37.5 µrad
Yaw	±75 µrad	±75 µrad	±75 µrad	±37 µrad	±37 µrad	±37 µrad



Note: Typical values, travel range, MIM, max speed, stiffness and load capacity are the same as the standard HXP's.



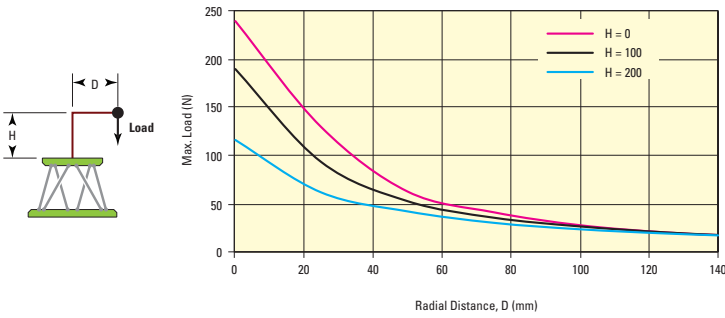
HXP100P-MECA Hexapod.

MAX. CANTILEVER DISTANCE OF THE LOAD

DIMENSIONS

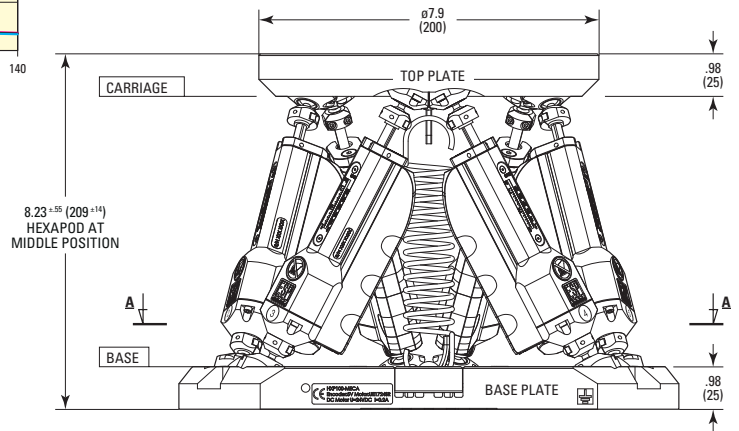
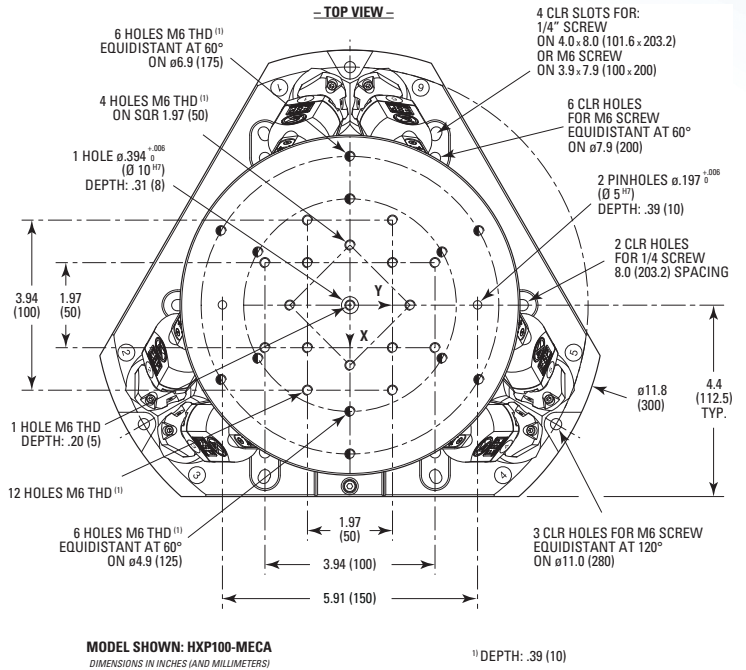
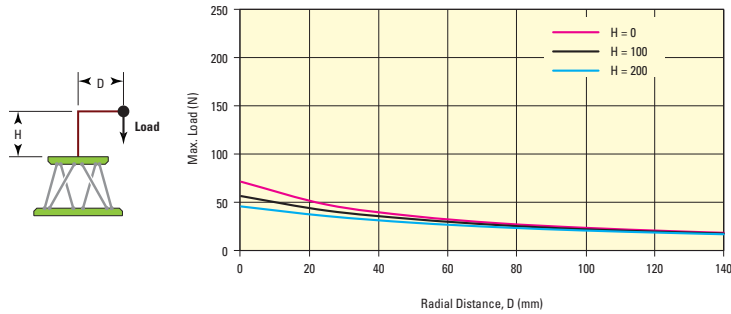
HXP100 Horizontal Base Plate

Load Position: D = 0 to 140 mm; H = 0 to 200 mm



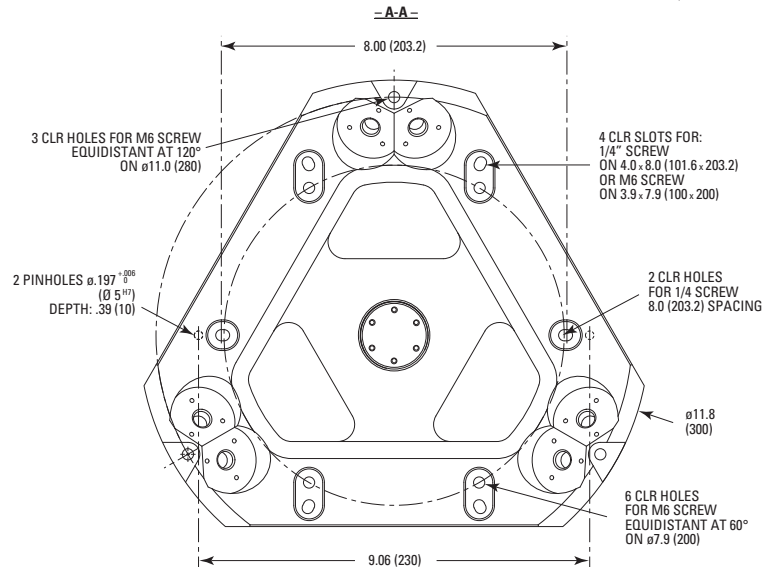
HXP100P Horizontal Base Plate

Load Position: D = 0 to 140 mm; H = 0 to 200 mm

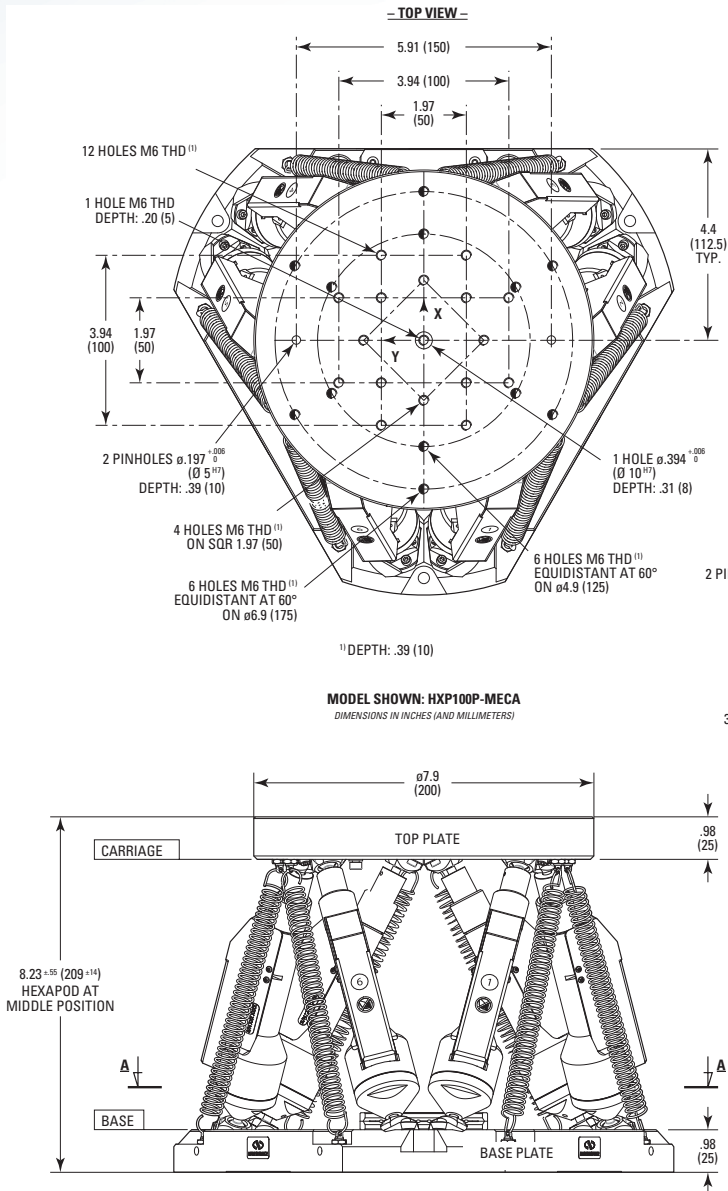


HXP100-MECA and HXP100HA-MECA

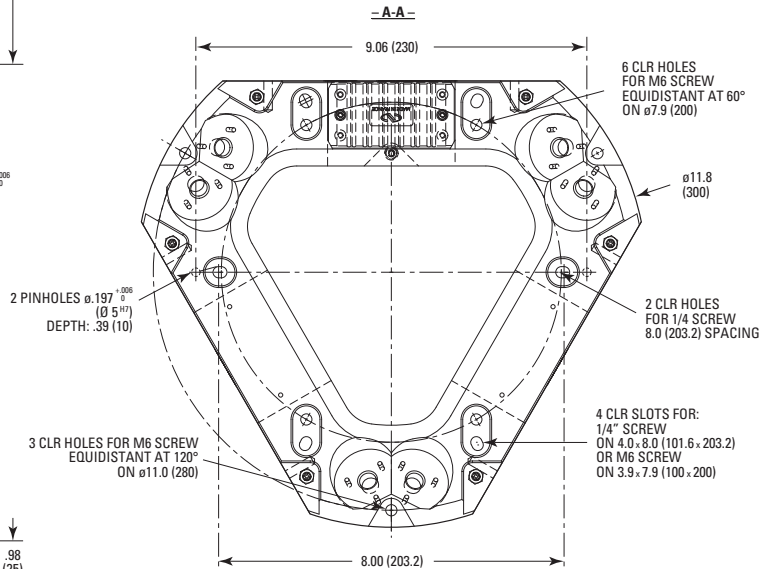
Note: Other top plate hole patterns or a center aperture are available upon request.



HXP100 HEXAPODS 6-AXIS-PARALLEL KINEMATICS POSITIONING SYSTEM



HXP100P-MECA and HXP100P-MECA



Note: Other top plate hole patterns or a center aperture are available upon request.

ORDERING INFORMATION

Model	Description
HXP100-MECA	Hexapod, 200 N load capacity
HXP100-ELEC ⁽¹⁾	Hexapod controller for HXP100-MECA
HXP100P-MECA	Hexapod Precision, 60 N load capacity
HXP100P-ELEC ⁽¹⁾	Hexapod controller for HXP100P-MECA

⁽¹⁾ Contact Newport for the two additional Single Axis drive capability.

Model	Description
HXP100HA-MECA	Hexapod with guaranteed specifications, 200 N load capacity
HXP100HA-ELEC ⁽¹⁾	Hexapod controller for HXP100HA-MECA
HXP100PHA-MECA	Hexapod Precision with guaranteed specifications, 60 N load capacity
HXP100PHA-ELEC ⁽¹⁾	Hexapod controller for HXP100PHA-MECA

Note: Call Newport for quotes on the 10⁻⁶ hPa vacuum version.



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