

## 6- Axis Hexapod

HIGH VELOCITY, MEDIUM LOAD, AFFORDABLE



### H-840

- + Load capacity to 30 kg
- + Travel ranges to 100 mm / 60°
- + Actuator resolution to 16 nm
- + Repeatability to  $\pm 0.4 \mu\text{m}$
- + MTBF 20,000 h
- + Velocity to 50 mm/ s
- + Works in any orientation
- + Rapid response
- + Sophisticated controller using vector algorithms, virtual pivot point
- + Comprehensive software package
- + CIPA certified

### 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

#### Drive variants

H-840.Gxx with DC gear motor

H-840.Dxx 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).

Hexapods are by default configured and delivered as a system including a controller

- C-887.52 compact bench- top controller for a lower system price. Digital I/ O interfaces, e.g. for external triggering
- C-887.11 19" controller, comprises the control for two additional single axes with servo motors. Options: Control of piezo axes, photometer cards for visible light or infrared light range

#### Upgrades for C-887.11 (order separately)

- Analog interface/ 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

#### Accessories

- C-887.MC manual control unit for Hexapods, USB, 3 m cable
- C-887.VM1 PIVeriMove software for collision checking

#### Fields of application

Research and industry. For tool control, life sciences, micromanufacturing

## Specifications

	H-840.Gxx	H-840.Dxx	Unit	Tolerance
	for higher resolution and loads	for higher velocity		
Active axes	X, Y, Z, $\theta_x$ , $\theta_y$ , $\theta_z$	X, Y, Z, $\theta_x$ , $\theta_y$ , $\theta_z$		
<b>Motion and positioning</b>				
Travel range* X, Y	±50	±50	mm	
Travel range* Z	±25	±25	mm	
Travel range* $\theta_x$ , $\theta_y$	±15	±15	°	
Travel range* $\theta_z$	±30	±30	°	
Single- actuator design resolution	0.017	0.5	µm	
Min. incremental motion X, Y	1	3	µm	typ.
Min. incremental motion Z	0.5	1	µm	typ.
Min. incremental motion $\theta_x$ , $\theta_y$ , $\theta_z$	5	5	µrad	typ.
Backlash X, Y	3	3	µm	typ.
Backlash Z	0.2	0.2	µm	typ.
Backlash $\theta_x$ , $\theta_y$	20	20	µrad	typ.
Backlash $\theta_z$	30	30	µrad	typ.
Repeatability X, Y	±0.5	±0.5	µm	typ.
Repeatability Z	±0.4	±0.4	µm	typ.
Repeatability $\theta_x$ , $\theta_y$	±7	±7	µrad	typ.
Repeatability $\theta_z$	±12	±12	µrad	typ.
Max. velocity X, Y, Z	2.5	50	mm/ s	
Max. velocity $\theta_x$ , $\theta_y$ , $\theta_z$	30	600	mrad/ s	
Typ. velocity X, Y, Z	2	30	mm/ s	
Typ. velocity $\theta_x$ , $\theta_y$ , $\theta_z$	20	300	mrad/ s	
<b>Mechanical properties</b>				
Load (base plate horizontal / any orientation)	30 / 10	10 / 3	kg	max.
Holding force, de- energized (base plate horizontal / any orientation)	100 / 25	15 / 5	N	max.
Motor type	DC gear motor	DC motor		
<b>Miscellaneous</b>				
Operating temperature range	-10 to 50	-10 to 50	°C	
Material	Aluminum	Aluminum		
Mass	12	12	kg	±5 %
Cable length	3	3	m	±10 mm

Technical data specified at 20 ±3 °C.

Ask about custom designs!

\* The travel ranges of the individual coordinates (X, Y, Z,  $\theta_x$ ,  $\theta_y$ ,  $\theta_z$ ) 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.

## Order Information

### H-840.D2

Hexapod Microrobot, Direct Drive, 50 mm/ s, 10 kg Load, Sub- D Connector, Cable Set 3 m

### H-840.G2

Hexapod Microrobot, DC Motor Gearhead, 2.5 mm/ s, 30 kg Load, Sub- D Connector, Cable Set 3 m

## Recommended controller

### C-887.52

6D controller for Hexapods, TCP/ IP, RS-232, bench- top, incl. control of two additional axes

## Accessories

### C-887.MC

Manual control unit for Hexapods, USB, 3 m cable

### C-887.VM1

PIVeriMove software for collision checking

## Hexapod systems with fieldbus interface

### H-840.D31

Hexapod Microrobot, Direct Drive, 50 mm/ s, 10 kg Load, Cable Set 3 m, with 6- D Hexapod Controller, EtherCAT® Interface

## Configuration options (to be ordered as a system)

### H-840.D11

Hexapod Microrobot, Direct Drive, 50 mm/ s, 10 kg Load, Cable Set 3 m, with 6- D Hexapod Controller, Control of 2 Additional Servo- Motor Axes Included, TCP/ IP and RS-232 Interface, 19" Chassis

### H-840.G11

Hexapod Microrobot, DC Motor Gearhead, 2.5 mm/ s, 30 kg Load, Cable Set 3 m, with 6- D Hexapod Controller, Control of 2 Additional Servo- Motor Axes Included, TCP/ IP and RS-232 Interface, 19" Chassis

## Upgrades (to be ordered separately)

### F-206.NCU

Rapid 3- Axis Piezo Nanopositioning System for Use in Combination with Hexapod Systems. Consists of P-611.3SF NanoCube® XYZ Nanopositioning System, 100 µm × 100 µm × 100 µm, Strain Gauge Sensors with Integrated Fiber Adapter Interface and E-760.3S0 NanoCube® Piezo Controller Board, ISA Bus

### F-206.iiU

Photometer card, 2 channels, infrared

### F-206.VVU

Photometer card, 2 channels, visible light

Ask about custom designs!

## Controllers / Drivers / Amplifiers

[C-887 Controller for Hexapod Positioning Systems](#)

## Related Products

[P-587 6- Axis Precision Piezo Stage](#)

[H-206 6- Axis Precision Alignment System](#)

[H-810 6- Axis Miniature Hexapod](#)

[H-811 6- Axis Miniature Hexapod](#)

[H-824 6- Axis Hexapod](#)

[H-850 6- Axis Hexapod](#)

[H-860KMAG High- Dynamics Hexapod](#)

[H-820 6- Axis Positioner with Controller](#)

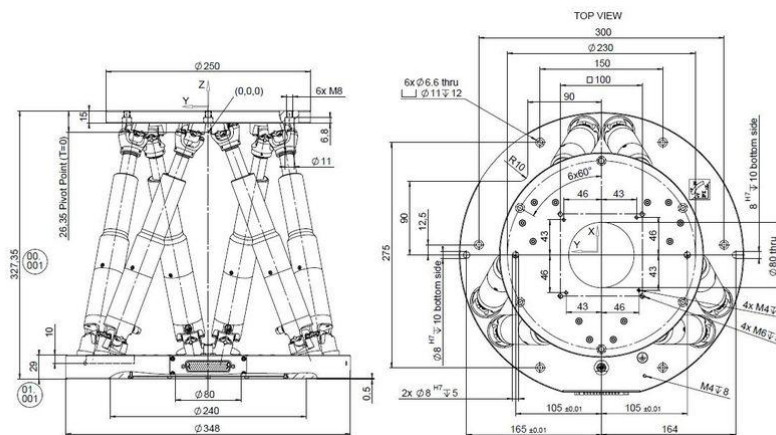
## Technology

[Hexapod- Specific Software from PI | Due to their parallel kinematic structure, Hexapods necessitate a particularly complex control system. Learn more ...](#)

[Hexapods – Parallel- Kinematics Positioning Systems | Hexapod platforms are used for precision positioning and alignment of loads in all six degrees of freedom, three linear axes, and three rotational axes. Learn more ...](#)

[Hexapod as Motion Simulator | Motion simulators have higher motion dynamics requirements \(shakers\). Learn more ...](#)

## Drawings / Images



H-840.D2, dimensions in mm



PI Hexapods are delivered as complete turnkey systems. In addition to the ordered controller configuration, immediate use is provided for with the included communication and interconnecting cables, peripheral devices and a substantial software package. The figure shows the H-850 high-load Hexapod and H-811 miniature Hexapod, the C-887.11, 19"-rackmount Hexapod controller and the C-887.21 compact controller

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