

6-Axis Hexapod

For Loads up to 250 kg



H-850

- Load capacity to 250 kg
- Repeatability to $\pm 0.2 \mu\text{m}$
- Travel ranges to $\pm 50 \text{ mm} / \pm 30^\circ$
- Actuator resolution to 2.5 nm
- Variants with BLDC motors and absolute encoders
- Works in any orientation

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. Heavy-duty precision bearings for 24/7 applications.

Brushless DC motor (BLDC)

Brushless DC motors are particularly suitable for high rotational speeds. They can be controlled very accurately and ensure high precision. Because they dispense with sliding contacts, they run smoothly, are wear-free and therefore achieve a long lifetime.

Absolute encoder

Absolute encoders supply explicit position information that enables immediate determination of the position. This means that referencing is not required during switch-on, which increases efficiency and safety during operation.

Fields of application

Research and industry. For astronomy, optics positioning, aerospace

Specifications

Motion and positioning	H-850.H2A	H-850.G2A	H-850.H2 / H2V**	H-850.G2 / G2V**	Unit	Tolerance
Active axes	X, Y, Z, θ X, θ Y, θ Z	X, Y, Z, θ X, θ Y, θ Z	X, Y, Z, θ X, θ Y, θ Z	X, Y, Z, θ X, θ Y, θ Z		
Travel range* X, Y	±50	±50	±50	±50	mm	
Travel range* Z	±25	±25	±25	±25	mm	
Travel range* θ X, θ Y	±15	±15	±15	±15	°	
Travel range* θ Z	±30	±30	±30	±30	°	
Sensor type	Absolute rotary encoder	Absolute rotary encoder	Incremental rotary encoder	Incremental rotary encoder		
Actuator design resolution	0.0025	0.025	0.005	0.05	μm	
Min. incremental motion X, Y	0.3	1	0.3	1	μm	typ.
Min. incremental motion Z	0.2	0.5	0.2	0.5	μm	typ.
Minimum incremental motion θ X, θ Y, θ Z	3; 3; 5	7.5; 7.5; 15	3; 3; 5	7.5; 7.5; 15	μrad	typ.
Backlash in X, Y	4	6	4	6	μm	typ.
Backlash in Z	0.5	1.5	0.5	1.5	μm	typ.
Backlash in θ X, θ Y	7.5	25	7.5	25	μrad	typ.
Backlash in θ Z	60	90	60	90	μrad	typ.
Repeatability X, Y	±0.6	±0.5	±0.5	±0.5	μm	typ.
Repeatability in Z	±0.2	±0.2	±0.2	±0.2	μm	typ.
Repeatability in θ X, θ Y	±3	±0.3	±3	±3	μrad	typ.
Repeatability in θ Z	±9	±7.5	±9	±7.5	μrad	typ.
Max. velocity in X, Y, Z	0.5	8	0.5 / 0.15	8 / 2.5	mm/s	
Max. velocity in θ X, θ Y, θ Z	6	120	6 / 1.8	120 / 30	mrad/s	
Typ. velocity in X, Y, Z	0.3	5	0.3 / 0.1	5 / 2	mm/s	
Typ. velocity in θ X, θ Y, θ Z	3	75	3 / 1.2	75 / 25	mrad/s	

Mechanical properties	H-850.H2A	H-850.G2A	H-850.H2 / H2V**	H-850.G2 / G2V**	Unit	Tolerance
Stiffness X, Y	7	7	7	7	N/μm	
Stiffness Z	100	100	100	100	N/μm	
Load capacity, horizontal base plate	250	50	250 / 80	50 / 25	kg	max.
Load capacity, base plate in any orientation	50	20	50 / 40	20 / 10	kg	max.
Holding force, power off, horizontal base plate	2000	250	2000	250	N	max.
Holding force, power off, base plate in any orientation	500	85	500	85	N	max.
Motor type	BLDC gear motor	BLDC gear motor	DC gear motor	DC gear motor		

Miscellaneous	H-850.H2A	H-850.G2A	H-850.H2 / H2V**	H-850.G2 / G2V**	Unit	Tolerance
Operating temperature range	-10 to 50	-10 to 50	-10 to 50	-10 to 50	°C	
Material	Aluminum	Aluminum	Aluminum	Aluminum		
Mass	17	17	17	17	kg	±10 %
Cable length	3	3	3 / 3 (air) + 2 (vacuum)	3 / 3 (air) + 2 (vacuum)	m	±10 mm

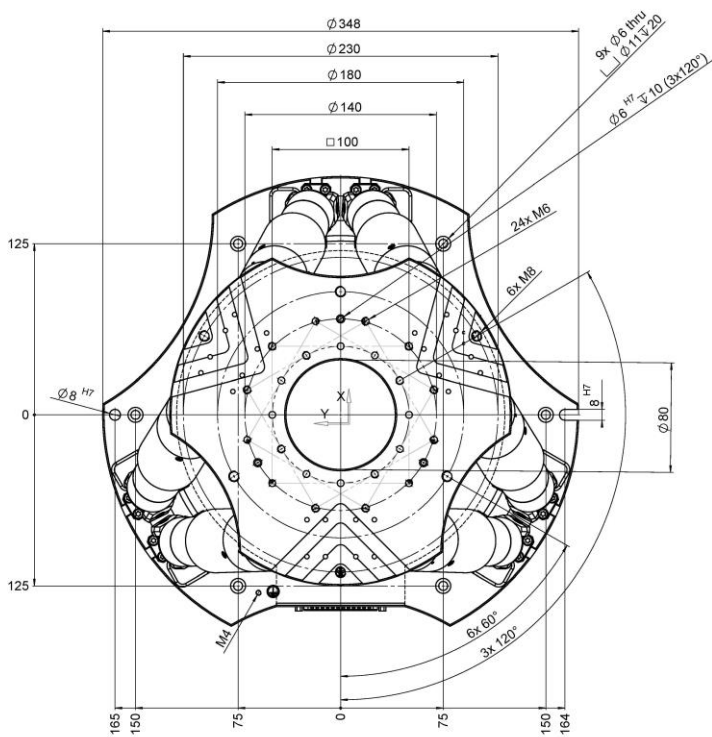
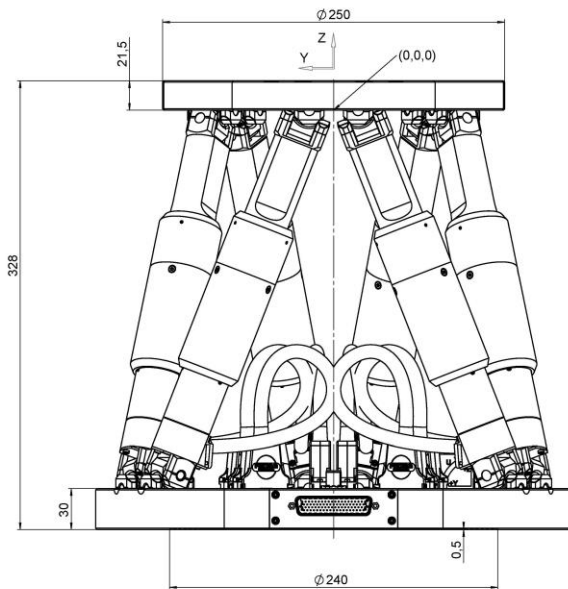
Technical data specified at 20±3 °C.

* 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 range, where all other axes and the pivot point are at the reference position.

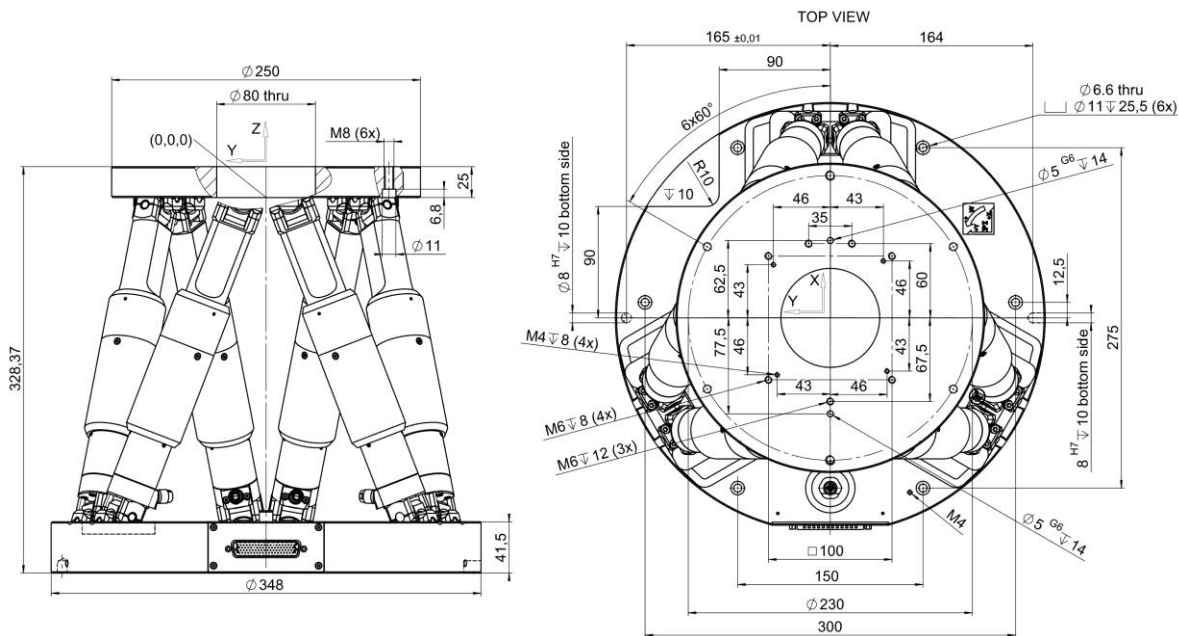
** For continuous operation in a vacuum, restrictions on operating parameters may be necessary due to heat generation.

Ask about customized versions.

Drawings / Images



H-850.x2A, dimensions in mm



H-850.x2 and H-850.x2V, dimensions in mm

Ordering Information

H-850.G2

Precision Hexapod microrobot, DC gear motor, rotary encoder, 50 kg load capacity, 8 mm/s velocity, including 3 m cable

H-850.G2A

Precision Hexapod microrobot, brushless DC gear motor, absolute encoder, 50 kg load capacity, 8 mm/s velocity, including 3 m cable

H-850.G2V

Precision Hexapod microrobot, DC gear motor, rotary encoder, 25 kg load capacity, 2.5 mm/s velocity, vacuum compatible to 10^{-6} hPa, including 3 m cable set on the air side and 2 m cable set on the vacuum side

H-850.H2

Precision Hexapod microrobot, DC gear motor, rotary encoder, 250 kg load capacity, 0.5 mm/s velocity, including 3 m cable

H-850.H2A

Precision Hexapod microrobot, brushless DC gear motor, absolute encoder, 250 kg load capacity, 0.5 mm/s velocity, including 3 m cable

H-850.H2V

Precision Hexapod microrobot, DC gear motor, rotary encoder, 80 kg load capacity, 0.15 mm/s velocity, vacuum compatible to 10^{-6} hPa, including 3 m cable set on the air side and 2 m cable set on the vacuum side