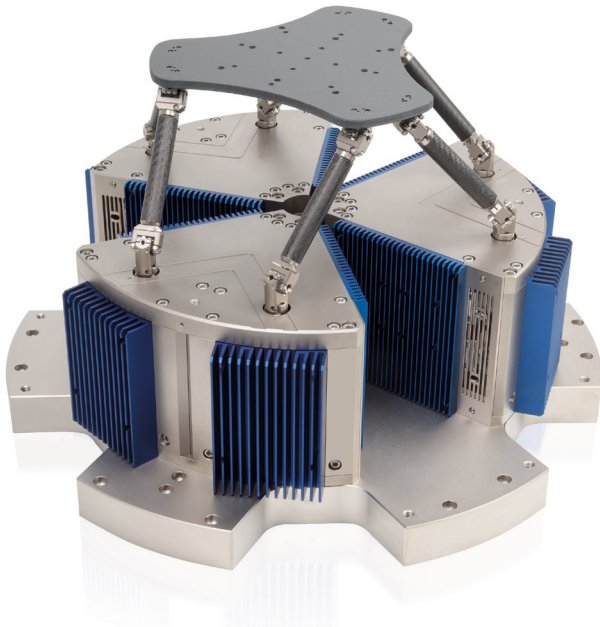# High Dynamics Motion Hexapod

Magnetic Direct Drive for High Velocity

H-860

- High velocity and dynamics
- Low moved mass
- Velocity up to 250 mm/s
- Precise path tracking
- Friction-free voice coil drive

Reference-class 6-axis positioning system

Parallel-kinematic design for six degrees of freedom making it significantly more compact and stiffer than serial-kinematic systems, no moved cables.

Precise running of predefined motion profiles with high path accuracy: Sine curves and freely definable trajectories.

PIMag® Voice Coil

Voice coil drives consist of 2 essential components: A permanent magnet and a coil, which are located in the air gap of the magnetic field. Thanks to their low weight and friction-free drive principle, voice coil drives are particularly suitable for applications that require high dynamics and high velocities at limited travel ranges. High scan frequencies and precision positioning are also possible with these drives, because they are free of the effects of hysteresis.

Fields of application

Research and industry, test systems, e.g., for image stabilization in cameras and mobile devices. Equipment for camera test systems and image stabilization software. Oscillation simulation, eye tracking, simulation of human and artificial motion.

Preliminary data	H-860.S2H		
Active axes	X, Y, Z, θ_X, θ_Y, θ_Z		
Motion and positioning			
Travel range* in X, Y, Z	±7.5	mm	
Travel range* in θ_X, θ_Y, θ_Z	±4	°	
Actuator design resolution	5	nm	
Minimum incremental motion in X, Y	1	µm	typ.
Minimum incremental motion in Z	1	µm	typ.
Minimum incremental motion in θ_X, θ_Y, θ_Z	9	µrad	typ.
Backlash in X, Y	0.2	µm	typ.
Backlash in Z	0.06	µm	typ.
Backlash in θ_X, θ_Y	4	µrad	typ.
Backlash in θ_Z	4	µrad	typ.
Unidirectional repeatability in X, Y	±0.5	µm	typ.
Unidirectional repeatability in Z	±0.5	µm	typ.
Unidirectional repeatability in θ_X, θ_Y	±9	µrad	typ.
Unidirectional repeatability in θ_Z	±9	µrad	typ.
Velocity in X, Y, Z	250	mm/s	max.
Max. frequency	30	Hz	
Amplitude-frequency product in X, Y, Z	30	mm·Hz	
Amplitude-frequency product in θ_X, θ_Y, θ_Z	15	°·Hz	
Amplitude error	10	%	max.
Phase error	60	°	max.
Mechanical properties			
Stiffness in X, Y	0.7	N/µm	
Stiffness in Z	8	N/µm	
Load capacity (base plate horizontal / any orientation)	1	kg	max.
Motor type	Voice coil		
Miscellaneous			
Operating temperature range	0 to 50	°C	
Material	Stainless steel, aluminum		
Mass	30	kg	±5 %

Technical data specified at 20±3 °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 range, where all other axes and the pivot point are at the reference position.
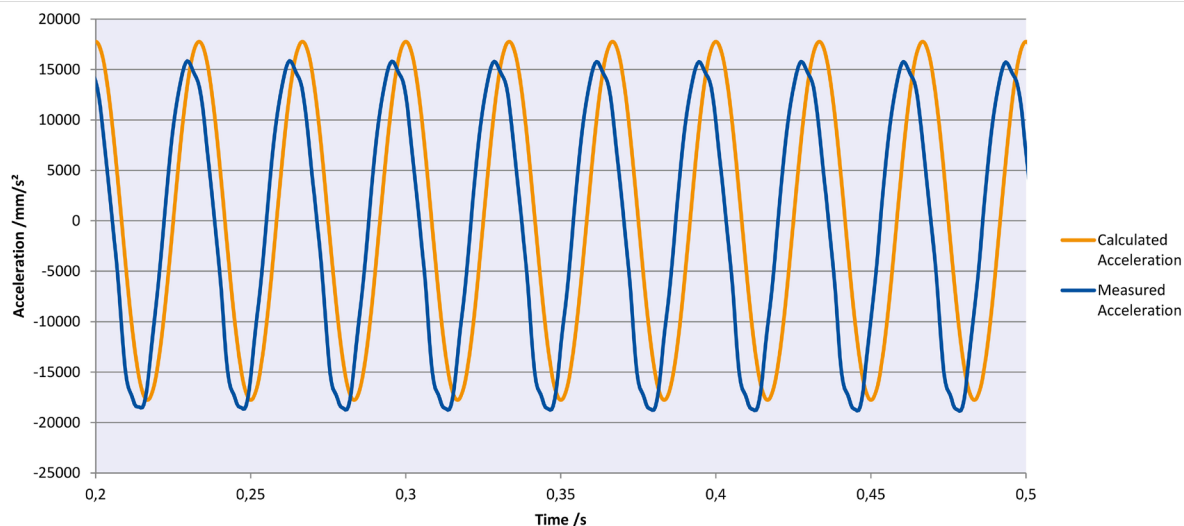
Drawings and Images
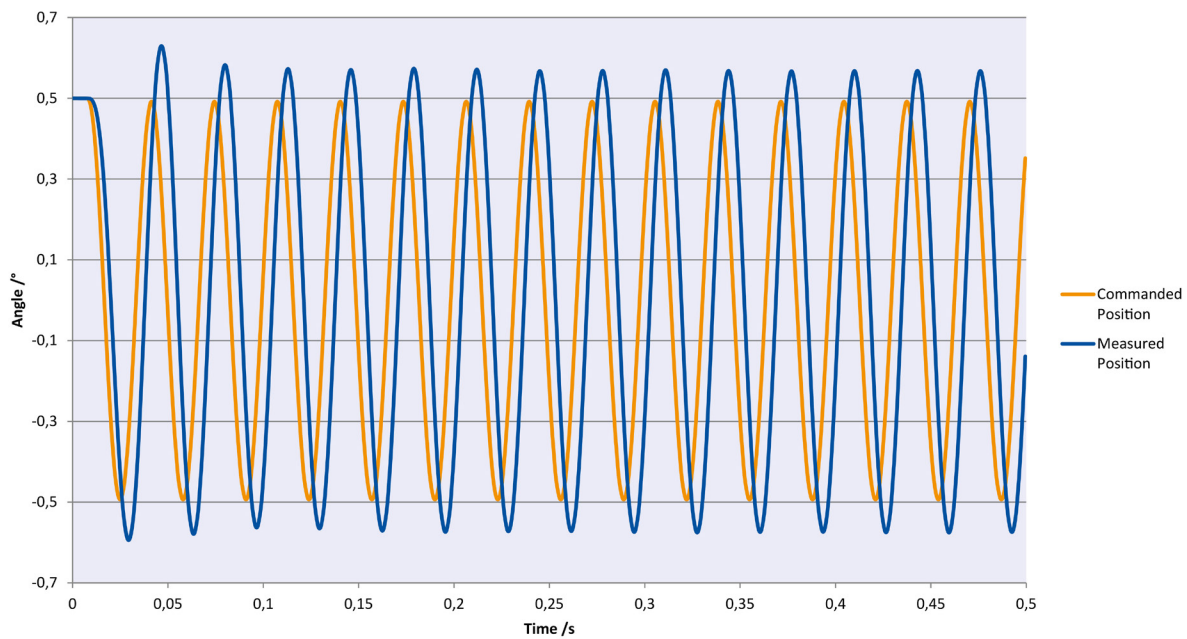
Sinusoidal oscillation with 30 Hz in ϑ_X. The H-860 follows the given trajectory precisely.
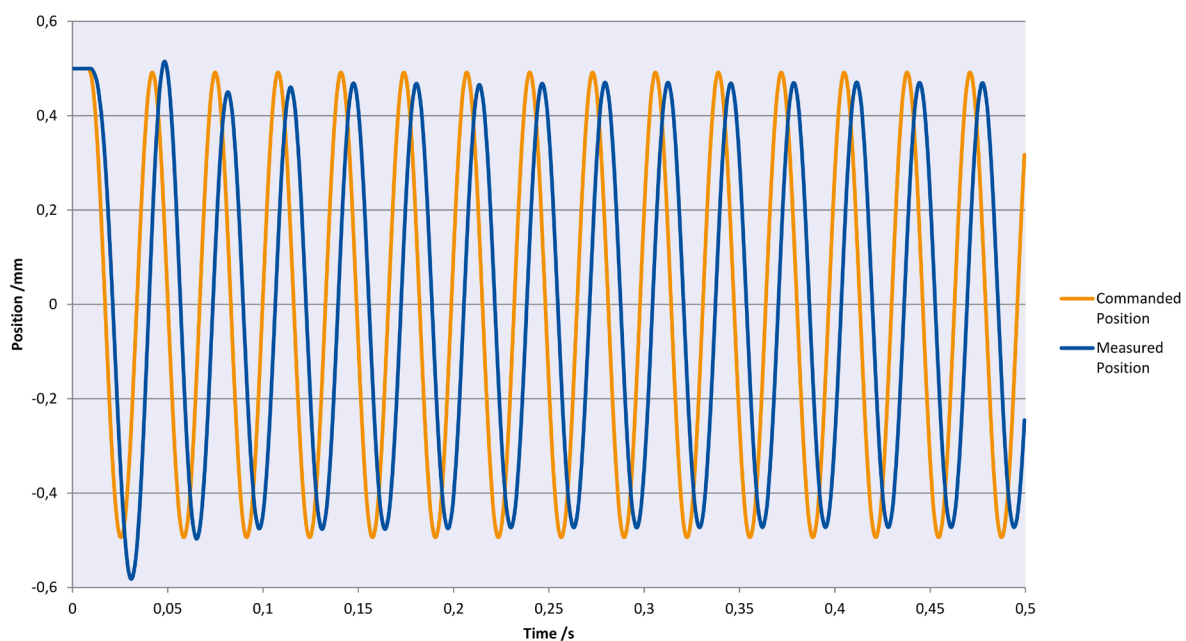
Sinusoidal oscillation with 30 Hz in Z. The H-860 follows the given trajectory precisely.

Sinusoidal oscillation with 30 Hz in Z, amplitude 0.5 mm. Due to the high dynamics and low mass being moved, the H-860 can simulate accelerations precisely. The acceleration was measured in Z direction with an external acceleration sensor directly at the motion platform.
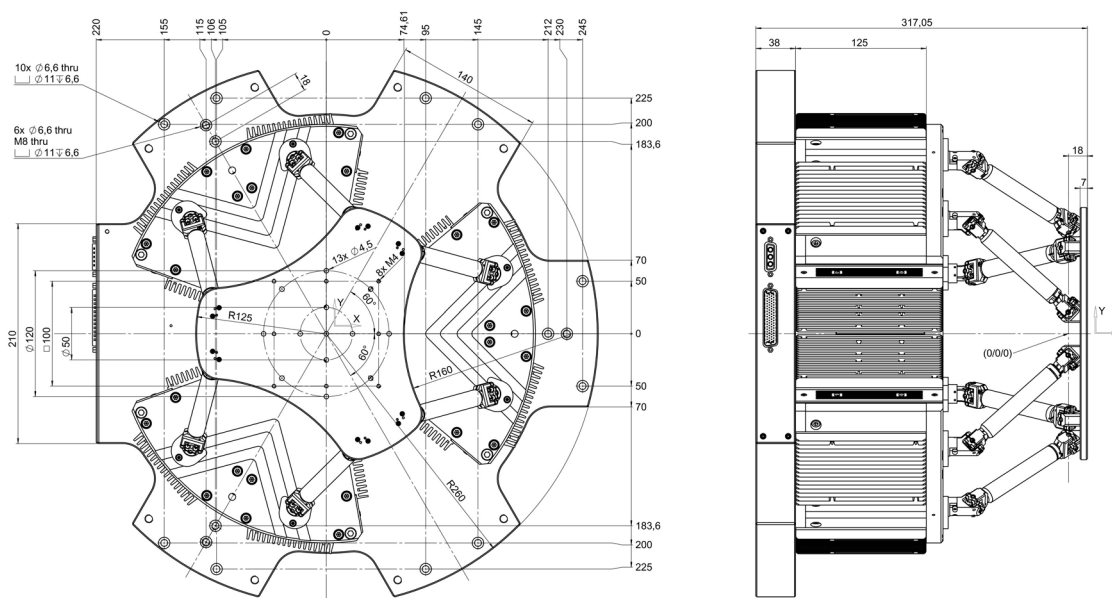
H-860.S2H, dimensions in mm

Ordering Information

H-860.S2H

High dynamics Motion Hexapod Microrobot, Voice coil, 1 kg Load capacity, 250 mm/s max. Velocity, Flexure joints, High-performance power supply, 3 m Cable Set